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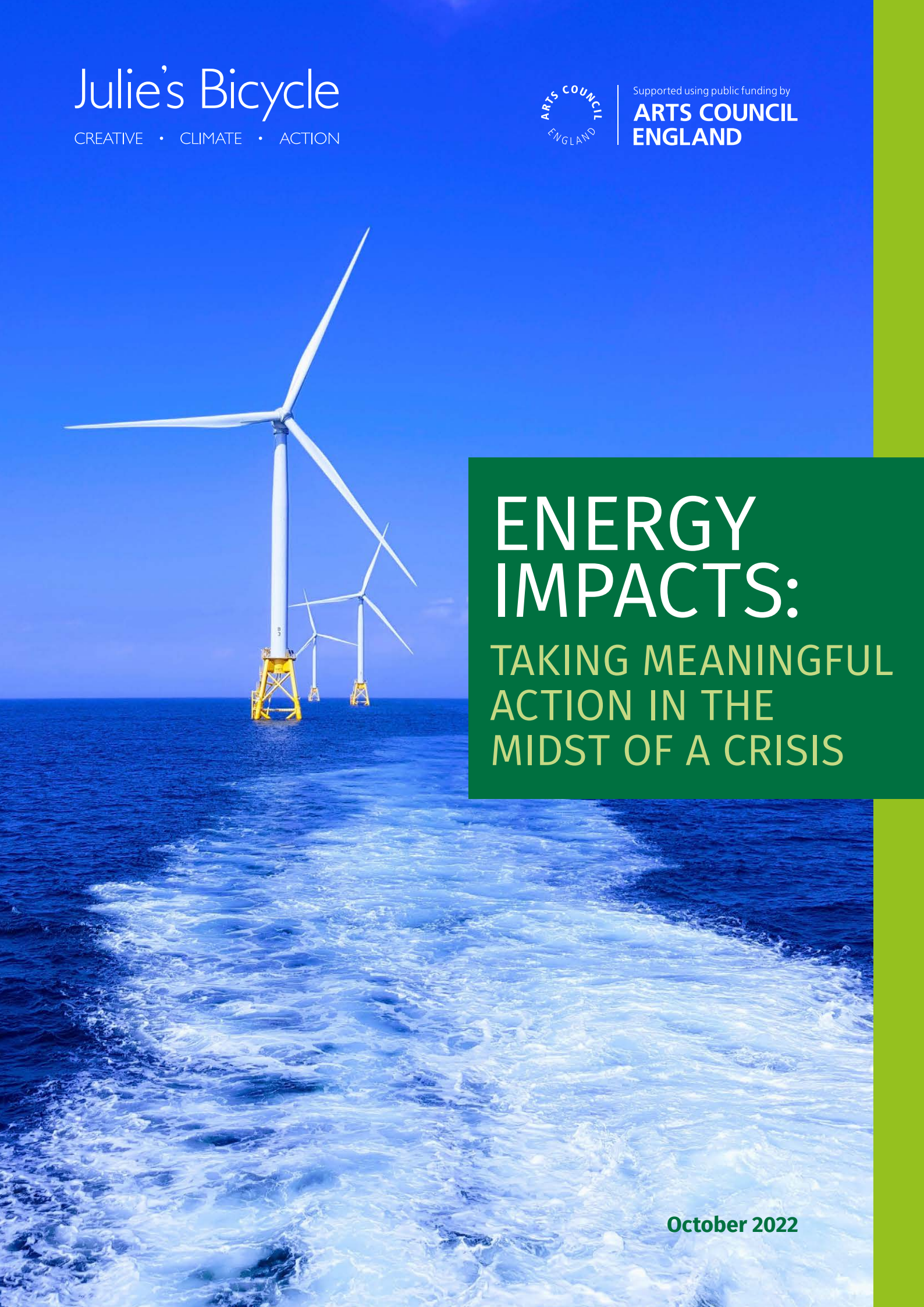


ENERGY IMPACTS:

TAKING MEANINGFUL ACTION IN THE MIDST OF A CRISIS

October 2022

CONTENTS

WHAT'S INSIDE?

This guide aims to explain the big picture: the energy industry's role in fuelling the climate crisis, how it needs to change, the current policy context and how culture can respond. It explains how the current energy crisis has come about, answers some of the common misnomers around the energy market, looks at the role of renewable energy, and how we can transition towards the system that we need in a just and equitable way.

This briefing is intended for anyone working in the cultural sector that wants to learn more about energy. For a more technical guide for energy managers please read our Transitioning to Net Zero report. For some more practical tips on strategies to reduce energy use within cultural organisations, see our Energy Action for Culture Top Tips.

WHY READ THIS?

We're now not only facing the climate and ecological crisis, but also an energy crisis that is further threatening lives and the survival of arts and cultural institutions. Non-domestic energy customers are facing price increases of five times their current level, which for many will be completely unsustainable.[1] The pandemic, the ever more obvious impacts of climate change and soaring energy prices are accelerating the urgent need for change, through much needed changes to energy policy and the energy system itself. This crisis goes beyond the ability of the sector to adapt and to reduce use, though we must do so, and urgently.

The way that we produce and consume energy has always been deeply interconnected with climate change, issues of social justice and tied to political will, levels of investment, development and uptake of low carbon technologies. This interconnectedness inevitably makes it a complex impact area to address.

Arts and culture has a critical role to play in achieving the clean energy transition, with the power to drive behaviour change, patterns of consumer demand, inspire sector leadership and encourage practical action.

[1] Cornwall Insight, 2022, available online: https://www.cornwall-insight.com/press/businesses-could-see-energy-bills-increase-fivefold-in-october/

ENERGY: NINE NEED-TO-KNOWS (in a Nutshell)

1. Reliable, affordable and consistent access to energy (energy security) is no longer a given in the Global North. A cold winter in 2021 across Europe, increasing demand as we emerge from the pandemic, and now the Russia-Ukraine conflict are all rapidly driving up the wholesale price of gas. Some countries are more affected than others, depending on energy sources and subsidies.

See: Explainers on 'energy crisis'

2. Electricity prices are set by the final source of energy used to meet demand. This is usually from natural gas (currently 38% of our electricity generation) which has a relatively high running cost. Long term we need to reduce and remove reliance on fossil fuels to avoid this volatile market.

See: Explainer on 'energy bills'

3. Fossil fuel generated energy production and consumption has many damaging impacts on people and places globally at all stages of production and consumption. Energy injustice needs to be addressed now, and throughout the transition to a clean-energy future.

See: Setting the scene: our consumption of energy and its impacts

4. Consumption is complicated. We have many different dependencies on energy: nationally how energy is produced, stored and distributed, and internationally who we import energy from, how far its travelled and how its sourced. Our financial system continues to support fossil fuel exploitation, in ways that are sometimes obscured. Understanding the fossil fuel industry and how it is financed is critical to support fossil fuel divestment.

See: How do we change this broken system? For further information, watch our webinar, Financing the Arts

5. There is a significant gap between our climate targets and the laws in place which make these targets reachable. Aside from energy supply, decades of inadequate policy, government investment or incentives in energy efficiency and renewables have exacerbated the energy crisis. The arts and culture, as a community, can push for action by speaking to local MPs, and partnering with others – including local, cultural, community and campaign networks, to put pressure on decision-makers and funders.

See: 'Cultural sector taking action' and 'cutting the green crap'

6. All sectors need to concentrate efforts – and invest – in energy efficiency and reduce energy use as well as sourcing clean energy.

See: Practical tips

7. Small changes can make a big difference, and can be affordable.

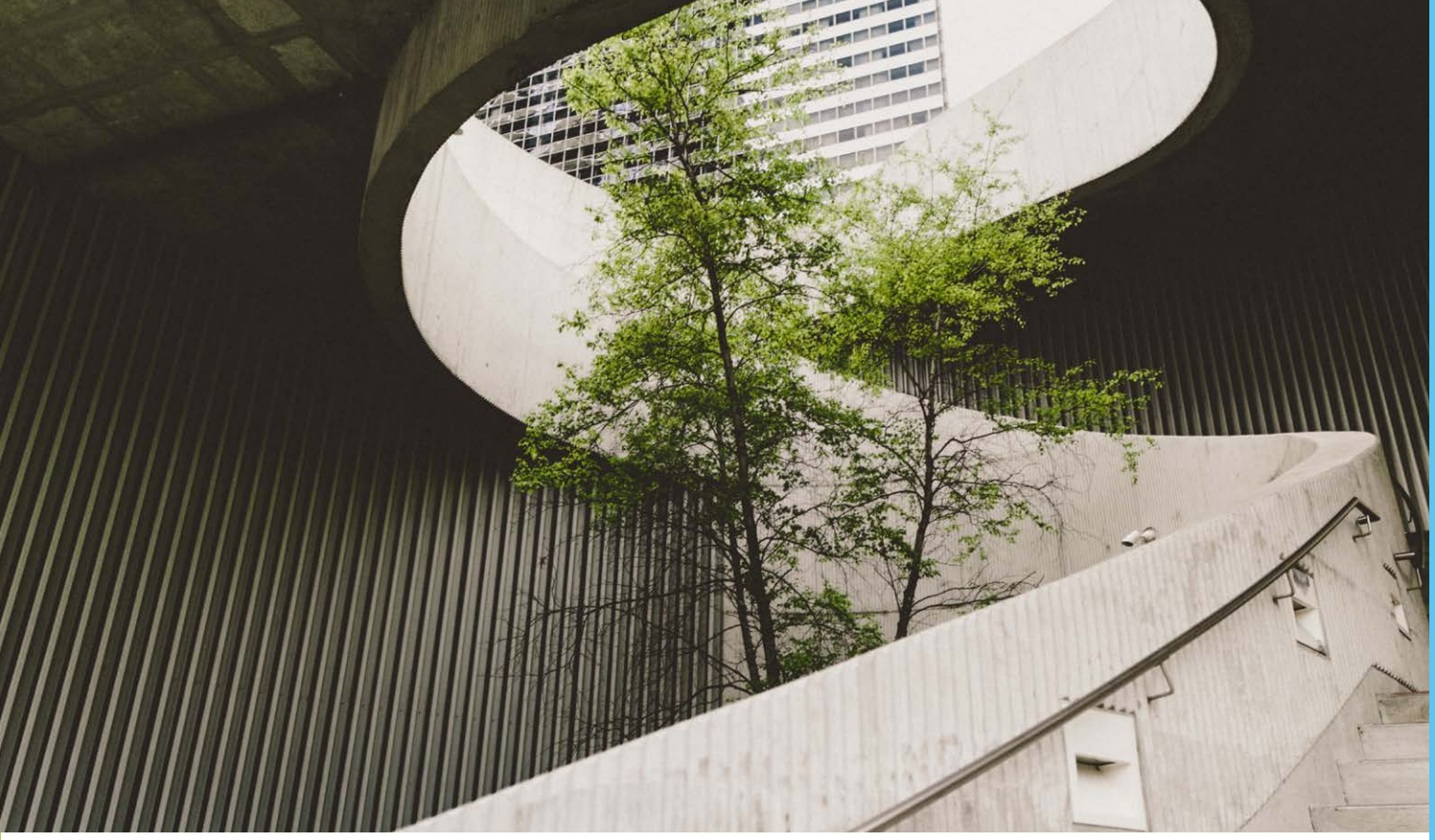
See: 'Cultural sector taking action', and case study examples

