

Creative Industries and the Climate Emergency

The path to Net Zero

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Julie's Bicycle
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About the Creative Industries Policy and Evidence Centre

The Creative Industries Policy and Evidence Centre (Creative PEC) works to support the growth of the UK's Creative Industries through the production of independent and authoritative evidence and policy advice. Led by Nesta and funded by the Arts and Humanities Research Council as part of the UK Government's Industrial Strategy, the Centre comprises a consortium of universities and one joint enterprise from across the UK. They are: Birmingham, Cardiff, Edinburgh, Glasgow, Work Advance, London School of Economics, Manchester, Newcastle, Sussex, and Ulster. The PEC works with a diverse range of industry partners including the Creative UK.

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The Creative Industries Policy and Evidence Centre (Creative PEC) is part of the Creative Industries Clusters Programme, which is funded by the Industrial Strategy Challenge Fund and delivered by the Arts and Humanities Research Council on behalf of UK Research and Innovation. The PEC has been awarded funding by the AHRC for an additional five years, and will have a new host organisation in 2023.

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About Julie's Bicycle

Julie's Bicycle is a pioneering not-for-profit organisation mobilising the arts and culture to take action on the climate and ecological crisis. Founded by the music industry in 2007 and now working across the arts and culture internationally JB focuses on high-impact programmes and policy change to meet the climate crisis head-on.

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Creative Industries and the Climate Emergency

The path to Net Zero

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Foreword

Our climate is changing and that is changing us. We are not surrounded by the biodiversity the world once had. We cannot be confident of our seasons, or the behaviour of our seas and rivers, or our own resilience. We know we have to change.

The Creative Industries have brought this nexus of changing the world and an imperative to change ourselves directly into our view. Actors, musicians and creative leaders have been at the forefront of environmental campaigns and industry action. The Arts and Humanities Research Council's (AHRC's) Cultural Value Project has made the case that promoting environmental sustainability is an important example of why culture matters so much. Those who have brought the natural world so vividly before us have naturally been leaders in protecting it.

At the same time, the Creative Industries contribute daily to the problems of sustainability. Everything we do has a carbon footprint, including the digital world we easily take for granted. Equipment, the energy demands of museums, theatres and concerts all make their mark and take their toll. Some 80% of the environmental impacts of a product are locked in at the design phase; that's why design matters so much.

Yet relatively little academic research or policy exists for the Creative Industries and climate change. There has been insufficient research and policy on the technical, financial, business and cultural issues needed for Creative Industries to reach Net Zero.

This report presents for the first time an environmental overview of all of the UK's Creative Industries. For every industry, it provides a summary of sources of carbon emissions and other environmental problems, projects to reach Net Zero, and obstacles to progress. We are immensely grateful to all of the industry informants, trade associations and academics who have helped us construct this foundational work.

The report shows that climate change and environmental issues are now at the top of the agenda for creative businesses, from international corporations to start-ups. There are dozens of innovative projects and tools to help reduce carbon emissions, and some are supported through UKRI.

But there is so much more to do. This report is a starting point and a call to action. The report highlights gaps in our knowledge base, opportunities for collaboration and co-ordination, the skills and education requirements of the sector, and potential research projects which need to be scoped and undertaken.

We have not yet brought our creativity to bear on our own sustainability challenge. I hope this report will mark a moment of change. The Creative Industries must look in the mirror it has so brilliantly shown to the rest of the world, and take steps to meet the challenge of our environmental crisis.

Professor Christopher Smith, Executive Chair,
Arts and Humanities Research Council

Executive summary

Human activity is causing rapid changes to the climate. Over the next two decades, global temperatures are expected to rise by more than 1.5°C above pre-industrial levels, largely driven by the burning of fossil fuels, and profoundly changing the world we live in.

In response, the British government's Net Zero Strategy: Build Back Greener sets out proposals for 'decarbonising all sectors of the UK economy to meet our Net Zero target by 2050'. This strategy does not provide policies at the sectoral level, but makes it clear that 'to reach Net Zero, everyone will need to play their part' through more energy efficient processes, the adoption of low-carbon technologies and the promotion of green choices in consumption and investment.

As a sector that represents 6% of the Gross Value Added (GVA) of the overall UK economy and employs over two million people, as well as being embedded in the supply chains of others, the Creative Industries will need to work with the government to meet these goals. This report, for the first time, presents a sub-sector by sub-sector overview of the Creative Industries, current industry-wide initiatives, barriers to progress and recommendations to strengthen existing efforts. While there has been particular attention to carbon reduction, it is impossible to treat it in isolation: biodiversity loss, ecosystem damage, pollution and so on are widely implicated in climate change, and vice versa. Alongside climate change, therefore, broader environmental concerns have also been considered, along with approaches such as circular economy design principles.

The report is a scoping study and does not provide in-depth analysis of value chains, neither does it attempt to evaluate methodologies nor calculate the carbon emissions of industrial activities. Rather, it offers: an overview of the current state of play; a summary of issues pulled from existing academic and policy literature reviews, and insights from interviews with key industry representatives from trade bodies and other well-placed organisations who are, in many cases, leading on climate initiatives in their sub-sector. We are grateful to all the industry contributions that were received, and a list of consultees is provided at the end of the report.

Over the last twenty years, the science and study of climate change has burgeoned, and during the same period the Creative Industries have also been the subject of increased academic and policy interest. Despite this, there has been little overlap or research attempting to bring the two fields together. Many Creative Industries have taken the initiative themselves, with a growing range of research and partnerships, mostly not peer-reviewed, guiding their climate initiatives and decision-making. The level of published research on climate impacts varies significantly between sub-sectors and academic-industry collaborations tend to reflect immediate practical needs. There has also been academic interest in broader notions of sustainability and the contribution that culture can make to well-being and more sustainable forms of consumption and production.

Although regarded collectively as a sector, it is well understood that the different Creative Industries have distinct structures, regulatory frameworks, value chains and working cultures that are often best analysed at the sub-sector level. This is very much the case with their environmental issues. This report therefore provides a brief overview of each sub-sector in turn (based on desk research and industry interviews), drawing out the major sources of carbon emissions and other environmental impacts, as well as the initiatives and programmes aiming to tackle them, the agencies that have been leading on this and the particular challenges that need to be overcome. All of these overviews consider the complete value chains of the sub-sectors, from origination through to production and consumption. In many cases the value chains can be complex and far-reaching, but it is only through assessing the indirect emissions made by a creative business, that the full environmental impact of the industry can be understood.

The overwhelming message from these sub-sector overviews is the importance of climate and the environment, and the extent to which businesses are engaging to promote positive change. This is demonstrated not just by industry declarations and public statements, but tangible work programmes. Commitment is widespread and growing, from large creative businesses, many of whom now have director-level responsibility for sustainability, through to small businesses and start-ups. Trade associations and other organisations that represent the Creative Industries are taking a leading role in this: raising awareness, developing tool kits and setting standards. However, while many leading figures in the Creative Industries are campaigning for change, and businesses are engaging with environmental issues, it is less obvious that this is yet being driven by consumers or investors.

Despite the industry commitment, it is recognised that governments at a national and regional level have an essential role to play. For instance, the country's hosting of COP26 in 2021 helped to galvanise a number of industry initiatives. But for industry energy and activity to be as impactful as possible, new ways of working need to be established which account for mitigation and adaptation with the Government helping to develop standards and targets to encourage industry activity and guide investment decisions.

An important part of industry activity is the development of a number of industry tool-kits for calculating carbon emissions and to assist businesses in implementing climate strategies. The distinct nature of the industries means that the tools need to be bespoke. Nevertheless, there is still much to be gained by collaboration across the Creative Industries and a forum for aggregating the industry data, promoting the use of tools, sharing learnings and publishing industry-wide progress towards reducing emissions would be valuable.

As part of broader policy issues around the Creative Industries and research and development (R&D), creative businesses would benefit from a substantial programme of R&D investment to help innovate and develop new technologies and processes for decarbonising and reducing waste and adapting to the inevitable changes already locked in to climate impacts. Linked to this is the need for greater research and understanding as to the sector's potential for promoting positive change and how its activities influence consumer attitudes and behaviours with regards to the environment.

1

Introduction and background

1.1 The environment crisis, 'Net Zero' and the Creative Industries

Human activity is unequivocally causing rapid changes to the climate. Over the next two decades, global temperatures are expected to rise by more than 1.5C above pre-industrial levels, largely driven by the burning of fossil fuels, and profoundly changing the world we live in. Human activities are breaching the planetary boundaries which constitute the fundamental conditions to keep the planet in equilibrium.

The UK's first legislative climate targets were enacted in the 2008 Climate Change Act. In 2019, Climate Change Act targets were made more ambitious, shifting from emissions reductions to achieving Net Zero Greenhouse Gas emissions by 2050. Also in 2019, the British Parliament passed a motion declaring an 'Environment and Climate Emergency', preceded by the Scottish and Welsh Parliaments respectively, with the European Parliament approving a similar declaration shortly afterwards. As of the beginning of 2022, more than three hundred local authorities in the UK have declared a climate emergency and, whilst there is no single definition, many have committed to reach Net Zero emissions with the most ambitious aiming to do so by 2030.

This report, for the first time, presents a sub-sector by sub-sector overview of the Creative Industries, current industry-wide initiatives, barriers to progress and recommendations to strengthen existing efforts. The emphasis is on greenhouse gas emissions and alignment with the UK's Net Zero targets; it identifies broader, common issues and associated policy implications, and highlights those areas where new cross-sectoral approaches, research and collaboration could promote progress.

The report is a scoping study and does not provide in-depth analysis of value chains, neither does it attempt to evaluate methodologies nor calculate the carbon emissions of industrial activities. The focus is on foundational approaches to measurement and mitigation with primary reference to the UK Climate Change Act. It does not look at the UK's Climate Change Risk Assessment, nor the National Adaptation Programme, which are beyond the remit of this study.

Roles for the Creative Industries as part of the Net Zero transformation.

Roles for the Creative Industries as part of the Net Zero transformation		
Decarbonisation	Tangible contributions activities towards Net Zero transformations	Intangible contributions towards Net Zero transformations
Reducing greenhouse gas emissions directly and indirectly caused by creative industry operations and business activities in line with UK and global greenhouse gas (GHG) emissions reductions targets.	Ways in which Creative Industries skills, outputs, and work will directly shape Net Zero communities, products and infrastructure (such as architecture, design, digital technologies).	Ways in which Creative Industries will influence cultural shifts, attitudes, behaviours, education and engagement linked to societal Net Zero transformations.

1.2 Net Zero, decarbonisation and the Creative Industries

Stabilising the concentration of greenhouse gases in the atmosphere can only be achieved by reaching Net Zero emissions globally. Net Zero means cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions absorbed by natural ecosystems, such as oceans and forests, or by using carbon capture technologies. To keep global warming to no more than 1.5°C, the UN IPCC estimates that global emissions need to reduce by 45% by 2030 and reach Net Zero by 2050. The year actual Net Zero is reached does not matter as much as the total amount of emissions before we get there: achieving reductions at scale and speed is paramount. The cornerstone – shifting away from fossil fuels to generate energy for electricity, heating, and transport – will require changes in how we live, produce, consume and move around.

The British Government’s Net Zero Strategy: Build Back Greener¹ sets out proposals for ‘decarbonising all sectors of the UK economy to meet our Net Zero target by 2050’. This Strategy does not provide policies at the sectoral level, but makes it clear that ‘to reach Net Zero, everyone will need to play their part’ through more energy efficient processes, the adoption of low-carbon technologies and the promotion of green choices in consumption and investment. As a sector that represents 6% of the GVA of the overall UK economy and employs over two million people, as well as being embedded in the supply chains of others, the Creative Industries will need to work with the government to meet these goals.

Some parts of the economy and society will need to decarbonise much faster than others, achieving ‘real zero’ rather than relying on carbon removals to compensate for on-going emissions. For example, the UK Net Zero Strategy has a target for all electricity to come from low carbon sources and to phase out the installation of natural gas boilers by 2035: this means that parts of the Creative Industries dependent on buildings have a more ambitious timeline.

1.3 The circular economy

While there has been particular attention to carbon reduction, it is impossible to treat it in isolation: biodiversity loss, ecosystem damage, toxic waste, pollution, land and water degradation and so on are widely implicated in climate change, and vice versa. This super-wicked problem requires systemic solutions to re-design the global economy and accelerate changes to the industrial and social infrastructure, alongside rapid restoration of natural systems.

A key approach to meeting these challenges, and one with particular relevance to the Creative Industries, is that of the circular economy – defined as a *“model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible.”*² In this way, the life cycle of products is extended and waste is minimised. It has been estimated that some 80% of the impact of any product or service is determined at the design stage³ and so it has been a major focus for design thinking over the last decade. The concept of the circular economy is of particular relevance to design-led disciplines including fashion, architecture and crafts, and those industries that make substantial use of materials and physical resources, for instance film and theatre set design.

1.4 Greenhouse Gas Protocol: Corporate Accounting and Reporting Standards

Addressing the carbon footprint of the UK's Creative Industries means considering complete value chains. This encompasses the origination and design; operation, production or manufacture; distribution and retail; and use, consumption or experience of the outputs of these industries. The GHG Protocol for Corporate Accounting and Reporting, the most widely used framework for business reporting, breaks emissions down into three 'Scopes':

Scope 1

Direct greenhouse gas emissions from sources 'owned or controlled' by a company

For example, fuel (oil and gas) burned in buildings or equipment owned or operated by your organisation, company vehicles, or the use of generators at a music festival.

