The Environment Council Briefing Paper on Sustainable Events

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1. Introduction

In looking at the carbon footprint of events, the following areas need to be considered: venue, catering, invitations/communications (including pre and post meeting information), event collateral materials (documents and resources distributed on the day of the event), and travel.

The current UK government conversion figures for emissions factors are relatively high level (travel/ electricity/ gas) and at present doesn't drill down to day-to-day office tasks. As such, this briefing paper takes a methodological approach to carbon footprinting, with more detailed calculations included where available.

2. Basic calculation for electricity

The basic conversion factor for electricity in the UK is taken as 0.53 kg CO2 per kWh. So a basic calculation for carbon footprint of electricity use would look like this:

Electricity kWh (of appliance) x hours of use x 0.53 kg CO2 = Total kg CO₂

3. Aspects of Event

3.1 Venues

To calculate the broad carbon footprint of a venue you need to go through the following steps¹:

Step 1: Total area of building ÷ Total area of venue space = area Step 2: Area x Annual Electricity used in venue = annual electricity used in venue area (kWh) Step 3: (Annual electricity used in venue area (kWh) ÷ 365 days) x no. of days of event = electricity used at venue during

Step 4:

Electricity used at venue during event (kWh) x 0.53 kg CO2 per unit = Total kg CO₂

The above calculation gives a broad overall carbon cost for the venue. However, it is possible to break this down to the specifics, such as lighting, air conditioning and so forth.

When looking at venues in terms of the sustainability of an event, it is important to consider using venues with natural light, as less electricity will be required for lighting. A calculation for the carbon impact of natural light over artificial light would require a measurement of electricity used for lighting the room; multiplied by the

event (kWh)

¹ Calculation based upon S. Putt del Pino and P Bhatia, World Resources Institute publication (2002) *Working 9 to 5 on Climate Change* p19/20 <u>http://www.ghgprotocol.org/downloads/calcs/working9-5.pdf</u>

number of hours. The saving of carbon assumes that a room with natural lighting would have a carbon footprint of zero.

NOTE: The following equation assumes all light bulbs in a given venue are of the same wattage. If variable wattage is present across the venue, group those with the same wattage and run the equation for each group, adding the result to get a total figure attributable to lighting.

Step 1: (No. of lightbulbs x wattage) ÷ 1000 = kWh Step 2: kWh x number of hours the room is used = electricity used in event (kWh) Step 3: Electricity used in event (kWh) x 0.53 kg CO2 per unit = Total kg CO₂ used in lighting the room in the course of the event

Other tips for sustainable venues:

Providing criteria and feedback to help the venue improve on environmental performance, and selecting central locations to allow for easier access by public transport that are as close to the majority of expected attendees, lowering emissions for the whole event.

It is also good practice to find out whether the venue buys products with reduced environmental impact e.g. energy-saving lightbulbs, energy efficient electrical equipment, recycled paper, low VOC paints, natural cleaning products etc. Additionally, you can enquire whether venues have installed motion sensors for corridor lighting or whether they buy green electricity. Even if venues have not considered items you are aware of, enquiring about them forms part of the process of recommendation and indicates required/expected development from client to provider, contributing to behaviour change in the market.

Where possible, it is preferable to select venues with large windows that can be opened to avoid using air conditioning. To calculate the carbon saving from this, it would be necessary to attach an electrical energy monitor to the air conditioning unit to establish the energy used in an hour with the unit on. It is worth noting that such monitors rely on a cumulative reading over the time period required, providing an average reading where levels of use vary during the time monitored. Where monitoring is not possible, and this may be the case for a number of integrated electrical appliances, try to contact manufacturers who should be able to provide typical kWh use data. The calculation would then be made as follows:

Step 1:

Electricity used by air conditioning unit in 1 hour (kWh) x no. hours of event = kWh of air conditioning

during event

Step 2:

kWh of air conditioning during event x 0.53 kg CO2 per unit = **Total kg CO₂** used in air conditioning in the course of the event

3.2 Caterers

At present the data on calculating the carbon footprint for catering is limited – largely because of the complexity of establishing conversion factors for the broader supply chain and so on.

