



**Sustainable Productions :
Detailed Guidance**

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Foreword

We're living in a climate crisis. Theatre makers - like everyone else - want to respond to that emergency. But for theatre, the need to change is particularly urgent. If theatre is to be part of the most vital conversation humanity faces, then it has to change its practice.

The ETC Theatre Green Book provides clear standards for that change. In other parts it shows how to improve the sustainability of theatre operations and theatre buildings. This part is about making productions more sustainably.

Climate emergency is the reality in which theatre - like everything else - is now made. But producing sustainable shows is not an end in itself. Theatre's purpose, range, creativity and ambition should remain as broad and vital as ever. Indeed, it is that very creativity and theatre's ability constantly to reinvent itself which will generate fresh theatrical thinking in this new reality.

Theatre artists always work within parameters (of time, cost or scale). Working in the context of the climate emergency, they should feel no more restricted in creative ambition than they do now. Rather, their purpose is to channel that creativity through a new set of premises.

Working together, theatre-makers of all kinds - freelancers and venues, companies and producers - have collaborated on the Theatre Green Book. Based on widely agreed values and strategies, the result is a shared standard for making work, as a community, in the reality of the climate crisis.

Lisa Burger and Paddy Dillon, Renew Culture

sustainable productions
DETAILED GUIDANCE

1 Introduction

1 The ETC Theatre Green Book

The climate crisis is an immediate threat to our safety, equity and prosperity.

Theatre cannot solve the climate crisis, but it can play a role in addressing it, by creating new narratives, and reflecting the challenge of a world facing frightening change.

To do that, theatre itself needs to become sustainable.

The European Theatre Convention has set a target for its members to achieve net zero by the end of 2030. The ETC Theatre Green Book provides a pathway to achieve this vital transition.

No theatre can become perfectly sustainable overnight. Reaching net zero - learning to make theatre without harming the planet - is a transition that will take place over a number of years.

The ETC Theatre Green Book provides its members with:

- A framework for planning the transition
- Standards for sustainability
- Guidance for each area
- Tools for measuring progress

2 The Framework

The ETC Theatre Green Book divides the challenge into three areas. Together, they give theatre clear, practical and detailed guidance towards sustainability:

- Sustainable Productions
- Sustainable Operations
- Sustainable Buildings

3 The Standards

The ETC Theatre Green Book sets three standards for the transition to net zero. The standards apply to all three areas of running a theatre: Productions, Operations, and Buildings.

- Basic standard is the first step on the journey. It requires meaningful change, but it isn't too hard to achieve. Many theatres are already working at basic standard.
- Intermediate standard is the next step on the journey.
- Advanced standard is, effectively, net zero theatre.

4 The Guidance

The ETC Theatre Green Book (main volume) explains the basic principles of sustainable theatre in each area, productions, operations and buildings. To support each area, the ETC Theatre Green Book also gives detailed guidance. This volume is the detailed guidance for productions.

5 Measuring Tools

The ETC Theatre Green Book provides tools for measuring your progress in each area:

- A Production Calculator to assess productions
- An Operations Tracker to manage progress in operations
- A Building Survey Tool to help generate a Sustainability Plan for buildings.

The tools can be downloaded as Excel workbooks from the Resources area of the ETC website.

6 Self-Certification

To help track progress towards the target of 2030, the ETC Theatre Green Book helps theatres to self-certify the standard they've reached.

- Begin with a Preliminary certificate to demonstrate commitment, and to show that you've made preparations to begin the transition.
- Then progress through the three standards - Basic, Intermediate, Advanced - demonstrating that you've reached each standard for your productions, operations and building.

An Excel workbook for submitting your self-certification can be downloaded from the ETC website resources area. When it receives them, the ETC will issue certificates and logos to include in websites and communications.

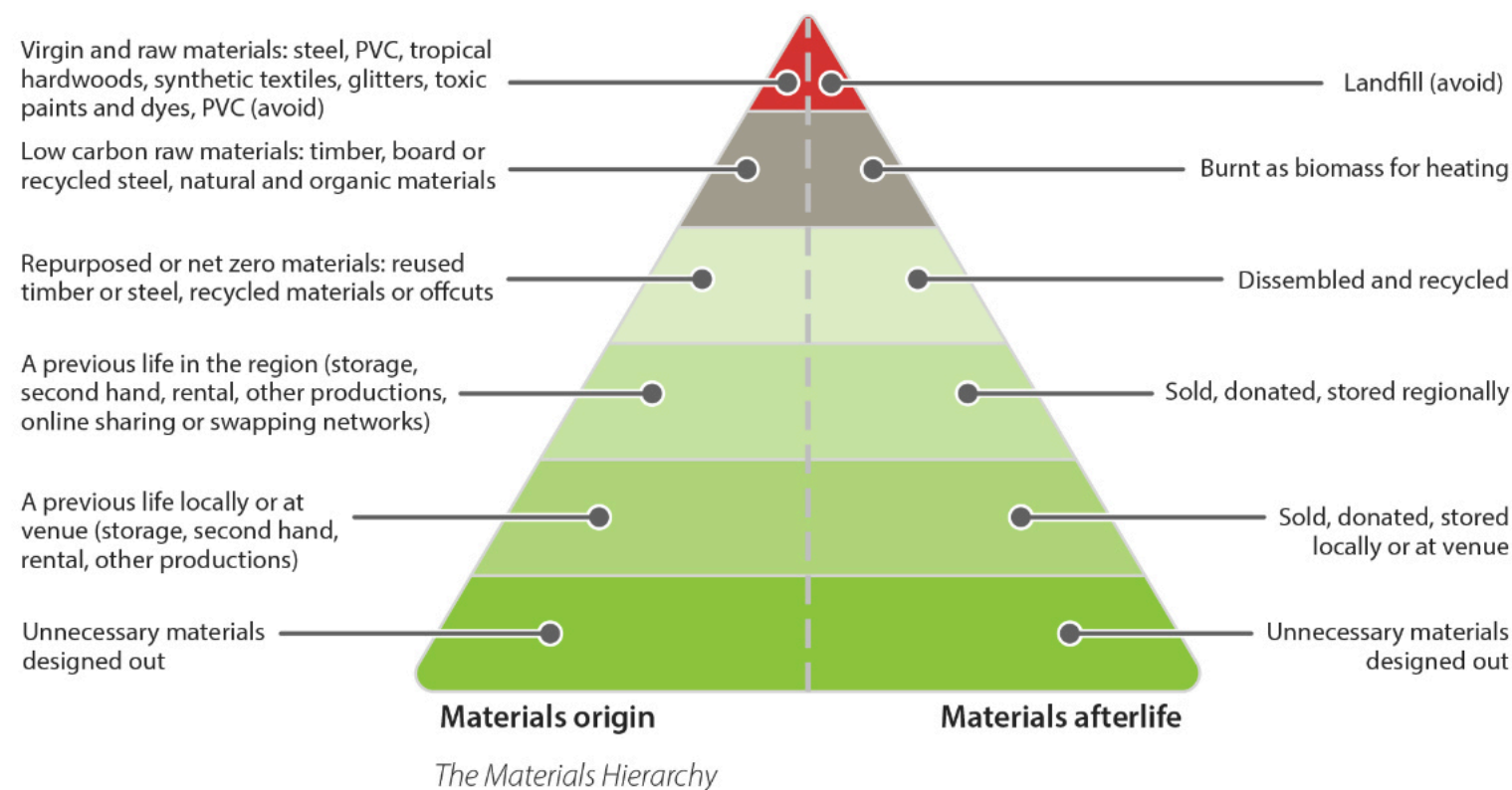
7 The European Theatre Convention

Theatre has an impact on the planet. Productions use energy and materials, require travel, create waste and employ harmful chemicals; while operations require travel and create waste, and buildings consume energy. The transition to net zero is vital and urgent.

