

Conference 08 Report

Building Sustainable Theatres

10 June 2008

The

Theatres

Trust



Protecting theatres for everyone

Conference Chairs

- Nigel Hinds**
- John Vidal**
Environment Editor, Guardian
- Ruth Eastwood**
Chief Executive, Leicester Theatre Trust
- Ian Blackburn**
Capital Projects Director,
Southbank Centre

Contributors

- Rt Hon Margaret Hodge MBE MP**
Minister for Culture, DCMS
- Sunand Prasad**
President RIBA, Senior Partner,
Penoyre & Prasad
- Richard Simmons**
Chief Executive, CABE
- John Graham**
Chief Executive, Historic Scotland
- Ruth Mackenzie OBE**
Expert Adviser, DCMS
- Peter Gingold**
Executive Director, TippingPoint
- Kirstin Warley**
Consultant Professional Support
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- Mark Watts**
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Actor, impressionist and WWF
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- Dr Ben Todd**
Executive Director, Arcola Theatre
- Gus Christie**
Executive Chairman,
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- Donna Munday**
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Principal, Short and Associates
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- Mark White**
Chairman, ABTT
- Ian Smith**
Partner, Max Fordham
- Stephen Jolly**
Group Director, Building Services
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- Peter Wilson OBE**
Project Director, RST Transformation,
Royal Shakespeare Company
- Rab Bennetts OBE**
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- Kevin Faulkner**
Premises Manager, Theatre Royal,
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- Natalie Lewis**
Environmental Officer, Ambassador
Theatre Group
- David Richards**
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- John Langley**
Theatre Manager, National Theatre
- Lee Collins**
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- Ben Robinson**
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Mhora Samuel

Director, The Theatres Trust



The aim of The Theatres Trust is to enable effective planning to secure, improve and achieve sustainability for theatre buildings throughout the UK.

By bringing together theatre consultants, architects, industry trade associations and organisations, venues, educational establishments and theatre practitioners from all disciplines, artistic and technical, Conference 08 was able to help theatres plan for a future where climate change will be a major influence.

I would like to thank the many contributors, sponsors, staff of the Trust, the Cottesloe and National Theatre and the Southbank Centre and the delegates for their energy, enthusiasm and dedication, which all went to make the conference a resounding success. Over 200 delegates attended the event, which chair John Vidal described as the most important conference they were likely to attend this year.

The end of this report includes a series of Theatres Sustainability Principles drawn from the proceedings of the day. In the first instance the Trust will be focusing on developing advice on Display Energy Certificates, including benchmarking and sharing experiences of their implementation among theatre owners and managers.

A further principle from Conference 08 related to harnessing the influence that theatres have on their audiences to promote awareness of climate change. However, the ways in which theatres need to be designed now and in the future to attract those audiences is similarly changing as a result of environmental, and economic, cultural and social influences.

To look at this further, Conference 09, 'Experiencing Theatres', which will take place on 9 June 2009, will consider ways in which theatres' architecture and design is meeting audiences expectations, can make the invisible visible, and what factors will be important in designing and improving theatres to attract their future audiences and ensure their place at the centre of our communities.

I look forward to welcoming you next year.

Nigel Hinds

Conference 08 Chair



The Theatres Trust's Conference 08 Building Sustainable Theatres proved that we all have something to learn when it comes to sustainability and its implications. A day for exploring ideas, looking at solutions and asking awkward questions, it was hugely rewarding as it opened access to keenly sought after information and helped people and organisations feel confident in taking more informed action.

Climate change is of course a human issue. To combat it and protect our future we need vision, common sense and past experience. Simply put, no action is too small to make a difference, and our impact will be all the greater the more we work together. In this spirit, the conference gave a direct insight into what individuals and organisations can already achieve given determination and knowledge.

In all it does, theatre makes visible the invisible and the complex. From how it conveys its messages to how it manages its buildings, theatre sets a powerful example to the public at large. To do this well theatre professionals need to understand what's going on in their buildings, to gather and learn from accurate data and take positive action. It is no longer an option to remain ignorant of our buildings and their sustainability, of the power that is used or the waste that is produced. These matters are not someone else's responsibility, they are ours.

Wherever we work in theatres, be we artists, technicians or administrators, we can develop effective partnerships. Whether forming procurement alliances, sharing information or advancing benchmark standards, there is experience readily available for us to learn from and to share. Working together we have the tools to put into practice truly effective strategies for sustainability.

Theatre wields a disproportionate influence on society, and always punches far above its weight. The challenge of climate change gives us the opportunity and the responsibility to use this influence now, championing the role of sustainable practices in creating a healthier and fairer global environment for us, our children and generations to come.

Introduction

On the 10 June 2008 over 200 people gathered at the Cottesloe Theatre to consider how theatres could reduce their carbon footprint. The day was opened by Margaret Hodge MBE MP, Minister for Culture and closed with an inspiring speech from Peter Head. This report provides a synopsis of the day, highlights comments made by the contributors and offers a series of Theatres Sustainability Principles arising from the conference.

For attenders at Building Sustainable Theatres the conference was about understanding how they could respond positively to the impact of climate change, pick up ideas, make new contacts, become more informed and develop a meaningful, sustainable approach to their own operations.

