ISAN

Developing Outdoor Arts

Environmental Sustainability Toolkit:

Making Outdoor Arts Sustainable

JULIE'S BICYCLE ***

SUSTAINING CREATIVITY

ISAN Environmental Sustainability Toolkit
Making Outdoor Arts Sustainable

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JULIE'S BICYCLE ****
SUSTAINING CREATIVITY

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Back cover image: River of Light, Liverpool Lantern Company, Lumiere 2011, produced by Artichoke in Durham
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Environmental Sustainability Toolkit:
Making Outdoor Arts Sustainable

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1.0 Forewords

It was in the early 1990s when I first came across environmental activism as art on the street. It was at a demonstration against the Criminal Justice Act in Trafalgar Square where I was taking care of the speakers PA. Due to over excitement (and overdriving the system) the PA (mains powered) burst into flames and a number of speakers, including Tony Benn, had no amplification, a toe curling moment. Cue a dayglo coloured group of activists accompanying the bicycle powered Rinky Dink Sound System to save the day. Rinky Dinks were present at many protests over the next decade, accompanied by performers, dancers and agitators. Claremont Road was one such focus of protest that was attempting to stop the widening of the A12 in East London.

I can still recall a sculptural garden that literally grew out of a rusting car emblazoned with the words "rust in peace." I mention these examples to illustrate that Street and Outdoor Arts have a long history of activism and discussing sustainability. Two recent examples are Biding Time/Tangled Feet's collaboration *Rantbox*, which discusses the public's attitudes to climate change and Nigel Jamieson's collaboration with Wired Aerial Theatre *As the World Tipped*.

Both pieces are in their own respective ways a call to arms – our planet's resources are finite and we all share a responsibility to both discuss these issues artistically and make tangible practical steps to reduce our carbon footprint – this Toolkit aims to assist with the latter.

ISAN began developing a sustainability strand of work at our conference in Derby in 2009 when we invited Catherine Langabeer from Julie's Bicycle to lead a breakout session. I'm delighted that two years later we have been able to commission Julie's Bicycle to develop and write this Environmental Sustainability Toolkit. This guide will provide you with the tools you need to assess, and then reduce, your current carbon footprint as a touring company or festival event. Please don't see it as a dry document that you put off reading, more as a practical toolkit that you can go back to again and again. This publication is the latest in a series of practical guides produced by ISAN, for further details visit http://isanuk.org/publications

Julian Rudd
ISAN Director
May 2005 – February 2012

ISAN is the latest creative community to advocate environmental sustainability in deeds as well as thoughts. This community constitutes an enormous range of arts activities encompassing just about the whole creative supply chain at all scales. Such a generous contributor to our artistic and cultural life and its effects on broader values makes the outdoor arts sector an important player in the wider gathering of cultural organizations committed to taking environmental action. ISAN's readiness to look into the sustainability of the making of events, as well as the events themselves, is what will inspire many more of us to understand that living sustainably is not just good for our planet, but for our creative insights too.

Alison Tickell
Director, Julie's Bicycle

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NoFit State Circus
Oi Musica
Other Half Productions
Shambala Festival
Southwark Council
St Paul's Carnival
The World Famous
Upswing
Visitation Productions
Watch This Space Festival, National Theatre
Will Dings
Wired Aerial
White Night Arts and Cultural Festival
Xtrax

3.0 Introduction

This Environmental Sustainability Toolkit is the first systematic attempt by ISAN to address the environmental impacts of the outdoor arts sector and to develop sustainable practice. Throughout the Toolkit there are case studies to reassure and inspire readers, and to learn through the experience of others.

Many people already recognise that their work has environmental impacts; climate change, and the web of inter-connected problems, will inevitably affect their work in real ways. Producers, artists, designers, and the wider outdoor arts community, are keen to understand what the implications of these bigger impacts might be on their own work, and to make what adjustments they can, whether that is through the artistic content of events or through the logistics of the production and the use of materials and resources.

International targets for cutting global greenhouse gas (GHG)[1] emissions range from 50% to 90% by 2050. The UK's 80% reduction target will only be met by shifting our current energy sourcing from fossil fuels, deploying new technologies and reducing our overall consumption. Regulations to support our 80% reduction target are already affecting larger venues, freight companies, and lighting and sound manufacturers. However, direct environmental regulation of the outdoor arts sector is limited to well-trodden territory such as waste and recycling, and indirectly via increases in the cost of oil, and taxation.

Notwithstanding the ethical dimensions of environmental sustainability, on a day-to-day basis practical change is usually stimulated by cost. Thriving markets in carbon trading have already priced the direct carbon generated by industry and business, and accounting for the economic impacts of wider environmental damage, such as replacing soil eroded when a tree is felled, or fertilising crops when a bee's habitat is destroyed, is becoming more common. Paying the real cost of goods and services, including the environmental costs, is being built into financial modeling and will affect businesses, organisations and audiences. The outdoor arts sector will benefit from pre-empting and championing a shift towards practices that minimise environmental damage.

There's no better year than 2012 to launch this Toolkit. The London Olympics, with its ambition to be the most sustainable games ever, has already inspired a rush of outdoor events, ideal opportunities to reflect and develop better practice in outdoor arts. We hope this will leave a lasting legacy.

2012 is also the first year that Arts Council England has built into its funding requirements organisational reporting on greenhouse gas emissions, and environmental policies. Such reporting requirements will filter through to other funding agreements, both in the UK and internationally. It is also highly likely that sustainability will become a key criterion for winning and delivering event contracts with public contractors and with commercial sponsors.

And then there is straight common sense. Minimising waste and working more efficiently saves substantial amounts of time and money. Sponsors, public funders and commissioners, artists, as well as audiences, will justifiably expect the sector to minimise unnecessary costs.

Developing an environmental strand will take commitment, time and resources but, wisely done, sustainable outdoor arts can inspire wider shifts that embed environmental sustainability into the heart of all our thinking. Dealing with these issues now will give us a greater ability to respond to future challenges and help us to determine our own future.

This Toolkit, written for the thousands of artists, producers and suppliers that constitute the outdoor arts sector, is the first step towards taking collective responsibility for our industry. We hope it will make a difference.

[1] Greenhouse Gas emissions are reported in units of carbon dioxide equivalent (CO_2e), the most widely used unit for reporting greenhouse gas emissions. This report will refer to CO_2e and GHG emissions interchangeably.

Large-scale outdoor arts event

Case study 1: Artichoke's Lumiere

Artichoke's Lumiere, the UK's largest light festival, returned to the medieval city of Durham in December 2011. Around 80 local and international artists, lighting designers and community groups worked together to produce a series of 35 installations and projections that illuminated Durham's buildings, streets and bridges.

Six months before the festival Artichoke partnered with Julie's Bicycle for advice on how to measure and reduce the environmental impacts of the event. All the installations were designed by that stage, though many of the designers had independently used energy-efficient bulbs and LEDs. Focusing on energy use and audience behaviour, Artichoke used mains power where feasible, rationalised its network of diesel generators on site to ensure it was as efficient as possible, encouraged the public to car share and use public transport, Park & Ride facilities were increased, and audiences were asked to turn off lights and appliances when they left home.

Artichoke's technical team estimated the energy demand of all the installations and counted how many streetlights and floodlights were turned off. Julie's Bicycle was able to estimate that approximately 3 tonnes of CO_2e were emitted by the installations, which is equivalent to a car being run for a year, or a home being heated and lit for a year. Turning off streetlights and floodlights for the duration of the festival saved about a third of a tonne of CO_2e. Julie's Bicycle conservatively estimated that attendees would save about 40 tonnes of CO_2e as long as they remembered to turn off lights and TVs on their way to the festival.

Hartmann Grid, Leonardo Meigas, Lumiere 2011, produced by Artichoke in Durham ©MatthewAndrews2011

In January 2012 Artichoke is submitting final actual data to Julie's Bicycle about energy used and audience travel. This will provide a baseline for future events and together Artichoke and Julie's Bicycle will agree actions to reduce emissions for future festivals.

4.0 Priorities

This Environmental Sustainability Toolkit is a starting point for the outdoor arts sector to address its environmental impacts.

The following priorities and recommendations have been developed in response to the research findings (see *Section 6.0 ISAN Green Initiatives Survey Findings and Conclusions*), which identified measures already in place, what the barriers and opportunities for further action are, and the pockets of good practice.

The research also identified three underlying factors inherent in current practice:

1) International relationships, exports and profile as major drivers;

2) A prevailing culture and business model which favours new work over existing work regardless of the success of the show;

3) An emerging body of artistic content that is inspired by environmental issues.

International programming and a culture of prioritising new work both present barriers to reducing environmental impacts – can we rethink the existing business model so that environmental considerations sit alongside financial and artistic considerations during the planning stages?

The emerging body of artistic content inspired by sustainability makes presentation of work, and the environmental credentials that sit behind it, increasingly important.

By using the Toolkit as a starting point, the sector will be in a strong position to understand the implications and opportunities of new business models and practices which place sustainability at their heart.

Effective environmental action is an on-going process and should be based upon the following four principles:

1) **Commitment** to tackle the issues;

2) **Measuring** your impacts;

3) **Improving** your impacts;

4) **Communicating** what you are doing.

The following headline recommendations are underpinned by these four principles. They are addressed to those responsible for organising outdoor events and to suppliers of products and services. In addition there are detailed tables of immediate actions for specific functions. These tables are in *Section 5.0 Guidance and Actions*.

4.1 Headline recommendations

4.1.1 Plan

◆ **Identify the potential greenhouse gas emissions of your event(s) in the planning stages using the free online carbon calculators, the Industry Green (IG) Tools[1].**
Use your results to prioritise your planning. Use the information to inform site selection, artistic content, production materials, etc.

◆ **Consider environmental sustainability in event planning alongside artistic and financial considerations.**
The key areas are: event power demand: set design; travel logistics; and goods and service procurement. Senior management support is critical, so that the business risks and benefits of environmental improvements are understood.

◆ **Address the power requirements of your event.**
Wherever possible reduce your overall power demand and your fuel and mains power usage. Maximise use of energy efficient technology and ensure it is switched off when not required. If your power comes from generators, make sure that the layout of the network on site is as efficient as possible so you can reduce the number of generators and ensure that they are running at maximum efficiency and turned off when not being used. Consider alternative power sources for your event such as waste vegetable oil (WVO) biodiesel for your generators, solar powered batteries and/or bike power.

4.1.2 Measure

◆ **Measure the greenhouse gas emissions of your event when it is over.**
Use the free Industry Green (IG) Tools to calculate the emissions of your events and evaluate the actual environmental performance of your event against comparable sector benchmarks. Use your results to track your progress over time, set targets and inform future actions.

4.1.3 Improve

◆ **Measure, manage and reduce the greenhouse gas emissions of your next event.**
Use your knowledge of your own work, this guidance and the results of the carbon calculators to prioritise effective and impactful change. Create an action plan with reduction targets for your next event. Evaluate how you fared against that action plan after the event, and revise the action plan accordingly for the following event.

◆ **Incorporate environmental sustainability in your contractual relationships.**
Contracts with your suppliers should include sustainability clauses or should be accompanied by Green Riders outlining your sustainability requirements[2].

◆ **Adopt a sector-wide Charter of Good Practice for the outdoor arts sector developed by ISAN.**
Formulate a Charter of Good Practice to incorporate sustainability as one of the guiding principles along with Accessibility, Diversity, Equality and the existing Code of Practice for the Engagement of Artists. Encourage the wider outdoor arts constituency (and not just ISAN members) to adopt the Charter.

[1] The IG Tools are free carbon measurement tools that provide a snap shot of environmental impacts. IG Tools broadly cover energy (gas and electricity), water, waste, audience, artist and business travel, as well as accommodation and freight for tours. The IG Tools are available for offices, tours, buildings, outdoor events and productions (www.juliesbicycle.com/resources/ig-tools)

[2] Contact Julie's Bicycle for more information on Green Riders and see Appendices I and II.

4.1.4 Sector-wide

◆ **Monitor and manage the sector's overall environmental impacts.**
Important statistical information about the sector is fragmented, opaque, or simply not collected at all. Encourage and support the collection of data to monitor the sector's environmental performance. Sharing this information regularly will inform strategic thinking and support bigger infrastructural shifts, as well as improve performance year on year.

◆ **Network and exchange information and provide peer support.**
Communicate your environmental efforts with your supply chain and peers to encourage collaborative action. The sector would benefit from information being shared regularly to encourage wider adoption of actions that can reduce its total environmental impact.

◆ **Identify opportunities to debate and pilot new approaches to sector-wide practices identified as barriers/opportunities for change.**
Work with your peers, networks, audiences, funders, promoters and suppliers to identify the most appropriate sources and vehicles for investment to support innovation. Sector-wide knowledge can identify low carbon future technologies, formats and business models specific to the outdoor arts sector, and to take the best innovations to scale.

Small-scale outdoor arts company

Case study 1: Other Half Productions

Other Half Productions, a small outdoor arts organisation founded in 1999, has developed and collaborated on a number of shows dealing with environmental and social issues, such as 'Weather or Not' commissioned for the Stoke Newington Festival in 2000 that dealt with climate change early on, and 'The Gorillas' by Creature Feature which explains the link between mobile phone consumption and the loss of the gorilla's habitat. The company has also performed for and supported many environmental causes and events such as the Big Green Gathering, Bank of Ideas, Occupy London etc.

Other Half Productions Archive

Due to the nature of their work, travel is the company's biggest impact as they tour their productions globally accompanied by weighty props, but every attempt is made to minimise flights and use trains where possible (although more often than not trains are not appropriate), as well as to keep freight to a minimum. Bikes are primarily used for commuting and business travel in London. They also combine work trips with holidays, and voluntary work. When abroad the team tries to increase occupancy of their homes by renting out their rooms for the period of time they'll be gone through the website Gumtree.

The company's office just had 1200W of photovoltaic panels installed and is already being powered by a green tariff. All lighting is LED and an energy-monitoring device (a Wattson) helps raise awareness amongst staff on their electricity consumption in real time. What can be reused and recycled is, including paper, batteries, printer cartridges, textiles, CFL light bulbs and small electronic devices. As well as using rechargeable batteries wherever possible, the company also uses a device which re-charges ordinary alkaline batteries to extend their lifespan. Bottled water is avoided as it is bulky to transport and an unnecessary cost – instead reusable water bottles are used.

Efforts are currently being made to engage with their supply chain such as their contractors, designers and costumiers about their environmental credentials and how they can work together to reduce their impacts. Finally by having ethical bank accounts they can rest assured that their funds are not being invested in industries with a bad environmental record such as the oil and gas or tobacco industries.

5.0 Guidance and Actions

For: Artists, Producers and Agents

BEFORE

Environmental Policy

Your actions	*Where we want to be*	*How you do it*
Develop an environmental policy.	All outdoor arts companies, artists and production companies have an environmental policy outlining their impacts and ambitions.	Use the existing guidelines, available on the Julie's Bicycle website and other sites (e.g. Business Link) to develop your policy. In summary you should conduct a review of your: ◆ Energy; ◆ Water; ◆ Waste; ◆ Procurement; ◆ Travel and transport. Identify what impacts will be addressed, how they will be addressed, who is responsible, who has endorsed the policy, and how success will be measured.

Planning a production

Your actions	*Where we want to be*	*How you do it*
Ensure environmental issues outlined in the environmental policy are taken into account when planning specific productions.	Environmental considerations are embedded into all planning decision-making.	Include responsibility for environmental issues in the job requirements of all those planning a production and allocate sufficient time for the work. Designate a green champion and/or green team with specific responsibility for coordinating environmental actions. Create a budget line for environmental action, which takes into consideration expenditure and savings across all areas of the budget.
Ensure staff on short-term contracts including designers, stage managers, technicians and performers are made aware of the company's environmental policy and ambitions from the start.	Greater awareness and commitment to environmental considerations across the sector.	Ensure contractual discussions encompass expectations for responsibility for environmental issues e.g. tourability of sets in design brief.

Greenhouse Gas (GHG) Emissions

Your actions	*Where we want to be*	*How you do it*
Estimate the GHG emissions measurement from production materials, lighting, travel and transport at the planning stage.	All productions are measured for GHG emissions at the planning stage to inform decision making.	Use the free web-based Industry Green (IG) Tools to estimate GHG emissions and inform your plan to reduce the emissions of your production.

Tour planning and logistics

Your actions	*Where we want to be*	*How you do it*
If responsible for site selection (including festivals and venues) select sites which can help minimise the environmental impact of your production.	Sites that can host productions while producing minimal environmental impact are preferred for outdoor arts events.	Assess how sites affect key environmental impacts resulting from the production, including transport and energy requirements. Use the Julie's Bicycle Green database online to assess environmental credentials when booking festivals or venues.
Minimise travel impacts of pitching, negotiation and production planning.	Non-essential travel is reduced.	Use digital communications (Skype/video-conferencing) as much as possible as an alternative to travel.
Avoid presenting one-off or single date productions away from home.	Single date or one-off productions are minimised to maximise the value gained from the costs and the environmental impacts of travel.	Maximise presentation opportunities near to home. Actively develop relationships with promoters based in the UK and mainland Europe. Identify multiple opportunities to present work in the same region on the same tour leg. Ask for support from the event promoter to maximise time in the region and avoid agreeing to exclusion clauses by explaining their environmental impact. Actively develop relationships with promoters close to existing partners. Explore opportunities for residencies, workshops, seminars etc., alongside performances e.g. by networking with academic and community organisations in the same cities as your key presenting partners.

Your actions	*Where we want to be*	*How you do it*
Optimise the tour itinerary.	Logical and efficient tour routing that minimises the GHG emissions produced from travel is commonplace.	Use the free web-based IG Touring Tool to work out the GHG emissions of route options. Minimise total distance travelled by scheduling performance dates and venues with reasonable proximity. Co-operate with other arts companies to share touring schedules in order to improve flexibility when booking sites, festivals and venues.
Use low emission travel and transport options where commercially competitive and feasible.	All tours make travel choices that minimise the GHG emissions from moving production equipment and personnel on tour.	Use rail rather than flying where possible. Encourage staff and performers to travel by public transport or in car shares to get to performance locations. Explore sharing freight and transport options with other productions when travelling to the same large-scale events. Use ground transportation for freight within Europe and sea freight rather than airfreight for inter-continental tours.

Select Green Suppliers

Your actions	*Where we want to be*	*How you do it*
Consider the environmental credentials of suppliers including logistics, accommodation and catering when booking.	The mainstream use of goods and services with strong environmental credentials and the creation of increased market demand drive the provision of greener goods and services from suppliers.	Use logistics companies with fuel-efficient vehicles and drivers with eco-driving training. If using biofuels for your vehicles make sure they are sustainably sourced e.g. waste vegetable oil (WVO) biodiesel. Use the Julie's Bicycle Green database online to identify and recommend to others green suppliers.

Site engagement

Your actions	*Where we want to be*	*How you do it*
Create a Green Rider (i.e. a document outlining your sustainability asks for your event(s), which will sit alongside your technical and hospitality riders) and use it to ask presenting/receiving managers about environmentally-friendly options available on the event site i.e. availability of recycling bins, availability of tap water, public transport stops nearby etc.	A Green Rider is standard when negotiating/agreeing contracts.	Use the Julie's Bicycle Green Rider Template (see Appendices II and III). Share the ISAN Environmental Sustainability Toolkit with those responsible to encourage the overall event to be as sustainable as possible.

