Research and exploration 2012: Summary of key findings

In 2012, the Powerful Thinking Campaign was set up as a collaboration between the Powerful Thinking (formerly Green Festival Alliance), Julie's Bicycle, a number of UK festivals, power suppliers and De Montfort University. Festivals include Camp Bestival, Latitude, Leeds and Reading festivals, Shambala, Sunrise Celebration, Croissant Neuf Summer Party, Camp Bestival and Summer Sundae. Participating power suppliers include Firefly Solar, Midas UK, RESource, Aggreko and Innovation. The collaboration aimed to explore the recommendations in greater depth by exploring the issues with a view to implementing, and taking to scale these recommendations.

The campaign directly monitored generators at 8 festivals, piloted new ideas at several events, collected detailed information about how different festivals manage their power, and worked with power suppliers and a focus group of industry professionals, who have reviewed and edited the Power Behind Festivals guide during its development.

Methods:

Monitoring current on generators at 8 Festivals (Ben Marchini, De Montfort University)
Monitoring 73 systems over three years to establish day and night load.
Anecdotal research from over 10 festivals
Industry focus group – editing
Power providers meeting

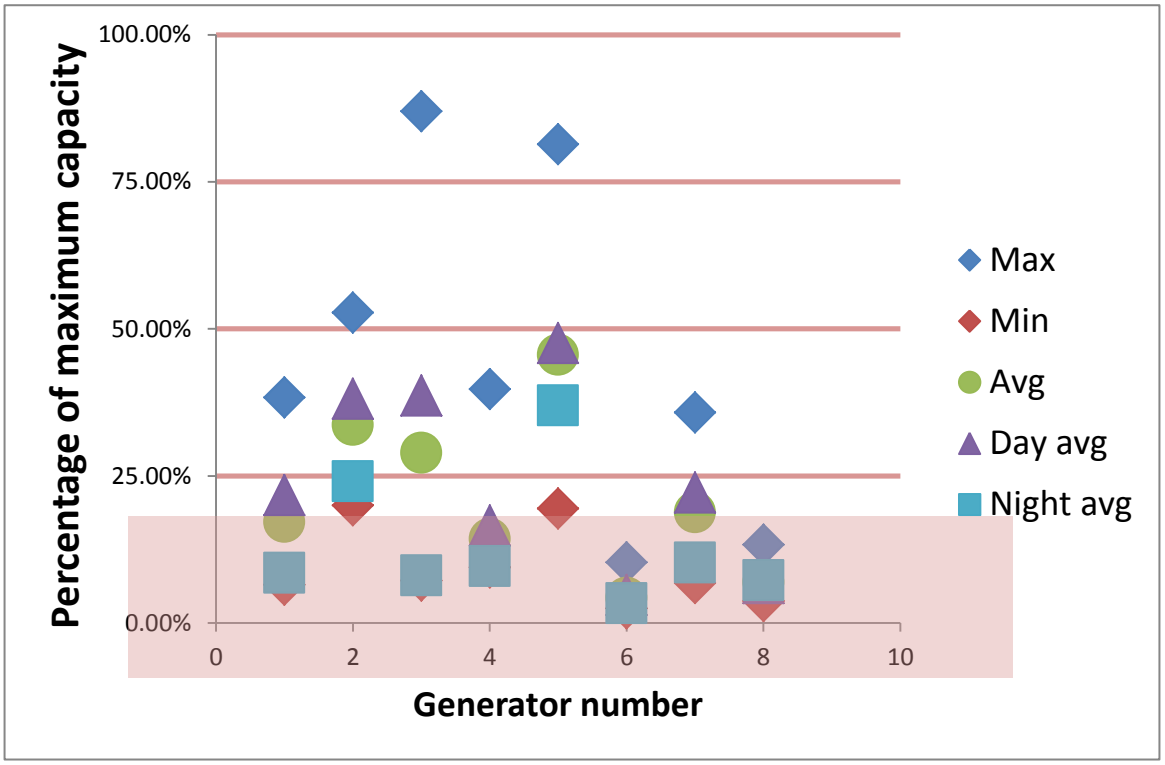
Findings from 8 monitored generators:

Current was monitored on 8 generator systems at 8 UK summer Festivals (2012) – please see Fig.1. It is recognised that this is a small sample, intended to be a 'snapshot' of loads. The findings are treated as indicative rather than conclusive of industry norms.

- Every single system had periods of working below 25% load
- Some generators operated *entirely* below 25%.
- The loading of systems varied considerably
- In many cases the generator was more than double the capacity required to meet peak load
- In one case the generator was 7 times the required capacity to meet peak load demand
- In all cases average night load was significantly below day load
- It is estimated that over half of the systems monitored could achieve fuel savings of at least 39%, and over 70% could achieve savings of 10%* by re-configuring the system.
- The use of back-up generators, or 'twin-sets' can reduce fuel efficiency of a system
- Generators are often employed for a single purpose resulting in lower loads

* Source: Ben Marchini, Institute for Sustainable Energy, De Montfort University. Methodology: Fuel saving presented as a %age based on analysis at quarter, half and three quarter loads from a sample of 8 generators monitored at 8 events in summer 2012. Fuel consumption derived from manufacturers and suppliers. Cost savings based on %ages of fuel savings based on a costs of £1/litre diesel. More detailed information about the analysis available on request.

