Future of Festivals Report 2019

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As festival season hits fever pitch, Siemens and Cardiff University have partnered to put a spotlight on the environmental impact of festivals in the UK and highlight what innovations and initiatives are needed to ensure greener, cleaner festivals of the future.

Whether you're into fast cars or running fast, seeing your favourite band or supporting your favourite team, festivals and events are big business in the UK. More than 10.4[i] million visitors spend an estimated £2.3 billion[i] at festivals and music events in the UK, and they were worth an estimated £1.1 billion[i] to the UK economy in terms of direct spend.

However, as the number of festivals and events in the UK continues to rise, the organisation and staging of festivals is having a significant environmental impact. From land use to noise pollution, carbon emissions generated by travel to diesel generators required for the simple running of remote events, festivals can often come at a cost much greater than that of a ticket.

As an official Technology Partner of the Goodwood Festival of Speed 2019, Siemens has partnered with Cardiff University to look at some of their compelling environmental research across the festival and event scene. Collectively Siemens and Cardiff University consider some urgent questions on the future of festivals and what organisers and visitors can do to help create cleaner, greener festivals of the future.

10.4m
Festivalgoers

£2.3bn
Spent at festivals

£1.1bn
to UK economy

[i] Data per year, based on 2015 results

The environmental impact of festivals in the UK

Cardiff University has undertaken a number of studies that have examined the economic and environmental impact of sports events and festivals in the UK.

Their research has consistently found that the way in which we travel to festivals is one of the most significant environmental impacts. Looking at three festivals and events across the UK including the Hay Festival, The FA Cup Final and Rugby 6 Nations, Cardiff University researchers found that:

Travel to festivals

55%
of travel to and from festivals or events is by car

19%
of travel to and from festivals or events is by air

18.5%
of travel to and from festivals or events is by rail

46.1m
kilometres are travelled in total to and from any one festival or event

528km
on average each visitor travels 528 km to and from a festival or event

The Ecological Footprint is the impact on the environment based on the amount of natural resources used to sustain the activity, in this case festivals and events. It's measured in global hectares (gha), a unit of analysis that measures the amount of biologically productive land comparable with a world average.

Festival Ecological Footprint

49%

Travel accounts for 49% of the Ecological Footprint per visitor at festivals and events

38%

Food and drink accounts for 38% of the Ecological Footprint per visitor at festivals and events

20.5%

of the Ecological Footprint is accounted for by accommodation

3,310gha

The average total Ecological Footprint per festival or event is 3,310 gha

388gha

This compares to an average 'at home' Ecological Footprint of 388 gha

Table 1
Breakdown of Ecological Footprint Results

Event	FA Cup Final 2004	R6N 2006	Hay Festival 2012
No. of visitors	73,000	85,499	100,000
Travel	1,670 (55%)	1,117 (31%)	2,000 (61%)
Food & drink	1,381 (45%)	2,177 (61%)	260 (8%)
Accommodation (energy use)	-	284 (8%)	1,100 (33%)
Total gha	3,051	3,578	3,300

