

# Making up Worlds

Sandra Dartnell, Create & Design Programme Manager at The Royal Ballet & Opera

**Behind every breathtaking performance at The Royal Ballet and Opera lies a world of creativity, craftsmanship and innovation. In the workshops at Purfleet, Essex, teams of skilled makers bring to life the spectacular sets that transport audiences from Covent Garden to distant worlds. Yet amid the sawdust, sketches and scenic paint, a new kind of artistry is emerging rooted in sustainability. The Royal Ballet and Opera are leading the way in sustainable theatre-making, guided by the Theatre Green Book, a shared commitment across the UK arts sector to create productions that tread lightly on the planet.**

The Royal Ballet and Opera make world-class ballet and opera for everyone. Everything seen on our stages is designed, sourced and crafted by our Technical, Production and Costume department, and our workforce includes our many apprentices, as well as by the freelance specialists we collaborate with.

In our scenic production workshops in Purfleet, Essex, we work on the sets for up to 10 new productions each year, as well as refurbishing and modifying sets from our existing repertoire of around 160 productions. We employ scenic draughtspeople, technicians, metalworkers, carpenters and scenic artists. We make scenery for the two theatres at our Covent Garden site; our main house which seats 2256, and the Linbury studio theatre which seats up to 400, as well as producing work for outside companies across the globe. Many of our new productions are collaborations with other opera houses around the world. This can be quite complicated, as each theatre has very different dimensions and technical specifications, but it makes it interesting!

The Royal Ballet and Opera are part of a wider national and international theatre sector. In the UK we have been collaborating to define better ways of working for a sustainable theatre and have committed to following the principles of the Theatre Green Book. The Theatre Green Book was created to provide a step-by-step guide for theatres and performing arts venues to become more sustainable. It covers all aspects of theatre including our buildings, operations and productions. We use it to help our staff understand that everyone has an important role to play in making The Royal Ballet and Opera more sustainable; many of us taking small steps together will result in big changes.

## A Balancing Act

Ensuring that we make sets that capture the designer's vision, have minimal impact on the environment and will last for performance after performance can be a difficult balance. At The Royal Ballet and Opera, we face many challenges to produce sustainable sets, but the will to be front runners is very strong throughout the team. We begin by employing curious people and creating the space to question things.

Everyone on the team is tasked to think about sustainability and consider where things come from, how much is really required and where something goes afterwards. Our repertory model, where productions are stored and then 'revived' or brought back to stage later, is inherently sustainable, but brings its own problems of longevity and durability.

## Start With Sustainability

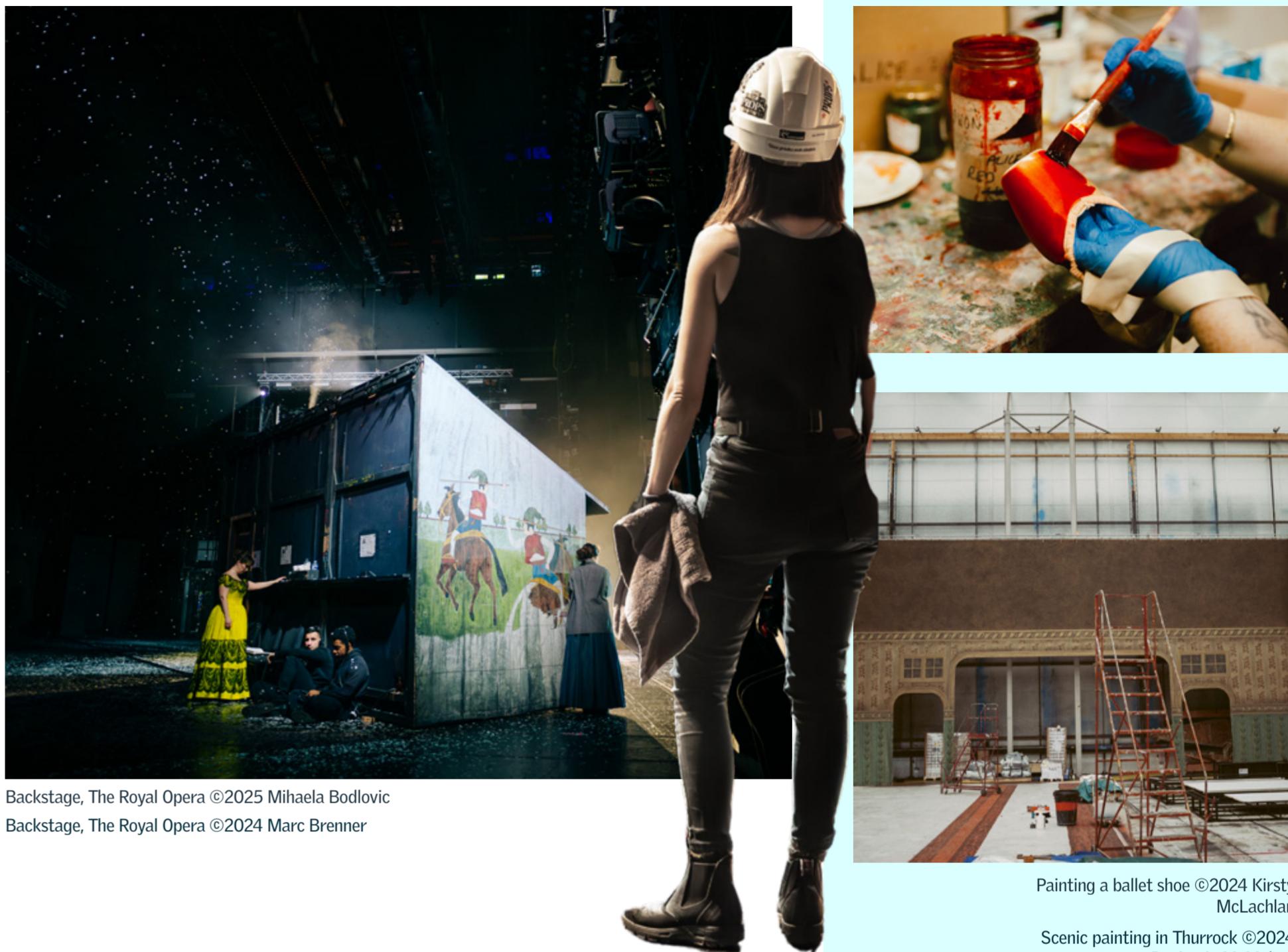
Continuous improvement in the field of sustainability is a vital part of the work we do across the Royal Ballet and Opera, and we were a founding contributor to the first edition of the Theatre Green Book and remain wholly committed to the ever-evolving standards. As a largely repertory theatre we have reused many sets for decades, for example a production of the opera *La Bohème* produced in 1974 and designed by Julia Trevelyan Oman was in our repertoire for 40 years and performed dozens of times, so we have a commitment to the longevity of what we produce built into our core principles.