It requires shared ideas and expertise, shared learning, and mutual support. It will only happen if we make the most of our networks.

The ETC is Europe's largest and most dynamic theatre network, uniting theatres of extraordinary creative energy. It has a unique role to play in achieving the transition to net zero by 2030.

2 Key Principles



1 A Creative Challenge

Productions have an impact on the planet. They use energy and materials, require travel, create waste and employ harmful chemicals. The ETC Theatre Green Book shows how to reduce that impact.

However, the climate crisis is not just a challenge to be overcome. Shifting the parameters by which theatre is made is a moment of exciting creative opportunity. Throughout its history, theatre has shown an extraordinary capacity for reinvention. The next few years should be seen not as a restriction, but as an invitation to dynamic creative change.

2 Key Principles

Sustainable Planning

A sustainable production must begin with a clearly-defined sustainability standard. Budgets and schedules need to allow for sustainability. Working sustainably requires more time. Collaboration and communication are essential.

Sustainable Creating

Sustainability starts with the director's concept and the designer's vision. The whole team collaborates to achieve that vision in a sustainable way.

New tools and Processes

The Production Calculator helps guide sustainability by working out how much material is reused or recycled.

Sustainable Materials

Sustainable theatre requires a step change towards the use of equipment and materials which have had a previous life, and will go on to be reused, repurposed or recycled.

Clean Procurement and Transport

Making shows sustainably needs a significant reduction in transport and deliveries.

3 The Materials Hierarchy

Everything in a truly sustainable show will have had a previous life. Everything will be used again. That creates a 'circular economy'.

Start by designing out the need for materials.

Whatever is needed should come from a reused or recycled source – locally, if possible, to reduce transport. Next best are materials which are, at least, sourced sustainably. At the bottom of the pyramid are raw materials which involve carbon, and are destructive to manufacture, and ought to be avoided.

There's a similar process for thinking what to do with everything afterwards, from best – reusing it in the theatre – down to the worst: throwing it away.

4 Theatre Green Book Standards

The Theatre Green Book sets three standards for sustainable working: Basic, Intermediate and Advanced. In a Basic production, 50% of the sets and scenery, props and costumes need to be reused or recycled, and 65% used again after the show (based on weight).

The Theatre Green Book Production Calculator gives you a checklist for each standard, and simple worksheets to help you calculate your percentage of reuse / recycling, and (for Advanced shows) a basic calculation of carbon impact.

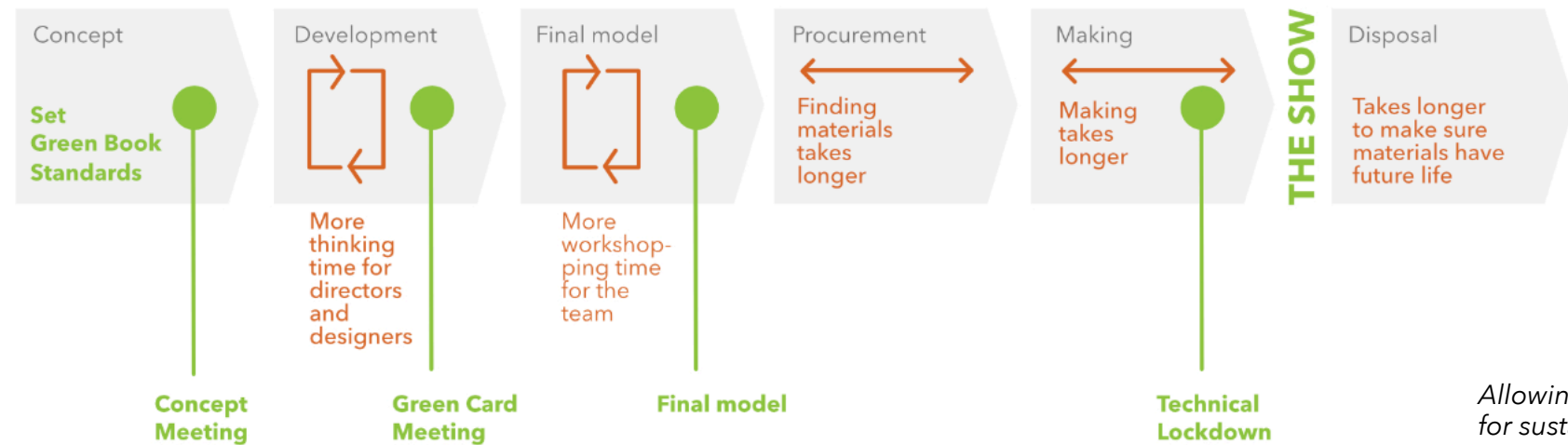
Assessing a production isn't an exact science. Use common sense, avoid getting lost in details, and the Calculator will give you a reliable tool for the transition to sustainable working.

What do We Mean by Green?

The Green Book uses 'sustainability' and 'greener practices' as catch-alls to cover decarbonising theatre productions, reducing waste and eliminating environmentally harmful practices. That keeps it simple and readable, regardless of anyone's prior knowledge.

For a more precise vocabulary for green theatre, the Future Materials Bank keeps an excellent lexicon of terms at www.futurematerialsbank.com/lexicon.

3 Planning a Sustainable Production



1 Key Principles

Planning a show sustainably means:

- Setting a clear sustainability target at the outset.
- Setting the team, budget and schedule to support sustainable working.
- Giving everyone the tools they need to achieve a sustainable outcome.

2 Different Production Models

ETC member theatres have different production models. Some produce for themselves, with in-house production facilities, staff and ensembles. Some co-produce with other theatres or collaborate with independent production companies. Some act as receiving houses for work made by others.

Different production models have an important impact on the control each theatre has over the production, and the actions needed to achieve a sustainable outcome.

- In-house productions give theatres the greatest control.
- Collaborative productions require discussion and negotiation. The outcome is likely to depend on the power each party has in the relationship - and their commitment to sustainability.
- Receiving houses have little control over the work. But they can use their relationship with visiting companies to influence and educate the companies they work with.

No one can take responsibility for outcomes beyond their control. At Basic level, the ETC Theatre Green Book only expects member theatres to record productions for which they are lead producer.

This section gives guidance on leading a new production. The next section, Co-production, gives guidance on working with other producers to achieve the best possible outcome.

3 Communications

Setting a Standard

The ETC Theatre Green Book helps set a standard for each production, which define what everyone needs to do. Those standards will become increasingly familiar to all theatre-makers within the network.

Most theatres who analyse their smaller productions find they're already working to Basic standard. Achieving Basic regularly on larger shows takes time. It doesn't matter if the first few productions don't reach the standard. The important thing is to learn through the experience.