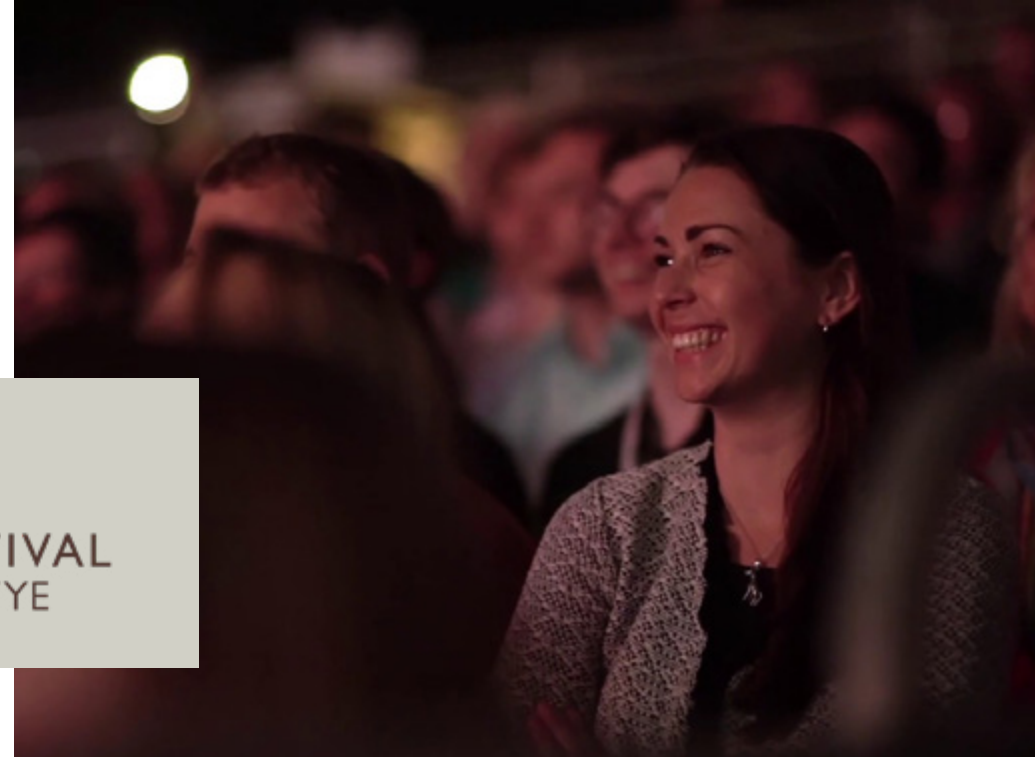
Table 2
Summary of Visitor Travel

Event	FA Cup Final 2004	R6N 2006	Hay Festival 2012
Mode		% distance travelled	
Air	-	3	35
Car	47	60	59
Rail	34	18	3.6
Bus & Coach	17	16	1.5
Other[1]	2	3	0.9
Total	43.2 million pkm	24.3 million pkm	71 million pkm
Average per visitor	591 pkm	284 pkm	710 pkm

Note. pkm = passenger kilometers; gha = global hectare.

[1] Includes boat, cycling, ferry, minibus, motorcycle and walking.

A spotlight on Hay Festival of Literature and Arts



HAY FESTIVAL
HAY-ON-WYE

About Hay Festival

Hay Festival is arguably one of the largest literature festivals in the world. It is an annual festival held in the rural town of Hay-on-Wye in Wales. Hay-on-Wye is renowned for its many books and bookshop and is the National Book town of Wales. Hay Festival was initially founded as a poetry festival in 1988, with a relatively small audience of 1,000 visitors. Since then the festival has grown quite dramatically in terms of its scale and scope and in 2018 sold 273,000 tickets covering 11 days of events.

The Research

Cardiff University research focused on measuring the environmental impact of the festival's audience using the 'Ecological Footprint'[1]. This involved conducting a survey with the festival's audience in 2012. The survey was used to collect information on the audience's purpose of visit, home location, method of travel (to/from and during the festival), length of stay, overnight stay (number of nights and type of accommodation), food and drink purchases, and spending on a range of items including travel, accommodation, food and drink, merchandise, retail shopping and other leisure activities.

Cardiff University Findings

- Cardiff's study found that visitor's total Ecological Footprint was an estimated 3,300 global hectares. The additional Ecological Footprint[2] generated by visitors attending the festival was 1,500 global hectares - two times greater than the average Ecological Footprint.
- The largest contributor to the audience's total Ecological Footprint was their travel, which accounted for 61% of their total Ecological Footprint. This was eight times greater than what their Footprint would have been at home (over the same period of time).
- Visitors travelled an estimated 71 million kilometres to/from the festival and during their stay in rural Wales. The average visitor travelled 710 km. 59% of the total distance travelled was by car and 35% by air (mostly international air travel). Travel by rail, coach, bus, and bicycle accounted for only 6% of the total distance.
- During the festival, visitors purchased an estimated 270 tonnes of food and drink from catering outlets. This resulted in an Ecological Footprint of 260 global hectares[3].

This case study shows that festivals have significant resource demands and environmental impacts. These are comparable with major sport sporting events, such as the FA Cup Final or a Rugby 6 Nations fixture (see Table 1). The resource demands of visitors were significantly different to those at home, in particular travel, which resulted in an Ecological Footprint some 8 times larger than if they had stayed at home and had gone about their day to day activities.

Hay in Figures (based on 2012 study)

- 100,000 visitors (2012)
- 11 days festival duration

Where did visitors travel from?

