Hybrid Futures Climate Case Study #4

Hybrid Futures exhibition at Salford Museum and Art Gallery, Spring - Autumn 2024

Hybrid Futures opened at Salford Museum and Art Gallery on 23 March -22 September 2024. The exhibition – bringing together artworks from Shezad Dawood, Parham Ghalamdar, Jessica El Mal and RA Waldon – was the last of the Hybrid Futures exhibitions.

As part of the Hybrid Futures project, staff at Salford Museum and the Salford University Art Collection collected as much data as they could about the energy, transport and material use associated with the exhibition (including some travel and accommodation from the wider HF project that helped to inform the exhibition). This information was then analysed by Danny Chivers, the Environmental Advisor to the project to see what could be learned about the climate impact of the exhibition.

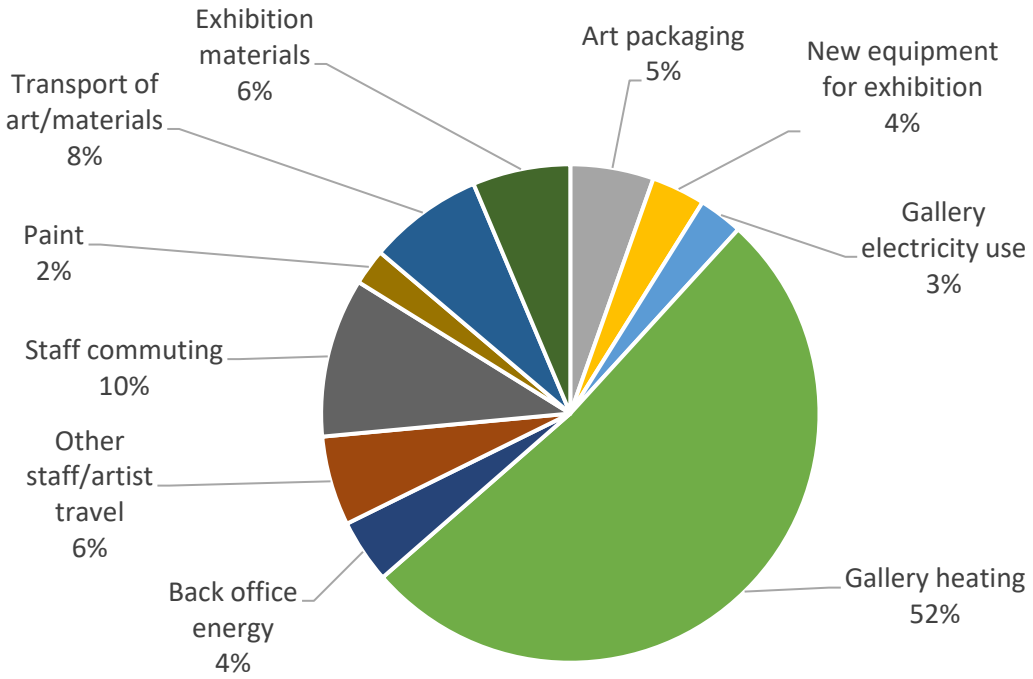
This produced the following headline results:

Activity	Sub-category	Energy or resources used	Calculated carbon emissions (kgCO2e)	Notes
Creation of artworks		None – all artworks were pre-existing, from previous Hybrid Futures shows	0	
Packaging of artworks		Bespoke crates for neons, Stiffy bags for paintings, plastic crates and blankets for ceramics, tissue paper	166	All kept for reuse. The estimated 15 kg of woollen blankets was the largest contributor (65 $kgCO_2e$), next was the plastic crates (54 $kgCO_2e$) and the bespoke neon crates (37 $kgCO_2e$).

Data storage and transfer		Minimal	Minimal	
Project travel	UK train and car travel for HF events (including some travel by freelancers)	Trains between NW England and London/Oxford, plus driving from Carnforth to Blackpool	121	
Setup of exhibition	Transport of artworks locally	478 km in large van, 638 km in small van	229	
	Travel by other contractors (tech support, decorators etc)	No significant travel	0	
	Purchased materials for framing, display, labelling	Display boards with vinyl printing with specific exhibition information, plus stickers for audience interaction	14	Other framing materials were re-used from previous exhibitions. Katz display boards made from recycled paper.
	Printing of promotional materials	100 A4 posters, plus an A3 poster and an A1 PVC poster	3	
	Paint for decorating space	Around 40 litres used, but only 20 litres purchased new	72	Half of paint used was existing stock
	Exhibition furniture/walls	Mostly reused, but 8 large new MDF panels purchased	177	
	New equipment bought for exhibition	Various new items of sound equipment: speakers, controllers, cables, adaptors etc - just under 20 kg of kit	107	Other items (eg film projector) were not purchased new so don't add extra carbon here
Other associated travel	Travel for exhibition engagement events	386 km by car and bus	57	Distances estimated
Energy use at gallery during exhibition	Heating of gallery space	625 litres of heating oil	1588	Estimated based on total building oil use, allocated to size of gallery space

