Sustainable Approaches to Costume Design

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by

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Abstract

Building a theatrical production requires numerous individuals and countless hours to create the scenery, costumes, props, lighting, and other elements that bring a show to life. The design and construction processes occur within a quick timeline and a tight budget. Once a show closes it must be deconstructed and removed from the venue as quickly as possible. This pressure-driven, take-make-waste system contributes to environmental unsustainability both locally and globally.

Young theatre artists are increasingly aware of the wasteful practices within the industry and are dissatisfied. A survey of Theatre Design and Production students at the University of Cincinnati College-Conservatory of Music showed that the majority of students believe their work has an environmental impact and that they would like to change their work to be more sustainable. However, many students reported feeling uncertain about how to integrate sustainability into their work. Costume students specifically noted their reluctant dependence on fast fashion and the harmful social and environmental effects that it has. Several students stated that they felt they did not have the time, money, knowledge, or power to change their work to be less harmful.

A costume designer *has* the time, money, knowledge, and/or power to make decisions that reduce negative environmental impacts and increase positive change within their communities. By reevaluating existing systems and old habits, a costume designer can discover numerous opportunities to make their work more sustainable.

This thesis presents a collection of suggested strategies for sustainable practices for costume designers. These strategies are drawn from other theatre artists, and related

industries such as architecture, industrial design, and fashion design. These strategies include reallocating budgets from products to people, renting and sharing resources with other companies, shopping secondhand, transforming existing stock, designing for reuse or decay, allowing time for experimentation, implementing health and safety initiatives, ceasing support for unethical businesses, practicing minimalism, designing for a season at a time, accounting for the value of existing stock and materials, promoting a circular or cradle-to-cradle economy, changing academic curricula, and expanding positive community impacts. By presenting a variety of strategies in this thesis, costume designers can find sustainable solutions that can be immediately integrated, as well as broader strategies to implement in the future.

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Introduction

Defining Sustainability

Sustainability is defined as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations Brundtland Commission, 1987). The United Nations characterizes Sustainable Development as the intersection of environmental, social, and economic sustainability. This thesis will address all three aspects, with a primary focus on environmental sustainability. The definition of environmental sustainability utilized in this work is borrowed from Julia Chase’s 2022 article, “It’s Not Easy Being Green, But We Have to Try.” Chase states, “For our purposes sustainability will refer to methods that have as little environmental impact as possible. It is an umbrella term that encompasses eco-friendly, green, zero-waste, and other environmentally conscious ideologies” (Chase, 2022). This thesis will use the terms *social sustainability* and *economic sustainability* as necessary, while using the general term *sustainability* to refer to environmental sustainability.

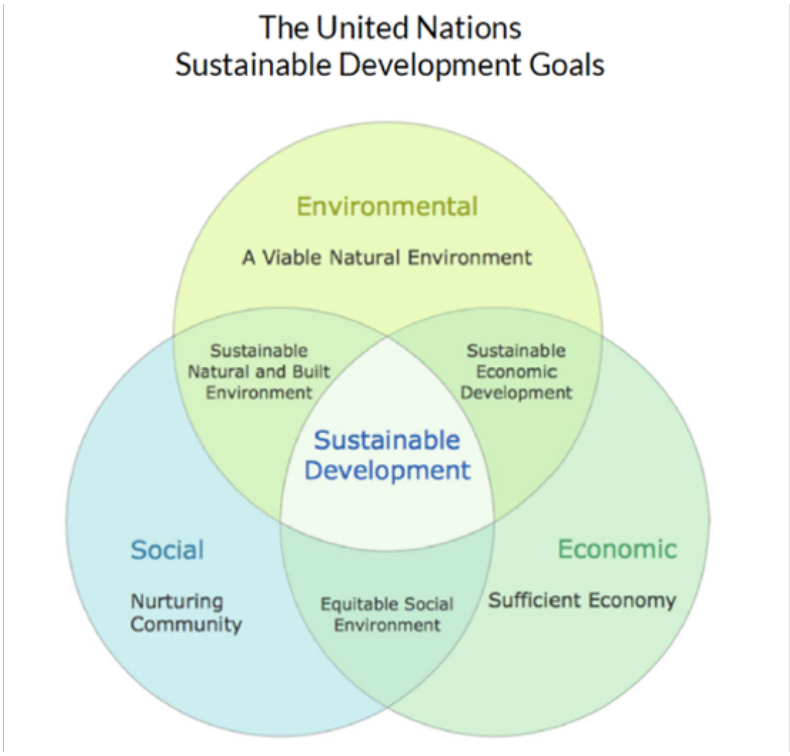


Figure 1: The United Nations Sustainable Development Goals

CCM Survey Results

As part of this thesis, a survey was conducted among Theatre Design and Production students at the University of Cincinnati College-Conservatory of Music. A total of 112 individuals participated in the survey, which included 5 staff or faculty members, 29 graduate students, and 78 undergraduate students. The participants specialized in various departments, including Costumes, Wigs Hair and Makeup, Sound, Lighting, Scenic Design, Stage Management, Technical Direction, Props, and Arts Administration. The survey asked three multiple-choice questions and two open-ended questions. The multiple-choice questions were: “Do you understand what sustainability is?” “Do you know how to implement sustainable practices into your work?” and “Would you be interested in changing how you work to be more sustainable?” The response options were “yes” “no”, and “unsure.” The results are presented in the table below.

Table 1: CCM Sustainability Survey Results (Fry, 2025)

Answers	Do you understand what sustainability is?	Do you know how to implement sustainable practices into your work?	Would you be interested in changing how you work to be more sustainable?
Yes	110	47	103
No	0	11	1
Unsure	1	52	7

The two open-ended questions were: “Do you believe that your work as a theatre maker has an effect, either positive or negative, on sustainability? (Environmental, Social, and/or Economic)” and “What are the biggest barriers or assets to being more sustainable in theatre?” Responses included:

“Do you believe that your work as a theatre maker has an effect, either positive or negative, on sustainability? (Environmental, Social, and/or Economic)”

- “We reuse a lot so I find that to be more positive… I don't feel like I know how to reduce waste while still doing what the show needs”
- “There are lots of things that aren't built to last.”
- “Anything we create for a limited use is wasteful if not for recycling/ reusing. I think theatre is a tool we can use to change perspectives on sustainability”
- “Negative to an extent with how much we rely on things like amazon and cheap materials… Positive when it comes to props using old, scrap material and reusing old props for shows as well as being able to use old items we can restore for theatrical use”
- “I think it is our responsibility as techies to be sustainable with how we use our resources because why waste labor, time, money, and resources”
- “Absolutely! As artists, our job is to foster story through human connection... Where would we be if we destroyed ourselves, others and the planet? We certainly wouldn't be in theater”

- “Yes, art projects a message… our choices on what we put on stage and how we chose to create them have positive/ negative impacts”
- “I think that I can have a positive affect, even if it doesn't change the world. Each individual action can prevent further detriment. I also think you can influence other people into being sustainable and it can snowball”
- “I think that my work could have a positive effect on sustainability because I use many different materials in my work and how I source them and what I do with them afterwards can affect the environment.”
- “I do, particularly with the toss away nature of our jobs. It's fleeting and it’s very difficult to justify not buying or creating something new as each show is different. Saving items and pieces also requires storage which isn't accessible everywhere”

“What are the biggest barriers or assets to being more sustainable in theatre?”

Note: Most responses to this question centered around **time** and **money**. To avoid redundancy, I have consolidated some answers.

- “You can only re-use wood/materials so many times”
- “Whether theaters have large and organized storage spaces”
- “Resistance to change (and science sometimes). Relative lack of initiative/ research into topic.”
- “Interdepartment collaboration”
- “More sustainable/ high quality materials are more expensive”

- “Challenging the norms, education”
- “We don't always get a choice of what materials we use and how they are made. We have to buy what we can afford”
- “Constant demand for new and different visuals bar reuse”
- “Single use plastics for sanitation”
- “The biggest asset would be reusing material, but the barrier to that is if it is actually reusable after a show”
- “Established sustainable practices”
- “Labor costs more than materials in most cases. The cost of properly disassembling of sets and reuse materials/ recycle is often not seen as cost friendly”
- “I think practitioners stuck in their ways are standing in the way of stepping forward with more sustainable practices.”
- “Material availability”
- “I don't control the money so I can't ensure proper facilitation of sustainable practices”
- “A companies willingness to adapt to new things”
- “Time, space, community support, planning far in advance of show needs.”

The results of the survey indicate that while most students understand sustainability and want to implement sustainable practices in their work, more than half are uncertain about how to do so. Responses to the question, “Do you believe that your work as a theatre maker has an effect, either positive or negative, on sustainability?

(Environmental, Social, and/or Economic)" included many mentions of waste generation and the potential for theatre to create a positive social impact. Most of the answers to "What are the biggest barriers or assets to being more sustainable in theatre?" cited time and money as the biggest barriers. Other identified barriers included perception, education, control, and artistic vision. Conversely, assets mentioned included the theatre's tendency towards reuse and creativity.

The results of this survey inform suggested practices within this thesis and support the acceptance and integration of sustainable practices in theatre.

Why Sustainability is a Theatre Issue

Theatre artisans will not save the world. They are not the largest contributors to climate change, nor do they have the power to reverse it. So, why should theatres care? The Edinburgh Fringe Festival's 2018 Green Guidelines lists four reasons:

1. It saves money
2. It creates a better reputation
3. You get ahead of regulation
4. It matters. (Sustainability Toolkit for Performing Companies, 2018)

The principle "It saves money" will be discussed in later sections, while the other three principles will be elaborated on here.

It Creates a Better Reputation.

The performing arts industry is not particularly profitable, and many companies struggle to attract interest and secure funding from the public. Theatre companies may feel they do not have the time or money to research and implement sustainable practices in their work. However, not doing so can damage a theatre's reputation. In the age of widespread information, discerning patrons can find what a company is purchasing, which businesses they are supporting, and where their funding is coming from. "For spectators who increasingly scrutinize the integrity of everyday items, such as electricity, food, cosmetics and fashion, the need to acknowledge the socio-ecological impact of that which we consume culturally seems highly plausible." (Beer, 2021).

Environmental accountability in purchasing and funding has already been demanded by many public arts foundations in the United Kingdom.

In October 2019, the Royal Shakespeare Company (RSC) in England severed its ties with long-term sponsor British Petroleum (BP) in response to threatened boycotts from students and schools associated with the company. Director Gregory Doran stated, “Central to our organizational values is that we listen to and respond to the views of young people… Amidst the climate emergency, which we recognise, young people are now saying clearly to us that the BP sponsorship is putting a barrier between them and their wish to engage with the RSC.” (Kolirin, 2019).

