

The Business Case for Sustainability - The Aviva Stadium

Pat Kirwan, Scott Tallon Walker Architects, discusses why the Aviva Stadium provides an example of how sustainable design and construction choices not only benefit the environment but also increase the economic viability of a business.

'Sustainability, 'energy efficiency', 'environmental design' – these are all topics that are becoming part of everyday discussions. But are they just buzz words used to add 'green wash' to a project's credentials, or do they promote a more sustainable future when incorporated into design or an organisation's corporate policy? Putting forward a business case for sustainability not only ensures that topics such as 'energy efficiency' are more than just phraseology but can add true environmental value while providing a return on investment.

While the environmental benefits of sustainability are widely accepted and undeniable, there is often a perception that integrating it into a design brief or corporate policy may be cost prohibitive, particularly in the current economic climate. However, making a business case for sustainability is fast becoming an essential part of sustainable design. Building regulation standards are increasing rapidly as targets in reducing Green House Gas Emissions are ever increasing while project budgets are decreasing. Developers and businesses need to realise that investing in sustainability today will not only shield them against the uncertain future of rising fuel costs and extra taxes but create new business opportunities. Incorporating an ethic of good economic and environmental stewardship into a company's business

model will benefit its long term economic viability through securing its supply chain, while also adding value to its services via integration of Corporate Social Responsibility commitments into its policies.

The Aviva Stadium, one of the largest construction projects in Ireland in the recent past, puts forward an excellent business case for sustainability. It highlights that integrating sustainability into the design can not only benefit the environmental impact of the building but also helps to secure its long term economic viability. The Aviva Stadium replaced the oldest international rugby ground in the world – Lansdowne Road Stadium. The new stadium sits within the site boundaries of the older stadium which ensures not only that the site usage has remained the same but also that it continues to be one of the most centrally located stadiums in Europe, within walking distance of the city centre and served by a range of public transport. The Aviva also acts as model stadium in terms of sustainability, having won the Irish Green Building of the Year, 2011 and the Green Entertainment & Leisure Award, 2012.

Sporting and event venues cater for many different activities. As such, intensity and duration of usage varies widely resulting in many venues experiencing periods of low energy usage and then a spike of vast amounts of usage during events. Energy efficiency through sustainable design measures can reduce energy consumption and as such lessen the environmental impact as well as operational costs. The Aviva Stadium's form and mass are defined by the site and the adjoining

neighbourhoods with the North Stand curving down to a single tier clad with a transparent façade which maximises natural daylight to adjacent properties. The translucent nature of both the roof and façade not only benefit the adjoining properties but also help to maximise natural lighting within the stadium bowl and internal accommodation, resulting in a reduction of energy usage due to lower artificial lighting demands.

During a sporting fixture or a concert, the energy required to run the stadium is primarily sourced from on-site diesel powered generators to ensure continuity of power in the event of a national grid outage. As well as making good business sense this choice of energy source also has beneficial environmental implications. The carbon emission factor of 1 kWh of energy sourced from Diesel Oil is approximately 50% less than that of 1 kWh of energy sourced from the national grid. To give an example, during the Irish Rugby teams world cup warm-up game against France in 2011, approximately 52,000 kWh of energy was used which generated carbon emissions in the order of 13.7 tCO₂. The saving on carbon emissions by using Diesel generators were equivalent to those generated by an average household over a period of four years. The generators are also designed to recover heat given off during their operation which in turn can be used to pre-heat water used in bathrooms and kitchens thereby further reducing energy requirements.

Despite Ireland's mild climate and abundance of rain, water shortages are frequently experienced, making it essential to conserve this, one of our most precious

1. The Aviva Stadium sits within the site boundaries of the former Lansdowne Road making it one of the most centrally located stadiums in Europe
2. During a sporting fixture or concert the energy to run the stadium is primarily sourced from on-site diesel powered generators reducing carbon emissions by approx 50%
- 3/4. Materials with low environmental impacts were specified throughout from the water-based resin flooring to the timber used in joinery elements.
5. The translucent nature of both the roof and facade not only benefit the adjoining properties but also help to maximise natural lighting within the stadium



natural resources. In addition, the advent of water charges in the near future makes water conservation financially appealing. The stadium utilises a number of water conservation measures such as waterless urinal bowls and troughs, sensor taps and dual flush toilets throughout. It is estimated that a saving of 400,000 litres of water is achieved through these measures throughout an average year in the stadium. In addition, rainwater is harvested, treated and stored for use in the pitch irrigation system which has a capacity for six days irrigation.

The stadium's waste management strategy is built on the premise of remove, reduce, recycle. A dedicated waste management area is installed to cater for the high volumes of waste generated by over one million people visiting the stadium annually. The stadium recycled on average 62% (or 102 tons) of all waste generated in 2011. The high recycling rate generates a healthy financial stream for the stadium while also benefitting the environment. A similar approach is taken to the grass cuttings from the pitch, with all cuttings being sold for compost.

Large sporting organisations and big business corporations are beginning to focus and take preference on service providers that take a sustainable approach to their business. The Aviva Stadium is a sustainable venue certified to BS 8901: 2009 which benchmarks sustainability management systems for venues and operates under headings of environmental, social and economic. Social aspects include an annual community fund of €100,000 being made available for local community projects which, along with employment opportunities, integrate the local community into the operations of the stadium. Supply chain procurement prioritises nationally or locally sourced products and services where possible. Sustainable venue certification has enabled the stadium to successfully compete for a number of major sporting events including the Europa League Final 2011 and the Heineken Cup Final 2013, while also attracting major corporations for non-match day events such as the Nokia global conference and, more recently, the global launch of BMW's new hybrid car at an event to discuss the future of green motoring.

Continued operational awareness and commissioning of the various heating, lighting and electrical systems have led to further reductions of energy usage since the opening of the stadium. Adjustments to the internal environment temperature have generated a 12% saving on gas usage in 2011. Electrical usage for 2011 has been reduced by 26% compared to the same period in 2010 and usage continues to fall as the operations team implements energy conservation measures to suit various activities at the stadium.

The stadium's success in its business model can also be attributed to the high quality of the interior fit-out of the various spaces. Materials with low environmental impacts were specified throughout from the water-based resin flooring to the timber used in joinery elements. The material with the potential to have the largest environmental impact due the volumes used was concrete. A ground granulated blast slag (GGBS) constituent was specified for use in all in-situ and precast elements. This not only saved approximately 4000 tCO₂ in embodied energy compared to if a more conventional Portland cement based concrete had been used, but also achieved a high quality finish. This saving in carbon dioxide is the equivalent of taking approximately 1,280 cars off the road for one year. Putting forward a business case for sustainability may be unique for all businesses and individuals and may not always have the 'societal case' at its core. However, there is an increasing body of evidence proving that organisations which foster sustainability thinking and practices enjoy positive benefits, and that companies who take the lead on sustainability will be market leaders.

The AVIVA in Figures

- Saving an estimated 400,000 litres of water each year
- Using GGBS saved approximately 4000 tCO₂ in embodied energy
- The saving in carbon dioxide is the equivalent of taking approximately 1,280 cars off the road for one year
- The stadium recycled 62% of all waste generated in 2012
- Powering the stadium from a diesel oil generator results in 50% less carbon emission than energy sourced from national grid
- Electrical usage has been reduced by 26% in 2011, compared to 2010
- 100,000 Euro is spent on an annual community fund