Scope 2

Indirect greenhouse gas emissions from the generation of electricity, heating, cooling or steam purchased by a company (but generated elsewhere)

For example, emissions from district heating, or from the electricity bought by a company to run offices, computer equipment, venues, museums, company-owned servers, etc.

Scope 3

All other indirect greenhouse gas emissions that are a consequence of the activities of a company/organisation up and down its value chain

For example, emissions from the extraction and production of purchased materials; or emissions from sold and purchased products and services, including digital services. In the Creative Industries this category could include anything from the emissions generated by a printworks fulfilling a publisher's order; audiences travelling to a music concert; the electricity used by customers watching television or gaming; or the agricultural impacts of growing cotton for the fashion industry.

As the sector profiles in Section 3 demonstrate, in many cases the value chains can be complex, far-reaching and opaque. The writing of a novel or designing of a dress in Manchester may make only the slightest of contributions to carbon emissions and a negligible ecological impact at the local level, but when its output has worked its way through to the printing of the book in China or manufacture of the garment in Bangladesh, then back to the UK to be sold and used, the impacts could be significant and none the less so for being difficult to calculate. Full value chains also do not map cleanly onto the UK Net Zero targets and strategies, which focus on territorial emissions (rather than consumption-based emissions). The particular relationship between Creative Industries, digital technologies and associated emissions is described in Appendix One.

Table: Illustrative GHG emissions for Creative Industries activities (all sources cited in Section 3)

Activity	Estimated average GHG emissions
Advertising commercial production	100 tonnes
£50m feature film production	2,840 tonnes
Annual emissions of UK festivals (excluding audience travel)	25,000 tonnes
Annual emissions of London theatres (excluding audience travel)	50,000 tonnes
Annual emissions of UK music touring	85,000 tonnes
Annual emissions of Spotify streaming service (2021)	353,054 tonnes

2

Literature review

2.1 Overview

Over the last twenty years, the science and study of climate change has burgeoned. The journal *Nature Climate Change*, an international peer-reviewed journal with the most up-to-date science on climate change, was launched in 2011 and there are now around 40 academic journals dedicated to the subject, with myriad international conferences, academic groupings and research centres. These range from the physical sciences and meteorology through to the environmental sciences, human geography, economics and public policy.⁴ The Intergovernmental Panel on Climate Change is tasked by the United Nations Framework Convention on Climate Change to synthesise published climate science in regular 'Assessment Reports'. The most recent Sixth Assessment Report, published across three Working Groups, had an author team in the many hundreds, received comments from over 100,000 scientists and academic and government experts and drew upon more than 66,000 citations.⁵

Over the same period the Creative Industries have also been the subject of increased academic and policy interest, although not of the same scale. This was recognised with the establishment of the Creative Industries Policy and Evidence Centre (Creative PEC) in 2018 – a major boost to coordinating and undertaking research in the UK, and also a reflection of the considerable body of work undertaken by universities, research institutes (such as Nesta), government agencies, funding bodies and other organisations.

Despite this, there has been little overlap or research attempting to bring the two fields together. A special edition of the journal *Cultural Trends* in 2018 dedicated to the issue of 'Culture and the Environment'⁶ recognised this: *"Culture and the environment are usually regarded as being distinct, situated, as they are, in different government departments and with little professional interaction between, say, those working at Arts Council England or the Environment Agency. The same is true of academia, with arts and humanities located in quite different faculties, or even campuses, from the environmental and biological sciences."*

This may be a reflection of wider trends in what has been called the 'misallocation of climate research funding,' in which the social science of climate mitigation received only 0.12% of all academic research funding between 1990 and 2018, while the natural and technical sciences accounted for the vast majority of the rest.⁷

2.2 Climate impacts of the creative sector

The Office for National Statistics publishes annual industry data on the intensity of greenhouse gas emissions (the level of emissions per unit of economic output).⁸ This includes the 'creative arts and entertainment services', for which it provides a figure of 0.01 thousand tonnes of CO₂e per £ million GVA. This is broadly similar to other service industries, such as pharmaceuticals (0.05) and telecommunications (also 0.01). In line with other sectors, this has fallen steadily since 1990 when the data set started, and the figure was 0.05. However, the measurement only covers Scope 1 emissions and ONS does not provide any more detailed information on the major sources of emissions.

One consequence of this research gap is that many Creative Industries have taken the initiative themselves, with a growing range of research and partnerships which go back as far as the early 2000s, mostly not peer-reviewed, guiding their climate initiatives and decision-making. The level of published research on climate impacts varies significantly between sub-sectors. Academic-industry collaborations in the Creative Industries tend to reflect immediate practical and actionable needs of the sub-sector in question, for example research exploring the implications of developments in materials science for different textiles in the fashion industry,⁹ or action research on environmental production methods in the theatre.¹⁰

Along with measuring the environmental footprint of industry activities, there have been a number of guidebooks and best-practice reports offering advice to creative businesses on how to reduce their carbon emissions and other climate impacts. These have generally been sector-initiated. The music industry took an early lead, working with Julie's Bicycle and the Environmental Change Institute at Oxford University on a carbon footprint analysis of the UK industry in 2006 in order to identify pathways for the sector to align with the UK Climate Change Act reduction targets.¹¹ This was followed up with additional research evaluating sector-readiness for carbon emissions reductions for touring across bands, theatres, and orchestras.¹² More recently, Massive Attack and the Tyndall Centre for Climate Change Research have attempted to map Net Zero aligned targets against the live music sector.¹³

Other industry-led research includes 'A Screen New Deal – a Route Map to Sustainable Film Production'¹⁴ 'The Show Must Go On: Environmental Impact Report and Vision for the UK Festival Industry'.¹⁵ and the Theatre Green Book.¹⁶ Initiatives to improve sector measurement have also multiplied, resulting in increased data collection across the sector. The longest-running of these, led by Arts Council England's mandatory environmental reporting for its National Portfolio since 2012, reflects that those industries in which the government has the most leverage (principally through grant funding) are the ones in which it has been easier to bring wider policy concerns and priorities to bear.

2.3 Culture and the promotion of environmental sustainability

The AHRC Cultural Value Project recognised that the contribution that arts and culture could make to encouraging sustainability should be regarded as a distinct and important form of cultural value. As part of its inquiry, it hosted a workshop on the relationship between culture, Creative Industries and environmental sustainability and the extent to which it can influence thinking and promote behavioural change around issues such as climate change. As a result of this, the AHRC's Understanding the Value of Arts and Culture report acknowledged the *"considerable interest in the role of art and culture in shaping attitudes to climate change, the biggest challenge of our time, yet one where it is proving difficult to get engaged public attention"*.¹⁷

The report suggested that *"information alone is not enough, and that engaging art and culture might be one way forward."* From this, it identified arts and cultural engagement as being distinctly able to *"engage people in thinking about climate change when used not didactically but as a basis for reflection and debate"*. It cited visual arts projects supported by the British Council and exhibitions held as part of UN climate change summits. However, it is also acknowledged that there had been little evaluation on the effectiveness of culture in promoting behaviour change on these issues, and that more evidence was needed.

There has been some academic interest in broader notions of sustainability and the contribution that culture can make to well-being and more sustainable forms of consumption and production. For instance, claims have been made, and evidence sought, on both how the natural environment and arts and culture can positively affect the well-being of audiences and participants. More widely, and within the visual arts in particular, there is an extensive body of work and study around environmental art. Through land art works, site-based interventions, artistic collaborations, residencies and activism, contested concepts such as human progress and the natural landscape are explored and challenged. The Art for the Environment Residency Programme run through University of the Arts London, for instance, provides residencies for emerging artists to develop their practice around themes such as biodiversity and environmental sustainability. The Centre for the Understanding of Sustainable Prosperity at the University of Surrey has similarly been running a programme focused on how arts and culture can contribute to a more sustainable quality of life.

3

Sub-sector overviews

3.1 Advertising



Environmental impact

Those working for advertising firms are predominantly computer-based professional services within office environments. There are, however, distinct and direct outputs that have a substantial environmental impact. Approximately 20% of the carbon footprint of the advertising industry is generated through production, and the largest footprint of a single production shoot measured by the UK's Advertising Association was over 100 tonnes of CO₂.¹⁸ Media distribution also has a significant Scope 3 environmental impact. This includes broadcasting platforms and digital servers, and also the considerable generation of print: there are tens of thousands of advertising billboards across the country, and it is thought that more than a million tonnes of leaflets, brochures and flyers are produced every year. Wider industry activity such as events and business travel also contribute to overall emissions from the sub-sector.

The advertising industry also creates demands for products, which – in turn – contribute to climate change. The campaign group, Purpose Disruptors has introduced the concept of 'advertised emissions'. It defines advertised emissions as: 'greenhouse gas (GHG) emissions that result from the uplift in sales generated by advertising.' Purpose Disruptors has calculated the scale of advertised emissions as being as much as 186 million tonnes of carbon dioxide emissions (CO₂e), or *"an extra 28% to the annual carbon footprint of every single person in the UK."*¹⁹



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In 2020, the Advertising Association launched its Ad Net Zero initiative, with a number of well-known brands, advertising agencies, media titles and industry bodies signing up to achieve Net Zero carbon emissions by 2030. Along with an industry summit, a report, with guidance for measuring and reducing emissions through advertising, was produced, including how to enable consumer behaviour change. There is an accompanying online Ad Net Zero course delivered by the professional body the IPA. A subsequent online summit was held in Glasgow to coincide with COP-26 and featured senior executive directors from many of the world's leading brands including Unilever, Meta and WPP.

In September 2020, the Advertising Association also launched AdGreen,²⁰ a platform with two aims: to measure advertising production carbon footprints allowing project teams to understand which activities have the biggest impact, and to empower the industry to reduce emissions and move to zero carbon and zero waste. The platform includes training in renewable energy and offsetting, a carbon calculator, and certification scheme. AdGreen worked with BAFTA's albert tool – carbon calculators and resources for film and television production – to licence use of their online training platform and repurpose the frontend for training for the advertising sector.

Whilst the advertising industry's capacity to influence consumers and drive sales has benefitted environmentally damaging sectors, the same capacity to influence can also benefit green products and causes. Nesta identified this opportunity in a 2008 report entitled 'Selling Sustainability: Seven Lessons from Advertising and Marketing to Sell Low-Carbon Living.'²¹ A decade later, the Advertising Association made the same case in written evidence submitted to the Environment and Climate Change Committee: *"Advertising also has a major role to play in raising awareness among consumers and stimulating behavioural changes. We are seeing newer trends emerge with ads encouraging people to switch to more sustainable, 'greener' alternatives, from electric cars to renewable energy tariffs."*²²

Obstacles to progress

Despite the high profile of the Ad Net Zero initiative, doubts about major industry shifts, given short-term commercial incentives and the demands of clients and brand owners, are evident: agencies aspire to win the advertising accounts of top brands from, for example, the motor industry and there are few disincentives for an agency to work with brands that have a damaging environmental impact. Furthermore, there are currently no industry-wide standards which ensure that brands can substantiate the degree to which sustainability claims are true. For consumers, understanding what is substantially evidenced and therefore trustworthy, can be complex.

Priorities for further research and support

Considering that the UK advertising industry is so large, with a GVA in excess of £17 billion,²³ an initial review suggests that too little sub-sector-specific research on environmental issues commensurate with its importance is available. Further research and data, in particular about the impacts of decision-making in production and media distribution activity, would support informed action. Such research may, for example, inform the desirability and design of policy recommendations that seek to incentivise agencies to choose to work with sustainable brands.

3.2 Architecture



Environmental impact

As with other creative services, architecture tends to have relatively low direct environmental impacts. Like advertising and other professional business services the work is typically computer-based and undertaken in offices. Carbon emissions fall primarily within Scope 3, and are mainly generated through the construction process itself and under the remit of the client once the building is in use.

However, with the foundational role architecture plays within the wider built environment, it is of paramount importance to the climate agenda. Estimates vary, but construction in its entirety perhaps contributes as much as 40% of all global carbon emissions,²⁴ with the production and use of concrete alone responsible for 8% of all emissions.²⁵ The speed with which architectural practice responds and is supported to have an increased impact on the broader built environment will be of crucial importance in addressing the climate crisis.



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The Royal Institute of British Architects (RIBA), as the professional body for the sub-sector, is in a strong position to lead on environmental issues and to set standards. RIBA's focus is on building capacity towards reducing Scope 3 emissions. In 2019 it launched the 2030 Climate Challenge to support architects to 'design within a climate conscious trajectory'. This provides a set of performance outcomes targets for architects in how they design for energy use, water use, embodied carbon and so on. These targets are voluntary and intended to encourage good practice, without associated certification. To date, approximately 400 out of 4,000 registered practices have signed up.

RIBA also runs events and professional development activities focused on environmental issues and is launching a Climate Literacy Test to help members keep up to speed with climate literacy in a changing landscape. RIBA is also working closely with other built environment organisations such as LETI²⁶ to coordinate action across the supply chain. The Royal Incorporation of Architects in Scotland (RIAS) is active on sustainability issues, having introduced an accreditation scheme to recognise sustainable architecture.²⁷

Amongst architects themselves, there is growing awareness of sustainability issues and the carbon footprint of the construction industry. In 2020, the Architects Climate Action Network (ACAN) was established as a 'network of individuals within architecture and related built environment professions taking action to address the twin crises of climate and ecological breakdown.' Since launching, ACAN has developed eight industry working groups to address specific themes, with a programme of campaigns and professional development around retrofitting, insulation, circular economy methodologies and using natural materials.