8. Even without the innumerable benefits to people and the planet, renewable energy (i.e. solar and wind) is now cheaper than fossil fuel energy, and comes with many other benefits.

See: 'Economic and social benefits of a clean transition' and 'So what are the solutions? What does this mean for the cultural sector'

9. The solutions exist, but the answer lies in protesting, in partnerships, building expertise and multi-sector solutions. These will benefit the wellbeing of communities, aid sustainable development and create an energy and climate resilient future for culture.

The energy crisis is just one more indication of a much greater challenge – climate change. Tackling this issue is also an invitation to confront and solve numerous other social and environmental injustices. To do this we can work together, at speed, with dedication, understanding, ingenuity, and care.



A VISION FOR THE SECTOR

Energy and the cultural sector

Imagine if all of our cultural buildings were powered by on-site renewable energy. Imagine if walls and roof spaces boosted local species biodiversity, helped prevent flooding and actively cooled our ever-warming air temperatures. Imagine if museums and large venues were community energy hubs, helping to give back positively to the local community and tackling fuel poverty.

There is significant opportunity for cultural organisations to become independent from volatile energy prices and unpredictable market conditions. Now is the time to stop imagining and act with urgency: this is the future that we need to achieve for a resilient and future-fit cultural sector. This vision must be held close as we navigate a volatile and uncertain future.

Energy is one of the most significant impact areas for the sector to tackle in overcoming the climate crisis, but is also one of the most challenging. Financial mechanisms to fund the necessary changes are hard to come by. Understanding the energy performance of a building and how to install technologies effectively is an area that requires skills and expertise, which is sometimes still lacking within the buildings and energy sector, let alone the cultural sector. We need to act now, collectively and with urgency, to future-proof our buildings and reduce energy demand, to enable an energy and climate secure future.

Practical solutions that we can implement include insulating and retrofitting our buildings to stop freely leaking emissions. We need to invest in onsite renewable technologies which decarbonise our energy consumption faster than relying on change from the National Grid. We need to find innovative

ways to exhibit, transport and display art in the most energy efficient ways possible.

Some within the sector are already leading the way and showing what is possible, setting a precedent for all to follow suit. By sharing knowledge and through collective action the sector can achieve Net Zero for our cultural buildings, but it will require leadership, investment and lobbying of policy makers to support the transition. The challenge is complex, our time is short, and we have to harness our collective power to make this transition together.

WHAT CAN CULTURAL ORGANISATIONS AND ARTISTS DO?

1. **Apply the Energy Efficiency First Principle:** Do what you can to reduce energy demand and increase the energy efficiency of your buildings, through behaviour change, monitoring and measuring and technology upgrades. Then assess opportunities for renewables and heat pumps.
2. **Upskill and capacity build:** invest in energy efficiency training and management for key staff.
3. **Lobby:** Make it clear to funders and policy makers that the sector needs further support to make the required transition at the required speed. Speak to your local MPs, partner with other cultural organisations in your locality to put pressure on decision makers and funders.
4. **Build clean energy partnerships:** Work with your community, with local renewable energy co-ops, other cultural organisations, local authorities and housing providers to build new opportunities for local renewable energy projects that can power your sites.
5. **Share what works:** Energy management and technologies can be complex. Share what you learn, what works and what doesn't so that the sector can transition more rapidly and can scale solutions.
6. **Divest:** Move your finances (e.g. pensions, bank accounts, sponsorships) to ensure that your assets are supporting renewable energy rather than fossil fuel exploitation.

SETTING THE SCENE: OUR CONSUMPTION OF ENERGY AND ITS IMPACTS

We are in the midst of a planetary emergency. Both the biodiversity and the functionality of the processes on earth we depend on for survival are being actively jeopardised as we take our species, and every other on the planet, into a state of unpredictable climate chaos. This is not breaking news. We've watched this unfolding for decades, with every year that passes the science has become more certain and the realities more terrifying, all while our excessive consumption of fossil fuels and resources continues to drive the crisis.

Our planet is now warmer than it has been in the past 3 million years[2]. One root cause of this planetary emergency **is the way that we produce and consume energy**. It started with the industrial revolution; agriculture, travel, and homes all became hungry for fossil fuels. Much of the Global North built its economic wealth through the violent and unjust colonial plundering of resources from the Global South, a practice which continues to have a severe impact on people and the planet into the present day. Worldwide, global corporations are stripping people of access to basic environmental resources, such as clean water, air and the forests and land, all in the name of profit.

These human rights abuses which include (but are far from limited to) loss of life, through direct killing of environmental defenders, pollution of land and water at extraction sites, and secondary impacts such as respiratory and cardiovascular diseases from exposure to pollutants emitted by coal plants. For example, in the case of the Niger Delta, a thirteen year long legal battle was fought between Shell and the local communities impacted by crude oil spills in the delta during the 1970s. In 2021 Shell was ordered to compensate three farmers for the environmental pollution, but the case went on so long that two farmers died before settlement was made[3].

Loss and damage to property is another example: 2.5 million acres of Indigenous homeland in Ecuador have been contaminated, deforested and colonised by Chevron and then afterwards by the agri-industry[4]. Perhaps the most significant human rights abuse of all is the extent to which the industry has actively worked to deceive policy makers and the public about the severity of climate change. For decades, fossil fuel companies' own scientists made them well aware of the impacts of their operations on the climate, yet they actively tried to hide the truth,

[2] IPCC, 2021, Summary for Policymakers | IPCC available online: accessed 12/09/22

[3] The Guardian, 2021, online: https://www.theguardian.com/business/2021/aug/12/shell-to-pay-111m-over-decades-old-oil-spills-in-nigeria, accessed 12/09/22

[4] 350.org, 2020, Climate Defenders, Savaresi and McVey, Human Rights Abuses by Fossil Fuel Companies, available online: https://drive.google.com/file/d/1k-aQMpzkPlNeelr9Ar_w6iR3JOVQ44rR/view, accessed 12/09/22

continuing with business as usual rather than investing in new energy solutions for the future. For many years powerful oil and gas companies have launched campaigns and messaging aimed at provoking climate denialism in the general public. Exxon alone has funded more than 40 groups whose purpose is to deny climate science and the industry has invested billions into lobbying to prevent any unfavourable climate laws being implemented.[5] A 2019 study found that Chevron, Shell, BP, Exxonmobil and Total spent a combined £153mn a year lobbying to delay, control or block policies to tackle climate change.[6]

The impacts of climate change are already being experienced globally; with the most vulnerable and least responsible for historical emissions impacted the most severely.

The examples of environmental injustices are endless; during the summer of 2022 much of Europe, USA, Asia and the UK became an unprecedented inferno of record-breaking temperatures, thousands died from heat related illnesses and tens of thousands were evacuated as wildfires broke out across the world destroying homes and communities. Research has found that climate change made the UK record-breaking heatwave 4 degrees hotter and ten times more likely than it would have been without emissions released by humans.[7] Airport runways melted and train lines buckled. UK buildings and infrastructure are woefully underprepared for a future where these temperatures become the norm.

The heatwaves are the most recent example of extreme weather events that have killed or displaced millions of people; in 2019 Cyclone Idai and Cyclone Kenneth devastated some of the poorest countries in South-Eastern Africa. Farmers in these areas have suffered years of droughts, many people are still in temporary accommodation and food insecurity has worsened as a result of the hurricanes.[8]

Extreme weather events are only set to become more frequent as global temperatures increase; and there is more and more evidence from climate scientists that they are directly attributable to human induced global warming temperatures.[9]

[5] The Guardian, 2021, Big oil and gas kept a dirty secret for decades. Now they may pay the price https://www.theguardian.com/environment/2021/jun/30/climate-crimes-oil-and-gas-environment, accessed 12/09/22

[6] as 4 above.