- 98% UK
- 0.8% Rest of Europe
- 1.2% Outside Europe

Environmental Impact

- Ecological Footprint - 3,300 global hectares
- 61% Travel
- 33% Energy use in overnight accommodation
- 8% Food and drink

Visitor Travel

- 71 million km - distance travelled by visitors to/from and during the festival
- 170 km - distance travelled by average visitor

Of the total distance travelled

- 59% Car
- 35% Air
- 3.6% Rail
- 1.5% Bus & Coach
- 0.9% Other (includes bicycle, coach, motorhome, ferry, walk)

Overnight accommodation

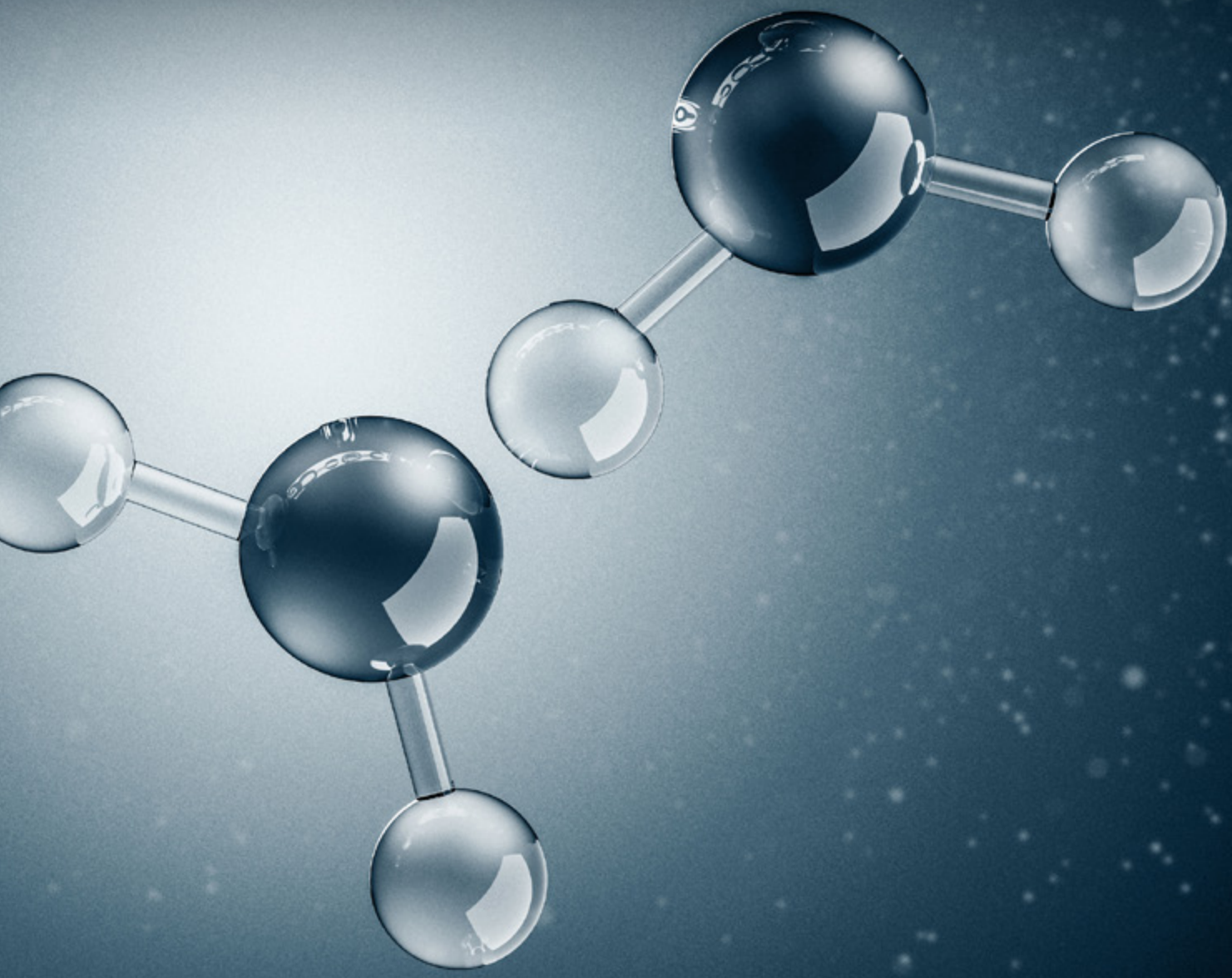
- 32% Campsites
- 22% Self-catering
- 20% Guest houses
- 9% Hotels
- 13% Friends and family

[1] The Ecological Footprint is a proxy measure of the global environmental pressures related to human resource use. It provides a quantitative assessment of the amount of bioproductive land required to provide the resources used by a defined population, and to assimilate the wastes produced (i.e. CO2 emissions), using prevailing technologies and resource management practices. The Ecological Footprint's unit of analysis is the "global hectare" (gha) and represents a hectare with a world-average biological productivity.

