

**Mhora Samuel** explains some of the environmental challenges and opportunities for new-build theatres in a zero-carbon world.

# Zero-carbon theatre



**Mhora Samuel**  
The Theatres Trust

What will a new theatre building look like on Zero Carbon day? No one really knows right now, but what's certain is that we can't wait until 2019 to find out. 2019 is when the Government expects all new non-domestic buildings to be netting off their CO<sub>2</sub> use and making sure that they are not responsible for releasing excess CO<sub>2</sub> into the environment. In the West, it is estimated that the built environment accounts for around 47% of CO<sub>2</sub> emissions; non domestic buildings account for about half of that. Theatres are clearly a tiny percentage of this (and, contrary to popular perception, lighting is only about 20% of a theatre's total energy input). But they speak volumes – literally, and are in the spotlight when it comes to leading the way. Whether it's the energy efficient lights on the flytower of the National on the South Bank in London or the high profile wind turbine in rural Glyndebourne, when a theatre does something (or when it doesn't) it grabs the headlines and people notice.

In 2019 audiences will still be going to the theatre, and, given our technological age, the live event is likely to become even more of a premium experience. It's also clear that no one wants to stop the wheels turning – a slowdown in the economy isn't good for anyone. The powers that be just want to make those wheels turn a lot greener. If we don't do it voluntarily, governments will start to make it harder (and more costly) for us to operate until we do.

In the past two years the structural and mechanical engineers who direct the environmental design of theatre buildings have seen massive changes in their role. Energy management expectations are now high. The solutions are being worked out, tested, prototyped and developed – but slowly. New energy-efficient lights for

public areas, and potentially also for theatre lighting, are being developed. There is also a greater readiness to look at energy-efficient plant, and use of available renewable sources of energy and cooling such as ground heat, wind, sun and water.

What's also clear is that one solution won't fit all. It is going to depend as ever on the location, footprint, type, size and scale of the theatre that's being built, and the expectations of the producers, artists, managers and audiences who will make use of it. Right at the start of a capital project, architects, theatre consultants and engineers will need to determine the overall energy performance of the building and incorporate that into all aspects of design. When the Building Regulations ask for a zero-carbon rating on Part L (they don't as yet, but I'm sure they soon will), a project that's not able to deliver will have to go back to the drawing board. Designing a theatre that will run up huge electricity bills and isn't managing its water and waste will be unacceptable in the future.

To keep the wheels turning, the theatre needs to continue to offer the best quality experience to its audiences and the best facilities for presenting shows. If new theatres succeed in doing this, there will also be the satisfaction of knowing that it is happening in an energy-efficient building. All public buildings will at some time be required to work out their energy efficiency and put up Display Energy Certificates – audiences will know how the theatre is doing and expectations will be high. But how will an existing theatre reconcile a 'cooking' auditorium with a poor energy management rating? This will be particularly testing for Victorian and Edwardian theatres built in an age of open fires burning coal.

New build only represents about 1% of building stock in the UK, and there's a longer distance to travel for existing and historic theatre buildings. But the time will come when we'll be re-employing older environmental management systems with energy-efficient mechanical assistance to keep the auditorium cool, reviewing the use of glass in designs, being more careful about managing solar gain, and looking at the use of new materials that hold in heat. Adaptation and retrofitting will be key to reducing our carbon footprint.

Much that needs to happen is uncharted, but construction and design industries have been moving forward. The technologies and materials developed in the course of creating zero-carbon homes is slowly coming our way. As more theatres take the issue seriously, undertake carbon audits, look at ways to replace inefficient boilers and harness renewables, the need is to make sure that this practice is being shared and that we have the specialists who will be able to offer professional advice.

At The Theatres Trust our role is to help facilitate this exchange of practice and feed theatre's views into policy-making. Our annual conference next month will provide the chance to hear about the initiatives that are being planned and implemented, from introducing carbon comfort into the Royal Shakespeare Theatre's Transformation project to the work on the Royal Festival Hall. We'll be covering the work at the National and at Glyndebourne and have updates from the Arcola Theatre and the Ambassador Theatre Group. Theatres are taking this seriously and we want to ensure that the experiences are being shared. Delegates will have the chance to weigh up different approaches and hopefully find answers for their own theatres.

Zero-carbon may be nearer than you think. It takes on average about 5–10 years to fully plan, design, raise finance, construct and open a new theatre. The more we are all able to understand the issues, and work with the architects, theatre consultants and engineers to get what we want the better it will be. In 20 years time I hope that we will have managed to create the totally green solution to keeping the auditorium cool, but I also hope in so doing that the experience of going to the theatre will remain as spectacular and memorable as ever. ■

*Mhora Samuel is Director of The Theatres Trust, whose annual conference, Building Sustainable Theatres, will take place on 10 June at The Cottesloe Theatre in London.*

*w: [www.theatrestrust.org.uk](http://www.theatrestrust.org.uk)*

<sup>1</sup>DTI 'Our Energy Challenge. Power from the people' (2006).

<sup>2</sup>Based on the energy consumption of the building as recorded by gas, electricity and other meters. It is accompanied by an Advisory Report that lists cost-effective measures to improve the energy rating of the building. Display Energy Certificates are required for buildings that are occupied by a public authority or an institution providing a public service, that are frequently visited by a large number of persons, with a total useful area greater than 1,000m<sup>2</sup>. The requirement for Display Energy Certificates comes into effect on 1 October.



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