[7] World Earther Attribution, 2022, available online: https://www.worldweatherattribution.org/without-human-caused-climate-change-temperatures-of-40c-in-the-uk-would-have-been-extremely-unlikely/ accessed 12/09/22

[8] World Vision, 2019, online: https://www.worldvision.org/disaster-relief-news-stories/2019-cyclone-idai-facts, accessed 12/09/22

[9] Seneviratne, S.I., et al, 2021, Weather and Climate Extreme Events in a Changing Climate. In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Masson-Delmotte, V., et al. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1513–1766, doi:10.1017/9781009157896.013.

HOW DO WE CHANGE THIS BROKEN SYSTEM?

The goal of limiting temperature rise to 1.5°C is all but lost. The latest IPCC reports have highlighted how desperately brief the window of opportunity is and the world is falling far behind on making the changes needed to limit the worst consequences. Science is telling us, with certainty, that we need to urgently **make rapid and deep emissions reductions in all sectors of the global economy**, and we need to do it now, if we want to have any prospect of avoiding an unlivable, not so distant future.

We need to transition away from polluting forms of energy; whether that is fossil fuels heating our buildings and powering the National Grid or diesel generators to power events, to clean forms of renewable power which don't have adverse impacts on people or our remaining biodiversity.

The way in which we produce and consume energy is incredibly complicated, it relies on both our national context – how energy is produced, stored and distributed, as well as the international context – who we import energy from, how far it travels, how it's sourced, whose land it is extracted from, and of course, how it is consumed and at what time of day. But it's not just this physical infrastructure that is important, there is also a wealth of other ways in which our daily lives and businesses are interwoven with the energy sector. Our financial system,

including taxes, subsidies, banking and pensions continue to fund fossil fuel exploitation, in ways that can be largely hidden and hard to uncover. These lock us further into our dependency on a broken energy system. For example, in the six years since the Paris Agreement was adopted, the world's **60 largest private banks financed fossil fuels with USD $4.6 trillion, with $742 billion just in 2021**[10].

"Globally there are still more subsidies directed toward fossil fuel consumers and producers than toward renewable energy: currently around USD 372 billion is spent on producer and consumer fossil fuel subsidies, overshadowing the USD 100 billion in support to renewable energy (Best et al., 2015; International Energy Agency [IEA], 2018b; Merrill et al., 2017)."[11]

These dependencies affect all sectors. For the cultural sector fossil fuels are embodied in the materials we use to produce art, the power that lights our shows, and the sponsorships which help keep cultural spaces open. Daily spending through our bank accounts and into our pensions indirectly funds fossil fuel exploitation and supports the related social and environmental injustices.

This report aims to untangle some of these less visible interdependencies and explain some of the often misunderstood parts of the energy system. Whilst disentangling ourselves from dependence on fossil fuels is a complex challenge, there are actions that everyone can take to fuel the transition to a cleaner and climate compatible energy system.

[10] Reclaim Finance, 2020, Banking on Climate Chaos report, available online: https://reclaimfinance.org/site/en/2022/03/30/banking-on-climate-chaos-report-2022/, accessed 12/09/22

[11] International Institute for Sustainable Development, Global Subsidies Initiative Report, Fossil Fuel to Clean Energy Swaps: How to Pay for an Energy Revolution available online: https://www.iisd.org/system/files/publications/fossil-fuel-clean-energy-subsidy-swap.pdf, accessed 12/09/22

THE ENERGY SECTOR: THE UK POLICY CONTEXT

From a global policy perspective, there remains a significant gap between greenhouse gas emissions reduction targets (which cover approx. 90% of global emissions) and the current climate laws in place to achieve them (53% of global emissions).

The UK's Net Zero Strategy is the key policy framework outlining how the UK intends to reach Net Zero by 2050. The picture here is no different; the recent Climate Change Committee report, which assesses the government's policy effectiveness, concludes that the Net Zero Strategy will cover just one third of the UK's emissions reductions required to meet the Sixth Carbon Budget in the 2030s.

In a historical ruling by the High Court, the Government's Net Zero Strategy has been found to be "unlawful" and too vague, due to the lack of sufficient detail on how emissions reduction targets will be met, and a lack of sector specific time-bound targets. This is in breach of the Climate Change Act 2008, which sets legally binding targets to reduce carbon dioxide emissions in the UK by 80% from 1990 levels by 2050[12]. The ruling follows legal challenges from the environmental campaign groups Friends of the Earth, Client Earth, Joanna Wheatley and the Good Law Project.

Whilst the electricity sector in the UK has decarbonised more rapidly than other sectors (largely through phasing out coal power – which is 1.5-2 times more carbon intensive than natural gas and oil respectively – and by the addition of new renewable energy). There is still some way to go, and the energy sector has a significant role to play if we are to meet Net Zero.

The UK's current policy ambition is for the UK's electricity generation to be from 100% low-carbon sources by 2035. The recent government Energy Security Strategy focuses on investment in nuclear and offshore

[12] Climate Change Act 2008: https://www.legislation.gov.uk/ukpga/2008/27/pdfs/ukpga_20080027_en.pdf, accessed 12/09/22

wind with a lot less emphasis on onshore wind and solar power, despite the large opportunity to increase capacity from these sources. Energy efficiency is barely mentioned, despite being widely acknowledged as one of the quickest, cheapest and easiest ways to reduce demand consumption, tackle the immediate energy crisis and protect the most vulnerable people from fuel poverty.[13] New nuclear plants, by comparison, can take up to twelve years to build, alongside the carbon emissions and rare earth minerals that go into their construction, security risks and the fact that there is no risk free solution to the storage of nuclear waste, which will be left for future generations to deal with. In addition, the economic costs of nuclear power are far higher than many renewable projects such as offshore wind.[14]

War and Crisis...

Russia's recent invasion of Ukraine has acted as a stark reminder that relying on fossil fuels puts our energy security and ability to pay for energy in jeopardy. The number of people in the UK choosing between heating or eating has risen from 4.5 to 6.5 million people between Oct 2021 and April 2022. This is being driven by years of inadequate policy and lack of investment in energy efficiency by government;[15] and more recently the Russia-Ukraine conflict, the pandemic recovery and the resulting increases to the wholesale price of gas which push up the energy price cap.[16]

Cornwall Insight, one of the top management consultancies in the energy, utilities and environmental sector, are predicting that energy bills could go up by about 80% during winter 2022, with direct debit customer bills on average rising from £3554 in October to £5,386.71 in January,[17] and then again to £6,616.37 in April 2023. This will push around two thirds of UK households into fuel poverty by January 2023[18].
For the cultural sector, as it currently stands, there is no price cap on the rates businesses can be charged, like other businesses, energy bills are projected to increase five times their current rates, which will leave organisations facing economic impacts that some predict will be worse than the pandemic.[19]

A price cap is set to come in at the time of writing but the details of this and the implications are not yet known.

"The UK could more than halve its energy demand by 2050, making a substantial contribution to global and UK climate goals. Existing policy instruments would only reduce energy demand by 5% by 2050."
"Without a stronger role for energy demand reduction, the electricity system needs to be four times the size that it is today. Substantial energy demand reduction will moderate the expansion of the electricity system to double its current size."
Centre for Research into Energy Demand Solutions (CREDS) 2021

[13] Institute of Engineering Technology, 'Scaling Up Retrofit 2050' report, available online: theiet.org/retrofit2050, accessed 12/09/22
[14] Zyga, L., 2011, Phys.org, Why Nuclear Power will Never Supply the World's Needs, online: https://phys.org/news/2011-05-nuclear-power-world-energy.html, accessed 12/09/22
[15] Business, Energy and Industrial Strategy Committee,2022, Third Report, Energy Pricing and the Future of the Energy Market, online: https://committees.parliament.uk/committee/365/business-energy-and-industrial-strategy-committee/publications/ https://committees.parliament.uk/publications/23255/documents/169712/default/, accessed 12/09/22
[16] National Energy Action, 2022, Energy Crisis, online: https://www.nea.org.uk/energy-crisis/, accessed 12/09/22
[17] Cornwall Insight Commentary, 2022, online: https://www.cornwall-insight.com/cornwall-insight-comments-on-the-announcement-of-the-october-price-cap/ accessed 12/09/22
[18] Child Poverty Action Group, 2022, Fuel Poverty Updated Estimates for the UK, online: https://cpag.org.uk/news-blogs/news-listings/fuel-poverty-updated-estimates-uk accessed 12/09/22
[19] The Guardian, 2022, Soaring MDF prices, extortionate interval drinks, cash-strapped audiences: the arts are staring inflation in the face, online: theguardian.com/commentisfree/2022/aug/19/covid-uk-arts-venues-energy-crisis-fatal accessed 12/09/22

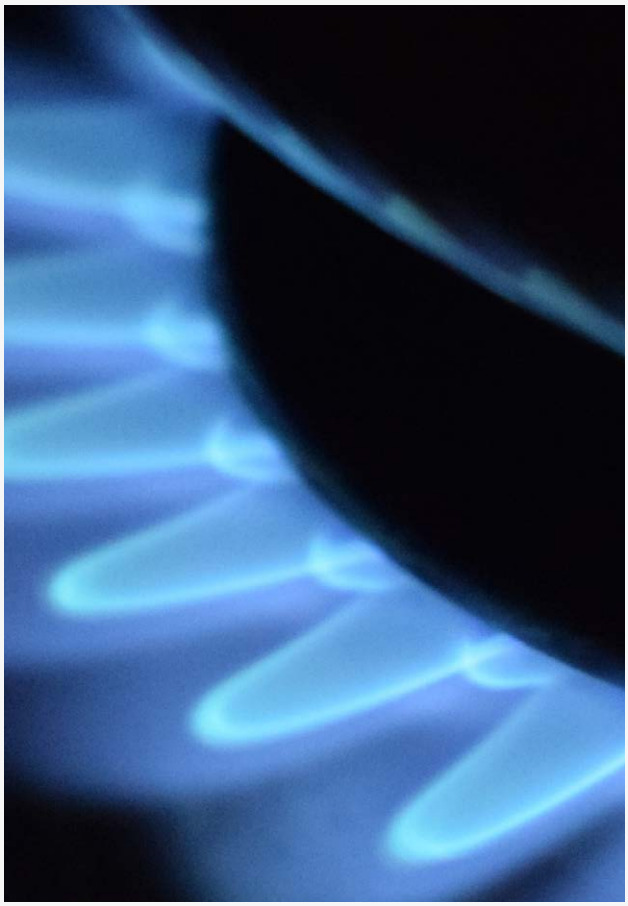
Explainer: Why are we in the midst of an energy crisis?