In contrast to the UK’s move towards environmental accountability, the United States has done little in response to the climate crisis. The League of Resident Theatres (LORT) is the largest professional theatre association in the United States, setting standards for both member and nonmember theatres to follow. “As of July 2021, fewer than 10% of League of Resident Theaters (LORT) theatres include sustainability, climate action or environmental justice in their mission statements or goals... What is being communicated by much of the material world of the American theatre is an unfortunate story of environmental degradation, waste and inequity in the context of an increasingly urgent climate emergency” (Goldmark & Purdum, 2021).

The behind-the-scenes work of theatre has a significant environmental impact, one that can be mitigated through internal company policies and goals. This can demonstrate to the public that a theatre company recognizes its impact and is striving for improvement.

A theatre company does not need to produce shows about environmentalism to include sustainability into its mission statement or goals.

One of the ways Canada's theatre industry is working to address its environmental impact is through its unions, specifically The Associated Designers of Canada Union, which is developing the "Green Collaboration Project." It is an agreement signed by designers and producers stating that they will strive for more sustainable practices. The goals of this agreement include reusing and recycling costume and set pieces, budgeting for sustainably sourced products, and limiting purchases from unsustainable vendors such as Amazon and Shein (ACD, 2025).

Audiences care about the companies they support, and failing to include environmentalism in a theatre company's goals and mission statements can lead to a bad reputation.

Get Ahead of Regulation.

"Theatre's prominent 'take, make, dispose' attitude is fast becoming outdated. Related industries such as architecture and fashion have been steadily accruing environmental resources, tools and precedents over the past decades and have found great success in the implementation and associate financial gains." (Beer, 2021). Examining other countries and industries reveals an increase in eco-regulations. Theatre intersects with many other industries, so even when environmental regulations are not specifically directed at them, they will inadvertently affect them. Examples of this in the United

States include the ban of Chlorofluorocarbons (found in spray paints and hairsprays) in the 1970s and the ban of Red Dye 3 (found in food coloring) in the 2020s. Both materials were utilized within theatre, and when they were banned, theatre artists had to seek alternative solutions.

Environmental regulations also vary from state to state; for instance, in California, water usage is restricted during periods of drought. Investigating the potential harms of the products and processes that the theater industry relies on will enable theater makers to proactively transition to less harmful alternatives before regulations are enacted.

It Matters.

In 2016, Barnard College hired the energy consulting firm Gotham 360 to conduct a greenhouse gas inventory for one of its productions. Based on their findings, researcher Sandra Goldmark estimated that “in the United States alone, approximately 1,800 regional theatres put on 22,000 productions a year (TCG, 2013). This does not count Broadway, touring productions, and academic productions… If each of these shows produced approximately 10 metric tonnes CO2, just a 50 percent reduction… would prevent the emissions of nearly 120,000 metric tonnes of CO2 annually” (Goldmark, 2019). Considering the small size of Barnard's production and the exclusion of Broadway, touring, and academic performances from the data, this estimate of greenhouse gas emissions generated by theater is likely an underrepresentation. A

nationwide adoption of even minor sustainable changes within the theatre industry could lead to a significant environmental impact.

Sustainability can seem intimidating and overwhelming, leading many individuals to overlook the issue due to feelings of helplessness. Despite decades of warnings from scientists about climate change, people struggle to comprehend and apply that information. However, “the arts can synthesize and convey complex scientific information, promote new ways of looking at issues, touch people’s emotions, and create a celebratory atmosphere.” (Curtis, 2012). Exploring and understanding sustainability through theatre serves as an effective tool both on and off stage. Sustainability matters in theatre because theatre makers are part of the problem, and they have the tools to create the solutions.

Why Sustainability Matters to Costume Designers

“Yvon Chouinard, the founder of Patagonia once wrote that ‘90 percent of the waste in a product is created in the design phase.’ This means that, if you want to reduce waste, or emissions, it is not enough to try to make something in a ‘green’ way; you have to intentionally design it that way from the very start.” (Goldmark, 2019). As a costume designer, particularly as a freelancer, it can feel as though the costume shop and producers are the ones with the capacity to make sustainable change. After all, they are the ones who decide on the shows, concepts, schedules, and daily operations. However, if the above quote is accurate, designers have the power to create new systems, and design in ways that can significantly impact the environment. This thesis focuses on sustainable strategies for costume designers, but some of the suggestions apply to other costume positions as well.

“The designer is both a consumer and producer of things, and these dualistic roles are coexistent, and ever-present. This is because in order to produce finished, resolved objects one must consume (often through specifying) materials, components and manufacturing processes.. much of the creative practice is the practice of appropriate consumption” (Chapman, 2007). The costume designer directs the acquisition and creation of their designs, and every choice carries an environmental impact. In Tanja Beer’s book “Ecoscenography”, she states, “No decision stands on its own: every design choice is intertwined with social, environmental, economic and political consequences.” (Beer, 2021). Understanding the repercussions of their decisions is integral for costume designers striving to create positive change.

Costume Designers and the Textile and Garment Industry

Costume design is heavily dependent on the textile and garment industry. Every purchase of clothing and fabric supports this system in some capacity. The Ellen MacArthur Foundation's report, "A New Textiles Economy: Redesigning Fashion's Future" (2017), states

> "Many workers face dangerous working environments due to unsafe processes and the hazardous substances used in production. High cost and time pressures are often imposed on all parts of the supply chain, which can lead to workers suffering poor working conditions with long hours and low pay, with evidence, in some instances, of modern slavery and child labour. The potential for negative societal impacts does not stop at the factory door. Local communities, while benefiting from employment in the industry, may suffer from its poor environmental practices. For example, discharging untreated production wastewater pollutes local rivers used for fishing, drinking, or bathing." (Ellen MacArthur Foundation, 2017).

Speaking further about the environmental impacts, the report explains that "The textiles industry relies mostly on non-renewable resources- 98 million tonnes in total per year- including oil to produce synthetic fibres, fertilizers to grow cotton, and chemicals to produce, dye, and finish fibres and textiles." (A New Textiles Economy, 2017). This is a devastating amount of non-renewable resources being used to produce clothing.

Most modern clothing contains polyester, also known as plastic. The plastic in our clothing is derived from crude oil and will never fully biodegrade; instead, it breaks down

into smaller and smaller pieces called microfibers. These fibers will remain in our water, food, and bodies forever. “Over the course of a year in the United States and Canada, clothes washing sheds 85 quadrillion microfibers, 3.5 quadrillion of which are believed to escape into waterways and the ocean. That’s 878 tons – the weight of 10 giant blue whales.” (Humes, 2024). These cheap polyester garments has also led many consumers to treat clothing as disposable, “Worldwide, the clothing that gets incinerated or dumped each year is equal to one garbage truck full of fashion every second.” (Humes, 2024).

To summarize, the production of clothing and textiles requires an excessive amount of energy, water, non-renewable resources, and exploitative human labor. The manufacturing process harms people and the environment, and once consumers receive garments, they pollute the earth with every wash, then eventually dispose of the item which will continue to pollute the earth from under the ground. Unfortunately, the bad news does not end there. Beyond the manufacturing and purchasing of garments, the processes of returns, donations, and textile recycling present a grim reality.

A common practice among costume designers is to purchase clothing items in various colors, sizes, and styles to try on in a fitting, then return what they do not need. This approach is a convenient, low-risk way of getting many options without spending lots of money. Although the designer does not directly pay for the labor and transportation involved in processing orders and returns (i.e. Amazon free shipping and returns), somebody *is* paying that price. Ethan Zuckerman, a research fellow at Harvard Law School, states, “Shipping stuff around the world may not cost much, but it weighs

heavily on the planet. Sending things around the world can significantly swell their ecological footprint, and the shipping industry itself has not been known as a green standard-bearer, as oil spills, toxic ship breaking (the process by which old ships are scrapped), and the dumping of polluted ballast water are all commonplace.” (Stone, 2009).

When designers return items, they assume their items are put back into circulation, but this is not always the case. In the New Yorker article “What Happens to All the Stuff We Return?”, author David Owen interviews an employee at a product destruction facility “who described receiving truckload after truckload of Amazon returns and shredding everything—ostensibly for recycling, although the recoverable content of a chewed-up random selection of consumer goods is not high.” (Owen, 2023). It costs money to ship an item back to a company, process the return of the item, inspect it, get it ready for resale, and then restock it, so for many large companies, it is cheaper to simply dispose of the items.

A common location for unwanted clothing is charity shops. This keeps the clothes out of landfills and allows someone else to buy and use them. Unfortunately, this is not always the outcome. In her investigation of what happens to clothing donated to thrift stores, Maxine Bedat found that “only about 40 percent of what we [consumers] donate to the Salvation Army is even in saleable condition, only about 20% is actually sold. So, to simplify, for every 100 pieces donated, only 8 will be sold on the Salvation Army sales floor.” (Bedat, 2021). In her book, "Unraveled: The Life and Death of a Garment,” she explains that items not sold in thrift stores (approximately 92% of donated clothing) are often broken down into commercial or industrial rags, used as furniture stuffing,

insulation, or building materials, or simply sent to the landfill. Some items may be deemed unsuitable for sale but not so damaged that they need to be shredded. Clothing that falls into this category may find its way to secondhand markets, such as the one in Kantamanto, Ghana. Here, sellers sift through the 15 million rejected garments that arrive weekly from the United States, of which only about half can be resold in market. The rest is disposed of locally (Besser, 2021). The infrastructure required to process that textile waste is enormous. Instead of developing this infrastructure within the United States, America exports its waste to other countries who have even less resources to process it. “There are large regional differences in collection rates [of textile waste]… in the US and China rates are between 10% and 15%. Many countries, particularly Asia and Africa, have no collection infrastructure at all. This is especially relevant as clothes collected … are mainly exported to these parts of the world.” (Ellen MacArthur Foundation, 2017). This practice is not only unethical but also dangerous. With no way to process the 7.5 million unusable garments that the United States sends to Ghana each week, mountains of textile waste cover the coast, polluting water supplies, collapsing on top of people, and regularly catching fire (Besser, 2021).

So, donating to charity shops is not a perfect solution. What about textile recycling? As mentioned in the previous paragraph, textile recycling capabilities vary from country to country; however, the overall field remains significantly underdeveloped. “Even if we tried to recycle all of our old clothes, it’s important to acknowledge that a lot of these textiles — about 60 percent of them — are not recyclable in the first place, which is why they end up in landfills or burned. Many of our clothes are made with plastic… which

makes them almost impossible to reuse in other ways — meaning they cannot be recycled or decomposed.” (Portela, 2021).