Through experience we have found that it is better to consider sustainability from the very beginning of the design process rather than trying to reverse engineer an existing design. Where we can, we use existing stock, repurpose unwanted sets and scenery and source second hand materials. Where we cannot re-use, we aim to buy sustainably sourced materials as much as possible, and work with suppliers to make continuous improvements.

There is an ever-growing number of companies creating products where the impact on the environment is far less harmful, and although this is not always as easy, it is a fast-moving industry with new products coming on the market all the time.

For example, we use a range of natural purifying mineral-based paints where we can, and all our timber used in scenic construction is FSC approved (Forestry Stewardship Council) and sourced from suppliers locally. In our metalwork department we have designed a system of modular frames shared between productions; using these to support the scenery and sets will not change the experience for the audiences, but it reduces the new materials we need to purchase.

When a production is retired, we strip the scenery, props and costumes of all we can reuse, and sell, hire, or donate them to contribute to a more circular economy. We then dismantle any remaining scenery and ancillary items we can, such as steel frames or wheels, and use them in the making of new sets; this reduces our reliance on new materials and gives these items a second life.



Backstage, The Royal Opera ©2025 Mihaela Bodlovic

Backstage, The Royal Opera ©2024 Marc Brenner

## Materials, Craft and Innovation

The Theatre Green Book gives step-by-step guidance on how to become more sustainable including requiring a certain amount of materials on stage that have had a previous life. These efforts to reuse, repurpose and purchase sustainably mean we are currently working to the Basic standard, or the first level, over the course of the season. To ensure we keep progressing, we have set dates by which we will achieve Intermediate and then Advanced standards; this is the highest level of certification. Use of sustainable products often involves more traditional techniques and substances, and we are keen to ensure traditional skills are maintained.

Our drive to create more sustainable sets also means working with industry to ensure more sustainable alternatives are available on the market. We test products to determine whether they will meet our rigorous standards and if not, look to find ways that they could be adapted to meet our needs. Collaboration with other theatres is an important part of this, to share our findings and learn from each other.

The 2010 design of our scenic production workshops building had sustainability incorporated from the initial concept with LED lighting, ground source heat systems, and a vast sedum roof. We are working on future improvements such as filtration and reuse of our water, and a commitment to greater biodiesel use for the fleet 7 trailers that take our scenery from here to Covent Garden, to our purpose-built scenic warehouse in Aberdare in Wales and back. The warehouse has capacity for over 1000 lorry-loads of scenery and props!

## Collaboration

The scenic production team makes sure that creativity is available to as many young people as possible, through our Schools Programme KS1-KS4 and our KS5 Design Challenge using the passion and expertise we have for ballet and opera to fight for the availability of arts education, including the Design & Technology curriculum and sustainability within it.

KS5 Design Challenge is a great way to develop skills and build a portfolio. Shortlisted work is seen by some of the world's most celebrated creators, artists, and technicians and receives professional feedback. We even get to meet the winners at the Royal Opera House. We collaborate on the creation of the brief and ask students to outline how a designer might show consideration of the environmental impact of their choices.

## Get involved

The Royal Ballet and Opera Design Challenge is a national, skills-based design competition that gives students the chance to work to a brief inspired by a Royal Ballet and Opera production. Each year the Design Challenge provides KS5 teachers with a new free resource to run a live brief in their classroom including lesson plans and teacher CPD. Competition pathways are Set Design, Costume Design, Wigs, Hair and Make-up Design, and Marketing Design. Design Challenge has now nurtured young talent and enabled access to our artforms for 15 years.

## Links



**Take the KS5 challenge!**  
Enrol your school to compete today.  
[tinyurl.com/52rmkedn](https://tinyurl.com/52rmkedn)



**Other ways to get involved**  
D&T Association Webinar for Primary and Secondary D&T Teachers.  
[tinyurl.com/34jx6s84](https://tinyurl.com/34jx6s84)



**Upskill with Secondary CPD**  
Find out about our online events for teachers  
[tinyurl.com/mr3vf7y7](https://tinyurl.com/mr3vf7y7)



**Attend a performance.**  
Find out about our Schools' Matinees for Secondary / FE. Being in the audience at a live performance develops empathy skills for designing for a live performance.  
[tinyurl.com/57hw3xkz](https://tinyurl.com/57hw3xkz)