The current global energy crisis is caused by an ongoing shortage of energy generated by natural gas, which has resulted in prices soaring to record-breaking levels. This is due to several factors:

1 **Security of supply:** Uncertainty in sourcing of supplies from Russia causing wholesale energy prices to rise dramatically. Russia provides around 40% of Europe's gas, and around 4% of the UK's gas. High wholesale prices have pushed many energy suppliers out of the market in the UK as smaller suppliers haven't been able to afford the high wholesale prices.

2 **Weather:** Cold and prolonged winter conditions in Europe between 2020 and 2021 reduced supplies of natural gas. In the UK we've experienced low winds and therefore less wind energy generation, increasing reliance on natural gas.

3 **Infrastructure failures:** There have been outages in some nuclear power stations. A fire in Kent impacted a power cable used to import energy from the continent which isn't expected to be running again until 2023. There have also been complications to the Nord Stream 2 pipeline in the Baltic Sea, an $11bn line which provides gas from Russia to Europe. The project has been faced by multiple sanctions to stop its construction from the US and is contentious because it would increase European reliance on Russia for gas. It is unlikely now that the project will be finished at all due to the war.



4 **Overall demand for energy:** demand for gas has increased following recovery from the Covid19 pandemic. At the start of the pandemic prices hit historical lows but have been gradually bouncing back as business returns to normal.[20/21/22]

[20] The Guardian, 2022, Gas Prices Hit Record High, online: https://www.google.com/url?q=https://www.theguardian.com/business/2022/mar/04/gas-prices-hit-record-high-again-as-ukraine-invasion-disrupts-markets&sa=D&source=docs&ust=1662634062461887&usg=AOvVaw3oLynrLxZdqblgMjXWJkNA, accessed 12/09/22

[21] Clean Energy Wire, Journalism for the Energy Transition, The energy crunch – What causes the rise in energy prices?, online: https://www.cleanenergywire.org/factsheets/energy-crunch-what-causes-rise-energy-prices, accessed 12/09/22

[22] Good Energy, 2022, Why are energy prices so high? online: https://www.goodenergy.co.uk/why-are-energy-prices-still-so-high-2/, accessed 12/09/22

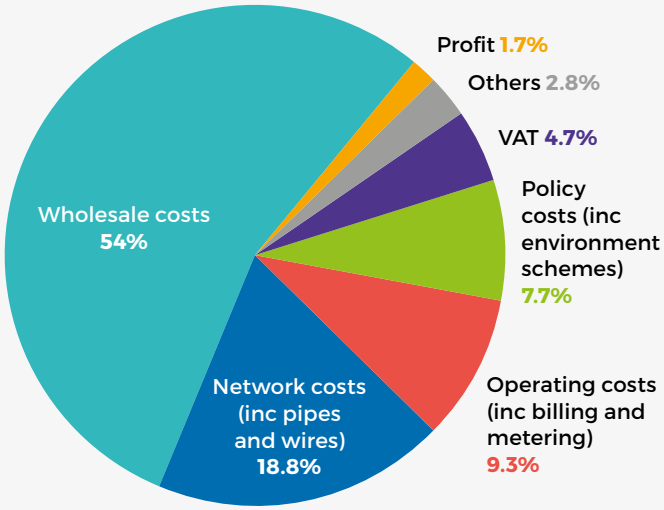
Explainer: What factors determine your energy bill?

The current way in which the British electricity market is designed means that electricity prices are mostly set by gas prices. This is because the short-term electricity market works on 'marginal pricing' – prices are set by the final source of energy used to meet demand. We use the renewable energy we generate first primarily because it's cheaper, and the last source of energy used is usually gas. For example, in 2019, electricity costs were set by fossil fuels 84% of the time. Today natural gas provides around 38% of our electricity generation, which has a relatively high running cost. We need to reduce and remove this reliance on gas or redesign the energy market to make prices more reflective of where our energy comes from.[23]

"Around the time that OPEC (Organisation of the Petroleum Exporting Countries) was quadrupling oil prices, the British rock band The Who released its totemic rant against corrupted governance, Won't Get Fooled Again. On oil and gas, though, we did get fooled again. Decisions made by successive governments perpetuated an industry that for 50 years has made a profit of $3bn per day while taking the climate system perilously close to dangerous instability."
Richard Black, senior associate at the Energy and Climate Intelligence Unit and honorary research fellow at Imperial College London

Whilst retail energy bills include costs all energy suppliers have to pay towards environmental schemes, such as investment in renewable energies or energy efficiency schemes, the bulk of a consumer bill is made up of wholesale costs; which is how much the supplier has to pay to buy gas and electricity on the competitive market. It is worth emphasising, therefore, that the policy costs of environmental schemes, such as new renewable energy projects, have very little impact on a consumer's overall energy bill; this money is also allocated to schemes such as the Warm Homes Discount which help protect the most vulnerable consumers from fuel poverty.

How your fuel bill is broken down
Typical customer on a price capped dual fuel tariff paying by direct debit, summer 2022



Others includes costs of direct debit administration and allowances approved by the regulator

Source Ofgem
https://www.bbc.com/news/business-58090533

[23] Good Energy 2022, Why does the price of gas drive electricity prices, online: https://www.goodenergy.co.uk/why-does-the-price-of-gas-drive-electricity-prices-including-renewables/, accessed 12/09/22

Explainer: If I buy energy from a renewable energy supplier, is my electricity consumption carbon neutral?

Unfortunately, procuring from a green supplier doesn't mean that your electricity consumption is Net Zero from an emissions perspective. If you consume energy from the grid, your electricity emissions will depend on the energy mix of the national grid at that point in time, and how much renewable energy capacity vs fossil fuel energy is being generated at a national level.

Green tariffs are not always as 'green' as they appear, so it is important to find out which sources the energy is generated from (i.e. fossil fuels or renewables). If the provider holds direct power purchase agreements with renewable generators, then this can help to reduce demand for fossil fuels, and support the addition of new renewable energy capacity to the grid. To learn more about purchasing renewable energy, and how to choose a reputable supplier (including understanding the crucial difference between suppliers who use REGOs vs PPAs), *see our FAQ's on purchasing renewable energy for more information*.

Explainer: 'Cutting the Green Crap': What are the missed opportunities from an energy and housing policy perspective?

So why exactly is the UK so far behind many of its European neighbours when it comes to energy efficiency and sustainable energy[24]? Carbon Brief analysis has revealed that previous abandonment or poor design of energy policies in the UK over the last decade means that energy bills are now nearly £2.5bn higher than they would have been had the government taken action. So what were the points of failure?

David Cameron's coalition government made some significant changes to levels of investment in energy efficiency policies. This included the 'Green Deal' energy efficiency scheme, which provided loans for householders to make energy efficiency improvements such as loft and cavity wall insulation to their homes. The scheme did little to benefit renters or social housing landlords, and the National Audit Office described the policy as a 'failure'.

In 2015 subsidies for onshore wind were withdrawn, and new planning reforms made any new onshore wind development very challenging. New Onshore wind capacity per year dropped from 1.8GW in 2017 to 0.1 GW by 2020.[25]

The Zero Carbon Homes Standard (under the Code for Sustainable Homes 2016), which required that all new build homes needed to meet zero carbon building regulations standards, was also scrapped in 2015. As a result hundreds of thousands of homes have been built to lower energy efficiency standards. Heating and powering buildings currently accounts for 40% of UK emissions.[26] To meet Net Zero goals, these newly built homes will now have to be retrofitted before 2050. There is currently a gap in energy efficiency policy for new buildings until the Future Homes Standard comes into place from 2025. This, along with Building Regulations, will aim to ensure that new homes built after 2025 will produce 70-80% less carbon emissions compared to homes developed under previous regulations.

[24] Wunderflats, 2022, The Green Living Index Report 2022, available online: https://wunderflats.com/page/reports/en-greenlivingindex2022, accessed 12/09/22

[25] Carbon Brief, 2022, Analysis, available online: https://www.carbonbrief.org/analysis-cutting-the-green-crap-has-added-2-5bn-to-uk-energy-bills/, accessed 12/09/22

[26] Gov UK, 2021, Press Release: New homes to produce nearly a third less carbo, available online: https://www.gov.uk/government/news/new-homes-to-produce-nearly-a-third-less-carbon, accessed 12/09/22

Explainer: Is nuclear energy really low carbon?

Research has shown that the lifecycle emissions of a nuclear power plant can range from 8 to 64gCO2e/kWh (depending on which life cycle assessment method is used) with averages well above the upper range of possibilities estimated by the Committee on Climate Change and significantly higher than the median value of 12gCO2e/kWh used by the Intergovernmental Panel on Climate Change.[27] This suggests that with this range of uncertainty in actual emissions, nuclear power may not be as 'low carbon' as is often believed by those who advocate for the technology, and more research is needed to fully understand the climate impacts of using nuclear power. Safe storage of waste, security risks and feasible exploitable abundance of uranium are all other issues that need to be considered.

