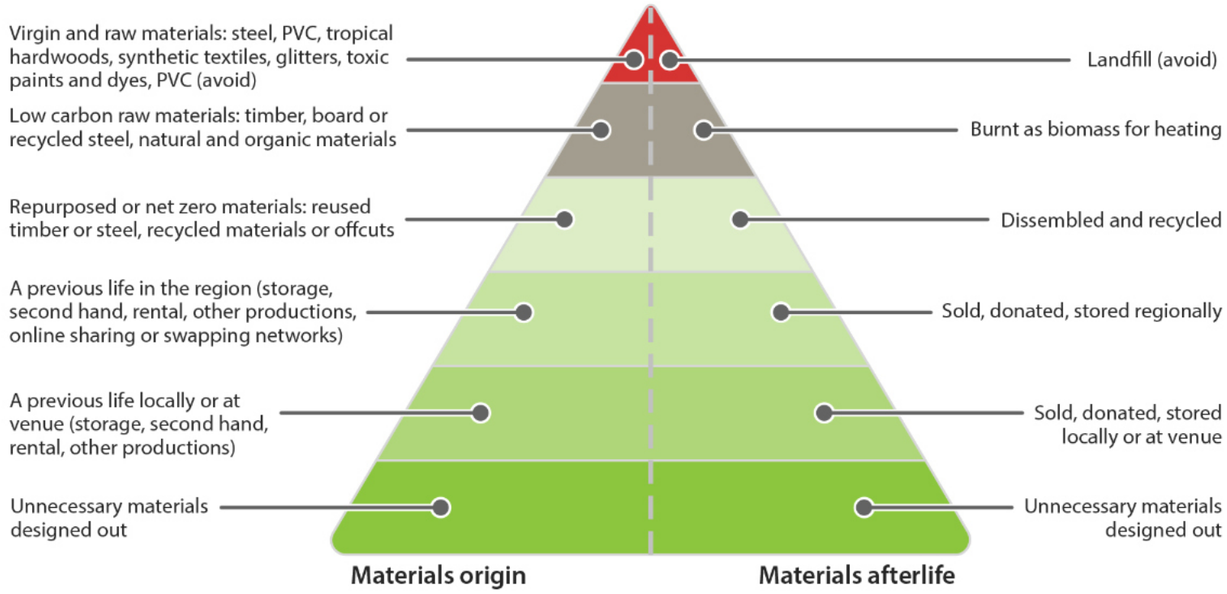
6 Sets and Scenery



The Materials Hierarchy

1 Key Principles

The ultimate goal is to eliminate raw materials, reduce transport, and build sets without damaging the environment.

The Materials Hierarchy

- The first step is to minimise, through design, how much material a set requires.
- The next is to find reused components or recycled materials – ideally locally, to reduce transport.
- Failing that, new materials can at least be sourced as sustainably as possible.
- The very last resort is virgin material from unsustainable sources which harm the planet.

'Reuse' and 'Recycling'

- Reuse means taking components – doors, floors, furniture – and using them again.
- Recycling means breaking something into materials which can be used again.

2 Communications & Planning

Making sets and scenery sustainably is a challenge for the whole team. To work sustainably, it's easiest if you can appoint everyone early, and promote collaboration.

Producers need to equip designers and makers with information on available sustainability resources. They must promote collaboration with teams working on other productions, to share floors, materials, components and equipment.

Budget and schedule must allow for the extra communication needed between designers, production managers and makers. They must build in, and pay for, the iterative process of refining ideas to their most sustainable form.

3 Design

Sustainability can never be achieved as an afterthought. It needs to be embedded in the design process.

A sustainable design process will be more collaborative. Makers and suppliers will join early meetings to offer suggestions and workshop solutions. Directors and designers will approach that dialogue flexibly, to allow space for sustainable solutions.

Sustainability needs to be a constant refrain, but two key meetings will embed sustainable practice:

- A sustainability meeting at concept stage integrates sustainable thinking from the outset.
- Later, the White Card model should be the focus of a 'Green Card' meeting where the whole team reviews the design against Green Book targets, workshops options, and agrees actions.

4 Materials

Reuse and Recycling

Finding reused components and recycled materials – and returning them to a future life – will be easier once theatre's sharing and storage systems are better established. Until then, a lot can be unearthed through venue storage, networks of designers, production managers, and set builders, online sharing sites, and second-hand shops.

After the show, set materials needn't only go back into set-building. A piece of plywood from a flat might go through multiple lives, some in theatre, and others in general use.

Go to the Toolkit for more on Reuse and Recycling.

Sustainable Sourcing

Sets and scenery mainly use steel, softwood, ply (and other sheet materials), and plastics. They all damage the planet. Steel has a high carbon footprint. Much UK plywood is imported long-distance from East Asia, from forests which may not be sustainably managed. Plastics interfere with ecosystems.

Theatre-makers can reduce their impact by specifying and sourcing materials sustainably. There are certification schemes for timber products, and green alternatives for glues and paints. Manufacturers' information can reveal carbon footprints and chemical content. Even plastics can be compostable or recycled.

Go to the Toolkit for more information on Sustainable Sourcing.