	Electricity use in gallery space	121 KWh for lighting, 167 KWh for neon artworks, 102 KWh for film projection.	88	Doesn't include electricity used elsewhere in building
Other energy use	Back office energy used by staff for planning/running exhibition	Estimated based on 25 days of back office work	127	See below for how this was calculated
Staff commuting	See below	Estimated based on 25 days of back office work plus 45 days of exhibition	316	See below for how this was calculated
TOTAL			3065	

Estimated carbon footprint of Hybrid Futures exhibition and associated Hybrid Futures activities at Salford Museum & Art Gallery ($kgCO_2e$)



The above chart shows the approximate breakdown of the greenhouse gas emissions associated with the travel, transport, energy and materials required to create the artworks, get them to the gallery and set up (and take down) the exhibition. These include some estimates and allocation decisions as described in the table above.

It also includes an estimate for the electricity and heating oil used at the gallery to

create and run the show including back office functions and an estimate for the staff commuting allocated to the show. See the Appendix below for more information on how these were calculated.

Note that the aim of creating this footprint is to identify good practice and opportunities for action, both for Salford Museum and Art Gallery and for other arts organisations in general. It is presented as an illustrative example, for educational purposes, in the hope of informing and inspiring further environmental action. It is not intended for comparison or benchmarking against other exhibitions or venues, including other shows within the Hybrid Futures project, as every exhibition has its own unique context and situation (including location, time of year, specific intended audience, availability of data and so on) that can limit the usefulness of such comparisons.

All carbon figures have been calculated in line with the World Resources Institute Greenhouse Gas Protocol (the global standard for carbon auditing), mainly using conversion factors from the UK Government and the Idemat database.

Visitor Travel

For the first time in the Hybrid Futures project, it was possible to create an estimate of the carbon emissions from visitor travel to this exhibition, thanks to an interactive display inviting visitors to place a sticker showing the distance they travelled to the gallery that day, and the primary mode of transport they used. Over 1400 visitors left useable information on the board, from which it was possible to calculate the following:

35% walked or cycled
23% came by car, from a median distance of 12 km away
22% came by bus, from a median distance of 12 km away
20% came by train, from a median distance of 20 km away

From the gathered data, it's possible to calculate an average carbon footprint per visitor of just over 4 $kgCO_2e$ from their journey to and from the museum. This is a third lower than the average travel footprint for a UK museum visitor (6 $kgCO_2e$), but higher than for a typical large central London gallery (which can be as little as 1 kgCO2e per person, largely due to the very high use of public transport in London)*.

Note that this only represents the emissions from overland travel on the day of the visit, so does not include (for example) flights taken by overseas tourists who might be visiting the museum as part of a longer trip to the UK.

The estimated visitor count for the Hybrid Futures exhibition at Salford was 15,900 people. This gives a visitor travel footprint of around 65,000 $kgCO_2e$ for the exhibition (65 tCO2e), about 21 times higher than the rest of the exhibition's emissions combined.

According to the Gallery Climate Coalition's Decarbonisation Plan for non-profit arts organisations, visitor travel should be considered separately from the rest of the organisation's carbon emissions:

"Visitor travel isn't a straightforward part of any public venue's carbon footprint, because it isn't purely under the gallery's control. The immediate decision to travel to a gallery or

museum, and the decision over which method of travel to use, lies with the individual visitor rather than the gallery. However, the gallery can have an influence over those decisions through its communications with its audience, the facilities it provides, the location and timing of events, the choices it makes over which audiences it is trying to attract (local, national or international), and the siting of any new gallery spaces. For these reasons, GCC views visitor travel as an area of shared responsibility between an arts organisation and its audience, to be considered separately from the organisation's main carbon reduction targets."

For this reason, the visitor travel emissions estimate has not been included in the total footprint of the exhibition but reported here separately as a source of "shared emissions". GCC recommends creating a separate target and action plan for these emissions, in partnership with other relevant stakeholders (audiences, local public transport companies, local authorities, active travel groups etc).

* Average UK audience travel calculated from travel data from the UK museum audience survey carried out by The Audience Agency in 2019; example London gallery data from the Gallery Climate Coalition.

Good practice to highlight.

The exhibition's emissions came to a total of around 3 tonnes of CO_2e (3065 kg). This is roughly equivalent to driving from Salford to Carlisle and back in an average car for every day that the exhibition was open.

Some key decisions that helped reduce these emissions:

- All artworks had already been created for the previous Hybrid Futures exhibitions, so no new materials, processing or creative travel were required.
- The great majority of furniture, display materials and equipment used for the exhibition were pre-existing items or hired, reducing the need for new materials. Half of the paint used had been saved from previous exhibitions.
- The information boards were made from recycled materials.
- The setup was mainly handled in-house or with local partners, reducing the need for contractor travel.
- The decision to work with artists based in the North West of England also reduced the amount of travel required.
- Staff at the museum are also diligent about saving energy wherever possible, by turning off lights and equipment when not in use.
- The artworks, exhibition materials, equipment and most of the packaging will have a continued life after the exhibition, thus helping to reduce the footprint of future exhibitions and events. Around 15% of the carbon footprint is associated with items that will be used again.