Explainer: Is mining for renewable energy projects just as bad as mining for fossil fuels?

Responsible sourcing of the minerals needed for the low carbon transition is another issue that must be tackled, putting human rights and ethical production at the centre of the transition. It is widely acknowledged that currently, mining for lithium, cobalt and other key minerals is an environmentally and socially unsustainable practice which is being scaled up for the roll out of electric vehicles and renewable energy technologies. Around 60% of global cobalt reserves are found in the Democratic Republic of the Congo, where human rights abuses and poor environmental conditions are rife. In Bolivia, around 17% of the worlds' lithium reserves can be found underneath the world's biggest salt flats, but historically mineral rights have been signed away to foreign companies, leaving the mineral rich country still very socially poor, with 40% of the population living in poverty.[28]

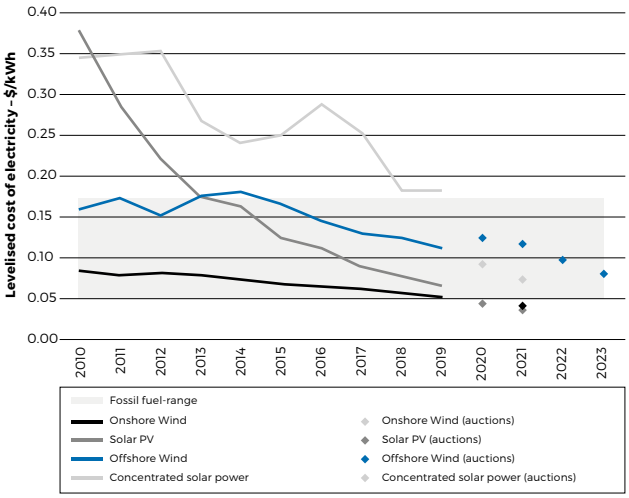
Despite the issues that need to be overcome to ensure ethical and sustainable supply chains for the minerals used in renewable energy solutions, the processes are significantly less intensive than the mining required for the fossil fuel based alternatives. Recycling to reduce demand for raw minerals and working to guarantee responsible resourcing are the most important solutions to focus on for ethically transitioning to electrification and a renewably powered future.[29]

[27] Francesco Pomponi, Jim Hart, The greenhouse gas emissions of nuclear energy. Life cycle assessment of a European pressurised reactor, Applied Energy, Volume 290, 2021,116743,ISSN 0306-2619, https://doi.org/10.1016/j.apenergy.2021.116743. (https://www.sciencedirect.com/science/article/pii/S0306261921002555)

[28] National Geographic, This metal is powering today's technology—at what price?, accessed 12/09/22

[29] Dominish, E., Florin, N. and Teske, S., 2019, Responsible Minerals Sourcing for Renewable Energy. Report prepared for Earthworks by the Institute for Sustainable Futures, University of Technology Sydney. https://earthworks.org/wp-content/uploads/2019/04/Responsible-minerals-sourcing-for-renewable-energy-MCEC_UTS_Earthworks-Report.pdf, accessed 12/09/22

ECONOMIC AND SOCIAL BENEFITS OF A CLEAN TRANSITION



Source: IRENA (2020) Renewable Power Generation Costs in 2019

"There are numerous co-benefits that could improve quality of life while reducing energy demand. People can still have access to local services, leisure and holiday activities, and diverse employment opportunities etc. Co-benefits to pursuing energy demand reduction include improved air quality, warmer homes, healthier diets and increased opportunities for exercise."

Whilst historically, the cost of installing renewables has been a major barrier to uptake, in more recent years, the cost of renewables has dropped significantly and solar and wind energy is now cheaper than fossil fuel energy.[30] The latest IPCC report predicts that globally, a shift to low-carbon energy could save money overall, due to the rapid cost reductions we're seeing in low-carbon technologies.

In health and wellbeing terms, the social benefits of phasing out fossil fuels is a 'no-brainer' and avoids social damage from climate change impacts. Some studies have quantified these social gains, for example a recent research paper analysed the costs and benefits to society of phasing out coal. They found that the world could "reap a social gain of 77.89 trillion dollars by phasing out coal. This represents around 1.2% of current world GDP every year until 2100."[31]

Globally it is vital that the transition to low carbon energy is an inclusive one and centres justice as a key consideration. For example, solar farms can't be placed in the Global South, only for the energy to be exported internationally whilst local people go without lighting and energy for cooking. These types of renewable energy development are unjust and mirror colonial exploitative practices – policy and practice needs to address instances such as these so that projects contribute to the local economies and energy infrastructures of developing countries.[32]

The Chinese exploitation of the African continent is one highly significant and controversial example. Africa is rich in minerals and hydrocarbons, holding around 30% of global reserves and 14% of the world's population. However, the continent's share of global manufacturing didn't shift between 2000 and 2011, remaining at just 1%.

[30] Lazard, 2021, Insights: Levelized Cost Of Energy, Levelized Cost Of Storage, and Levelized Cost Of Hydrogen, available online: Lazard.com | Levelized Cost Of Energy, Levelized Cost Of Storage, and Levelized Cost Of Hydrogen, accessed 12/09/22

[31] Adrian, T., et al, 2022, The Great Carbon Arbitrage, Working Paper No. 2022/107, available online: https://www.imf.org/en/Publications/WP/Issues/2022/05/31/The-Great-Carbon-Arbitrage-518464, accessed 12/09/22

[32] Forbes, 2018, Markets: What is China doing in Africa? online: https://www.forbes.com/sites/panosmourdoukoutas/2018/08/04/china-is-treating-africa-the-same-way-european-colonists-did/, accessed 12/09/22

Since then China has been using Africa's resources to fuel its ongoing industrial expansion, following patterns of exploitation developed and upheld by Europe and the USA. Many argue that despite the economic input into African countries, very little benefit is passed on to local communities and the overall economic development of the continent.[33] [34] For example, renewable energy investment in sub-Saharan Africa by China has been found to have only bounded local economic benefits, for example, some locally created jobs and training of local staff. Much of the labour and equipment is imported from China and better designed policies are needed to support local economic co-benefits.[35]

[33] Forbes, 2018, Markets: What is China doing in Africa? online: https://www.forbes.com/sites/panosmourdoukoutas/2018/08/04/china-is-treating-africa-the-same-way-european-colonists-did/, accessed 12/09/22

[34] Enerdata, 2020, China's strategy in Africa, accessed 12/09/22

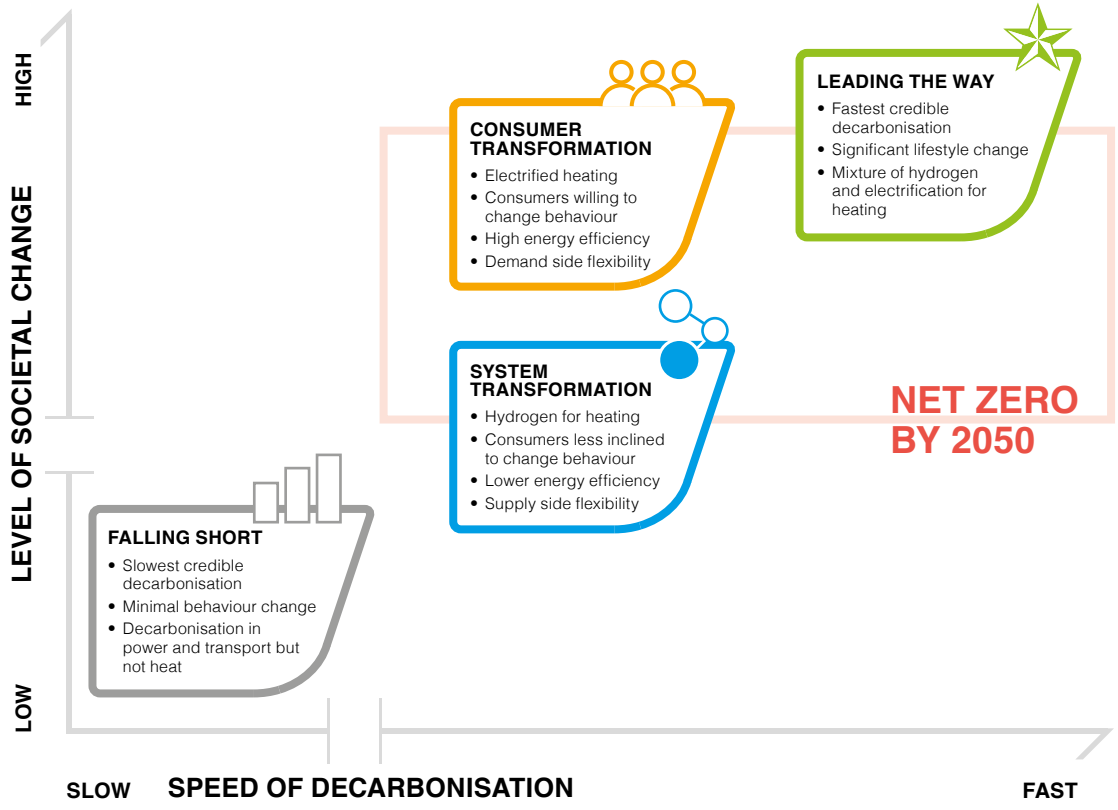
[35] Lema,R. et al, 2021, China's investments in renewable energy in Africa: Creating co-benefits or just cashing-in? – ScienceDirect. World Development, Volume 141,, accessed 12/09/22

WHAT MIGHT THE UK ENERGY SECTOR LOOK LIKE IN THE FUTURE?

To meet Net Zero the energy market needs to be reformed.

