



# **GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY**

2014-2015 Environmental Scan

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# EXECUTIVE SUMMARY

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The Live Performance Australia, Greener Live Performances through Energy Efficiency project is providing thoughtful leadership and inspiration towards a more sustainable, culturally creative future. The program is challenging industry norms by asking for participation in activities not generally embarked upon, including the capture and reporting of energy consumption information, creating energy efficiency policies and completing checklists to ensure all that can be done towards a more energy efficient future – is being done.

The industry, segmented into performance venues, production companies, touring productions and outdoor events and festivals, has been given the means to contribute to a more intentional future, via the publication of technical resources, stories and videos about industry best practice and digital diagnostic tools.

It's not about who is winning or who is losing in the era of integrated energy efficiency, it is all about a willingness to master something new - something foreign but something extremely worthwhile - in a bid to reverse the damage of the industrial revolution.

The live performance industry is one of creative, expressive story telling. Artists take the stage every night to communicate a message, evoke an emotion or represent what they believe in. These artists are supported by a plethora of talented, professional, skilled people that turn an idea into a physical reality.

They matter. The work they do matters. The way they use the planet's resources matters. Adopting a more sustainable, energy efficient future is non-negotiable for this industry. They are willing to stand up and be counted as an industry that influences change.

They are proud, and they continue to contribute.



## GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

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# INTRODUCTION

In 2012, Live Performance Australia (LPA) began working towards a goal of empowering the live performance industry to become more environmentally sustainable. The first step in the process has been to ensure the industry has access to meaningful and relevant information resources that support improvement programs within individual enterprises. At the same time, LPA has communicated the need for measurement, and has collected and reviewed data sets to assist companies to improve their financial and environmental outcomes by employing best practice energy efficient actions.

Greener Live Performances through Energy Efficiency is a national program established by Live Performance Australia and made possible by funding received from the Australian Government via the Energy Efficiency Information Grants program. The project, now in its final phase, has successfully met all program deliverables and produced a comprehensive suite of information resources, freely available for download via the project portal:

[www.greener.liveperformance.com.au](http://www.greener.liveperformance.com.au)

The Objectives of Greener Live Performances are:

- To support senior management to commit to and develop structures to integrate energy efficient practices into their SME by offering sample policies and procedures, case studies and testimonials.
- To provide easy to use data collection systems that facilitate industry analytics and provide meaningful performance metrics for individual organisations through the development of online calculators that provide individual reports.
- To address the challenge the industry faces in making energy efficiency an actionable item in the face of limited resources and competing demands, by providing resources and events that support and inspire organisational and individual change.
- To offer collaborative platforms that encourage shared learning and information exchange through the delivery of forums, workshops, interactive online webinars, round table discussions and social media channels.



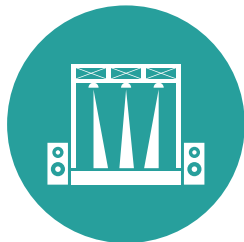
## INTRODUCTION

### SECTORS

Due to the diversity and complexity of the live performance industry, Live Performance Australia has structured all project resources into discrete industry sectors:



**VENUES**



**PRODUCTIONS**



**TOURS**



**OUTDOOR EVENTS  
AND FESTIVALS**

Each sub-sector requires specific and sometimes complex information about how, individually and collectively, it can achieve significant energy efficient outcomes.

# GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

## 2014-2015 Environmental Scan



### VENUES

Venues are categorised as built structures that provide one or more areas for the presentation of a live performance. They range in size from small black box theatres that seat less than 500, up to large venues that seat upwards of 5,000.

For energy efficiency purposes, venues can also be segmented according to variables such as:

- Includes restaurant/bar/cafe
- Has onsite administration
- Combines performance space and convention/exhibition space
- Has an entertainment/gambling area
- Has an undercover carpark
- Has retail areas
- Has other major ancillary functions

Resources developed and released for Venues are:

- Venue Public Areas: Energy Efficient Lighting Fact Sheet
- Managing Peak Electricity Demand Fact Sheet
- Building Management System (BMS) Information Kit
- Checklist for Achieving Energy Efficiency in Performance Areas

- Design Guide for the Retrofitting of HVAC in Venues
- Design Guide for the Installation of Energy Efficient Lighting in Performance Spaces
- Best Practice Case Study highlighting a range of Performance Venues
- Best Practice Case Study highlighting Merrigong Theatre Company
- Best Practice Case Study highlighting Mandurah Performing Arts Centre
- Video testimonial from Ipswich Civic Theatre
- Video testimonial from City Recital Hall Angel Place

The resources created have informed the development and release of a bespoke online data analytics tool called the Venues Greenhouse Gas Calculator. The tool has been designed to capture basic electricity consumption information from venues' bills and will allow Live Performance Australia to gather industry intelligence and develop benchmarks over the coming years.