Communications and Marketing

Your actions	*Where we want to be*	*How you do it*
Share the (estimated) environmental impacts, ambitions and green values of the production with audiences when promoting the event.	Green marketing influences the choices made by the audience (e.g. which event to attend, how to travel) and the audience's future behaviour (e.g. use of public transportation to reach an event in the future).	Use the Julie's Bicycle Communications guides available online for Audience, Staff and Supply Chain.
Minimise paper publications for PR prior to the event (e.g. programmes, leaflets, posters, etc.) and use post-consumer and/or FSC paper products when printing.	Replace paper publications with new media for PR such as digital publications and social media platforms.	Request environmental information about proposed goods and services from suppliers. Preference for suppliers with strong environmental credentials.
Communicate sustainable travel options to the event to your audience via ticketing, the website and marketing material.	Public transportation is the preferred mode of travel for all visitors.	Use the Julie's Bicycle Audience Travel and Communicating with your Audience guides available online.

DURING

Monitoring

Your actions	*Where we want to be*	*How you do it*
Maintain systems for monitoring and addressing environmental impacts during the production and performance phases.	Environmental action is embedded within production and performance processes.	Remind staff and supply chain of environmental responsibilities during production and performance phases and provide regular internal updates on progress during the production and performance phases.

Communications and Marketing

Your actions	*Where we want to be*	*How you do it*
Share the (estimated) environmental impacts, ambitions and green values of the production with audiences when promoting the event.	Green marketing influences the choices made by the audience (e.g. which event to attend, how to travel) and the audience's future behaviour (e.g. use of public transportation to reach an event in the future).	Use the Julie's Bicycle Communications guides available online for Audience, Staff and Supply Chain.
Minimise paper publications during the event (e.g. programmes, leaflets, posters, etc.) Use post-consumer and/or FSC paper products when printing.	Replace paper publications with new media for PR such as digital publications and social media platforms.	Request environmental information about proposed goods and services from suppliers. Preference for suppliers with strong environmental credentials.

AFTER

Greenhouse Gas (GHG) Emissions

Your actions	*Where we want to be*	*How you do it*
Undertake post-event GHG emissions measurement for each event.	All events are measured for GHG emissions upon completion.	Use the free web-based IG Tools to measure and track the emissions of your event.
Report event GHG emission results to Julie's Bicycle, staff, suppliers and audiences as well as for industry tracking.	All events report their GHG emissions to assist with benchmarking and tracking of the outdoor arts sector.	Use the free web-based IG Tools to report emissions for confidential anonymised sector analysis.

Post-event review

Your actions	*Where we want to be*	*How you do it*
Evaluate performance against ambitions following the event with the key stakeholders including commissioning body and/or local authority.	Environmental ambitions are realised across the sector.	Talk to your presenters, commissioning body and/or local authority about lessons learned and opportunities for future events. Incorporate your learning into your own future planning.

Communications and Marketing

Your actions	*Where we want to be*	*How you do it*
Develop a case study of your event's greening experience to share learning with peers. Minimise paper publications following the event and use post-consumer and/or FSC paper products when printing.	All outdoor arts companies and artists participate in a network to share lessons learned and experiences with sustainability. Replace paper publications with new media for PR and marketing such as digital publications and social media platforms.	Use online platforms and in person networks to share knowledge and good practice. Request environmental information about proposed goods and services from suppliers. Preference for suppliers with strong environmental credentials.

Top 5 Tips

☑ Develop an environmental policy to cover at least energy, water and waste environmental impacts (www.juliesbicycle.com/resources/environmental-policy-guidelines).

☑ Embed environmental consideration into your planning processes from the earliest stages.

☑ Give a team member responsibility for co-ordinating environmental initiatives and/or set up a green team.

☑ Use the free web-based IG (Industry Green) Tools to measure and manage the emissions of your event (www.juliesbicycle.com/resources/ig-tools)

☑ Use a Green Rider (www.juliesbicycle.com/resources/jb-green-riders) to help ensure contractual discussions include environmental impacts.

BEFORE

For: Event Production Teams and Contractors, including Stage Managers, Designers and Technicians

Production

Your actions	*Where we want to be*	*How you do it*
Work with Artistic Directors to develop a production design that has a low environmental impact.	Environmental impacts are a consideration when realising the design vision.	Use the free web-based IG Production Tool to evaluate the carbon impacts of different design options.
Work with the production team to minimise the environmental impacts of the production.	Environmental considerations are part of the regular agenda at production meetings.	Identify ways to reduce the environmental impact of sets e.g. by avoiding tropical hardwood and using less, lower impact and recycled materials where possible. Consider the weight/cubic capacity/packaging of materials and equipment to minimise transport impacts.
Learn about the environmental impacts of set materials and lighting technologies.	Sector specific information about environmentally responsible lighting technologies and set materials are widely available and increasingly understood.	Plan the production process to allow for time to investigate and source greener practices and suppliers. Talk to your suppliers about what environmentally responsible products and services they offer and are available on the market. Use the Julie's Bicycle Green Suppliers database online to learn about suppliers with environmental credentials. Use the White Light Green Lighting guide. Access latest guidance on the Julie's Bicycle website. Join the Julie's Bicycle Lighting Forum online network.
Adopt an environmental sustainability procurement policy to use environmentally responsible suppliers where possible.	Use of sustainably sourced materials, locally sourced equipment (where possible) and low energy demand lighting is widespread.	Choose suppliers with environmental credentials.

Your actions	*Where we want to be*	*How you do it*
Use recycled materials for building sets as well as reused production equipment, staging, set and properties where possible.	Database of recommended suppliers, craftspeople and technicians is available and regularly updated.	Talk to your suppliers and use the Julie's Bicycle Green Suppliers database online for guidance.
Freight only essential production elements.	Sector-wide freighting of lighting and set materials is minimised.	Contact site managers upfront to ensure you have up to date information on all available equipment and materials. Consider renting equipment locally.

Lighting and Show Power Demand

Your actions	*Where we want to be*	*How you do it*
Minimise the show power demand.	All productions/tours have minimised show power demand.	When designing the show calculate the total show power demand and identify design and technologies that will reduce the power demand.
Communicate to suppliers and technicians that you want show power demand to be minimised and equipment used efficiently in set-up and rehearsals.	There is strong communication and co-operation between production team and suppliers about opportunities for minimising environmental impacts cost effectively.	Talk to your suppliers about what environmentally responsible products and services they offer and are available on the market. You can use the Green Rider to specify your show power demand and the type of energy-efficient equipment you require.
Establish a routine to ensure lights and equipment are switched off.	All lights and equipment switched off when not in use.	Communicate with your staff and artists during rehearsals about environmental goals. Include your switch-off asks in the Green Rider.
Use renewable energy sources where possible.	All events powered by renewable energy.	Talk to your suppliers and use the Julie's Bicycle website and Green Suppliers database online for guidance. You can use the Green Rider to request renewable energy sources for show power if possible.

DURING

Monitor performance

Your actions	*Where we want to be*	*How you do it*
Ensure lights and equipment are being switched off when not in use.	All lights and equipment switched off when not in use.	Incorporate monitoring of lighting and power demand into the stage or area manager's job description.
Use rechargeable batteries for all equipment.	Rechargeable batteries to completely replace disposable ones.	Join the Julie's Bicycle Better Batteries campaign.

AFTER

Production

Your actions	*Where we want to be*	*How you do it*
Store, re-use and recycle production equipment, staging and properties where possible.	National and regional storage hubs with searchable online databases are created for the sharing of set materials.	Use agencies such as Scenery Salvage and Set Exchange to rent and recycle set materials. Join or establish partnerships and mechanisms with other organisations for sharing production resources.

Post-event review

Your actions	*Where we want to be*	*How you do it*
Evaluate environmental performance against ambitions.	Environmental ambitions are realised across the sector.	Use the IG Production Tool to compare impacts of actual production to planning estimates and feedback to designers and production company management.

Communications and Marketing

Your actions	*Where we want to be*	*How you do it*
Develop a case study of your production's greening experience to share learning with peers.	All outdoor arts companies and artists participate in a network to share lessons learned and experiences with sustainability.	Use online platforms and networking opportunities to share knowledge and good practice.
Minimise paper publications following the event and use post-consumer and/or FSC paper products when printing.	Replace paper publications with new media for PR and marketing such as digital publications and social media platforms.	Request environmental information about proposed goods and services from suppliers. Preference for suppliers with strong environmental credentials.

Top 5 Tips

☑ Opt for low energy lighting, low impact materials and renewable energy sources (www.juliesbicycle.com/resources/practical-guides/production).

☑ Switch-off equipment and lighting when not in use.

☑ Use rechargeable batteries (www.juliesbicycle.com/resources/practical-guides/better-batteries).

☑ Hire production equipment, staging, set materials and properties.

☑ Recycle and/or store set materials, props and staging for reuse.

BEFORE

For: Festivals and Outdoor Events (Programming and Production)

Environmental Policy

Your actions	*Where we want to be*	*How you do it*
Develop an environmental policy.	All festivals and outdoor events have an environmental policy outlining their impacts and ambitions.	Use guidelines to develop your policy, available on the Julie's Bicycle website and other sites (e.g. Business Link). In summary you should conduct a review of your: ◆ Energy; ◆ Water; ◆ Waste; ◆ Procurement; ◆ Travel and transport. Then identify what impacts will be addressed, how they will be addressed, who is responsible, who has endorsed the policy, and how success will be measured.

Event planning

Your actions	*Where we want to be*	*How you do it*
Ensure environmental issues outlined in the environmental policy are taken into account when planning specific events.	Environmental considerations are embedded into all planning decision-making.	Include responsibility for environmental issues in the job requirements of all those planning a production and allocate sufficient time for the work. Designate a green champion and/or green team with specific responsibility for coordinating environmental actions. Create a budget line for environmental action, which takes into consideration expenditure and savings across all areas of the budget.
Ensure staff on short-term contracts including designers, stage managers, technicians and performers are made aware of the company's environmental policy and ambitions from the start.	Greater awareness and commitment to environmental considerations across the sector.	Ensure contractual discussions encompass expectations for responsibility for environmental issues.

Greenhouse Gas (GHG) Emissions

Your actions	*Where we want to be*	*How you do it*
Estimate the GHG emissions measurement from the planned energy use, and any other available data from previous events for water, waste and travel.	All events are measured for GHG emissions at the planning stage to inform decision-making	Use the free web-based Industry Green (IG) Tools to estimate the GHG emissions of your event and inform your plan to reduce the emissions of your event.

Programming and Artist/Producer Engagement

Your actions	*Where we want to be*	*How you do it*
Rationalise exclusion policies (i.e. provisions in contracts that prevent the production you are hosting to also be hosted by other events within a certain mile radius and within a certain timeframe of it appearing at your event).	Use of exclusion policies is kept to a minimum and supports overall sustainability of the sector.	If you use an exclusion policy make sure it is based on audience development research and not preventing a production from presenting work outside your audience catchment area.
Share event environmental information with artists and producers.	There is strong communication about environmental responsibilities between incoming productions and host organisations. The amount of equipment needing to be moved from event to event is reduced.	Share the event's environmental policy with artists and producers at time of negotiating contract. Make available information about on-site production equipment, technical specifications and local suppliers including hotels with environmental credentials. Ask incoming productions about what steps they are taking to reduce their environmental impacts and how you can support them to achieve this.

Production

Your actions	*Where we want to be*	*How you do it*
Reduce the energy demand of the festival/outdoor event.	Energy demand as minimal as possible.	Rationalise generators and networks. Use LED and low energy lighting and energy efficient equipment and communicate what is available to incoming productions to avoid excessive energy demand. Offer information on local suppliers. Introduce systems to ensure that lighting, equipment and power sources are switched off when not in use. Limit energy demand from concessions.
Increase use of renewable energy sources.	Energy provision is as low carbon as possible.	Utilise as many (WVO) biodiesel generators as possible. Expand on-site power generation i.e. solar water heating for kitchens, and solar panels (photovoltaics) for electricity.
Plan to minimise waste.	Festivals and all outdoor events are zero waste events.	Work with waste contractors to minimise waste sent to landfill. Introduce recycling processes onsite with clear communications and train stewards and volunteers to support audiences to recycle. Require caterers to use reusable, recyclable or compostable supplies. Compost food waste.
Plan to minimise sewage waste.	Sewage waste to be minimal.	Maximise use of composting toilets.
Plan to minimise impact of audience travel.	Maximise opportunities for audience to travel by public transport, cycle, or on foot and car share.	Incentivise audience to use public transportation and/or cycle and walk (e.g. a combined performance and public transport ticket, reduced ticket rates, preferential camping spots). Promote car-sharing and full car occupancy (e.g. preferential car parking spots) using companies like Liftshare. Provide bike racks on site and let audience know via the website and tickets that racks are available. Provide audience with a carbon calculator on your website to help them investigate the mode and route with lowest emissions (e.g. the Transport Direct Carbon Calculator – see *Section 8.0 Resources*). Work closely with local transport operators to maximise provision of public transport services and synchronising services with the start and end times of the event.

Your actions	*Where we want to be*	*How you do it*
If using the same event site every year, look at investing in permanent green facilities (e.g. water efficient showers, composting toilets, etc.).	Permanent facilities run more efficiently, are more reliable and can save on costs in the long run. Any spare money can be used to invest in other sustainable initiatives.	Research other similar events, which have invested in permanent facilities on site (for example Glastonbury has invested in a reservoir on site to help with their water management, alongside the solar panels which power the farm). Start a conversation with the site owner and undertake feasibility studies for the installation of permanent facilities (e.g. of a water reservoir, of composting toilets and of renewable power sources, etc.). Engage with other organisations using the site and determine whether use of the facilities and capital costs for installation and maintenance could potentially be shared.

Green Suppliers

Your actions	*Where we want to be*	*How you do it*
Adopt an environmental sustainability procurement policy to use environmentally responsible suppliers where possible.	The mainstream use of goods and services with strong environmental credentials.	Use the Julie's Bicycle Green Suppliers database online to learn about the environmental impacts of goods and services to influence decision-making.
Minimise paper use.	Printed materials are used sparingly.	Use digital publicity material as much as possible. Rationalise quantities of printed materials ordered. Ensure all printed materials have recycled content and/or use Forest Stewardship Council (FSC) certified paper and are printed using non-toxic and biodegradable inks.

BEFORE

Communications and Marketing

Your actions	*Where we want to be*	*How you do it*
Share the (estimated) environmental impacts, ambitions and green values of the production with audiences when promoting the event.	Green marketing influences the choices made by the audience (e.g. which event to attend, how to travel) and the audience's future behaviour (e.g. use of public transportation to reach an event in the future).	Use the Julie's Bicycle Communications guides available online for Audience, Staff and Supply Chain.
Minimise paper publications prior to the event and use post-consumer and/or FSC paper products when printing.	Replace paper publications with new media for PR and marketing such as digital publications and social media platforms.	Request environmental information about proposed goods and services from suppliers. Preference for suppliers with strong environmental credentials.

DURING

Monitoring

Your actions	*Where we want to be*	*How you do it*
Maintain systems for monitoring and addressing environmental impacts during the production and performance phases.	Environmental action is embedded within the production and performance processes.	Remind staff and supply chain of environmental responsibilities during the production and performance phases, including minimising waste, water use, switching off all lights and equipment and generators when not in use. Monitor audience travel behaviour. Provide regular internal updates on progress during the production and performance phases.

Communications and Marketing

Your actions	*Where we want to be*	*How you do it*
Share the (estimated) environmental impacts, ambitions and green values of the production with audiences when promoting the event.	Green marketing influences the choices made by the audience (e.g. which event to attend, how to travel) and the audience's future behaviour (e.g. use of public transportation to reach an event in the future).	Use the Julie's Bicycle Communications guides available online for Audience, Staff and Supply Chain.
Minimise paper publications during the event and use post-consumer and/or FSC paper products when printing.	Replace paper publications with new media for PR and marketing such as digital publications and social media platforms.	Request environmental information about proposed goods and services from suppliers. Preference for suppliers with strong environmental credentials.

Greenhouse Gas (GHG) Emissions

Your actions	*Where we want to be*	*How you do it*
Measure the GHG emissions of your event.	All festivals measure their GHG emissions.	Use the free web-based IG Festivals and Outdoor Events Tool to measure your emissions.
Apply for external assessment of your environmental performance.	All festivals and outdoor events seek external assessment of their environmental performance.	Apply for Industry Green for Festivals and Outdoor Events; for the 'A Greener Festival' award; for the 'Clean 'N' Green' award; for BS 8901/ISO 20121; and/or for the Carbon Trust Standard. Submit information on certification gained to the Julie's Bicycle Green Festivals database.
Minimise the impact of future events.	All events to have minimal impact on the environment and to continually improve their environmental performance.	Create an environmental improvement plan with targets and timelines for reducing environmental impacts.

Communicating with your Audience and Supply Chain

Your actions	*Where we want to be*	*How you do it*
Share the results of the efforts being taken to reduce those impacts with your audience, staff and supply chain.	All festivals and outdoor events report their GHG emissions to assist with benchmarking and tracking of the outdoor events sector.	Use the free web-based IG Tools to report emissions to Julie's Bicycle for confidential sector analysis. Develop and share a case study through online forums, networks and other communication channels.
Minimise paper publications and use post-consumer and/or FSC paper products when printing.	Replace paper publications with new media for PR and marketing such as digital publications and social media platforms.	Request environmental information about proposed goods and services from suppliers. Preference for suppliers with strong environmental credentials.

Top 5 Tips

- ☑ Develop an environmental policy for your event to cover at least energy, water and waste impacts (www.juliesbicycle.com/resources/environmental-policy-guidelines).
- ☑ Have a green team responsible for co-ordinating environmental efforts.
- ☑ Include sustainability clauses in contracts with suppliers.
- ☑ Use the free web-based IG Festival/Outdoor Events Tool to measure the emissions of your event.
- ☑ Communicate with your audience and supply chain (www.juliesbicycle.com/resources).

For: Commissioning Bodies (e.g. Local Authorities, Festivals)

See also the *Festivals and Outdoor Events* section.

Your actions	*Where we want to be*	*How you do it*
Work with production team to ensure the site offers environmental services (e.g. recycling bins, water taps, nearby public transport stops etc.).	There is strong communication between incoming productions and event sites.	Use the Julie's Bicycle environmental reporting template (or equivalent) available online to respond to the Green Rider requirements of artists and/or companies.
Adopt an environmental sustainability procurement policy to use environmentally responsible suppliers where possible.	The mainstream use of goods and services with strong environmental credentials.	Use the Julie's Bicycle Green Suppliers database online to learn about the environmental impacts of goods and services to influence decision-making.
Support the production in reducing its environmental impact.	All productions have minimised energy, water, and waste demands and positively influenced travel.	Help support minimising energy, water and waste usage. Discuss putting on extra public transport services and synchronising services with the start and end times of events with local travel operators.

For: Membership Bodies and Trade Associations (e.g. ISAN, NASA)

Immediate Actions

☑ Make environmental sustainability a standing agenda item at industry events and your own board meetings.

☑ Keep up to date on environmentally related legislation, financial/economic implications and audience concerns.

☑ Provide training to members and signpost to online resources for reducing, monitoring and reporting environmental impacts.

☑ Develop a Charter of Good Practice for the outdoor arts, which sets out environmental principles and includes a commitment to monitor and reduce GHG emissions.

☑ Recognise and award members that are environmental leaders, and promote models of good practice.

☑ Use lobbying power to push further development of environmentally sustainable technologies.

☑ Encourage the collection and collation of statistics relevant for monitoring the environmental impacts of the entire outdoor arts sector.