Conference 08 proved that there's a genuine desire to achieve a better level of sustainability amongst theatres, while the required level of knowledge has yet to be acquired. When it comes to sustainability the theatre industry, as with many others, is in its infancy. But there are clear leaders in the sector, and we were delighted that many of them contributed to the day and shared their experiences and leadership with us.

The Conference Chairs, in particular Nigel Hinds who convened the whole day, and John Vidal, the Environment Editor of the Guardian, deserve special thanks alongside Ruth Eastwood and Ian Blackburn, in helping to guide the day and bring the best out of contributors and attenders.

And once again without the sponsors, ABTT, ETC, Arup, Carr & Angier, Charcoalblue, Harlequin Floors Northern Light, Theatre Projects Consultants, White Light, and the support of Max Fordham and all the staff at the National Theatre and the Southbank Centre, Lighting & Sound International and The Stage, The Theatres Trust would not have been able to host the event.

This report looks at the challenges that artists, technicians, designers, consultants and venues face now and in the future. It picks up on the energy-related climate change and building legislation that will affect theatres, and offers guiding principles for the future.

We hope you find this a useful, informative document that helps your theatre to start the journey along on the road towards a more sustainable future.

Chair, John Vidal
Environment Editor, Guardian

Rt Hon Margaret Hodge MBE MP
Minister for Culture

Sunand Prasad
President RIBA, Senior Partner,
Penoyre & Prasad

Opening Address

Margaret Hodge took the stage of the Cottesloe Theatre to formally welcome delegates to Conference 08. Leading the debate she said that climate change is one of the greatest challenges facing the world today. And whilst the theatre sector may not be the largest contributor to carbon emissions as a creative and innovative industry it has the potential to be a driving force for change by inspiring audiences.

"Theatre is ideally placed to show audiences what is possible; to set a good example in the way its buildings are run; to reflect what is happening in society and to show people that living a lower carbon lifestyle is something to be excited about, to be energised and inspired by."

Margaret Hodge MBE, MP

For her, developing sustainable theatres by meeting the environmental challenges of climate change and rising energy costs also made good business sense such as the exemplar National Theatre and Philips partnership. Hodge also gave a brief overview of the work of the DCMS and its own Sustainability Action Plan and its sustainability web-based resource for the cultural sector.

Concluding, the Minister called for everyone to work together in partnership to take action to reduce the cultural sector's carbon footprint, through putting in place strategies for the long term, reducing our energy use, and promoting activities that engaged with the public to improve awareness and understanding.



Keynote

For Sunand Prasad climate change is a huge cultural issue. He wondered why, if humanity can develop the technology to leave the planet, take a photograph of it and return safely, it still struggled with tackling climate change. Whilst the Earth will adapt to change the real question is, could humanity? He introduced the concept of 'contraction and convergence', where safe target concentration levels are agreed and then allocations are defined for each country.

Prasad identified that theatre has a disproportionately positive impact in society to the level of its carbon emissions. He encouraged everyone to follow good building management and adopt simple, inexpensive modifications to general building lighting, waste and water to demonstrate how 'no action is too small'.

"Providing you are truly conscious of the impact of what you are doing, then no action is too small. To me, that's a fantastically liberating and democratising thought - it means that everyone can do something."

Sunand Prasad

As an architect addressing the theatre sector he said, you change minds, we design buildings, politicians need to produce the frameworks which allow us all to do our work and set the targets. He left delegates with two thoughts: that theatre will always have a political dimension and it should harness its ability to deliver complex messages in a condensed way; and that theatres could create a new type of offsetting saying, "every time you change someone's mind you can have another light on in the theatre."



John Vidal asked three government advisers to give architectural, heritage and theatre perspectives on the impact of climate change.

Chair, John Vidal
Environment Editor, Guardian

Richard Simmons
Chief Executive, CABA
(Commission for Architecture and the Built Environment)

John Graham
Chief Executive, Historic Scotland

Ruth Mackenzie OBE
Expert Adviser, DCMS
(Department for Culture, Media and Sport)

Sunand Prasad
President RIBA, Senior Partner,
Penoyre & Prasad

Perspectives

Opening the first panel session of Conference 08, Richard Simmons explained how CABA is looking to transform the public response to global warming by making the invisible visible. To achieve this CABA ran the first Climate Change Festival in Birmingham in 2008. Over nine days it explored how cities might be redesigned and reinvented and how people can achieve more sustainable and enjoyable lifestyles.

He highlighted that by 2019 the Government's ambition is that every new public building will be zero carbon, including theatres. However it was important to realise that only 1% of the building stock nationally is new build, and we needed to be equally concerned with the other 99%. Simmons openly admitted he'd no idea what a zero carbon theatre would look like, and raised concerns over the impact of a theatre given a poor energy rating, pointing out that audiences are going to start asking how environmentally sustainable a theatre is and how they can get to it sustainably. He felt there would be increasing pressure on theatres to answer those questions.

He also announced that to help those commissioning new capital arts projects CABA and Arts Council England had commissioned a new Client Guide, due to be available in 2008, which will provide a check list on how to address sustainability areas including waste, energy, water, and lighting. The Guide should be useful for any client in charge of procuring public buildings and will provide guidance on the main stages of the process. The new publication will also include case studies of arts building projects including refurbishments and extensions along with entirely new buildings.



