



Hybrid Futures Climate Case Study #1 ●

Shezad Dawood Leviathan: From the Forest to the Sea exhibition at Touchstones Rochdale - Summer 2023

Leviathan: From the Forest to the Sea opened at Touchstones Rochdale on 3 June – 12 August 2023. The exhibition featuring the eighth film in Shezad Dawood’s Leviathan Cycle plus a series of physical artworks was the first of the Hybrid Futures branded exhibitions to open.

As part of the Hybrid Futures project, staff at Touchstones and the team at Shezad’s studio collected as much data as they could about the energy, transport and material use associated with the exhibition. This information was then analysed by Danny Chivers, Hybrid Future’s Environmental Advisor to see what could be learned about the climate impact of the show.

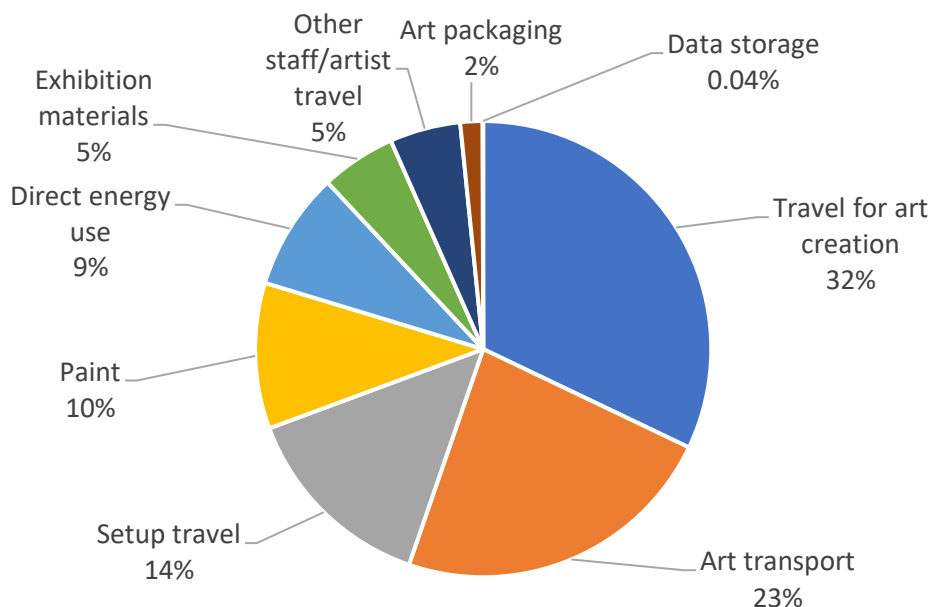
● **This produced the following headline results:**

Activity	Sub-category	Energy or resources used	Calculated carbon emissions (kgCO ₂ e)	Notes
Creation and transport of Leviathan 8 film	Travel in Brazil (driving to and from filming locations by local team and performers)	Around 1850 km in average sized cars	326	The film was produced remotely in partnership with filmmakers and Indigenous performers in Brazil, without the use of international flights.
	Filming equipment and energy use	Minimal	Minimal	Pre-existing hand-held camera, no floodlighting or extra tech required
	Cloud data storage and transfer	4 GB stored on Google Drive and 377 GB stored on Dropbox over 12 months, plus 34 GB in other cloud storage for a month	0.4	Files were usually zipped, larger transfers of data were done by physically handing over hard drives