For: Funding Bodies (e.g. Arts Council England, Local Authorities), Partners and Sponsors

Immediate Actions

☑ Ensure environmental sustainability is a core issue on the agenda for strategy development.

☑ Signpost information on good practice for greening productions and tours within the outdoor arts sector.

☑ Support organisations providing resources and training to help the sector embed environmental decision-making within all event areas and/or working to co-ordinate efforts to reduce their environmental impacts of presenting work.

☑ Set GHG emission guidelines and reporting requirements for grant recipients to measure and report GHG emissions.

☑ Assess the funding support given to organisations on environmental criteria in addition to the artistic and financial criteria.

☑ Encourage budget provision for environmentally sustainable practice in all funding applications.

☑ Publicise models of good practice, including outstanding creative achievements using green technology.

For: Marketing and Communications with your Audience, Supply Chain and Staff

Top tips for Communicating with your Audience

Pre-event

- Engage your audience in online campaigns created by artists and promoters to promote the sustainable aspects of the upcoming event.
- Set challenges and goals for your audience before they attend the event, such as signing up to using public transport or car share options.

During the event

- Actively engage your audience in green events and reward them for it e.g. incentives for reuse and recycling and/or for increased car occupancy, donation schemes based around camping gear, or art installations that encourage audience interaction with environmental issues, etc.
- Communicate your own efforts to green your event with your audience.

Post-event

- Tell the audience what worked and what didn't, and what impact they themselves made.

Encourage industry change:

Encourage your audience to ask their favourite artists, venues, events and festivals what they are doing to reduce environmental impacts.

Top tips for Communicating with your Supply Chain

☑ When you create or update your environmental policy involve your supply chain to incorporate their commitments or encourage them to share your commitments.

☑ Use the Julie's Bicycle IG Tools to measure your emissions and share the results.

☑ Encourage your supply chain to measure their emissions using carbon calculators like the IG Tools and provide promoters and programmers with their relevant data.

☑ Build environmental advice or requirements into contracts with your supply chain – for example ask to see their environmental policy or require them to have one.

☑ Keep the lines of communication open – regular updates on progress and innovation from all parties maintains a sense of achievement and shared endeavour.

☑ Switch to greener merchandise, equipment and other products. General principles are to choose renewable, reusable, recyclable, lower embodied environmental impact and lower operational energy products. Work with your suppliers and independent certification bodies to improve your purchasing.

Top tips for Communicating with your Staff

☑ Communicate your environmental ambitions to all new staff, permanent, temporary or freelance.

☑ Involve your staff team in creating and updating an environmental policy.

☑ Use the Julie's Bicycle IG Tools to measure your emissions and report results regularly to staff.

☑ Sign up for environmental certification – this will help staff feel proud of what has been achieved.

☑ Designate environmental champions and give green responsibilities and additional training to specific staff members. Encourage a green team to meet and give them a budget to achieve improvements. Ensure managers support staff to have sufficient time to fulfil their responsibilities.

☑ Send out green email updates or newsletter.

☑ Communicate cost savings to motivate and maintain action. Provide incentives to staff that take action, and reward everyone with a themed party or prizes when targets are met.

Production

Case study 1: ArtsAgenda

ArtsAgenda, an arts consultancy and producing company, have most control over their office operations and ensure that they are managed sustainably, for example by using trains instead of flying for their business trips. In their productions they have used biodiesel generators, and have recycled and reused materials as much as possible. They also hire rather than buy props, such as for example mirrors, which they would have ended up disposing of when the show ended, and are looking into hiring storage space for some of the props and sets they do re-use, such as kettles.

For ArtsAgenda it is important to work with the technical team and staff such as the Production Manager early on to ensure that sustainability is a standing item on the agenda in the planning stages and any decisions made are as green and local as possible. One of their upcoming projects is with an environmental arts group whose productions are site

specific: “We’re working with Red Earth on Northala Fields (the 4 hills made up of Wembley stadium debris in Ealing), one of the Hidden London projects 2012, involving local greenwood structures and soundscape with a fire finale coinciding with the Paralympic torch relay.”

Case study 2: Firefly Solar and White Night Arts and Cultural festival

Firefly Solar provides solar power, PAs and lighting to the **White Night Arts and Cultural festival** in Brighton in six varied locations. The festival is an all-night event that takes place when the clocks go back in late October. In 2011, there were more than 70 events, half indoors and half outdoors and attracting over 45,000 people. All of the events are created especially for the festival with the majority being ‘one night only’ experiences. The largest solar rig was utilised at the Village Green on the Old Steine in the City of Brighton and Hove. The main stage was powered by Orion solar generators, the sound system was a HK Actor DX PA with HK monitors, and an LED and HID lighting rig was used to light the stage and internals of the big top. A quirky urban golf course had a Cygnus solar generator to power a range of lighting including HID and low energy floods. Pictor solar generator was used to power the PA and lighting for an installation in Pavilion Gardens.

White Night Arts and Cultural festival ©EmmaGutteridge

“The main challenges [of White Night] were ensuring we had accurate usage calculations as all of the solar power came from battery banks charged up with solar at our warehouse. If you are working with other suppliers it can be difficult to obtain accurate information on their power usage, as many companies don’t have to factor it in the same way we do. We overcame this by doing as much pre-production and research before the event as we could to ensure we spec’d the right solar rig.” Firefly Solar

Solar power provision is silent meaning that the generators can be closer to the stage and the public. A range of generator sizes also helps with the power distribution and avoids the need for cabling running through the site to power outlets. It also means there is no need to store flammable liquids on site, which has a range of associated legal and health and safety benefits. Currently however, solar energy cannot be used for powering catering units or large lighting rigs, which can pose a problem for large events. It is also slightly more expensive than its conventional counterpart, but for White Night the benefits did outweigh the costs, particularly as it is organised by Brighton & Hove City Council, the first local authority UK-wide to achieve BS 8901 for all of its events.

Firefly Solar work on a high volume of outdoor art events throughout the year and find them perfectly suited to the use of solar power. Many outdoor art performers have quite minimal technical requirements with quite short shows so this makes it very easy to use solar power. The benefits for outdoor art performers are the silent, reliable power supply that will not detract from the show. A solar generator like a Pictor or Pyxis that is mobile and can be easily transported is recommended for outdoor art performers.

“The best advice we can give to outdoor art performers is to try and use efficient equipment that keeps their energy consumption low. This includes using active PAs or class D amps and using LED and low energy lighting.” Firefly Solar

6.0 ISAN Green Initiatives Survey Findings and Conclusions

Julie's Bicycle in collaboration with ISAN created a Green Initiatives Survey, as a means to understand what environmental initiatives were already underway in the outdoor arts sector, and to identify the obstacles, opportunities and support needs for the sector to engage with environmental sustainability. See *Appendix I: Survey Methodology* for more information on the methodology employed and the survey questions.

ISAN sent out the link to the survey to its 105 members (October, 2011), and shared it through Facebook and its website. A total of 38 organisations signed up with 32 fully completing it (84%). The remaining 6 partially completed it. 18 of these 32 organisations were ISAN members (56%) with the remaining organisations being part of the wider outdoor arts constituency.

Julie's Bicycle also conducted phone interviews with 15 key respondents to better understand their survey responses and to identify opportunities for reducing the sector's impacts.

The majority of the respondents are already committed to environmental sustainability through their environmental/sustainability policies or action plans, a green team or champion, and many have applied for a certification or an award. Several have been involved in other environmental initiatives around travel, recycling, production, lighting, measuring and monitoring emissions etc. (21 out of 38 or 55%).

The majority of the respondents consider travel and the associated fuel usage (business, production, audience, artist) and touring (including freight and logistics) to be the operational areas with the biggest impact for their organisations (22 out of the 38 or 58%) with the remaining 42% considering energy (heating, cooling and lighting) and production (construction, materials, props and staging) to be the areas of biggest impact for their organisations. Accommodation, waste, consumables and procurement were also mentioned as potential high impact areas for some organisations.

61% of respondents (23 out of 38) considered finance (limited budgets) as the main obstacle to environmental sustainability in their business operations. 45% (17 out of 38) also mentioned logistical barriers, 42% (16 out of 38) identified time (last minute decisions for example affecting the availability of disposable versus reusable cups, or diesel versus biodiesel powered generators), and 39% (15 out of 38) thought there was a lack of knowledge, training and skills (identifying a gap ISAN and Julie's Bicycle could fill). Interestingly, only 24% (9 out of 38) thought artistic considerations were a barrier and 21% (8 out of 38) mentioned lack of green suppliers to help them green their productions were an obstacle (especially relevant with regards to pyrotechnics, duct tape and cable ties).

Other barriers identified were:

- Lack of control of their buildings and sites;
- Sharing a space;
- Inefficiency of using trains for transporting freight as opposed to driving;
- Partnerships with other organisations which might not share the same priorities and values;
- Unsupportive landlords;
- Lack of control over utilities.

The respondents identified a number of opportunities for improving their impacts. Recurring themes were reducing travel, transport and freight (for example by sharing transport and freight, incentivising audiences to travel sustainably), reusing and recycling, using recycled materials in production and educating and communicating with staff, audience and supply chain through campaigns which help them link their actions with environmental impacts. Designing productions

to minimise power consumption and freight requirements and rationalising touring schedules were also mentioned.

To tackle these there is a necessity for better planning, realistic time frames and more flexible timetabling for outdoor events. Investing in renewable energy such as solar panels (photovoltaics) on rooftops and touring vans as well as using waste vegetable oil (WVO) biodiesel (green fuel) were other ideas. Networks were considered to be an effective way of sharing knowledge and good practice. Also noted were partnerships, which facilitate shared commissioning costs with overseas projects, thereby maximising touring opportunities while minimising impacts and/or cross-festival programming of international artists. A green suppliers database as a point of reference when planning a production or tour (allowing for the use of local suppliers or for sharing) and the development of procurement policies, and collaborating with local government on transport provision, were also mentioned.

The majority of the respondents 66% (25 out of 38) would like guidance to help translate information into practical actions and funding to support them in reducing their impact. 61% of respondents (23 out of 38) would also like tools to help them measure the environmental impacts of their production and/or tours (*Julie's Bicycle already offers the IG Tools for Touring, Festivals and Outdoor Events, Offices and Venues, with the Production Tool launching in February 2012*). 55% (21 out of 38) think professional development would help them and enable them to educate their peers on these issues. 45% (17 out of 38) would also like other online resources to be available to help them when needed, with 42% (16 out of 38) requesting a Green Rider template, a Green Suppliers, Festivals and Venues database and the formation of networks for sharing knowledge and good practice. 38% (13 out of 38) also thought workshops might be helpful.

There was a repeated request for well-presented information available online that is simple and straightforward. Databases would help with the choice of suppliers, including catering and waste contractors, and accommodation. The need to engage with these issues early on in the design and production stage was also expressed. Finally the possibility of holding a competition and/or developing a kite mark to indicate commitment and raise awareness was expressed, which would help incentivise artists and companies and ensure their commitment is also public facing.

In the office

Case study 1: Los Kaos

Los Kaos specialises in innovative street theatre and extreme puppetry. Actions to minimise the carbon footprint of their office space have included changing all light bulbs for energy savers, switching electricity supply to a green supplier, heating both buildings with wood burning stoves using salvaged wood, improving their insulation and ordering printed materials on recycled or mixed stock paper, printed with eco inks.

Los Kaos also donates to Greenpeace as part of its environmental policy. One of the company's previous successful shows that blend education and entertainment was used as a platform to inform the audience about polar bears being endangered and how climate change is affecting their habitat. Following that show the company wanted to actively support an action group that was taking action in this remit and Greenpeace was an easy fit as it is a global action group which is actively putting pressure on big business and world leaders to clean up their act. They are the only direct action group attempting to stop oil extraction in the Arctic, which has serious repercussions on the polar bears habitat.

Case study 2: ArtsAgenda

ArtsAgenda in Brighton encourages staff to use public transport and cycle to work. They have recycling implemented in the office and use a water filter instead of bottles. They consider trains instead of planes for long trips and favour trains over cars for all business trips.

Touring

Case study 1: BiDiNG TiME

Tube Group Photo, BiDiNG TiME ©AlexBrenner

BiDiNG TiME is an ambitious international experiment to create new music theatre during 2012 by sharing a story around the world. Described as a theatrical adventure, partners are encouraged to create shows, readings and explorations, inspired by the story and adapted to suit local conditions. There are many ways to get involved. People can engage wherever they are, in ways that suit them, reaching out to their own communities while connected to a wider project. BiDiNG TiME puts a process into the public domain and engages people in ideas about change. Climate change and our relationship to the natural environment is a significant thread. Partners also sign up to the aims of the project; one aim is that at least 50% of the materials used are recycled or from a sustainable source. BiDiNG TiME seeks to pilot a new model for international collaboration, where people focus locally, think globally and share their work virtually. As part of the company's research and development in this remit a small-scale touring outdoor show was produced; 'RantBox'. 'RantBox' used documentary theatre to canvas public opinion about climate change and toured on public transport. It was made in partnership with Tangled Feet Theatre and won the Gone In 20 Minutes showcase Jury prize in 2011.

Case study 2: The World Famous

The World Famous provides spectacular fire, flame, fireworks and pyrotechnic art for site-specific works as well as commissioning touring productions. These spectacular shows combine pyrotechnics with performance, music, lighting and projections. Their latest tour 'All Hands' has been developed specifically to fit into a 7.5 tonne truck, with public transportation used for crew and performer travel. The show's ethos of collective endeavour being able to overcome obstacles insurmountable by one person led to a commitment to minimising the carbon footprint of the show and the tour. This placed

Fuse, The World Famous Archive

environmental sustainability high on the agenda early in the development of the show and was incorporated into design and production management decisions from the outset. Previous touring shows from the company like 'Full Circle' travelled in a 40 feet steel shipping container which doubles as a workshop on site. The aim with 'All Hands' was to tour a third of that volume and weight of equipment and fit this into a vehicle with a much smaller carbon footprint. Local scaffold companies provided hire equipment for the set of the show although that did require an extra day on-site to construct with their assistance. In the first shows a 20 feet shipping container was also sourced locally, but it has now been eliminated from the production. These measures alongside using local AV production companies have avoided the need for transporting heavy bulky equipment across the country, thus saving on fuel costs and greenhouse gas emissions.

Pollutant in TV, Bash Street Theatre Archive

Case study 3: Bash Street Theatre

Bash Street Theatre is a small theatre company that produces mid-scale outdoor shows that tour across the UK, Europe and internationally. The company aims to be self sufficient with all performers and equipment touring in the company vehicle. Technical requirements are kept to a minimum and local suppliers are used whenever possible. The company has strong environmental values that influence all areas of its work including: company management, marketing, production and touring. Bash Street has developed and performed shows with environmental themes and is keen to find new ways to improve its environmental sustainability.

Case study 4: Bespoke Humour

Bespoke Humour is Derek Carpenter, a professional touring clown who builds his shows with minimum waste and travels sustainably on electric Bikes and Quads. His comedy car has also recently been fitted with an electric engine instead of diesel. The portable puppet show uses photovoltaic energy and an analogue amplifier that uses four times less energy than a digital equivalent. The use of PVs has reduced the number of batteries used significantly.

Electric Cyclus Circus, Bespoke Humour Archive

7.0 Hot Topics

The following set of short research pieces cover a wide range of hot topics on sustainability that are relevant to the outdoor arts sector.

Hot Topic 1: Programming and Commissioning

A culture of valuing new commissions over existing work

The prevailing business model in the outdoor arts favours commissioning new work – whether home grown or international – over existing work, even where a show has proved successful. There are many strong reasons for this to be the case such as:

- Allowing promoters to differentiate themselves.
- New commissions add artistic value overall to the outdoor arts sector.
- It can be difficult for artists to keep works in repertoire for long periods of time because of the cost of storage and remounting.
- Funding applications require a strong case to be made as competition can be high, and it is often easier to make the case for new commissions over remounting existing work, which may be judged as duplication or seen as less innovative.
- Producing companies often return regularly to a fairly limited touring circuit thus requiring new repertoire.
- The perception that the novelty value of new work or the prestige of a premiere is more appealing to audiences.

However, in environmental terms, new commissions result in new impacts – more material use, more waste and, often, more total energy used, all of which are sources of carbon. If work is kept in repertoire for longer, the environmental impacts – as well as financial – would be reduced. This is particularly the case in outdoor arts where, being prey to weather, the likelihood of a production to be its absolute best when performed only once is worth considering. However, keeping the work in repertoire and allowing it to develop over time ensures that the resources used in making the work are maximised. It becomes more appealing to hire because promoters know what they are getting, the work is more mature, it runs more efficiently and audiences are drawn in increasing numbers to proven success. A production's impact and value is increased with every new audience that it's exposed to; a production that's been touring for a few years is still as good as new for an audience watching it for the first time.

An international flavour to programming

Hosting international companies in festivals and events carries with it an added credibility amongst peers, audiences and funding partners, and added value due to the diversity, and desirability, of the programme. It also provides the festival with an international brand identity that can attract better quality local work, as well as increased audience numbers and additional funding opportunities. It is also often more economical to book an international production rather than British work, because the outdoors arts sector, particularly in Europe, receives greater financial support, and the cost of making, rehearsing (and/or hiring) and touring British work can outweigh the cost of importing international work. This is particularly the case for larger-scale productions. However, the travel and freight involved in importing international companies are both carbon-intensive activities.

On the flip side there are also British outdoor arts companies touring work internationally, which is particularly pertinent when a show has been in repertoire for a while and needs to extend its touring circuit to be able to reach new audiences. The touring circuit in the UK tends to be limited, both in terms of scale (i.e. number of events showcasing work) and length (i.e. limited to the summer season due to weather conditions). As a result, opportunities for British companies to tour internationally are crucial to increasing the impact and value of the UK outdoor arts sector, and developing the financial viability of UK-based companies. The environmental impacts are in this case identical to international companies touring to the UK, with the biggest culprits in terms of greenhouse gas emissions being travel and freight, be it via road, train, sea or air.

What would the perfect balance be?

Environmental sustainability should not be seen as a bolt on but as a platform for artistic development. If embedded at the core of artistic practice, sustainability can provide the basis for a more robust business model. This would factor in consideration of the environmental and financial costs of carbon-intensive activity whilst ensuring that the resources available to the outdoor arts sector are used efficiently and to the best of their potential. Environmental sustainability is not a barrier to artistic achievement but has the potential to be a driver for the development of our incredibly rich arts and cultural industries.

A key recommendation, therefore, is to invest in creating the opportunities and the infrastructure for artists and touring companies to sustain well-made work in repertoire longer, to maximise the economic and environmental resources spent as opposed to channelling the majority of available resources into creating new work. This would have the added benefit of increasing economic sustainability alongside improved environmental performance – helping the sector towards greater resilience.

Next steps for the outdoor arts sector

Form stronger artistic collaborations with producers

For attitudes to shift and change to happen more dialogue is needed between artists and creative producers. A good creative producer can provide artists with the guidance and support needed to make work that is of excellent quality, increasing a production's chances of a longer lifespan. A creative producer will secure the necessary resources to enable this process, will ensure that the work is toured as widely as possible for as long as possible, and will develop and maintain key relationships with funding bodies and festival producers.

How?

- Increased collaboration between ISAN, NASA, ACE and other funding partners, as well as trusts such as the Clore Foundation that provide leadership and professional development programmes can help provide a framework for these conversations.
- The creation of networking opportunities for artists and producers, and opportunities to showcase work in progress.
- The provision of funding for reviving and touring existing work and providing bursaries specifically for producers working in the outdoor arts sector.

