

exhibition design for our time

A guide to reducing the
environmental impact of exhibitions

Draft for consultation – March 2023

the
DESIGN
MUSEUM

URGE






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introduction

For the Design Museum, the idea of producing this guide emerged out of our ‘Waste Age: What can design do?’ exhibition which opened in Autumn 2021 and highlighted a change in the culture of design. Designers have been complicit in the throwaway economy, but a new generation has taken on the challenge of reducing the industry’s impact and taking responsibility for what they put out into the world. The Design Museum is supporting this ambition through the work of the Future Observatory, a national programme for design research supporting the UK’s response to the climate crisis. As an institution, it is important that we take up the challenge in our own work, which is why we asked URGE Collective to continue the collaboration which began on the Waste Age exhibition and help us to create this guide to sustainable exhibition design.

... the way in which we plan, design and operate exhibitions has an important role to play in reducing our overall carbon footprint.

While this guide is based on our work at the Design Museum, we hope that it offers some core principles that are useful to other institutions and enable them to reflect on their own working processes. Of course we recognise that exhibition making is only one of the ways in which museums create emissions. The excellent Bio27 Sustainable Cultural Production Guide (on which we have drawn for some of the advice included here) has a more comprehensive list. Nevertheless, the way in which we plan, design and operate exhibitions has an important role to play in reducing our overall carbon footprint.





As a sector, we need to think about:

- Our buildings and energy use for lighting, heating and cooling
- Our programme: the decisions we make about the content of our exhibitions, how long they run for and who we partner with in order to make them happen
- The materials we use: for the construction of the exhibition structure and displays as well as in our communications and learning programmes
- How we construct and de-construct our shows including the electronic devices and displays used in the exhibition itself and by staff working on its production
- How, or even if, we transport objects for an exhibition and the materials used to make and operate it
- Our administrative processes: are we being efficient in our use of emails and other digital communications (all of which have an impact), as well as the print, paper and ink used during the production and operation of our exhibitions
- The waste we generate during the production and operation of our exhibitions



In this guide we will set out how the Design Museum team will work to lessen its impact across all these areas, but this is very much a work in progress.

**POST WASTE:
NEW WAYS
OF LIVING**

We are facing urgent choices about how to live and consume. There is no single answer. Diverse approaches and multiple solutions, at global, national and local levels, are needed to tackle the waste crisis. Designers are seeking cross-disciplinary collaborations with biologists, chemists and engineers to design systems, materials and processes for living for a waste-free future.

Public opinion is behind immediate action. Systems will encourage the sharing of our resources, reduce consumption. Designers are thinking about product's end-of-life by making decisions at the design stage, where up to 80% of a product's environmental impact is determined, to ensure a product is more repairable and recyclable.

Designers are innovating with plant-based materials to replace oil-based plastic packaging. Gathered from a lab or extracted from food waste, materials biodegrade back into the soil. The new income streams for local communities, and to maintain biodiversity. The disruption of the world made in response to COVID-19 show that systems and behaviours is not impossible. Change made to entrenched systems – it is not too late.

**ENSURE SUSTAINABLE
CONSUMPTION AND
PRODUCTION PATTERNS**

Environmental Impact Working Group

We don't want environmental impact to be the responsibility of just one person at the Design Museum: it has to be embedded in our culture. The Environmental Impact Working Group is responsible for delivering on the Museum's ambitions and overseeing the implementation of this guidance.

key findings

What we learnt from the
environmental audit of
our Waste Age exhibition

audit

Our Waste Age exhibition (which ran from October 2021 to February 2022) asked what design can do to leave our throwaway culture behind. We wanted to make an exhibition with as minimal a carbon footprint as possible - and we learnt a lot in the process.

Architecture practice Material Cultures were engaged as spatial designers for the exhibition while SPIN designed the 2D experience. Both studios were briefed to develop solutions that design out waste in the design and production of the exhibition.

So that we had some real data to work with, we asked URGE Collective to conduct an environmental audit of Waste Age to calculate its impact and help us develop best practice processes for future exhibitions. This was one of the first Life Cycle Assessments conducted on an exhibition in the UK.

URGE created an Impact Model to monitor the three life cycle stages – pre-exhibition, live exhibition, and post-exhibition – and to highlight the technical source of impacts. Our curatorial, design, facilities and production teams were all involved in the audit process through interviews and data gathering.

The Impact Model captured data from: stakeholder interviews, desk research, exhibition design reviews, email trackers, facilities procurement, energy and the renewability of energy sources, analysis of resource consumption, waste generation, manufacture and transport of exhibition build materials, exhibition specific commissions, the weight, materiality and transport of exhibits, exhibition graphics and collateral, transport and energy requirements of technical equipment, observation of the production process and more.

We found that, at opening, the total exhibition impact of Waste Age was approximately 28 tonnes of CO₂e – 30% of which was in the build and 50% in a single installation that we shipped from afar.



The total exhibition impact of Waste Age was approximately 28 tonnes of CO₂e

key findings

Energy

Switching energy supply to a renewable source is the biggest step we can take to reducing emissions. By using renewable electricity the Design Museum ensured that the impact of the Waste Age was 28 tonnes otherwise it would have been about 185 tonnes CO₂e. This alone cut the total possible impact by about 85%.

Exhibits

The exhibits featured in Waste Age weighed roughly 2.5 tonnes and the average distance travelled was roughly 1,250 km. Here's where curatorial decisions have a significant impact on sustainability. Just one exhibit in Waste Age was responsible for 2 tonnes of the 2.5 tonnes total weight. Given that many of the exhibits were from the UK, the fact that this one was shipped from abroad was also responsible for pushing up the average distance travelled by exhibits. The logistics footprint, excluding this major commission, was less than 20kg CO₂e (or 0.06% of the total footprint) and including it was around 5 tonnes CO₂e, plus its embodied carbon was estimated at around 9.3 tonnes CO₂e (5.6 tCO₂e in the TVs and 3.7 tCO₂e in the copper casts). The total emissions related to the one exhibit was approximately 14.2 tonnes CO₂e, and almost half the exhibition's impact. So: should we have included it?