Networks were traditionally designed with power stations in the North, where coal and gas were extracted, with energy transmitted largely south to urban centres. Now offshore wind farms are in very different locations to the previous transmission model. We now need a more flexible and adaptive model, and an energy system that can rely on more variable energy sources such as wind and solar PV. Energy markets need to adapt and include more thermal and electric energy storage, more demand side response with public and private finance mobilised to roll out these types of solutions.[36]

The National Grid annually publishes the Future Energy Scenarios report, which looks at different options for how the UK energy system might change between now and 2050. The report outlines three possible scenarios whereby the UK can reach Net Zero before or by 2050, either by changing the way in which we use energy, changing the way we generate and supply it, or through a combination of high consumer engagement, adoption of technology and investment. The fourth 'Falling Short' scenario is similar to a 'business as usual' scenario whereby we would not reach Net Zero by 2050.



Source: The National Grid Future Energy Scenarios report 2022

[36] Cornwall Insight, Market Design Amidst a Global Energy Transition, available online: https://www.cornwall-insight.com/our-thinking/insight-papers/future-proofing-energy-market-design-the-net-zero-challenge/, accessed 12/09/22

CULTURAL SECTOR TAKING ACTION

Many leading organisations within the sector are taking a proactive approach to tackle emissions from energy as part of their commitments to sustainability and Net Zero, using creativity, innovation and determination despite the lack of funding options for renewable installations or retrofitting. The Spotlight Programme, for example, is a cluster of large infrastructure cultural organisations working together on a science-based targets pathway to Net Zero.

But this leadership is not unanimous across the sector. Given the urgency of the transition that is required, we should have already moved far beyond switching to energy efficient light bulbs. Our cultural buildings are largely dependent on the National Grid (whether or not energy is procured from a green supplier), and our often listed, leaky buildings allow energy to escape freely where deep retrofits or insulation measures are needed.

> *"...the UK Government has also not done enough to provide a long-term funding settlement for public buildings; nor has it taken strong enough action on boiler phase-out dates, particularly for commercial buildings."* The Committee on Climate Change

The sector has not been supported by effective policies or funding to address these challenges, and the cultural sector is not alone in this battle. The UK Government has not given sufficient investment in the skills gaps, renewable

Horniman Museum. Photo © Andrea Liu

technology and policy that is needed to truly transform the UK buildings sector, (which includes the leakiest buildings in Europe[37]). We need Net Zero infrastructure that is fit to mitigate against our rapidly heating planet and protect financial and physical wellbeing in the process. The same goes for capital investment; we have the technology and knowledge to build zero carbon buildings, but the approach needs to be adopted universally, including by the cultural sector. Any building, new or old that doesn't achieve zero carbon standards, is not compatible with a climate and energy secure future.

Lacking the skills and investment in infrastructure required to support the transition we need, the sector has largely only been able to take smaller actions to improve energy management and reduce use. These actions are critical, and can make a significant difference to operational costs. Environmental data from annual NPO reporting (as part of the Arts Council Environmental Programme) includes the following proactive changes:

[37] Wunderflats, 2022, Sustainable housing in Europe | Green Living Index 2022, accessed 12/09/22

In 2020/21 ACE reporting period:

- **57%** of NPOs had energy efficient or LED lighting installed.
- **34.4%** reported using a green energy supplier
- **21.5%** had access to half hourly meter readings
- **22.5%** of NPOs had environmental policies and science-based targets that align with 1.5 degrees of warming by 2050.

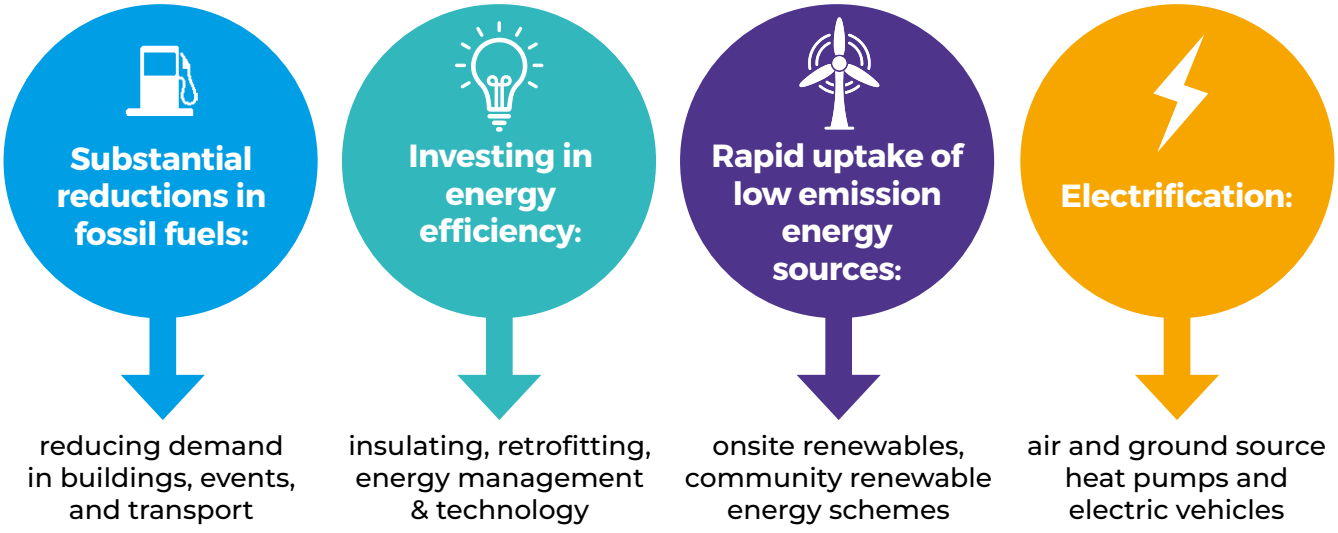
These statistics show some of the opportunities for organisations to take action, which are relatively simple, less expensive and have shorter payback periods, before going on to tackle the necessary retrofits and renewable energy infrastructures that are needed for Net Zero.

So what are the solutions? What does this all mean for culture?

"The Energy Efficiency First principle must guide the secure and sustainable energy transition."
Climate Action Network, Europe.

The latest IPCC report breaks down how, globally, we can achieve the required emissions cuts;

How we can achieve the global emissions cuts and what this means for the cultural sector



Whilst the investment needed for these measures can be somewhat daunting, shifting to low carbon energy and onsite renewables is likely to save money, if the continued trend of rapid cost reductions in renewable technologies we've been seeing over the last decade continues. In addition, investment in minimising energy demand and greening supplies provides organisational resilience against future price spikes in fossil fuel energy, from energy shortages and geo-political disruptions. In light of the current wholesale prices, building business cases on an "invest to save" model rather than a return on investment model may be a more effective approach, and in addition could provide an opportunity to more rapidly address social inequalities and justice issues related to energy.

"Some energy demand reduction measures offer earlier mitigation opportunities and a greater reduction in cumulative emissions... For buildings, a triple approach of the rapid roll-out of heat pumps, retrofit of existing building stock and addressing the inefficiency of occupancy rates is required"
The Centre for Research into Energy Demand Solutions

[35] CREDS, 2022, The role of energy demand reduction in achieving net-zero in the UK - CREDS

CONCLUSION

In the context of both the energy and climate crisis, ambitious energy action by cultural organisations which builds on the successes of the sector to date, is imperative.

The current challenges, including the threat of an impending economic recession, mean that audiences will not be choosing whether to attend a performance, but between heating and eating. This is a crucial moment in time, where action must be supported by robust policies, incentives and capital investment which support the system change we need.

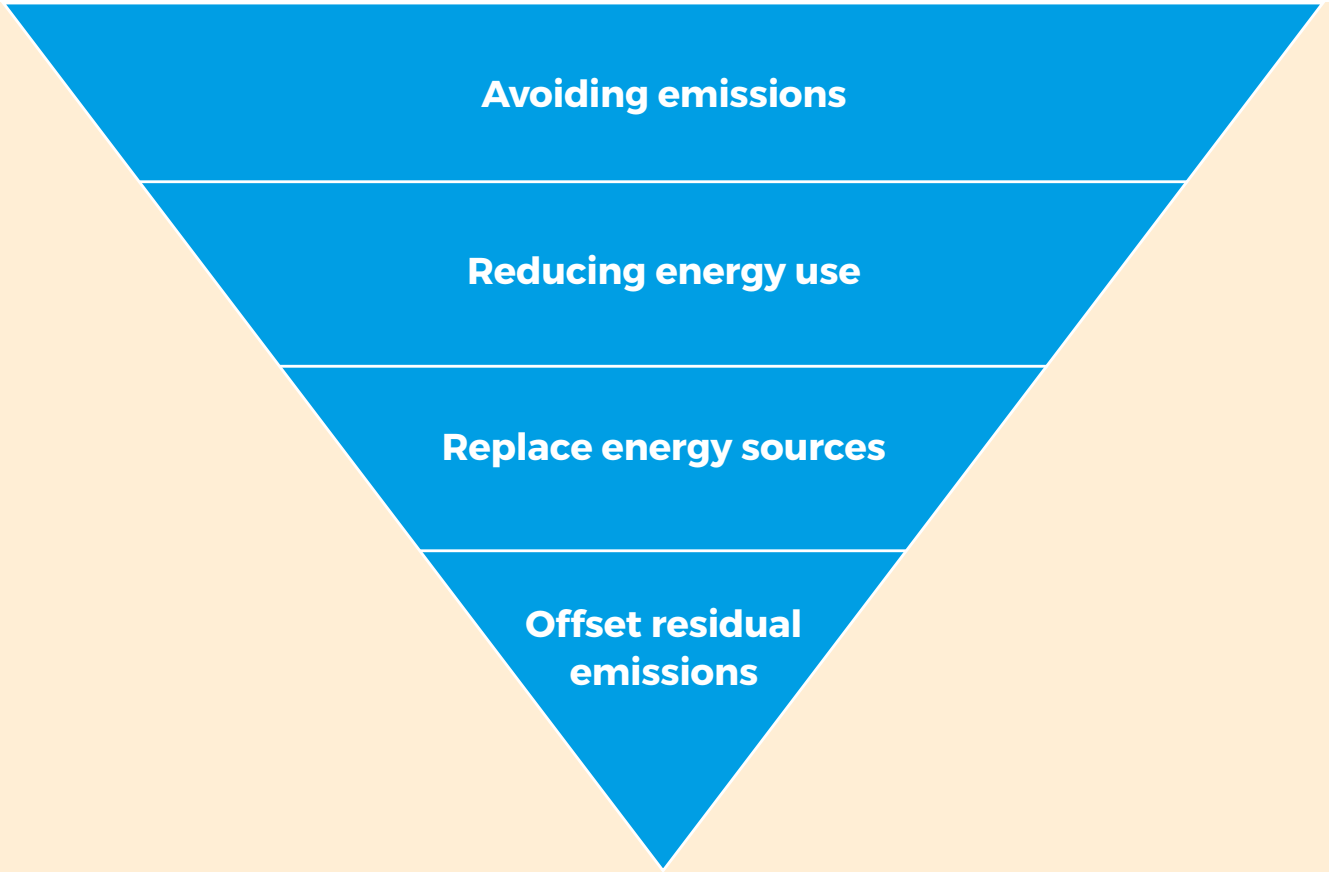
The question is how the sector is going to come together to respond. How can we lobby and demand the change we so desperately need to transition to a vision of a cultural sector in which our buildings add renewable capacity to the grid, help tackle fuel poverty in our communities, and fight climate change in the process. The solutions exist, but the answer lies in protesting, in partnerships, building expertise and multi-sector solutions, which benefit the wellbeing of communities, aid sustainable development and create an energy and climate resilient future for culture.