Obstacles to progress

There is not yet a collective understanding of what Net Zero exactly means in the built environment. Furthermore, Net Zero is not understood as a static concept, with carbon emissions heavily dependent on conditions such as energy usage once a building is operational. The UK Net Zero Building Standard²⁸ is a new industry-wide initiative to develop the UK's first Net Zero buildings standard, with involvement from organisations such as the Carbon Trust, RIBA, LETI, and IStructE.

According to ACAN, a major issue in the UK is the extent to which environmental issues are being addressed within education: 'architectural graduates are entering the workplace unaware of the severity of the climate emergency, and without the technical know-how to tackle it.' There is increasing interest in environmental sustainability within architectural schools, but it still tends to be regarded as a specialist subject and therefore taught within particular courses or modules, rather than embedded across the whole curriculum. With 85% of UK architecture practices having fewer than 10 employees, investing in professional training and building up specialist expertise in sustainability is a challenge.

Priorities for further research and support

Architects often have little influence on the delivery and outcome of construction, and many buildings have no architect involved at all. Once a design is completed, the construction process is decided largely by the client, and for example an architect might specify a material for a project, but cannot guarantee it will be used. Industry-wide organisations across the built environment such as LETI are crucial to support shared understanding and practice. Public Practice have also been helping to develop deeper public sector design expertise to support decision-making across the design and construction process.²⁹ Greater involvement for architects across the whole scope of building projects would enable a greater carbon lifecycle approach and consistency across decision-making.

The Built Environment Report³⁰ produced by RIBA in partnership with Architects Declare makes the case that the built environment must drastically reduce its carbon emissions to work towards Net Zero, and includes a list of recommendations to governments globally. One of the greatest challenges in measuring and limiting carbon emissions in the built environment is embodied carbon – the understanding that materials can emit carbon throughout their life, maintenance, demolition and disposal. Although discussed in the government's Net Zero Strategy there are still no targets set towards it, and architects rely significantly on the knowledge of the wider supply chain to use materials with a lower embodied carbon. By setting targets the whole industry could take more action to address embodied carbon.

Post occupancy evaluations (POE) which review a building's performance once occupied and in use, include data on carbon emissions, useful for informed decision-making and advocacy. However currently only approximately 3% of UK practices conduct POEs, with RIBA calling for POEs to become mandatory on government funded projects, and eventually standard across the industry. According to the RIBA, a quarter of construction projects in the UK are government funded, and so government procurement has significant potential to effect change in the built environment.

Some 85% of housing stock currently in use is predicted to still be in use in 2050. Therefore retrofitting measures such as improving fabric efficiency and installing low carbon heating could have a significant impact on overall carbon emissions in the built environment and save money in terms of energy costs for consumers. The 'Homes for Heroes: Solving the Energy Efficiency Crisis in England's Inter-war Suburbs' report³¹ urges the government to focus on a new National Retrofitting Strategy to update 3.3 million homes that were built between 1919 and 1939. With fewer new buildings to be built, there may also be greater commercial opportunities for architecture practices in directing resources towards retrofitting.

3.3 Crafts

Environmental impact

Designer making, jewellery and crafts (as opposed to large-scale manufacturing) has a relatively small carbon footprint. Notwithstanding concerns with the accuracy of the official industrial classifications as they relate to crafts, it is the creative sub-sector with the smallest economic size as recorded by the Government,³² and as such it tends to be less intensive in its use of capital, energy, resources and transport.

The environmental impacts largely depend on the type of materials being worked with and how they are sourced, especially if precious metals are being used. Although ceramics production requires kilns and the use of fossil fuels to generate high temperatures, the individual works and small batches associated with crafts means that, at the aggregate level, they are unlikely to be making a large contribution to carbon emissions.

The path to sustainability

Within craft making, there is a strong tradition of using natural materials and working in ways that embody sustainable values. Many craft workers are mindful of adverse impacts and minimise them while also advocating against over-consumption and for sustainable sourcing of materials. Makers are taking active steps towards reduction in emissions such as reducing kiln temperatures, and using waste products from materials such as corn and coconut.

The Crafts Council published a report promoting environmental sustainability in crafts more than a decade ago, and it remains an active part of their programme. The Council has a concrete set of policy commitments and action plan, whilst working closely with the sub-sector itself in areas such as energy consumption, material supply chains and sustainable packaging. Since 2014, Craft Scotland has operated an accreditation scheme, whereby scheme members pledge to reduce their environmental impact and are asked to report annually on their actions.³³

The sub-sector is also engaged in funded research into new materials, efficiency in materials creation and use, and other innovations within craft and design. There are also strong partnerships between the Crafts Council, higher education and other sectors involved in materials research. For instance, the Council is about to embark on an AHRC-funded project exploring the potential of bio-inspired textiles and is exploring collaboration with a consortium of universities to examine furniture design and supporting repairability over more disposable production. The Crafts Council is part of a collaborative project with the Royal College of Arts, 'Ecological Citizens', with commercial partners such as IKEA, exploring the digital preparedness of the sub-sector for Net Zero including manufacturing of surplus materials and helping people digitally exchange knowledge and resources.

Consumer engagement has been an important part of the drive for sustainability within the crafts sub-sector. Research into the market for craft, conducted by the Crafts Council in 2020, revealed that nearly 50% of makers and consumers consulted said that buying from sustainable businesses, using sustainable materials and local supply chains is important.

Obstacles to progress

Crafts is probably the smallest and most under-capitalised of all the Creative Industries, made up mainly of individual high-skilled artisans and micro enterprises. Compared to other sub-sectors, crafts activity is widely distributed across the country, including in rural areas, without the concentrations in large cities that characterise many other industries.³⁴ Craft makers often operate very differently from other creative practitioners with some makers sharing studio space, using more energy-efficient processes, or with greater proximity to supply chains.

Although craft workers and businesses often share facilities and studio space, securing finance is difficult and it is a challenge to invest in energy-saving measures or technologies, such as newer and more efficient pottery kilns. Small craft businesses are struggling with the effects of Brexit customs costs, coupled with rising energy costs and the cost of living and difficult decisions need to be made to ensure that businesses survive financially alongside their sustainability commitments.

Priorities for further support

Many craft makers are already aware of the importance of their supply chains on their sustainability. Effective micro-clusters such as the Jewellery Quarter in Birmingham are strong examples of groupings of businesses across the supply chain which enable craft makers to use local resources and services with a lower carbon footprint. Detailed mapping of supply chains across the industry could support further development of micro clusters in the UK, enabling craft makers to decide where to be and how to operate.

The Crafts Council has identified a range of knowledge and skills that would benefit the sub-sector, for instance the need for jewellers and smiths to better understand how precious metals are sourced.³⁵ There is a definite willingness to invest in training and skills development, but this can prove too expensive for some small businesses. There is currently no industry standard toolkit, while some businesses adopt toolkits for specific needs, such as Julie's Bicycle's guidance for building maintenance. With such a variety of different crafts businesses, rather than prescriptive guidance, openly accessible shared resources, practice and metrics are welcomed.

3.4 Design

Environmental impact

Design is not best characterised as a single creative sub-sector with a distinct value chain; rather it is a set of creative practices and skills applied across industries and contexts reaching into most of the economy. Environmental impacts will depend upon the kind of design work being undertaken: graphic design and visual communications is closely linked to advertising, while product design is associated with engineering and manufacturing. Service design is a more recent and especially relevant practice, with well-designed, user-centred services key to enabling the uptake of new technologies that work for people and planet, whether it be car sharing or low carbon heating systems. Depending on the particular industry – automobile, furniture or electronic goods for instance – the potential to make positive contributions to the global climate challenge is enormous. Environmentally conscious design is recognised as a cornerstone to a new global economy living within planetary boundaries.

The path to sustainability

In 2021, the Design Council launched Design for Planet, described as *"the Design Council's strategic shift to achieve a sustainable, climate-first future."*³⁶ The first output was Planet Unearthed, a two-day festival in November 2021. The Design Council said that the festival would be *"the first of many events ... to share best practice by designers who are leading the way in sustainability and climate action. These events will complement Design Council's core business of commissioning research, delivering programmes and influencing government policy – all of which will now emphasise Design for Planet."*

Another initiative of the Design Council is the Design Value Framework, helping designers and commissioners to identify and assess the wider social, environmental and democratic impacts of their work. It builds on design sector-specific tools, and provides, for the first time, a single framework for the whole of the design economy to use together, and across a holistic set of values.³⁷

The Centre for Sustainable Design – part of the University for the Creative Arts – is also providing sector leadership on environmental issues in terms of research, policy and projects.³⁸ The CSD often undertakes highly specific work on design practices or on specific fields within design. This is illustrated by the titles of recent research published by CSD: ‘Sustainability, Cricket Gear, Clothing and Apparel’; ‘China Energy Label Products’; ‘Global Survey of Precious Plastics Projects’. Many designers are making advances in materials-based research and innovation through approaches such as biomimicry, seeking sustainable solutions to human challenges and material design by emulating nature’s patterns and strategies at macro and micro-scales.

Obstacles to progress

As with architecture, within design the client has a significant impact on whether climate is addressed within a project’s remit. Many design businesses are small and medium-sized firms (SMEs) and the majority of emissions fall within Scopes 2 and 3. Design SMEs feel they are unable to significantly drive this agenda and influence the supply chain without client support. Furthermore, many design SMEs employ staff on a freelance basis, and lack capacity to systematically measure and address emissions across their activities.

Digital design has long been a growing area within design, encompassing the look and feel of screen interfaces, animation and multimedia, and interactive services. However, there is still little awareness of the scale of the impact of digital activity such as use of servers on carbon emissions. There is little investment in education and skills to embed sustainability across digital practice, or understanding as to how design can minimise the digital carbon footprint – see Appendix One for a fuller description of this issue.

Priorities for further support

The varied design disciplines lack a collective approach to climate commitments. While there are climate movements straddling different areas, such as graphic, digital, industrial and product design, these are not necessarily aligned and therefore lack the collective power to influence client commissioning.

According to the Design Council, 80% of the environmental impact of a product is determined at design stage. By integrating climate commitments into design briefs across the design economy, from the very project inception, design businesses and clients can collectively commit to taking action, and sustainable practice could become more

'business as usual'. Innovate UK's Design in Innovation Strategy³⁹ gives particular emphasis to the environment and design's 'vital role to play in shaping innovative solutions to the big challenges facing our society and the world' and that 'design means that people can make better purchasing and behavioural choices'. This echoes policy work from Creative PEC highlighting the UK's pre-eminence in design,⁴⁰ both in terms of industry and higher education institutes, and the opportunity for the UK to be a global leader in shaping sustainable design practice.

Alongside investment into materials, tools and production, further investment in design curriculum and skills, to embed practice in the workplace will be needed in order to integrate sustainability across every part of design businesses. Continuous professional development (CPD) opportunities would also be valuable to ensure skills are refreshed in line with new research and understanding, for instance into new materials.

3.5 Designer fashion



Environmental impact

Designer fashion, by shaping production of clothes and accessories, has almost certainly the largest environmental footprint of all the Creative Industries. In fact, on the global level, it is sometimes claimed to have one of the biggest negative impacts amongst all industrial sectors. Due to the complexity of international supply chains, estimates can vary widely – one study by McKinsey estimated the entire fashion product life cycle is responsible for up to 4% of total global greenhouse gas emissions.⁴¹ Such is the extent of the problem that London Fashion Week, the UK industry's flagship event, has been specifically targeted by activists, with high-profile campaigns by Extinction Rebellion for it to be cancelled. At the same time, controversies about 'greenwashing' and potentially misleading claims from fashion businesses have led to an investigation by the UK Competition and Markets Authority.⁴²

When it comes to sustainability, the fashion industry faces a profound challenge to its fundamental business model and culture. The value and desirability of clothes and accessories has always depended in large part on their novelty and newness and the incessant need for consumers to have the very latest styles. The changing fashion seasons underpin this, and have been accelerated in recent years by 'fast fashion' design and production techniques, in which a new garment transfers rapidly, in high volume and low cost, from the catwalk and showrooms to high street retailers, and is bought in order to be worn for a short space of time before being 'out of date' and discarded.



The path to sustainability

Although one of the most polluting industries globally, the UK fashion sector is making strong steps towards more sustainable practice both through carbon reduction and zero waste designs, and is ahead of the industry in many other countries. With increased awareness from consumers and activists, fashion business leaders have recently started to face up to the scale of the problem. For example, in 2020, the British Fashion Council helped to establish the Institute of Positive Fashion, with a stated ambition for the fashion industry to be 'more resilient and circular through global collaboration and local action'. A key goal for the Institute is to bring together representatives from across the whole industry – including fashion brands, manufacturers, academia, finance and legal expertise.

The majority of UK activity is through voluntary sign-ups to organisations and commitments such as Textiles 2030.⁴³ Signatories collaborate on carbon, water and circular textile targets, and contribute to discussions around policy development for textiles in the UK. The EU's Circular Economy Action Plan⁴⁴ has also been a significant driver for change. The directives include implementation deadlines between 2023 and 2024, mandating immediate action. Other international initiatives with a particular influence on UK business practice include the UN's Fashion Charter for Climate Action, Office for Partnerships and Fashion Pact, born out of the G7 Summit.