The build

What had the biggest carbon footprint in the whole exhibition build? The screws. Building Waste Age took 4,800 standard stainless steel decking screws to hold everything together. They had an impact of 1.9 tonnes CO₂e – roughly 7% of the total exhibition footprint. Using a timber frame system instead of a standard aluminium frame saved 1.5 tonnes CO₂e, and reduced the impact by about two thirds. Using unfired bricks instead of fired bricks saved 6 tonnes CO₂e, the second most significant saving after switching to renewable electricity. We also made savings by retaining some of the walls from the previous exhibition, and re-purposed Silicate blocks from the previous exhibition to make new plinths.



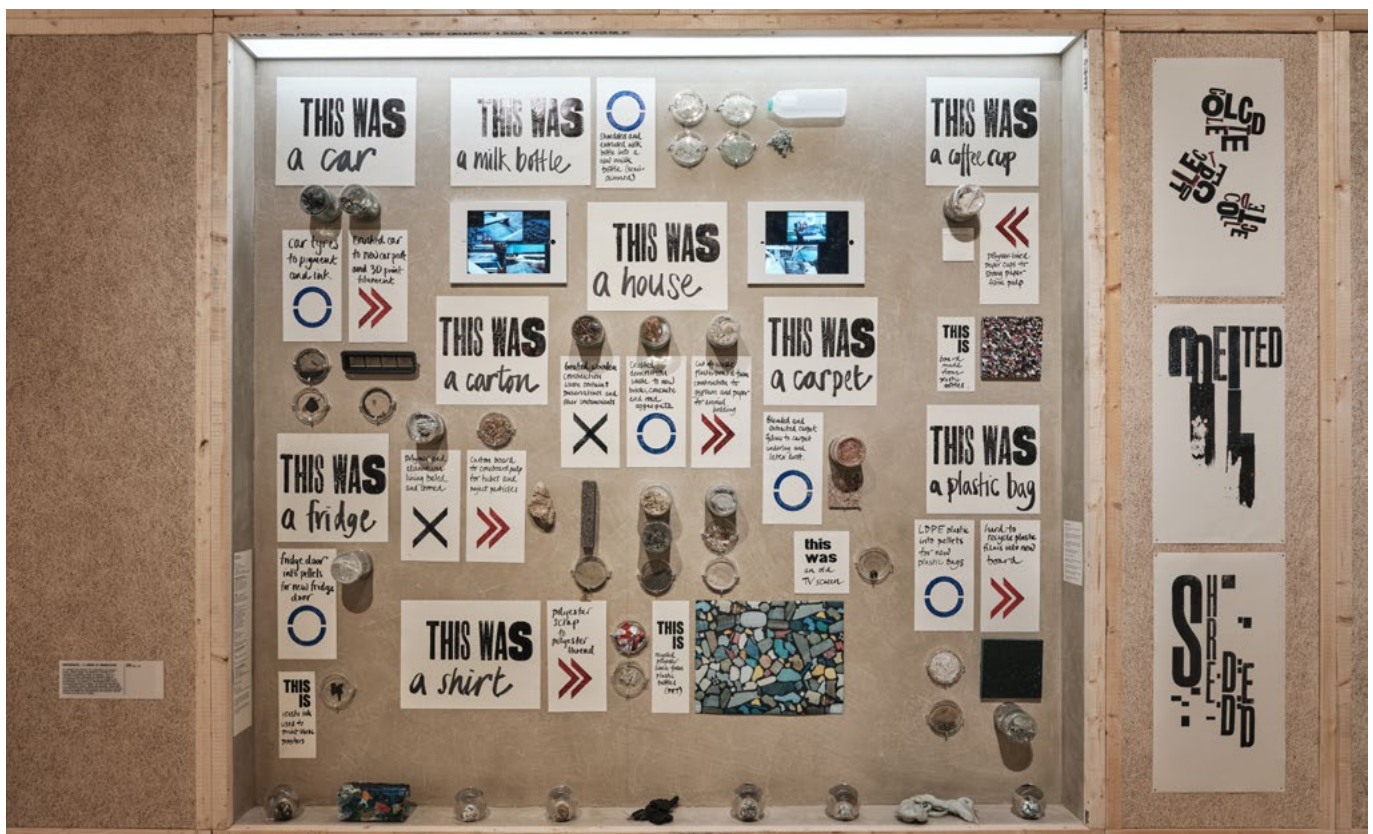
Re-use

The second life of materials was key to keeping Waste Age's carbon footprint low. We managed to secure new homes for:

- All of our wood wool and timber, which was donated to a local construction company
- 800 fired bricks which were also donated to the same construction company
- Perspex cases: most will tour with the exhibition to Paris, some were given to Royal College of Art students
- 250 fired bricks, 10 silicate blocks and 10 adobe bricks which were donated to a local interior designer
- All of our felt, which was donated to a local fashion designer for a collection

Digital communication

We sent around 11,000 emails making Waste Age. About 11GB of data was shared during the exhibition production process. The two together equate to around 1 tonne of CO₂e. We also spent around 750 hours on video calls (we don't know how many of these were spent telling people they were on mute). This process revealed that no more than 3% of the total footprint for Waste Age was associated with digital communication.



lessons

Reducing impact starts with curatorial decisions

Including just one large scale installation had a huge impact on the carbon footprint of Waste Age. So was it necessary? Did including this one installation add so much to the exhibition that it was worth the environmental cost? Could we have included it in another way? In future, our curators will need to consider these factors when deciding on the content of our exhibitions.