The Invitation

It's essential to define the sustainability standard with the first invitation to team members, explaining what it means and how they will be supported. Introduce it later, and sustainability will appear restrictive. Include it from the start, and it will be built into creative thinking from the outset.

Artistic Directors have an essential role to play in making the sustainability standard a clear part of the invitation, and making sure creative teams achieve it.

Induction

You'll only achieve a sustainable result if everyone fully understands their part. Whenever team members are brought in, induct them in how the ETC Theatre Green Book works, and the responsibility they have.

Freelancers

Regular teams will soon become familiar with the Theatre Green Book. Freelancers may be new to it. Give them the support they need - including climate literacy training - to deliver what you ask.

Appointments

Sustainable working needs teams to be appointed early, so makers can help achieve creative ideas in sustainable ways.

Contract Riders, or Green Production Agreements, help make your values clear, and help the team to collaborate in achieving a given target. Contracts with suppliers and makers should reference the same standard.

Collaborative Working

Sustainable theatre-making needs teams to collaborate. Where possible, makers and suppliers should join early meetings to offer suggestions and workshop solutions. Directors and designers need to respond flexibly, to make space for sustainable thinking. Producers must foster an atmosphere of mutual respect and trust across the whole team.

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

- A sustainability meeting at concept stage integrates sustainable thinking from the outset.

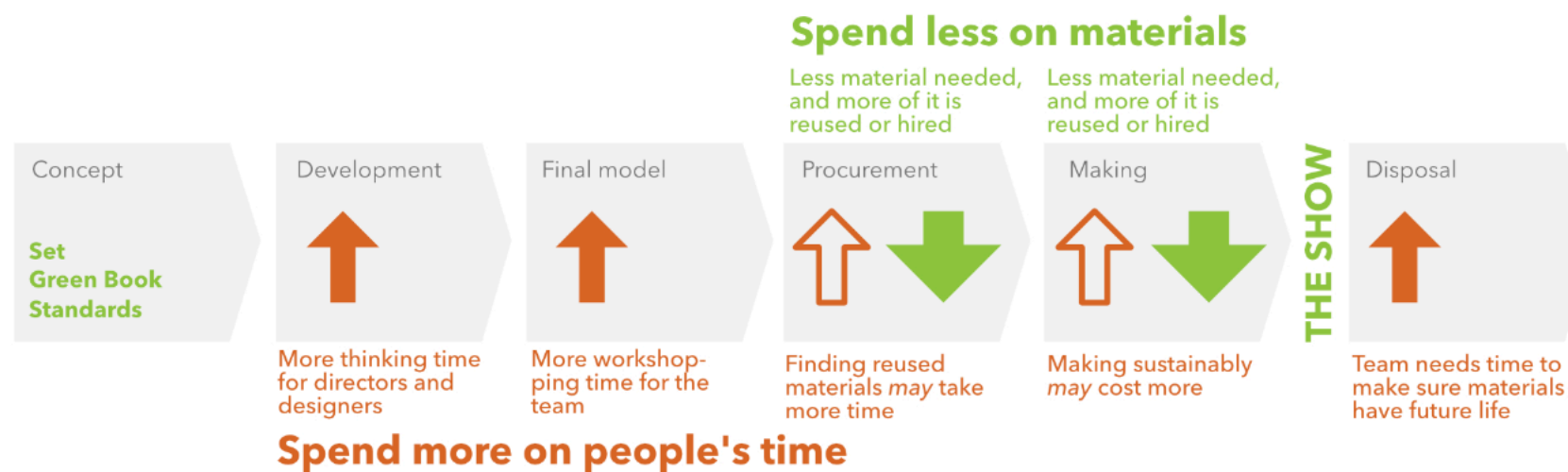
Commissioning Multiple Shows and Seasons

Whenever shows can be commissioned together as a series or season, they can share resources and reuse components.

Consecutive shows might share the same floor. Lighting and technical set-ups can be retained. Props and set components can be shared. Designers working together can swap information and access the same recycled materials.

The result can be significant savings in materials and energy, along with the costs and emissions associated with remaking, rigging and transporting components.

Rethinking costs : budgeting for sustainability



- Later, the whole team can review the sketch model to test the design against ETC Theatre Green Book targets, and find solutions together.

Space and Storage

Being able to recycle and reuse most effectively requires space. You may need to rethink how you find storage for the elements which can be reused in another production. There are good examples of companies coming together to share stores for mutual benefit.

3 Schedules and Budgets

Schedules

Sustainability takes time.

Time spent at concept stage refines thinking and avoids late change. Designers need time to explore creative solutions. They may need to visit the store, or meet other designers working in the same season, to share design elements. Achieving sustainability requires regular conversations among the team. Even ordering second-hand costumes takes longer than buying online.

Therefore, schedules need rethinking to support sustainable practice (see above).

Budgets

Budgets need to buy extra time from designers and makers for the collaborative conversation sustainability needs.

Purchase costs will change. A new set made with sustainably-sourced materials may cost more. Made with reused components and recycled materials, it can cost less.

Show budgets, like schedules, need to change (see above).

4 Tools and Methods

Information

Theatre-makers need the right tools to reach sustainable outcomes.

Producers can help freelancers with information about in-house and local resources. They can encourage different production teams to share components, materials, floors, equipment and ideas. Theatre's strong networks are an essential resource for sustainability.

Intellectual Property

Designers may rightly be concerned that their designs will be reused without permission. It's important they have the chance to define elements of the design which they see as protected (for example, a bespoke staircase or sculptural set). These elements can be defined individually, leaving generic components (standard windows and doors, masking, floor textures) and materials to be reused freely.

Evaluating

The Productions Calculator helps you evaluate the sustainability of each production. It gives you checklists for the three ETC Theatre Green Book standards: Basic, Intermediate and Advanced. Excel worksheets help assess how much of your sets and scenery, props and costumes are reused / recycled based on weight.

Measuring a production isn't an exact science, and production teams are always short of time. Don't get lost in too much detail. Use common sense to guide decisions. The Production Calculator is not a perfect system but a tool to help you think more sustainably, and record how your practice is changing.

Go to Productions Resources for the Production Calculator.

Fit-up and Rehearsal

Sustainability needs particular care as more individuals join the production and the opening gets closer. For some companies, rehearsal is the creative moment when a production is created - often leading to last-minute purchasing and making. The creative team, stage management and workshops must work closely together to

minimise the remaking of scenic elements and multiple last-minute deliveries.

The end of the show

A sustainable show doesn't end on the closing night. Planning how materials and components, costumes and props will be reused is just as important as procuring them sustainably in the first place.

Producers need sustainable disposal systems and protocols. Online theatre networks can help. Good relationships with local second-hand shops, community centres, other theatres and prop stores will help make sure materials have an afterlife - and you throw away as little as possible.

5 Sharing and Training

Sustainability will become easier as we try things out and share what we've learnt. So it's essential, after a show, to review outcomes and share results honestly.

The ETC network is an opportunity to share learnings with all member theatres. Case studies of your productions, shared on the ETC website, will help others to learn.

Making work sustainably can be something to share with audiences, as well, who will increasingly expect sustainable practice.