John Graham raised the complexity of incorporating sustainability into existing historic buildings as there will be a growing need to modify them to accommodate climate change, without compromising the heritage, integrity and fabric of the building.

For him the priority was to understand the physical impacts that global warming might have on older buildings. Some would be complex, others subtle, but he offered a warning that ill-informed measures taken in the name of energy efficiency could cause damage to the fabric and longer term sustainability of historic buildings.

"We've proved that older buildings, pre-war, are already reasonably energy efficient. To improve that efficiency we need to know the impact of different interventions. For example, the interventions you can take to deal with high heat loss through traditional sash and draught-proofing and wooden shutters can have a better overall carbon impact than ripping old windows out and replacing them with a manufactured double glazed unit."

John Graham

He felt that managers of historic buildings should make sustainability part of their inspection and maintenance schedule so that problems could be dealt with as they arose.

"Building managers should have comprehensive risk-based maintenance plans with targeted cycles of inspection which will ensure that problems are caught before they become big problems. This is the biggest tool you have until you have to do something major to the building. Also don't forget occupant behaviour because this is key to the energy performance of your building."

John Graham

Ruth Mackenzie, previously General Director of the Manchester International Festival (MIF), agreed that the solution to introducing sustainable practices lay with staff, suppliers and users. She championed the idea of engaging people running venues and programmes to encourage better practice in others. MIF 2007 was one of six pilot schemes for British Standard 8901, a new national standard for sustainable events management.

She pointed out that environmental and energy management policies and their implementation wouldn't work if they were only top down, and that involvement at all levels was crucial.

"Unless staff at all levels are engaged and on side this will be impossible to implement. Every small thing makes a difference and there is nothing that's too trivial to discuss. These all ease people into the enormity of the problem which can often be the excuse for people disengaging completely."

Ruth Mackenzie

"If you're looking at how to make progress in sustainability you need to look at your own practice, but also at your audience and most importantly at your suppliers. The way in which you influence suppliers to improve practice is a significant way to make an impact beyond your own practice."

Ruth Mackenzie



John Vidal invited leading environment champions to share their thoughts on improving the sustainability of theatres.

Chair, John Vidal
Environment Editor, Guardian

Peter Gingold
Executive Director, TippingPoint

Kirstin Warley
Consultant Professional Support
Lawyer, Linklaters

Mark Watts
Climate Change Adviser,
Greening London's Theatres

Alistair McGowan
Actor, impressionist and WWF
(World Wildlife Fund) Ambassador

Dr Ben Todd
Executive Director, Arcola Theatre

Gus Christie
Executive Chairman,
Glyndebourne Productions

Directions

Peter Gingold felt that it was important to deal with artistic and practical issues in the same forum, not as separate entities.

"I don't think it's clever to distinguish the practical issues to do with sustainability and climate change from the deeper artistic issues. I urge those of you who are artistic or general managers of theatres not to park it exclusively in the nuts and bolts box."

Peter Gingold

Kirsten Warley pointed out that understanding the main legal requirements relative to sustainable building - whether a new build, refurbishment or refit project was also essential. She said that we should be clearly distinguishing between the construction process, the standard of the completed building and a building's ongoing use.

Crucially, one person's idea of how we should measure the energy efficiency of a building was currently not another's. There also seemed to be a number of different definitions for zero carbon, many of which failed to account for the embodied energy of a building, i.e. the energy used to build it. She noted that the average energy expended building a new office block can equate to that expended through ten years of use.

During the later debate Energy Performance Certificates and Display Energy Certificates were criticised because their benchmarks are based on a notional building types. There was concern related to defining the notional theatre and its energy usage. To get anything positive from the law Warley felt that theatre needed to be proactive in setting its own targets, looking at how buildings can be best evaluated and what measures can be taken to improve sustainability.

"Don't wait for the law. If you really want to lead the field then you're going to have to go further and beyond what the building regulations require at the moment."

Kirstin Warley

Mark Watts described how London has set targets for a 80% or 90% reduction by 2050 with a 60% target for 2025. As buildings generate 50% of the West's carbon emissions, for Watts it was common sense to begin by improving efficiency of existing buildings.

"London theatres produce 50,000 tonnes of CO₂ compared with London's overall emission of 44 million tonnes. However theatre can play a totally disproportionate role in terms of its ability to communicate with seven million Londoners."

Mark Watts

Actor Alistair McGowan said he was rarely in any one venue for long enough to set standards. He suggested that actors should be advised on a venue's environmental policy at the same time they get the mandatory health and safety talk.

Dr Ben Todd of Arcola Theatre stressed that sustainability is part and parcel of looking at world equity and social justice, not just the nuts and bolts of energy usage. He explained how we could all change something for the better and that money is not, as many would have it, the issue. Todd described how Arcola had found clever ways to work symbiotically with suppliers to maximise mutually beneficial publicity and PR. Grabbing the headlines, they had raised awareness of the wider climate change issues throughout the industry and beyond.



"One of the big issues with sustainability is people take it very seriously, not in a kind of doing things way but in a kind of didactic - we must discuss it and understand it - way. The concept of a carbon neutral theatre is a beautiful concept. Think of it as an artistic expression."

Dr Ben Todd

"Theatres need to green from the stage door to box office, from the first production meeting to closing night and make sure were doing everything we can to make our work sustainable and environmentally friendly."