The textile and garment industry poses significant risks to both people and the planet. However, costume designers rely on this industry to perform their work. It is essential for individuals and companies that work with and benefit from the textile and garment industry to adopt practices that minimize dependence on businesses that exploit their workers and harm the environment.

Suggested Strategies

So, what now?

Studies indicate that the lack of urgency and action regarding the climate crisis is not due to a lack of information, but a lack of motivation and accountability (Parant, 2017). In Parant's 2017 paper, "Raising Students Awareness to Climate Change: An Illustration with Binding Communication" they found that *facts* and *fear* are ineffective in motivating action. In contrast, providing *multiple options* for *immediate change*, coupled with *accountability*, proved to be highly effective.

The remainder of this thesis will adhere to the study's recommendations by moving beyond the grim realities and overwhelming statistics, focusing instead on a variety of strategies that costume designers can use to effect positive environmental change. Each concept will be explained, followed by an exploration of potential implementations. These implementations will include the pros and cons of each idea, along with personal anecdotal examples of their application. The aim is to inspire and empower costume designers to adopt more sustainable practices in their work. While not every idea will be suitable for every project, creating realistic goals based on these recommendations can help a costume designer to improve their environmental impact.

Shifting Budgets from Products to People

The Idea

The Theatre Green Book is a UK-based organization focused on finding and distributing resources to help theatre companies become more sustainable. They produce a resource titled *The Theatre Green Book*, which offers detailed sustainability recommendations for all areas of theatre production. When discussing how strategies vary based on a theatre's size and capabilities, they state, "Small-scale shows may involve smaller teams and less resources, but the principles of sustainability are the same: to create more with less; to collaborate more closely; to focus on people not objects; to replace the consumption of resource with creativity" (Burger and Dillon, 2024). One key takeaway from these guidelines is to "[shift] our focus from resources to people… spend more on people's time, spend less on materials" (Burger and Dillon, 2024).

The Implementation

When a designer is deciding which clothing items to pull, build, or buy for a production, there will always be items that could fit into any of these categories. Although it may be quicker and/or cheaper to purchase certain items, costume designers can alter existing stock items and build garments instead of buying them when possible. This redirects funds that would typically go to large businesses into the pockets of theatre employees.

Additionally, altering and repurposing existing stock garments provides the benefit of giving new life to items that the shop already owns.

Due to restraints of labor, budget, and time, this strategy is not feasible for all items in a production. Nevertheless, it can be a valuable consideration when finalizing pull/build/buy lists in collaboration with a costume shop manager. Caution must be taken when making these decisions to ensure that employees are fairly compensated for their work and provided with adequate time to complete it. When implemented on a large scale, this strategy may also necessitate adjustments to timelines and the hiring of additional staff members, so it should be decided on well in advance.

Reallocating funds from products to people must also consider the labor required to maintain and retain garments after a production closes. “We need to pay for a person to take this… apart and pay for somebody to properly log and look after and store and make networks to share.” (Piper, 2023). Cleaning and cataloging clothing items during and after the run of a show is not typically the responsibility of costume designers; however, these tasks could be included in contract and budget negotiations.

Renting and Sharing

The Idea

Theatres frequently rent costumes from rental companies and from one another. Renting is commonly used when a theatre has an inadequate stock or requires specialty items. Renting is a sustainability strategy because it reduces the number of new garments purchased and helps keep costumes and money circular. Additionally, renting and sharing between companies broadens the options available to designers.

Scenic designer Tom Piper shared his approach to designing the scenery for *The Tempest* at the National Theatre in London, England. He visited local theatres to see what productions they were currently doing and to inquire about their plans for set pieces once the shows closed. During these visits, he asked if he could borrow, buy, or have various scenic elements once their shows closed. Using this information, he designed a set that incorporated these elements, then went to collect them once their productions closed. (Piper, 2023). Knowing what local theatre companies have in their inventory and what productions they are putting on can allow a designer to access additional resources, minimize waste, and increase circularity.

The Implementation

Co-productions are a common practice among large opera companies, where multiple theatres contribute to a single production budget. This arrangement requires an agreement on who will build the pieces, who will transport them, and who will store

them. This concept could be implemented on a smaller scale, with theaters collaborating on projects across shows within a season. Even if the companies are not doing the same production, they could coordinate on making garments that serve both shows. For instance, Company #1 could provide Company #2 with additional funds to create petticoats for their production, with the agreement that Company #1 would be able to use them for free later in their season. Having a designer who is contracted across multiple theaters and productions is a valuable way to facilitate these agreements.

Finding the right company to collaborate with can be challenging. Reciprocity differs between companies, and some theaters may not be interested in sharing or renting with others. Building trust between organizations is often difficult and can take time; however, the results can be mutually beneficial if companies treat each other with care and respect. An additional advantage of renting or sharing is that a company requires less physical space to store its items.

Storage spaces can be expensive to maintain, as they often require paying for rent, lighting, cleaning, heating and cooling, pest control, shelving, bins, cataloging etc. It takes an enormous amount of time, money, personnel, and careful planning to create and maintain a good, usable stock. Even without databases or barcodes, a well-organized inventory and a straightforward written agreement can allow most theatre companies to rent from one another effectively.

Another way for theatre companies to collaborate is by sharing the cost of bulk materials, and/or renting storage spaces together. In “Theatre Design and Production

Reimagined: Four Principles for a Sustainable Future" Brunner & Mehler discuss this concept, stating, "If they [the theatre companies] can agree to a shared warehouse of products… the theatres would have the leverage of purchasing materials in bulk, thereby reducing the cost per unit of more sustainable materials" (Brunner & Mehler, 2013). Sustainable products often come at a higher price, making this approach an excellent option for costume shops looking to purchase large quantities of basics, such as muslin, from more sustainable sources. Additionally, sharing rental costs for physical spaces enables theatre companies to retain more of their costumes for future reuse, rather than discarding them once a production closes.

Secondhand Shopping

The Idea

Most costume designers purchase secondhand clothing for productions already because it is economical and offers a wide variety of vintage and pre-worn or distressed items. Costume designer and sustainability advocate Sinéad Kidao encourages designers to utilize thrift stores even more, stating that they should opt for “secondhand for more ordinary, everyday looks that would usually rely on the high street” (Kidao, 2022). The environmental impact of new versus secondhand contemporary basics can be significant; “the estimated emissions saved from buying a used shirt instead of a new one is 2.5 kilograms of CO2 equivalent which amounts to the carbon absorbed by 127 trees in one day period” (Goldmark, 2020). Shopping secondhand is one of the easiest and least expensive ways for costume designers to decrease their negative environmental impact.

The Implementation

Some drawbacks of shopping secondhand are that options are limited, it requires time and luck to find specific items, and if an item does not work out it usually cannot be returned. While most thrift stores do not offer returns, some may offer exchanges or in-store credit. When a designer is looking for something very specific and has exhausted local options, they can turn to the online secondhand marketplace, which has expanded significantly over the past decade. Nowadays, finding vintage and contemporary

clothing online in great condition is quite easy. Websites such as eBay and Depop allow buyers to purchase directly from sellers, while platforms like Beyond Retro and ThredUp provide quality-checked items that are paid for and distributed by a central company. Online secondhand retailers with large stocks also allow buyers to search by color, size, style, and brand, making sourcing much quicker. This feature also allows for the possibility of finding multiples of a single garment which is rarely possible when thrifting in person. Sinéad Kidao's *The Costume Directory* has an excellent list of online secondhand clothing and material shops. The companies listed in *The Costume Directory* are primarily UK-based, so a supplementary list of US companies can be found in Appendix 1.

Secondhand fabrics can also be purchased online using the keyword *deadstock*. Deadstock refers to fabric that is no longer in production or is leftover from a previous manufacturing process. Deadstock quantities can be substantial in some cases, with dozens of yards, and samples being available for customers to purchase. Buying deadstock fabrics is a great way to get high-quality designer textiles at a fraction of the price, making it a smart economic and environmental choice. A list of online deadstock fabric retailers can also be found in *The Costume Directory* and Appendix 1 of this thesis.

Thrift stores can be an excellent source of fabric. Secondhand curtains, tablecloths, bedding, and clothing items, such as formal dresses are a wonderful source of material. "Not only does that 15-year-old prom dress cost less than buying the fabric from which it is made; it does not use raw materials and petrochemicals, reinforce sweatshop labor

models, create the chemical ridden waste water, or require shipping the fabric from Asia. The original creation of the dress did all those things. The damage is done. The embodied carbon footprint of the garment has already been incurred. Giving that dress a second life prevents me from adding another carbon footprint.” (Jones, 2014). In addition to fabric, thrift stores are a great place to find costume shop supplies such as furniture, hangers, binders, shelving units, and bins.

Not all thrift stores are the same, so it is helpful to keep track of what certain thrift shops tend to stock, when they put out new merchandise, what types of sales they offer, and what their return/exchange policy is. Price and inventory will vary depending on the economic makeup of the store's surrounding neighborhood. So, if a costume designer is looking for high-end cocktail dresses, they may find more options at thrift stores in wealthier areas; however, these items will often be more expensive.

In addition to thrift stores, many cities have organizations where secondhand craft materials can be sourced. For example, in Cincinnati, Ohio, where I am currently based, there is a secondhand craft store called Indigo Hippo that sells fabric, thread, notions, patterns, and sewing machine accessories, a small sustainable garment factory called Sew Valley which sells its excess materials and old sewing machines annually, and The Cincinnati Reuse and Recycle Hub which has lots of office and storage supplies for free. Connections to local artisan guilds such as weavers, fiber artisans, and quilting groups, can also be a great resource for acquiring or donating secondhand materials. Although it takes time and patience to find these organizations, once found, they can strengthen community ties and foster creative, sustainable solutions.

Transforming Existing Stock/ Upcycling

The Idea

“Most regional theaters have a fine stock of supplies… however, stock is often treated as a second-tier option; ‘we can't afford to build or buy something new, so let's just pull something’. If designers begin to turn that assumption on its head and see ancient habits of circularity as a rich resource of knowledge and materials with both social and environmental benefits, then theatre artists have a potential for outsize impact.” (Goldmark and Purdum, 2021). When working on a production, costume designers can collaborate with past artisans by reusing items from stock. Pulling from stock is not only a practical asset, but also a great source of inspiration. Designer Maison Schiaparelli from the fashion brand The Social Outfit says that when they start to develop a collection, “We look at what we have received and design from the fabric back” (Press, 2024). Starting a design by assessing what garments, fabrics, and resources a theatre has access to is not only environmentally sustainable, but also smart, efficient design.