Depot in Lewes

PRACTICAL TIPS FOR ADDRESSING ENERGY IMPACTS

How cultural organisations can transition to Net Zero for energy related emissions:

- There are a number of actions that organisations can take to achieve Net Zero for energy-related emissions. These include:



- **Avoiding emissions** –
  By identifying where power is not needed at all (e.g. night time audits, 'switch-off' policies when lighting and heating is not being used).
- **Reducing energy use** –
  By implementing energy efficiency measures (e.g. Building Management Systems, LED lighting, insulation).
- **Replace energy sources** –
  By opting for low-carbon alternatives for electricity and gas.
  Electricity – e.g. green tariffs that add capacity to the grid (not just use REGOs), Corporate Power Purchasing, on-site generation
  Heat pumps in place of gas heating or switching to biogas or green gas where access to the grid or heat pumps is not possible.
- **Offset residual emissions** –
  By balancing any unavoidable emissions with solutions that take carbon out of the atmosphere. This should only be the approach for any emissions you cannot feasibly remove by the previous actions and should be approached with caution to ensure the offset has the positive impact you intend. (Read more in our briefing Putting a Price on Carbon)

ENERGY EFFICIENCY: What Can Cultural Organisations Do?

TOP TIPS

1. Get control of your data

You can't manage what you don't measure. It is a legal requirement for large business energy users to have half hourly metres installed. If your organisation has a peak load energy usage over 100 kW, you will need to get a half hourly metre. These are free for small users from your supplier. Having a half hourly metre is also the best way to understand your energy use and make changes to reduce your overall consumption. Doing a night audit can also show you were devices and energy are being drained which could be energy saving opportunities.

"We have 53 sub metres installed across site in our 2014 refurbishment."
Sadler's Wells Trust

2. Get an energy audit

Employing an energy assessor to carry out an audit of your building can help you to understand opportunities to reduce and save energy, and put together an energy action plan.

3. Implement energy efficient technologies into your buildings

In 2020-21, 59% of NPOs had installed energy efficient lighting systems. Lighting has a significant energy consumption, therefore it provides opportunities for energy efficiency and emissions reduction.

4. Take control of your energy generation

Investing in onsite renewable energy generation is one of the best things you can do to reduce your footprint. Assess whether installing an air source or ground source heat pump is an option and whether your roof space of other areas of your site might be suitable for solar thermal or solar PV.

Glyndebourne Opera built their own wind turbine in 2012. Within six years it had paid for itself, and continues to create profit and provide energy security for the organisation.

Between 2012 and 2021 it has generated the equivalent of 105% of the electricity used by the company in that period, resulting in a 50% cut in carbon emissions. Any electricity not

Glyndebourne Opera house & turbine. Photo © Sam Stephenson

5. Work with others to build community owned renewable energy systems

used directly on-site goes back into the National Grid providing clean power to the local community.

Glyndebourne have also signed up to the Race to Zero Campaign, and undertaken a number of other activities aimed at reducing energy consumption including: installation of new, more efficient gas boilers that could reduce gas consumption by 20%, making changes to the air conditioning system to lower energy consumption, replacing auditorium lights with low-energy LEDs, and installing timers and light sensors.

Examples:

- Bristol Music Trust: Are investing in solar PV in their redevelopment, the system will potentially generate 111000KWh.
- Chichester Festival Theatre: Have a ground source heat system where the ROI is approx £8000 per annum during a normal year.
- Sadler's Wells Trust: Invested in solar panels their roof and fly tower during their 2014 refurbishment, they produce approximately 17,000 kWh per year.

Working with other local organisations and groups can be a great way to pool resources for mutual shared benefits. In 2020-21, 10% of NPOs were a part of a community-based or government energy scheme or group.

Knowles West Media Centre have solar panels from Bristol Energy Cooperative (BEC). BEC is a community-owned energy cooperative growing Greater Bristol's local green energy supply, they make the benefits available to all. They develop renewable energy and energy efficiency projects, and help others to do the same.

Examples:

- Museum of London: is part of Citigen – a district heating system serving the City.
- B:Music: is part of the Birmingham District Heating Scheme.

"Energy communities are a valuable tool in order to accelerate the energy transition and sufficiency in a just and fair way"
Climate Action Network Europe

© Glyndebourne Productions Ltd. Glyndebourne Opera House site and turbine. Photo: James Bellorini

6. Hire a dedicated energy manager, and recruit voluntary energy champions

Having a dedicated energy manager responsible for monitoring, reporting and evaluating energy use will help you to deliver ongoing energy reductions, support installation and understanding of new systems and technologies, monitor and evaluate their impacts.

In 2020-21, 55% of NPOs formally recognised environmental responsibilities in job roles.

Z-arts have two permanent (CL-trained) staff lead the Green Champions Team which has recently been re-launched post-Covid with an all-staff Environmental Strategy workshop. Three senior managers have now received Carbon Literacy Training (including Chief Executive) and they are hoping to roll out Carbon Literacy Training to the rest of the permanent staff.

Opera North rolled out Climate LIteracy training to the majority of their staff during 2020, as well as training staff from Leeds 2023, Leeds Playhouse and Leeds Conservatoire.

7. Implement science-based targets

Whilst this action requires some expertise and an investment of time, you will be certain that your organisation aligns with the Paris Agreement and global emissions reductions targets.

Currently, 26% of NPOs environmental policies align with science-based targets.

Manchester City aims to be Net Zero by 2038, HOME Manchester, SICK! Festival, Walk the Plank and Z-Arts have aligned their organisational targets to the 2038.

8. Employ sustainable production and exhibition methods

52% of NPOs have trialled sustainable productions or exhibition methods.

Read about SS Great Britain's unique approach to energy efficiency and working towards carbon neutral whilst conserving this important heritage site.

For more information about digital impacts see Environmental Sustainability in the Digital Age of Culture.

9. Switch to a green supplier (procurement)

This is one of the easiest ways to support and invest in renewable energy generation in the UK. However, it is important to look carefully and compare the energy sourcing of the energy supplier. check that the supplier invests and directly **builds renewable energy** capacity rather than through buying REGOs (Renewable Energy Guarantees of Origin) or other loopholes which could be greenwash.

CASE STUDIES FROM THE SECTOR

DEPOT CINEMA

The Depot Cinema in Lewes is highly committed to sustainability. Their building was designed with the ambition to create a building with the lowest possible environmental impact as it was understood at the time in 2014-5.

The building was designed to minimise energy consumption, with excellent insulation – double glazed curtain walling, LED lighting, roof vents instead of air conditioning, automated systems for internal and external lighting, and shutters which regulate sunlight and heat. The building is EPC A rated.

There is a living roof that provides a multitude of benefits. The substrate provides excellent heat and sound insulation and prevents excessive water run off, therefore reducing flood risk to the building. A number of solar panels provide an additional source of renewable electricity. The roof features 72 different local Chalk and Downland plant species which provide a rich food source for pollinators, including 9 species of bees recorded by a local bee expert. They have linked with important conservation projects including the Nationwide Buglife B-lines project and the local project Wildflower Lewes. They also have swift, sparrow and bat boxes, and are working with experts Lewes Swift Supporters to encourage swifts to nest there.

The building was designed with the local architecture in mind, drawing on inspiration from the local South Downs National Park. They worked with a local flint and lime conservation specialist as well as used local pebbles as a design feature on the roof, and local shingle in the screed restaurant flooring. The shutters were sourced from local chestnut trees.

They invested in a large ground source heat pump system which serves as a geothermal heating and cooling system. Unfortunately, the system was not specified correctly the first time round, and new specialists had to be brought in to ensure it performed as was originally intended. GSHP technology is highly effective when the specifications and design are correct, so to help others learn about their experience, Depot have been very transparent about the issues, keeping an open communication with audiences and helping others in the sector to learn from their experience. Read more about what happened here: https://lewesdepot.org/heating

THE ROYAL COURT THEATRE

The Royal Court Theatre have sustainability high on their agenda, and aimed to transition to net zero in 2020, before the pandemic altered the timescale of their ambitions.