Invest in partnerships

Developing work in partnership involves a wider list of stakeholders, and subsequently a wider network for touring opportunities and potentially greater financial sustainability. Working in partnership, for both the revival of old work and new commissions, ensures that high quality standards are maintained. In addition, the production's impacts, namely the scale, audience reach, production costs, artistic quality, and environmental impacts, are built into the early planning stages to ensure longevity and sustainability.

How?

- Use successful partnership models, such as Without Walls and Sticky (produced by Improbable and The World Famous), to rethink how you produce work.
- Consult existing networks and membership bodies such as ISAN and NASA to find the organisations that would potentially make good creative partners.
- Form strategic, long-term relationships that can help attract funding and extent the longevity of your work.

Incorporate sustainability in decision-making

The holistic approach that sustainability offers (in terms of economic, social and environmental considerations) provides the perfect framework with which to assess the scale and volume of your activities, and ensures that resources – materials, time, energy and money – are used efficiently. Embedding environmental sustainability into planning processes and in early discussions between all stakeholders will give rise to creative solutions to ensure that artistically excellent work need not be sacrificed for environmental concerns. An example of environmentally driven choices being a driver for positive creative consequences, is an international partnership where, instead of importing a full company of artists, one artist is flown in to collaborate with a UK-based company to (re)create work.

How?

- Formulate a Charter of Good Practice to incorporate sustainability as one of the guiding principles along with Accessibility, Diversity, Equality and the existing Code of Practice for the Engagement of Artists. Encourage the wider outdoor arts constituency (and not just ISAN members) to adopt the Charter and agree that the relationships between practitioners will be governed by the principles outlined in it.
- Have sustainability as a standing item at meetings and conferences such as those led by ISAN and NASA to increase awareness and provide practical solutions to environmental issues.
- Reward and incentivise environmentally sustainable outdoor arts organisations financially or via other means, such as award schemes.
- Share examples of innovative practice through existing networks to stimulate creative responses to the challenge and support more rapid change within the sector.

Hot Topic 2: Power

Many outdoor events use temporary power sources usually provided by generators, the majority of which run on red diesel (intended for agricultural use and taxed at a lower rate to domestic diesel, so-called because red dye is added to it to control its use), which is a non-renewable and carbon intensive fuel. Since energy tends to be responsible for the majority of an event's emissions (excluding audience travel), replacing red diesel with less carbon intensive alternatives such as waste vegetable oil (WVO) biodiesel, and/or moving towards renewable energy sources such as solar power, small-scale wind turbines and pedal power, can make a significant contribution to reducing environmental impacts.

Julie's Bicycle, in partnership with University of Sussex, researched power supply across the UK festival season[1] and identified that UK music festivals in 2010 used 12 million litres of diesel which consumed 48,360 MWhs of electricity and produced 31,600 t CO_2e emissions. This is the equivalent of powering 10,000 homes for a year. This highlighted that diesel generators run at an average of only 40% fuel efficiency and therefore use much more energy to power equipment as compared to the national grid. Waste vegetable oil (WVO) biodiesel is currently meeting 3-6% of festival power supply, and on-site renewable energy – solar powered battery, temporary wind or pedal power – is meeting just 0.026%. The current capacity of renewables is 0.1% (91kW) of demand.

The corresponding percentages from the outdoor arts sector as a whole have not been studied but are likely to be comparable. The study highlighted the barriers that have been hindering a greater uptake of temporary renewable energy technologies (TRET) across UK music festivals, which are also relevant to the wider outdoor arts constituency.

The most important barriers were:

1) Lack of funding or financing;
2) Lack of experience amongst suppliers to operate in a market;
3) Lack of trust from banks/investors to further invest;
4) Administrative or legal barriers;
5) Social acceptance; and
6) Suppliers' capacity.

There is, however, potential for these barriers to be overcome and therefore to increase the percentage uptake of temporary renewable energy technologies. With scientific advancements behind alternative technologies progressing almost on a daily basis, outdoor events have a growing number of options for cleaner power sources, be it solar panels for stage lighting, waste vegetable oil (WVO) biodiesel for backup generators and pedal power for stalls. Mains power should also be used where possible, as the grid is more efficient than generators and produces less carbon emissions. This is usually only possible for urban outdoor events however.

When planning your distribution of power you should also be aiming at minimising total fuel demand and improving efficiencies through:

- The use of energy efficient equipment and the installation of power factor correction devices.
- The use of the right size generators for your power requirements (oversize generators tend to waste fuel unnecessarily).
- The rationalisation of the placement of mobile generators to maximise efficiencies by establishing the number of outlets requiring power, the maximum load for each outlet and the peak usage times.

[1] Julie's Bicycle and University of Sussex (2011). What are the barriers to operationalising and expanding temporary renewable energy capacity at UK music festivals? Julie's Bicycle and Sussex University, UK

Top tips for powering outdoor events:

- Plan generator placement, cabling and distribution.
- Reduce generator size.
- Put quotas and restrictions on users.
- Supply all generators to control fuel volumes.
- Measure usage and set goals.
- Opt for waste vegetable oil (WVO) biodiesel to power your generators.
- Use more energy efficient kit for PA and lighting.
- Tour bus operations to significantly reduce energy demand.
- Energy suppliers to provide better information about the power and entertainment output provided by diesel, biodiesel and renewable installations to increase confidence and promote forward planning.

Options for powering outdoor events

Biofuels for generators

What they are: Fuels derived directly from living matter e.g. biodiesel, algal fuel, and bioethanol. There are three categories of biofuels, which refer to the type of plant material used to create the fuel. The first category of biofuels are derived from plant material that is also a food source e.g. ethanol from corn. The second category of biofuels is derived from plant material that is not a food source such as biodiesel from inedible oil. The third category of biofuels refers to algae used to derive biodiesel. Currently only the biofuels in the first category are economically viable at scale.

Pros: Biofuel derived from waste products (such as used cooking oil or animal carcasses) has minimal environmental and carbon issues. There could be carbon benefits if the biofuels used are reducing or preventing carbon emissions overall. Biofuel crops are one of the main markets for Genetically Modified (GM) alternatives; all crops tend to have competing uses (i.e. for food or for energy), so the GM alternatives for biofuel crops could relieve pressure on food crops.

Cons: Biofuels may compete with food production, causing spikes in food prices and/or displacement of food cultivation to un-cleared lands i.e. rainforest (land-use change is a leading factor contributing to climate change). Increased production can lead to biodiversity loss and displacement of local communities. In the tropics crop and plantations cultivation contributes to carbon emissions through the clearing of carbon-rich forests; soil erosion from intensive agricultural methods; the large use of fertilisers; and the transport of feedstock. Producing biofuels from crops, plant material and algae is expensive and not necessarily economically viable, so biofuel generation tends to be heavily subsidised by governments.

Solar Power

What it is: Energy derived from the sun; simply put the sun shines on solar panels (photovoltaic cells), it is captured through batteries and inverters and is used to provide a steady stream of electricity via a distribution board to which you can plug your generators, lights etc. Scientific advancements to solar technology means that there are now solar power providers which can provide mobile kits specifically for the event industries. Solar panels can be fitted on trailers, trucks and rooftops and can be used to power stages, sound systems, installations, lighting and stalls at outdoor events. As an example of microgeneration like wind, you can find grants and subsidies to help you with some of the infrastructure costs. If you also have a permanent outdoor site you could consider permanent microgeneration to power your event as well as also offer value to your surrounding community.

Pros: Ideal for one-day shows as hassle free and contributes zero greenhouse gas emissions to the atmosphere. Visible on site, so you can educate and incentivise your audience. Suppliers such as Firefly Solar offer pre-charged solar batteries so you are not reliant on solar power on the day of the event.

Cons: You need the sun to be shining to generate power and a south facing spot to set up the solar panels so that they are not shaded, otherwise a WVO biodiesel fuelled generator on standby, as a backup, would also be required. For multi-day events you would need to know your exact power demand for all various equipment, how long they will be running for and when during the day, as well as carefully monitor power consumption to make sure that you allow enough power for batteries to be recharged at the end of the day in preparation for the following day. You also need to be careful that the allocated power is not being used up during the event e.g. by a member of the audience plugging in.

Wind Power

What it is: Energy derived from the wind. When windy, the wind turbine will harvest the wind capturing it through batteries and inverters and using it to provide a steady stream of electricity via a distribution board to which you can plug your generators, lights etc. As an example of microgeneration like solar, you can find grants and subsidies to help you with some of the infrastructure costs. If you also have a permanent outdoor site you could consider permanent microgeneration to power your event as well as also offer value to your surrounding community.

Pros: Contributes zero greenhouse gas emissions to the atmosphere and is visible on site, so you can educate and incentive your audience.

Cons: You need the wind to be blowing to generate power; otherwise a WVO biodiesel fuelled generator on standby, as a backup, would also be required. Like solar, for multi-day events you would need to know your exact power demand for all various equipment, how long they will be running for and when during the day, as well as carefully monitor power consumption to make sure that you allow enough power for batteries to be recharged at the end of the day in preparation for the following day. You also need to be careful that the allocated power is not being used up during the event e.g. by a member of the audience plugging in.

Pedal Power

What it is: Bike powered set-ups used to produce power by the audience or dedicated volunteers who sit on these stationary bikes and pedal as much as they can. For example, according to Jones (2010) ten bikes daisy-chained can power a PA big enough for around 200 people.

Pros: Contributes zero greenhouse gas emissions to the atmosphere. It is fun to use and a free form of exercise. Educates the public and generates of sense of achievement, participation and community. This set up can be used for sound systems, stalls, stages, screens, lighting, and even washing machines.

Cons: You need individuals to pedal to generate power and there is limited potential to be a practical solution to unsustainable energy options for large-scale events.

Other alternatives: Biomass; Biogas; Hydrogen Fuel Cell Power; Micro Hydro Power.

For examples of organisations already using alternative and renewable energy sources to power their events please see the *case studies on Artichoke's Lumiere and ArtsAgenda*.

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Festivals

Case study 1: The Bath Fringe festival

The Bath Fringe festival has used pedal power on their greenfield event sites, recycling where possible and green messaging throughout the event.

Up until recently the festival organisers were unaware of renewable energy suppliers such as Firefly Solar and Midas Productions Ltd (biofuel powered generators) that can cope with high demand for power. Thus far LED lights have solved much of the high power level issues and they have used small-scale/portable solar, wind and pedal power. For example a pedal-power system powered the PA for a dance area, which provided the ideal context to keep the pedalers going!

Rinky Dink an old but very looked after rig, runs on the same principle of renewable power and has been an almost permanent fixture of Glastonbury festival for some years. It comes equipped with its own pedal-powered sound system that is cycled around the event. For Bath Fringe this tends to come with a band that often is made up of friends and local residents, but they can also offer a more similar stage-sized static system, which the organisers have used for indoor performances.

The Rinky Dink Sound-system, Bath Fringe festival ©ChrisGreenwood

Case study 2: The City of London festival

The City of London festival has an environmental policy embedded throughout its business and creative programming. Initially this meant transferring the staff team's personal energies and established domestic commitment into the professional context of the festival and was relatively straightforward to undertake with a small and committed staff. The festival then underwent a professional eco-audit of both the organisation and its activities, funded by The City Bridge Trust as part of the 'Greening the Third Sector' initiative. This had a positive impact on the festival by adding value to their work and furthering

City of London festival ©RobertPiwko

encouraging them to seek out sustainability-related contacts, partners, suppliers and organisations, culminating with them winning 'A Greener Festival' award.

Their biggest challenge has been in their inability to control the festival venues, which they do not hire commercially. This means that it is not always possible to impose environmental standards on their operations. This is now changing as suppliers, especially caterers, are becoming increasingly aware of the issues and changing their businesses. However, counterbalancing these obstacles is the benefits of a city location – the festival does not have to bring in a large infrastructure and public transport links are excellent. They also program a number of environmental themes running through each festival (such as bees in 2010 as part of the International Year of Biodiversity, birds in 2011, future focus on flowers in 2012 and trees in 2013). These themes are explored through a public programme of creative performances, workshops and exhibitions, which seeks to integrate the green agenda with an artistic response.

Case study 3: Manchester International festival's (MIF)

Festival Square in Albert Square is **Manchester International festival's** (MIF) central hub, comprising of the festival Pavilion, the Pavilion Theatre, the Glasshouse, the festival Cafe and an outdoor seating area. Attracting over 90,000 people in 2011, the MIF understood that addressing waste management on site, as part of their environmental policy, could make a big impact to waste produced. As a result they managed to only send 21% of waste to landfill in 2011 – even lower than their original goal of 25%. Waste, recycling and composting ideas were present throughout the planning process, following on from the

lessons learned from the 2009 event. Waste management and sustainability issues were central to all decisions made across the site.

The festival developed a waste and monitoring plan for the site, which was implemented by a secondee from Manchester City Council. This person also worked with Enterprise Manchester to obtain reports on waste collected. All volunteers and site staff were briefed on the recycling scheme (the contracted caterers took responsibility for all the hospitality staff). The volunteers were also pro-active in sharing this information with the public. These briefings not only went over how to separate waste but also why and general background facts that helped to contextualise such instructions. MIF procured a range of compostable tableware so that all items on site were served in/on compostable packaging, with the exception of champagne flutes, which were re-usable. To avoid contamination they had

Festival Square, Manchester International festival ©KarenRichardson

better designed bins at the event with smaller holes, with clear signage and also had the same stickers and colour codes used by Manchester City Council for residents, in order to communicate clearly with the audience. They also had the catering staff verbally tell customers at the point of selling that the containers were compostable. At the beginning of the second week they sent out a mid-report to volunteers and staff to show how well targets were being met. All of these efforts made and in particular the better-designed bin lids, the briefings and having a dedicated staff member had a very positive impact on the amount of waste produced at the event.

For the future MIF plan to build on their success based on observations made at last year's festival, especially around communication, in the form of better signage (i.e. highlighting that the cups are compostable), branding, and use of the big screens on-site and of social media to communicate their initiatives. They are also considering suggesting the use of compostable packaging to other venues used for MIF events following a successful trial in the production office and green room. MIF already include information on green issues in their contracts so that they can potentially engage artists on green issues, and aim to expand on this for future festivals.

MIF have shown how high targets can be achieved by analysing past events and incorporating sustainability from the beginning of the planning stages.

Hot Topic 3: Pyrotechnics

By Ben Stephens
The World Famous

All Hands, The World Famous Archive

The World Famous is known for the use of pyrotechnics in our productions. Whether it is stage effects or fireworks, pyrotechnics are however perceived by the public and the media to have an exceptionally heavy impact on the environment. This is arguably unfair so we have decided to look into the environmental impacts of pyrotechnics and determine whether public perception is indeed accurate and whether we should continue on using them in our shows. The World Famous is currently working with The Centre for Sustainability at The University of Greenwich and hopes to publish a research piece on pyrotechnics and environmental sustainability in 2012 for the Street Arts and Fireworks communities, to help educate them and enable them to make informed programming decisions for events. I summarise below some of the preliminary findings our research has given rise to.

Starting with stage pyrotechnics – the vast majority in use in the UK are manufactured nationally with readily available (if tightly regulated) materials, and are responsible for low indirect emissions during manufacturing and transportation. The main material used in production is cardboard with very few plastic parts (if any at all) and the active compositions used are relatively small. With regards to carbon emissions produced, the CO_2e released on detonation of a large stage gerbe fountain[1] is approximately equivalent to using a standard single 1kW stage light for 3 hours[2],[3],[4]. Pyrotechnics used to punctuate a spectacular moment in a performance could also be bought or offset by cutting a single lantern from the lighting design.

Fireworks on the other hand are generally bigger, heavier and contain more gunpowder than their stage equivalents. They are predominantly imported in bulk by sea from China, with some manufacturing taking place in the UK and a small importation coming from Europe. Preliminary research shows that the indirect carbon emissions of production and importation are potentially smaller than a pair of football boots (the relevant research piece has not been published yet but

it is on-going). We generally use no more than 200kg N.E.C of fireworks even on our largest of productions or displays, which release approximately 5.7 tonnes CO_2e of direct carbon emissions into the atmosphere. By our calculations this equates to each audience member driving an average car half a mile [3],[5],[6].

By addressing how the audience travels to a show or display (see other relevant Julie's Bicycle guides) and advising our clients about these impacts, then we can potentially use pyrotechnics in our shows and still produce a sustainable production. The social, artistic, economic and community benefits as well as the economic and social sustainability of engaging in a shared experience are currently un-quantifiable, but we believe are more beneficial to society than other events with much greater carbon footprints.

We hope our research will help shed light on these issues and enable practitioners to make educated decisions about the overall sustainability of their productions, which may include the use of pyrotechnics.

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[1] A device in which sparks, flame or other effects, are shot continuously upwards from a tube.

[2] Berners-Lee, M. (2010). *How Bad are Bananas? The Carbon Footprint of Everything.* Profile Books, London.
The carbon footprint of a 100W incandescent lightbulb is calculated at 500kg CO_2e per year.

[3] Carbon Reduction Institute (2010). *Carbon Audit Summary Report, 2010 Sydney New Year's Eve*. Carbon Reduction Institute, Sydney.
2012kg of fireworks are calculated to have direct emissions of 57,330kg CO_2e.

[4] Based on 45g Net Explosive Content (N.E.C.) 20'x20 second stage grebe.

[5] Berners-Lee, M. (2010). *How Bad are Bananas? The Carbon Footprint of Everything*. Profile Books, London.
The carbon footprint of driving 1 mile is calculated at 710g CO_2e for an average car @ 33mpg.

[6] Based on an average audience attendance at large events of 15,000.

Production Transport

Case study 1: Wired Aerial

Wired Aerial specialise in aerial theatre and 'bungee-assisted dance'. Their most recent production 'As The World Tipped' was commissioned to explore the theme of climate change, and toured UK outdoor arts festivals in the summer and autumn of 2011. The show was then taken to Sydney for performance in January 2012. Wired Aerial deliberately sent the production materials by sea rather than air and reduced the size of their crew compared to their Summer 2011 tour. A collaboration with Julie's Bicycle then identified that the total impact of the travel, accommodation, freight and show power would be 54.4 tonnes of CO_2e. If they had followed a 'business as usual' approach and sent the materials by air and not reduced the size of their crew, their emissions would have been 200.9 tonnes of CO_2e – an increase of 370% from what they eventually achieved. 'As The World Tipped' uses a specially fabricated wall as a crucial part of the performance. Weighing in at just over 2 tonnes of aluminium, the embodied impact of the mining and manufacture of that aluminium is 24 tonnes CO_2e. This is based on the assumption that it has no recycled content, which is a worst-case scenario. Considered over the nine performances in the UK and Australia, this impact is currently 2.7 tonnes CO_2e per performance. This impact will reduce every time the wall is reused. The performance also uses a hired truss, so the embodied impact was not attributed to 'As The World Tipped', but to the hiring company. Considering the embodied impact of productions is still a relatively new area for performing arts companies.

Wired Aerial has said that it is difficult to come to terms with the impact of big productions and sometimes it is hard to see how a significant carbon reduction can be made. However their experience so far of addressing the issues has been very positive. For instance the early analysis of a production's impacts and the presentation of benchmarks has been critical in guiding where future improvements can be made. An analysis of their touring showed how their emissions profile is tied up with decisions made at very early stages; for example the site selected for a performance, and whether it takes place in a city centre/urban location close to public transport routes and associated services, or a more rural location, will have major implications on power and audience travel. They have also found it useful to have on a range of communications tools so that company members are aware of the environmental drivers. Wired Aerial are adopting the Julie's Bicycle Green Rider (see Appendix III) and writing green clauses into tour contracts.