Alistair McGowan



Arcola had also done much of what is perceived as the boring stuff, but in an attempt to open up the wider debate, Arcola also installed its own hydrogen fuel cell.

"When you tell a lighting designer he or she has 5K to light a show using the fuel cell they have to rethink their usual approach - a great way to motivate artists to think about what they are doing, how they do it and how they can change it for the better."

Dr Ben Todd

The session closed with Gus Christie, who eloquently told the story of Glyndebourne's wind turbine. The site is on the South Downs in East Sussex which is an area of natural beauty. The turbine had its fair share of objectors and the application went to Public Inquiry. However, as Christie pointed out, the 850Kw turbine will provide all Glyndebourne's electricity needs and reduce direct carbon emissions by 70%: about 850 tonnes of carbon per year. Since the conference, the Inquiry concluded that the benefits of the turbine outweighed any negative impact and it got the go-ahead.

The cost of the turbine together with the Public Inquiry was around £1.2m. He described that with current electricity bills around £120,000-150,000 per year and rising, payback should be eight years or less, and that it made total economic sense.

"We're backed by David Attenborough and Sussex Enterprises. Both believe Glyndebourne's turbine sets a good example for businesses and individuals in the local area. We're committed to launching a public awareness-raising, programme over and above the turbine's physical presence. Our education department will work with local schools to promote understanding and we're committed to becoming an established centre for conferences on renewable energies for local business."

Gus Christie

The first of the afternoon sessions looked at the planning and management of capital arts developments for a zero carbon 2019.

Chair, Ruth Eastwood
Chief Executive, Leicester Theatre Trust

Donna Munday
Arts Management Consultant

Alan Short
Principal, Short and Associates Architects

Alistair Fair
Buildings Conservation Group, Alan Baxter and Associates

Mark White
Chairman, ABTT (Association of British Theatre Technicians)

Ian Smith
Partner, Max Fordham

Stephen Jolly
Group Director, Building Services Design, Buro Happold

Peter Wilson
Project Director, RST Transformation, Royal Shakespeare Company

Rab Bennetts OBE
Co-founder, Bennetts Associates Architects

Developments

Chair Ruth Eastwood introduced freelance consultant Donna Munday who talked about her experience as a client on the Royal & Derngate, a combined redevelopment and complete restoration of two theatres on the same site in Northampton. Donna pointed out how important it was to have a good working relationship with local authority officers responsible for planning and building regulations before starting any project. If the building was listed this included the Conservation Officer. She emphasised the need to be confident about the business case and be prepared for the inevitable rise in project costs.

Dr Alistair Fair then introduced the 'Designing Dynamic Environments for the Performing Arts' project. In studying the plans of work of six different projects, including Contact Theatre, Hackney Empire and the Lighthouse in Poole, the teams at the Universities of Salford and Cambridge led by Alan Short, discovered that value-engineering exercises quickly cut efforts made towards sustainability. Often design elements crucial to the original vision were lost. Short and

Associates Architects were subsequently engaged to update the existing CABE and Arts Council England Capital Arts Projects Client Guide, referred to earlier by Richard Simmons.

"The ACE/ CABE Guidance expands and picks up on the issue of building sustainability into the entire process. It is not enough to design a building then bolt on some sustainable features. The entire design and conception of the building should reflect sustainability at all stages."

Alistair Fair

One area where improved energy efficiency can be raised considerably is in cooling and heating. Short, a proponent of naturally ventilated environments said that until Willis Carrier invented air conditioning in 1908, all theatres were naturally ventilated.



"The enormous heat loads associated with theatres would drive huge amounts of air through the space. The future is in the development of hybrid strategies where there's some mechanical cooling available if you really need it. The trick is to keep it switched off as long as possible by getting the basic design geometry of the building right. I would be very surprised if the theatre built before the 1920s could not go back into this kind of shape without too much effort – it certainly started out life as a naturally ventilated object."

Alan Short

He pointed out that well designed natural ventilation can facilitate a drop in temperature in a fully occupied auditorium to almost uncomfortable levels and that this would require a huge air conditioning system to achieve the same result.

In a bid to help theatres get the most out of EU and government legislation, in 2008, ABTT revised its technical standards publication aimed at places of entertainment. As Mark White said it "now weaves in guidelines on sustainability and the latest building regulations, ensuring we get it right from the beginning".

In an interview with White, Ian Smith stressed the importance of establishing the demand profile of a building. Once this is understood it's much easier to address energy efficiency and make use of the various options available.

"There's a lot of green wash around and much green rush into green technology. It mustn't be displaced. What we need is green hush, to get on with it quietly, sensibly, responsibly."

Ian Smith

At £112.8m probably the biggest capital theatre project taking place in 2008 is the transformation of the Royal Shakespeare Theatre. Stephen Jolly gave a short presentation on the project after which its architect Rab Bennetts observed that, opening and operating a sustainable theatre is a lifetime commitment.

"The project has looked at the overall organisation and structure of the RSC as a performing company in Stratford and London. The whole of its estate in terms of its built assets and how they're used, where offices, rehearsal spaces, education spaces should be sited as part of a mass plan, how it sits in the local community of Stratford and the wider parts of the West Midlands and the organisational structure that's required to take the RSC as a company forward into the future."