The Implementation

Ecoscenographer Tanja Beer said “In the future, I think the designers who are clever and creative in their constant re-use and re-imaging of scenic elements between productions will be lauded… we can reduce things back to their base elements before re-constructing a new purpose.” (Beer & Ross, 2021). The ability to see a garment's potential is a practiced skill and a wonderful design challenge. It requires designers to

understand how garments are constructed, how they can be altered, and how various disconnected pieces can be combined into one cohesive look. This process is often referred to as upcycling.

“'Upcycling” is a smart development of the word “recycling” that shows us how a material value can actually be upgraded through the process of design.” (Woven & Worn, 2019). Upcycling items from stock can involve significantly altering and/or embellishing garments so that they are revitalized and can serve a new purpose. Some costume shops may be hesitant about this because these transformations can take a lot of time, be frustrating, and may result in strange construction techniques. However, if a designer can persuade a shop to take on these projects, they can learn new skills together and make existing garments more usable for future productions.

I use this technique extensively in my work. Occasionally, it leads to frustrating pieces that would have been easier, quicker, and cheaper to make from scratch. However, most of the time, I find that upcycling stock is more economical and leads to useful, beautiful garments that I would not have designed otherwise.

Minimalism

The Idea

One of the simpler and less exciting strategies for sustainable design is minimalism. Theatres are engaged in fierce competition for audiences' money and attention, prompting many productions to feel the need for more: more lights, more speakers, more costumes, and more dance numbers, a spectacle unlike anything that has ever been created! Relying on excess and spectacle can lose money and detract from the heart of a story. It is essential not to underestimate audience members' ability to empathize and imagine. They are active participants in a performance, and it is through their engagement that the stories flourish.

The Implementation

Be intentional about what is included and excluded in designs. “I once heard a literary person I deeply respect articulate the idea that every word in a script which is there but does not need to be is depreciating the value of all the words that do need to be there. The same is true of stuff. If you have only the stuff you really need onstage then it is all valuable. Your savings can be both environmental and artistic” (Barnard and Briscoe, 2012). By focusing on the needs of the story, a designer can avoid excess and maintain a realistic scope and scale for the production. “By understanding what is important, the artists eliminate that which is superfluous, giving weight to what remains.” (Beer, 2021).

Design for Reuse vs Decay

The Idea

In McDonough and Braungart's "The Upcycle," the authors discuss products designed with their end of life in mind: "We can design with myriad futures in mind, thinking how everything we make will move through the world, how it might eventually decompose, or how it will be used again" (McDonough & Braungart, 2013). They state that ideally, all materials used in the creation of a product would either return to the earth as biological nutrients or be put back into circulation as technical nutrients. An example of biological versus technical nutrients in clothing is broken wood buttons being thrown into the woods to decompose, compared to broken metal buttons being melted down and reformed into something new.

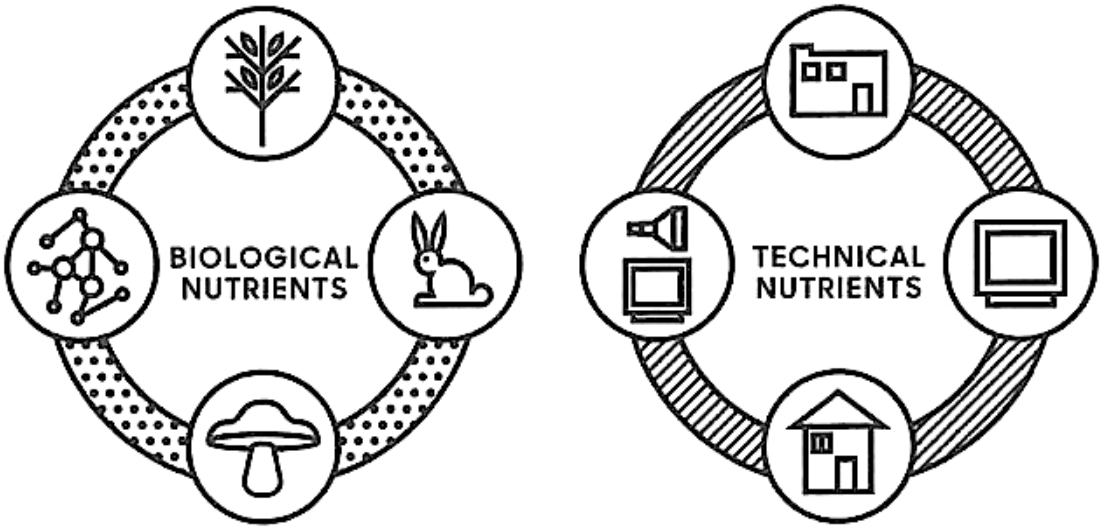


Figure 2: Biological Nutrients and Technical Nutrients (McDonough & Braungart, 2013)

Through a series of exploratory interviews and conversations regarding sustainability in costume design, Dierker et al. identified the recurring theme of “Decay and Preservation- How long-lasting should costumes be?” They defined decay as “the recycling of costume parts that are only used temporarily” and preservation as costumes designed for “durability and reuse.” (Dierker et. all, 2023). The concepts of *Decay and Preservation*, along with *Technical Nutrients* and *Biological Nutrients*, encompass the possible afterlife of all costumes used in a production.

The Implementation

A costume piece designed for preservation is planned and constructed to be re-fit and repurposed again and again. This incorporates practices such as leaving generous seam allowance, building skirts and bodices separately, topstitching trims, basting hems, avoiding glue, making distressing temporary, and reinforcing high-wear areas (Gwilt & Rissanen, 2012). Planning for a costume's use beyond its intended production can also enhance its visual versatility.

Designing for disassembly is a common concept in sustainable literature about scenography but it can also be applied to costume design. “Design for disassembly’ focuses on designing for material recovery, value retention and material reuse through easy deconstruction. The approach informs decisions and material choices, changing how materials are combined and layered to ensure flexibility and reversibility.” (Beer, 2021). An example of designing for disassembly, preservation, and reuse would be designing a costume for the character Mayzie Labird from the musical Suessical. As the

name suggests, this character is a bird and is accompanied by a chorus of dancing bird girls. There are not many other productions that include a chorus of bird dancers, so to design for visual versatility, one could design a base dress with a feathery addition that is separate, removable, or lightly tacked on for the production. This would require extra time and planning, however, has the benefit of a whole chorus of base dresses that are more useful to other productions. Having a separate base dress could also come in handy if a swing or understudy is a different size and has their own base dress, and if the right fabric is chosen, the base dresses could also be washed regularly.

Laundering makes a big difference in the lifespan of a garment. "Designers can incorporate clothing care considerations at the design phase that reduce resources used in the clothing consumption system by enabling and promoting low impact care behaviors" (Gwilt & Rissanen, 2012). In other words, a sustainably made garment that requires unsustainable cleaning and repairing techniques is not sustainable. Theatrical costumes often utilize materials and structures that require dry cleaning, a process that is harmful due to its chemical use. While an alternative to dry cleaning is not currently available on a large scale, it could be integrated into costume shops in the future as technology advances.

When a costume piece is no longer usable, it can be disassembled into its technical nutrients by salvaging various parts for future use. However, this approach has the drawback of requiring storage space for these salvaged pieces. Another option is recycling, however as previously mentioned, this is not a feasible solution for most

garments and most municipalities. Designing for decay or breaking down a costume piece into its biological nutrients, is also very difficult in theatre.

Even when purchasing organic materials, they are often made less biodegradable or non-biodegradable due to the addition of dyes, sizing agents, and chemical preservatives. These substances are often added by manufacturers before the textile or garment reaches the consumer, and manufacturers are not obligated to disclose any of the chemicals or additives they use. This lack of transparency makes it nearly impossible to determine whether the material will easily decompose (Wicker, 2023).

Some costume designers have taken the idea of design for decay as an opportunity to create their own materials. One incredible example is the work of Sarah Mosher who has created bioplastics composed of starch, gelatin, and alginate. Her thermoplastics are durable enough to withstand the run of a show and can be composted once the show closes. Her work can be found at www.sarahmosher.com/biodesign

Figure 2: Bio plastic translucent sheets and 3D fish (Mosher, 2025)

Figure 3: Bioplastic sheets and fish attached to a costume piece (Mosher, 2025)

Another amazing example of design for decay is the artist Ingvill Fossheim who grew microbial cellulose sheets that were used in a contemporary dance piece (Fosseheim, 2019). Her work can be found at www.ingvillfossheim.no/.

Figure 4: Costume piece made from microbial cellulose. (Fossheim, 2019)

Whether designing for decay or preservation, knowing the end-of-life goal for a costume piece will inform the choice of materials, construction methods, and maintenance taken for the garment.

Allowing Time for Experimentation

The Idea

In an article titled “Sustainability in the Opera Sector: Main Drivers and Limitations to Improve the Environmental Performance of Scenography,” a survey was conducted asking theatre practitioners what factors most prevented them from implementing sustainable practices. The top results were Money (58.3%), Time (50%), Work Habits (45.8%) and Knowledge of Alternatives (41.7%) (Roca et al., 2021). It takes time to source items secondhand or to build things in a manner that allows them to be disassembled and reused. Additionally, researching, sourcing, and learning to utilize new materials demands considerable time and financial resources.

Even when extra money and time are not found, theatre practitioners should integrate experimentation into their work. “In the face of immediate deadlines and demands, such changes can seem messy, burdensome, and threatening, even overwhelming. But as Albert Einstein observed, ‘if we are to solve the problems that plague us, our thinking must evolve beyond the level we were using when we created those problems in the first place’” (McDonough and Braungart, 2009). Allocating time and resources for research and experimentation with new processes and materials is essential for sustainable growth in the theatre industry.

The Implementation

“Each production can be an opportunity to explore new materials and processes, allowing for better informed choices and learnings that can be further investigated in the next design.” (Beer & Hes, 2017). Designers should allow themselves the grace and space to fail and to discover imperfect solutions that can be improved upon. New products and materials emerge regularly and designers can find projects within their work that can benefit from experimentation and innovation with new processes and products.

Not everyone will be willing or able to give extra time and money for experimentation. When speaking about trying new products in a scene shop, Brunner & Ranseen state, “The extent to which any theatre carpenter, designer, or technical director can predict the performance of a new novel product is based almost entirely on trial and error, and many are either unwilling or not empowered to experiment.” (Brunner & Ranseen, 2017). While trying a new product or process can be risky, designers can advocate for the necessary time and resources to discover creative solutions through collaboration and experimentation.

The biomaterials mentioned in the previous section, developed by Mosher and Fossheim, were both created in an academic setting with the support of grant funding. Exploring research grants in material science or sustainability initiatives could provide the necessary resources for trying new materials. Even a little bit of additional funding can enable a costume shop to support material innovation by purchasing eco-friendly products, such as biodegradable glitter and pineapple leather.