It is, however, possible to look at the environmental impact of catering in terms of the volumes of methane emitted in the degradation of organic waste in landfill (which accounts for 12% of global methane in the atmosphere)². Methane is approximately 21 times more damaging to the climate than carbon dioxide, though it should be noted that methane does not remain in the atmosphere for as long as carbon dioxide. One cause of methane emissions is degradation of organic waste in landfill – accounting for 12% of global methane in the atmosphere.

A calculation³ for the approximate carbon cost of sending catering waste to landfill would be as follows:

Step 1:

Establish mass of general mixed waste sent to landfill (kg)

Step 2:

General mixed waste sent to landfill (kg) x 0.56 kgCO_{2e}/kg = **Total kg CO_{2e}** from landfill methane

Other tips for catering at sustainable events include:

- Ensuring all leftover food is donated to a local food bank rather than taken to landfill (savings of methane emissions could be calculated by weighing the amount donated and using the formula above)
- All catering plates, cups and glasses to be china or glass (non-disposable). If plastic, they must be washable (biodegradable or compostable is better), although there would obviously be a methane cost involved with this.
- Serving condiments in bulk containers, rather than as individual servings, to save packaging. This includes sugar, cream, sauces, butter etc.
- Most importantly plan catering volumes carefully to reduce unnecessary waste, ensuring final attendee numbers are as accurate as possible as far ahead of the event as possible with option to adjust following review shortly before the event, accounting for 'drop-out' invitees.
- Where possible offer local produce to reduce air miles (and therein reduce the carbon impact) and support local economies.
- Use Fair-trade tea and coffee, to support small farmers in developing countries, and organic produce to support environmental farming practice.

3.3 Invitations and reminders/ Event materials

² The Environment Agency

https://www.carbontrust.co.uk/NR/rdonlyres/5FD1930C-9355-493A-A3C4-

http://www.environment-agency.gov.uk/business/444255/446867/255244/substances/185

³ Calculation based upon conversion factor for methane given in Carbon Trust, Practical Guide to Carbon Footprinting – Presentations (15 June 2008)

The information for calculating carbon footprints of small-scale office-based activity is currently extremely limited. However, here we hope to suggest a few ways of potentially estimating the carbon footprint involved in the pre-event activities and the impact of producing the event collateral such as delegate packs.

Approaching costs from an office equipment angle - i.e. the cost of using computers, printers, photocopiers etc. during designing and producing the necessary paperwork and so forth – allows us to use a calculation based upon general office data.

According to The Chartered Institution of Building Services Engineers, desktop and associated IT equipment such as computer, printers, modems and faxes typically average about 160 W per work location⁴. Therefore it would be possible to work out the average carbon footprint of the event logistics and collateral using this calculation:

Step 1: 160W x number of hours used in event collateral/invitation production = electricity used (kWh) Step 2: electricity used (kWh) x 0.53 kg CO2 per unit = Total kg CO₂ used in office-based event planning

The carbon footprint for communications to invitees can be considered in a number of ways, which is part of the reason why calculating it is so complex. For example mobile phone chargers can account for between 35 and 70kg per person per year, making communications via mobile phone carbon-intensive. Sending letters, by contrast, represented only 0.01kg^5 . At present there is no data on the carbon cost of landline phones.

With regards to assessing the impact of paper usage, your office supplies manager should be able to tell you how many reams of paper your organisation has purchased over a given time period. This information may also be contained on invoices.

From this you can take a broad average of daily paper usage by dividing the total volume of paper used by the number of days spent on preparing for the event. This calculation can be made more robust by establishing the carbon cost of the type of paper that is being used. The manufacturer or supplier may be able to provide you with this information. Even if they are not able to at present, there is value in making suppliers aware of sustainability issues in their sector and enquiries such as this can promote behaviour change in the market.

However, for a more accurate calculation you would need to do the following:

Step 1

(Number of reams x average weight of ream in grams) ÷ 1000 = weight of paper (kg) **Step 2**

Weight of paper x emissions factor for paper* = CO2 equivalent** emissions

⁴ The Chartered Institution of Building Services Engineers, 'Energy Consumption Guide: Energy Consumption in Offices', 2000 <u>http://www.cibse.org/pdfs/ECG019.pdf</u> p 15

⁵ http://www.martinfrost.ws/htmlfiles/dec2006/carbon_footprint.html

Step 3
Weight of paper x emissions factor for disposal of paper*= C02 equivalent** emissions
Step 4:
Total kg CO₂ = sum of step 2 and step 3

* - emissions factor depends on content of paper ie virgin or recycled. The emissions factor also varies depending on waste disposal method (recycling, incineration, landfill)

**- C02 equivalent is the standard unit for comparing the degree of harm that can be caused by emissions of different GHGs

At present Defra do not have an emissions factor for paper available and the Confederation of European Paper Industries⁶ is still in consultation with its members on this issue.