The tool can be found here:

[www.calculator.liveperformance.com.au](http://www.calculator.liveperformance.com.au)

Further information about the methodology behind the tool can be found within the Appendix of this report.



## INTRODUCTION



### PRODUCTION

Production companies are responsible for creating and presenting a live performance such as theatre, opera, dance

and music. Key agents for change in production companies include employees such as Production Managers, Stage Managers and Technical Directors, as well as external specialists such as lighting and sound designers.

The gambit of production types includes factors such as:

- Cast size
- Technical complexity (may require more technical equipment)
- Static versus moving sets
- Use of technology such as LED screens
- Stage size (larger stages and auditoria may require more lights and stronger sound)
- Recorded music versus orchestral musicians

The production resources developed and released are:

- Energy Efficient Stage Lighting Fact Sheet
- Changing Technologies and the Rise of the LED Screen Fact Sheet

- Energy Efficient Sound Fact Sheet
- Checklist for Achieving Energy Efficient Lighting Design
- Best Practice Case Study highlighting King Kong the Musical
- Workbook supporting data entry for the LPA IG Tools (Production and Touring)
- Video testimonial from Circus Oz

Production resources have been supported by the licensed release of the Australian version of the Industry Green (IG) Greenhouse Gas Calculator tool developed by UK based not-for-profit, Julie's Bicycle. The IG Tool captures basic information about production impacts including stage lighting and sound energy consumption.

The tool can be found here:

[www.lpa.ig-tools.com/signup](http://www.lpa.ig-tools.com/signup)

Further information about the tools can be found within the Appendix of this report.





## GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

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### TOURS

Touring shows include theatre, dance, comedy and contemporary music performances travelling throughout capital city and

regional Australian markets. The primary focus areas for this sector are consideration of travel, freight and accommodation impacts. Tours range in size from a 1-person show like a stand-up comedian or acting monologue through to a full opera or ballet production with orchestral accompaniment.

Touring resources developed and released include:

- Energy Efficient Touring Fact Sheet
- Auditing a Tour for Energy Efficiency Fact Sheet
- Checklist for Achieving an Energy Efficient Tour
- Workbook supporting data entry for the LPA IG Tools (Production and Touring)
- Best Practice Case Study profiling 'The Confidence Man' toured by Performing Lines
- Video testimonial from Monkey Baa Theatre for Young People – an international touring company.

Touring resources have also been supported by the licensed release of the Australian version of the Industry Green (IG) Greenhouse Gas Calculator tool. The IG Tools capture basic information about touring impacts including crew travel, freight and accommodation.

The tool can be found here:

[www.lpa.ig-tools.com/signup](http://www.lpa.ig-tools.com/signup)

Further information about the LPA-IG Tools can be found in the Appendix of this report.



## INTRODUCTION



### OUTDOOR EVENTS AND FESTIVALS

The outdoor festival and event sector is quite different from other live performance sectors, in that it is completely seasonal

in its activity and has a multitude of variables such as length of event, geographic location, camping component, availability of mains power or need for temporary power generation. Each festival or event presents live performances (generally music) but also often includes the provision of on-site catering, bars and market traders. The sector is fragmented and culturally different from the performing arts – making it more difficult to engage.

Outdoor events and festivals can be segmented as follows:

- Events held of varying durations – single day event, multiple day event (without camping), multiple day event (with camping)
- Events of various sizes – small (less than 5,000 people), medium (up to 10,000 people), large (up to 100,000 people), mega (over 100,000 people)
- Events held in various settings – urban (parks, streets and public spaces), outdoor (at an existing facility), brownfield (limited infrastructure), greenfield (no infrastructure)

- Event type – music festival, multi arts festival, music concert, others
- Event location – NSW/ACT, VIC, QLD, TAS, SA, NT, WA
- Event location – capital city, regional

The Outdoor Events resources developed and released are:

- Energy Efficient Permanent Power Outdoor Events Fact Sheet
- Energy Efficient Temporary Power Outdoor Events Fact Sheet
- Checklist for Achieving an Energy Efficient Outdoor Event
- Power Planning Pathway for Outdoor Events
- Design Guide for the Power Planning Pathway – Catering and Bars
- Design Guide for the Power Planning Pathway – Stage and Audio Visual
- Best Practice Case Study highlighting Outdoor Events
- Best Practice Case Study highlighting Earthcore Festival
- Best Practice Case Study highlighting Falls Festival Tasmania
- Mobile Generation Ready Reckoner

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- Workbook - Capture of Consumption Data and Mobile Generation
- Case studies from a range of outdoor festivals.
- Best Practice Case Study of Earthcore Music Festival
- Video testimonial from North Byron Parklands - home of Splendour in the Grass and Falls Festivals
- Video testimonial from Festivals Adelaide.