Health and Safety Initiatives

The Idea

Environmental concerns are often health and safety concerns. Monona Rossol's "The Health and Safety Guide for Film, TV, and Theatre" does an excellent job detailing these hazards and provides practical solutions. Her organization, Arts, Crafts, & Theatre Safety (ACTS) is a great resource and offers health and safety consultancy services as well.

The most common harmful chemicals found in costuming are present in dyes and adhesives, but there are also safety hazards in certain cleaning agents and the fabrics themselves. "The German catalog of textile auxiliary 2008-9 report found 5800 agents in textiles containing 400 to 600 ingredients- and that's not including dyes. Final fabric can be comprised of 28% chemicals by weight- and that's only if they've been made of 100% natural fibers; synthetic fibers have even greater concentrations" (Bedat, 2021). In her book, "To Dye For: How Toxic Fabric is Making us Sick- And How we Can Fight Back," Alden Wicker says

> While beauty and cleaning products and packaged foods come with an ingredient list, fashion does not... Fashion products have some of the most complicated and multilayered chemical profiles of any product you or I can buy... Multiple chemical substances are used to manufacture, process, weave, dye, finish, and assemble clothing and accessories. Each step in this daisy chain can leave residue, either intentionally or unintentionally (Wicker, 2023).

The Implementation

Sustainability and health and safety often overlap, and initiatives in one area can lead to improvements in the other. Recognizing the potential health and safety implications of the materials and garments used by costume designers can help them to advocate for sustainable changes within a shop.

Stop Supporting Unethical Businesses

The Idea

One of the most powerful tools consumers possess is where they choose to spend their money. Diverting dollars away from unethical and unsustainable businesses demonstrates that consumers prioritize people and the planet over the convenience of cheap products.

Costume designers should limit their purchases from fast fashion companies such as Temu, Shein, Fashion Nova, H&M, and Amazon. Costumers know how much it costs to make a garment because they do it in their own shops. The prices of garments on fast fashion websites should be a red flag. If consumers *are* getting what they pay for, they are receiving poorly made garments that are uncomfortable and will not last. If the consumer is getting *more* than what they paid for, it means someone else is paying to make up the difference. “Examine the “hidden” costs… such as unfair labor practices, toxic production methods, environmental degradation, cultural destruction, CO2 emissions, etc.” (Steen, 2010). When consumers purchase from these companies, they are effectively endorsing the abuse of workers and the environment, justifying it for the sake of cheaper clothing. “Each garment you purchase helps to reinforce the working model of the corporations that helped it reach you” (Jones, 2014).

A large culprit of these social and environmental issues is Amazon. Over the past decade, costume designers have increasingly relied on Amazon due to its low prices, extensive product selection, fast shipping, and free returns. One reason Amazon can provide this level of convenience is the massive monopoly it has established by driving

other companies out of business. Another reason is due to the mistreatment of its employees.

Employees at Amazon earn a median annual salary of $28,446, "a wage that forces many Amazonians to go on government assistance, including food stamps [which are not accepted at the Amazon cafeteria] … Our tax supports people who cannot get their basic needs met by working at one of the world's most success companies… And sitting at the top of all of it all is Bezos himself, who became the first person on the planet to amass a fortune over $200 billion" (Bédat, 2021). In chapter 5 of "Unraveled: The Life and Death of a Garment," author Maxine Bédat speaks to current and former Amazon employees who describe workplaces not unlike the sweatshops she visited in third world countries.

The Implementation

I do not buy from Amazon or fast fashion companies as an individual consumer, and I have made it a goal to avoid these purchases in my role as a costume designer as well. By employing strategies such as shopping secondhand, reallocating budgets from products to people, and upcycling existing stock, I have been able to easily meet my production needs. Additionally, I typically have enough money in my budget to purchase a few well-made, sustainable garments from ethical companies. This approach requires me to be more selective about my purchases, as I cannot afford to buy the same quantity of items, and it requires me to make decisions earlier, as I do not have the luxury of next-day delivery.

I encourage designers to refrain from supporting companies that profit from the exploitation of people and the planet. Victor J. Papanek, in his book “Design for the Real World,” stated that being a sustainable designer “means that designers refuse to participate in work that is biologically or socially destructive (whether directly or by implication is of no importance)” (Papanek, 2019).

Designing for a Season

The Idea

When a company approaches a season as an interconnected unit, a costume designer can design clothing items that can be utilized across multiple productions. “Whenever shows can be commissioned together as a series or season, they can share resources and reuse components” (Burger et al., 2024). An example of this would be a series of productions set in the same era or featuring a similar aesthetic.

The Implementation

This can be extremely difficult to coordinate. If it is not achievable, knowing titles in future seasons can allow a costume designer to make decisions that can benefit upcoming productions. In their article “Theatre Design and Production Reimagined: Four Principles for a Sustainable Future,” Brunner & Mehler discuss a children’s theatre company called Childplay, which has adopted a "three-year season planning cycle that permitted better prediction of production component lifespan and the repetition of entire productions. They also have retained designers for multiple productions in a single contract so as to encourage thoughtful reuse of materials from one show to another.” (Brunner & Mehler, 2013). While costume designers typically do not have a say in season selection, considering future productions can help them choose garments with the potential for future reuse.

Accounting for the Value of Existing Stock and Materials

The Idea

Sandra Goldmark is a theatre designer and sustainability advocate. She has been part of team that is working to implement sustainable theatre practices at Barnard College. One of the programs they started was incorporating items they already owned into their budgets. While this may seem redundant, it allowed the school to recognize the value they were deriving from their existing stock.

The Implementation

Gathering information about the financial value of a costume shop's inventory is essential for advocating for funds to improve storage, cataloging systems, and potential rental support. Below is an example of how Barnard established a baseline value for individual costume pieces:

Table 2: Average Costs for Props and Costumes in Barnard College's 2015-2016 Season (Goldmark, 2023)

Calculating the cost of props and costumes was a bit more complicated due to their significant variation in price. One cheap bracelet might cost $3 and a winter coat might cost $300. To determine an average stock price per item for props and costumes, Barnard divided the budgets for all of the shows in a previous season by the number of props and costumes purchased or rented to get an average for each.

Props Total 2015-2016

# of Items	Total Cost	Avg Cost per Item
114	$3,160.88	$27.73

Costumes Total 2015-2016

# of Items	Total Cost	Avg Cost per Item
211	$5,686.85	$26.95

In addition to assigning financial value to their existing stock, Barnard also divided their production budgets into money for new products and materials versus money for secondhand products and materials. This encouraged students, faculty, and outside designers to prioritize utilizing existing stock and purchasing secondhand. Allocating a larger portion of the budget for alterations and maintenance is another strategy to maximize the value of what already exists. It represents an investment in the assets that a theatre company already owns.

Circular Economy/ Cradle-to-Cradle

The Idea

In their 2002 book, “Cradle to Cradle: Remaking the Way We Make Things,” authors William McDonough and Michael Braungart introduced the concept of ‘cradle-to-cradle’ systems. This approach served as an alternative to the ‘cradle-to-grave’ model predominantly used in modern manufacturing (Braungart and McDonough, 2002). These systems are also referred to as circular and linear economies. A linear economy, or cradle-to-grave system, follows a sequence from extraction to production, distribution, consumption, and ultimately, disposal (Leonard, 2009). The primary issue with this system is that is does not account for the waste produced, nor does it replenish what it destroys. If humanity does not transition to a circular economy and focus on replenishing and rebuilding, it will continue to deplete resources and pollute the Earth until it is unusable.

The 2021 Circularity Gap Report estimates that industries are only 8.6% circular on a global scale (Circle Economy, 2021). The World Resources Institute suggests that “by doubling global circularity in the next 10 years, global greenhouse gas emissions could be reduced by 39% and shrink the total material footprint by 28% by 2032” (Goldmark, 2022). A global transition to circularity is integral not only for the success of industries but also for the sustainability of life on Earth.

“A New Textiles Economy: Redesigning Fashion’s Future” is a report published by the Ellen MacArthur Foundation in 2017 that assesses the harms of the textile industry and proposes viable solutions. One of their primary recommendations is the transition to a

circular economy. The report states, “The overarching vision of a new textiles economy is that it is aligned with the principles of circular economy: one that is restorative and regenerative by design and provides benefits for business, society, and the environment. In such a system clothes, textiles, and fibres are kept at their highest value during use and re-enter the economy after use, never ending up as waste.” (Ellen MacArthur Foundation, 2017).

Implementation

Smaller theatre companies tend to practice circularity better than larger companies because they have no choice but to use and reuse what they already have. Circularity is “a way to think about waste, and it’s a way to think about the front end, what we make and buy. With circular consumption, every resource we extract from the earth is incredibly valuable and stays in use for a long, long time.” (Goldmark, 2022). Larger companies can extend their circularity by partnering with local schools, theatre companies, and other arts programs that could benefit from materials they no longer need.

Changing Academic Curriculums

The Idea

When discussing the importance of integrating sustainability into theatre education, Ian Garrett, founder of The Centre for Sustainable Practice in the Arts, stated, “Students today are enrolling with more advanced awareness of ecological issues… Responding to this trend, theatre education must not just prepare students for a specified methods of production, but also teach them to think critically about competing goals related to environmental sustainability” (Garrett, 2021). Educators have an obligation to teach themselves about sustainability and find ways to incorporate it into their curricula. “With future generations of creative industry professionals relying on the knowledge of their tutors and lecturers, the root change needs to begin with the academic, with their dissemination of knowledge being key in the integration of sustainable values.” (James, 2021).

The aforementioned survey taken of Theatre Design and Production staff and students at the University of Cincinnati College-Conservatory of Music revealed that 99% understand what sustainability is, 43% know how to implement sustainable practices in their work and 47% are unsure how to do so. Additionally, 93% expressed interest in changing how they work to be more sustainable. Overall, students are eager to learn how to incorporate sustainability into their work.