[2] The additional Ecological Footprint is calculated by subtracting visitors Ecological Footprint 'at home' from their total Ecological Footprint at the event.

[3] This Footprint only relates to food and drink purchases made at the festival, and excluded food and drink brought to the festival or purchased elsewhere.

Innovations and initiatives to promote cleaner, greener festivals of the future



Siemens solutions for cleaner, greener festivals of the future

Unprecedented technology transitions are driving change - across transportation, grids, energy systems, buildings, infrastructure and industry. As Technology Partner at Goodwood Festival of Speed 2019, Siemens is showcasing examples of ingenious technology that will help power the future of transport, infrastructure and industry and ultimately the future of festivals such as Goodwood - helping organisers and festivalgoers alike become cleaner, greener and ultimately, carbon free.

Clean Decentralised Power Sources: Siemens Hydrogen Fuel Cell

Anyone who has been to a festival or large outdoor event will be familiar with large, diesel, generators that provide the power for often remote events. This year, Siemens will be showcasing at Goodwood a cleaner and greener alternative - the hydrogen fuel cell.

Hydrogen (H_2) is a non-toxic, colourless gas; it is the most abundant element in the universe - when used as a fuel, the only by-products are heat and water. It does not create particulates or carbon dioxide which pollute the atmosphere. 'Green' hydrogen is made from water in an electrolyser (such as the Silyzer produced by Siemens), powered by 100% renewable energy (from a wind farm or solar panels for example). Fuel cells, like the one being showcased at Goodwood, combine hydrogen with oxygen from the air. This chemical reaction releases electrical energy, providing a clean energy source to service the energy needs of festivals:

- The hydrogen fuel cell at the Goodwood Festival of Speed produces 100kW of electricity

  - This is like running 33 domestic kettles simultaneously (and continuously!)

  - Or, it could provide enough power to drive a typical electric vehicle over 10,000 miles; the same as going from Land's End to John O'Groats 12 times

  - Alternatively, it could recharge over 200,000 mobile phones to 100% charge from flat

- To produce this power, the fuel cells consume hydrogen at a rate of around 6kg per hour

- At this power level, the fuel cells produce approximately 54kg per hour of water

- The only other by-product is heat – there are no particulates, CO2 or NOx emissions from running a fuel cell on hydrogen

In the future, the hydrogen fuel cell system could be used to provide the primary source of energy – i.e. as a generator and for other purposes such as Electric Vehicle (EV) charging – for festivals and events. Entirely self-sufficient, with no need to rely on complex infrastructure, the hydrogen fuel cell could provide remote locations with enough clean, green energy to dramatically reduce the Ecological Footprint and provide a sustainable solution to powering the future of festivals.

E-mobility

The number of festivals being held up and down the country is increasing year on year. Cardiff University's research has clearly demonstrated that event-related travel is the single biggest contributor to the Ecological Footprint of a festival or event.

Siemens is committed to driving cleaner, greener transport using new and existing infrastructure - including electric cars and sustainable, energy-efficient trains and bus fleets - all of which can contribute to a significant reduction in the size of the Ecological Footprint at festivals and events.

One of the greatest challenges facing the uptake of EVs is the availability of charging points - and this is often due to the lack of availability of a suitable power grid. Festivals are a particularly difficult case - thousands of people, and almost no electrical network. This is where the Siemens Solution comes into play.

Siemens can bring the power of the future to festivals now. The Siemens fuel cell solution can provide for any number of EV charging points - a wardrobe-sized rack will power up to 24 EV charge points. The only input is green hydrogen, and the exhaust is pure water. No diesel fumes to harm the environment, and no noise to spoil the ambience!

How can festival organisers help reduce the environmental impact of festival travel?