Outdoor and Site Specific Shows

Outdoor and site specific shows can be extremely sustainable. They may need minimal lighting and set, for example.

They also impose specific challenges, like how to provide power sustainably, set up dressing room facilities etc. In some natural locations it's important to check the show doesn't harm wildlife.

Go to the Toolkit for more guidance.

4 Co-productions and Visiting Companies

1 Key principles

The previous section described a production model where the theatre has full control over each production. However, many ETC member theatres present work conceived and produced by independent directors and their production companies. Others co-produce work with different theatres. In both cases, the theatre is not fully in control of the production. The challenge is to achieve the most sustainable outcome you can.

The influence you have depends on the relationship. If you want to work with a leading director who has little interest in sustainability, you have little chance of persuading them to deliver a sustainable production. A new company which is keen to make work at your theatre will be more willing to adopt ETC Theatre Green Book standards.

Sometimes, it won't be possible to make a production sustainably. But co-production is also a great opportunity to share your own expertise, and to promote shared sustainable thinking in other companies.

In all cases, to co-produce a sustainable production to ETC Theatre Green Book standards requires sensitivity, flexibility, and good communication.

2 Starting Out

At the outset of a project, it is essential to decide what's realistic, and if possible - agree the sustainability ambition of the production. This should be written into partnership agreements wherever possible.

Induct new partners into the ETC Theatre Green Book and its standards (they may already be familiar with national Theatre Green Book networks). If your partners are keen to make a sustainable production, agree early how the production's green credentials will be used as part of marketing and communicating the show.

3 Responsibilities

If partners are willing to collaborate, decide who is responsible for ensuring the production meets its ETC Theatre Green Book standard.

Identify who will have responsibility for completing the Production Calculator and other measurements (e.g. travel and waste).

A meeting between heads of production of the main partners will allow them to identify expertise which might help the team achieve a sustainable outcome.

Decide who will have responsibility for disposing of the production after the tour is over.

4 Planning for Sustainability

Sometimes, co-production partners can pool resources for reuse and recycling, and make them available to the creative team. Share technical resources at each venue, to give the team all the information they need to plan a sustainable tour.

For touring shows, try to plan the tour to minimise travel. At an early stage, the partners should consider how best to reduce the set, equipment and people that will need to tour. Define a haulage limit for the tour, and make sure this is fully understood by all.

5 Opportunities

A coproduction is a sharing network. It's an opportunity to spread best practice & expertise.

If you can, ask your production partners to work to ETC Theatre Green Book standards. If that isn't possible, then at least make sure they understand your values, and suggest they start to think about their own transition.

- At ETC Theatre Green Book Basic standard, members need only assess and record the productions they make themselves, or co-productions they lead on.
- At Intermediate standard, include all co-productions.
- At Advanced standard, all the productions in your theatre should reach ETC Theatre Green Book Advanced standard.

Achieving that will take some years. But more and more producers are working sustainably. More and more work will be made in ways that respect the climate crisis.

5 The Creative Challenge

1 Why change?

Many creative theatre-makers find this question easy to answer. If theatre wants to reflect the climate crisis, theatre must become sustainable. And if theatre can achieve the transition to net zero, it can show the way to other sectors, generating change across society.

Productions are not theatre's largest impact on the planet, but they are the most visible. They're what theatre is for.

Thinking and working differently is a big creative challenge. The climate crisis has generated a new set of parameters in which we need to work. A creative response begins by recognising our responsibility for the decisions we make - including decisions that harm the planet.

However, sustainable theatre mustn't only rest on directors and designers. It needs the collective support of the whole production team to develop a vision to its most sustainable form.

Sustainability can, of course, be seen as restrictive. It makes it harder to achieve some familiar ideas. That's why creative thinking is needed to conceive a new future for theatre - one which avoids harm to the planet we live on.

2 A Different Challenge

The challenge facing theatre writers, directors and designers is to conceive and create ambitious new shows which express everything they wish to say about the world while working within the reality of the climate crisis.

That reality, and the challenge of responding to it, is already shaping the work of many designers and directors.

A work of theatre might take the climate emergency as its subject - in which case it's important to make it in a sustainable way. But making shows sustainably is not an end in itself. Theatre's purpose and ambition haven't changed; but we have new parameters within which to make it.

Parameters are nothing new. Theatre makers have always worked within boundaries of cost, space and time. For many, limitation is a spur to invention. Most theatre artists in their early careers work within constraints, making shows with whatever is to hand.

The climate emergency has brought a new set of parameters. Working within them is a new creative challenge.

3 A Different Approach

The purpose of the ETC Theatre Green Book is not to suggest creative solutions, but to define the parameters within which theatre must work. For some artists, sustainability might suggest an experiment with aesthetic austerity and minimalism. Others may look for new ways to achieve spectacular effects sustainably.

Theatre has always responded to crucial new subjects through creativity and invention, and, in the process, discovered unanticipated new forms of expression.

The climate crisis creates a new reality. In adapting their art-form to it, theatre-makers are already conceiving theatre in new ways.

4 A Different Way of Working

In the collaborative chain that makes a show, no one person can 'own' sustainability. Everyone's practice is affected; everyone is dependent on others, from producers to set-builders, to work in new ways. Responding to the climate emergency is a collective responsibility.

Sustainability requires new ways of working. It needs collaboration, which demands more time, and promotes different kinds of creative relationship.

Making shows in a linear and hierarchical way stifles the collective conversations which allow sustainable answers to be found. Makers' expertise is needed at early stages to develop an idea in the most sustainable possible way. Collaboration is needed to take a vision, and develop it to its most sustainable form.

Working in this way needs more time. Working collectively also requires trust and mutual respect. Makers, production staff and suppliers are all part of a team whose shared purpose is to realise creative ideas sustainably.

New Writing and Devised Work

New writing and devised work present special challenges. Even more than usual, rehearsal is a journey of discovery and change. That energy mustn't be squeezed out of the process. Planning in advance shouldn't exclude the effect of the unanticipated.

Directors and Designers will learn over time how to balance the drive to avoid last minute change, with the need to retain creative energy. The aim must be to cushion the effect of late surprises, not wholly to exclude them.

Plan everything possible. Question a last-minute impulse to rely on 'stuff'. Think twice about making or buying more, or throwing away something that's already been made.

5 Some starting-points

The ETC Theatre Green Book doesn't prescribe creative answers. There is no single creative prescription for working sustainably. The notes below suggest some starting-points which summarise theatre-makers' experience so far.

The Concept

Whether a show can be achieved sustainably can depend on the director and designer. Responsibility for working sustainably lies with everybody, and teams must collectively rise to that challenge. But making work within the parameters of the climate emergency is a journey that starts with the initial concept.

Sustainability can never be an afterthought. It needs to begin at a show's inception.

Collaboration

Making a show sustainably is a collective task. By working together, teams can refine a show towards sustainability using their common expertise.

New production milestones are needed to support this:

- A sustainability meeting at concept stage integrates sustainable thinking from the outset.
- Later, the sketch model can be the focus of a ' meeting where the whole team audits design against ETC Theatre Green Book targets, and collaborates on next steps.

Flexibility

Collaboration requires flexibility. Working with a team means sharing control. Everyone needs to keep their minds open.