Businesses across the fashion industry are very aware of the need for carbon reduction, with the path towards action different for different scales of business. Smaller businesses have tended to focus on zero waste design and using more sustainable materials, whereas larger businesses have focused more significantly on Net Zero targets – particularly energy usage and transport – and reducing processing waste. There is an emphasis on developing economy design methodologies and R&D for new materials, dyes, recycling processes and waste management. Businesses are also coming together to collaborate on sustainable ventures. For instance, some retailers are jointly investing at the source so as to guarantee access to materials such as organic cotton, and to encourage regenerative farming.

There is an increasing awareness of the commercial and competitive advantages of new, more sustainable business models. For instance, there is growing interest in rental and resale businesses. Larger companies with significant stakeholders, and those with private investment are also influenced by investor demands and are required to complete ESG reporting. For smaller businesses, the drive often comes from a strong sense of values that are often part of the brand identity.



Obstacles to progress

The UK fashion industry has developed a complex network of supply chains, with materials sourced and clothing produced around the world through myriad outsourcing arrangements. In recent years, there have been concerns and media investigations into problematic social and environmental practices that have arisen from this, with British fashion brands accused of being complicit in this.⁴⁵ It is challenging for businesses to track their supply chain, with little transparency and traceability within the industry supply chain. Smaller companies in particular have very little power within a supply chain to dictate measures such as only using fully traced cotton. Larger businesses have a greater ability to influence the impacts of their decision-making, but there is a sense that a fundamental reset is required within the sub-sector in order to address the climate crisis.

Fast-fashion practices also continue to present a challenge to progress. The 2018 Environmental Audit Committee included the recommendation that *"the Government must end the era of throwaway fashion. It should make fashion retailers take responsibility for the waste they create by introducing an Extended Producer Responsibility scheme for textiles and reward companies that take positive action to reduce waste."*⁴⁶

Although it is positive that there is a proliferation of schemes to support businesses towards sustainability and Net Zero, it is challenging for businesses to ensure there is no duplicity in reporting activities and that they are using the most appropriate tools available. This can be particularly challenging for SMEs to navigate. There are some targets and guidance in place around energy, but little to date around physical product. The UK Fashion and Textile Association has been working to determine a baseline for metrics particularly around industrial waste for use across the industry where there has previously been no collectively agreed understanding.

There is a broad awareness of sustainability amongst consumers, although to varying degrees at different price points. High street retailers are increasingly committed to educating consumers, but without any mandatory metrics around what it means for a product to be sustainable it is challenging for consumers to understand the real impact of their purchasing choices.

Priorities for further research and support

While the industry feels well served in terms of knowledge about sustainability, further support towards implementation would be welcomed both in terms of centralised guidance and grant support. Although there have been UKRI-funded projects focused on sustainable fashion, necessary areas for change, such as the upgrading of current manufacturing processes, are not classed as innovation and so are not eligible for grants. Forms of financial support that foster industry-wide collaboration rather than competition for individual grants would better support infrastructure across the industry and its supply chain.

Establishing ethical standards, improving the transparency of supply chains and the quality of environmental reporting is a major priority for the industry. However, measuring and reporting would be much easier with industry-wide agreement on definitions and metrics. It is challenging when data collection is voluntary rather than mandatory, and with no financial support to enable businesses to conduct this on a systematic level. With greater industry-wide initiatives, there could be further opportunities for shared learnings within designer fashion and the wider Creative Industries.

Supply chain investment is also crucial to enable impactful change. Particularly investment in skills and education around manufacturing processes, and extracting value across the supply chain, such as in collection and use of pre-consumer waste, and opportunities around use of dead stock to increase the value of runs long-term. Promotion of UK-based or near-shoring (moving operations from a distant to a near country) of manufacture would also be of benefit, reducing the footprint of supply chains, and in the longer-term driving further inward investment, and reducing business costs.

3.6 Film and television

Environmental impact

Carbon emissions resulting from film and television production have become better understood in recent years, with the BFI collaborating on a comprehensive study with BAFTA albert and Arup in 2020.⁴⁷ These have been found to be significant, particularly for big budget productions, which are estimated at 2,840 tonnes of CO₂ for an average film production with a budget of over US\$70m. Just over half of emissions are related to transport, and of this 30% is accounted for by air travel. But there is also considerable on-set energy consumption, with electricity and gas use accounting for 34% of emissions. There is also widespread use of diesel generators contributing to the remaining 15%. In addition to this, material waste is generated throughout the production process – from studio facilities and set design to props and catering supplies, and the report identifies a number of areas where rates of reuse and recycling need to be improved.

The BFI, BAFTA albert and Arup study was exclusively focused on production and did not account for the distribution and exhibition of film and television. The carbon emissions associated with cinemas are similar to those of theatres and other venues, and so largely depend upon the age and efficiency of the building and use of low-energy lighting and digital projectors.

The path to sustainability

The UK film and television industry is notable for the progress it has made on climate action through an industry-led initiative. In 2011, BAFTA brought together a consortium of broadcasters and production companies to develop albert, an online tool that calculates the amount of greenhouse gases emitted into the atmosphere as a direct result of a production. The tool has become increasingly widely used over the last decade, with more than 1,300 television production companies using the tool, and 7,500 production footprints calculated. It is also increasingly being used for film production. It enables producers to draw up a carbon action plan and implement it to achieve albert's Sustainable Production certification, regularly seen on film and television credits.

Albert is now an organisation in its own right, with a dedicated team publishing reports detailing environmental impacts and promoting best practice. It provides both online and inhouse training tailored for businesses ranging from small independent studios to large-scale productions. Albert is now also providing training modules for undergraduates through education partnerships with over 40 UK higher education institutions.

The British Film Institute (BFI)'s Film Fund for independent productions requires carbon footprinting for all funded productions, working with the BAFTA albert programme, and all feature films funded have to be BAFTA albert certified too. The BFI also regularly monitor provisions such as types of catering, levels of waste management on set, and the sources of energy used in the productions they support. The BFI are soon to launch a new strategy which incorporates environmental sustainability as a principle of all funding decisions, and within this is a programme of support for grant awardees to take tangible actions for change.

Screen Scotland commissioned Creative Carbon Scotland to produce a report in 2020⁴⁸ to identify the appropriate means, opportunities and instruments for Screen Scotland to promote stronger mitigation of carbon emissions in the screen sector. This included the recommendation that Screen Scotland should consider introducing mandatory carbon reporting using the albert system for all funded projects. This would include working with BAFTA to support the development of a version that is more specific to Scotland, using local examples and providing practical advice for use on production, including local low carbon service providers etc.

Creative Wales are also beginning to integrate sustainability into funding requirements for both capital and grant funding for the film sector. Before submitting an application, applicants must complete an 'economic contract' which states the sustainability measures they will take, particularly in terms of 'climate resilience'.

There is a proliferation of resources available to the sub-sector aside from BAFTA albert for sustainable production as well as its new voluntary 'Studio Sustainability Standard'. The Arts Green Book of Sustainable Buildings which emerged out of theatre has applicable resources for cinemas, as does the Independent Cinema Office Green Cinema Guide and Green Screen project by Film London. The Eureka monitoring tool⁴⁹ is also in development in the Netherlands, inspired by the BAFTA albert tool and incorporating metrics against a wide range of sustainability and biodiversity impact areas such as types of paint and wood.

Initiatives such as a Welsh cluster pilot born out of the Screen New Deal report⁵⁰ have potential to support upskilling, capacity-building and change across local supply chains. A group of partners led by Creative Wales, with support from screen R&D programme, Clwytwr, and sector screen agency, Ffilm Cymru, are working with the BFI, BAFTA albert and Arup to reach out to screen companies, studios, broadcasters and suppliers across the whole value chain in the Cardiff City region and beyond to map what they are doing, and where opportunities are for intervention for the greatest impact. Albert and Arup are collecting data across 12 months, to create the first Screen New Deal implementation plan and to provide proof of concept, with the ambition to roll these lessons out across other clusters in the UK.

Transportation infrastructure is a significant challenge across Northern Ireland, with few public transport links, and heavy reliance on cars for moving people and goods. Studio Ulster⁵¹ will be Northern Ireland's largest virtual film production studio. Set to open in 2024, the Studio will integrate virtual production with traditional film, animation, games and broadcast alongside leading-edge R&D/VFX capability. An increase in virtual production will reduce a significant amount of travel required by the film sector in the country, and in turn its carbon output. Future Screens Northern Ireland have also partnered with NI Screen to explore what new skills are required to support virtual filming.

There is little evidence suggesting that audiences and consumers are driving sustainable action within the film and TV industries. The closest points of contact between consumer preference and industry delivery are in cinema buildings where decisions around food and beverages and how the venue is run can be influenced by the public's preferences, but consumers are not close enough to producers to drive change in productions themselves. That being said, there is a growing genre of films and documentaries with sustainable themes at their core, which have significant and growing popularity and particularly with younger generations. The BFI are seeing an increased interest in climate-related content, particularly in the documentaries they fund, and BAFTA albert are conducting work on the editorial side through its 'Planet Placement' programme to ensure that sustainable practices like recycling are seen on-screen in soap productions.

Obstacles to progress

Despite adoption of the albert tool, the BFI's Green Matters report⁵² identified significant challenges affecting the UK industry's prospects for reducing its environmental impact. It acknowledged that climate change remains a low priority in the face of immediate commercial pressures, including the squeeze on studio and crew capacity resulting from the current production boom. The situation is complicated by the fact that the major US studios making films in the UK use an alternative system of carbon calculation and sustainability certification run by the Production Guild of America. This overlaps with albert, but there is no common standard and sustainability practices vary from production to production.

The film and TV industries are by their nature fast-paced, and productions are looking to spend the least money as possible with the greatest possible return. It is often easier to use single-use plastics for a production with a short turnaround time, rather than reuse of materials which takes time and often with a higher cost at the outset. There has also been a regression in practice since the COVID-19 pandemic, as single-use and disposable materials were preferential for hygiene concerns. There are also specific barriers around asset disposal and recycling of sets as productions can sometimes face financial liability when handing materials on.

Priorities for further research and support

To enable greater reuse of production materials, regulatory incentives and financial and legal support are required for studios and productions to overcome some of the existing barriers and liabilities involved with transfer of materials. Some work has begun with sustainability consultants and screen agencies to formalise roles that work on sustainability within the industry.

The industry would greatly benefit from wider access to renewable energy, and ability to tap into the grid across the UK for on-location filming, and investment should prioritise grid infrastructure or decentralised energy solutions for clusters of studios. Better coordinated funding would also support such initiatives. For instance, an electrical cabinet was built in Victoria Park by Film London, and while it faced significant challenges the cabinet was successfully installed and will go live in late 2022. The project received collaborative funding from the Greater London Authority, and some smaller contributions from different organisations and the project is now looking at additional sites. Greater coordination between industries such as film and festivals and available budgets could support not only the cross-fertilisation of ideas, but more ambitious projects and initiatives which benefit multiple sectors.

Having identified that smaller productions and studios often struggle more than larger companies to introduce change, grants or tax credit relief would be welcomed to support them to take action. This would enable the whole supply chain to have impact rather than just big business. In terms of training, greater investment in higher-level training for producers would help to embed action on a senior level, and build leadership within the industry. Support with signposting tools and resources would also better enable productions to close the gap between knowledge and action, and navigate the range of resources in circulation. And by implementing training across the whole supply chain, a more holistic approach to sustainable action could be supported.

3.7 Music

Environmental impact

The environmental impacts of the music industry are probably better understood than the impact of any of the UK's other Creative Industries, reflecting the history of strong engagement on this issue by leading artists and businesses in the sub-sector, many of whom were instrumental in the establishment of Julie's Bicycle in 2007. Over this period, issues and concerns have evolved – early work, for example, was concerned with problems associated with CD packaging. Current areas of interest include vinyl manufacturing, music streaming, live touring, and venues and festivals.

A study by Julie's Bicycle into the UK music industry found that the annual greenhouse gas emissions from artists touring in the UK and British acts touring overseas was approximately 85,000 tonnes of CO₂e in 2010.⁵³ According to research from campaign group Powerful Thinking, in 2018 the UK festival industry generated 25,000 tonnes of CO₂e (excluding audience travel), created 26,000 tonnes of waste and used 7 million litres of diesel.⁵⁴ Live music has comparatively significant Scope 1 and 2 emissions through energy use in buildings and on site at festivals, as well as in touring vehicles – however, these are still outweighed by Scope 3 value chain emissions (in particular, audience travel).

The recorded music industry's Scope 1 and Scope 2 footprint is relatively minor, consisting largely of office spaces and recording studios, but it has significant Scope 3 emissions including from the production and distribution of vinyl and other products (which also involve complex international supply chains). Although digitalisation has driven significant shifts in music consumption, the market for physical vinyl products is rapidly growing and providing important income to parts of the sector.

Alongside this, the environmental impacts of music streaming are high on the agenda, but detailed data is not currently available due to a lack of transparency and shared reporting frameworks from digital distribution and streaming platforms. Studies have suggested that digitalisation may not always lead to a reduction in overall impact due to the way it drives change in listening habits.⁵⁵

In its most recent Equity and Impact Report, Spotify estimates it had a carbon footprint of 353,054 tonnes CO₂ in 2021, and that 42% of its GHG emissions come from listeners streaming, but the company acknowledges there is still a lack of information on the breakdown of impacts across cloud servers, Content Delivery Networks, data centres, end-user devices. Spotify has joined DIMPACT, a partnership between the University of Bristol and media companies around the world on better understanding the emissions associated with delivering digital content.⁵⁶



The path to sustainability

In 2019, Music Declares Emergency was launched – a call to action signed by more than 3,000 music artists in the UK, but also now a campaigning entity with a small full-time team and industry trustees. Music Declares Emergency issues direct guidance (co-produced with Julie's Bicycle) on how artists and businesses can create change, such as pressing lighter weight 140 gramme vinyl (instead of 180 gramme). Music Declares Emergency also runs campaigns targeted at audience engagement under the 'No Music on a Dead Planet' banner.