The resources developed for Outdoor Events have been supported by the issuing of a select number of licenses for the Sustainable Event Management System (SEMS) toolkit - an online diagnostic tool used to assist event managers with their sustainability reporting requirements. The overarching purpose of the tool is to provide a system that meets the obligations of ISO Standard 20121 (Event Sustainability Management System).

Further information about the SEMS Tool can be found in the Appendix of this report.

### OVERARCHING GENERAL MANAGEMENT

In addition to the sector specific resources outlined above, a number of more general Management resources have been developed as part of the project.

- Management Guide for Integrating Energy Efficiency into Production Contracts
- Management Guide for Integrating Energy Efficiency into Procurement Activities
- Management Guide - How to Assess/Purchase Sub Metering Systems
- Management Guide - How to Write an Energy Efficiency Policy
- Management Guide - How to Build a Business Case for your Board or Sponsors
- Workbook supporting - How to Build a Business Case
- Template - Integrating Energy Efficiency into Technician Inductions
- Template - Integrating Energy Efficiency Information into Venue Hire Kits



# INDUSTRY ENGAGEMENT

Achieving high levels of industry engagement is fundamental to the success of the Greener Live Performances project therefore key strategic activities have included the presentation of face-to-face workshops and online webinars, as well as conference and tradeshow sessions.

## WEBINARS DELIVERED:

- Energy Efficiency for Bars & Catering at Outdoor Events
- How to Calculate Demand for Mobile Generation at Outdoor Events
- Recording Energy Efficiency using the Sustainable Event Management Systems tool
- Recording Energy Efficiency Outcomes using Venues GHG Calculator
- Recording Energy Efficiency Outcomes using LPA IG Tool for Production
- Recording Energy Efficiency Outcomes using LPA IG Tool for Touring
- How to Build a Business Case for Energy Efficiency
- LPA IG Tools – User Experience Updates

## TRADE SHOW PRESENTATIONS DELIVERED:

- ENTECH – Sydney July 2013
- ENTECH – Melbourne July 2014
- CX Roadshow – March 2014

## FACE-TO-FACE WORKSHOPS DELIVERED:

- Sustainable Stages Workshop Series – Sydney, Melbourne, Brisbane, Adelaide and Perth – February and March 2014
- Energy Efficient Greener Live Performances Roundtable (luncheon) Series – Brisbane, Melbourne, Adelaide and Perth – April-May 2014
- Northern Australia Regional Performing Arts Centre Association (NARPACA) Technical Managers' Workshop – Gladstone, February 2014
- Melbourne Recital Centre – Energy Efficient Venues Workshop – Melbourne, December 2014
- Northern Australia Regional Performing Arts Centre Association (NARPACA) Technical Managers' Workshop – Ipswich, February 2015
- Festivals Adelaide – Energy Efficient Festivals Workshop – Adelaide, April 2015
- TechWest Conference Workshop – Perth, April 2015

## CONFERENCE PRESENTATIONS DELIVERED:

- Northern Australia Regional Performing Arts Centre Association (NARPACA) Managers' Conference – Brisbane, February 2014
- Australian Performing Arts Centres' Association (APACA) Conference – Hobart, July 2014
- Venue Managers' Association (VMA) Congress – Melbourne, May 2014



## GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

2014-2015 Environmental Scan

- Victorian Theatre Meeting – Melbourne, August 2014
- BigSound Music Conference – Brisbane, September 2014
- Victorian Association for Performing Arts Centres (VAPAC) Technical Managers Conference – Melbourne, March 2015

### CALL TO ACTION CAMPAIGNS RELEASED:

- Know Your Venue Power
- Know Your Stage Power
- Know Your Touring Impact
- Know Your Catering & Bars Power at Outdoor Events
- Know Your Outdoor Events Power

### DIGITAL AND SOCIAL MEDIA PLATFORMS USED:

- Twitter - @LivePerfAust
- LinkedIn Group – Greener Live Performances through Energy Efficiency
- Facebook - Live Performance Australia page
- YouTube Channel

Information dissemination has also been supported through the release of regular Greener Live Performances eNewsletters, mentions in the LPA Monthly Wrap and email promotions from supporting industry associations such as the Australian Performing Arts Centres Association (APACA), Theatre Network Victoria, Arts Sector Roundtable (Victoria), the ArtsHouse Greenie-in-Residence, Green Music Australia, Performing Arts Touring Alliance (PATA) and the Venue Managers' Association (VMA).