Minor changes to a design (e.g. changing dimensions so as to use a staircase from store) can have an impact on sustainability. Designers working sustainably keep their minds open to change.

Time

Working in this way needs time. It takes time to invent sustainable ways of achieving a creative vision, just as it takes time to track down sustainable materials.

Conceiving a show sustainably also needs more time. Less resource demands more invention; template solutions will no longer work. Theatre-makers need time to find new answers to new questions.

Doing More with Less

Whenever designers ask themselves if each element is working hard enough, sustainable thinking is aligned with creative process. Sustainable theatre-making requires everything – every idea, every piece of material – to work as hard as possible.

Sustainable Making

There's guidance for sustainable making throughout this volume.

- 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.

Intellectual Property

Bespoke designs need to be protected. No one wants to see their work turn up unaltered in someone else's show. But copyright can be safeguarded by identifying the specific components a designer wants to protect. Everything else – generic components such as windows and floors, masking, salvaged materials etc – can be made available for reuse or recycling.

More Isn't the Answer

When a show proves troublesome, teams have sometimes tried to solve the problem by modifying sets or ordering new props. That can ruin a show's sustainability. Better solutions may need more time instead – for planning, preparation, or experiment.

Look Ahead

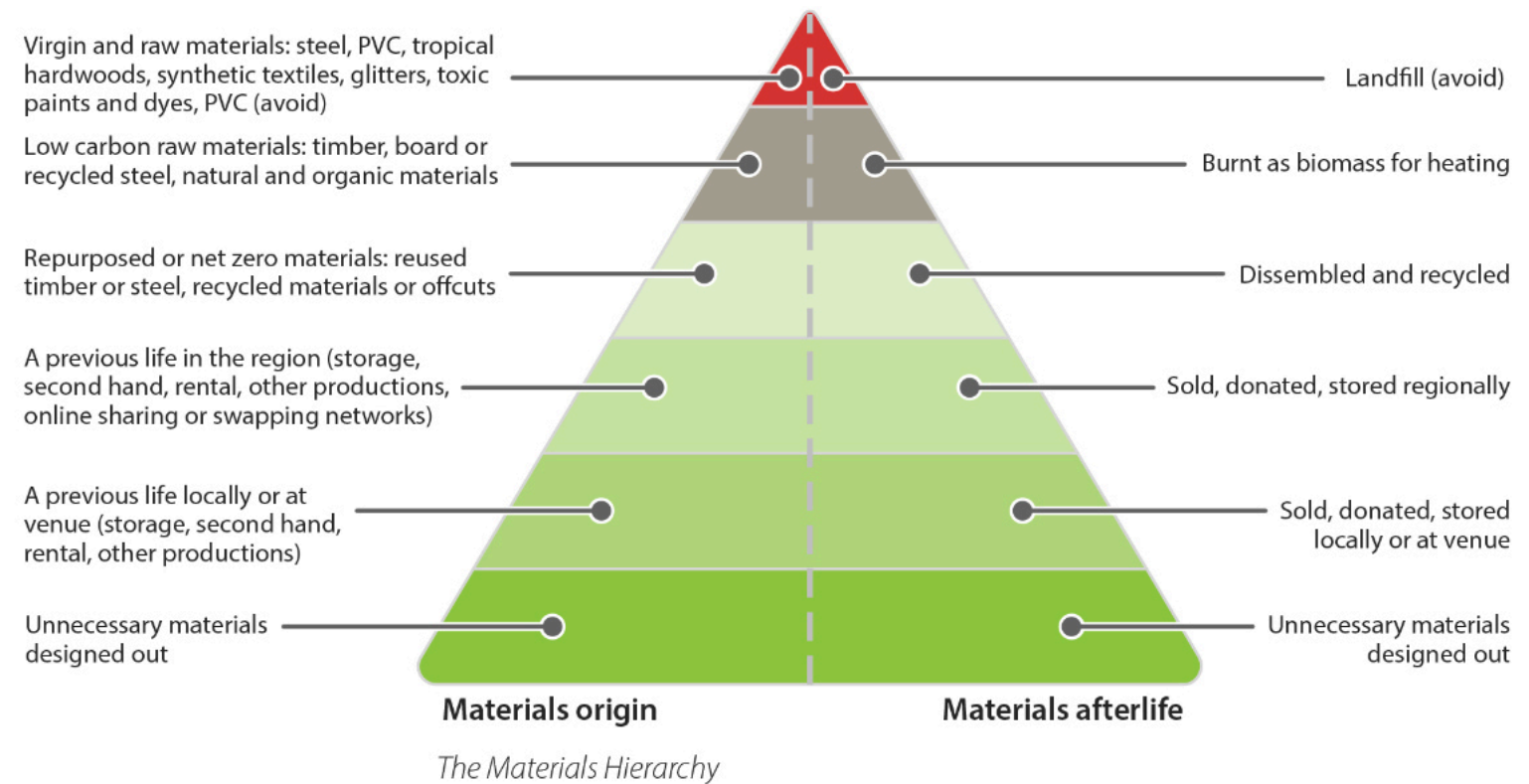
Productions don't end at the final curtain. In a circular economy, everything on stage should have been used before, and will be used again – and theatre makers need to think of that in advance. If the team has made something of value, there will be other ways of valuing it again.

6 Additional Benefits

Sustainable practice doesn't only benefit the environment.

- Working collaboratively improves working culture for everybody.
- Working collectively brings more diverse talent into the industry.
- Working locally connects theatre to communities.

6 Sets and Scenery



1 Key Principles

The goal is to minimise 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 last choice 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, appoint everyone early (if possible), and promote collaboration.

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

The schedule should allow time for the extra communication needed between designers, production managers and makers. It takes time to develop ideas to their most sustainable form.

3 Design

Sustainability can never be achieved as an afterthought. It must be part of the design process.

A sustainable design process is collaborative. Makers and suppliers join early meetings (where possible) to offer suggestions and collaborate on solutions. Directors and designers will be flexible, accepting sustainable solutions whenever they can.

Sustainability needs to be a constant subject (like budget). Two important meetings help sustainable practice:

- A sustainability meeting at concept stage includes sustainable thinking from the outset.
- Later, the sketch model should be the focus of a meeting where

the whole team reviews the design against ETC Theatre Green Book targets, and agrees next steps.

4 Materials

Reuse and Recycling

Finding reused components and recycled materials - and returning them to a future life - will be easier when sharing and storage systems are better established. Until then, a lot can be found through local 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 can go through multiple lives, some in theatre, and others in general use.

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. Plywood is often imported long-distance, from forests which are not sustainably managed. Plastics interfere with ecosystems.