Case study 2: Bureau of Silly Ideas

Bureau of Silly Ideas (BOSI) finds innovative ways to reduce the environmental impacts of their production freight requirements. They have booked freight transport using websites such as Shiply (www.shiply.com) and Anyvan (www.anyvan.com), which host online auctions for haulage companies with space in their vehicle or empty return journeys. One successful booking involved transporting an 8 feet tall remote controlled Christmas tree taken from Aberdeen to London for £80. BOSI' experience of using delivery auctions has been in the UK, although the practice is increasingly common on an international scale for all manner of products – and is worth exploring in the arts (see Wired for a discussion of the phenomenon: www.wired.co.uk/news/archive/2010-02/22/new-delivery-auction-websites-save-money-and-co2).

Another tip from BOSI is to consider East Coast trains for the transport of items, especially unconventional ones such as trees, barrels and so on. East Coast long journeys have freight cars and can allow for the transportation of such items. Unfortunately this isn't possible on west coast trains, as the pendolino trains which run on this route don't have any freight capacity.

Hot Topic 4: Finance

Macro scale

Our current industrial economy is totally dependent upon products and services that use the raw materials of the natural world and return them, often in a degraded state. Our species is absolutely dependent on a complex and only partially understood broad ecosystem made up of millions of mutually symbiotic events and substances which provide an abundance of life. One such example of an earth system crucial to the effective management of CO_2 is illustrated by the capacity of our oceans, vegetation and soil to absorb carbon emissions. Despite being completely reliant on these ecosystems, our economic model does not recognise, and therefore does not financially represent, i.e. price, these services. This basic omission in economic modelling has recently been recognized, as natural resources are coming under pressure and shortages of basic commodities are creating price hikes and social unrest. A United Nations Environment Programme (UNEP) backed initiative is currently seeking to address this problem. The Economics of Ecosystems and Biodiversity (TEEB) study found that the costs of conserving biodiversity compared to the benefits of doing so are in a ratio of 1:10 – 1:100. At the 10th Conference of the Parties of the Convention on Biological Diversity (CBD) in Nagoya, Japan (2010), the European Commission decided to follow up on the TEEB study by examining opportunities for implementing its analyses. In particular a synthesis of approaches to assess and value in economic terms the ecosystem services in a European Union context, as well as at a national level, will be put together by 2020. The Institute of Environment Studies (IVM) at the University of Amsterdam has been contracted to produce the year-long study, which was launched in December 2011 and will be completed by late 2012.

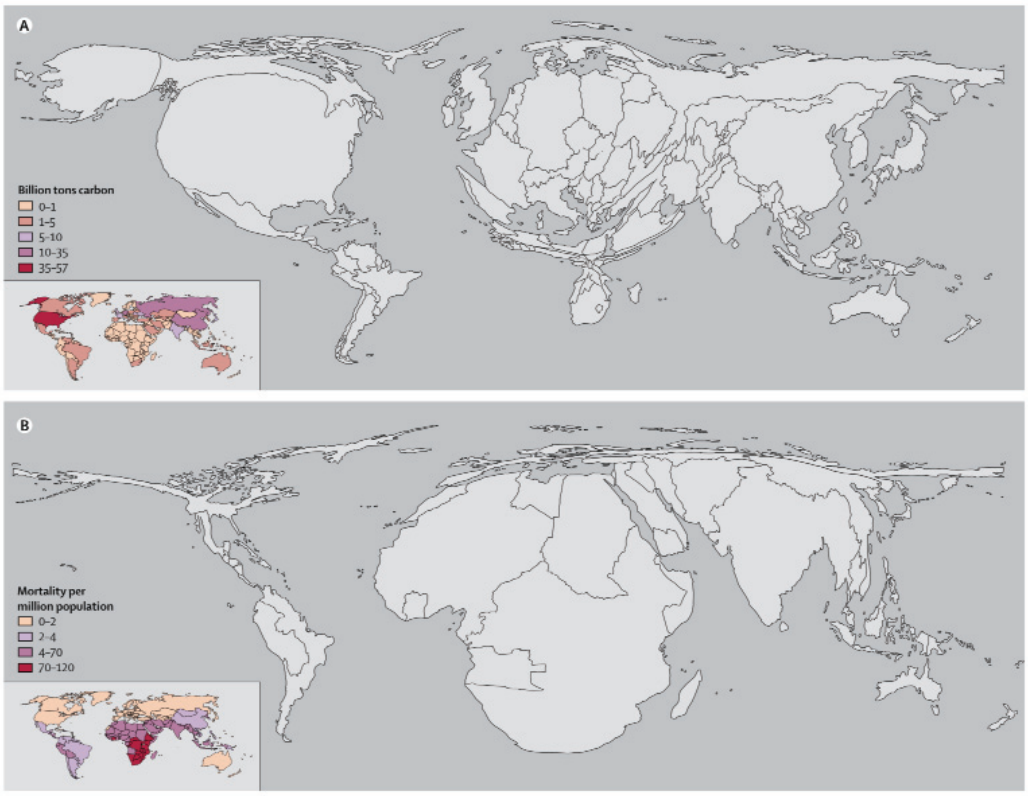
Increasingly studies are attempting to identify the whole cost of a product or a service. For example, currently the costs incurred by felling a tree to make a musical instrument or to print a theatre script might include running the chainsaw, paying the lumberjack and transporting the log. However, costs excluded might be the longer-term consequences of the effect of losing that tree on soil erosion, a home for an orangutan, a livelihood for an indigenous person, the future capacity of that tree and soil to absorb carbon from the air. These implicit costs are rarely factored in to the economics of a musical instrument or paper manufacturing.

Economists have termed this an externality: simply put, when a price does not reflect the full costs. Positive externalities are commonplace and unnoticed: for example a beekeeping business generating revenues from honey while the surrounding farmers receive a free pollination service.

Another often cited negative externality is the example of a factory polluting a river and, as a consequence, fishermen downstream catching fewer fish. The factory pollutes for free while the fishermen pay the costs of that pollution.

Climate change is perhaps the most dramatic example of global negative externalities. The illustration below (Figure 1) depicts country size according to responsibility for climate change 1950-2000 and highlights the distribution of four climate-sensitive health impacts during the same period. This shows that those generating the emissions are not those suffering the consequences.

Figure 1 *Comparison of undepleted CO_2 emissions by country for 1950 (A) – 2000 (B) and the distribution of climate-sensitive health consequences (deaths from malaria, malnutrition, diarrhea and inland flood)*



Source: Lancet 2009

To solve an externality a financial value needs to be calculated for the damage so that it can be internalised – i.e. accounted for within our economic system. This is relatively straightforward for the factory versus fishermen example: the fishermen sue the factory. However the complexities of climate change, particularly who is responsible for emissions over what period, expose the legal system as totally inadequate and present many barriers to businesses including externality costs in their prices. Individuals seeking to include environmental and ethical issues in their purchasing decisions are often confused. The size and complexity of the externalities requires centralised government intervention to make prices more accurate.

So how best to internalise the costs of climate change: in other words to put a price on carbon? Economists argue for two approaches:

- **Fix the price:** estimating the costs of climate change and levying a tax that equals those external costs. For example in the UK, electricity users pay a Climate Change Levy on their bills. Despite best efforts, a tax may still not equal all external costs or reflect everyone's approach to the risks resulting from climate change.

- **Fix a limit on the amount of pollution:** setting a limit on emissions and then allowing emitters to trade in emissions. This sets a price for emissions through the creation of a market where carbon is traded like any other commodity. This is currently implemented through the EU Emissions Trading System. Industrial lobbying to gain the permits to over-emit combined with uncertainties about the extent to which trading converts into effective mitigation impacts can result in the limit on emissions set by the EU not being adequate to make a significant impact on the problem even if trading remains brisk!

New tools and frameworks to protect the environment are urgently needed. Our current economic model, based on the traditional principles of a free market, competition, and private ownership of the means of production, is unfit for purpose in this new context. It needs to be redesigned to reflect environmental costs and benefits. The UK Government is developing its work on carbon valuation to help design policies effectively.

Companies need to recognise that there are costs excluded from the current budgets, and that, eventually government action will factor in, and internalise those costs as they are already internalized in, for example, the price of electricity thereby penalising events with high emissions.

Micro scale

On a micro scale, red diesel, for example, is generally cheaper than waste vegetable oil (WVO) biodiesel for mobile generators, but unlike WVO biodiesel it significantly contributes to greenhouse gas emissions. But its cost should not be the only consideration when considering the type of fuel for your event. Taking into account the volatility in fuel prices, particularly oil, and the potential for government policies to internalise environmental costs associated with the use of fuel in the near future, it makes sense to work with suppliers now for cleaner fuel alternatives. This could provide you with a competitive advantage over your competitors, as well as positive PR for your audience. You could even sell your used cooking oil from your event to suppliers to help increase the supply of the fuel while generating some cash.

Even with alternative energy sources that require an initial investment in infrastructure such as solar panels and wind turbines, there are government and other grants as well as tax breaks when moving to more sustainable energy sources. And this is in addition to the payback from reduced electricity and diesel costs that you will be experiencing.

There are some new costs associated with becoming more sustainably powered, not least in the additional staff time needed to understand new information. Additional staff time to engage with new suppliers and build new relationships, implement new processes and instigate new solutions, and monitor and evaluate enforcement, is necessary.

It is a common misconception that environmentally friendly alternatives cost more than their non-environmentally friendly counterparts. While in some cases this might be true, in other cases, such as recycling, the landfill tax is so high that it is cost-efficient for event promoters to minimise waste to landfill as much as possible. Switching off lights, generators and equipment when not in use (as opposed to keeping them on and getting charged unnecessarily), also brings costs down without any additional expenditure. When planning an event it is possible to include sustainable initiatives in the budget, identifying savings in the immediate and long-term in all major areas of your event such as energy, fuel supply, procurement, transport, hire costs, waste disposal, water usage.

It is often the case that an environmentally-friendly alternative will become more costly than its conventional counterpart because of the lack of planning and the tight timeframes for delivery, meaning your suppliers cannot satisfy your demands in the time available cheaply. But if planned ahead of time and included in the budget early on, the environmentally friendly alternative could cost the same as, if not less, than its conventional counterpart.

By making a sustainable purchasing and contracting decision you are also contributing to growing the demand for sustainable products and services in the events industry, which in turn can lead to cost reductions through economies of scale (for example an alliance between outdoor events requesting WVO biodiesel would prompt suppliers to work together to generate the supply which in turn would bring down costs). It is often the case that the resulting efficiencies (such as optimising the layout of mobile generators on the event site) can maximise fuel efficiencies and lead to savings in fuel, costs and carbon.

It is crucial that you also include your environmental sustainability efforts in funding applications as they could see you attract new funding sources that might have been unavailable to you in the past.

Sponsorship is a key element of producing a sustainable event, so choosing sponsors whose products or company aligns with your sustainability goals is crucial to how sustainable your event will be seen to be. Apart from the money and exposure, a sponsorship relationship will inevitably lead to an image transfer, so the event/sponsor could benefit (or the opposite) by the brand image or reputation of the sponsor/event. Product placement may form part of that partnership so you could consider sponsors that have strong environmental credentials, including sustainable practices in their logistical operations and in their communications practices with the audience.

Partnering with environmentally responsible products and companies can add value to your event so having a sponsorship or ethical policy that includes a sustainability checklist for the organisations you are considering working with could help you make informed choices about potential sponsorship opportunities. The same rationale can be applied to your traders and contractors.

You might also be willing to consider offsetting for your event alongside your internal emission reduction strategy. Offsetting is a last but significant final action after all efforts have been taken to reduce the emissions of your event internally. If you do decide to proceed with offsetting you should support offsetting companies with at least Gold Standard accreditation for GHG emissions offsetting projects. For more information on offsetting please see the relevant Hot Topic on *Offsetting*.

For more information on the practicalities of considering these additional costs in your budget and proceeding with your sustainability journey please see the *Wired Aerial* case study and the factsheet on *Costing the Environment* on the Julie's Bicycle website (www.juliesbicycle.com).

Hot Topic 5: Production

Producing any kind of event takes design and operation of various elements such as lights and sound. Familiarising yourself with the available options will mean that you can make educated choices regarding production materials and lighting technologies that will minimise the environmental impacts of your event.

Lighting

Lighting is responsible for 19% of the electricity consumption of an event thus offering substantial potential to reduce both energy usage and carbon emissions (Moving Arts, Volume 3, 2010). Investing in energy efficiency measures in electricity consumption is generally a cheaper way to reduce your environmental impact than investing in renewable power generation. There is therefore a trend amongst the events industry to transition away from traditional light sources such as incandescent light bulbs to Compact Fluorescent Lights (CFLs) and Light Emitting Diodes (LEDs). LEDs can last up to twenty times longer than incandescent lighting. The reduced heat generated by LEDs also means that less material is needed to act as a heat sink resulting in smaller units and more design flexibility. However, the high cost of LED's has slowed down the transition, despite offering pay back in the long term, regardless of this prices are dropping at a rate of about 20% per year.

Lighting has a central role to play in the aesthetics of a show and balancing the aesthetics and the environmental demands of a product is possible with smart lighting design and technologies. Manufacturers such as Philips, White Light, PRG and GLP have been investing in innovative technologies with strong environmental credentials, kick-starting the trend to low carbon lighting across the performing arts.

Artistic directors, lighting designers and the production teams should keep up to date with emerging technologies while also reducing the power demand of their productions.

Top tips for lighting

- Use less and dim them as much as possible.
- Use efficient bulbs e.g. tungsten moving lights rather than discharge.
- Use LEDs.
- Ensure lights are turned off when not in use.
- Conduct rehearsals under working lights.

Sound systems

While sound systems require less energy than lighting, they are still a major source of greenhouse gas emissions due to the energy required to power and transport them on site (Moving Arts, Volume 1, 2010). Advances in technology have meant that PA's have increased in output while diminishing in size, weight and energy requirements, thereby reducing energy consumption and transport requirements. The Funktion One, a patented, highly efficient, horn loaded loudspeaker system that produces four times more output than comparable products is an example of an emerging demand for more sustainable kit.

Top tips for sound systems

- Design intelligently for the space.
- Consider new lower impact products e.g. Harman Crown XLS, Dobson Sounds pulse-width modulation systems.
- Switch from analogue to digital desks.

Set Design and Disposal

Materials used in constructing the set, the construction process (including painting and décor) and how it is stored or disposed of at the end of its life cycle can generate a large amount of GHG emissions. This makes the construction and planning of sets a significant consideration when preparing budgets and hiring the production team and crew.

Challenges:

- Materials – Wood is considered biologically carbon neutral whereas aluminium and steel are associated with energy-intensive manufacturing processes, which require electricity and generate GHG emissions. Furthermore different types of wood have varying environmental credentials: plywood, depending on the method of harvesting, transportation and processing can be very environmentally destructive.
- Storage – Tight budgets cannot accommodate storage facility fees particularly when the possibility of re-using the set in the future is uncertain. The end result therefore is usually landfill disposal as most production managers are unaware of local recycling centres, or locations to recycle or reuse sets.
- Transportation – Sets and props need to be taken to and from the site, and to the various event locations, leading to the generation of GHG emissions from transportation.

Top tips for Set Design and Disposal

- Use FSC or other certified timber for set and staging construction.
- Avoid tropical hardwood, especially plyboard.
- Use standard measures as much as possible.
- Use non-PVC materials and choose fabrics that can be easily reused or recycled.
- Avoid polystyrene.
- If the production is touring design for the set to fit into the minimum number of vehicles.
- Reuse and recycle set, staging, props, costumes and special effects equipment:
  - Internally within your own productions.
  - Through agreements with other producing companies, for example using freecycle or Set Exchange (www.set-exchange.co.uk).
  - Through commercial services such as Scenery Salvage (www.scenerysalvage.com)

Musical Instruments

Wooden instruments

Many musical instruments are made from woods that are sourced from the world's tropical forests, therefore ensuring that they are made from well-managed forests is crucial. Increasingly more and more manufacturers are turning to tonewoods certified by FSC and sustainably sourced bamboo for their instruments. For example, Taylor, Martin, Fender and Yamaha are all working with Greenpeace as part of the Music Wood Coalition to stimulate the supply of FSC certified Sitka spruce, the species most commonly used for soundboards for their guitars.

Electronic instruments and equipment

With electrical items such as keyboards, synthesizers, guitar amps and pedals, consider how much energy the gear uses in operation and whether the manufacturer has ISO 14001 certification.

Top tips for musical instruments

- Use ethically sourced and environmentally responsible materials.
- Opt for energy efficient manufacturing or factories powered by renewable energy.

For a practical example of a sustainable event see the case study on *Bath Fringe festival*. For an in-depth understanding of the environmental impacts of pyrotechnics and their use in productions see the Hot Topic on *Pyrotechnics*.

Other companies and/or products to look out for which have already been engaging with sustainability in the production process include:

- GDS: Arcsystem: Dimmable LED lighting
- Bambu Brasileiro: Sustainably sourced bamboo for instruments
- Cycs go LED: Lighting
- EST: Sustainable Fleet
- Firefly Solar: Solar power generators
- Greenpeace: Music Wood Coalition
- KB Event Ltd: BS 8555 accredited trucking company
- Mariner Guitars: Sustainably Managed Wood
- Midas Productions: Biofuel generators
- Power logistics: Reductions and efficiencies
- Sonic Fabric: The world's first audible fabric
- Tigertours Ltd: Efficient Fleet
- McGuiness Forwarding: Efficient Fleet
- Tyler GT: Eco-friendly trussing
- Wicked Rechargeables: Rechargeable batteries on Broadway

You can access further case studies on production involving the above organisations at: www.juliesbicycle.com/resources/case-studies/production.

Green Carnival Floats

Case study 1: Brighton Carnival

Brighton Carnival was the first UK carnival to lower the output of harmful exhaust fumes emitted by the floats by allowing only electric, PPO, local bio-diesel and pedal power vehicles and generators on the parade. All the food stalls and traders have to comply with the carnival's green fuel policy and vehicles on site are discouraged. With the only Green local MP in the UK (Rt Hon Caroline Lucas) the Carnival had sufficient support to be pursuing the sustainability agenda and the City of Brighton and Hove has a wealth of sustainable transport suppliers in the area suitable for transporting carnival structures. Examples include The Big Lemon Coach Company and Shabitat – a part of the Magpie Recycling Co-operative. Although the costs of sourcing alternatives to diesel powered vehicles and generators were initially more expensive, the costs dropped the more they sourced.

Case study 2: Kambe Events

St Paul's Carnival ©JadeSummer

Kambe Events have put sustainability at their core and it informs all their projects including the St Paul's Carnival in Bristol. The organisers have been using electric powered golf buggies and pedal floats supplied by Pedalwallah with integrated sound systems using iPods for the last couple years. They say: "They don't quite have the impact of 17.5 tonne lorries, but they do provide the sound for the dancing troupes and use much less fuel thus producing much less carbon." The carnival uses 12 buggies in total and all are delivered on one lorry.