## INDUSTRY DATA

Along with producing and delivering meaningful information resources to industry, another key project strategy has been the collection and analysis of relevant energy consumption data. The collection of energy efficiency data is a developing function for management and their staff. Before the release of the Greener Live Performances GHG Calculators and Tools, the only

industry relevant, online data capture system available in Australia was the Sustainable Event Management System (SEMS) toolkit – a specialist tool for the outdoor events and festivals sector.

Uptake of the tools showed early positive indications with sign-up numbers as follows:

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**TO THE VENUES GHG  
CALCULATOR**

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**REGISTRATIONS TO THE  
LPA IG TOOLS PRODUCTION  
AND TOURS**

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**EXPRESSIONS OF INTEREST  
FOR SEMS TOOLKIT  
LICENSES OUTDOOR  
EVENTS AND FESTIVALS**

To date, the number of energy data sets available for analysis is broken down as follows:

- 12 data sets by 7 venues
- 1 x production company
- 3 x tours
- 12 data sets by 10 outdoor events/festivals

Workshops held in the early months of 2015 are showing, with a full suite of information resources and better knowledge of why data collection and measurement is important, that industry representatives are establishing their own clusters (based on geographical location) to

collectively collate energy data, input data into relevant tools, and to then compare energy efficiency outcomes. The tools will remain available to industry post completion of this project, therefore it is expected that data volumes will continue to increase over time.

# GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

## 2014-2015 Environmental Scan

### ENERGY EFFICIENCY UPTAKE - PERFORMANCE VENUES

Performance venues continue to be a highly engaged sector and have reported the following actions and operational improvements during the course of the project:

#### Achievements

- Energy efficient public area lighting has received priority status with many venues upgrading systems for greater efficiency
- Venues are actively avoiding over-lighting areas by providing lighting only where it is necessary
- Assessment is undertaken by venues to understand and list all energy sources within the boundary of the building
- Venues have a commitment in place to reduce greenhouse gas emissions, i.e. policy or commitment statement
- Greenhouse gas emission offsetting strategies are being developed and integrated into management programs
- Venues are increasingly utilising the passion from an internal sustainability leader or advocate
- Local contractors are used where possible
- Local staff are employed where possible
- Alternative transport modes are promoted to patrons, staff and visiting crew.

#### For further attention

- To install plant and equipment, like HVAC, hot water or refrigeration, that is a more energy efficient model or will be operated more efficiently
- To determine how best to integrate more energy efficient stage lights within venue inventory
- To continue to investigate the financial viability of installing on-site solar generation, wind generation, hydro-electric or alternative biofuels
- To carry out an annual environmental risk assessment
- To provide environmental training and awareness programs for venue staff.



## INDUSTRY DATA

### DATA SAMPLE OF PERFORMANCE VENUES

Live Performance Australia is yet to receive sufficient data volumes to support the creation of fully verified, sector specific benchmarking. Challenges that hinder broad scale benchmarking comparisons include:

- Large variation between venue size;
- Variation of climatic conditions, i.e. tropics, sub-tropics, arid zones;
- Variation between venue operations, i.e. theatres, galleries, restaurants, cinemas; and
- Lack of data representing the full cross-section of venue size and operations.

For the purposes of this report, the data samples presented are representative of an 'Average' venue based on the size and type of venues that submitted data. The sample includes venues from:

- Victoria: representing 71% of the sample
- New South Wales: representing 43% of the sample
- Western Australia: representing 14% of the sample

Venues from the sample welcome between 14,000 and 180,000 patrons each year, range in size from 256 m<sup>2</sup> up to 5,400 m<sup>2</sup> and have seating capacity from 110 seats to 4,800 seats.

Ideally, data would be collated and presented as true representations of the sub-categories in the sector, but for the purposes of this activity (and for the reasons outlined above) all data will be tabled as an 'Average' of the sample.





# GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

## 2014-2015 Environmental Scan

### AVERAGE VENUE PROFILE -2012-2014-

Table 1: An Average Venue Profile

Average Size/Capacity	Size (m <sup>2</sup> )	2,316
	Number of Patrons per Year	81,431
	Seating Capacity	1,075
Average Profile of Onsite Facilities	Restaurant/cafe/bar	70%
	On-site administration	70%
	Convention/exhibition space	40%

### VENUE ENERGY PERFORMANCE AVERAGES -2012 - 2014-

Table 2: Average Energy Performance of the Sample Venues for year 2012-2014

Average Total Energy Usage (kWh)	398,713.23
Average Total % green power (%)	7.60
Average Total Emissions factor (kg/kWh)	1.00
Average Total CO <sub>2</sub> generated (kg)	361,176.71
Average Total Energy Cost (\$)	\$70,735.71



## INDUSTRY DATA

Using the sample data supplied, the following performance indicators have been developed:

### INDICATORS PER CUSTOMER

Table 3: Energy Performance Indicator per Venue Customer

Indicator	Venue Performance	Best Practice Level
kWh/Customer	4.90	3.14
CO <sub>2</sub> /Customer	4.44	3.01
\$/Customer	0.87	0.76

### INDICATORS PER SIZE -M<sup>2</sup>-

Table 4: Energy Performance Indicator per Venue Size (m<sup>2</sup>)

Indicator	Venue Performance	Best Practice Level
kWh/m <sup>2</sup>	172.10	131.44
CO <sub>2</sub> /m <sup>2</sup>	155.90	150.71
\$/m <sup>2</sup>	30.53	32.00

# GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

## 2014-2015 Environmental Scan

### ENERGY EFFICIENCY UPTAKE - PRODUCTION COMPANIES

Production companies within the live performance industry are positively engaged with the idea of becoming more sustainable. However, small companies with large production demands, have little time available to develop manual systems to capture performance related data. It is also prohibitively difficult to acquire information such as 'show power' if presenting venues do not have accurate sub-metering of different performance areas.

More often, production companies are working retrospectively with performance data collected after the season is over. Subsequently, with long pre-production timeframes, extended performance seasons and post-production wrap up, companies that commence integration of data collection processes will not finalise data collection for some months (possibly up to or more than 12 months) after the production process started.

Due to the time constrained nature of this project, we are yet to see the real effects of production companies implementing changes and commencing the data collection process. The LPA IG Tools, released in June 2014, has been supported with a number of engagement activities i.e. workshops, webinars and user guides and is slowly building momentum. The expectation is that data sets will continue to increase in number after project funding concludes.

#### Achievements

- The most notable achievements within the production sector has been in set design, where the majority of materials used to create sets is borrowed or rented and then returned, sold or recycled.
- Large, commercial, long-running productions are utilising LED stage lighting technologies. The length of the season, with the total number of shows, makes it financially justifiable.
- Large, commercial, long-running productions are starting to integrate energy efficiency requirements into production and/or procurement contracts.

#### For further attention

- To review current systems and processes to determine how better data sets can be captured and entered into the LPA IG Tool.
- To encourage presenting venues to investigate installing sub-metering systems in the auditorium and/or stage so the production company receives accurately measured show energy consumption.
- To facilitate better collaboration between production company management and presenting venues, to maximise energy efficiency opportunities.



## INDUSTRY DATA

### DATA SAMPLE OF A MEDIUM-SIZED PRODUCTION

The following example data set is representative of a medium sized subsidised production with an average audience size of 850 people.

Table 5: Example Data Set for Medium sized, subsidised production

Total Energy Usage (kWh)	39,684
Total Emissions Factor (kg/kWh)	1.16
Total CO <sub>2</sub> generated (kg)	46,430
Total CO <sub>2</sub> per Performance (kg/performance)	5 158

### PRODUCTION PROFILE -2013-

Table 6: Sample Production Profile

Size/Capacity	Stage Size (m <sup>2</sup> )	240
	Number of Performances in Season	9
	Ticketing	7,650
Profile of Production	Venue Crew (people)	8
	Production Crew (people)	16
	Rehearsal Days	24



## GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

2014-2015 Environmental Scan

### ENERGY EFFICIENCY UPTAKE TOURING COMPANIES

The touring sector can be broadly spilt into performing arts (theatre, opera, dance), comedy and contemporary music. Each of the sub-categories has engaged with the project, offering significant insight into very complex operations. The range and scope of the different types of touring acts varies considerably, making it difficult for tour management to implement some of the efficiency gains they would personally like.

As with production companies, touring coordinators are working with extremely long timeframes considering pre-production, production, tour and post-production activities. The availability of data for a touring show is often compiled at the end and reviewed retrospectively. Like production companies, there is an expectation that momentum for data collection will continue to build, extending far beyond the end date of the funding of this program.