Table 3: Do you Understand What Sustainability is? (Fry, 2025)

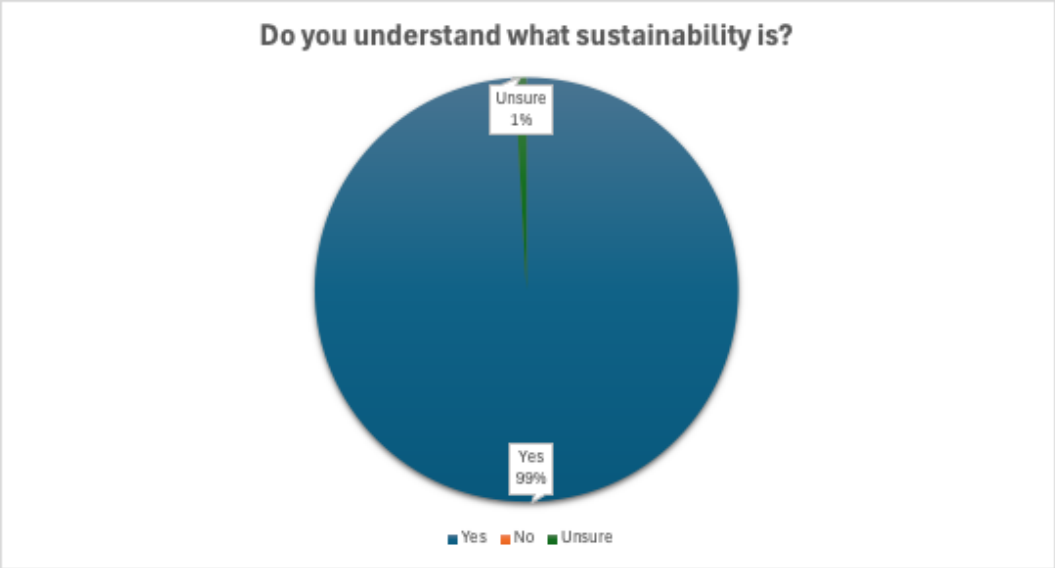


Table 4: Do you Know how to Implement Sustainable Practices Into Your Work? (Fry, 2025)

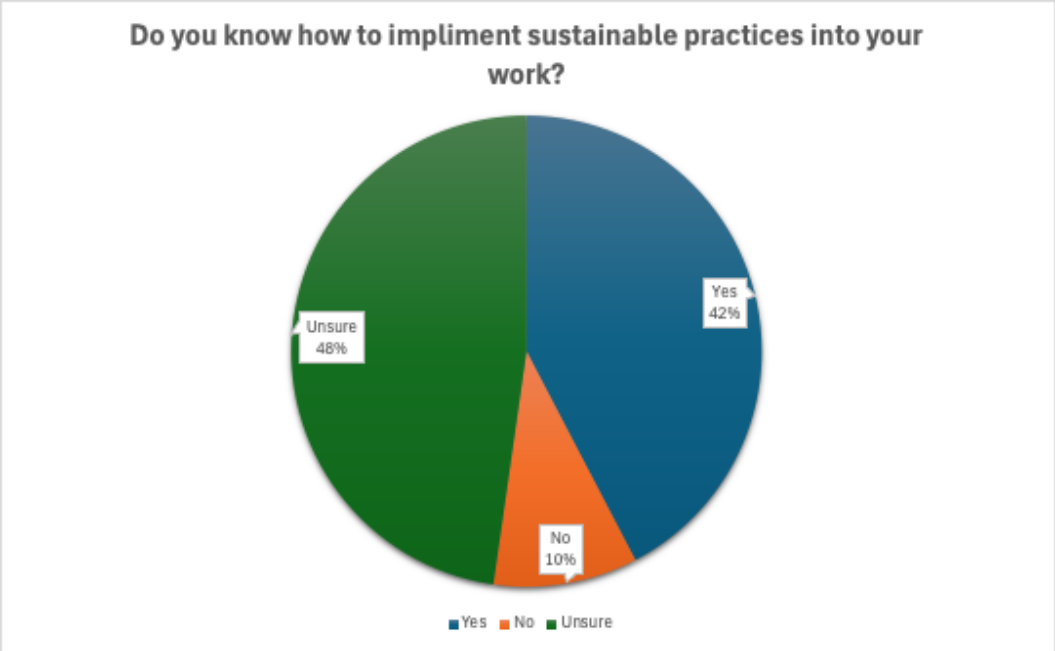
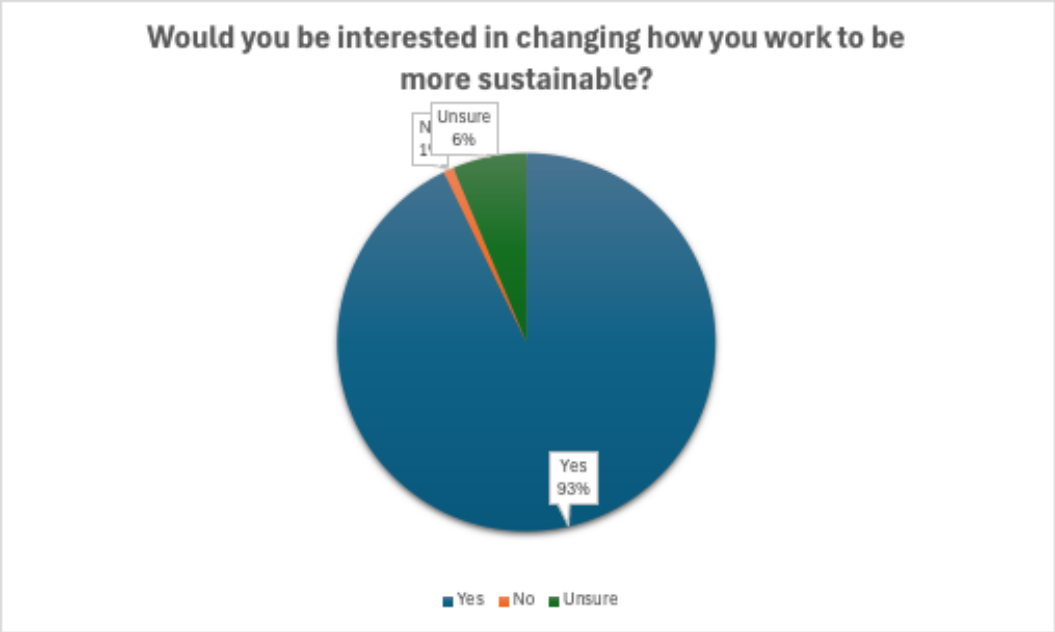


Table 5: Would you be Interested in Changing how you Work to be More Sustainable? (Fry, 2025)



Elaborating on the scope of sustainable education, “The Future Generation of Fashion: How Higher Education Contextualizes Sustainability as a Key Design Tool” by A.M. James states that students “need to have an appreciation for the principle of sustainability from a number of different perspectives to ensure a deep-rooted knowledge of the subject area. This cannot only be from the point of view of the creative design process, but rather the positioning of this practice within a global context. The understanding of the value and potential of sustainability from a social, environmental and economic perspective is key.” (James, 2021). He further asserts that “future industry professionals are said to need knowledge of; environmental regulations, chemical use, recyclability of materials, supply chain complexities, designing for waste reduction, and ethical responsibilities.” (James, 2021). A deeper understanding of

overlapping industries and the associated environmental and ethical impacts of their work will strengthen designers.

The Implementation

In Sandra Goldmark's 2019 article "Circular Design and Production" she discusses several projects that Barnard College has implemented to practice sustainable design in a classroom setting. Two concepts that emerged in many of these projects were understanding theatre materials and imposing realistic limitations. Some of these projects included:

- Completing life cycle assessments
- Studying a material's carbon cost
- Learning the properties, strengths, and weaknesses of various materials.
- Looking for and understanding certifications
- Not teaching 'the sky's the limit'
- Having predetermined budgets that allocate funds for both new and reused materials
- Doing projects with limited palettes and materials (Goldmark, 2019).

The article states that Goldmark's students have achieved great success by integrating sustainability into the classroom. Integrating elements of sustainable design thinking into curricula is an important and effective part of creating long term change.

Expanding Positive Impacts in Communities

The Idea

“As long as human beings are regarded as “bad”, zero is a good goal. But to be less bad is to accept things as they are, to believe that poorly designed, dishonorable, destructive systems are the best humans can do. This is the ultimate failure of the “be less bad” approach: a failure of the imagination.” (McDonough, and Braungart, 2009). Merely attempting to mitigate humankind’s negative impact on the world is inadequate and uninspiring. A more engaging approach to sustainability involves discovering ways to positively contribute to community health and well-being. Ecoscenographer Tanja Beer posed the question, “Can we create designs that not only enrich our audience, but our community and environment as well?’” (Beer, 2015).

The Implementation

An excellent example of this principle in action is Imogen Ross, a sustainability-focused scenic designer who actively involves the community in her creations. As part of her work, Ross has donated rugs and cushions to community groups, milk crates to a struggling social enterprise, and solar-powered lighting to a funeral company (Beer, 2021). When planning a theatre season, producers consider what audiences want to watch and what messages the theatre wants to share with its community. Similarly, designers can forge connections with the local community and consider their needs while embarking on the design process. This approach is particularly important to

scenographer Marie-Renée Bourget Harvey, who says “We must take the time to think about the community and inject meaning into our decisions.” (Beer & Bourget Harvey, 2021).

Other applications of this idea include shopping locally, utilizing local materials, and collaborating with non-profit organizations. In “Design for Sustainability: A Multi-level Framework from Products to Sociotechnical Systems” it explains that successful sustainable systems “should prioritise the use of local resources. These include natural resources and material and energy flows from productive activities, as well as social and cultural resources” (Ceschin & Gaziulusoy, 2019). A sense of community is one of the reasons people are drawn to theatre, and as artisans working within this field, it is important to include the community in decision-making processes.

Conclusion

“If theater is to be part of the most vital conversation humanity faces, then it has to change its practice.” (Burger and Dillon, 2024). Theatre has the potential to tell beautiful, engaging stories that help audiences understand climate change and inspire them to transform their communities. However, these narratives become hypocritical if they are produced in ways that harm the planet and its inhabitants. The objective of this thesis has been to educate costume designers on their impact and provide a variety of strategies for sustainable development within their work.

> Wherever you fall on the spectrum of idealism and pragmatism, there are ways to make your designs more sustainable. Whether you choose to build versatility into constructed costumes to allow reuse, limit the number of new pieces, allow the existing stock at your theatre to influence your color palette, or attempt to purchase only recycled fabric, each production allows some kind of green initiative. (Jones, 2014).

By holding themselves to realistic and scalable goals, and allowing for experimentation, failure, and growth, costume designers can decrease their negative impact on the environment and increase their positive impact on their community.