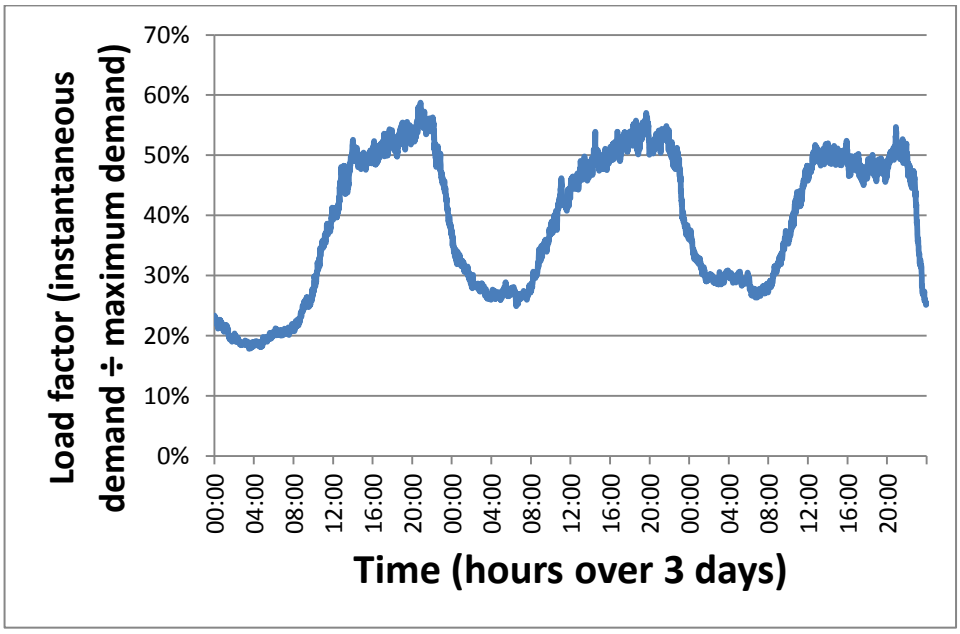
Fig. 1: Loads for 8 generators



What does this mean?

- It suggests that there may be opportunities to combine loads on generators, reducing the number of sets required on a festival site
- In some cases the size of the generator could be reduced
- Both the above would need to be assessed based on the requirements on the individual system.

Fig.2: Load factor averages*



*Based on monitoring of 73 power system at UK festivals between 2009 and 2012. The power systems monitored include all types of end-use i.e. stages, traders and mixed use

Key findings:

- Day and night load vary considerably
- The pattern of day and night load is consistent throughout events, regardless of generator purpose

What does this mean?

There may be opportunities to provide base loads at night using a secondary power source, which could result in lower emissions, and reductions in fuel consumption

State of the market: Renewable Solutions

- There is currently in the region of 12 solar and wind power suppliers in the UK festival market supplying power as a standalone service.
- Most offer small-scale solutions in the region of 1-10kW
- Many offer combined packages including power stage lighting, and audio
- Current total solar and wind capacity in the UK is estimated at circa 90kW
- The leading solar supplier can supply up to 45kW of power
- There is currently one medium-large scale supplier exclusively offering 100% WVO biodiesel fuelled generators, with a significant fleet of generators of up to 200kVA in size
- There are a range of pedal power suppliers who offer small-scale cinema's, audio and light and phone charging packages.
- Solar generators are becoming more common as a solution to powering overnight base load
- Two key UK suppliers (one biodiesel and one solar) offer 'whole event' services, including planning, power supply and site lighting.
- A handful of UK events ranging from 3,000 – 10,000 capacity are powered using majority or 100% renewable sources (WVO biodiesel, solar and wind)
- Biodiesel is meeting 5% of the total power for the 94 festivals engaged with the Julies Bicycle Ig tool.
- Some larger events are using a significant percentage of

Feedback from renewable power suppliers on the employment of renewable solutions at outdoor events:

- There is a lack of clarity about capabilities of renewable systems and the terms used describe them
- The provision of solar systems can be increased with confidence in future business
- Hybrid systems offer the best chance of meeting current power demands at most events
- Independent advise to industry can provide opportunities to increase market share

Feedback from festival organisers on their perceived problems:

- Festival managers are keen to know more about how power can be managed, and the options available to them.
- Festivals are keen to reduce costs and emissions
- There is nervousness about reducing the level of redundancy in systems
- Many suppliers are reluctant to diversify into biodiesel due to lack of expertise and perceived problems
- Biodiesel is more expensive than red diesel
- Renewable solutions are perceived as more expensive

Feedback from traditional diesel generator suppliers:

- Fuel consumption can be reduced if festivals organisers engage with all stake holders to provide more accurate information in advance, and reduce demand
- Combining loads across festival sites through better planning offers the best chance of reducing fuel consumption
- Equipment that require high 'start-up' power result in larger generators
- Festival clients, artists and contractors can reduce their requirement