LIVE UK was established in October 2020, bringing the UK industry's trade associations under one umbrella group as a single, united voice. They have launched the LIVE Green programme, which aims to collate and provide research, expertise and cross-industry innovation that is informed by the best science and supports the transition to a regenerative future. All 14 association members of LIVE have ratified its declaration to deliver measurable and targeted action on climate change, with the ultimate aim of reaching Net Zero emissions by 2030.⁵⁷ LIVE UK is also currently working with the Institute of Licensing to look into how best to bring sustainability issues to the fore when local authorities are considering licensing for venues and events.

There are examples of individual music artists taking a strong interest in reducing their carbon footprint. For example, the rock band Coldplay are working with environmental scientists at the Grantham Institute, Imperial College to measure the impact of their current global tour, which will feature more than 50 concerts in 15 countries over seven months. A public announcement put particular emphasis on Coldplay's capacity to affect the behaviour of their audience: *"Influencers, and other high-profile people such as the band members from Coldplay can play an important role in showing the way forward and getting this message out to parts of society that climate scientists find it difficult to reach."*⁵⁸

In the festivals domain, UK Festival Vision: 2025 has convened over a hundred music festivals and outdoor events.⁵⁹ Events that sign up to Festival Vision: 2025 are 'committing to take action to reduce their greenhouse gas emissions by at least 50% by 2025 and to work together to share experiences and knowledge.'

There has also been a significant acceleration in engagement in the recorded music industry. As of 2022, smaller independent companies are supported to measure their carbon footprint with a custom carbon calculator developed by IMPALA (the European organisation for independent music companies and associations) and Julie's Bicycle. Larger companies are investing in specialist sustainability roles, and demonstrating willingness to share resources and expertise with the wider industry.

The sector is looking at the climate crisis as a pre-competitive issue that enables cross-industry collaboration in the recorded sector from the largest global companies to SMEs. The Music Climate Pact⁶⁰ was initiated by the UK's Association of Independent Music (AIM) and record labels association BPI as a global platform for a series of high-level commitments that serve as a declaration of intent for the global music sector. The Pact brings together key actors from across the independent music community and major music groups to align the sector and address environmental challenges collaboratively, working towards a global framework to agree methodologies and aggregate data.

Obstacles to progress

Despite growing momentum, decarbonising the live experience remains a daunting challenge for the sector. Key challenges include significant investment required into decarbonising buildings (venues), including many that are listed; shifting festivals off diesel generators; and the emissions associated with audience travel and touring – with the latter in particular posing specific challenges as a business model dependent on moving artists and equipment around over large distances.

Vision: 2025's annual Festival Industry Green Survey repeatedly identifies three main barriers to change for the festival sector: cost, lack of time to implement change and 'inability of contractors to deliver sustainable options.' The live industry including its supply chain is still recovering from the COVID-19 pandemic, which has significantly impacted on its ability to invest.

When it comes to recorded music, the industry has limited influence over large, global supply chains. Record companies have little influence over the plastic companies who make substrate for vinyl, for whom the recorded music industry is a minimal contributor to overall turnover. Manufacturing processes like vinyl pressing are highly specialised and energy-intensive, requiring R&D investment for decarbonisation.

Priorities for further support

The music industry would benefit from a programme of rapid skills development, including both basic background knowledge (e.g. sustainability becoming a required module on all further and higher education courses) as well as on-going professional development for those in the workforce.

Greater action to improve supply chain transparency would be welcomed by the recorded and live music industry, including more transparent standards and requirements to report against environmental performance to assist companies (especially SMEs) to do due diligence on potential suppliers against their environmental claims.

For venues and studios with buildings, greater access to investment for energy efficiency would help accelerate decarbonisation (through more available grants for publicly owned or SME businesses, and low-interest financing for larger venues). The sector has benefited from some R&D partnerships – for example, Innovate UK funding that has supported suppliers of battery power to outdoor events and the exploration of circular economy business models for festivals. However, these have been relatively small projects and there are significant opportunities to further this work.

3.8 Performing arts

Environmental impact

A study by the GLA and the Theatres Trust found that London's theatre industry is responsible for 50,000 tonnes of CO₂e emissions per annum with audience travel estimated at an additional 35,000.⁶¹ Sustainability issues relating to theatre premises (e.g. air conditioning, boilers, insulation) were a particular focus for the study. In addition to the environmental consequences of venue operation and travelling audiences, the world of performing arts involves touring companies travelling nationally and internationally; the use of materials for sets, props, and costumes; and the provision of food and beverage in public catering, all of which carry additional environmental burdens.

The path to sustainability

In May 2022, PointOne and Indigo Ltd partnered to deliver Act Green, a piece of research into the attitudes of UK cultural attendees towards the climate crisis. Its aim was to understand more about what audiences expected from cultural organisations in this area, and what part they were willing to play. Research found that 77% of audience members expect theatres to address the climate emergency.

Many performing arts organisations in England are within the remit of Arts Council England funding, which has worked with Julie's Bicycle to develop best-practice guides and education programmes on themes like sustainable production, energy management for venues, and greener procurement. Most significantly, the Creative Green Tools, which enable organisations to calculate their environmental impacts, are a crucial element of Arts Council England's funding agreements with more than 800 National Portfolio Organisations (NPOs). Since 2012, environmental reporting has been a condition of all Arts Council funding agreements for National Portfolio Organisations, with beneficiaries required to provide data each year (collected using the Creative Green Tools) in areas such as energy use, waste, water consumption and travel. NPOs are also expected to submit environmental policies and action plans.

In Scotland, the 121 organisations regularly funded through Creative Scotland are also required to report their carbon emissions and carbon management plans. In 2022, Creative Scotland commissioned Creative Carbon Scotland to produce a Climate Emergency and Sustainability Plan. This includes the ambitious target that all creative businesses reach Net Zero by 2045, and clear messaging that not only do the Creative Industries need to reach Net Zero, but also all of the industries that the CCIs serve and support. Following the Report, Creative Scotland have drafted guidelines to extend mandatory carbon reporting to all creative businesses funded through their programmes, as well as those regularly funded.

Bringing together a wide-ranging industry consortium, the Theatre Green Book is looking to set out a comprehensive new standard for environmental action in the performing arts. Set out in three 'volumes', the Green Book sets standards in three main areas: making productions sustainably; making theatre buildings more efficient; and improving the sustainability of operations like catering and front of house. There is also progress towards developing a self-audit tool for venue operators, which will be released via the Green Book as a simple tool which prioritises action by impact and ease to implement.

Companies at the vanguard of the dance industry are also demonstrating their commitment to change through individual and collaborative action. The New Adventures dance company under direction of the influential choreographer Matthew Bourne, was involved in the development of Julie's Bicycle Creative Green Touring Certification, and piloted the certification with its 2018-19 Swan Lake tour of the UK.⁶² In addition, Julie's Bicycle, New Adventures, Sadler's Wells and Norwich Theatre Royal have formed a sustainable touring consortium with support from Arts Council's Accelerator Programme. The consortium aimed to improve *"co-operation across receiving houses and touring companies and ... to exchange best practice and get to grips with what more can be done by them as a group but also for touring more broadly."*⁶³

Obstacles to progress

Many of the challenges faced by the performing arts are those shared with the live music industry. In common with the UK's galleries, the performing arts have also been severely disrupted by the COVID-19 pandemic. It can be likewise conjectured that the environmental agenda may have become deprioritised as the sub-sector has focused upon navigating its way out of the pandemic. A key challenge is the existing infrastructure, with considerable investment required to retrofit and enhance venues, including improving building fabric and energy efficiency. With so many theatres and concert halls having been in operation for decades, structural improvement is very costly, and venues simply do not have access to the necessary funds.

Priorities for further support

Further support for research and metrics around how audiences travel to events has been highlighted as a key area of development, not only for the performing arts but for live events and exhibition activity across the creative sector. Further investment to support carbon audits and capital investment to support implementation including retrofitting and upgrading venues will enable venue operators and festival managers to take these necessary steps.

3.9 Publishing

Environmental impact

The distinctive environmental impacts of publishing are those associated with printing and paper production. Although the last decade has seen the increased consumption of online news and electronic books, print production remains substantial. The UK has long been a major international centre for publishing, with more than 180,000 new book titles coming out each year – more per capita than any other country.⁶⁴ At the same time, and despite falling print circulation, the UK is home to more than ten national newspapers, hundreds of local papers and several thousand consumer and trade magazines.

Producing virgin paper from timber for all of these is highly energy intensive, and the print industries are thought to represent up to 4% of global energy consumption. Added to this is the large amount of water required in producing virgin paper – estimated to be 10 litres of water per A4 sheet.⁶⁵ Pulp and paper mills, with their extensive use of bleaching agents and other chemicals, are also significant polluters. In recent decades, the printing of books has become an increasingly off-shore activity, with associated transport energy costs, but it remains the case that there are substantial print works in the UK, especially for newspapers and magazines.

The path to sustainability

Overall, there is broad enthusiasm and willingness from within the industry for publishing to become more sustainable. Most large publishers now have a sustainability director, and many smaller publishers also demonstrate strong engagement. Climate change is one of the primary issues discussed by members of the Publishers Association (PA), and of the 170 members, 75 sit on the organisation's Sustainability Task Force. The Task Force advises and makes recommendations to the PA Council, chaired by the President, which in turn allocates budgets and sets workstreams. In November 2021, the PA launched Publishing Declares, with signatories at CEO level from large companies.

Publishing Declares is an initiative co-ordinated by the PA and unveiled in the run up to COP26. It is a pledge to set 'measurable targets across our own operations and extended supply chain to achieve Net Zero as soon as possible' and has been signed by the Executive Directors of more than 90 of the UK's major publishing companies and printers.

The PA has also been developing a Carbon Calculator tool in partnership with RISE, the Research Institutes of Sweden. It will measure the carbon output (Scope 1-3) of publishing companies. Companies will be able to see the data generated for their own company, while the PA will aggregate and provide industry-wide statistics on an annual basis. The PA is also, with the same partners, developing a Materials Matrix. This will use the same online interface, and allow publishers to calculate the carbon outputs for a new book, depending on inputted variables (paper thickness, inks etc), and to make more sustainable production decisions. Due to licensing costs, these tools will, to begin with, only be freely available to PA members.

The Sustainability Industry Forum was also recently launched by six publishing organisations (Association of Authors' Agents, Booksellers Association, Book Industry Communications, Independent Publishers Guild, Publishers Association and Society of Authors). Such initiatives demonstrate a growing focus on sustainability in the industry, alongside other international initiatives on a European and global level.

Obstacles to progress

Up until now, the industry hasn't had sufficient data to take effective action, but it is understood that the main problem in terms of carbon emissions is around paper and printing. This is a complex and global problem. There is a need to reduce levels of book returns – books which are printed, distributed to booksellers and then come back unsold and are pulped. The industry needs to find a way to reduce the practice.

Much of the carbon emissions to do with printing, paper production and transport are part of global supply chains and difficult for publishers in the UK to manage on their own. For instance, there is a global shortage of paper at the moment which is outside of publishers' control. Much of the paper and printing is done in China or in other parts of Europe, and there is little prospect of paper production coming back to the UK. In November 2021, Penguin Random House's Social Impact Director acknowledged this at an event hosted by The Bookseller: *"It's really easy to get distracted by the things in our face in our offices like coffee cup recycling. It is still super important but actually for us 98% of our carbon footprint is in the supply chain, our paper mills, printers and distribution. So much of that impact is hidden."*

Priorities for further support

Although there are a growing number of roles in the industry relating to sustainability and people at a senior level undertaking projects, further investment in training would be welcome. Through the Sustainability Task Force, the Publishers Association runs workshops with partners such as legal experts and organisations like the Ellen MacArthur Foundation. These tend to be well attended, however further technical expertise and the support to enact change would enable deeper impact.

There is generally limited discussion or awareness of the national government's strategies or targets around Net Zero. Rather, publishers are committed to change within the sector. Although the PA is in regular dialogue with the government regarding issues such as copyright and skills, there are no active conversations around sustainability or Net Zero. Greater government-led dialogue and directives would be welcomed.

3.10 Video games

Environmental impact

As with software more generally, the design and production of video games and other forms of interactive leisure software is an almost entirely digital undertaking. This is even more the case as downloading has now become the most common form of purchasing a game,⁶⁶ removing the need for packaging and retail distribution. The manufacture of consoles, screens and other audio-visual devices necessitates large energy costs and also the use of extracted materials such as tin, gold tungsten and tantalum, with concerns that they are often sourced from conflict zones.⁶⁷ Games consoles are highly complex with soldered parts and cannot easily be recycled or upgraded when, as happens every few years, a new generation launches. Very little of this manufacturing activity takes place in the UK, which is much more focused on the design and development of the games themselves.