Chase data

Gathering detailed information and following up with suppliers throughout the audit helped the Design Museum make informed decisions. The team was able to challenge assumptions and demonstrate that some unexpected options – such as using recycled plastic rather than cardboard for exhibition captions – were in fact the lower impact choice.

Choose materials wisely

We worked with architects Material Culture to ensure all the materials were natural, biodegradable or recyclable, but could we have used better materials in the exhibition structure? Could the screwed together timber frame have been replaced with an aluminium structure that we can re-use for future exhibitions?

Challenge convention

Both the 3D design and audit processes encouraged the team to question accepted methods of planning and building exhibitions. Minimising our carbon footprint isn't something that can be achieved instantly, but the more alternatives are explored, the more viable and genuinely effective options are found.

Work together

Only the combined expertise of many specialists made the audit process possible. Communication between museum departments revealed how making changes can have knock-on effects, such as setting up an Environmental Impact Working Group to help the museum teams confidently carry co-operation forward and ensure that sustainability is embedded in our culture.

Just one large scale installation had a huge impact on the carbon footprint of Waste Age



... the more alternatives are explored, the more viable and genuinely effective options are found.

Count digital carbon

The audit's carbon tracker exposed the surprisingly high emissions created by our digital communications. Working smarter and more efficiently (do you really need all those attachments?) can make a real difference here.

Minimise air travel

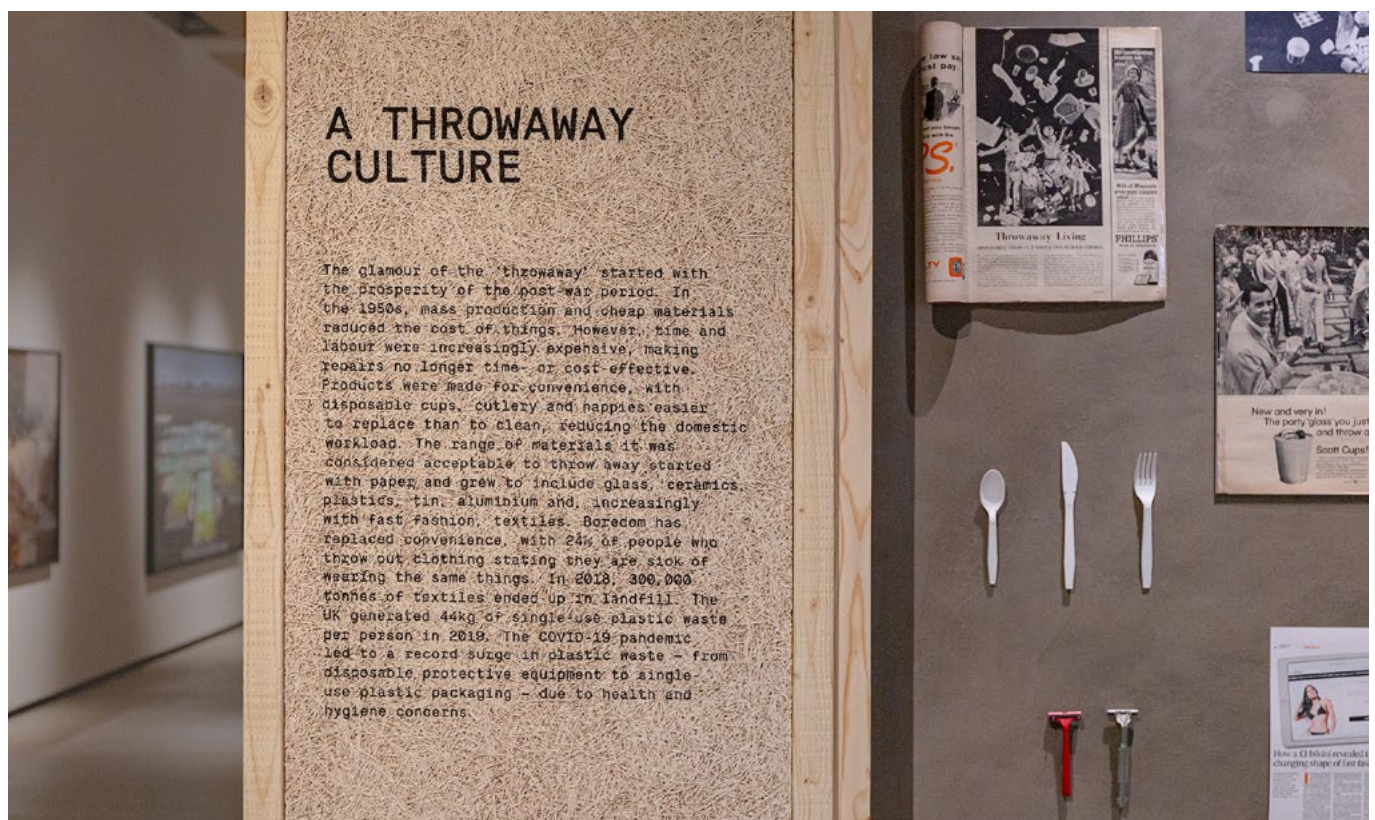
We developed Waste Age during the worst of the Covid-19 pandemic, so travel was inevitably reduced. Though not perfect, we learnt that remote solutions can help reduce the need for flights: video calls, for example, instead of flying in couriers to oversee installations.

Build a network for sharing resources

We tried to recycle all of the exhibition materials, donating them to other companies and institutions. And at a certain point we thought we'd achieved a zero-waste exhibition. But at the last minute, one institution pulled out meaning that we had to hire a skip and quickly dispose of tonnes of material before the next exhibition build arrived on site. These sharing systems are fragile, and we learnt that all the parties need to understand what's involved in taking "free stuff".