Stephen Jolly

The most important thing was to ensure that once the building was completed the RSC knew how best to use the venue and how to improve it. The project includes monitoring of energy consumption of the building over the longer term to be able to provide feedback and allow occupants to learn. Bennetts talked about the importance of Post Occupancy Consultancy. In offices, as yet untested in theatres, this can improve building performance by an impressive 30%. Peter Wilson agreed: "You can design a building that's green and sustainable but it takes will on the part of the inhabitants to use it in the right way."

Stephen Jolly added that there isn't enough data in the theatre industry at the moment to provide specific set targets and that they had had to set their own. He explained how difficult it is to explain to directors how their artistic decisions affect the carbon footprint of their building.

In the final session, Ian Blackburn invited contributors to speak about practical adaptations they had made to theatres to improve their sustainability.

Chair, Ian Blackburn
Capital Projects Director,
Southbank Centre

Kevin Faulkner
Premises Manager, Theatre
Royal, Plymouth

Natalie Lewis
Environmental Officer,
Ambassador Theatre Group

David Richards
Building Group Leader,
London, Arup

John Langley
Theatre Manager, National Theatre

Lee Collins
Deputy Director, Theatr Brycheiniog

Ben Robinson
Director, Dulas Solar, Low
Carbon Partnership

Adaptations

Kevin Faulkner of Plymouth Theatre Royal had some very practical solutions. Using a kettle to represent the stage area and a light bulb for the rest of the theatre he insightfully illustrated that, in terms of power consumption, the light bulb is more energy hungry than the kettle. If you accept the kettle is only on three or four times a day and the light bulb 24 hours a day, then - in a 24 hour period - it's the light bulb that consumes most energy. With that logic in mind Faulkner had taken a long hard look at the systems running 18-24 hours a day at the Theatre Royal, Plymouth to see where most energy was consumed.

A champion of Building Management Systems (BMS), Faulkner achieved huge savings by 'looking away from the glitz and down into the dungeons!' He found that general lighting, computers, heating, air conditioning and staff habits were largely responsible for resource waste. By modifying how and when they were used or on he made considerable savings and Theatre Royal Plymouth became the first theatre in the UK to receive the Carbon Trust energy efficiency award. By plugging his BMS back in and fine tuning it, since 2002, the Theatre Royal has reduced its annual electricity consumption by 19%; gas by 46%, water by 33% and CO₂ by 33%.

With an estate of 23 very different theatres Natalie Lewis adopted a more formal approach. In developing an environmental management policy, she addressed the importance of setting realistic targets, and engaging staff at all levels. To help implement the policy a forum for sharing ideas and developing best practice has been initiated across all ATG venues in association with the ABTT.

In response Ian Blackburn emphasised that legislation will soon drive actions and the sooner the theatre sector gets on board the easier these legislative demands will be to implement. David Richards agreed as he introduced EPCs (Energy Performance Certificates) and DEC (Display Energy Certificates), both of which will be law by October 2008.

"An EPC is a bit like when you buy a new car and you get a manual outlining the car's performance i.e. what it should do in a set of standard conditions. The DEC is like your MOT, it tells you what the car is actually doing."

David Richards

The National Theatre - a huge consumer of energy - set itself a target in 2006 to cut energy consumption by 20% in two years. John Langley explained that the buildings were surveyed and the company took advice from the Carbon Trust amongst others. Surprisingly a large amount of energy was being used overnight running boilers and chillers, computers and other electrical items.

The theatre's visionary chief engineer quickly changed boiler burners from fixed to modulated, instantly reducing gas consumption by 18%. The National Theatre also formed a relationship with Philips Lighting, and its public areas will provide a showcase for the latest Philips energy efficient lighting technology.

Taking the renewable energy-source route, Lee Collins talked about the process of installing photovoltaic cells on Brecon's Theatr Brycheiniog's south-facing roof, saving around £1,000 per annum in energy bills and cutting carbon emission by 5,000kg. Whilst this is a reasonably modest saving the theatre could see the benefits of the associated education programmes and the impact it would have on visitors and audiences. The initial obstacle for Collins was cost and a lack of knowledge when it came to funding applications.

With the help of his installer Dulas Solar, Collins approached the Department of Trade and Industry's Low Carbon Buildings Programme securing half the money, which was then match funded by two companies. Obtaining the funding was relatively easy. Large energy companies have Corporate Social Responsibility programmes and are looking to make commitments to environmental initiatives.

When it comes to funding Ben Robinson explained that there is a £40 million fund remaining in Phase 2 of the Low Carbon Building Programme allocated to public buildings, 'not for profit' organisations and charitable trusts. The technologies that can access this funding are ground source heat pumps, biomass boilers and solar thermal technology. The maximum capacity allowable for the grant is 45Kw of heat. For others such as photovoltaic and wind the maximum is 50Kw. Match funding is available through the Community Sustainable Energy Programme managed by BRE, but there are other pots available locally and nationally.