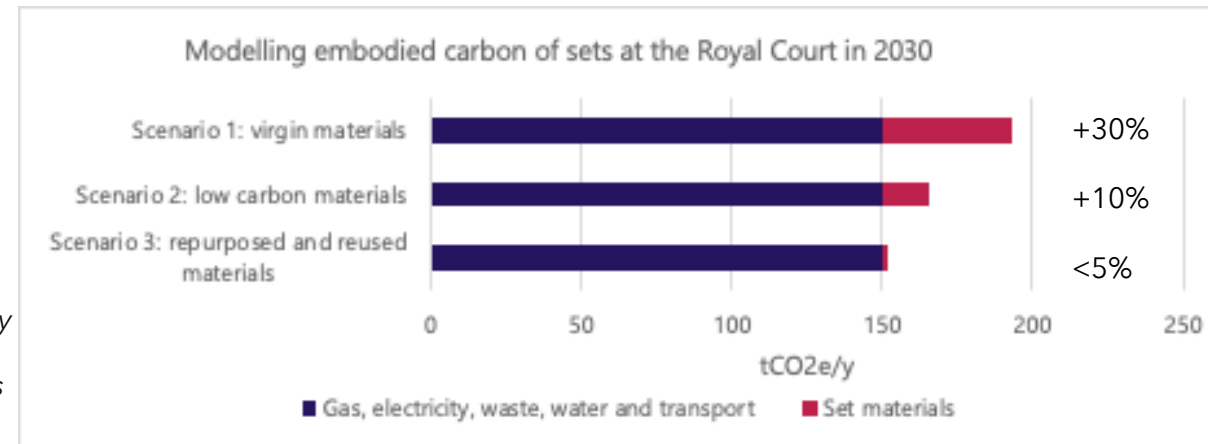
Theatre-makers can reduce their impact by specifying and sourcing materials sustainably. There are certification schemes for timber products, and green alternatives for glues and paints. Manufacturers' information can reveal carbon footprints and chemical content. Even plastics can be compostable or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

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%.



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 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).

Materials to Avoid

Some materials are particularly damaging, including polystyrene, PVC, unrecycled steel and tropical hardwoods. They should be phased out of use in theatres as quickly as possible. For some, like polystyrene, there is not yet a good equivalent, but its use should be reduced to a minimum.

5 Tools & Processes

Evaluation

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

Measuring the carbon footprint of a production can be complicated, inaccurate and time-consuming. The ETC 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 measure carbon impact as well. The Production Calculator does that by focusing on 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 90-95% of the impact of each show. The ETC Theatre Green Book Production Calculator measures them for you.

Two design approaches make sustainability easier:

Modular Design

Sets often include generic components: floors, flats, doors, walls, windows, stairs, balustrades. If they are designed to modular dimensions, these components are easier to reuse in new sets.

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

Designing and Making for Disassembly

Sets and scenery should 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 for the next show.

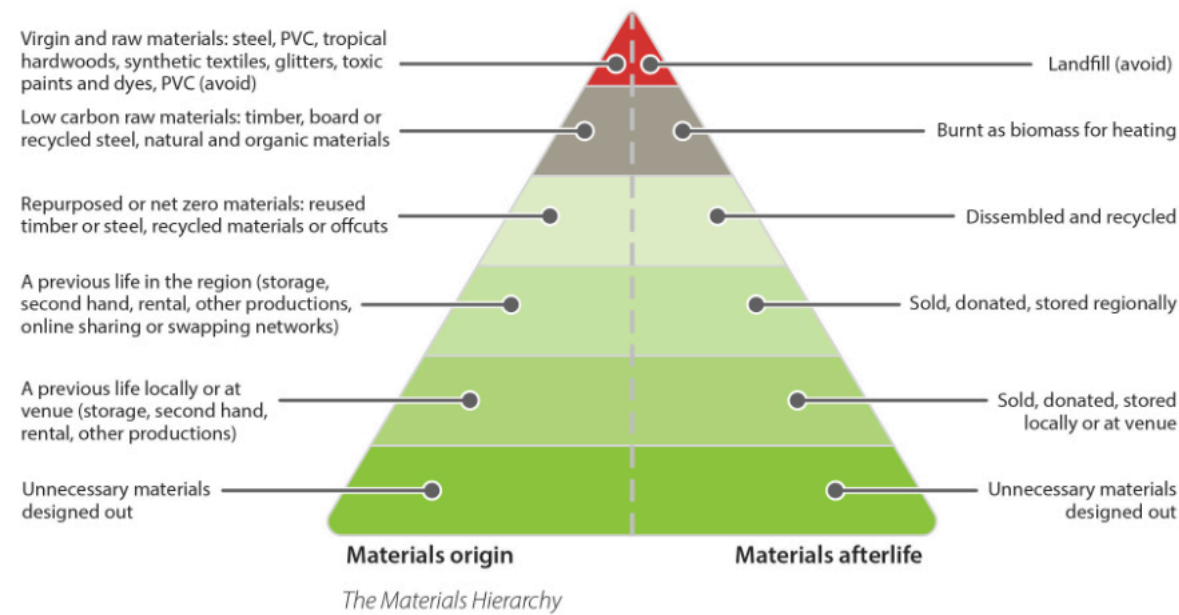
If flats, floors and other components are made for disassembly, their materials can be reused and recycled over a long period.

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.

7 Props



1 Key Principles

The goal is to eliminate raw materials, reduce transport, and provide props without damaging the environment.

Sourcing Ready-made Props

Sustainable theatre-making means reusing existing props and furniture wherever possible, and making sure they have another life after the show. Theatre networks can help locate the right props for the show.

To reduce how much they buy new, designers and props supervisors need more time for sourcing, and a flexible approach to using what's available. Producers must make time and budget available.

Making Props: the Materials Hierarchy

- The first step is to minimise, through design, how much material a show's fabricated props require.
- The next is to find reused components or recycled materials - ideally locally, to reduce transport.
- Failing that, new materials should be sourced as sustainably as possible.
- The last resort is virgin material from unsustainable sources which harm the planet.

Workshops

Workshop practices should be made as sustainable as possible.

2 Communications and Planning

Working sustainably needs collaboration. Designers and props departments should start talking early to find props and furniture from sustainable sources. Producers and theatres need to provide information on what's available from store, or on local second-hand shops and networks. They should connect designers with teams working on other productions to reuse as much as possible.

The schedule should allow for the communication needed between designers, production managers and makers. It must include the time needed to source props sustainably.

Designers can help by being flexible in what they ask for.

Directors can help by choosing early on the props they need for rehearsal. Where possible, use substitutes to avoid requiring props out of sequence. Avoid last-minute ordering and multiple deliveries.

Last-minute changes may sometimes be unavoidable - but you need a good reason for them.

3 Reuse and Recycling

Wherever possible, source reused props and furniture, rather than making or buying new.

There are many sources to explore, including props stores, networks of props stores in other theatres, productions planned for the same stage, props hire companies, local second-hand shops and networks, online second-hand resources for theatre, and online second-hand networks.

Make sure that, after the show, props and furniture are reused, either by returning to store, or being sold through second-hand markets.

4 Materials

Sustainable Sourcing

Props don't use large quantities of material, but are often made of materials that harm the planet. Plastics, in particular, harm to the environment; so do many glues, paints, enamels and other chemical products.

Theatre-makers can reduce their impact by finding alternatives to harmful materials, and specifying wood, metal and plastic sustainably. Check manufacturers' information for harmful content. Where possible, choose plastics which can be composted or recycled.

Materials to Avoid

Some materials are particularly damaging, including polystyrene, PVC and tropical hardwoods. Always look for alternatives, and use them as little as possible.

Last Minute Ordering

To avoid last minute deliveries:

- Include props and costumes earlier in the production. Encourage directors to plan what they need for rehearsal.
- Be flexible. Avoid over-specific requirements.
- Use local suppliers.
- Make single large orders, to reduce the number of deliveries.