Remote solutions can help reduce the need for flights.

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exhibition design development process

How do we integrate a low-impact approach within the design process?



what to consider

From initial concept to opening, making an exhibition at the Design Museum follows a process that brings together stakeholders, sponsors, external designers and suppliers. How do we ensure that minimising our carbon footprint is a core part of the exhibition decision-making process, every step of the way?

Programme

The duration, content and model of an exhibition has consequences on its impact. Staging fewer exhibitions, longer in duration can be more efficient. Exhibitions which feature local artists' and designers' work are likely to have a lower impact than those requiring the shipping of objects from overseas.

- Ask: How does our approach to programming impact our sustainability goals? Should we have an annual carbon budget for exhibitions? Can the exhibition be conceived so that it does not require the presence of overseas curators or contributors on-site? Should each exhibition have a desired ratio of local vs imported content, or a target percentage of objects from the museum's permanent collection?

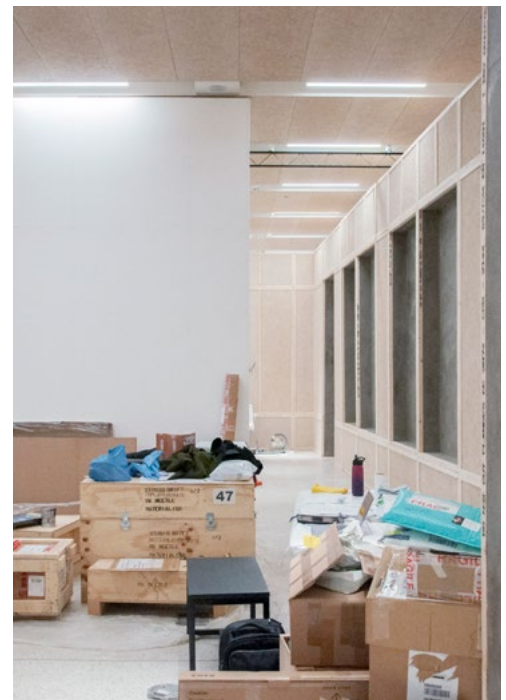
Shipping/Transport

The transportation of exhibition content can dramatically increase the exhibition's carbon footprint.

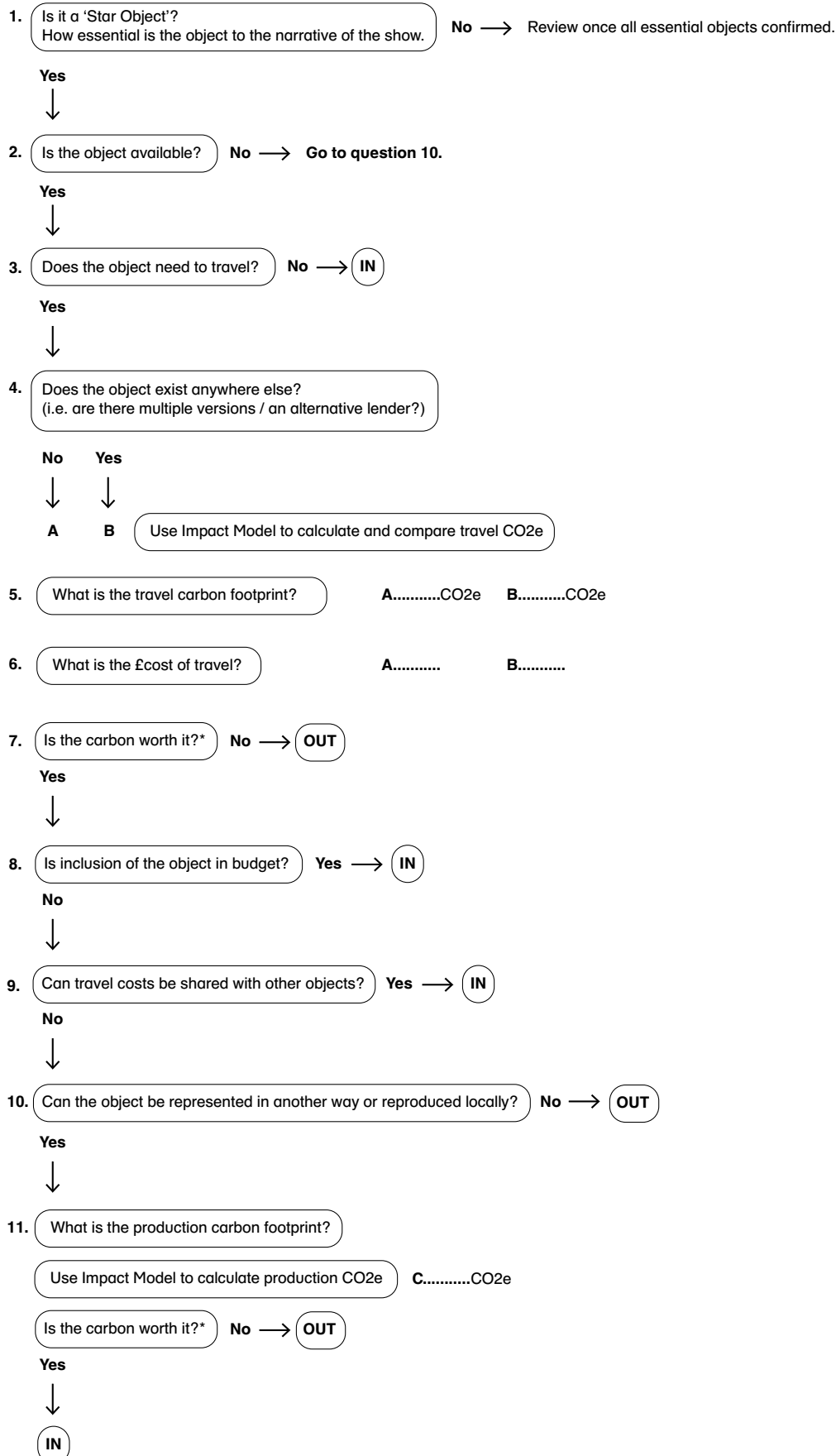
- Ask: Is it worth the carbon? Curatorial decisions need to balance the value of including certain objects in exhibitions with the environmental cost of shipping them. Can objects and artworks be locally sourced or digitally represented instead? Can lower impact (and often slower) transportation be used for essential objects and time allowed for in the planning phases? What will the carbon footprint of touring the exhibition look like?