Closing Address

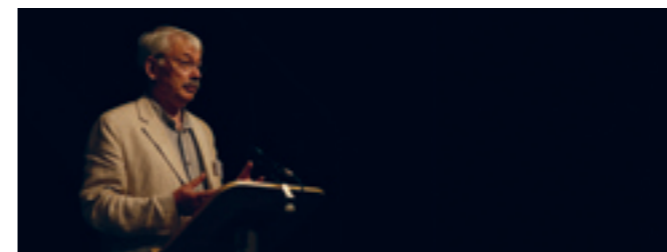
Peter Head brought the conference to a close with an inspired and uplifting address. He stated that to solve world-wide climate change issues we needed to engage people and communities culturally to take action, and examine how best to retrofit the built environment so it performs in a more energy efficient way.

"Theatres create communities every day with every performance or shared experience. There's a powerful opportunity to reconnect people with cultural roots of sustainable development and help communities to change. There's a big opportunity for theatres to play a major role in combining the socio-economic dimensions of community, education and learning and sustainable development into a new paradigm. The theatre can become a central hub in partnership with schools, engineers and other people to help communities to grow and change."

Peter Head

He made the point that those who refer to GDP as the measure of growth encourage over-consumption of resources, which destroys our ecosystem. In 1900 each person on the planet had about eight hectares of land to support them. Today we each have about two. To redress this balance we need to retrofit cities and the rural environment in a significant way. The only way to do this fast enough is at a regional level, improving energy, water and waste efficiency, greening the environment, improving transport systems and enabling people to walk, cycle and use public transport.

Head offered guidance for the way we design theatres and use technology in the future - 'smart, responsive, simplicity rather than rigid complexity'.



Round Up

This call for simplicity was echoed by Nigel Hinds, Conference Chair, in his closing remarks.

"The way that theatres should refashion is not to make more and more layers of complexity but less and less: more flexibility, making things less complex and therefore easier to maintain, adapt and change."

Nigel Hinds

One of the big areas of concern arising from the day's debate related to benchmarking. With the introduction of DECs and EPCs, Hinds asked, how we might establish standards for theatre buildings so that new certificates can be applied meaningfully and easily? He also touched on the influence of theatres.

"Theatre's role is in making the invisible visible. This relates to the way that theatres convey messages, but also to helping others understand what's going on in your building, sourcing accurate data, facing up to what's there and using common sense to find your way through."

Nigel Hinds

He stressed that all our actions are connected, and that we make more of an impact working together in partnership than we do as individuals. With the help of The Theatres Trust and other organisations, we can nurture partnerships, procurement alliances and the sharing of information.

As Conference Chair, Hinds thanked everyone for their contributions and invited all attendees to move on towards a more sustainable future.

Theatres Sustainability Principles

Conference 08 contributors and delegates discussed how best to reduce energy use and the carbon footprint of theatres. A number of principles emerged. Summarised below, these fall into four distinct areas. In the first instance they focused on what could be done right now to reduce energy consumption. These included immediate actions and longer term adaptations to buildings. Secondly was how best to harness renewable energy sources once energy management reductions were underway. For those considering major capital projects there were thoughts relating to design and building regulations. Finally, the principles behind the leadership that theatres had demonstrated throughout the day offered a route map for others to follow.

Reduce energy consumption

Commit to producing short, mid and long-term plans to reduce the effects of climate change on your theatre, help save you money, and make you more sustainable. No action is too small. Simple and inexpensive actions on a regular basis will help in the short term.

Evaluate the operational demand profile of the whole building. With the introduction of Display Energy Certificates there will be more advice on obtaining accurate data on building energy consumption, usage, how much and where. With this you can start to manage your theatre better.

Understand your Building Management System (BMS) and make sure it's tuned for optimum energy efficiency.

Become a good house keeper. In the mid-term a well thought-out and regular maintenance routine with targeted cycles of inspection which ensures all equipment and plant is well maintained will help. Regular attention to the fabric, plant and equipment, insulation and energy efficient replacements will save you money in the long term.

Tackle the easy things first. Look at what's in use 18-24 hours a day and ask does it need to be? For example are you using the most suitable energy efficient products; are cooling

and heating systems both on at the same time; do you need to have certain lights on; when did you last do a power factor survey; or are there more efficient ways of controlling lights, heating, computers and hot water?

Create a working culture around sustainability by engaging others with your environmental policy. Ask artistic, lighting and technical departments to collaborate on developing sustainable working practices including purchasing, reducing energy consumption, transportation, recycling, waste and reuse of materials. Developing simple incentives, rather than taking a top down approach, will be more beneficial.

Share information with other theatres and harness sustainability initiatives and advice to apply best practice for your theatre estate and help to drive costs down further.

Develop procurement alliances with other buyers and work with manufacturers, dealers and suppliers to develop demand and improve supply and affordability of sustainable products.

Introduce adaptations to retrofit your theatre and make it more sustainable in the long term. These might include replacing boilers, air handling, heating and cooling equipment, and lighting; introducing structural solutions to manage solar gain and heat loss; and energy management systems. Be mindful of the whole-life cost of your adaptations.

Harness renewables

Plan to make use of renewables to help the theatre be more sustainable in the long term. Once you've reduced demand for carbon, what can you do to your theatre to reduce its overall carbon impact?

Consider geographical location and environmental influences. Decide which forms of intervention and renewable energy sources will deliver the most benefit for the least impact and ensure there is the business case for applying them.

Think about water. Whilst there is much focus on energy savings, how can the design of your theatre help to manage water resources? Making savings can help your theatre to be more sustainable.

Research eligibility for grants to install renewables. Government departments may be leading schemes and providing advice.