The environmental concerns around video games therefore mainly relate not to their development but rather Scope 3 emissions, and the considerable amounts of energy required for playing games. The next generation of video gaming on the latest consoles⁶⁸ have especially heavy energy demands, with dynamically generated immersive worlds, realistic audio-visual content, continual player interaction and large numbers of participants on global network platforms. These energy requirements will only increase as games companies help lead the development of the metaverse. As such, the issues are a particularly urgent instance of the wider concerns and efforts to make computing and telecommunications more efficient and less dependent on electricity generated by fossil fuels. An example of the energy usage required to power this sub-sector can be found in the studio footprint of London software designer Space Ape – according to their calculations, 50% (or approximately 375 tonnes) of their carbon emissions are produced by the cloud servers used to operate their games.⁶⁹

The path to sustainability

The Playing for The Planet Alliance is a new campaign group that is seeking to create change within the global video games industry, and currently consists of 35 big businesses and a host of SMEs.⁷⁰ The United Nations Environment Programme (UNEP) co-founded the Alliance in 2019, and UNEP provides the Alliance with on-going support. With members including Microsoft, Sony and Ubisoft, the Alliance undertakes a range of initiatives 'to rally the industry to reduce its carbon footprint' and 'to inspire environmental action' through video games. For example, the Alliance exacts commitments to specific environmental actions from its member organisations, and then reports on their progress against their commitments. Playing For The Planet also petitions for member organisations to add 'green activations' to their games in order to influence the gaming community – green activations being 'new features and messaging ... which highlight environmental themes such as conservation and restoration.'

The environmental agenda is also a priority area for UKIE – one of the UK’s trade bodies for the interactive entertainment sector. UKIE has partnered with Playing for The Planet to produce the Green Games Guide handbook.⁷¹ The Guide is aimed at encouraging organisations to take their first steps into sustainable practices, with an emphasis on basic education about climate emergency and fundamental measures such as calculation of carbon emissions. The Guide supports businesses to identify where they can reduce their emissions immediately and offset the rest by 2030. It also encourages games developers to consider how green themes and calls to action can be integrated into their games to inspire behaviour change. Further activity by UKIE such as the International Green Games Summit builds connections between the industry and climate change experts to support ongoing dialogue and innovation.

Obstacles to progress

The poor availability of data is identified as a major obstacle for the games industry. According to UKIE’s Green Games Guide: ‘There is not yet a single source of data that can give an accurate picture of the overall sector’s carbon footprint but this is a priority for the industry.’ While there are several guidebooks and tools available for reducing Scope 1 and Scope 2 emissions, there is no industry-wide Scope 3 definition, and therefore no industry-level targets. While individual companies in the industry, such as PlayStation, are taking a lead in generating tools and publishing data there is little unified data across the industry, and the international nature of buying and playing games, usually over online platforms, makes the collection of national data difficult.

There is also a gap in understanding in how the current Greenhouse Protocol and other initiatives apply to the games industry. Many government-led guidelines are written with other industries in mind, and can be challenging to adapt to the sub-sector. For instance, there is a very different production cycle in the interactive leisure software industry to that of TV and film, and very little circulation of physical goods, unlike industries such as designer fashion. As set out in Appendix One, the digital realm requires a very different set of frameworks.

Priorities for further support

Much more work needs to be done to define and capture Scope 3 emissions in the video games industry. With such a high proportion of emissions falling under Scope 3, this is critical to the overall sustainability of the industry. UKIE are currently working with Playing for the Planet Alliance to commission research to determine a Scope 3 definition, and further support is needed to build on this work.

In recent years, the green coding ‘movement’ has emerged within the software engineering and technology profession, with the aim of promoting design principles and practices that seek to minimise the carbon emissions associated with processing software code. Although not institutionalised, it has begun to direct focus towards software development with reduced energy intensity, rather than the orthodox emphasis on performance or memory optimised development styles. It is still a nascent field, but with wider professional uptake and support from businesses and industry bodies, there is significant potential to mainstream green coding practice across the games industry.

3.11 Visual arts

Environmental impact

Although the visual arts sub-sector is relatively small compared with other industries in terms of GVA, there is a good understanding of its major sources of energy waste, carbon emissions and other environmental damage. This is probably a result of its relatively close association with public sector agencies such as Arts Council England. As long ago as 2010, the Greater London Authority (GLA) and Julie's Bicycle published research into the environmental impact of London's visual arts sector. The research estimated that audience travel accounted for a majority share (56%) of the sector's CO₂e emissions.⁷² A 2019 report by the Tate Gallery found that audience travel accounted for 240 million tonnes of CO₂e, or 92% of the gallery's total carbon footprint.⁷³ Clear data also exists around other key areas of carbon emissions, such as air freight and energy consumption for arts venues and storage facilities.

The path to sustainability

Organisations including the Galleries Climate Coalition (GCC) have accelerated progress particularly over the last few years. The GCC's membership has grown from the London arts community to over 900 country-wide members, and an international membership of 20 countries that is growing all the time. The GCC supports the sector to align targets, terminology and strategy. However, rather than using Net Zero as a target, they focus on near-term tangible reductions, including a 50% reduction by 2030 across the whole sector, alongside zero waste. All of the GCC's member organisations agree to these targets upon joining. In April 2023, the Coalition will introduce a second tier of membership for those that can prove they are actively reaching these targets, shifting the momentum from commitment to action.

Obstacles to progress

According to a 2021 report into the global visual arts sector by Julie's Bicycle, an obstacle to progress is the visual arts sector's degree of engagement with the climate emergency: *"The visual arts are predominantly not prepared for the transition to Net Zero carbon. On the basis of our research the sector has a limited understanding of its environmental impacts, with a small number of galleries, fairs and artists making their carbon footprints public. More carbon footprint data is needed, and the methodology should be standardised, footprints shared and progress monitored."*⁷⁴ Despite considerable effort and momentum led by the GCC and its members, evidence points to large gaps in other areas of the visual arts sub-sector.

Furthermore, the pandemic has been tough on the UK's art galleries. Research by national charity Art Fund in 2021 found that *"the latest lockdown is a body blow and is leaving our museums and galleries fighting for survival."*⁷⁵ In the face of this, it is likely, and inevitable, that environmental action has become less of a priority than viability and revenue recovery. According to the GCC, there is also a perception amongst many in the sub-sector that reducing environmental impact comes with a higher cost.

The high-end art market also presents particular sustainability challenges. Although many auctions are now held online, there has been an exponential growth in international art fairs, accompanied by additional business and audience travel, and artwork freight. It is challenging to map national climate targets against the particularly international nature of the high-end market.

In many other creative sub-sectors, an industry-wide body has developed programmes to educate its members and encourage change. This is not the case for the visual arts where there is no longer a dedicated industry body to represent the interests of UK galleries since the closure of the Visual Arts and Galleries Association in 2014. Unlike a trade body, the GCC is not set up to represent the broad interests of the visual arts and relies on galleries actively joining the movement.

Priorities for further research and support

The GCC is the only industry-wide representative body that has taken responsibility for advocating the sustainability agenda among UK galleries. There may still be the role for a programme or agency that can provide specialist education and leadership to improve sustainability practices, reaching businesses who have not actively joined self-organising initiatives like the GCC.

Investment in the supply chain could also advance greater change. Although galleries report on their direct emissions, there are gaps in the information supplied by the shipping industry, including air freight, which has a significant impact on the sub-sector's overall emissions. The GCC have been campaigning to change the standards in the sub-sector so that all shippers provide carbon estimates and data in a consistent format. Investment in renewable energy generation, such as solar panels on the roof of galleries, would further support reduction. Outside of Net Zero, many businesses would benefit from tools focused on waste reduction, with investment in the circular economy and business ventures such as rental services for gallery equipment.

4

Insights, drivers and opportunities

4.1 Industry willing and national policies

The overwhelming message from sub-sector overviews and interviews from industry representatives and informants is the importance of climate and the environment, and the extent to which businesses are engaging to promote positive change. This is demonstrated not just by industry declarations and public statements, but tangible work programmes. Commitment is widespread and growing, from large creative businesses, many of whom now have director-level responsibility for sustainability, through to small businesses and start-ups. For younger businesses and entrepreneurs in particular, awareness of the climate crisis and other environmental problems is high, with willingness to embed sustainability into their work.

As the profiles show, trade associations and other organisations that represent the Creative Industries are taking a leading role in this: raising awareness and understanding, co-ordinating activities, campaigning, developing tool kits and setting standards. While the associations vary in their resources, almost all now have a staff member with responsibility for climate change.

Despite the commitment and activity from industry, it is recognised that governments at a national and regional level have an essential role to play and many are looking for more policy guidance and incentives. Many of the trade associations highlighted the UK's hosting of COP26 in 2021 in helping to galvanise public commitments and industry initiatives and accelerate work programmes such as tool kits. However, given the importance of the issue, there has been relatively little subsequent engagement with the national Government.

The Government's Build Back Greener strategy makes little reference to individual sectors, and none at all to the Creative Industries. Whilst this is understandable for a high-level strategy, it is clear that industry would welcome a stronger read across from national priorities to sector policy. For industry energy and activity to be as impactful as possible a number of challenges need to be overcome and new ways of working established, with the Government helping to develop standards and targets to encourage industry activity and guide investment decisions.

4.2 The value of tool-kits

As the sector profiles show, recent years have seen the development of a number of industry tool-kits for calculating carbon emissions and to assist businesses in implementing climate strategies. Julie's Bicycle launched its first set of carbon calculators in 2010 for music venues, tours, offices, and festivals, and numerous toolkits specific to other Creative Industries. BAFTA's albert's production tools have been in operation since 2011 and are used widely across broadcast media and film, and most other creative sub-sectors are following suit: at least 17 tools were identified in the course of the research, as summarised in Appendix Three.

Despite their importance in emissions reductions strategies which are already enabling businesses and others (including funders) to calculate emissions, monitor progress and inform decisions, these tools have been subject to relatively little in the way of academic or other external scrutiny. Rather, tools have generally been assessed and refined by the organisations that developed them with some external diligence, and while they are tested with user groups as part of their development, standardised and broader analysis of their effectiveness and uptake is lacking.

4.3 Creative leadership

A striking feature of the response to the climate crisis for the last two decades, has been the particular role played by leading individuals within the UK's Creative Industries. The COP26 conference was opened not by a political leader, but rather by Sir David Attenborough, one of television's greatest broadcasters. Long before politicians and business leaders started to speak out on the gravity of the crisis, there have been figures from the music, arts and entertainment industry who have done more than anyone to ensure that the issue has been kept to the forefront. To coincide with COP21 in 2015, Julie's Bicycle, albert and Centre for Sustainable Fashion, co-ordinated an open letter from well-known creative figures, including David Bowie, Vivienne Westwood and Emma Thompson, demanding action from the assembled politicians while also pledging to speak out *"to our audiences and customers, using our creative voices to affect the public narrative and create social consensus for action on climate change and environmental degradation."* The letter succeeded in attracting global media attention, illustrating the impact that the creative sector can have beyond its own footprint.

The UK music industry has demonstrated particularly strong leadership in this regard, and were instrumental in the establishment of Julie's Bicycle. However, the extent to which individual leadership results in long-term change is not well evidenced and artists have their own profile and means of communicating. The decision of bands such as Coldplay and Radiohead to address the carbon footprint of their touring helped draw attention to the substantial carbon emissions associated with global tours, and also created a backlash where artists have been publicly called out for their excessive carbon footprint. But it is not clear if this has led to more general efforts to reduce the footprint of touring across the industry. Better understanding is needed of the extent to which the actions of creative figures lead to sustained progress and long-term behavioural change, across industry and consumers.

4.4 Market drivers

While many leading figures in the Creative Industries are campaigning for change, and businesses are engaging with environmental issues, it is less obvious that this is being driven by consumers or investors. Consumers might be more environmentally mindful, but this does not mean they are yet purchasing different creative products and services. There are potentially exceptions to this in areas like music, crafts and fashion, but consumers are not directing production processes or supply chains by, for instance, choosing a more sustainably printed book or video game, or going to a cinema that only shows albert-certified films.

In terms of private investors, there is little sense that investment is changing to reflect environmental priorities in the creative sector. There is certainly a burgeoning interest and investment activity in companies developing environmental solutions or technologies, with Tech Nation reporting more than 500 companies in the UK who are developing tools and services in order to reduce environmental impacts and that in terms of venture capital funding it is one of the fastest growing technology sectors. But other than those venture capital funds that are specifically focused on 'green tech', environmental issues are not shaping investment and socially responsible investing does not seem to be an important consideration for those investing in the creative sector. Venture capitalists are much more concerned with the success of their investments and performance over a five-year period and want the managers of their businesses to be focused on meeting financial goals. The intensity of start-up and scale-up activity hinders people's capacity to consider broader social and environmental issues.

4.5 Education and skills

In recent years, environmental issues have become more and more prominent in the provision of arts and Creative Industries education. This is particularly the case for disciplines such as architecture, design and fashion, in which it is increasingly regarded as an essential element of the curriculum. Across the country as a whole, there are now many hundreds of Higher Education MA and degree courses that could be categorised under the broad label of 'environmental arts', covering not just design and architecture but almost every creative discipline: fine arts and sculpture, crafts, fashion, creative writing, performing arts, journalism and audio-visual production. As well as courses there are also academic centres for cross-disciplinary research, policy, study and teaching. Well-established examples include the Centre for Sustainable Fashion, founded in 2008 and based at the London College of Fashion, and the Centre for Sustainable Design, housed within the Business School for the Creative Industries at the University for the Creative Arts.

What is less evident is the extent to which environmental issues are being embedded in continuous professional development and ongoing skills provision for the industry. Many of the larger trade associations run a programme of events and workshops to raise awareness and understanding, and some are developing educational programmes. However, there are few instances of qualifications or certification processes, and technical expertise is still lacking across the creative sector.