Case study 3: Festive Road

Festive Road are a vibrant, inclusive and innovative community arts organisation with a wealth of experience in engaging and empowering people in creative learning and participatory experiences. They have a policy of using recycled, reclaimed and sustainable materials as much as possible for the work they do, and have developed some innovative approaches to mobile renewable energy sources on their carnival structures. They have also been involved in a number of projects dealing specifically with eco-learning and sustainability issues.

One such project was 'Green Journey', developed with Ashcroft High School in Luton and supported by the UK Centre for Carnival Arts, as part of their 2011 Creative Partnerships programme. It sought to encourage students to participate as effective global citizens in their local community. Festive Road sourced a 'retired' London double-decker bus which students helped to transform into a 'Green Classroom'. This not only provided an alternative teaching space (complete with a cinema space with facilities for sound and projection) but also became a showcase for demonstrating work done on green technologies and renewable energy sources, including a wind turbine and cycle power generator that had been developed with the school's science department. They also worked with the art department to create a bicycle-powered entry to the Luton International Carnival using exclusively recycled materials. Another off-shoot of the project was the construction of a greenhouse fashioned from recycled plastic bottles, which Ashcroft students helped to construct in the garden of a neighbouring special needs school.

Hot Topic 6: Up in air or out to sea?

(Adapted from the original developed by Tristan Smith, University College London Energy Institute)

Why the environmental concern about aviation and shipping?

Aviation and shipping are the workhorses of globalisation. Together they move an overwhelming majority (80% of global trade travels by ship) of the raw materials, fuels, manufactured products and labour force around the world that has been fundamental to high consumption lifestyles typical of the West, as well as the inexorable industrialisation of China and the Far East. As a result, both sectors have experienced feverish growth rates over the last few decades. Growth projections, assuming business as usual, suggest that, if we fail to control emissions from aviation and shipping, they could contribute as much as 30% of anthropogenic emissions by 2050.

Beyond the headline figures on emissions proportions, both shipping and aviation have separate and additional climate challenges. Aircraft emissions are complicated by the physical and chemical impacts of their emissions on the upper atmosphere. Shipping's dirty secret is that it burns some of the lowest grade fuel that we extract from the ground; high sulphur fuels that have been all but banned from most of its previous applications. Through the International Maritime Organisation (IMO), there is now a framework in place to bring shipping's sulphur emissions down from current levels (about 4.5% of exhausted emissions) closer to that of a modern car.

One way to solve the land-based anthropogenic GHG problem is to decarbonise energy supply. However, it is not easy to plug a plane or a ship into a wind turbine. For these reasons neither the aviation nor the shipping sector currently foresees an imminent switch away from liquid fossil fuels. The physics of flight constrain planes to energy dense fuels and compact high-power-to-weight ratio engines. Ships are less restricted from a technological perspective, and have more space and carrying capacity to explore the application of emerging (or recurring) technologies. Some now see the combined challenges of high fuel prices and GHG emissions stimulating resurgence in wind powered shipping.

Many modern ships are too large to be powered wholly by sail, however, giant kites, flettner rotors (a rotating column which generates lift from the wind) and folding deployable wings have all been studied. Similarly, solar panels can be used to augment the power generated through internal combustion and their integration into ship design could become commonplace in the future.

Renewable power sources are not reliable and so future ships and planes still need to carry either fuel or energy storage that can be tapped into when the sun stops shining or the wind is not blowing. Biofuels are the most obvious technological answer because they require minimum disruption to our existing liquid fossil fuel infrastructure. Indeed, blends of biofuels are already in use. However, as demand for biofuels in all sectors increases, constraints on supply due to the large surface areas and resources (e.g. water) required for their production are likely to constrain their viability. This leaves synthetic fuel, such as hydrogen, ammonia and methanol. Low carbon generation of these fuels is technologically feasible, but the high costs associated with this will prevent their widespread uptake until sufficient regulation is in place.

Government aviation and shipping policies

Aviation and shipping are both included in the UK government's commitment to reduce GHG emissions by 80%. However, it is hard for the UK to act without international collaboration. Fortunately, as we await those global commitments, the EU has been busy pioneering a GHG Emissions Trading Scheme (ETS), which places caps on the GHG emissions in certain sectors and provides a market so that the higher emitters can buy 'permission' to emit GHG from lower emitters. This ETS will start a third phase this year that will include aviation within its scope. The United Nations Framework Convention on Climate Change (UNFCCC) has delegated the

responsibility of developing emissions regulation for shipping to the IMO, a UN agency. The EU is concerned about the rate of progress at IMO, although it recognises that only global regulation can produce the fundamental changes in the sector that are required for it to achieve a substantial reduction in emissions.

This means that emissions reductions are only likely in the shorter time scale if individuals and businesses make careful decisions. Only travelling when absolutely necessary and ensuring that preference is given to sourcing raw materials and products locally is the most effective and immediate response that individuals and companies can take.

Figure 2 *Grams of CO_2e per tonne-km associated with each type of freight*

Source: NTM (Swedish network for transport and the environment) – cited in British Chamber of Shipping (2009)

Guidance for reducing aviation and shipping emissions when touring

Air freight is easily the worst emitter, and whenever possible preference should be given to transport by ship, even over rail and road transport. Unfortunately, the timescales associated with global freight movements by ship may not be consistent with a hectic touring schedule. Perhaps ports will become the preferred concert venues of the future – you could do worse than Sydney, New York and London.

When it comes to passenger transport, because we demand short passage times, ferries have been getting faster. Combining the higher speeds with the space and levels of comfort that passengers demand means that in practice a switch from flying to travelling by sea would rarely result in significant emissions savings.

If aviation is the selected mode of passenger transport then you can make some contribution by choosing the most efficient type of flight. The responsible thing to do is to shun being pampered in first class, as first class seats reduce the number of more spatially efficient economy class seats you can fit on a plane. Airlines would stop fitting out large areas of their aircraft to higher-class travel if there was no longer the customer demand for this service. There are steps being taken to bring in regulation, which will provide a framework for implementing change in the future. In the meantime, the best advice if you want to create the minimum GHG impact is to take your time and to enjoy your journey.

For interesting examples of outdoor art companies addressing production transport see the case studies of the large-scale production transport used by *Wired Aerial* and the small-scale production transport suggestions made by the *Bureau Of Silly Ideas*.

Sustainable Event Management Certification

Case study 1: Event Cornwall

Event Cornwall has an extensive event portfolio stretching across corporate, community and creative activities all of which are treated to an extensive sustainability management plan. They have achieved BS 8901 compliancy (see *Section 8.0 Resources* for more information on BS 8901) and won the 'Best Managed Small Business' award at the Cornwall Sustainability Awards in 2010 and in 2011.

Group of Small Lanterns, Event Cornwall ©SteveTanner

Event Cornwall's biggest challenge is posed by their rural location (and lack of public transportation available), as well as their increasingly national portfolio. They are working with local and regional government bodies to support sustainable development of their transport infrastructure as part of the strategic development of the events economy. They are seeking partnerships in order to develop sustainable practice throughout the sector in this area, and increase leverage, influence and relationships with local government to minimise their environmental impact and maximise their economic and social outputs.

Event Cornwall also delivers lectures on sustainable issues for Event Management students at University of Plymouth and University College Falmouth in order to ensure that the sustainable agenda is central in the education of future event managers.

Hot Topic 7: Carbon Offsets: cop-out or climate winner?

(Adapted from the original developed by Dr. Adam Bumpus, University of British Columbia, Canada)

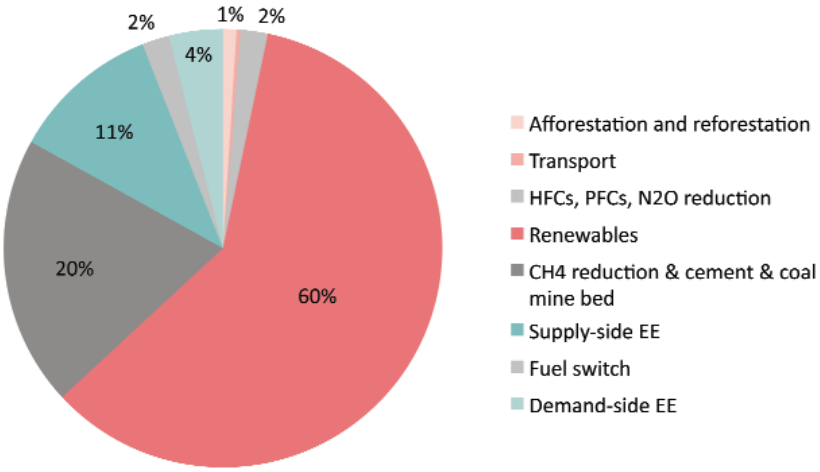
What exactly is carbon offsetting?

A carbon offset is a mechanism that allows a company, organisation or individual to reduce its environmental impact on the atmosphere in one area by investing in projects that reduce greenhouse gas (GHG) emissions in another. Offsets are controversial. Some offset projects have questionable emissions reductions, create unwanted local effects and open the possibility for fraud and profiteering by 'carbon cowboys'. On the other hand, carbon offsets are popular because they are often cheaper, faster and easier than domestic emissions reductions. Often carbon offsets are carried out in developing countries and in some circumstances projects have led to significant local benefits.

How does carbon-offsetting work?

Carbon reductions can come in the form of removing carbon directly from the atmosphere, such as planting trees to increase carbon sequestration, or by investing in energy efficiency or new clean technology to replace fossil fuel burning. The difference in emissions that would have been emitted and the current, lower emissions (i.e. because of the new project investment) create reductions that are traded as metric tonnes of CO_2 equivalent (i.e. carbon credits). Many types of projects are used in carbon offsets. These range from industrial gas destruction to community-based agro forestry (see Figure 3).

Figure 3 *Number (%) of CDM projects in each category*



Source: UNEP Riscoe, Feb 2010

Markets for creating reductions

The reductions and transference of credits take place in two broad market categories. These markets differ in governance, size, project types and prices. Firstly, the compliance market includes the Kyoto Protocol's Clean Development Mechanism (CDM) and Joint Implementation (JI). Secondly, the voluntary carbon offset (VCO) market is not regulated and is used by organisations not bound by Kyoto to offset their emissions primarily for public relations and for reasons of corporate social responsibility (Hamilton et al., 2009). Although traditionally the voluntary and compliance markets differed in project types, credit sourcing in the CDM is increasingly influencing the voluntary markets as project developers sell Verified Emission Reductions (VERs) while awaiting CDM registration (e.g. 32% of project types are Hydroelectricity in both CDM and VCO markets).

Evolution of offset markets

Since the mid-2000s the carbon offset markets have evolved significantly in terms of knowledge, practice and their effective use. More recently, the Clean Development Mechanism (CDM) is being reformed away from the 'project-based approach' to programmes of activities (i.e. reducing emissions of a whole city) or reductions of emissions by industrial sector (i.e. setting standards for emissions reductions in a specific industry). In addition the voluntary market is increasingly self-regulating in the context of consumer awareness around carbon offsets. Increasingly the compliance and voluntary markets are merging as self-regulation increases.

The UK Carbon Trust has suggested a useful way of engaging offsets through a three-stage process:

1. Focus on direct emissions reductions through efficiency;
2. Look at reducing indirect emissions up and down the supply chain;
3. Develop an offset strategy.

Guidance on what to look for when purchasing a carbon offset for your tour

Rather than project type or size, the best way to ensure credible carbon offsets is to use a credible standard. The Clean Development Mechanism (CDM) is the most regulated standard, but the Voluntary Carbon Standard is increasingly seen as an alternative for project types and geographic regions not allowed under the CDM. For organisations that want to promote the local community development stories associated with carbon offsets, then the Gold Standard (GS) or the Climate Community and Biodiversity Standards (CCBS) will help source credits that have explicitly channelled finance into development projects. Any credible standard should produce offsets that are additional to business as usual practices, measureable, reportable and verifiable. Standards should also encourage the use of a carbon registry to track offset credits in order to prove that they have been retired (taken out of circulation) when they are bought.

Conclusions

A robust offset strategy involves achieving internal reductions as far as possible, and then sourcing carbon offsets that are registered to credible standards and tracked through carbon registries. Carbon offsets can be forces for good, but they should be considered as a tool in the box of climate solutions, not as an end in themselves.

Bibliography

Hamilton, K., Sjardin, M., Shapiro, A. and Marcello, T. (2009). Fortifying the Foundation: State of the Voluntary Carbon Markets 2009. Ecosystem Marketplace and New Carbon Finance, London.

Hot Topic 8: Leisure Travel: the untapped savings

(Adapted from the original developed by Dr. Jillian Anable, University of Aberdeen)

Why leisure travel is important when considering GHG emissions

Audience travel is the largest cause of greenhouse gas (GHG) emissions in the performing arts sector; in any given event it will account for two-thirds of its emissions, overshadowing that of energy, waste etc. The apparently insatiable demand for the movement of goods and people, particularly by road and air, means that the transport sector is consistently responsible for around a quarter of carbon dioxide emissions in developed countries. About two-thirds of these emissions are accounted for by individual passenger movements, and the rest by freight demand.

Leisure travel, in all its guises (but not including shopping), is responsible for around 30% of personal travel emissions. In terms of car dependency, leisure comprises one of the fastest growing sectors of car based travel demand. Yet, apart from the occasional focus on holiday traffic 'mayhem', leisure travel rarely hits the headlines or is afforded the policy and research attention it deserves.

Government transport policies

In the study of leisure sociology and psychology, most authors agree that leisure participation is an expression of identity, personal values and attitudes. Precisely the same factors closely associated with leisure also conjure up notions of a state of mind connected with the 'love affair with the car' such as freedom of choice, freedom from obligation, liberty and free access, enjoyment, relaxation, a lack of evaluation, voluntary participation, and so on. Consequently, for policy to be successful in this area, interventions need to replicate the necessary conditions for this state of mind to be created whilst using transport modes other than the car.

In the UK and elsewhere, the overwhelming balance of effort lies with technical solutions at the expense of attempts to alter mode choices and patterns of movement. This emphasis on vehicle and fuel technologies ignores the increasingly large body of evidence now pointing to the potential for the right combination of incentives, service improvements and information to alter travel choices over relatively short time periods, for many different types of journey at low cost. The mobility management approach is aimed at encouraging the use of alternative modes by changing behaviour on behalf of organisations and individuals and utilises interventions such as travel plans, ticketing and pricing alterations, car clubs and car sharing schemes, personalised journey planning and promotional campaigns. The important point is that the definition of 'behaviour change' in mobility management is not simply restricted to mode choice, it also involves using the transport mode most appropriate for each journey, flexible use of travel time and route choice. Most of all it involves increasing understanding of travel behaviour and the reasons for individual journeys in order that interventions can be designed and targeted accordingly.

Guidance for how to reduce audience travel emissions

Targeting audience travel to venues hosting festivals, music, sporting and theatrical events has the potential to have an impact much greater than the sum of its parts. Successful changes achieved in audience travel behaviour could have a trickle down effect and help to embed lower carbon choices into a wider set of travel decisions.

Efforts to influence audience travel patterns necessitate excellent partnership working between transport operators, promoters, local authorities and venues. The journey experience itself needs to become an integral part of the whole cultural and leisure experience. This includes integrated methods of payment, which at least offer the illusion of 'free travel' to rival the often perceived 'free' marginal costs of car travel.

Some key ways to encourage green audience travel include:

- Choose locations that are easily accessible by public transport, walking and cycling. If this is not possible, take steps to improve the local transport, and work with the providers.
- Communicate lower carbon travel options to your audience.
- Survey travel options to inform your strategy.
- Encourage lower carbon options through ticket sales and incentives: bundle coach and event tickets, provide limited parking or charge for parking, reward those that arrive on public transport, etc.
- Provide a cycle infrastructure.
- Take audience travel surveys (this is the best way to overcome the challenges of measuring audience travel for free events).

Most importantly, lower carbon alternatives need to be aspirational experiences to alter social norms and expose audiences to alternative ways of doing things.

You can refer to the case studies on Julie's Bicycle website for examples of green travel incentives used by various outdoor events and for guidance in developing your own audience travel surveys.

Commissioning

Case study 1: CREATE festival

CREATE festival is a partnership of the 2012 Olympic and Paralympic host boroughs that are working with leading arts organisations, venues and practitioners to develop an internationally significant annual arts festival in the lead up to, and beyond, 2012.

The lowest level of cultural engagement in Western Europe can be found in the London host boroughs even though a large number of high-level cultural organisations are based there. Research shows that there is a strong correlation between cultural engagement and socio-economical factors and CREATE seeks to addresses these issues by facilitating and encouraging local audience to engage with these cultural organisations in their back yard.

"The CREATE festival has developed a well-respected, award-winning commissioning model in the four years it's been running. One of the reasons the model works well is because it's inherently sustainable. At CREATE we work with local artists and audiences. We are a lean, extremely effective strategic unit, bringing a strong committed partnership together to work collaboratively across sectors, art forms and practices. We like to say we source our cultural produce locally!"

By sourcing their artists locally this can have a positive knock on effect on business travel, audience travel and potentially material sourcing, thereby minimising the environmental impacts of the festival. By working with local audience the organisation can ensure a local audience rate of 39%, which in turn limits the greenhouse gas emissions resulting from audience travel to the event. The festival also runs a number of events that are more explicitly about sustainability, with the objectives being to raise awareness and encourage public engagement with these issues.

8.0 Resources

This section identifies some of the resources available to help outdoor arts organisations improve their environmental performance. These resources fall broadly into three categories:

Tools – usually online calculators and databases that offer automated but targeted information, e.g. carbon auditing/footprint results.

Guidance – publications, websites, and apps that gather together best practice, advice, worksheets, templates and case studies to inspire improved environmental performance.

Certifications, Standards and Awards – assessment, labelling and awards programmes that support environmental ambitions by offering assurances that a product or service has met predetermined environmental criteria or is complying with environmental standards including emissions reductions. They can also provide guidance directly to the certifying or awarded organisation, by specifying what organisational practices are required to achieve a minimum level of achievements.

The options below should be seen as a starting point. Outdoor arts organisations should also search for local resources that can complement outdoor arts specific resources. Often local municipalities, central government environment departments, NGOs, charities or universities develop generic resources that can be beneficial to outdoor arts organisations.