N.B. In order to calculate the weight of paper used in the printing of productions such as brochures, newsletters, and annual reports you can contact the printing companies or in-house print shop staff, who should be able to tell you the weight of paper used for each printing job. Some organisations use project codes to be able to activate machines such as copiers and printers, and this is another way of monitoring exactly the volume of printing and copying attributed to one event.

Other more general tips to save electricity and reduce waste when producing event literature and so forth, include:

- Printing all handouts on two sides using post-consumer recycled paper, or better still, provide all handouts online following the event. The carbon savings would be calculated by working out the weight of paper saved – in the same manner as the calculation above.
- Use recycled paper and vegetable- and soy-based inks for promotional materials and handouts.
- Provide reusable containers for handouts or samples (pocket or file folders, cloth bags).
- > Use of websites and email for event promotion (again minimises paper wastage)

3.4 Travel to and from event

The current information available for transport conversion factors is very comprehensive⁷, and the calculations for the various forms of transport and fuel types are listed below.

Private transport

	Units	x	kg CO ₂ per unit = Total kg CO ₂
Average petrol car:	miles	х	0.3372
	km	х	0.2095

⁶ http://212.3.246.141/Objects/1/Files/Carbon%20footprint%20statement%20annual%20reports.pdf

⁷ Guidelines to Defra's GHG conversion factors for company reporting Annexes updated June 2007

Average diesel car:			miles	х	0.3197	
			km	х	0.1987	
Medium petrol hybrid car:			miles	х	0.3372	
			km	х	0.2095	
Large petrol hybrid car:			miles	х	0.3604	
			km	х	0.2240	
Average car (unknown fuel):		l):	miles	х	0.3340	
2			km	х	0.2075	
Average petrol motorbike:		1	miles	х	0.1718	
			km	х	0.1067	
Public transport						
Passe	nger kn	ns t	ravelled	х	kg CO ₂ per unit = Total kg CO ₂	
Bus:		pkn	า	х	0.0891	
Rail:	-	-				
National	pkm			х	0.0602	
Light rail	pkm			х	0.0650	
Underground	I	pkn	า	х	0.0526	
	Pkms	x	kg CO ₂ p	er u	unit \times km uplift factor = Total kg C	02
Air- International:						
Long-haul	pkm	х	0.105	6	x 109%	
Short-haul	pkm	Х	0.130	4	x 109%	
Air- Domestic:	pkm	х	0.158	0	x 109%	

N.B. cycling and walking are normally agreed to have no carbon impact

In order to calculate an accurate carbon footprint of the event, each individual's transport calculation would need to be made and added to the event total; however these could be categorised under broader headings should it be required if attendees are unable to provide the relevant details.

e.g.

total no. miles travelled by car by attendees x $0.3340^* =$ Total kg CO₂

*conversion factor for average car (unknown fuel)

4. Conclusions

At present it is possible to measure the carbon impact of an event with a fair degree of accuracy in terms of:

- > Participants' travel to and from the event,
- > Office equipment usage in the planning stages of an event,
- > Both the lighting for a venue and its overall electricity usage,
- And of food waste into landfill.

We would therefore suggest that these become the Key Performance Measurements in any Sustainable Events policy or requirements.

From our research we also conclude that in the near future (within the next five years) it will be possible to calculate the footprint of paper usage and for many more of the smaller scale activities involved in events planning. This will present a more comprehensive footprint calculation and Sustainable Event requirements should be adjusted accordingly.

In the meantime, it is worthwhile for organisations to use their position as a 'carbonconscious' customer to influence the activities of caterers, venue owners and their office suppliers and highlight the importance of sustainable behaviour and an awareness of carbon impact. Such demand can guide the market towards more sustainable practice far more swiftly, and also drive the creation of legislative guidance and frameworks that give a more comprehensive base for carbon accounting.