	Courier of hard drive within London	Motorbike travelling 11 km	1	
Creation and transport of other artworks	Materials for artwork creation	No new resources consumed – already existing artwork	Minimal	
	Transport of physical artworks from London to Rochdale and back	370 km each way in a 2.3 t capacity diesel van, twice	234	When art was collected and returned, the van also carried out necessary deliveries on the way down, thus saving some journeys.
	Packaging of artworks	Estimated 5 kg of bubble wrap, tape, polythene	16	All packaging was reused to return the artwork.
Setup of exhibition	Transport of projection equipment from Leeds to Rochdale and back	224 km in average car	37	Purposefully locally sourced
	Travel by other contractors (tech support, decorators etc)	4 contractors, commuting in for 3 – 5 days each. Total 638 km by car	106	Purposefully locally sourced (Todmorden, Manchester)
	Purchased materials for framing, display, labelling	Paper and board, including panel with vinyl lettering, plus blackout fabric and second hand books	54 (approx. 15 for paper and board, 10 for large panel and 29 for fabric)	Relatively small as most materials were re-used from previous exhibitions. Second hand books had minimal footprint.
	Paint, including projection paint and copper paint	Around 30 litres	105	
	Exhibition furniture	Shelves, display cases, metal brackets, benches, exhibition cases, Perspex stands, chairs.	0	All repurposed from previous exhibitions, and set aside to use again, so no additional footprint. Projection equipment was leased, not purchased.
	Energy for lighting space during install and takedown	Approximately three weeks of lighting, estimated 57 kWh	13	
	Travel in the UK (trains between London, Manchester and Rochdale)	Around 840 km by UK train	30	Travel by Shezad and team for exhibition setup and launch
	Hotel use in the UK	Two nights in a Manchester hotel	21	Travel by Shezad and team for exhibition setup and launch

Energy use at gallery during exhibition	Direct energy use in gallery for lighting and film projection	Estimated at 320 KWh (207 for lights, 114 for projection)	72	Light bulbs are low energy (6 – 11 Watts), projection and sound used approximately 2.3 KWh per day
	Wider energy use in building that could be linked to exhibition	See below	See below	See below
Staff and visitor travel to exhibition	Data not available	See below	See below	See below
Indirect energy use by office and studio staff planning and organising artwork and exhibition	See below	See below	See below	See below
TOTAL			1016	Includes direct, measurable emissions only

Estimated carbon footprint of Hybrid Futures Leviathan exhibition at Touchstones Rochdale (kgCO₂e)



The above chart shows the approximate breakdown of the greenhouse gas emissions associated with the more directly attributable and measurable aspects of the show – the travel, transport, energy and materials required to create the artwork, get it to the gallery and set up (and take down) the exhibition; and the energy required to light the exhibition rooms and run the projector during the show.

● Good practice to highlight.

This comes to a total of just over 1 tonne of CO₂e (1016 kg). This is roughly equivalent to driving from Rochdale to Leeds and back in an average car for every day that the exhibition was open.

Some key decisions that helped reduce these directly measurable emissions:

- The film *Leviathan: From the Forest to the Sea* was created in partnership with film-makers, Indigenous artists and activists in Brazil using remote communications technology, without anyone flying between Brazil and the UK. A single return flight between these countries would have added around 3800 kgCO₂e to the footprint of the film and would have more than quadrupled the measured carbon footprint of the exhibition.
- The great majority of furniture and display materials used for the exhibition were pre-existing items or hired, meaning minimal new materials were purchased.
- Contractors for the setup and the projector were sourced relatively locally, reducing the travel required.
- Transport of artwork from London was shared with another shipment, saving a trip and thus reducing the carbon allocated to the Hybrid Futures show.
- As the exhibition took place in summer, the gallery spaces required no heating, and natural cooling and ventilation was sufficient to maintain an appropriate temperature and humidity in the rooms without the need for extra air conditioning/climate control.

However, there are some other, less direct emissions associated with the show that are harder to quantify or allocate, but still need to be taken into account.

● Other emissions to consider.

There are three key areas of less direct – but still important – emissions to consider: energy use in the rest of the Touchstones building; energy and resources used by office-based staff in the planning and administration of the show; and visitor/staff travel during the show.

● Energy use in the rest of the building.

The exhibition ran between 3 June to 12 August 2023. Over this period, the lighting and projection in the exhibition consumed around 320 KWh of electricity. However, over the same period the metered electricity use for the whole Touchstones building was 9784 KWh. The exhibition was open to the public for 50 of these 72 days, so if we assume that the building electricity use was roughly equally spread across the period, that means that the building used around 6989 KWh of electricity during the days that the exhibition was open. This would mean that the lighting and projection was consuming just 5% of the electricity used on the days it was open.

The remaining 95% was presumably consumed by lighting and appliances in the rest of the building, including office space, events space, the cafeteria, shop, lifts, and computer server room. Unfortunately, precise data are not available for how this energy use breaks down.

Over the same period, the building also used 5300 KWh of gas – approximately 3786 KWh on the days the exhibition was open. As the building was not being heated during this time, this energy was presumably used for hot water in the café, toilets and elsewhere.