Key things to note for the future.

- Gallery heating was by far the largest contributor to the footprint, at 52% of the total, even though the exhibition took place between March and September, not during the winter months. The museum uses heating oil, one of the most carbon-intensive forms of heating available – a similar amount of energy purchased as gas would have a carbon footprint 25% lower. Providing the same energy via an air source or ground source heat pump could have a footprint 70% lower*.
- Staff commuting made up an estimated 10% of the total. The Gallery Climate Coalition recommends that commuting (in a similar way to visitor travel) is seen as a shared source of emissions between an arts organisation and its staff, and something to work on together, separate from the organisation's core annual decarbonisation targets. However, it is included in this exhibition footprint to give a sense of its significance compared with the other activities that made the exhibition possible.
- Of the remaining emissions, the largest contributors were travel and transport. This was partly because the rest of the exhibition's footprint was so low, but also highlights another area where the use of lower-carbon options (eg electric vans) could made a difference.
- The purchase of just five pieces of sound equipment, plus their accompanying wall mounts and cables, had a higher carbon footprint than the estimated electricity use of the whole exhibition. This shows the energy intensity of manufacturing technical equipment, and the importance of ensuring these items are purchased as rarely as possible and are given a long usage life.

  * Assuming an average coefficient of 3, ie a heat pump producing 3 units of heat energy for every unit of electricity consumed.

Going beyond carbon

While this study focuses on the climate impact of the show, it's important to remember this isn't the only environmental crisis we are facing. Some other potential environmental hotspots for future consideration include:

- Whenever chemical products are used in significant quantities, there is the risk of toxic materials entering the environment, through the manufacturing process as well as from the use of the product. In this case, standard wall paint was used to decorate the exhibition space. There could be value in investigating environmentally friendly paint brands in the future.
- Vinyl printing was used for the information boards, as finding more environmentally friendly yet practical alternatives proved to be challenging. This will be an area for further research in the future.
- The reuse of exhibition furniture, equipment, materials and most of the packaging is a positive step for reducing pressure on global resource use, biodiversity loss and the waste crisis. Some new packaging was purchased for specific exhibits, which will continue to be used for their transport in future.
- The issues raised by the exhibition itself will hopefully have had a positive effect on the understanding, engagement and motivation to act of the audience

attending the show. This is of course very difficult to measure though.

APPENDIX: Estimating energy use and staff commuting

Energy use for the exhibition

This is often a challenging item to calculate for an art exhibition. For Salford Museum & Art Gallery – as for many cultural buildings – the energy use of the entire property is included in the energy meter readings. However we need to estimate how much of that energy was consumed by the exhibition itself, how much by office staff working in support of the exhibition, and how much for other activities unconnected to the exhibition.

This case study uses a mixture of methods to allocated this energy use, based on the type and quality of data available. Note that some of these methods differ from the ones used in the other Hybrid Futures case studies.

Over the length of the exhibition, the building as a whole used 7500 litres of heating oil. The exhibition space occupies about a twelfth of the building's floorspace, so we have estimated a total oil use of 7500/12 = 625 litres. For gallery electricity use, we looked at the daily power consumption of all the lighting, sound and projection equipment, and the neons, and scaled it up to the length of the exhibition, giving a total of 390 KWh of electricity.

For "back office" energy, we assumed a total of 25 days of staff time for planning and setting up the exhibition. The office space in the museum is also about a twelfth of the building and has a staff occupancy of six people on a typical day. The daily heating oil use during the 9-week exhibition period for the office space was therefore 7500/12/(9*7) = 9.9 litres per day, or 1.7 litres per staff member per day. This gives an approximate total of 1.7 x 25 = 41 litres of heating oil for back office support, or 105 $kgCO_2e$. Back office electricity use was estimated from the typical daily electricity use of a UK office worker (3.16 KWh/day, according to calculations by WSP Environmental). This gave a total of 79 KWh of electricity, and 18 $kgCO_2e$. There was also 4 days of working from home time for marketing staff, which (using home working carbon estimates from EcoAct), added a further 11 $kgCO_2e$.

Staff Commuting for the exhibition

The total distances commuted by staff for the 45 days of exhibition installation, operation and deinstallation, plus the 25 days of "back office" time, were as follows:

241 passenger-km by bus: 31 $kgCO_2e$
1287 km by small petrol car: 185 kgCO2e
845 km by battery electric car: 40 kgCO2e
1689 passenger-km by train: 60 kgCO2e

For more details on the exact methodology and assumptions used in this case study, please contact us at artcollection@salford.ac.uk marking your query 'Hybrid Futures methodology'.