Based on Cardiff University's research and collaborative activities with festival organisers, they recommend that organisers should actively take steps now to drive down the environmental impact of travel to festivals by its visitors, performers, sponsors, volunteers, media, caterers and suppliers. Cardiff advises that:

- Organisers should provide attractive financial incentives to encourage festivalgoers to choose public transport and other low carbon travel options such as EV
- Organisers should start to facilitate and encourage travel to and from their events via EVs now - providing suitable EV charging solutions on site (such as the hydrogen fuel cell). This would help drive down the travel footprint of festivals significantly
- Festivalgoers are now much more environmentally aware and demand more transparency. Organisers need to take responsibility for the environmental impact of their event and demonstrate clear actions they are taking to reduce it - or risk reducing visitors' numbers and visitor loyalty in the future

"Future festivals and events should be supported by the right infrastructure and technology to minimise their Ecological Footprint. Siemens solutions such as the hydrogen fuel cell and our innovations in eMobility can help ensure our favourite festivals become more sustainable."

Juergen Maier, CEO Siemens plc

How can festivalgoers help reduce their Ecological Footprint at festivals?

- Where possible travel by public or group organised transport
- Check if the festival provides any incentives to travel by public transport or other low carbon travel options such as EV
- If it is necessary to travel by car, car-share. Some festivals promote car-sharing schemes on their festival website
- Consider hiring an EV with other festivalgoers and investigate the charging option on your route

Whilst travel is the single biggest contributor to the Ecological Footprint, organisers and visitors need to work hard to reduce their use of plastic and general waste as well. There are already some good examples of eco-friendly initiatives taking place that need to be rolled out more broadly across the festival and event scene, including:

- Glastonbury has introduced a new single use plastic ban for 2019 and are providing over 100 free water kiosks for attendees. In addition, only compostable or reusable plates and cutlery may be used throughout the weekend
- Boomtown is offering a '£10 ticket refund' for every festivalgoer that drops off a bag of recycling before going home
- Festivals including Boomtown, Bestival, Green Man, WeAreFSTVL have all banned the use of glitter

"We have a real passion for festivals here in the UK, they have become part and parcel of the Great British summer. But the vast Ecological Footprint they make is becoming increasingly hard to ignore and organisers must act now if we are to continue enjoying festivals in the future. Solutions from companies like Siemens will enable organisers and festivalgoers to take responsibility to limit the environmental impact of festivals and leave a positive legacy for future generations."

Dr. Andrea Collins, Lecturer, School of Geography and Planning, Cardiff University

In conclusion

Our journey to a festival is often part of the overall experience. However, Cardiff University's research has shown that festivals and events do have significant environmental impacts, with travel being the biggest single contributor to the overall Ecological Footprint of an event. It's not only the distances that we are prepared to travel, but our over reliance on transport via car, often to remote locations where public transport options are limited.

As a nation fond of festivals and events, our appetite to see our favourite bands, support our favourite teams and indulge in our favourite hobbies continues to grow. But festival organisers must act now if we are to enjoy cleaner, greener and more sustainable festivals in the future.

Notes to editors

About Siemens at Goodwood

For the first time, Siemens is a Technology Partner for Goodwood Festival of Speed 2019. Siemens is a champion of ingenious technology that supports the way people live across transportation, grids, energy systems, buildings, infrastructure and industry. Siemens aims to offer solutions that will help people become cleaner, greener and electric.

Primary Report Contributor

Dr. Andrea Collins is a Lecturer at Cardiff University's School of Geography and Planning. She has research interests in the environmental impacts and legacies of major events. She has undertaken a number of studies that have examined the environmental impact of sport and cultural events in the UK and is a member of Cardiff University's Festival Research Group. Her research has informed the development of UK Sport's event IMPACTS Toolkit and Golf Environment Organisation's International Sustainability Standard for Golf Tournaments.

Cardiff University's Festival Research Group

The Festival Research Group (FRG) was set up in 2016 to bring together academics at Cardiff University and key stakeholders to undertake collaborative research on the festival's scene, and to consider urgent questions on the future of festivals.

The key focus for the FRG has been music and arts festivals; members of the group have substantial experience working with and at festivals such as Glastonbury, Green Man, Hay Festival, Sŵn and the National Eisteddfod as well as at food-themed events. The FRG is keen to connect academic research with the experiences of festival goers, organisers, performers and other stakeholders. Festivals also present researchers with different platforms for engagement and the sharing of research through participatory methods.