8 Costume, Wardrobe, Wigs, Hair and Makeup

1 Key Principles

To make costumes sustainable, maximise reuse and recycling, and minimise the use of unsustainable and inorganic materials.

To make wardrobe, wigs, hair and makeup sustainable, use products which are sourced sustainably and ethically, and don't damage the environment.

At present, costumes, wigs and care products often use materials for which there are no sustainable alternatives. Theatre-makers should lobby suppliers to find better alternatives, and use the ETC network to share knowledge.

Sourcing Costumes

Wherever possible, costumes should be reused or recycled. Some will come from store, others – including basics like T-shirts or jeans – should come from second-hand sources. It's important to ensure that costumes are returned to storage or the second-hand market after the show, rather than thrown away.

Last Minute Ordering and Fast Fashion

Shows often order at the last minute, using fast fashion retailers and next day delivery. That means a lot of one-off deliveries, and last minute quick alterations which make clothes harder to reuse later. Instead:

- Plan costumes earlier in the production. Ask directors to decide early what they need for rehearsal.
- Design and source flexibly, avoiding over-specific requirements.
- Use local costume suppliers.
- Last minute changes may sometimes be unavoidable – but be sure there's a good reason for them.

Making costumes

Making costumes is one of theatre's greatest skills. Sustainable costumes use recycled or sustainable textiles. They should be cared for sustainably and recycled afterwards. In planning materials for new costumes, choose durable fabrics which will last and can be adjusted for future performers.

Stage blood and other effects often require harmful cleaning products. It may be possible to design removeable sections which can be washed separately.

Costumes for dance and ballet have special requirements, which are covered in the Dance and Ballet section.

During the Run

Laundry and cleaning of costumes and wigs often have more environmental impact than the costumes themselves. Avoid harmful chemicals wherever possible. Consolidate washing and drying loads.

2 Communications and Planning

Departments should be involved early to give time for sustainable sourcing. Good planning reduces last minute ordering, next day delivery and use of 'fast fashion'. Directors can help by identifying early on the costumes or wigs they need for rehearsal.

To work sustainably, designers and costume departments need more time for sourcing, and a flexible approach to choosing from what's available. Producers must make time and budget available.

Producers and theatres need to provide information on what's available from store, and on local second-hand shops and networks.

3 Reuse and Recycling

Wherever possible, source reused costumes, rather than making or buying new. After the production, return them to store, or give them a second life through storing, selling or donating. If worn out, they should be disposed of through sustainable recycling operations.

4 Materials

Sustainable Sourcing

If possible, costume departments should use recycled or 'deadstock' fabrics and cottons. Failing that, textiles should be certified organic, contain only organic dyes, be sourced locally if possible, and be machine washable, to avoid chemical or dry cleaning. Scraps should be recycled in textile banks.

For hair and makeup, sustainable, non-toxic products should be used, with clear environmental labelling and disposal instructions.

Materials to Avoid

Some materials used in costumes, wardrobe, wigs and make-up are particularly damaging. These include glitter, synthetic dyes and products containing parabens and triclosan. For fastenings, use sewing, ties, pins & clips, instead of tapes, pastes & glues.

Cosmetic products should be accredited with an EU Ecolabel, Ecocert, COSMOS or similar, and come in 100% recyclable, compostable or reusable packaging.

5 Caring for Costumes and Wigs

Sustainable care of costumes and wigs means reducing the use of harmful chemicals and energy. Launder textiles below 30°C with products that meet AISE or EU Ecolabel requirements. Avoid tumble drying if possible.

6 Deliveries

Last-minute, one-off deliveries can best be avoided by early decision-making, and avoiding last minute changes of mind.

Combined orders from single sources avoids multiple deliveries. Good planning reduces last-minute ordering. Co-ordinating with other productions reduces deliveries even more. Deliveries are more sustainable if they're local, and use public transport or bike couriers.

9 Lighting, Sound, AV

1 Key Principles

Technical theatre is a success story for sustainability. New technologies use less energy. Equipment is modular, and reused many times.

However, lighting, sound and audio-visual equipment uses energy, even when on standby. Some equipment also generates heat, needing cooling from air conditioning systems.

To make technical theatre more sustainable, we need to:

- Improve technical design.
- Consider the whole-life of technical equipment.
- Reduce deliveries, and reduce the use of unsustainable products like PVC tape.

2 Design

Designers can reduce energy by minimising equipment and considering natural acoustics and lighting (where possible) to reduce energy need.

Where possible, use technical equipment which is readily available, and share it with other shows. Bespoke systems need more resource and energy. Instead, use in-house lighting and systems, rigs from other productions in the venue, or equipment readily available at hire companies. Modular and standard designs are easier for others to reuse.

Think flexibly. For example, question whether available lighting gels are acceptable, instead of ordering new ones.

3 Communications and Planning

Working sustainably needs lighting, sound and AV designers to integrate their thinking early in a show's conception. Producers should set up the necessary meetings, provide information so designers know what's available locally, and connect them with other teams to share thinking and equipment.

For example, a single set-up might be configured to suit a sequence of different shows, saving deliveries, resource – and cost.

4 In Use

Switch-on and off routines should minimise energy use. For lighting, this might include switching off discharge lighting between the end of the reset or rig check and the half hour call before the show starts, and between matinee and evening performances; and turning off dimmer racks, PSUs, drivers and other tech overnight.

Reduce energy use where possible by lower wattage lamps and reducing dimming settings.

Where possible, replace cable ties and PVC tapes with cloth ties, snap fasteners and clamps.

Ancillaries like lighting gels should be used for as long as possible and stored for reuse, rather than being thrown away. For long-term installations, consider dichroic filters.

5 Equipment

Lighting, Sound and AV are most sustainable where efficient equipment is reused repeatedly for a long time.

Equipment and AV systems should be carefully looked after, repaired frequently to maintain energy efficiency, and refurbished (where possible) rather than thrown away. They should be replaced by new equipment only when they have reached the end of their life. Don't ask for new or upgraded equipment unless shows really need it.

Lighting and AV teams should extend equipment lifespans with careful handling and frequent maintenance. Arrange maintenance training for complex equipment. Repair equipment rather than replacing it.

At end of life, make sure equipment is disposed of safely. Think how it can be reused, donated, repurposed, recycled or stored.

6 Deliveries

Avoid multiple deliveries of ancillary products or spares. Instead, plan ahead, communicating with other departments and productions to reduce the number of deliveries. When hiring, try and ensure adequate spares are included, to avoid re-ordering. Low carbon transport for deliveries – such as electric vehicles and rail transport – reduces transport emissions.

Receiving Venues

In many receiving venues, each show has its own technical set-up, requiring transport and set-up, often to create similar rigs.

- Where possible, collaborate between productions to share rigs.
- Ask incoming productions to use local hirers or green transportation.
- Help productions develop shared guidance on the use of standard systems and equipment.

10 Rehearsing, Show Run

1 Key Principles

The sections above indicate how to produce and develop a show sustainably. It's important to keep working sustainably through rehearsal; the run; and beyond to final disposal.