Look at the direct and wider benefits of renewable energy such as education, PR and audience participation.

Capital projects

Embed sustainability goals early in the capital design process so they can't easily be removed at Value Engineering stage. Sustainability should not just be bolted on.

Think about the occupancy of the building and how it will be used, and work with design teams and contractors to deliver a zero carbon or more resource efficient theatre, 'quietly, sensibly, efficiently'.

Hold the idea of 'smart, responsive, simplicity rather than rigid complexity' at the heart of your project.

Consider existing historic features if your project relates to an older theatre. For example you may be able to adapt natural ventilation engineering systems.

Remember older buildings need air circulation and ventilation. Capital works that involve sealing could create new problems.

Become aware of changing regulations for building projects and waste management. These will affect your capital theatre project. By 2019 every new building will need to be carbon neutral.

Keep up to date with energy efficient technologies and be aware of their potential impact on your project.

Ask contractors for simple guidance on how best to protect and efficiently run your venue. The more efficient the energy consumption the less you will need to spend on renewables and larger capital projects.

Become a leader

Don't wait for the law to act. Legislation is constantly changing and what may not affect you now will undoubtedly do so in the future.

Benchmark your experience and help shape legislation. Theatres are physically unique buildings and new legislation may not have considered how it will impact on theatres. This is particularly important in the introduction of Energy Performance Certificates (EPCs) and Display Energy Certificates (DECs).

Make your theatre a beacon for sustainability and encourage action among audiences by championing new technology in the building, in productions, and education programmes. Reducing theatres' carbon footprint also includes encouraging audience to make use of sustainable methods of transport.

Actively promote policies for Corporate Social Responsibility (CSR), and Environmental and Energy Management, and communicate these to your stakeholders.

Make the invisible visible and use the press to promote your activities to audiences, the theatre industry, the wider public and stakeholders.

Support local, national and international initiatives. Theatres grab headlines and help to raise awareness of climate change. Working in partnership with other theatres increases the impact.



Attendees

Jonathan Adams Capita Percy Thomas
Belinda Aird Royal Shakespeare Theatre
Teresa Aldea Arcola Theatre
Georgina Alexander Conference 08 Production
Sian Alexander
Gregory Allan Charcoalblue
John Allen Northern Light
Anna Anderson Royal Shakespeare Theatre
Lesley Arend Entertainment Technologies
Deborah Aydon Liverpool Everyman and Playhouse

Richard Bailey Mercury Theatre
Ioannis Balaskas Christian Garnett Partners
Chris Baldwin ACT Consultant Services
Dan Bailly Conference 08 Photographer
Lalayn Baluch Stage
Jason Barnes The Theatres Trust
Blossom Beale
Kate Beard Barbican Theatre
Anna Beech London Mayor's Office
Ken Bennett Hunter Stage
Rab Bennetts OBE Bennetts Associates Architects
Petrus Bertschinger Conference 08 Production
Peter Bingham Central School of Speech & Drama
Fran Birch The Theatres Trust
Ian Blackburn Southbank Centre
Andrzej Blonski Andrzej Blonski Architects
Gavin Blyth Ambassador Theatre Group
Tom Bolton CABE
Jessica Bowles Central School of Speech & Drama
Russell Braterman Transport for London
Richard Brett Theatreplan LLP
Suzie Bridges Arts Team
Matt Britton Carr & Angier Theatre Consultants
Philip Brown Ambassador Theatre Group
Richard Brown Apollo Victoria
Liz Bury AMPC Ltd
Robert Butler Journalist

Kate Carmichael The Theatres Trust
Gus Christie Glyndebourne Productions Ltd
David Clark Max Fordham
John Clarke Rider, Levett, Bucknall
Lee Collins Theatr Brycheiniog
Jeremy Collins Selecon Europe BV
Paul Connolly The Theatres Trust
Chris Cotton Royal Albert Hall
Paul Covell Paul Covell Theatre & Lighting Consultants
Sally Cowling British Council
Sarah Cropley Buro Happold
Paul Crosbie Charcoalblue
Adam Crosthwaite Charcoalblue
Colin Cuthbert Northern Light
Marilyn Cutts The Theatres Trust

Mark Davies Belgrade Theatre
Richard De Boise Tim Foster Architects
Fanny Deleris Arcola Theatre
William Differ Delfont Mackintosh Theatres Ltd
Eleni Dimou Arts Team
Nick Dodds Festivals and Events International
Christopher C Durham Chipping Norton Theatre

Ruth Eastwood Leicester Theatre Trust
Barbara Eifler Stage
Mark Evans RPS Gregory
David Evans Theatrical Solutions
Mark Everett Marlowe Theatre

Alistair Fair Alan Baxter and Associates
Kevin Faulkner Theatre Royal, Plymouth
John Faulkner
Robin Firman Austin-Smith: Lord LLP
Mark Foley Burrell Foley Fischer LLP
Paul Franklin Carr & Angier Theatre Consultants
Andy Franks Mercury Theatre
Rose Freeman The Theatres Trust

Nick Gale Design Innovation Ltd
Scott Georgeson HGA Architects
Eleni Giakoumaki Arts Team
Soutra Gilmour Northern Stage
Peter Gingold TippingPoint
Adrian Grady Mercury Theatre
John Graham Historic Scotland
Gavin Green Charcoalblue
Ric Green Opera North
Paul Griffiths Harlow Playhouse