Object Decision Tree

This Object List Decision Tree has been created with the Design Museum's curatorial team to support an 'environmental review' of the object list when it is at 80% and help the curatorial team make decisions about what to include in the show based on both financial costs and carbon impact.



Object decision tree



Materials and Waste

As we learnt from Waste Age, choice of materials can have a major impact on the overall carbon footprint of an exhibition, as can design decisions which allow for easy disassembly and considering the after-use life of materials. “When planning an exhibition, it is as important to think as much of how it will be de-constructed as how it will be put up” (Bio27). Sets, walls and displays should be designed to be easily dismantled, re-used, re-purposed, or recycled. Using the right material for the right use is key. Waste generated by both the design and operation of the exhibition must be minimised, e.g. foster a closed-loop economy, design out waste. We should aim to reduce, reuse and recycle more construction, renovation, and demolition waste and eliminate single-use plastics. Additionally, the manufacture of some materials may require a change of land-use or otherwise negatively impact biodiversity. Researching how materials are made and reducing demand for those which are harmful can help improve biodiversity at source.

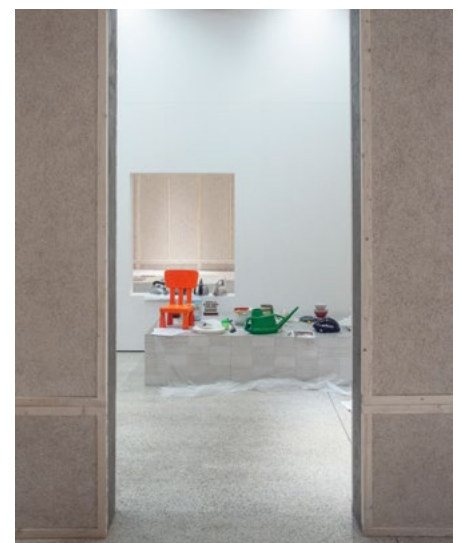


- ❓ Ask: Can we reuse existing display units? Are we designing the exhibition with reuse in mind? How are we assessing the impact of the materials we are going to use? What will happen to the materials after the exhibition finishes? Post-exhibition, how will materials be disposed of/reused? Can a system for sharing, reusing materials with other local institutions be devised? Can we create a Red/Amber/Green or ‘No’ list of the museum’s exhibition design materials?

Electronic

In addition to considering operational efficiency during project development, thought should be given to the use of electronic devices in the production and planning of the exhibition. This can be measured, compared to previous exhibitions and reduced.

- ❓ Ask: Are devices ethically sourced? Are they regularly serviced to ensure efficiency? Can they be switched off when not in use?



Are devices ethically sourced? Are they regularly serviced to ensure efficiency?

Buildings/Energy

The most significant impacts in this category can be made at the institution level (e.g. using renewable energy). Nevertheless, the operational energy required by the exhibition should be minimised and measured by comparing energy demand versus previous exhibitions.

- ❓ Ask: What aspects of the exhibition drive energy demand (e.g. screens, projectors and other AV hardware) and can lower-use alternatives be found?

Administrative operations efficiency

Digital communications, including email, video calls etc contribute to the overall carbon footprint of an exhibition. Museum-wide policies regarding their use should be in place but such communications should also be measured for each exhibition from the initial stages using the Impact Model. Impact can be reduced by use of alternative channels e.g. Slack, cutting use of attachments, using plain text, etc. (see Bio27 guide). Also, data should be stored in the cloud using services which utilise renewable energy, and switch to a more sustainable search engine e.g. ecosia.

Considerations also extend to printed materials and other consumables used in the planning and production of the exhibition. The Design Museum's use of materials sourced from sustainable suppliers can be measured and a target set. Similarly, policies should be in place at an institutional level regarding efficient use of paper, ink etc.

Community building, Outreach and education

From Bio27: "Through public programmes you can begin to inspire and support your visitors to make choices to increase their positive impact on the environment. Connect educational activities with sustainable practices – growing a museum garden can be a children's workshop."

- ❓ Ask: How can sustainability be embedded in the outreach and education programmes? How are we measuring the diversity of groups we engage with?



Through public programmes you can begin to inspire and support your visitors to make choices to increase their positive impact on the environment.

The Bio27 Sustainable Cultural Production toolkit, referenced in this guide, can be downloaded from <https://27.bio.si/resources>

commissioning design

How to commission designers,
contractors and suppliers

considerations

To design exhibitions with as little environmental impact as possible, we need to work with our commissioned designers, contractors and suppliers to communicate and deliver on our ambition, develop effective ways of working and ensure we capture the information we need in order to measure our carbon impact.

When considering which design studios to commission, we might ask:

- Have they demonstrated the ability to minimise the impact of their work?
- Can they provide information on the carbon footprint and impact of their work?
- Have they signed up to a Climate Declaration Movement such as Design Declares?
- What materials are they using / will they use?
- Do they have a plan in place to reuse/donate the materials at the end of the exhibition cycle*?
*nb this could be end of exhibition or end of the exhibition tour to different venues.