1. Tools and Databases

Eventberry

Developed for event organizers, suppliers and venue managers, Eventberry is an events and buildings management system tool for sustainability reporting, including information on risk analysis, environmental policy, energy, waste, water, community, construction, location, health and safety, purchasing and sourcing.

http://eventberry.com/

Gadidi

Gadidi is sophisticated energy management software designed for buildings with automated internal energy data. Currently in development by the energy experts that created sMeasure, Gadidi's cutting-edge energy use visualisation and analytics will be customised to the requirements of the building to make complex sub metering systems easy to understand and manage. Gadidi v1.0 will be built in 2012 and piloted with twelve cultural organisations for 12–18 months starting in January 2012. For more information and/or to participate in the pilot contact: catherine.bottrill@pilio-ltd.com

Inventory of Carbon and Embodied Database

The University of Bath has developed the ICE database. It enables you to calculate the embodied energy and carbon emissions that are associated with different materials used to create a stage set. To use the database you will need to know the type and quantify of materials used.

www.bath.ac.uk/mech-eng/sert/embodied/

Julie's Bicycle Green Databases

Julie's Bicycle is developing two Green databases; one for Festivals, Venues and Events and another for Suppliers to the creative industries. They will be showcasing a wide range of green events, products and services in the creative industries that fulfil specific sustainability criteria. They will be launched in Spring 2012.

www.juliesbicycle.com/resources/jb-green-database

Julie's Bicycle IG (Industry Green) Tools

Developed specifically for the creative industries, the IG Tools are free-to-use online carbon calculators suitable for use across the world. The IG Tools measure the greenhouse gas emissions produced by Touring, Production, Venues, Festivals and Outdoor Events, and Offices. The IG Tools provide results on greenhouse gas emissions generated by energy, water, waste, audience and business travel. The IG Touring and Production Tools can also be used as a planning tool before the tour or production takes place, to calculate expected emissions, and then revisit when the event is complete to identify the actual emissions. Alongside the IG Tools are tips, guidance, resources and publications on the Julie's Bicycle website.

www.juliesbicycle.com/resources/ig-tools

www.juliesbicycle.com/resources

sMeasure

sMeasure is an online energy analysis tool specifically designed for small and medium businesses by researchers at the Environmental Change Institute at Oxford University. Using weekly meter readings for electricity and gas, sMeasure's easy-to-use sophisticated weather analysis assesses the energy performance of buildings against weather conditions. In addition, the performance is assessed against national standard energy efficiency benchmarks thereby facilitating a good estimation of energy over- and under-spend. sMeasure now also includes water.

http://smeasure.com/

Sustainable Event Management System (SEMS)

A comprehensive sustainability management system designed for all event and meetings organisers. Implementation of SEMS reduces the economic, social and environmental impacts of an event and provides a reporting mechanism for attendees, staff, customers and shareholders.

www.sustainableeventsolutions.com.au

The Event Sustainability Tool

The Event Sustainability tool is an online tool designed to support event managers and includes measurement checklists, communication templates and industry best practice advice. The online tool generates a report, complete with a direct emissions calculation, which can be used as evidence of steps taken towards compliance with industry standards including BS 8901.

www.eventsustainability.co.uk

Transport Direct Carbon Calculator

By entering journey distance and intended travel mode this free calculator will compare the greenhouse gas emissions across different travel modes (car, rail, bus/coach and plane).

www.transportdirect.info/Web2/Tools/Home.aspx?cacheparam=4

2. Guidance

Environmental Policy

It is beneficial for all organisations and companies to have an Environmental Policy, which focuses on the environmental impacts created by their activities and includes commitments and strategies to reduce those impacts. Julie's Bicycle offers information, guidance and templates for developing an environmental policy appropriate for your organisation or company.

www.juliesbicycle.com/resources

Green Rider template

Julie's Bicycle has developed a template as well as environmental sustainability contract clauses that companies can use and adapt to the specific needs of their event. In addition, Julie's Bicycle also can provide guidance if the venue, festival or promoter wants to request incoming productions to adhere a set of environmental guidelines.

www.juliesbicycle.com/resources

GRI: Sustainability reporting guidelines

The Global Reporting Initiative (GRI) is a network-based organisation that has pioneered the development of a widely used sustainability-reporting framework. They are committed to its continuous improvement and application worldwide. This framework sets out the principles and indicators that organisations can use to measure and report their economic, environmental, and social performance.

Tailored versions of the GRI Guidelines are available for different sectors in Sector Supplements. For the event organising world the relevant supplement is the GRI Event Organisers Sector Supplement (EOSS), which provides reporting guidance that is suitable for all types and sizes of events. This includes business events (e.g. exhibitions, meetings and conferences), sports events and cultural events (e.g. festivals). The guidance covers the reporting organisation's event and other activities throughout the complete project life cycle of an event, including business operations during the planning phases, and can be used to report on multiple or one-off events.

www.globalreporting.org

www.globalreporting.org/reporting/sector-guidance/event-organizers/Pages/default.aspx

Julie's Bicycle Factsheets

A range of short research pieces available for free on the Julie's Bicycle website that look into some of the more controversial hot topics relevant to the arts and creative industries. There are currently factsheets on Freight; Biofuels; Food; Governance; the Science behind Climate Change; Travel; Merchandise; Offsetting and Stage Set Construction and Disposal.

www.juliesbicycle.com/resources/fact-sheets

3. Certifications, Standards and Awards

For Buildings

BREEAM Assessments

BREEAM provides a rating related to a range of categories including: management, health and well-being, energy, transport, water, materials, waste, land use and ecology, pollution and innovation. BREEAM is an assessment method for sustainable buildings enabling designers, developers and building managers to demonstrate environmental credentials.

www.breeam.org/

Display Energy Certificates (DECs)

A Display Energy Certificate shows the energy performance of a building based on actual energy consumption as recorded annually over previous years. A DEC is valid for one year and must be updated annually. It is required for buildings that are occupied in whole or part by public authorities and by institutions providing services to the public, such as concert halls, theatres, libraries and museums.

The DEC uses an average kWh/m2 for gas and electricity to work out where a venue is on the A-G scale. The average was developed by CIBSE (Chartered Institute of Building Services Engineers). Julie's Bicycle has found that average to be unreliable for many performing arts venues, so has calculated a new average based on data from over 100 venues. Julie's Bicycle is now developing a document to go on the wall next to a venue's DEC, which explains the building's performance against the new average. This 'co-display' document will support venues by providing more industry-specific data than the current DEC can provide.

www.communities.gov.uk/publications/planningandbuilding/displayenergycertificates

Industry Green for Venues and Offices (IG)

Industry Green is a simple voluntary certification programme that is based on four principles of environmental good practice: commitment, understanding, improvement and communication. With carbon dioxide (CO_2) reduction at its heart, the certification covers impacts associated with energy, water, waste and travel alongside organisational commitment, improvement and communication. It is externally verified by the Environmental Change Institute, Oxford University and an independent Expert Advisory Group.

www.juliesbicycle.com/industry-green

ISO 14001

A voluntary, internationally recognised standard for implementing an environmental management system with guidance in your building. ISO 14001 provides assurance that the organisation is in control of the processes and activities that have an impact on the environment.

www.iso.org

ISO 50001

A voluntary, internationally recognised standard for energy management that gives organisations the requirements for energy-management systems (EnMS). It is compatible with the IG Tools and the Industry Green certification.

www.iso.org

For Festivals and Outdoor Events

A Greener Festival

A popular award for festivals in the UK and abroad. 46 festivals across the UK, Europe, Australia and North America have been awarded the prestigious Greener Festival Award for their green efforts in reducing their environmental impact 2011.

www.agreenerfestival.com/

BS 8901

A voluntary British Standard specifying a sustainability management system for events. The guidance documentation promotes continual improvement of organisational sustainability performance by identifying what a company should consider/address.

www.bsigroup.co.uk/en/Assessment-and-Certification-services/Management-systems/Standards-and-Schemes/BS-8901/

Green 'N' Clean

Originally launched by Yourope, the European Festival Association in 2006/07 as a printed booklet with environmental guidelines for music festivals, Green 'N' Clean is now supplemented by an online tool providing festival organisers with customised environmental advice plus an award for festivals who achieve a defined number of criteria in terms of environmental measures.

www.yourope.org/green_clean.aspx

Industry Green for Festivals and Outdoor Events (IG)

Industry Green is a simple voluntary certification programme that is based on four principles of environmental good practice: commitment, understanding, improvement and communication. With carbon dioxide (CO_2) reduction at its heart the certification covers impacts associated with energy, water, waste and travel alongside organisational commitment, improvement and communication. The certification is externally verified by the Environmental Change Institute, Oxford University and an independent Expert Advisory Group.

www.juliesbicycle.com/industry-green

ISO 20121

A voluntary, internationally recognised standard for event sustainability management systems based on BS 8901, currently in development and expected to be complete in mid 2012.

www.iso.org

Other

EMAS

The Eco-Management and Audit Scheme is a voluntary initiative established by European regulation to improve a company's environmental performance.

http://ec.europa.eu/environment/emas/index_en.htm

Fairtrade

The Fairtrade mark is an independent consumer label, which appears on UK products as a guarantee that they have been certified against internationally agreed Fairtrade standards. It shares internationally recognised Fairtrade standards with initiatives in 20 other countries, working together globally with producer networks as Fairtrade Labelling Organisations International (FLO). The Mark indicates that the product has been certified to give a better deal to the producers involved – it does not act as an endorsement of an entire company's business practices.

www.fairtrade.org.uk

FSC

The FSC logo is a branded trust mark that identifies responsible forest management in the market place. It empowers consumers to make responsible purchasing decisions on forest products. All forest products with the FSC label carry a guarantee to consumers that the product comes from responsible sources. An FSC certified product can only carry the FSC logo if the production chain can be fully and reliably traced from the forest through each and every processing stage all the way to the shelf. There are three FSC labels: FSC 100%, FSC mixed sources and FSC recycled.

FSC 100%: Products that come only from well-managed forests that have met FSC's high social and environmental standards.

FSC mixed sources: Products that support the development of responsible forest management worldwide. The wood comes from FSC-certified well-managed forests, recycled material and/or controlled wood from non-controversial sources.

FSC recycled: Products that support the reuse of forest resources that helps to reduce the pressure on natural forests.

www.fsc-uk.org/

Green Key

Eco-label primarily for hospitality facilities that aims to contribute to prevention of climate change and sustainable tourism by awarding and promoting good initiatives.

www.green-key.org

Soil Association

Any product sold as 'organic' must comply with strict rules set at national, European and international levels. These rules (known as standards) assure consumers they are buying genuinely organic products that can be fully traceable back to the farm. A product with the Soil Association symbol indicates that it not only meets the UK government's minimum requirements, but also exceeds them – especially in areas concerning the environment and animal welfare. The Soil Association have also developed standards for areas not covered by government or EU regulations such as conservation, fish farming, textiles and health and beauty care products.

www.soilassociation.org

9.0 Glossary

Aerosols

A collection of air-borne solid or liquid particles, with a typical size between 0.0001 and 1000µm, that reside in the atmosphere for at least several hours. Aerosols may be of either natural or anthropogenic origin. Aerosols may influence climate in two ways: directly through scattering and absorbing radiation, and indirectly through acting as condensation nuclei for cloud formation or modifying the optical properties and lifetime of clouds.

Adaptation

Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Various types of adaptation can be distinguished, including anticipatory, autonomous and planned adaptation:

Anticipatory adaptation - Adaptation that takes place before impacts of climate change are observed. Also referred to as proactive adaptation.

Autonomous adaptation - Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. Also referred to as spontaneous adaptation.

Planned adaptation - Adaptation that is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state.

Afforestation

It is the establishment of a forest or stand of trees in an area where there was no forest (as opposed to reforestation which is the reestablishment of forest cover, either naturally (by natural seeding, coppice, or root suckers) or artificially (by direct seeding or planting). Many governments and non-governmental organizations directly engage in programs of *afforestation* to create forests, increase carbon capture and sequestration, and help to anthropogenically improve biodiversity.

Anthropogenic

Human impact on the environment (can be positive or negative). The term is sometimes used in the context of carbon dioxide emissions that are produced as a result of human activities but applies broadly to all major human impacts on the environment.

Atmosphere

The gaseous envelope surrounding the Earth. The dry atmosphere consists almost entirely of nitrogen and oxygen, together with trace gases including carbon dioxide and ozone.

Biosphere

The part of the Earth system comprising all ecosystems and living organisms in the atmosphere, on land (terrestrial biosphere), or in the oceans (marine biosphere), including derived dead organic matter, such as litter, soil organic matter, and oceanic detritus.

Biodiversity

The total diversity of all organisms and ecosystems at various spatial scales (from genes to entire biomes).

Biofuels

Fuels derived directly from living matter e.g. biodiesel, algal fuel, and bioethanol. There are three categories of biofuels, which refer to the type of plant material used to create the fuel. The first category of biofuels are derived from plant material that is also a food source i.e. ethanol from corn. The second category of biofuels are derived from plant material that is not also a food source i.e. biodiesel from inedible oil. The third category of biofuels refers to algae used to derive biodiesel. Currently only the biofuels in the first category are economically viable at scale.

Biomass

The total mass of living organisms in a given area or volume; recently dead plant material is often included as dead biomass. The quantity of biomass is expressed as a dry weight or as the energy, carbon or nitrogen content.

Cap and Trade Scheme

A central authority (usually a government body) sets a limit or cap on the amount of a pollutant that can be emitted. The limit or cap is allocated or sold to firms in the form of emissions permits, which represent the right to emit or discharge a specific volume of the specified pollutant. Firms are required to hold a number of permits (or carbon credits) equivalent to their emissions. The total number of permits cannot exceed the cap, limiting total emissions to that level. Firms that need to increase their emission permits must buy permits from those who require fewer permits. The transfer of permits is referred to as a trade. In effect, the buyer is paying a charge for polluting, while the seller is being rewarded for having reduced emissions. Thus, in theory, those who can reduce emissions most cheaply will do so, achieving the pollution reduction at the lowest cost to society.

Carbon Dioxide

A naturally occurring gas, and also a by-product of burning fossil fuels and biomass, as well as land-use changes and other industrial processes. It is the principal anthropogenic greenhouse gas that affects the Earth's radiative balance. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of 1.

Carbon Dioxide Equivalent (CO_2e)

The universal unit of measurement used to indicate the global warming potential (GWP) of each of the 6 Kyoto greenhouse gases. It is used to evaluate the impacts of releasing (or avoiding the release of) different greenhouse gases.

Carbon Footprint

A measure of the impact human activities have on the environment in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide.

Carbon Dioxide Sink

Carbon dioxide reservoir that is increasing in size. Main natural sinks are (1) the oceans (absorbed about one-third of all human-generated CO_2 emissions to date) and (2) plants that use photosynthesis to remove carbon from the atmosphere by incorporating it into biomass and release oxygen into the atmosphere. This concept of CO_2 sinks has become more widely known because the Kyoto Protocol allows the use of carbon dioxide sinks as a form of carbon offset.

CDM (Clean Development Mechanism)

The CDM allows greenhouse gas emission reduction projects to take place in countries that have no emission targets under the United Nations Framework Convention on Climate Change (UNFCCC) Kyoto Protocol, yet are signatories.

Climate

Climate in a narrow sense is usually defined as the "average weather," or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands of years. The classical period is 3 decades, as defined by the World Meteorological Organisation (WMO). These quantities are most often surface variables such as temperature, precipitation and wind.

Climate Change

A change of climate that is attributed directly or indirectly to human event that alters the composition of the global atmosphere and which is in addition to natural climate variability over comparable time periods (Source: United Nations Framework Convention on Climate Change).

Climate Justice

Reparation for the past and entitlement to equitable standards of living for the future

Deforestation

Natural or anthropogenic process that converts forest land to non-forest. See *afforestation and reforestation*.

Direct Emissions

Emissions that are produced by organisation-owned equipment or emissions from organisation-owned premises, such as carbon dioxide from electricity generators, gas boilers and vehicles, or methane from landfill sites.

Ecological Footprint

Ecological footprint analysis compares human demand on nature with the biosphere's ability to regenerate resources and provide services. Using this assessment, it is possible to estimate how many planet Earths it would take to support humanity if everybody lived a given lifestyle.

Embodied Carbon Emissions

The term 'embodied carbon' refers to carbon dioxide emitted at all stages of a good's manufacturing process, from the mining of raw materials through the distribution process, to the final product provided to the consumer. Depending on the calculation, the term can also be used to include other GHGs.

Embodied Energy and Carbon

Embodied energy is defined as the commercial energy (fossil fuels, nuclear etc.) that was used in the work to make any product, bring it to market, and dispose of it. Embodied energy is an accounting methodology which aims to find the sum total of the energy necessary for an entire product lifecycle, including raw material extraction, transport, manufacture, assembly, installation, disassembly, deconstruction and/or decomposition.

Embodied carbon, in the same way, refers to the greenhouse gases released during the lifecycle of a product, as a result of producing it, bringing it to market and disposing of it. It also refers to the greenhouse gases released as a result of building construction i.e. the embodied carbon in buildings.

Emissions

The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere.

Emissions Standards

Requirements that set specific limits to the amount of pollutants that can be released into the environment. Many emission standards focus on regulating pollutants released by cars but they can also regulate emissions from industry, power plants, small equipment such as lawn mowers and diesel generators. The 700 million cars currently on the world's roads produce 2.8 billion tons of CO_2 annually. This represents 20% of the world's CO_2 emissions.

Emissions Trading

Like with cultural goods, our economy is not organised to sufficiently value environmental goods and services in financial terms. As a result the implicit costs of using and/or degrading environmental goods and services are often excluded from the external price, which in economics is termed an 'externality'. Climate change, for example, is the most dramatic example of a global negative externality. One of the two ways currently available to internalise the costs of climate change into our economy is a cap and trade scheme. The scheme sets a limit on the quantity of emissions allowed over a given time period so reductions are certain, but the price per tonne will change depending on how easy it is for the economy to stay within the emissions limit. The EU Emissions Trading Scheme for large energy users is the largest trading scheme globally. A number of governments are considering carbon taxation as an option for reducing emissions.

Energy Efficient Lighting Equipment

Efficient energy use, sometimes simply called energy efficiency, is the goal of efforts to reduce the amount of energy required to provide products and services. For example, installing fluorescent lights or natural skylights reduces the amount of energy required to attain the same level of illumination compared to using traditional incandescent light bulbs. Compact fluorescent lights use two-thirds less energy and may last 6 to 10 times longer than incandescent lights. Improvements in energy efficiency are most often achieved by adopting a more efficient technology or production process.

Environmental Credentials

Qualifications and/or achievements of an organisation in the remit of environmental sustainability, such as a certification (e.g. Industry Green, BS 8901, ISO etc.).

Environmental Impacts

The effects human activity has on the environment, usually measured in terms of carbon dioxide equivalent (CO_2e). Examples of negative impacts on the environment include emissions released from travel, energy, waste, water consumption etc.

Environmental Sustainability

Environmental sustainability refers to the ability of natural ecosystems to remain diverse and productive, thus being able to support life over a period of time. All human activity is based on these ecological goods and services. Some human activities, such as the excessive production of GHG emissions (including carbon dioxide), have led to the decline in natural ecosystems and to changes in the balance of natural cycles, thus undermining and degrading the capacity of ecosystems to continue supporting life. Living sustainably, for example, by reducing carbon dioxide and other GHG emissions, will ensure the long-term viability and productivity of these ecosystems, providing both humans and other living systems with the capacity to endure. It is in this context that we create a direct link between GHG emission reductions and environmental impacts.

Global Warming

The continuous gradual rise of the earth's surface temperature thought to be caused by the greenhouse effect and responsible for changes in global climate patterns (see *Climate Change*).

Global Warming Potential (GWP)

The GWP is an index that compares the relative potential (to CO_2) of the 6 greenhouse gases to contribute to global warming i.e. the additional heat/energy, which is retained in the Earth's ecosystem through the release of this gas into the atmosphere. The additional heat/energy impact of all other greenhouse gases are compared with the impacts of carbon dioxide (CO_2) and referred to in terms of a CO_2 equivalent (CO_2e) e.g. Carbon dioxide has been designated a GWP of 1; Methane has a GWP of 21.

Green Champions

Individuals within organisations, or organisations that are willing to be sector leaders in environmental sustainability, piloting initiatives and campaigns.

Green Rider

A Green Rider is intended to offer guidelines and to stimulate a dialogue between visiting managers (touring companies, artists and producers) and receiving managers (venues, festivals and promoters) about best practice in reducing environmental impacts. It follows the format of a technical rider that performing arts companies have been accustomed to use, and focuses on touring and presenting work in more environmentally sustainable ways.