Arguably, at least some of this energy use should be allocated to the Hybrid Futures exhibition. Exhibition visitors will have walked through other rooms in the building to get to the exhibition, used the lift and toilets, and made purchases in the shop and café. The staff overseeing the exhibition will have used the office space and other facilities in the building. However, many other activities, events and exhibitions were also happening within the building during this time.

If just 20% of the building's remaining energy use was allocated to the Hybrid Futures exhibition on the days it was open, this would add 757 KWh of gas and 1334 KWh of electricity to its energy footprint, and 436 kgCO₂e to its carbon emissions – an increase of more than 40%.

This highlights the importance of energy reduction – and energy decarbonisation – in the buildings where exhibitions like this are housed and displayed. In the winter, with the heating on, these figures would have been significantly higher. Touchstones is currently in the process of a major refurbishment, which will provide an opportunity to make the building more energy efficient.

● Office energy used by artists and staff while doing creative/administrative work on the project.

Shezad Dawood's studio has estimated that designing, planning, creating and editing the film probably required around 192 hours of work over a 9 month period from Shezad and his team. At the time of writing, it has not been possible to accurately assess the daily energy use of the studio itself due to challenges with gathering data, but a very rough estimate (based on the [typical energy use of workers in a London-based office](#)) would give this a total carbon footprint of around 54 kgCO₂e – an extra 5% compared with the direct emissions of the exhibition.

Meanwhile, the total annual footprint of Touchstones' electricity and gas use in 22/23 was 55 tCO₂e, around 150 kgCO₂e per day. It is hard to determine how much of this energy to allocate to office functions, and also to estimate what proportion of staff office time was spent on the Hybrid Futures exhibition that year. If – just as an example – office functions were responsible for 20% of energy use in the building, and 10% of staff office time over six months was spent on planning and preparing for the Hybrid Futures exhibition, then this would add another 550 kgCO₂e to the exhibition footprint.

These are very approximate ballpark figures, but together they would increase the direct exhibition footprint by around 950 kg, almost doubling the total. Again, this shows the significance of reducing and decarbonising energy use in buildings for the art sector.

Staff commuting and visitor travel to Touchstones.

A visitor travel survey was included as part of the exhibition at Touchstones, but unfortunately staff resource was not available to actively engage visitors with the questionnaire, and so insufficient data was gathered to allow a visitor travel footprint to be calculated. However, we do know that at least 800 people attended events linked to the exhibition; while many of these will probably have been local visitors, if just a quarter of them drove an average of 4km round trip to attend, this would create an extra 133 kgCO₂e – and this does not include everyone who attended the exhibition without coming to an event, which could be many times higher.

On top of this, the typical commuting emissions from a UK office worker are 900 kgCO₂e/year; if (say) the equivalent of a third of an FTE staff member's time over six months was spent on planning and preparing for the Hybrid Futures exhibition, then this could add another 150 kgCO₂e. A further 10 kg can be added from commuting by Shezad and his team (this is lower because they spent less time on the project, and we know they frequently walk to the office), making a total of 160 kg of commuting emissions associated with the exhibition.

Once again, these are very approximate numbers and should be thought of as illustrative examples only. However, they show how visitor travel and staff commuting – while often hard to measure accurately - can add another significant chunk to the footprint of an exhibition. However, these emissions fall into a slightly different category, as they are an area of shared influence between the venue and visitors/staff – the museum does not have complete control over how people travel, although it does have the potential for significant influence through the provision of facilities, incentives and encouragement for low-carbon travel.

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. The decorators hired to paint the exhibition space do have an environmental policy, but it doesn't explicitly say they are aiming to use low-toxicity paints and chemicals.

- Touchstones did try to find an affordable, more sustainable alternative to the use of vinyl lettering on the largest exhibition board, but were unable to do so with the resources they had available. The smaller boards were made by printing (non-vinyl) onto recycled paper and pasting it onto repurposed wooden boards.
- The reuse of exhibition furniture, equipment and materials is a positive step for reducing pressure on global resource use, biodiversity loss and the waste crisis. However, the standard plastic bubble wrap and film used for art packaging probably ended up in the waste stream quite quickly (although they were reused at least once).
- 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!



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'.