Appendix 1-Secondhand Shopping Resources

Online Deadstock Fabric Stores

Company	**Link**
Lakes Makerie	https://lakesmakerie.com/collections/remnant
Sew by Sew	https://www.sewbysew.com/
Lyrical	https://lyricalfabrics.com/product-tag/deadstock/
Core Fabrics	https://corefabricstore.com/collections/deadstock-designer
Stone Mountain and Daughter Fabrics	https://stonemountainfabric.com/product-category/fabric/deadstock/
Fab Scrap	https://shopfabscrap.org/
Swanson's Fabrics	https://www.swansonsfabrics.com/shop-home
The New Craft House	https://thenewcrafthouse.com/collections/fabric
Mood Fabrics	https://www.moodfabrics.com/fashion-fabrics/qz/not-reorderable?product_list_order=bestsellers
Fabric Mart Fabrics	https://fabricmartfabrics.com/
Kokka Fabrics	https://kokkafabrics.com/collections/deadstock-fabrics
Amo Threads	https://amothreads.com/
Riverside Fabrics	https://riversidefabrics.com/collections/deadstock
Frankie Rose Fabrics	https://frankierosefabrics.com/collections/deadstock
Ragfinders	https://ragfinders.com/
Finch Fabrics LA	https://lafinchfabrics.myshopify.com/
Surge Fabric Shop	https://surgefabricshop.com/

Online Thrift Stores

Company	**Link**
Poshmark	https://poshmark.com/feed
Depop	https://www.depop.com/
Thredup	https://www.thredup.com/
Ebay	https://www.ebay.com/
Etsy	https://www.etsy.com/
Rent the Runway	https://www.renttherunway.com/
Facebook Marketplace	https://www.facebook.com/marketplace/
Vinted	https://www.vinted.com/
Goodwill Finds	https://www.goodwillfinds.com/
Swap	https://swap.com/
Grailed	https://www.grailed.com/
Beyond Retro (UK)	https://www.beyondretro.com/
Raghouse	https://raghouse.com/
The Vintage Twin	https://www.thevintagetwin.com/

Appendix 2- Examples of Sustainability Agreements for Costume Designers

The following exerts are taken from a document created by Oper Leipzig for costume designers to understand the company's sustainability goals, as well as the procedures, materials, and resources that the designer will have access to at the theatre.

Dear Costume Designers,

We are delighted to welcome you here in the Costume Department of the Leipzig Opera and to acquaint you with our Sustainability Guidelines. These guidelines are part of the Costume Department's approach to the sustainable transformation of the Leipzig Opera. They are based on an assessment of our own processes in the Costume Department during the Sustainable Costumes Project [1].

For us, the Costume Department of the Leipzig Opera, and the Leipzig Opera itself, sustainability means designing our costume production needs in such a way that we actively reduce negative impacts on local and global environmental and social systems, which we directly and indirectly use and influence.

We are pleased to work with you. We love making costumes, and costume making is a craft that has been proudly practiced here in Leipzig for a long time. The first Leipzig opera house, the Oper am Brühl, was founded in 1693. Today, the Costume Department of the Leipzig Opera has more than 100 talented and experienced costume Designers with rich costume knowledge in our 5 trades – ladies' and a men's tailoring shop, the hat department, the shoe making, the paint department, and in the theater workshops, the armory department, which also supports the Costume Department. We are proud to offer a large and well-organized costume and material storage. We supervise four different theater houses in the city of Leipzig, each with its own specific requirements and guidelines.

As at most theater houses, a circular economy in relation to work with the costume stock has long been part of the working method. We have about 20,000 costume pieces in our stocks, which are available for reuse and repurposing.

Furthermore, we look forward to trying out new sustainable ideas regarding materials, production, and collaboration. We are excited to hear about your experiences with sustainable productions and your ideas and designs to make costumes more sustainable.

The Costume Department of the Leipzig Opera

[2] Sustainable Costumes is a Next Stage Grant project, funded by Fedora and Opera Europa, and led by the Leipzig Opera. Sustainable Costumes was inspired by the work and research of Urs Dierker on sustainable transition in the field of costume design. Dierker is the founder of the Circular Costume Design platform.

Engage in dialogue with us!

A good working atmosphere is essential for sustainable work. Collaborating and exchanging relevant knowledge are fundamental for the successful completion of a costume production. Together, we are stronger, and this requires good communication for a large house like ours.

If costume designers want to develop some of their design work independently, that is okay. In that case, the costume designer must inform the costume director, the costume assistants and costume workshops during the initial costume presentation (Kostümabgabe) to the costume department.

Transparency and Communication

The integration of the costume department into design processes is essential. This presupposes the exchange of information between costume designer, the director and the set designer. Information that affects the work of the costume workshops must be communicated by the costume designer and costume design assistants to the costume workshops as soon as it becomes known. This may include:

> Construction of the stage (slopes, stairs)
> Use of blood, water, etc.
> Use of props (possibly integration of pockets in the costume)
> Scenic arrangements/stage directions (running on stage, climbing stairs, rolling on the floor, etc.)
> Other important information (use of a harness, etc.)

When the costume designer should be present

> For the initial costume presentation (Kostümabgabe) to the costume department
> To discuss material samples
> For the budget debriefing (also possible via Zoom)
> Costume fittings/meetings for at least 15 working days. These meetings are coordinated with the costume director and production management at the time of costume submission (Stückabgabe)
> Participation in the concept rehearsal and the three final rehearsals (dress rehearsal, orchestra rehearsal, general rehearsal)

Costume Assistance for the Designer

> Costume assistance is available throughout the production, i.e., for sampling, material ordering, research, costume assembly, measuring of costumes, and passing on information to all trades
> Communication and attendance at costume fittings.
> Conducting costume fittings independently according to the instructions of the costume designers
> (!) No rehearsal assistance possible, please negotiate separately – or inquire with the costume director about possibilities for internships / shadowing.

Sustainability is important to us.

Working sustainably is important to us. This is evident not only in the durable costumes we produce. As with most theaters, a circular economy approach to the costume stock has long been part of our way of working. We invite you to collaborate with us to:

> Save materials
> Consciously select sustainably produced materials
> Buy materials locally

We are also looking for new ways to work sustainably. Evaluations of the CO2 footprints of costume productions show that the costume department has only a minor negative impact on the overall CO2 budget of a production. What can sustainable action mean beyond reducing, reusing, and recycling in costumes? Thinking sustainably extends beyond the short period of production. A costume is, materially speaking, more than its presence on stage.

Traditional relationships between costume designers and costume departments are optimized for costume creation. The costume department is a »service provider« for the designer to realize their artistic vision. The production of costumes is a finely tuned and efficient process.

Costume is changing in terms of manufacturing and audience. These changes occur not only on a technological level (digital) but also in terms of the perception of costumes. The audience wants costumes that visually and substantively engage with questions about our future, regardless of whether they are historical, contemporary, or futuristic designs. Costume designers and costume departments are jointly called upon to look to the future. Together they can shape their influence on artistic, craft, procedural, and material decisions in a contemporary way, without losing the rich tradition of costume making.

Procedure

Conceptual Phase

In the conceptual phase, there is the greatest potential to mitigate the negative impacts of costumes and to experiment with something new. The conceptual phase is the most important time to set sustainable goals in terms of production size, the type and use of materials, and visual message, together with the artistic director, the director, and the set designer. Designing a show sustainably is a communal task. Production specifications and agreements as laid out in the Theater Green Book are the most advanced guidelines for theater productions. Current best practices are reduction and reuse.

> Reducing material use has the greatest environmental effect.
> Reusing materials is an important step towards sustainability.

The conceptual phase is also important for verifying the feasibility of the design. In this early development phase, the costume director is your contact person who can assist you with questions about sustainable materials and production methods. The costume department is currently setting up an internal reference library with biomaterials and suppliers.

Feasibility of Costume Design:

> Discovery of knowledge about new, sustainable materials and production methods
> Verification of washability (e.g., color gradient)
> Testing various costume processing methods
> Planning for the durability of the costumes (revival)
> Planning for the reusability of the costumes
> Planning for the special use of costumes, e.g., considering closure options for quick
> costume changes

The conceptual phase ends with the acceptance of the costume design by the theater management or the artistic management of the production.

Material Research

Sustainable work also means experimenting with new materials, natural substances, and products. The concept phase is a good time to explore alternative, sustainable materials, such as natural dyes for coloring costumes. Here is a link to our Sustainable Materials Database.

Here is a link to our Sustainable Materials Database.

The costume department also has an internal reference library of suppliers of sustainable materials, etc., which you are welcome to use. Here is a selection of our suppliers.

Fabric Dealers

Vendor / Händler	Link
House of U (Niederlande)	https://www.houseofu.com/de/
Komon Koubou Uni Textiles (Japan)	https://www.komon-koubou.com/en/
Kattun Stoff (Deutschland)	https://www.kattun-stoffe.de/
Anita Pavani Stoffe (Deutschland)	https://www.naturstoff.de/shop/
Organic Textile Company (UK)	https://www.organiccotton.biz/store/
Seidentraum (Deutschland)	https://www.seidentraum.biz/
Fabric Sight (Spanien)	https://www.fabricsight.com/en-de
Funki Fabrics (England)	https://www.funkifabrics.com/
Verhees Textiles	https://www.verheestextiles.com/de/
Ipeker	https://ipeker.com/products
Quality Textiles	https://www.quality-textiles.de/
Nooteboom Textiles	https://www.nooteboomtextiles.com/de/
Ersat Tekstil	https://ersattextile.com/
Grausam Textil	https://www.gratex.at/
Microtex Cotton Club	https://www.microtexcottonclub.it/
Noon	https://noon-stoffmarkt.de/
Mohné	https://nachhaltige-stoffe.de/
Lebenskleidung	https://www.lebenskleidung.com/de/
True Fabrics	https://truefabrics.de/

Westfalenstoffe	https://www.westfalenstoffe.de/de/
Meterwerk	www.meterwerk.de
Nelly Morelli	www.biostoffe-meterware.de
Flachs und Leinen	https://bio-leinen.de/
Stoffbiotop	https://www.stoffbiotop.de/
Danisch Pur	www.danischpur.de

Initial Costume Presentation (Kostümabgabe)

The initial costume presentation (Kostümabgabe) is undeniably the most critical moment at the start of the production phase. A well-planned and timely handover can save a lot of time and allows for the complete realization of the costume idea. Our goal is to introduce the following timelines for costume deliveries for the various houses:

Oper Leipzig
9 months before the premiere

Musikalische Komödie und Leipziger Ballett
6 months before the premiere

Schauspiel Leipzig
(large stage): 6 months before the premiere /
(small stages): 4 months before the premiere

Theater der Jungen Welt
3 months before the premiere

> Costume documents or files must be accessible to production management no later than 2 working days before the initial costume Presentation (Kostümabgabe)
> At the costume presentation, discussions regarding material selection, cutting direction, functionality, quantities, and specific requirements will take place with the department heads of all participating workshops and the costume assistants. >
> These discussions are essential for creating a preliminary cost estimate
> Appointments regarding the necessary presence of the costume designer are made

Budget Calculation

> Calculation: all costume parts are recorded and a parts list is created. If the budget is exceeded (either in terms of labor or costs), a meeting is necessary to revise the designs or reduce the number of pieces.
> With the approved cost estimate, material ordering begins, and production starts. (TDJW and the Drama Theater have their own costume assistants.)