When considering which contractors to commission we might ask:

- Do they use renewable energy in their own operations?
- Is their vehicle fleet electric?
- Have they conducted an environmental audit and/or measured their carbon footprint? Will they share that data?
- Do they have a plan to reduce their carbon footprint?
- Do they have ISO accreditation?
- Do they follow British Standards?
- Are they a B-corp?
- What environmental policies do they have in place?
- What evidence can they show us to demonstrate that they are working with their own suppliers to minimise impact?

Asking the right questions at the right time is an integral part of a successful commissioning process.

Briefing

We need to embed environmental impact considerations in our briefing process. We can ask designers to explain how their proposed design will meet our ambition for minimum waste and maximum reuse, aligned with our desire to use low-impact materials and find solutions to minimise our carbon footprint. We should also ask designers to suggest how they will provide the data we need for our Impact Model.

Similarly with contractors and suppliers, we can identify companies who have expressed a desire to minimise their carbon footprint, have adopted industry best practice for low impact and can demonstrate the ability to provide relevant carbon data.

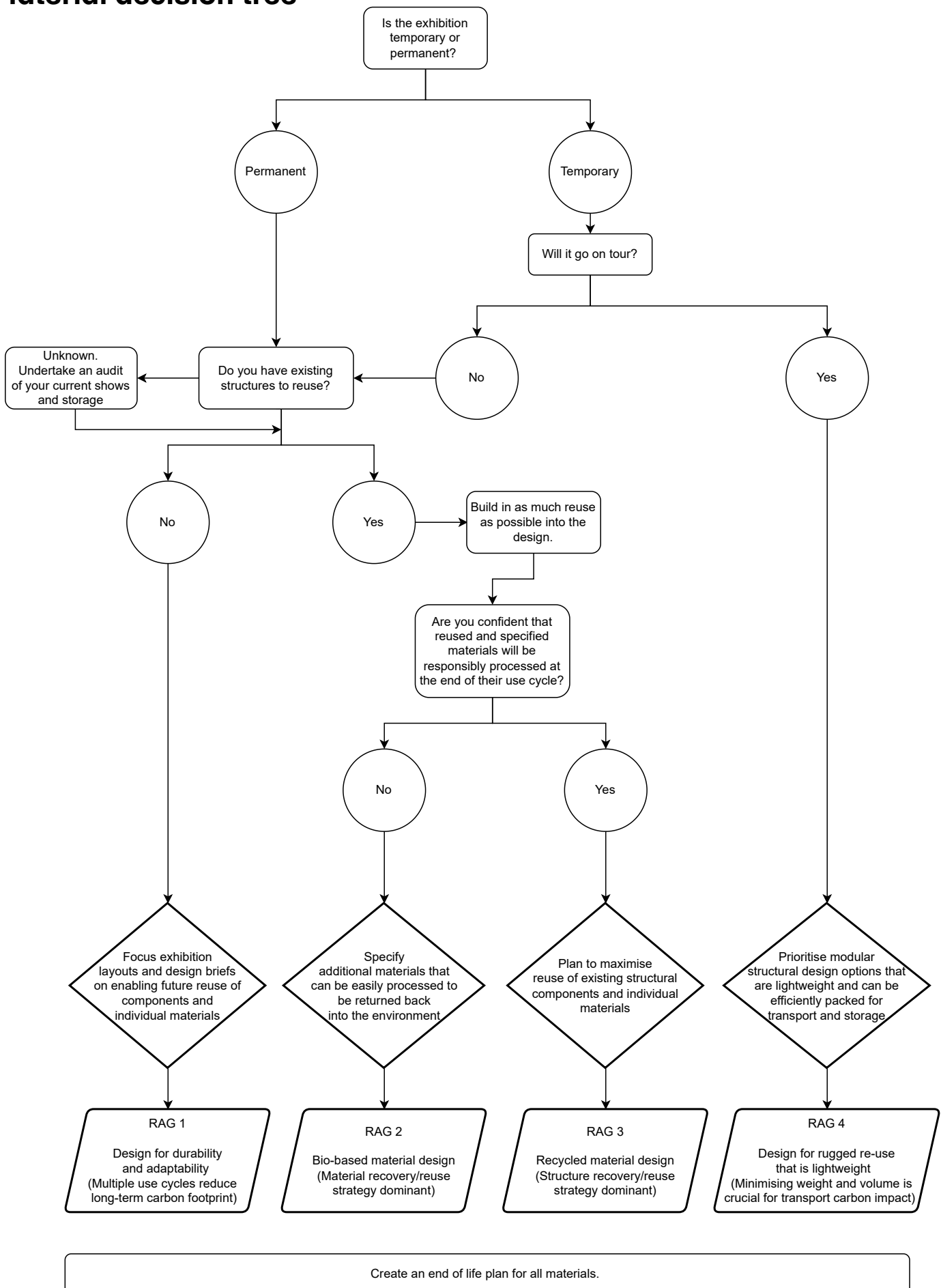
We can ask designers to explain how their proposed design will meet our ambition for minimum waste...



Material Decision Tree

A Material Decision Tree with corresponding Exhibition Design Material Red/Amber/Green (RAGs) have been created to support the Design Museum and commissioned designers to make better choices around materials. A specific RAG can be chosen by the exhibition production team and supplied to commissioned designers to improve material selection.