4.6 Research and innovation

It is recognised that a key factor in reducing carbon emissions will be through innovation and the development and uptake of new technologies, processes and business models. As such, the UK's over-arching innovation agencies and programmes, and the priority they are giving to Net Zero and other environmental concerns is crucially important to the Creative Industries being able to achieve its objectives.

Despite the size of the Creative Industries, the sector has not always been able to engage with UKRI around this agenda effectively. For instance, as part of the Industrial Strategy Challenge Fund, substantial funding was allocated by AHRC and Innovate UK towards R&D in the Creative Industries, but relatively few of the projects had a focus on environmental sustainability. Where there has been most progress, it has been around the circular economy and in particular the drive to reduce material waste in certain production processes – for instance the AHRC-funded Future Fashion Factory led by the University of Leeds which is exploring how improved circular economy design processes can lead to efficiencies and reduction in textiles waste.⁷⁶

But in order for innovation activity to be truly impactful in this area, the broader issue of R&D for the Creative Industries needs to be addressed. This includes notions of innovation, the strategy of funding agencies and definitions for tax relief purposes. At present, by under-representing or excluding arts, humanities and social sciences R&D we risk under-incentivising crucial R&D in the Creative Industries geared at reducing carbon emissions and promoting sustainability.

5

Recommendations and next steps

The purpose of this report has been to review the landscape, identify major drivers and barriers, and highlight research and evidence gaps, rather than to develop grounded recommendations. That said, the review points to a number of possible areas for policy and research which would address existing knowledge gaps and help to accelerate progress towards the creative sector achieving Net Zero. These are sketched out below.

Environmental tools – Specialisation vs Aggregation

Many of the carbon calculators and other environmental tools have been developed by and for a particular industry, and this has been important in their effectiveness and adoption (see Appendix Three). The very different nature of the industries means that the tools need to be distinct. This can be the case even in the same industry with, for instance, the environmental impacts of music performance and music production being very different. Nevertheless, there is still much to be gained by collaboration across the Creative Industries – as demonstrated by the Advertising Association's recent adaptation of the albert tool developed for film and television. A forum for aggregating the industry data, monitoring and publishing industry-wide progress towards reducing emissions, promoting the use of tools and sharing learnings on their design and development would be valuable.

Creative clusters and localised supply chains

While the economic benefits and features of clustering and co-location of creative businesses and organisations have been much studied, there has been relatively little attention paid to its environmental implications. But the shortening of supply chains and reduction in transportation could have significant impacts, especially in terms of near-shoring, and the relocation of manufacturing associated with the UK's Creative Industries, such as textiles and printing. At the city and local level, more could be done to understand the benefits and to help progress this aspect of the green creative economy.

The Creative Industries and behavioural change

A recurring theme from industry representatives and commentators is the creative sector's disproportionate impact on society over and above its economic size, and its potential for promoting positive change. However, although the claim is almost universally made, there is at present little in the way of evidence or understanding of how the activities of the Creative Industries influence consumer decisions or attitudes and behaviours with regards to the environment. Although it would make for a complex and ambitious research project, the subject is an urgent one and a scoping study on how it could be undertaken should be initiated.

Innovation and R&D

Many of the industry bodies would welcome a more ambitious and substantial programme of R&D investment to help businesses innovate and develop new technologies and processes for decarbonising and reducing waste. In particular, dedicated funding competitions for the Creative Industries would help to encourage further cross-sector innovation and collaboration, of the kind that has already generated benefits.

Adaptation research

The Creative Industries will need evidence to map across to the Climate Change Risk Assessment in order to align with the National Adaptation Programme. Research into the risks, implications and opportunities for Adaptation is long overdue.

International benchmarking and perspectives

Many of the industry bodies referenced international initiatives that they engage with as well as those on a UK level. It would be beneficial to carry out a benchmarking of international policy and sector activity in a range of geographies to review alongside that of the UK, and to provide further insight into best practice examples.

Appendices

Credits

Industry and research contributions and expertise were received from:

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Appendix One: Digitalisation and the Creative Industries

Over the last twenty-five years, the Creative Industries have been transformed by digital technologies: whether it is software used for authoring and creating, producing and recording tools, or the consumption of content on electronic devices. This has prompted a recurring question: is digital also greener? As the creative economy evolves and broadens into the digital economy, will its environmental footprint be reduced?

Our intuitions suggest that it must be. To take music as an example – how can a downloaded track have the same impact as the hard, oily reality of a CD or record? But it is a deceptively complex question, requiring common metrics and an approach based on a comparable life-cycle assessment (LCA).

To continue with music, a CD needs to account for the sourcing of raw materials that go into the disc and the player, and the manufacture of both; the packaging and distribution; how the consumer

obtains them, how many times they are used, and how they are disposed. When it comes to digital music, the life-cycle assessment needs to account for a different range of factors: the proliferation of devices and their susceptibility to consumer obsolescence; the telecommunications hardware, the wires and fibre optics used for delivery. The number of places a track is held or shared, from desktop to tablet to phone will all impact on the total measurement. And it should be borne in mind that the digital consumer tends to access hundreds more tracks than in the past, when the average music buyer bought just a few CD albums a year.

Given the increasing pervasiveness of digital technologies, it is probably more helpful not to make comparisons with the physical, but rather to better understand the full environmental impacts of the digital economy. In this, there are some basic things to think about:

Materials and manufacture

Computers contain several non-renewable natural resources extracted from the earth with processes that often need considerable amounts of energy.

Component parts

Hard drives, keyboards, screens and plastic casings are usually shipped elsewhere for assembly into the finished product and then shipped again, all over the world – packaged in plastics, Styrofoam and cardboard.

Waste

The UK produces one million tons of electronic waste each year. It is estimated that only 15-20% of electronic waste is recycled⁷⁷ with the vast majority going into landfills and incinerators.

Energy

All digital activities require electricity, which in turn needs to be generated. It has been estimated by the Swedish KTH Royal Institute of Technology that internet use is around 10% of the world's total electricity consumption.

Appendix Two: Case studies

Association of Independent Music (AIM) – Music Climate Pact

The Music Climate Pact is a global platform, initiated by the UK's Association of Independent Music and record labels association the BPI, as a response to COP26 and the urgent call for collective action to combat the climate crisis. The platform hosts a series of high-level commitments that serve as a declaration of intent for the global music sector, developed with the support of the UN Environment Programme (UNEP). The Pact brings together key stakeholders and businesses from across the independent music community and major music groups. Its goal is to align the sector's actions globally, and to work collectively towards shared, actionable targets.

Signatory businesses include the three major labels, Sony Music Entertainment, Universal Music Group and Warner Music, alongside a roster of independent labels including Ajunabeats, Ninja Tune and BMG. The companies sign up to one of two schemes – the Science Based Targets, or Race to Zero programme,

and both have bespoke criteria for SMEs. All signatories pledge to achieve a 50% reduction in greenhouse gas emissions by 2030, and to reach Net Zero by 2050.

It can be challenging to aggregate and use data when different businesses within the music sector use different toolkits and metrics. Alongside these commitments, all signatories also commit to collaborate on measuring carbon emissions in the industry. This involves working with streaming companies such as Spotify to obtain data and work collaboratively across the music ecosystem. By signing up to the SME Climate Commitment (via either of the two pathways), businesses have 18 months to produce their first emissions report, with support from AIM and the BPI and the IMPALA Carbon Calculator.⁷⁸ Other areas of collaboration include supporting artists to speak out on climate issues effectively, and to communicate with audiences about climate change, and how the music industry can work to address it.

Design Council – Beyond Net Zero: A Systemic Design Approach

Enabling sustainable living is one of the Design Council's three key priorities outlined in their Strategy 2020-24. It builds upon the Design Council's 2019 Framework for Innovation, which includes the key principles and design methods that designers and non-designers need to take to achieve significant and lasting positive social and environmental change.

In 2020, the Design Council set out to research how design methods, frameworks and principles were being used to achieve Net Zero, including circular and systemic methods. The goal was for this work to feed into the national government's Net Zero targets, and to be used by those

working in the design economy in both the UK and abroad. This approach was based on the understanding that the design sector needs to focus not only on fossil fuel reduction, but on a holistic approach to broader regenerative goals.

The Systemic Design Framework⁷⁹ was launched in 2021 to help designers working on major, complex challenges cutting across disciplines and sectors which place people and planet at the heart of design. It enables designers to work collaboratively to look at a project in a systemic way, and to address the systemic design changes required to enable significant change.

Birmingham Jewellery Quarter

The Jewellery Quarter⁸⁰ is a 1.07 square km area in Birmingham City Centre which produces 40% of all jewellery made in the UK. The Birmingham Jewellery Quarter is a strong example of the potential for clustering to support more sustainable practice, through the shortening of supply chains, and reduction in transportation distance. The Quarter is Europe's largest concentration of businesses involved in the jewellery trade, and houses over 800 businesses including 100 specialist retailers, 50 contemporary designer-makers and material suppliers within the jewellery industry.

The Quarter's development has been strongly supported by the Birmingham City Council. The Birmingham City Council led a regeneration scheme for the Quarter, which was tied into wider regeneration plans for Birmingham. In 2011, the Jewellery Quarter Development Trust

(JQDT) was formed as a Community Interest Company to coordinate the various existing arms of regeneration. Since 2012, the JQDT has operated the JQ Business Improvement District (JQBID). The BID's remit is to improve the Quarter and increase inward investment and footfall through creating a more welcoming environment, improve marketing activities and improve connectivity both between businesses in the district and with the city centre.

Effective clusters such as the Jewellery Quarter in Birmingham are strong examples of groupings of businesses across the supply chain which enable craft makers to use local resources and services with a lower carbon footprint. Detailed mapping of supply chains could support further development of clusters in the UK, enabling craft makers to decide where to be and how to operate.

London Film – Grid Project

When filming on location, productions establish a unit base that requires generators to supply electricity, using diesel or petrol. Analysis by ARUP for the Victoria Park area of Tower Hamlets, London alone estimated that during 2018, production generators consumed 64,082 litres of diesel and 1,656 litres of petrol. The estimated CO₂ emitted by the generators was 169,556kg.

Film London have set up a pilot to address this problem and supply renewable energy to productions. The Grid project⁸¹ aims to supply green energy via the mains network to key unit bases across London by installing electrical cabinets. This will reduce CO₂ emissions by 100% and particulate matter and nitrogen dioxide emissions to zero from film and TV productions at point of use. The first pilot will take place in Victoria Park, although the ambition is for this to

be rolled out across other locations in London, including Battersea Park and North Horse Ride.

The Grid Project started as part of the European partnership project Green Screen through Film London. The Victoria Park pilot is supported by the Mayor of London's Good Growth Fund, British Film Commission and NBCUniversal, and receives EU funding from Interreg Europe under the European Regional Development Fund. The pilot will be delivered with Tower Hamlets Council, The Film Office, ARUP, UKPN, Ingenious Power and power distribution pillar specialist Lucy Zodion. However Film London is still fundraising for the cabinets in Battersea Park and North Horse Ride. The cabinets will also be available for use for events including festivals, reducing diesel and petrol generator usage in other creative sub-sectors, too.

BAFTA albert

In 2011 BAFTA brought together a consortium of broadcasters and production companies to develop albert, an online tool that calculates the amount of greenhouse gases emitted into the atmosphere as a direct result of a production.

The tool has become increasingly widely used over the last decade, with more than 1,300 television production companies using the tool, and 7,500 production footprints calculated. It is also increasingly being used for film production. It enables producers to draw up a carbon action plan to achieve albert's Sustainable Production certification, regularly seen on film and television credits. The British Film Institute (BFI)'s Film Fund for independent productions requires carbon

footprinting for all funded productions through the BAFTA albert programme, and all feature films funded by BFI have to be BAFTA albert certified.

Albert⁸² is now an organisation in its own right, with a dedicated team publishing reports detailing environmental impacts and promoting best practice. And they provide both online and bespoke, inhouse training tailored for businesses ranging from small independent studios to large-scale productions. Albert is now also providing training modules for undergraduates through education partnerships with over 40 UK higher education institutions.

AdGreen

AdGreen was launched by the Advertising Association with the goal of eliminating the environmental impacts of advertising production, and enable the advertising community to measure and understand waste and carbon impacts. AdGreen's advisory board includes businesses such as Havas, Publicis Groupe UK, Sky, Google, WPP and Unilever.

The AdGreen Carbon Calculator⁸³ was launched in partnership with BAFTA's albert to adapt the online tool created for the film and TV production community for advertising production. The Calculator allows companies to work out the carbon footprint of motion, stills

and audio projects within advertising campaigns so that they can assess the environmental impact of production activities.

AdGreen also analyse the carbon calculator's dataset to assess where infrastructure projects can support a faster shift to Net Zero. They then work with the largest businesses in the supply chain to support more sustainable practice, including transport, studios, generators and equipment. The ambition is to establish AdGreen in other production hubs across the UK and internationally, to provide support and training to local teams.

Arts Council England (ACE) – Mandatory Reporting

Since 2012, environmental reporting has been a condition of all Arts Council funding agreements for National Portfolio Organisations (NPOs), with grant beneficiaries required to provide environmental data each year in areas such as energy use, waste, water consumption and travel. The data is collected using the Creative Green Tools developed by Julie's Bicycle.⁸⁴

Accompanying the reporting, NPOs are also expected to submit up-to-date environmental policies and action plans, supported by an extensive guidance and training programme. Julie's Bicycle has developed guidelines to help Arts Council England NPOs develop their own environmental policy and provided examples to see what a policy should look like in practice. Results of these are analysed and published annually.⁸⁵

The Arts Council is committed to leading on environmental responsibility, and in November 2021 set out the first environmental policy and action plan within the report, *Our Environmental Responsibility: From Understanding to Action*⁸⁶ in partnership with Julie's Bicycle.