#### Achievements

- By default, touring a small cast and crew achieves greater energy efficiencies than a larger production.
- Ensuring cast and crew are capable of undertaking multiple duties reduces the need for support personnel for bump in and bump out, reduces the number of people on the road needing transport and accommodation.
- If the production is small enough, transporting production freight in the same van as cast removes the need for separate freight requirements.
- Working with lighting and sound designers to create a production that can operate on low levels of lighting and sound, thereby constraining energy requirements.
- Sourcing lighting and sound equipment that is light-weight, easily packed, reducing the pay-load of the freight moved, reducing the amount of fuel used.
- Consciously hiring touring vehicles based on low greenhouse emissions ranking.
- Hiring a vehicle that is fit-for-purpose – the right type of vehicle for the tour destinations along with the right sized vehicle for the equipment to be transported. Resisting the urge to hire bigger – just in case.
- Mixing hotel nights with nights spent staying with friends or family. For further attention
- To review current systems and processes to determine how better data sets can be captured and entered into the LPA IG Tool.
- To encourage presenting venues to investigate installing sub-metering systems in the auditorium and/or stage so the production company receives accurately measured show energy consumption.
- To facilitate better collaboration between production company management and presenting venues, to maximise energy efficiency opportunities.



## INDUSTRY DATA

### DATA SAMPLE OF MICRO SUBSIDISED TOURS

The touring sector is predominantly made-up of contemporary music concerts, medium sized theatre, opera and dance and micro theatre. Often, theatre touring in Australia is undertaken with the support of funding from federal and state bodies.

The following data set is representative of a small sample of micro subsidised theatre tours in Queensland.

#### PRODUCTION PROFILE -2013-

Table 7: Sample Average of a Tour's Energy Performance

Average Total Energy Usage (kWh)	380
Average Total Emissions Factor (kg/kWh)	1.02
Average Total Emissions Factor (kg/km)	0.633
Average Total CO <sub>2</sub> generated (kg)	5,138
Average Total CO <sub>2</sub> per Performance (kg/performance)	87.08

#### AVERAGE TOUR PROFILE -2013-

Table 8: Sample Average Tour Profile (micro subsidised tour)

Size/Capacity	Distance Travelled (km)	2,554
	Number of Performances in Season	20
	Season Ticketing Numbers	2,575
Average Profile of Tour	Tour Crew (people)	2.3
	Accommodation Nights for Season	30

# GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

## 2014-2015 Environmental Scan

### ENERGY EFFICIENCY UPTAKE - OUTDOOR EVENTS AND FESTIVALS

The outdoor events and festivals sector is singularly responsible for bringing together some of the largest crowds experienced in the industry. Based on the data set available, some of the larger events can expect over 15,000 people per event day. The logistics of managing such a large group of people, often in a greenfield site with temporary infrastructure and powered using temporary generation systems, is significant.

#### Achievements

- Engaging with catering and bar stallholders to determine power needs.
- Integrating renewable fuels, such as biofuel into the energy mix. The sample group showed that 30% of all fuel used was a biofuel blend.
- Quirky, innovative technologies such as kinetic dance floors, exercise bikes powering blenders for smoothies and solar powered lighting towers.
- By including a mix of mains and temporary power, events have reduced energy consumption by 50%.
- Adopting a user pays system, with the installation of sub-metering and a supply cap, stallholders are encouraged to manage power requirements better, using less.

#### For further attention

- Tracking of fuel supplied to specific generators at specific times of day.
- Working with generator supply companies to determine the right size and number of generators required to power the event.
- Adopting a planning process to best understand overall power requirements including peak power demand bands.



## INDUSTRY DATA

### DATA FINDINGS OUTDOOR EVENTS AND FESTIVALS

Due to the seasonal nature of the outdoor events sector and therefore the seasonal engagement of event staff, it is difficult to collate a suitably sized data set for analysis. The figures below are representative of a broad cross

section of the group with the largest event attracting over 500,000 attendances over 30 days and the smallest attracting 2,500 people over 4 days.

#### OUTDOOR EVENT ENERGY PERFORMANCE AVERAGES -2014 AND 2015-

Table 9: Performance Average of Sample Events

Average Total Mains Power Energy Usage (kWh)	216,822
Average Total Renewable Mains Power Energy (%)	0%
Average Total Fuel for Generated Energy (litres)	16,800
Average Total Renewable Generated Energy (%)	36%
Average Total CO <sub>2</sub> generated (kg)	56,811
Average Total CO <sub>2</sub> per Audience Person per Day (kg/person/day)	0.72



## GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

### 2014-2015 Environmental Scan

Using the data sample provided for a total of 66 event days during 2014-2015 the following sample profile for outdoor events and festivals attracting less than 100,000 people has been calculated.