Many of the original team will move to other projects. Responsibility for sustainability often passes to stage managers, cast and crew. It's important to make sure that everyone who joins the production understands the sustainability target.

Stage Management

Stage managers' role is often important in rehearsals. They can monitor and support the show during a period when changes might threaten sustainability targets.

If it's possible to appoint the stage manager early, their expertise can also be valuable during the show's development.

Cast

Many actors have a strong commitment to sustainability. It's important the cast understands the show's sustainability target. They can have impact in talking about the production's sustainability in promotional material. They have an important part to play in the rehearsal room, and in choices made for travel and accommodation during a tour.

2 Rehearsals

The rehearsal period sometimes undermines the achievement of conceiving and making a production sustainably.

Rehearsal Rooms and Spaces

Sustainable Operations gives advice on running buildings as efficiently as possible. Rehearsal rooms should be heated or cooled only when they're occupied. Keep windows and doors closed whenever the heating is on. When the weather allows, ventilate with fresh air rather than running mechanical ventilation systems. CO2 sensors can make sure ventilation is only running when needed.

Make sure lighting is switched off when not needed.

Choose hired rehearsal spaces which minimise travel, and provide a sustainable environment.

Rehearsals

Reduce the number of paper scripts you print (not every change needs a full new script for everyone). Research materials can be shared on laptops. Some casts and directors work with digital scripts on tablets.

Catering for rehearsals should avoid single-use coffee cups and packaging for food. If you regularly send out to the same suppliers, then find a local supplier who delivers sustainably, offers vegetarian options, and uses sustainable packaging.

Change

Creative rehearsals rely on change - particularly for new work and devised shows. But any change, whether to sets, props, or costumes, is likely to be last-minute, needed in a hurry, and difficult to source sustainably. The more it is avoided, the better.

3 Show Management

Dressing Rooms

Much of the guidance for rehearsals also applies to dressing rooms. Heat or cool dressing rooms only when they're occupied. Make sure hot water for showers is only provided when needed. Make sure actors understand how heating systems work, and switch off lights.

Consumables

Long-running shows consume everything from rechargeable batteries, through food and drink to printer ink and packaging.

Use the ETC Theatre Green Book's Operations section to manage them sustainably.

Cast, Freelancers, Visitors, Contractors

Communicate with visiting cast, creative and freelance teams. Induct them on environmental policies when they arrive, making sure they understand your sustainability values and targets.

Make sure you provide guidance on:

- Travel.
- The use of heating, ventilation and other systems, including how to switch them off if they're last to leave.
- Your policies around catering, bottled water etc.

Most of all, make sure you listen to their needs and help find sustainable responses to them. Different casts and creative teams may have very different requirements.

11 Touring

1 Key Principles

Touring by ETC members may be national or international. Tours may involve work of all scales. In all touring, the priority is to reduce:

- Movement of people (travel)
- Movement of things (transport)

More distance travelled, with less sustainable means, has more impact on the environment.

Touring is part of the practice of many ETC theatres. It is inherently sustainable, since it helps each production reach more people. Touring will become easier as more sustainable freight options become available. In the meantime, you can tour more sustainably by:

- **Planning** - with early discussions with all staff and receiving houses.
- **Design** - reducing how much material you move.
- **Freight** - reducing and limiting the amount of set and equipment needed.
- **Travel** - choosing the most sustainable options & routes available.
- **Accommodation** / people - reducing the number and impact of overnight stays.

2 Communications & Planning

Set an ETC Theatre Green Book standard for each touring show. Learn from each tour to improve the next.

Whenever possible, arrange the tour geographically so that each journey is as short as possible. Avoid covering the same route twice. Early co-ordination with all partners is important. If possible, plan additional activity, or extra performances, so you stay longer in each location, achieving more activity for the distance covered.

During the planning phase, replace physical site visits with online meetings and detailed plans. Share resources and information about each touring venue, to minimise how much equipment you take on tour.

3 Designing Touring Shows

Set an agreed limit on freight (e.g. 'a single 3.5 tonne van'). If possible, design around common stock items which are available at venues, or easily hired or made locally.

Design shows to fit into suitcases that travel with the company. If a company member has to travel by air, an additional bag in the hold has less impact than a separate freight movement.

For international tours, consider re-building the set to avoid air freight. If time limitations are an issue, construct two sets that travel independently by slow sea freight.

4 Freight

Wherever possible, road freight should be in either electric, biomass or 'Euro 6' compliant vehicles.

Touring Technical Equipment

If possible, use in-house equipment to avoid transporting technical equipment. Alternatively, consider hiring locally, to avoid touring equipment. If you need to tour equipment, try to use sustainable transport.

Touring Set and Scenery

Where possible, reduce the volume of set both by design (see above) and by sourcing as much as possible at each venue (e.g. chairs).

For long-distance and intercontinental touring, good logistical planning is needed to reduce the impact of complex movements:

- Avoid moving empty or semi-laden vehicles.

- Use sea freight rather than air freight whenever possible (it emits only a sixtieth of the CO2 of air freight).

5 Travel

Choose rail travel over road and air whenever possible. If using private transport, try to make sure it is shared between several people.

If air flight is unavoidable, book direct flights only (take-off and landing cause more impact than direct miles). Use rail / flight combinations instead of multiple flights.

6 Accommodation / People on the Road

Book self-catering accommodation rather than hotels, where possible. If hotels are needed, seek green accreditation. Try to limit the number of staff travelling with the company, and many venues they visit.

Consider hiring staff locally for certain roles. For example, for a show travelling long-distance, send a single technical team member to set-up, and teach locally hired crew the show. An extra day's fit-up is better than moving large numbers of people.

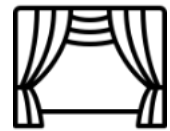
In some instances, consider managing set-up, focus or show calls remotely via zoom or specialist software.

7 Monitoring

Record all areas of activity in as much detail as possible: distance covered, mode of transport, nights of accommodation, energy consumption etc. The Production Calculator includes a travel calculator to help. Use kgCO2e data as a benchmark against future touring, focusing efforts on reducing the heaviest areas of emission.

Share what you learn from each tour, and feed it into your planning for the next.

You'll find tools and more in the **RESOURCES** area



Sustainable Productions

for...

- Downloadable Production Calculator
- Detailed guidance
- Case studies
- Toolkit

Go to **Productions** resources



Sustainable Operations

for...

- Downloadable Operations Tracker
- Detailed guidance
- Case studies
- Toolkit

Go to **Operations** resources



Sustainable Buildings

for...

- Downloadable Building Survey Tool
- Detailed guidance
- Case studies
- Toolkit

Go to **Buildings** resources

Certification

for...

- Downloadable Self-certification forms

Go to **General** resources

Renew Culture are co-founders and co-authors of the Theatre Green Book. We have pioneered the growth of Green Book networks across the world, and are leaders in theatre's journey to sustainability.

<https://www.renewculture.co.uk>

Renew Culture
The Theatre Green Book

Buro Happold is an international, integrated consultancy of engineers, consultants and advisers. After leading the construction industry in declaring a climate emergency, we've committed to reduce our own impact by achieving challenging science-based targets. We are collectively working towards an equitable and green future by adapting our business to mitigate climate change and the biodiversity crisis and helping others achieve their sustainability goals.

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