Greenhouse Effect

Trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. Some of the heat flowing back toward space from the Earth's surface is absorbed by water vapour, carbon dioxide, ozone, and several other gases in the atmosphere and then reradiated back toward the Earth's surface. If the atmospheric concentrations of these greenhouse gases rise, the average temperature of the lower atmosphere will gradually increase. See *greenhouse gases, anthropogenic, climate, global warming*.

Greenhouse Gases

The current Intergovernmental Panel on Climate Change (IPCC) inventory includes six major greenhouse gases. These are Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF_6).

Greenhouse Gas Protocol

Greenhouse Gas Protocol is the most widely used international standard for understanding, quantifying, and managing greenhouse gas emissions. It is published by the World Business Council for Sustainable Development and the World Resources Institute.

Indirect Emissions

Emissions that are a consequence of the activities of the reporting company but occur from sources owned or controlled by another organisation or individual. They include all outsourced power generation (e.g. electricity, hot water), outsourced services (e.g. waste disposal, business travel, transport of company-owned goods) and outsourced manufacturing processes. Indirect emissions also cover the activities of franchised companies and the emissions associated with downstream and/or upstream manufacture, transport and disposal of products used by the organisation, referred to as product life-cycle emissions.

Industry Green (IG) Tools

Julie's Bicycle has developed a suite of online, free-to-use carbon calculators, designed specifically for the creative and arts industries, to enable users to calculate their carbon footprint. There is an IG Tool for Venues; Festivals and Outdoor Events; Offices; Production and Touring. The Tools ask for information on your energy, water, waste and travel (personnel/business and audience) and enable users to note any innovations and initiatives they have been involved in.

IPCC

The Intergovernmental Panel on Climate Change. A special intergovernmental body established by the United Nations Environment Programme (UNEP) and the World Meteorological Organisation (WMO) to provide assessments of the results of climate change research to policy makers.

Kyoto Protocol

The Kyoto Protocol originated at the 3rd Conference of the Parties (COP) to the United Nations Convention on Climate Change held in Kyoto, Japan in December 1997. It specifies the level of emission reductions, deadlines and methodologies that signatory countries (i.e. countries who have signed the Kyoto Protocol) are to achieve.

LED Lights

A light-emitting diode (LED) is a semiconductor light source – they are used as indicator lamps in many devices and are increasingly used for other lighting. LEDs present many advantages over incandescent light sources including lower energy consumption, longer lifetime, improved robustness, smaller size, faster switching, and greater durability and reliability.

Life Cycle Analysis (LCA)

Also referred to as a life cycle assessment, or cradle to grave analysis. Investigation and valuation of the environmental impacts of a given product or service caused or necessitated by its existence. It is a variant of input-output analysis focusing on physical rather than monetary flows.

Methane (CH_4)

A hydrocarbon that is a greenhouse gas with a global warming potential most recently estimated at 23 times that of carbon dioxide (CO_2). Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion. The GWP is from the IPCC's Third Assessment Report (TAR).

Nitrogen Oxides (NO_x)

Gases consisting of one molecule of nitrogen and varying numbers of oxygen molecules. Nitrogen oxides are produced in the emissions of vehicle exhausts and from power stations. In the atmosphere, nitrogen oxides can contribute to formation of photochemical ozone (smog), can impair visibility, and have health consequences; they are thus considered pollutants.

Nitrous Oxide (N_2O)

A powerful greenhouse gas with a global warming potential of 296 times that of carbon dioxide (CO_2). Major sources of nitrous oxide include soil cultivation practices, especially the use of commercial and organic fertilisers, fossil fuel combustion, nitric acid production, and biomass burning. The GWP is from the IPCC's Third Assessment Report (TAR).

Offsetting

A carbon offset is a mechanism that allows a company, organisation or individual to reduce their greenhouse gas emissions in one area of activity (e.g. building energy use or air travel) by investing in projects that seek to reduce the greenhouse gas emissions in another (i.e. energy efficiency, new clean technology, forestation). The idea of carbon offsetting is to neutralise net emissions. The emissions saved from a carbon offset project should be certified as carbon reduction. These offset credits can then be sold and bought through the carbon market as tonnes of CO_2 equivalent.

Pollutants

Carbon monoxide [CO]: road transport is responsible for 90% of the carbon monoxide in the air.

Nitrogen dioxide [NO_x]: a highly poisonous brown gas formed in high temperature environments, contributes to visibility degradation.

Sulphur dioxide [SO_2]: is a colourless, non-flammable gas with a penetrating odour that irritates the eyes and air passages.

Particulates [PM10]: tiny particles responsible for most of the smell and dirt associated with traffic pollution. Mostly diesel vehicles are responsible for 90% of the particulates in the air.

Ozone [O_3]: Smog, or ground-level ozone, is the build up of secondary photochemical pollutants.

Benzene and 1,3-Butadiene: These are part of a group known as polycyclic hydrocarbons. They are carcinogens caused mostly by petrol vehicles.

Lead [Pb]: a soft heavy malleable toxic metal, causes blood and brain disorders.

Reforestation

Planting of forests on lands that have previously contained forests but that have been converted to some other use. For a discussion of the term forest and related terms such as afforestation, reforestation and deforestation, see the *IPCC Special Report on Land Use, Land-Use Change, and Forestry (IPCC, 2000)*.

Renewable energy sources

Renewable energy is energy which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally replenished).

Stratosphere

Highly stratified region of atmosphere above the troposphere extending from about 10 km (ranging from 9 km in high latitudes to 16 km in the tropics) to about 50 km.

Sustainable development

Development that meets the cultural, social, political and economic needs of the present generation without compromising the ability of future generations to meet their own needs.

Troposphere

The lowest part of the atmosphere from the surface to about 10 km in altitude in mid-latitudes (ranging from 9 km in high latitudes to 16 km in the tropics on average) where clouds and 'weather' phenomena occur. In the troposphere, temperatures generally decrease with height.

United Nations Framework Convention on Climate Change (UNFCCC)

The Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognises that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases. The Convention enjoys near universal membership, with 189 countries having ratified it.

Water Vapour

The most abundant greenhouse gas, it is the water present in the atmosphere in gaseous form. Water vapour is an important part of the natural greenhouse effect. While humans are not significantly increasing its concentration, it contributes to the enhanced greenhouse effect because the warming influence of greenhouse gases leads to a positive water vapour feedback. In addition to its role as a natural greenhouse gas, water vapour plays an important role in regulating the temperature of the planet because clouds form when excess water vapour in the atmosphere condenses to form ice and water droplets and precipitation. See *greenhouse gases*.

Weather

Atmospheric condition at any given time or place. It is measured in terms of such things as wind, temperature, humidity, atmospheric pressure, cloudiness, and precipitation. In most places, weather can change from hour-to-hour, day-to-day, and season-to-season. Climate in a narrow sense is usually defined as the "average weather", or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period is 30 years, as defined by the World Meteorological Organisation (WMO). These quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system. A simple way of remembering the difference is that climate is what you expect (e.g. cold winters) and 'weather' is what you get (e.g. a blizzard).

Appendix I: Survey Methodology

1.0 Research approach

ISAN has partnered with Julie's Bicycle to develop an Environmental Sustainability Toolkit for the outdoor arts sector. The Toolkit includes sector-specific guidance and tools for the outdoor arts sector on sustainable practice and will aim to generate a collective understanding of priorities for joint action. It is intended to identify and support practical steps towards improving environmental impact across the sector by embedding the skills and knowledge for sustainable practice across key roles.

The Environmental Sustainability Toolkit includes:

- A practical guide for the outdoor arts sector, created as a downloadable PDF;
- Online or downloadable tools hosted on the Julie's Bicycle website;
- Sector training on recommendations and the use of Tools;
- Online networking via the Julie's Bicycle Green Theatre network;
- Measurement and carbon analysis of exemplar organisations in the sector to establish a sectoral baseline.

This Toolkit identifies current practice in the industry around environmental sustainability and offers the sector guidance and support to translate the headline recommendations and priority actions into practical and applicable how to's focusing on the specific role of each protagonist (e.g. artists, producers, stage managers, designers, membership and funding bodies, etc.).

The Toolkit focused on the following research aims:

- To promote and support sustainable practice in the outdoor arts sector;
- To gain sectoral commitment to reduce environmental impact;
- To embed skills and knowledge for sustainable practice across key roles in sector;
- To generate a digital network for ongoing advice and action.

The original research undertaken for the Toolkit was in five-parts:

1) Julie's Bicycle and ISAN co-hosted a symposium event, held at the offices of the Greater London Authority (GLA) in October 2011. It was attended by 12 key individuals in the sector. The symposium explored the current state of play in the outdoor arts sector with regards to environmental sustainability; identified opportunities for joint action and commitments moving forward; investigated how best to promote the ISAN Environmental Sustainability Toolkit in 2012; and identified the skills and training needed for the sector to reduce its environmental impact.

2) Julie's Bicycle created an online survey on Survey Monkey (titled the ISAN Green Initiatives Survey) that focused on current environmental practices in the sector, as well as the barriers to and opportunities for being more environmentally proactive. The Toolkit also asked respondents about the type of support they would need to further reduce their environmental impact and asked for case studies of good practice in the sector to include in the Toolkit. The survey was distributed by ISAN to its members and wider constituency via its website and Facebook page. Julie's Bicycle also promoted the survey via its website and Facebook page.

3) Julie's Bicycle interviewed by phone a small number of key informants building on their survey responses to provide in-depth case studies for the Toolkit.

4) Julie's Bicycle facilitated a breakout group discussion at the November 2011 ISAN Conference, Brilliance & Resilience, held in Glasgow.

5) Julie's Bicycle drew on its own intelligence and research knowledge from previous publications (such as the *On the Move Green Mobility* guide and the *Moving Arts, Volumes 1-3* report) to apply transferable learning and expertise to the outdoor arts sector.

2.0 Research boundaries

Setting the study scope is critical to understanding the findings, and to ensure that the analysis can be interrogated both on its own terms but also in comparison to other reputable research and data.

2.1 Sector boundary

The Toolkit focused on the outdoor arts sector including festivals (greenfield/urban), street arts, carnival and one-off spectaculars.

2.2 Timeframe boundary

The survey and interviews were conducted in late 2011 and early 2012, with the Toolkit being released in February 2012.

2.3 Beyond the scope of the Toolkit

This Toolkit does not cover any events taking place indoors, or any outdoor arts events taking place outside the UK.

3.0 Data collection

The study collected qualitative data via the online survey, the phone interviews with key informants, the symposium and the breakout group discussion at the ISAN 2011 Conference in Glasgow. Julie's Bicycle also drew on its own intelligence and research knowledge from previous publications (such as the On the Move Green Mobility guide and the Moving Arts, Volumes 1-3 report).

3.1 Survey

An online survey was circulated to the outdoor arts constituency. The survey was used to understand current working practices with regards to environmental sustainability in the sector and identify the barriers to and the opportunities for organisations to become more environmentally proactive. The survey was distributed by ISAN to its members and the wider outdoor arts constituency via its website and its Facebook page. Julie's Bicycle also promoted the survey via its website and Facebook page.

The survey outline was as follows:

a. General Information:

- Organisation name and address;
- Contact name, job title, email and telephone number;
- Website address; and
- Type of organisation.

b. Environmental Considerations:

- What environmental initiatives are already in place;
- What aspects of the business practice have the greatest environmental impacts;
- What the key barriers to tackling those impacts are;
- What opportunities are available for reducing those impacts;
- What type of support and assistance is needed to enable further action.

c. Case-study information and feedback.

The survey had 38 organisations signing up and 32 complete responses from outdoor arts companies. 18 of these 32 organisations were ISAN members. For more information on the survey findings see section *6.0 ISAN Green Initiatives Survey Findings and Conclusions*.

3.2 Interviews with key informants

Researchers interviewed 15 key informants, selected in consultation with ISAN to cover a wide range of scales, roles and practice within the sector. The interviews provided the researcher with a 'real-life' context for the issues, and enabled Julie's Bicycle to determine the opportunities and obstacles that outdoor arts organisations face. The insights given in these interviews reiterated the overall themes of the Toolkit.

The types of questions asked built on survey responses and included:

- General information about the organisation;
- Environmental considerations;
- Opportunities and obstacles for addressing environmental issues at the company and sector level;
- Role of supply-chain and government in catalysing sustainability;
- Issues of support and capacity building.

Table 1 below outlines the total primary data contributions to the Toolkit.

Table 1 *Primary data contributions to the ISAN Environmental Sustainability Toolkit*

	ISAN Environmental Sustainability Toolkit
Interviews	15
ISAN Green Initiatives Survey	38

Appendix II: Julie's Bicycle Green Rider template for the outdoor arts

JULIE'S BICYCLE ****
SUSTAINING CREATIVITY

GREEN RIDER

Our commitment to environmental sustainability and how you can make a difference.

This Green Rider is from * * * [YOUR NAME] to the * * * [EVENT PROMOTER.]

Greening your own events will reduce the impacts of climate change and environmental damage, and help to create a sustainable and more equitable future. Using a Green Rider will make a practical contribution to the outdoor arts sector's efforts to cut carbon.

Apart from reducing the carbon footprint and environmental impacts of your performances, the Green Rider is a good way to tell audiences that you are taking practical steps to protect the environment.

Please tick the check boxes below that apply to you and return the JB Green Rider to [Artist/Management team].

Measuring and managing year-round environmental impacts

❑ You are measuring energy use and carbon emissions on an annual basis. The free web-based IG Tools (carbon calculators) are a useful first step: www.juliesbicycle.com/resources/ig-tools.

❑ You have an environmental policy and/or action plan.
Please send it with your response to this rider.

❑ You are reducing your impacts in various ways (please describe).

Julie's Bicycle Green Database of Festivals and of Suppliers

Festivals/events already measuring their carbon footprint, which have an environmental policy and/or contracts with suppliers with environmentally friendly products and services can be listed on the JB Green databases, which helps artists and promoters to find green venues, events, products and services.

For our performance

1) Public transport:

- You and your ticket agent(s) include public information about public transport and car sharing programmes.

- You provide us with public transport, car sharing and cycling details as early as possible so we can share them with our audiences.

2) Energy:

- All unnecessary lighting and stage equipment is turned off when not in use.

- Tour buses are provided with mains electricity to reduce vehicle idling.

- We would like to support temporary event suppliers of renewable energy and waste vegetable oil (WVO) biodiesel.

- Dressing room lights and air conditioning/heating are not turned on until just before we arrive.

3) Waste:

- There are recycling facilities for paper, cans, plastic and glass available.

- If the festival/event collects biodegradable waste, composting bins should also be available.

- Ashtrays and/or butt bins are provided in smoking areas.

4) Catering:

- ❑ Only food requested is provided.
- ❑ Organic, locally and seasonally sourced food with minimal disposable packaging.
- ❑ Re-usable/washable service-ware is used for our catering.
- ❑ Disposable plates and cutlery are biodegradable and collected separately for composting.
- ❑ Unopened drinks are not thrown away.
- ❑ Filtered mains water (or standpipes or bulk water dispensers) and refillable bottles are easily available to our team at all times.
- ❑ [Optional: vegetarian meal options are provided.]

Please let [Artist/Management team contact email] know as soon as possible if any of the above requests cannot be met.

Contact Julie's Bicycle

Outdoor arts events that would like support with measuring and managing environmental impacts can contact Julie's Bicycle:

info@juliesbicycle.com +44 (0)20 7078 4885 www.juliesbicycle.com

Julie's Bicycle is helping to make environmental sustainability intrinsic to the business, art and ethics of the creative industries. Established in 2007 by leading figures in the UK music industry, Julie's Bicycle is a non-profit company working across the arts and creative industries providing expertise in environmental sustainability to organisations in the UK and internationally.

Appendix III: Example of an adapted Julie's Bicycle Green Rider

From: As the World Tipped, Wired Aerial Theatre

To: The hosting festival

Wired Aerial Theatre is trying to reduce the environmental impact of our work and we have been working with environmental advisers Julie's Bicycle to help us measure and reduce our carbon emissions.

We will be developing this area of work over the coming year but it would help us if you could assist us in measuring and reducing our carbon impact by noting the following:

1. Choosing a site for the performance

We recognise that all festivals work in different contexts. However where we perform can make a big difference in terms of our overall carbon emissions. For example, a location with power on site can remove the need for generators, and a location that is near to good public transport routes can hugely reduce the number of audience members who travel to the performance by car.

We realise that there will be multiple considerations in choosing a location for the show but we request that you consider the carbon impact implications of each site as part of your decision making process.

2. Marketing

Audience travel is often the largest (or one of the largest) areas of carbon emissions in our shows. Therefore we request that you make information available to audiences about public transport options and car-pool/lift-share programmes on your websites and other promotional material about the event.

We also request that you encourage and promote cycling to the festival and that secure bike parking is provided.

3. Energy

We request that you consider energy usage in our dressing rooms and on site and that generators, dressing room lights and heating/cooling systems are turned off when not in use.

4. Waste and recycling

Please provide recycling points for paper, cans, plastic and glass for the audience and our team back stage, and if you can recycle food waste please also provide us with composting bins backstage.

Please note – we require drinking water for our team on site, and we are happy to bring our own water bottles to refill from a clean source to reduce plastic bottle usage, provided it is close to our site.

5. Measuring the carbon impact of our performance

Please help us to measure the carbon impact of our performance by:

- Monitoring the fuel and energy used as part of the show e.g. the fuel used for the generators (if applicable), the fuel used by the crane, and other essential production elements of the show (such as dressing rooms, production vehicles etc.).
- Asking audiences how they travelled to the event in any audience surveys you undertake.
- Measuring the waste you generate on site.
- Providing us with any other carbon impact assessments relating to our performance at your festival.

6. Advice and support

We are still learning how to measure and reduce our environmental impact and we are not experts in this field. For further advise from people with expertise in this area we recommend you contact Julie's Bicycle – their website is an excellent source of information: www.juliesbicycle.com

The ISAN Environmental Sustainability Toolkit focuses on practical achievable measures and highlights examples of good practice from case studies covering a range of presentation platforms, generic processes and contexts. It contains good practice guidelines, resource information, a glossary of terms and useful contacts to facilitate the creation of environmentally sustainable outdoor art.

It is designed to help the wider outdoor arts constituency to develop sustainable practice. It is intended to be used by both small and large organisations as a means to support and develop greener and more efficient working practices.

Keeping it Green...

We are keeping printing to a minimum and as such the Toolkit is available as a download from www.isanuk.org and www.juliesbicycle.com

ISAN (The Independent Street Arts Network)

ISAN is a strategic organisation that plays a key role in ensuring that excellent art happens by supporting the development of outdoor arts practice and bringing the sector together.

ISAN is a membership-led organisation for producers, artists, presenters, promoters and support agencies working in outdoor arts from the UK and Ireland. We develop the outdoor arts sector through networking, lobbying, information-sharing and training, research and advocacy support and advice for our members.

Since being established in the late 1990's, ISAN has developed a strong track-record of delivering effective development support for the outdoor arts sector and strategic projects with national and international impacts.

Julie's Bicycle: Sustaining Creativity

Julie's Bicycle is helping to make environmental sustainability intrinsic to the business, art and ethics of music, theatre and creative industries.

Established in 2007 by leading figures in the UK music industry, Julie's Bicycle is a not-for-profit company working across the arts and creative industries, providing expertise in environmental sustainability to hundreds of organisations in the UK and internationally.

We offer practical advice, tools, resources and Industry Green environmental certification, informed by world-leading research into the environmental impact of the creative industries.

ISAN Developing Outdoor Arts

JULIE'S BICYCLE SUSTAINING CREATIVITY

Supported by ARTS COUNCIL ENGLAND