Costume Production

Material Ordering

> Preferably, costumes and materials should be sourced from the Oper Leipzig costume and material stock, which is not only sustainable but also saves time and money.
> Purchase of second hand / vintage clothing.
> Preference for sourcing fabrics or garments regionally.
> Fabrics with Öko Tex standard.
> Fabrics with GOTS certification.
> Fabric dealers with sustainable fabrics.

Costume Processing

> Avoid unnecessary color accuracy/dyeing.
> Use environmentally friendly dyes.

Implementation of Costume Design

> Time management is paramount! Costume designers must maintain an overview of the development process and its progress.
> After each costume delivery, the hours (fabrication, alteration) of each costume part are calculated and aligned with the initial agreed budget.
> Requests for changes or additional work must always be consistent with the previous calculation.

Prototype Fittings

> Occur 2 weeks after the release of the cost estimate, i.e., for the Opera: 8 months, Muko/Ballet: 5 months before the premiere, SH/TDJW as needed.

Fittings of Series and Solo Costumes

> Start choir rehearsals for the Opera: 5 months before the premiere, Muko/Ballet: 3 months before the premiere.
> Fittings SH large stage: 3 months before the premiere, small stage: 2 months before the premiere, TDJW: 1-2 months before the premiere.
> Soloist rehearsals start at the beginning of rehearsals for Opera/Muko/Ballet, SH/TDJW as mentioned above.

Recalculations

> Subsequent changes to costumes or the number of pieces due to recasting require a recalibration of the budget.
> Changes must be submitted in writing via a recalculation request to the costume/production management and require approval (task of the assistants/costume cutters or workshop managers).

Final Rehearsals

> Mandatory attendance at all final rehearsals is contractually fixed.
> During the breaks of the final rehearsals, costume corrections and discussions in small groups with department heads/staff occur in the foyer.
> The implementation of changes takes place in the workshops until the next dress rehearsal.
> No costume changes occur after the final (general) rehearsal. Repairs and necessary size adjustments or functional additions are possible.

Post-Production

> Appreciation of the individual workshops and costume professionals
> Appreciation of the costumes as craft objects
> The costume designer is welcome to give us feedback.

"Sustainability Guide for Costume Designers." *Oper Leipzig*, Fedora, www.oper-leipzig.de/en/fedora.

The Royal Opera House also has a wonderful guide for sustainability for costume designers and costume production managers. Their guide has been copied below;

Sustainability Guidance for Costume Designers & Costume Production Managers

The Royal Opera House recognises the climate and ecological crisis and is committed to creating productions that work towards a more sustainable production model.

The Green Production Agreement is included in creative contracts and sets out the basic principles of making productions greener, the aim of this document is to give more detailed guidance.

We encourage the creative team to engage and work with us throughout the design process, so we can achieve the best possible outcome while supporting the aesthetic of the production and integrity of the design.

Links are provided throughout this document to further sustainability guidance within the venue information folder you have access to. If you have any trouble accessing these pages, please contact the Costume Production Manager for help.

The first principles of working greener

- ✓ **Do more with less**
- ✓ **Use more reused components and recycled materials**

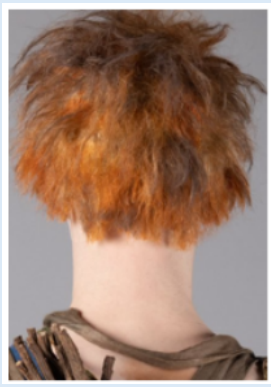
We encourage Designers to work with the Costume Production Manager (CPM) and consider using costumes that have had a previous life:

- Please consult with the CPM to explore if existing costumes items and fabric from available stock could be repurposed.

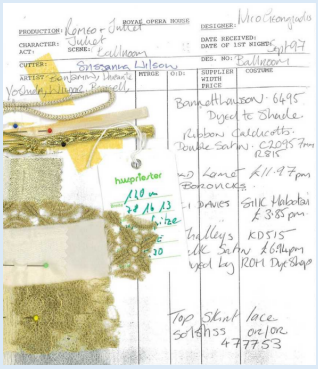
- Review the list of general stock items with consideration to using e.g., belts, ties, t-shirts, underpinnings etc.

- Where in-house reuse isn't an option, we encourage the purchase of costume items from second-hand or vintage sources.

The creative and costume teams for The Marriage of Figaro started with materials from existing ROH stock that were durable and kinder to the environment. Linens and cottons were used for those performing as the household staff and fine silks for the gentry to create costumes that looked authentic to the 16th century. Natural fibres are durable, easier to dye and can be washed using gentler detergents that are less environmentally damaging.



Most wigs used on our most recent production of Rusalka were from general stock, supporting the principles outlined in the Green Book. The wigs can be stored for future revival or kept as general stock.



At 50+ years Romeo and Juliet is one of our oldest productions and is regularly revived for the main stage. The image on the left shows a page from the Romeo and Juliet costume bible with original fabric swatches and trim for each costume. The Juliet ballroom dress pictured was worn by both Darcey Bussell and Fumi Kaneko.

Source sustainably

- ✓ **Make conscious material choices**
- ✓ **Reduce the use of harmful chemicals and processes**

We encourage Designers to engage with the CPM as early as possible and as frequently as appropriate, to allow time for sustainable sourcing in the early stages of the production.

- When buying from new, please work with the CPM to consider retailer environmental policies and the fabric that the garment is made from. Trading standard certifications that may indicate good standard include GOTS, GRS, OEKO-TEX and Fairtrade.

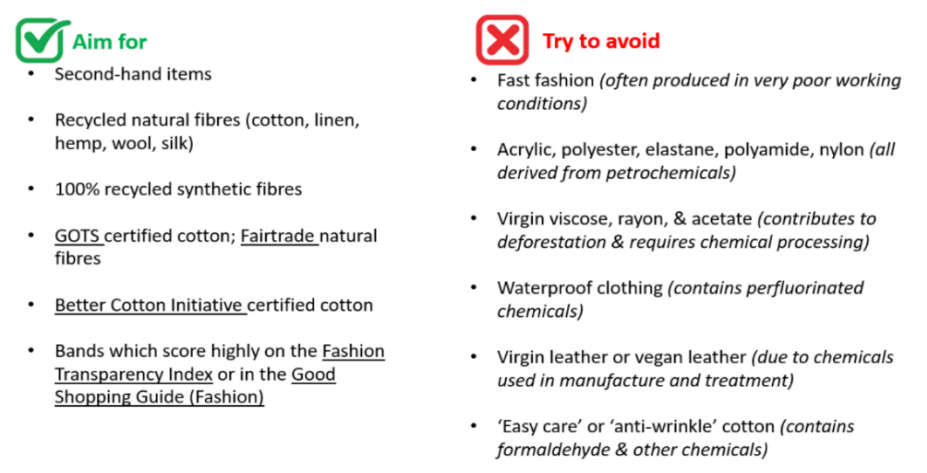
- We would actively encourage a move away from fast fashion which has environmental and ethical problems associated with it. More detailed guidance has been provided in the ROH Sustainability Guidance folder to help us make these choices, including further information on the *material hierarchy & certifications* and *textile purchasing*.
    - *Sustainability ratings for high street retailers can also be found here: https://thegoodshoppingguide.com/subject/ethical-fashion-retailers/*

- Wherever possible, natural fabrics, organic cottons and recycled or deadstock fabrics should be sourced for making costumes. Textiles should ideally be manufactured or produced as locally as possible (UK based for example).
    - *The Costume Directory provides a more in-depth look at textile sustainability here: https://www.sineadkidao.com/the-costume-directory*

- Textiles should ideally be washable to avoid chemical or dry cleaning.

- Some materials used in costume, wigs and make-up are particularly damaging. These include glitter, synthetic dyes and products containing parabens and triclosan (antibacterial). Please work with CPMs to identify alternatives where possible. Cosmetic products should ideally be accredited with an EU Ecolabel, Ecocert, COSMOS or similar and come in recyclable packaging.

- *A list of recommended suppliers and alternative products is provided in the* ROH Sustainability Guidance folder



FAIRTRADE

GLOBAL ORGANIC TEXTILE STANDARD

BCI Better Cotton Initiative

Certified B Corporation

A company's sustainability commitments are most often reflected by their credentials, including environmental and fairtrade certifications. These certifications may either apply to the company as a whole or to specific products they source. Key labels to look out for are shown above.

fh fabric house

ECOLOGICAL TEXTILES
Sustainable fabrics for fashion and interior

AmoThreads

Organic Textile Company

We have created a list of textile suppliers and products with strong credentials to help teams make more sustainable purchases for productions. You can access this list here.

A future life for costumes

- ✓ **Enable a future of designed elements through the design, construction method and materials chosen**

To help us work towards more sustainable productions and report on our actions, we would encourage Designers to work with CPMs to think about choices made and to keep a record of greener decisions, or why a more sustainable option was not appropriate for a particular design.

The future life of a costume is a key driver for sustainability:

- Can we ensure that costumes are in a suitable condition to be returned to general ROH stock at the end of the show's run?
- Can we ensure that costumes are in a suitable condition to be stored and reused in future revivals?
- Are we able to create universal pieces that could have a second life in other productions?
- Have we considered the construction of the costume to allow for removal of certain elements that are decorative, or provide a special effect e.g. oil stain or blood?

Deliveries, last minutes changes, and waste

- ✓ **Reduce travel of persons and materials**

We aim to combine orders to avoid the need for multiple deliveries from the same supplier, we want to reduce the reliance on last minute ordering, and we would like to use local suppliers as much as possible. The earlier in the process that design designs are made, the more ethical and sustainable the choices that can be made by the CPMs and the Workrooms.

To avoid courier and the carbon costs that every journey generates, please help us avoid last minute or one-off deliveries and returns. Making decisions as early as possible in the production process will give us time to source and return in a more carbon conscious way.

Lastly, please be aware that returns are often destroyed rather than the company incur the laundry, labour and repackaging costs of returning items to sale. This becomes more problematic when multiple items are sampled and returned as we know that multiple items will be destroyed. Returning in-store is preferrable, as return-to-sale is then more likely, but multiple sampling and last-minute choices make this problematic.

Modern slavery

As the manufacture of fabric and costumes has raised well-publicised ethical considerations in countries around the globe, we would like to take the opportunity to highlight the principles in the ROH Modern Slavery and Human Trafficking Statement provided in the Sustainability Guidance Folder.

Here to help

Lastly, we're here to help. If you need support identifying sustainable suppliers, checking credentials, or have any questions please get in touch at XXXXXX.

Appendix 3 - Suggested Further Readings

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