Material decision tree



RAG 1: Design for durability and flexibility (Multi use reduces initial CO2 footprint)

Category	Red (Should not be considered)	Amber (Will need to get agreement to use it from the museum)	Green (Is acceptable to be used)
Structural	Steel (Single-use)	Steel (Welded or complex to disassemble and reuse)	Steel (Built for reuse with high recycled content)
	MDF (Not formaldehyde free)	MDF (Formaldehyde free), Chipboard	Structural ply (FSC)
	Aluminium (Single-use)		Aluminium (Built for reuse)
	Timber (Non FSC certified) including Oak or any hardwood (Single-use)		Timber (FSC certified or reused)
	Softwood board/panels (Non-FSC)	Plasterboard	OSB (Oriented strand board) plates
	Fired bricks with mortar		Fired bricks (No mortar), Calcium Silicate Blocks (No mortar)
	Adhesive (Permanent bonding)	Screws (Single-use temporary bonding)	Bolts, screws (Recoverable), reusable fixing systems
Non-structural	Perspex/Acrylic with no recycled content	Recycled Perspex like Greencast	Glass, Rescued and reused Perspex/ Acrylic
	Acoustic panels (Non FSC and single-use)		Acoustic panels like Rockfon Koral (For re-use)
	PVC (Vinyl)	PVC Free Matt Vinyl	
Finishes	Paint (High VOC)		Paint (Low VOC or water-based)

Identified reused materials or objects (Structural or non-structural) from the museum are acceptable. See procurement list of available elements and preferred recycled materials suppliers. Reusable materials and objects from other sources must be approved by the museum. All materials must have an end of life plan approved by the museum.

RAG 2: Biobased material design (Material recovery/reuse strategy dominant)

Category	Red (Should not be considered)	Amber (Will need to get agreement to use it from the museum)	Green (Is acceptable to be used)
Structural	Fired bricks (Single-use with mortar)	Fired bricks (Reuse without mortar), Calcium silicate blocks	Unfired bricks (e.g. earth & straw), rammed earth wall sections
	Timber (non-FSC)	Timber (FSC)	Timber (reused)
	Aluminium (Single-use)	Aluminium (Reused)	Timber (Reused)
	Plasterboard	OSB board, Plywood (Reused)	Clay (Unfired)
	Adhesive (Permanent bonding)	Screws (Single-use temporary bonding)	Timber joinery connections (mortice & tenon)
Non-structural	Acoustic Panels	Wood wool	Chalk Hemp
	Textile (Multi-material, non recycled)	Textile (Recycled)	Textile (Organic minimum dye)
	Perspex/acrylic	perspex/acrylic (Reused)	glass (Clear or green recycled)
	PVC (Vinyl)	Wallpaper, print (Direct to media)	Single colour print, Paper and Card (Post Consumer recycled and FSC)
Finishes	Paint (Mineral based VOC)	Paint (Vegetable based non VOC)	Paint (Water-based or clay based)

Identified reused materials or objects (Structural or non-structural) from the museum are acceptable. Reusable materials and objects from other sources must be approved by the museum. All materials must have an end of life plan approved by the museum.

RAG 3: Recycled material design (Structure recovery/reuse strategy dominant)

Category	Red (Should not be considered)	Amber (Will need to get agreement to use it from the museum)	Green (Is acceptable to be used)
Structural	Timber (Non FSC)	Timber (FSC)	Timber (Reused), MDF (Reused), Ply (Reused)
	Steel, Aluminium (Single-use, welded)		Steel (Reused, recycled), Aluminium (Reused)
	Adhesive (Permanent bonding)	Screws (Single-use temporary bonding)	Bolts, screws (Recoverable), reusable fixing systems
	Fired bricks (With mortar)		Fired bricks (No mortar), Calcium Silicate blocks
Non-Structural	PVC (Vinyl)	Wallpaper	Cardboard, paint and print direct to wall
	Textiles (Mixed fibre, virgin)	Textiles (Reuse and recyclable)	Textiles (Recycled)
	Composite layered virgin materials, Dibond	Plywood (FSC), OSB (Oriented strand board)	Recovered or recycled Plywood (FSC)
	Perspex/Acrylic (Virgin)	Perspex/Acrylic (Recycled)	Perspex/Acrylic (Reused)
	Paper and Card (Non FSC)	Paper and Card (Virgin but FSC)	Paper and Card (Post Consumer and FSC)
Finishes	Mineral based inks, Spray paint (VOC)	Spray paint (VOC free)	Vegetable-based ink, Water-based inks

Identified reused materials or objects (Structural or non-structural) from the museum are acceptable. See procurement list of available elements and preferred recycled materials suppliers. Reusable materials and objects from other sources must be approved by the museum. All materials must have an end of life plan approved by the museum.

RAG 4: Design for rugged reuse and transportation (Weight dominant)

Category	Red (Should not be considered)	Amber (Will need to get agreement to use it from the museum)	Green (Is acceptable to be used)
Structural	Steel (Single-use)	JJI Joists	Aluminium (Reusable)
	Clay (Unfired)		
	Bricks, Unfired bricks (e.g. earth & straw), rammed earth wall sections	MDF (Formaldehyde free),	Structural plyboard (FSC)
	Plasterboard	Plywood (FSC)	Cardboard (Post Consumer recycled and FSC)
	Adhesive (Permanent bonding)	Screws (Single-use temporary bonding)	Bolts, screws (Recoverable), reusable fixing systems
Non-structural	PVC (Vinyl)	PVC Free Matt Vinyl	Paper and Card (Post Consumer recycled and FSC), Print gun (Printing direct-to-wall)
	PVC material (Vinyl)	Textiles (Re-use and recyclable)	Textiles (Recycled)
	Paper and Card (Non FSC)	Paper and Card (Virgin but FSC)	Paper and Card (Post Consumer recycled and FSC) updatable sections
Finishes	Mineral based inks	Spray paint (VOC free)	Vegetable-based ink, Water-based inks

Identified reused materials or objects (Structural or non-structural) from the museum are acceptable. Reusable materials and objects from other sources must be approved by the museum. All materials must have an end of life plan approved by the museum.