#### AVERAGE OUTDOOR EVENT PROFILE -2014-2015-

Table 10: Profile of an Outdoor Event/Festival (with attendance less than 100,000 people)

Average Size/Capacity	Attendance per Event	68,000
	Number of Days per Event	4.3
	Attendance per Event Day	6,933
Average Energy Profile of Outdoor Event	Fossil Fuel - Percentage of Total Fuel	68%
	Renewable Fuels - Percentage of Total Fuel	30



# BEYOND PROJECT END DATE

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Funding for the Greener Live Performances through Energy Efficiency project concludes in May 2015. Beyond the project end-date, Live Performance Australia will continue to engage with industry to encourage:

- Further integration of energy efficiency initiatives, those highlighted in the project resources, and other innovations discovered and shared via communication channels such as LPA social media platforms
- Adoption of management systems including the development of policies, programs and staff awareness campaigns around efficient energy use
- Measurement that provides tangible evidence of progress leading to inspiration and further motivation.
- The creation, adoption or modification of operational systems to capture relevant data sets for ongoing analysis and possible benchmarking
- Collaboration across the sectors, learning from each other's successes and challenges
- Discussions about achievements, passions and hopes for the future.

Whilst project engagement has been high, to achieve an industry-wide change a cultural revolution is required, where data is considered paramount – being collected and analysed as a part of everyday operational activities – assisting managers to make informed decisions when buying new equipment, upgrading existing infrastructure, mapping tour requirements or designing a show.

# APPENDIX

## GREENHOUSE GAS CALCULATION METHODOLOGY

All calculations are underpinned with the National Greenhouse Accounts (NGA) Factors as prepared by the Department of Environment. Designed for use by companies and individuals to estimate greenhouse gas emissions. While drawing on the National Greenhouse and Energy Report (Measurement) Determination 2008, the methods described in the NGA Factors have a general application to the estimate of a broader range of greenhouse emissions inventories.

The calculators developed and used by the Greener Live Performances project, utilise 'Method 1' from the National Greenhouse and Energy Report (Measurement) Determination 2008, reporting both direct and indirect greenhouse gas emission estimates.

The National Greenhouse Accounts support guidelines adopting the emissions categories of the international reporting framework of the World Resources Institute/ World Business Council for Sustainable Development reported in The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard ("The GHG Protocol").

The GHG Protocol defines three 'scopes' of emission categories:

1. Direct emissions from sources within the boundary of an organisation's activities – such as on-site power generation.
2. Indirect emissions from the consumption of purchased electricity.
3. All other indirect emissions including fuel consumption from airline travel.

Data analysis and reporting include capture of:

- Production of energy, by fuel type (petrol, diesel, biofuel)
- Consumption of energy, by fuel type (mains power)
- Additional activity data to support the estimation of greenhouse gas emissions

Greener Live Performances through Energy Efficiency calculator tools function using a mixture of Australian NGA Factors and other equivalent international emissions codes (as appropriate for the tool).



## APPENDIX

### Venues GHG Calculator

The Greenhouse Gas Calculator tool is a bespoke tool developed specifically for live performance venues in Australia. The tool has been designed to capture basic electricity consumption information from venues' bills and include the following components:

- Annual electricity consumption
- Cost of electricity
- GHG calculation for the data period
- Comparison performance outcomes against venues of a similar size and located in similar climate zones
- Suggested energy efficiency improvements based on responses to a series of Yes/No/Don't Know questions.

The GHG Calculator Tools for venues is considered the first step in preparing venues to process year upon year data capture and comparison. The tool is expected to provide standardisation in the collection and analysis of venue energy impacts. Performance metrics include:

- GHG per square metre of venue area
- GHG per performance
- Annual kWh consumption
- Annual GHG impact
- Electricity cost per square metre of venue area.

### Baseline and Best Practice Figures

The tool also contains indicative baseline results for venues to compare their own results against. The Baseline and Best Practice figures within the LPA GHG Estimator have been calculated based on scientific data provided by EarthCheck. EarthCheck operates the world's most scientifically rigorous benchmarking program providing the only historical record of the global environmental impacts of the tourism, hospitality and events industry over the past 12 years. The EarthCheck benchmarking values are derived from extensive worldwide research into available and appropriate case studies, industry surveys, engineering design handbooks, energy audits, and climatic and geographic conditions.

The current benchmarks embedded in the LPA GHG Estimator have been calculated based on the Energy Consumption (kWh) and Greenhouse Gas Emissions (kg CO<sub>2</sub>-e) per area under roof of operations which were assumed to be similar in size and scope to 'Live Performance Venues'. The cost benchmarks are based on the energy use baseline and best practice figures per area under roof multiplied by an estimated average cost per kWh. Additional benchmarks per total number of customers have been developed to facilitate further data analysis, but are not embedded in the tool.



## GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

### 2014-2015 Environmental Scan

A benchmarking result at, or above, the Baseline level demonstrates that the venue is achieving above average performance. A result below the Baseline level indicates that a venue can and should carry out actions that will make beneficial improvements in performance. The LPA

GHG Estimator contains a comprehensive question set that generates a tailored action plan helping venues in identifying the necessary steps to improve their performance.

LPA GHG BENCHMARKS	BASELINE	BEST PRACTICE	Table 11: LPA GHG Benchmarks built into Venues Calculator
kWh per Customer	4.49	3.14	
Kg CO2-e per Customer	4.29	3.01	
\$ per Customer	1.09	0.76	
kWh per m <sup>2</sup>	208.05	145.63	
Kg CO2-e per m <sup>2</sup>	222.25	155.58	
\$ per m <sup>2</sup>	45.71	32.00	

The Baseline and Best Practice performance levels for the LPA GHG Estimator indicators will be continuously reviewed and are likely to change over time. As more data is collected through the tool, the benchmarking figures will be normalised by venue size and activity, climate zone and their ancillary features, allowing for a fairer comparison between venues.

The tool is currently collecting the following data helping us to establish more robust benchmarks over time:

- Venue postcodes to determine the venues' location and climate zone
- Total number of patrons a venue or performance space receives
- Venue size in terms of total seating capacity
- Type of ancillary features provided by the venue (Restaurant/cafe/bar, Convention/exhibition space, Retail Area, Entertainment/gambling area, undercover car-park, on-site administration, other major ancillary functions)



## APPENDIX

### **Live Performance Australia – Industry Green Tools**

The Julie's Bicycle Creative Industry Green (IG) tools have been licensed for use by LPA in Australia. The tool has undergone an adaption process including rebranding and hosting via the LPA website.

The tools are a free set of unique calculators specifically for the live performance industry. They are used by 2,000 organisations across 40 different countries to understand the environmental impacts of cultural buildings, offices, outdoor events, tours and productions. For the purposes of the LPA Greener Live Performance project, the tools are used predominantly for tours and productions.

Components of the Touring tool include:

- Distance travelled and vehicle type for Production Freight
- Distance travelled and vehicle type for Cast and Crew movement
- Performance statistics
- Accommodation

Components of the Production tool include:

- Show power demand – Lighting
- Show power demand – Sound

Performance metrics include:

- GHG per energy type
- GHG per performance tour

- Annual energy consumption
- Annual GHG impact

A benchmarking result at, or above, the Baseline level demonstrates that the venue is achieving above average performance. A result below the Baseline level indicates that a venue can and should carry out actions that will make beneficial improvements in performance. The LPA GHG Estimator contains a comprehensive question set that generates a tailored action plan helping venues in identifying the necessary steps to improve their performance.

### **Baseline and Best Practice Figures**

The option is available to utilise Julie's Bicycle UK benchmarking statistics though it is difficult to draw a suitable comparison between a touring production in Australia, to that of one touring Europe. Differences in vehicle types, fuels and greenhouse gas accounting factors, along with geography distances travelled render the figures unsuitable.

### **GHG Calculation Methodology**

The UK version of the tools contains backend calculations that are supported by GHG factors produced by the Department for Environment, Food and Rural Affairs (Defra). These factors are presented differently than those of the National Greenhouse Gas Accounting Factors for Australia. After extensive research and

# GREENER LIVE PERFORMANCES THROUGH ENERGY EFFICIENCY

## 2014-2015 Environmental Scan

engagement with Australian government departments, state agencies, industry associations and tertiary research institutions, the final emissions factors entered into the LPA version of the IG tools is a mix of Australian and UK indicators.

### **Sustainable Event Management System (SEMS) Toolkit**

The SEMS toolkit is a specialist online diagnostic and management system developed for the outdoor events and festivals sector. Whilst the toolkit has a comprehensive list of functions, energy efficiency elements have been the primary focus for the Greener Live Performances through Energy Efficiency project. The toolkit is offered to LPA under an individual license arrangement. Each of the licensees will register to use the tool via LPA and an online portal.

Components of the tool include:

- Measurement of energy consumption
- Identification of fuel type and use
- Calculation of relative GHG emissions
- Report generation

Outdoor events and festivals rely primarily on mobile generation and are therefore large liquid fossil fuel consumers with variable peak power demand challenges.

Performance metrics include:

- GHG per litre of fuel used
- GHG per audience person per event day
- Annual fuel consumption
- Annual GHG impact

### **Baseline and Best Practice Figures**

The SEMS toolkit does not provide baseline or offer best practice figures for individual event comparison.

[www.liveperformance.com.au](http://www.liveperformance.com.au)  
[greener.liveperformance.com.au](http://greener.liveperformance.com.au)



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