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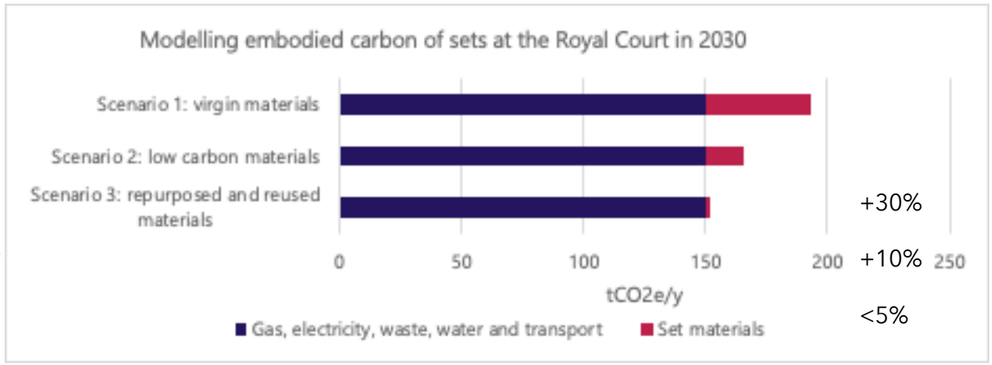
How Much Carbon in a Set?

Sets and scenery are a significant part of theatre's footprint – depending how they're sourced.

One typical theatre uses 30,000 kg a year of steel, timber and boards. By 2030, when they'll be halfway to carbon zero, that will represent about 30% of their overall carbon footprint from building and operations.

Sourced sustainably, the same sets could represent only 10%. Reduce the need for new materials still further through design, reuse and recycling, and they'd be less than 5%.



Materials to Avoid

Some materials are particularly damaging, through scarcity, manufacture, or chemical harm. These include polystyrene, PVC, unrecycled steel and tropical hardwoods. They should be phased out of use in theatres as quickly as possible. *Go to the Toolkit for a list of Harmful Materials.*

Scenic Art

Scenic art is a specialist theatre skill with an important contribution for sustainability.

- Paints, equipment and materials can be harmful, and should all be sourced sustainably.
- Some of the guidance for props (below) also applies to scenic art.
- Scenic artists should be consulted early to make sure time and budget is allowed for sustainable practice (such as the costs and drying-times of water-based paints). *Go to the Toolkit for more guidance.*

5 Tools & Processes

Evaluation

Unless we assess our work, it's impossible to know how sustainable it is. The Theatre Green Book gives you checklists to evaluate which standard you've reached.

Measuring the carbon footprint of a production is complicated, inaccurate and time-consuming. The Theatre Green Book concentrates first on measuring 'circularity': how much of the material on stage is reused or recycled, and what happens to it afterwards. Use the Production Calculator to record sets and scenery, props and furniture, and costumes. Record them by weight (there are tables to help), score each one by where it comes from and your plan to dispose of it afterwards, and it will automatically report what standard you've reached.

For advanced productions, as theatres approach net zero, it's helpful to start measuring carbon impact. The Production Calculator does that by focusing on those elements which you can measure easily and accurately: new set materials such as steel, aluminium and timber, and the travel required by deliveries and touring. Together, they represent perhaps 90-95% of the impact of each show. The Theatre Green Book Production Calculator measures them for you.

Go to Productions Resources for the Production Calculator.

Over time, two design approaches will make sustainability easier:

Modular Design

Sets often include generic components: floors, flats, doors, walls, windows, stairs, balustrades. Designed to modular dimensions, those components become far easier to reuse in new sets – making them available to subsequent designers cheaply and sustainably.

Explore modular framing, which can replace carbon-intensive welded steel with reusable 'meccano' & scaffold-type systems.

Go to the Toolkit for more guidance.

Designing and Making for Disassembly

Sets and scenery can be designed and made to allow easier disassembly and reuse of materials. Generic materials, kept in whole sheets and fixed with demountable joints, can be recycled as a sustainable resource for the next show.

If flats, floors and other components are made for disassembly, their materials can be reused and recycled over a long period.

Go to the Toolkit for more guidance.

Sustainable Working : Designers

Foamboard, glue and paint contain harmful chemicals, and most models are thrown away – unsustainably. Venues should help by providing robust, reusable model boxes (which designers must return in reusable condition).

For set modelling, most designers already reuse materials where they can, and more sustainable foamboards and glues are becoming available. Meanwhile, CAD modelling is zero-waste, and will become zero-carbon as electricity systems decarbonise. In future CAD may cross-reference to inventories of set materials and components. *Go to the Toolkit for more guidance.*

Sustainable Working : Makers

Workshops and makers can shift to sustainable tools and practices, such as electric tools, air drying, sinks that separate harmful wastewater, and cold laundries for textiles. *Go to the Toolkit for more guidance.*

Workshops, Buildings and Machinery

Workshop machinery should be managed for sustainability:

- When buying new machinery, check it is energy-efficient, durable, and easy to maintain.
- Good maintenance is necessary to make equipment last as long as possible.
- At the end of machinery life, replace with energy efficient alternatives.
- Install LED lighting in workshops to reduce electrical demand.
- Consider "Ecodesign" welding.
- Make sure extract equipment is adequate and well-maintained, and replace filters regularly.

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