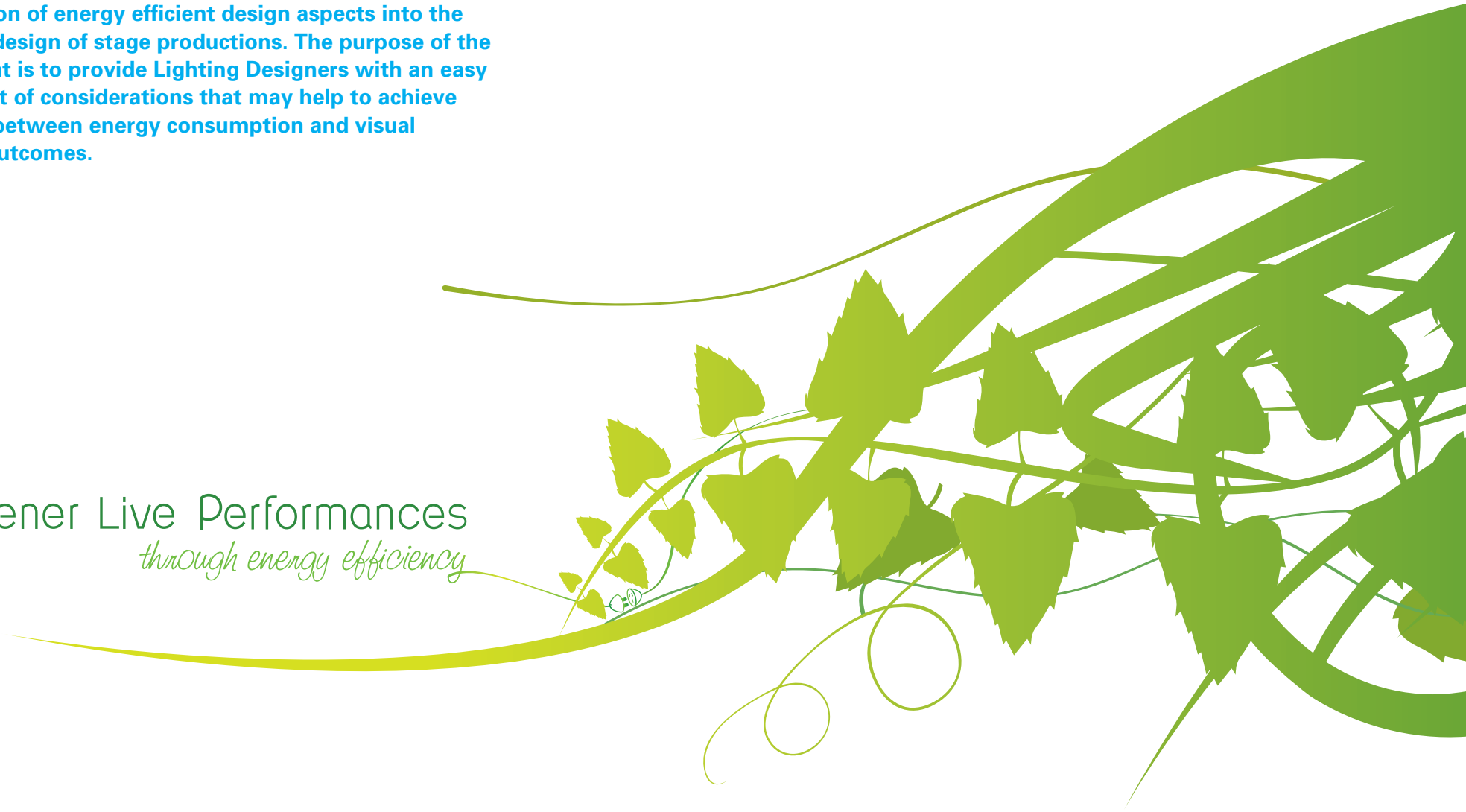
Checklist

Design for Energy Efficiency

This checklist has been developed to support the integration of energy efficient design aspects into the lighting design of stage productions. The purpose of the document is to provide Lighting Designers with an easy to use list of considerations that may help to achieve balance between energy consumption and visual artistic outcomes.

Greener Live Performances

through energy efficiency



Assess

- Power supply options
- Instrument supply options
- Internal engagement opportunities

Manage

- Design the plot
- Calculate rig energy requirements
- Integrate reduction opportunities

Perform

- Energy conservation
- Integrated measurement
- Operational efficiencies

Disclosure

- Disclose energy efficiency outcomes

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Assess →

Discussions during pre-design process, between the Lighting Designer, The Director, Production Manager, Set Designer, Costume Designer and Venue Manager about integrating Energy Efficiency aspects into the show will reap rewards. Including energy efficiency, as an agenda item in production meetings will facilitate shared information, collectively working towards focused outcomes.