Michael Hall Everyman Theatre
Simon Harper Royal Shakespeare Theatre
Andy Hayles Charcoalblue
Peter Head Arup
Richard Heason Aylesbury Civic Centre
Roger Hennigan White Light Ltd
Phil Heselton Arup
Nigel Hinds Conference 08 Chair
Margaret Hodge MBE MP Minister for Culture
Michael Holden Michael Holden Associates
Peter Hood Horsecross Arts Limited
Martin Huber Managing the Arts Worldwide
Arnot Hughes Lawray Architects
Martin Hunt Wales Millennium Centre

Nicola James Capita Percy Thomas
Barry James Royal Exchange Theatre, Manchester
Tony Jay Wales Millennium Centre
Stephen Jolly Buro Happold
Mike Jones Brewery Arts Centre

Simon Kahn RPS

John Langley National Theatre
Graham Large Waterman Lighting Design
Lloyd Lee Arcola Theatre

Jane Lemon Ambassador Theatre Group
Andy Lerpiniere Arup
Damian Le Sueur The Theatres Trust
Natalie Lewis Ambassador Theatre Group
Graham Lister Leicester Theatre Trust
Vicky Long Cape Farewell
Robert Longthorne Liverpool Everyman and Playhouse
Brian Loudon Wales Millennium Centre

Ruth Mackenzie OBE Department for Culture, Media and Sport (DCMS)
Iain Mackintosh
Patricia Mandeville Department for Culture, Media and Sport (DCMS)
Brod Mason Royal & Derngate
Su Matthewman West Yorkshire Playhouse
Nathalie Maury Charcoalblue
Elsbeth McBain English National Opera
Suzanne McDougal The Theatres Trust
Steve McEvoy Conference 08 Production
Alistair McGowan Actor
David McKeown MP Theatre Consultants
Stuart McKnight McInnes, Usher, McKnight Architects (MUMA)
Keith McLaren Carr & Angier Theatre Consultants
Angela McSherry TippingPoint
Dave Mead Three Rivers District Council
Will Mescher Haworth Tompkins
Nick Moran MA BSc Central School of Speech & Drama
James Morse Light and Design Associates Ltd
Keith Motson Association of British Orchestras
John Muir
Donna Munday

Leyla Nazli Arcola Theatre
Sophie Nield Centre for Excellence in Training for Theatre

Amanda O'Reilly Havant Arts Centre
Gavin Owen Charcoalblue

Rob Packman
Cliff Parkinson Walton & Parkinson Limited
Matthew Pitman Martin Professional
Sunand Prasad RIBA, Penoyre & Prasad
Mark Price The Theatres Trust
Barry Pritchard Arts Team

Sacha Queiroz Apollo Victoria

Mark Ravenhill Martin Professional
Eddie Redfern Little Theatre Guild
Tom Redman Delfont Mackintosh Theatres Ltd
Rupert Rhymes OBE The Theatres Trust
David Richards Arup
Chris Ricketts Sherman Cymru
John Riddell Theatre Projects Consultants
Ian Rimington Arts Council England

Steve Roberts AMPC Ltd
Ben Robinson Dulas Solar, Low Carbon Partnership
Elizabeth Rogers Findhorn Foundation
Tim Ronalds Tim Ronalds Architect
Sarah Rushton Read Conference 08 Reporter

Torunn Saksvikronning Light and Design Associates Ltd
David Salter Arcola Theatre
Mhora Samuel The Theatres Trust
Emma Savage Carr & Angier Theatre Consultants
Nikki Scott Stage Technologies Ltd
Mike Sell The Theatres Trust
Juhi Shareef Arup
Louisa Sharpless Young Vic
Gillian Shaw Scottish Arts Council
Andy Shewan Unicorn Theatre
Alan Short Short and Associates Architects
Richard Simmons CABE
Ian Smith Max Fordham
Derek Smith Auditoria
Joel Staley Institute of Contemporary Interdisciplinary Arts (ICIA)
Nick Starr National Theatre
Nadia Stern Rambert Dance Company
Jon Stevens Charcoalblue
Judith Strong a-ap Consulting
John Struthers Institute of Contemporary Interdisciplinary Arts (ICIA)

David I. Taylor Arup
Crispen Taylor Conference 08 Production
Andrew Thomas Chipping Norton Theatre
Jack Thompson White Light Ltd
David Tildesley Royal Lyceum Theatre Company
Dr Ben Todd Arcola Theatre
Robin Townley ABTT
Andrew Tucker Mansfield Palace Theatre
Karen Turner Cape Farewell

John Vidal Guardian

Tracey Wainwright New Vic Theatre
Tony Wakefield Abbey Theatre
Nicola Walls Page Park Architects
Alex Wardle Arup
Kirstin Warley Linklaters
Mark Watts
Susan Whiddington Mousetrap Theatre Projects
Mark White ABTT
Chris Whitehouse
Peter Wiles Marine Theatre
Philip Wilson Salisbury Playhouse
Peter Wilson OBE Royal Shakespeare Theatre
Neill Woodger Arup
David Wright Arts Architecture International
Tomas Wright Birmingham Rep

John Young Ambassador Theatre Group