To include in the 2D design brief:

- define the museum's sustainability ambition
- be specific about wanting designers to use sustainable and regenerative design and production methods
- request design solutions that avoid unnecessary waste or toxic materials
- specify re-use or touring so that 2D modules can be designed that are easy to dismantle / re-use / transport
- specify the need to capture carbon data for the Impact Model during the design process
- set design guidelines and parameters e.g. use only 1 colour / use a print-gun

Engage an independent networks / build consultant with experience in exhibition building

To include in the 3D design brief:

- define the museum's sustainability ambition
- be specific about wanting designers to use low impact design and production methods
- be explicit about low carbon materials and using materials as local as possible to the site
- provide guidance on which materials to use e.g. try and use raw materials grown from the ground
- provide a baseline about what structures are available for reuse
- specify reuse for touring so that 3D modules can be designed that are easy to dismantle / re-use / transport.
- be specific about embodied carbon
- carbon parameters for transport / after-life and cite a data set if carbon targets need to be achieved (nb a numerical carbon target might be tricky)
- encourage decision-making based on low carbon materials / end of life strategy etc.
- encourage designers to work with artisans / crafts people

Using a consultant to assess design proposals for impact

We propose to engage an independent networks/build consultant with experience in exhibition building to review submitted design proposals at concept stage and again at the developed design stage. The intention is to identify and resolve issues at an early stage. The consultant would assess the feasibility of proposed designs, and the appropriateness of materials and build techniques. They will be asked to challenge assumptions and to suggest lower-impact alternatives where needed.

Tendering and interviews for contractors

We will develop a questionnaire to be included in the tender pack to assess the sustainability credentials of contractors. Based on a proposed contractor's answers in the tender document, we will use the interview stage to further assess commitment to reducing the impact of the exhibition and the contractor's attitude to, and knowledge of, sustainability and low-impact methods and materials. We will look for evidence of their commitment and willingness to collaborate to minimise impact.

We will ask contractors to provide comparative costs for using 'normal' and 'low-impact' materials. This will aid decision-making but also build knowledge to help guide future projects.

... ask contractors to provide comparative costs for using 'normal' and 'low-impact' materials.



measuring impact

The Impact Model
and how to use it

the impact model

The Impact Model is currently an Excel-based tool (in beta version) to help calculate the estimated carbon footprint for an exhibition that is developed by the Design Museum. It is intended for use by the exhibition, curatorial and project management teams to help make decisions during the exhibition development and production process.

The Impact Model is where the museum should capture (directly, or linked) all impact related data and information. The model enables the measurement of an exhibition's carbon footprint across the following stages:

- Project Development
- Object Transport
- Build / Setworks
- Reused Resources
- Museum Operations
- Waste
- Touring

Collating all inputs is intended to fall under the responsibility of the Exhibition Project Team, led by the Exhibition Project Manager with support from the Exhibition Coordinator and Exhibition Curator, Assistant Curator and Facilities colleagues, who are all encouraged to treat the tool as a dynamic resource throughout the exhibition lifecycle.

The inputs would start with a record of all anticipated elements and their estimated quantities (i.e. tonnes of timber) across the above stages. Once the procurement has been completed, this information should be updated along with defining their qualities (i.e. virgin, recycled, reused, etc).

In particular the 'Touring' stage should be treated as an ongoing task to measure an exhibition's total carbon footprint beyond its residency at the museum. While developing a tour, the museum team would consider how necessary couriers are to oversee installation, modes of transport for objects and people and how existing build elements can be substituted for locally available alternatives to avoid shipping.

A more detailed user guide is included in the tool. On the summary page, the tool includes an evaluation of how complete the carbon assessment is in the context of all resource requirements for an exhibition. This is expressed as a percentage in terms of a minimum benchmark as well as a stretch target, which would reflect best-in-class reporting quality.

The model's design is deliberate so that it can, and should, be used by other museums, galleries, events and exhibition spaces. It is open-source and capable of being continuously refined and expanded.

[Download the Impact Model here](#)

The Design Museum is currently trialling the Impact Model on the 2023 exhibition programme and invite colleagues in the sector to test it for their organisation.

conclusion

final thoughts

In the grand scheme of things, the culture sector is not one of the planet's great polluters, and we all agree that museums are a force for good. However we know that exhibitions can be very wasteful and every sector needs to think about how it can reduce its environmental impact. We are also only too aware that museum teams are often stretched and already working under various pressures. The difficult work of trying to build a more sustainable operation can feel like yet more pressure. We've been lucky at the Design Museum to have a team that was committed to the challenge. But it's important that this culture shift within museums is acknowledged and supported by the executive team. The director's buy-in is crucial, and some investment to bolster teams or acknowledge extra responsibility may be required. We hope this guide offers some useful guidance for your institution. It's only a starting point - please build on it and adapt it to your own needs.



with thanks to

- The Design Museum: Justin McGuirk, Elise Foster Vander Elst, Gabria Lupone and the new Environmental Impact Working group
- URGE Collective's environmental audit team: Alexie Sommer, Patrick Burgoyne, Ralf Waterfield and Sophie Thomas
- The authors would like to acknowledge the inspiring work of Julie's Bicycle in mobilising the arts and culture sector to take action on the climate crisis, see juliesbicycle.com
- Images: thanks to all the lenders featured in the exhibition photography.
 - 'Exhibition design development process' courtesy of the Design Museum, photography Felix Speller
 - All other images are courtesy of Material Cultures and SPIN Studio
- This toolkit has been developed with the support of Future Observatory, a partnership between the Design Museum and the Arts and Humanities Research Council (AHRC), part of UK Research and Innovation (UKRI)

**FUTURE
OBSERVATORY**

UKRI Arts and Humanities Research Council

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