Rather than focusing on Net Zero in this strategy and investment principles, ACE instead focus support for organisations to make big reductions quickly in line with what is realistic and achievable. The Council are also increasingly emphasising the need to streamline environmental action through all areas of a cultural organisation or business, rather than through one individual role profile in order to upskill the wider workforce.

Shambala Festival

20,000 capacity festival Shambala has been monitoring and transparently reporting its greenhouse gas emissions since 2009, including energy, waste, water use, and audience travel.⁸⁷ The festival is powered through a mix of mains grid energy and renewable HVO diesel, was one of the first UK events to shift to reusable cups, has had a site-wide ban on the sale of drinks in plastic bottles since 2014, and eliminated disposable coffee cups in 2022 (instead asking audiences to bring their own). Audiences are incentivised to arrive on public transport or coaches, with over a third of audiences now arriving in this way. The festival went entirely

meat- and fish-free in 2016 to 'spark the conversation about how our diet shapes the world around us'. In the post-event survey, one in three attendees reported reducing their meat and fish intake at home after the festival (not counting those who were already vegetarian/vegan). Shambala festival also worked with CarbonCloud in 2019, encouraging their traders to create a 'One Planet Plate' meal as part of their food offer that conforms to WWF Sweden's estimate of a 'One Planet Plate' meal that is responsible for 0.5 kg CO₂e. For comparison, the average UK meal currently factors in at around 2 kg CO₂e.

Royal Albert Hall

The Royal Albert Hall (RAH) is one of London's iconic music venues, built by Queen Victoria and a Grade I listed building, from an energy and sustainability perspective, it has its challenges.

The Hall is developing a carbon management plan for the venue which includes a set of KPIs for achieving Net Zero carbon. Since 2016, the hall has been working to change all of the lighting in its 5,500 capacity auditorium to LED lighting, on average reducing energy consumption by 66%. During the pandemic, the hall invested £900,000 in an upgrade to their ventilation system, which includes Variable Air

Volume units which are able to sense CO₂ levels in the air, which then automatically reduce fan speeds in rooms that aren't being used. This is projected to save a lot of energy in comparison to the previous system which ran 24 hours a day.

In addition, the RAH are introducing green riders to encourage artists to use the venue's own PA system and lights to reduce freight and travel emissions. They have also invested in an in-house audio rig with an integrated power monitoring system which allows staff to log in and monitor emissions and power on a show by show basis.

MAST

Since 2010, Manchester's cultural community has been working together through MAST to understand their impact, share learnings, and take climate action. MAST involves around 35 diverse arts and cultural organisations from community-based arts centres and iconic cultural venues to an internationally renowned festival and national broadcasters. Working alongside Julie's Bicycle, MAST has become one of the UK's – and Europe's – most successful demonstrations of the role the arts sector can play in positive environmental change.⁸⁸

MAST's member organisations reduced their carbon emissions by 16% over three years as a

result of their collective actions, avoiding 2,800 tonnes of CO₂ and saving £890,000 in energy costs. A third of members are now generating or purchasing low or zero carbon energy. MAST is part of the steering group that oversees development and delivery of the Manchester Climate Change Strategy 2017-2050. The strategy set out the city's ambition to become zero carbon by 2050 – since brought forward to 2038 in light of Manchester's climate emergency declaration – and identifies the crucial role for arts and culture in finding new ways to engage people on climate change.

Ecodisco Reusable Cups

Sustainable nightlife consultancy ecodisco is tackling single use plastics and GHG emissions in the UK events industry.

With expertise in carbon footprinting, reusable cup systems and specialist communications, ecodisco is pushing for a more environmentally and economically sustainable nightlife scene in the aftermath of the COVID-19 pandemic. Last summer, ecodisco released the 'Disposables Discontinued' report, which highlights the overwhelming environmental and financial benefits of establishing reusable cups as an events industry standard. Having received funding from Innovate UK in 2020, ecodisco built a novel service for the urban events industry whereby reusable cups are delivered, collected

and washed off-site. This type of system already exists in the world of music festivals and sports stadiums but many nightclubs, theatres and other urban events continue to serve drinks in single-use cups.

All ecodisco cup designs are standardised with instructional messaging only and no branding – this allows the cups to be used for their maximum life-cycle. Electric bikes and vans are used to transport the cups where possible and hyper-efficient washers and dryers keep the cups clean and dry for the next customer. The loss-rate of reusable cups is monitored closely and a carbon footprinting methodology is used to ensure that the service remains less emissions intensive than single-use.

Appendix Three: Toolkits

Toolkit	Sectors	Owners/developers	Effectiveness and uptake
albert	Film, Television	Developed in 2011 by BAFTA with a consortium of production companies.	<p>Online tools to allow productions to quickly measure their environmental impact and gain recognition for putting green practices in place.</p> <p>Since 2011, more than 1,300 production companies have used the tool. In 2022 albert developed The Studio Sustainability Standard with ARUP.</p>
Carbon Calculator and Materials Matrix	Publishing (book and journals)	Publishers Association, developed with Research Institute of Sweden	<p>Commissioned RISE (Research Institutes of Sweden) and software specialists Solstice to design the first and only carbon calculator that is bespoke to the UK book and journal publishing industry. Built into the carbon calculator, the materials matrix is an index of the most commonly used materials in the publishing supply chain and sustainable alternatives.</p> <p>Will be launched in autumn of 2022. To begin will only be accessible to Publishers Association members.</p>
Creative Green Tools	Arts, museums, galleries, performing arts, venues	Julie's Bicycle developed the tool in 2012 in collaboration with Arts Council England. It has undergone revisions and improvements over this time	<p>Free to access tools to measure energy use, water consumption, waste generation and recycling, travel and production materials.</p> <p>Has been integrated with Arts Council funding since 2012, with all NPOs (800+ organisations) having to use the tool as part of their annual reporting.</p>
Tech Zero Tool-kit	Digital technology businesses	Launched in 2021, by Tech Nation, and developed in partnership with Supercritical	<p>Aims to demystify climate jargon and make it simpler for companies to set a Net Zero plan. Includes compiled resources, best practice and companies who can provide further support. It is updated on an ongoing basis as further resources become available.</p> <p>Publicly available and shared with all businesses who sign up to the Tech Zero commitment.</p>
Theatre Green Book	Theatre and performing arts	Developed by a network of theatre partners and engineers, Buro Happold	<p>The Green Book is published in 3 volumes. Volume 1 is available now, and focuses on making shows sustainably. Volume 2 is in Beta stage, and is about making buildings more sustainable. Volume 3 is also in Beta and is about sustainable operations and front of house.</p> <p>The toolkit is still in Beta stage of its trial. When theatre companies use the Green Book, they are also invited to register on the platform so that the network can gather data, and connect theatre-makers to build a community of practice.</p>

Appendix Three: Toolkits (continued)

Toolkit	Sectors	Owners/developers	Effectiveness and uptake
Green Screen	Film, Television	Green Screen is a joint initiative between Film London and sustainability consultancy Greenshoot. The Green Screen environmental programme is supported by the London Filming Partnership and London's Borough Film Services	<p>A practical online tool that supports environmentally friendly filming in London. The platform enables productions to set their own environmental targets, and provides them with an action plan to help them achieve their goal. Productions that register for Green Screen receive access to resource guides, a bespoke crew memo, simple tailored tips for each production department and a trained Green Steward.</p> <p>16.8% of carbon savings have been achieved across over 300 productions that have shot in London and certified through Green Screen.</p>
ICO Green Cinema Toolkit	Film exhibition	Developed by the Independent Cinema Office (ICO) with Julie's Bicycle, and ICO cinemas: Curzon, Depot and HOME	<p>This free to access guide includes a review of climate change issues, case studies, guidance for green cinema, regulations and legal obligations, and links to further tools, guidance and resources.</p> <p>Created for all those working in the film screening industry – from small venues to large-scale festivals.</p>
Ad Green Carbon Calculator	Advertising	Ad Green, part of the Advertising Association and in partnership with BAFTA's albert	<p>The AdGreen Carbon Calculator allows companies to work out the carbon footprint of motion, stills and audio projects within advertising campaigns so that they can assess the environmental impact of production activities.</p> <p>The carbon calculator has been developed from BAFTA albert's established online tool.</p>
RIBA 2030 Climate Challenge Guide	Architecture	Royal Institute of British Architects (RIBA)	<p>The 2030 Climate Challenge sets a series of targets for practices to adopt to reduce operational energy, embodied carbon and potable water.</p> <p>To date, approximately 400 out of 4,000 registered RIBA practices have signed up to the Climate Challenge, however with many others taking active steps towards these commitments.</p>
Net Zero Carbon Buildings Framework	Architecture and built environment	Created by the UK Green Building Council (UKBC) in 2019, following a 4 month industry-wide consultation process	<p>The primary focus of the framework is to set in place a path to achieve Net Zero carbon buildings in both construction and operation (in-use energy consumption), whilst beginning to provide direction for addressing whole life carbon in the industry.</p> <p>As a freely available resource, the framework is intended to be used by building developers, designers, owners, occupiers and policy makers to inform the development of building tools, policies and practices.</p>

Appendix Three: Toolkits (continued)

Toolkit	Sectors	Owners/developers	Effectiveness and uptake
The Higg Index	Fashion and textiles	Sustainable Apparel Coalition, developed over 10 years in partnership with consultants, stakeholders and industry experts	<p>The Higg Index is a suite of tools for the standardised measurement of value chain sustainability. It is comprised of a core set of five tools that together assess the social and environmental performance of the value chain and the environmental impacts of products.</p> <p>Across topics such as water use, carbon emissions, and labor conditions, consumer goods brands, retailers, manufacturers, governments, NGOs, and consumers can use the Higg Index to inform their individual sustainability strategies and drive collective action.</p>
UKIE Green Games Guide	Interactive leisure software	UKIE in partnership with Playing for the Planet Alliance	<p>The Guide supports businesses to recognise the urgency of action, and to see where they can reduce their emissions immediately and offset the rest by 2030.</p> <p>Compiles toolkits and guidance from multiple sources. Including guidance on how to define scope and timeline to reduce carbon footprint, how to measure carbon footprint, to take action, offset, review and mobilise others in the industry.</p>
Textiles 2030 Roadmap	Fashion and textiles	Climate-action NGO, WRAP. Textiles 2030 is funded by its signatories and government	<p>The voluntary agreement builds on the learning and success of the Sustainable Clothing Action Plan (SCAP 2020) and aims to engage the majority of UK fashion and textiles organisations in collaborative climate action. Signatories will collaborate on carbon, water and circular textile targets, and contribute to discussions around policy development for textiles in the UK.</p> <p>WRAP has a wealth of expertise, research, market reports and data that are freely available for use by the fashion and textiles industry, technologists, academia and interested individuals including the Textiles 2030 Roadmap.</p>
Carbon Management Tools and Resources	Arts and Culture	Creative Carbon Scotland	<p>Creative Carbon Scotland began in 2011. As part of the organisation's work it provides Scottish arts organisations with training in carbon measurement, reporting and reduction including supporting nearly 120 key organisations in mandatory carbon reporting to Creative Scotland.</p>

Appendix Three: Toolkits (continued)

Toolkit	Sectors	Owners/developers	Effectiveness and uptake
<p>Gallery Climate Coalition Carbon Calculator</p>	<p>Visual arts</p>	<p>Gallery Climate Coalition (GCC)</p>	<p>GCC is an international charity and membership organisation providing environmental sustainability guidelines for the art sector. The GCC supports the sector to align in targets, terminology and strategy. The carbon calculator is a free online tool designed to help estimate the carbon footprint of businesses based on metrics common to most art galleries in today's international art world.</p> <p>The GCC's membership has grown from the London arts community to over 900 country-wide members, and an increasing membership internationally across 20 countries.</p>
<p>Stakeholder actions and connections' diagram</p>	<p>Fashion and textiles</p>	<p>Institute for Positive Fashion, initiated by the British Fashion Council</p>	<p>The Stakeholder Actions and Connections Diagram has been developed to enable the key players across the fashion ecosystem to explore how they can take direct action to implement change.</p> <p>Action areas include circular design, consumer empowerment, circular and sharing business models, demand for circular and sustainable fibres, enhanced identification and tracking, post-use ecosystem, sortation and recycling, ecosystem modelling, policy and regulation and innovation investment.</p>
<p>LIVE Green</p>	<p>Performing arts</p>	<p>LIVE (Live music industry venues and entertainment), and their membership</p>	<p>LIVE Green aims to collate and provide research, expertise and cross-industry innovation that is informed by the best science and supports the transition to a regenerative future. Alongside this work, LIVE Green has developed a voluntary Declaration that individual businesses may sign up to and Purpose statement, that will help shape the group's collective work.</p> <p>All 14 association members of LIVE have ratified the Beyond Zero Declaration to deliver measurable and targeted action on climate change, with the ultimate aim of reaching Net Zero emissions by 2030.</p>
<p>Design Value Framework</p>	<p>Design</p>	<p>Design Council</p>	<p>The Council have developed a framework for designers and commissioners to identify and assess the wider social, environmental and democratic impacts of their work.</p> <p>The framework builds on design sector specific tools, and provides, for the first time, a single framework for the whole of the design economy to use together, and across a holistic set of values.</p>

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