Power supply options **Assess** which of the available power supply options might be feasible for your production, considering whether a more environmentally responsible alternative is achievable:	**Yes**	**Mostly**	**No**
• Lighting rig is powered by house (grid) power			
• House power is sourced from renewable sources			
• Venue has permanent renewable energy generated onsite			
• Innovative solutions to rig power supply have been considered			
• Production can trial emerging technologies to prove efficiency gains			

Instrument supply options **Assess** the equipment requirements of the production against any equipment list provided by the venue or production company and then consider the following options:	**Yes**	**Mostly**	**No**
• Engage Set & Costume designers to discuss impact of proposed lighting effects on materials, textures, textiles and colours			
• Map each piece of equipment in order of lamp efficiency (lumens / watt) - engage with production staff and/or manufacturers in need			
• Consider full lifecycle impact of lamp when mapping for efficiency			
• Discuss innovative equipment substitution options with production stakeholders to incorporate lighting advancements (as appropriate)			

Internal engagement opportunities **Assess** opportunities to engage with internal production stakeholders and consider the following:	**Yes**	**Mostly**	**No**
• Share measurement calculations with production team			
• Discuss proposed reduction targets with production team soliciting endorsement from them			
• Outline house responsibilities as part of the proposed energy efficient lighting operation model and discuss with Venue Manager			
• Develop an action plan for operational implementation and distribute			
• Ask venue to prepare sub-meters to capture actual consumption of the performance			

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Manage →

Part of the journey towards greener live performances includes not only considering the energy that we consume but also the number of full lifecycle resources used. Reducing the number of lanterns used on a rig is one way to reduce energy consumption. Additionally, it will also reduce the overall lifecycle impact by decreasing the required minimum number of lanterns needed for stock.

Design plot	**Yes**	**Mostly**	**No**
Manage consumption of energy through a well designed and considered lighting plot that incorporates:			
• Lighting stock that is Fit for Purpose			
• A rig with a set power limit			
• Least amount of equipment and/or energy used (as possible)			
• Creative freedom balanced with environmental and ethical responsibility			
• A mixed rig incorporating new and old generation stock			

Calculate rig energy requirements	**Yes**	**Mostly**	**No**
Manage the efficiency of the proposed lighting plot by measuring consumption and providing a projected energy target. To achieve this consider the following:			
• Measure rig capacity using tools appropriate for the task			
• Review the measurement outcomes for consumption impact of the proposed plot			
• Share findings with production team to discuss opportunities for further reductions			
• Set a target to achieve a further 10% (or other %) reduction in overall consumption			

Integrate reduction opportunities	**Yes**	**Mostly**	**No**
Manage the integration of additional reduction opportunities, as identified at a production team meeting. Actions include:			
• Re-plot the design as per identified opportunities			
• Substitute equipment and/or integrate an identified technology			
• Re-calculate the energy requirements of the new plot			
• Share the calculated outcome of the revised plot(s) with production team			

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Perform →

It's now time for the Lighting Designer to perform ensuring that all energy efficiency aspects of the design are not lost during the actual stage performance of the show.

Engaging venue technicians and venue lighting managers is imperative in the process to achieve desired lighting related efficiency outcomes.

Energy conservation	**Yes**	**Mostly**	**No**
Performance conservation is vital in achieving desired energy efficiency goals. To realise projected reduction outcomes, consider the following:			
• Plotting the show starting from lower levels			
• Engaging with venue technician to discuss and then implement energy conservation strategies			
• Delegating responsibility for additional conservation tasks as required – via Action Plan			
• Asking that energy conservation is included on the agenda for Tech Meetings			

Integrated measurement	**Yes**	**Mostly**	**No**
Perform a measurement diagnostic for the show by looking at overall efficiency along with identifying segments of efficiency by:			
• Interrogating venue provided sub-metering results to identify aspects such as consumption baseline, peak demand and segment analysis			
• Reviewing per show sub-metered results to compare night upon night performance outcomes			
• Discussing show efficiency outcomes at post-show debrief including the identification of consumption anomalies			

Operational efficiencies	**Yes**	**Mostly**	**No**
Perform operational checks collaboratively with venue technician and venue lighting manager to achieve the best possible efficiency outcomes. Discuss:			
• Dousing discharge fixtures during the show			
• Preventative maintenance process to determine if instruments and dimmer panel are in peak working condition			
• Opportunities for technicians to switch lights and identify at what point equipment can be turned off when not being used			
• Conducting rehearsals under LED working lights (where possible)			
• The consequences for venue personnel not following the requested energy efficiency protocol			

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Disclose →

Your lighting design has pushed the boundaries of industry expectations and challenged the status quo by presenting a visually relevant design while using the least amount of instruments, balanced creative intent and responsible consumption, and utilised collaborative engagement to achieve energy efficiency outcomes.

Now is the time to share your journey and success with others.

Disclose energy efficiency outcomes	**Yes**	**Mostly**	**No**
Disclosing the energy efficiency outcomes of the show is a vital component of the process. By sharing ideas and outcomes (successful or not) industry professionals will be able to refine their practices. Suggested actions include:			
• Share data collected with Production Manager for reporting and historical recording			
• Input lighting data into the LPA IG Tool to receive a greenhouse gas emissions impact and allow further analysis into industry wide impacts			
• Capture information about equipment disposal and end-of-life process for fixtures and bulbs			
• The establishment of a benchmark baseline for this design plot to enable comparison against other similarly lit shows			
• Record innovative design aspects via LPG IG Tool or through the development of industry case studies			
• Start the discussion and share outcomes from new generation technology trials via Greener Live Performances LinkedIn Group page			

Acknowledgement:

Inspiration, information and aspects of Julie's Bicycle Sustainable Production Guide were replicated in the development of this resources and are reproduced under the Creative Commons license Attribution – Non-commercial – ShareAlike