The energy part of their strategy involved commissioning a feasibility study from EnergyLab to assess their current heat and power system and assess the opportunities to generate power onsite with renewables. As their building is listed, and in a dense urban area, Ground Source Heat Pumps and Air Source Heat Pumps were not viable options, and solar on the roof would only reduce their carbon by 1%. Their boilers are only 5-7 years old, so they made the decision to leave them in place as it was not sustainable to remove them after such a short operating period.

The Royal Court already procure 100% renewable electricity from Good Energy and Carbon Neutral gas from Ecotricity, however, given their limited opportunities to generate renewable power onsite, they are focusing on energy reduction targets to meet net zero, in recognition that procuring green energy still relies on a relatively carbon intensive national grid.

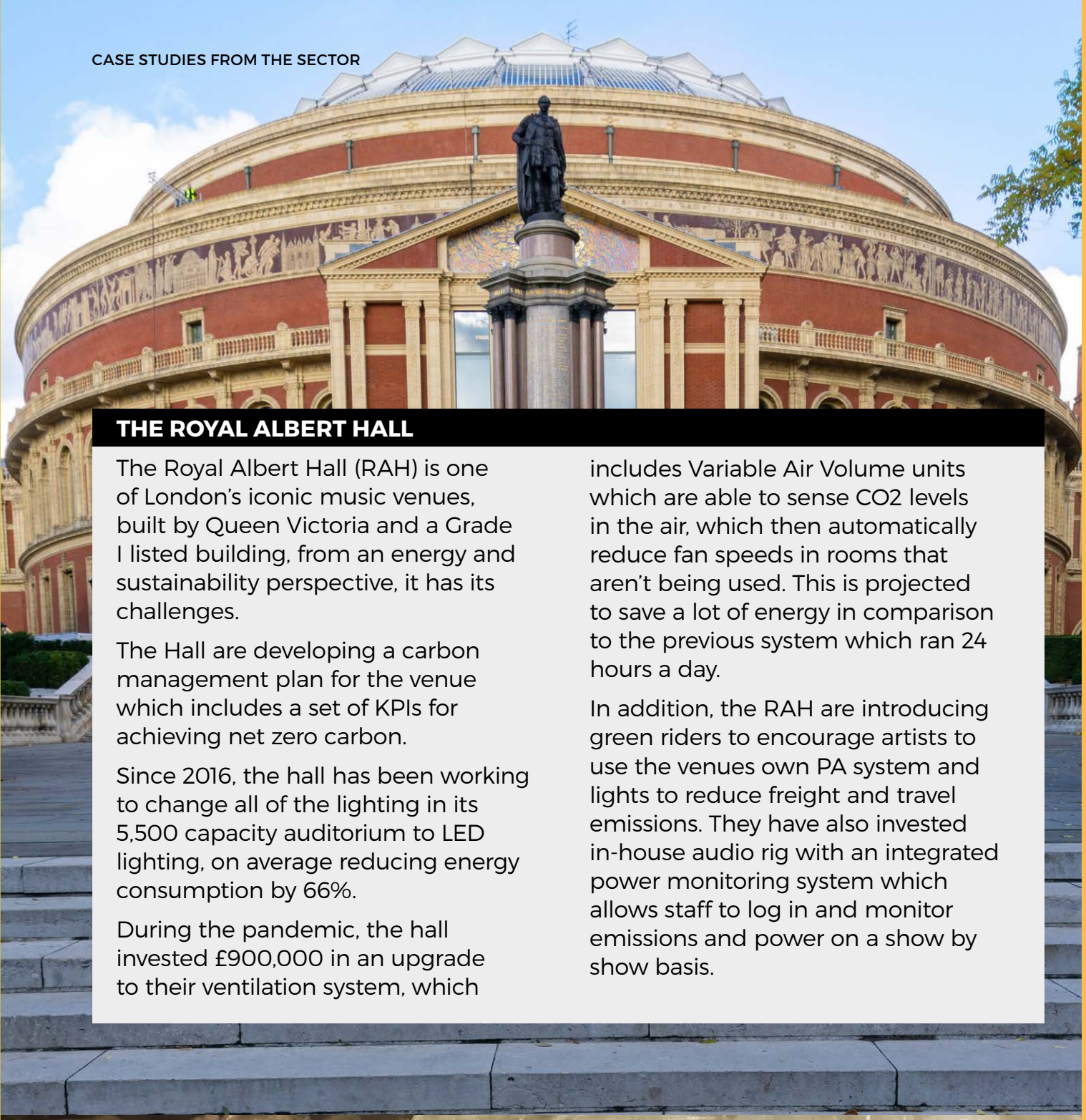
Their energy benchmarks are to reduce electricity by 37.5% a year and by 16% a year for gas. This will be achieved through re-setting the operating times of their BMS, replacing lighting in the building with LEDs and allocating staff responsibility for monitoring their metering system.

For building heat loss they are commissioning a thermographic survey to identify heat loss and opportunities for building fabric improvements.

POWERING PARKS

Powering Parks is a project by Possible, Scene and Hackney Council, piloting the installation of heat pumps in the borough's parks and green spaces to provide heat to nearby buildings.

The pilot project is delivering promising results and could offer an exciting model for more green spaces in cities going forward. They have developed a toolkit to help local authorities and park managers find opportunities, shortlisting sites and how to assess cost and benefits of park heat projects.



THE ROYAL ALBERT HALL

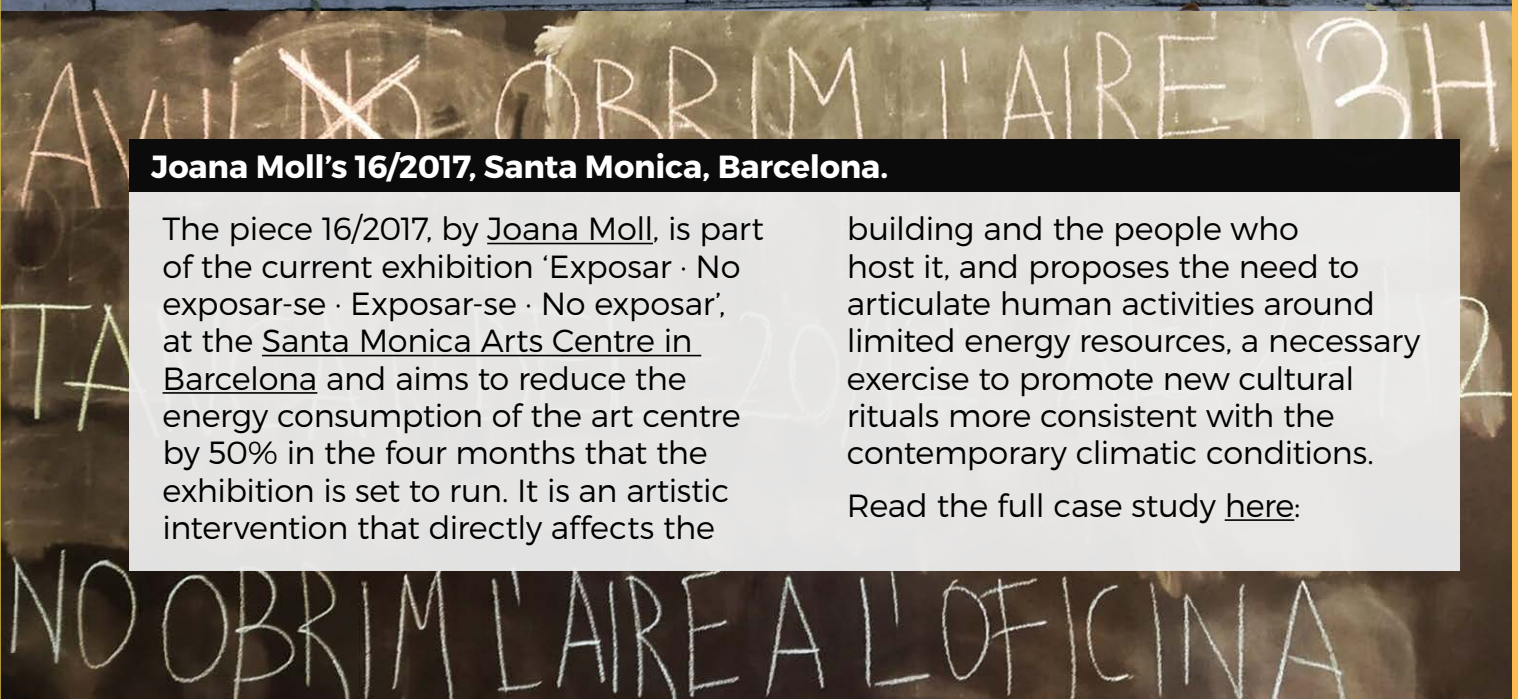
The Royal Albert Hall (RAH) is one of London's iconic music venues, built by Queen Victoria and a Grade I listed building, from an energy and sustainability perspective, it has its challenges.

The Hall are 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 venues own PA system and lights to reduce freight and travel emissions. They have also invested 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.



Joana Moll's 16/2017, Santa Monica, Barcelona.

The piece 16/2017, by Joana Moll, is part of the current exhibition 'Exposar · No exposar-se · Exposar-se · No exposar', at the Santa Monica Arts Centre in Barcelona and aims to reduce the energy consumption of the art centre by 50% in the four months that the exhibition is set to run. It is an artistic intervention that directly affects the building and the people who host it, and proposes the need to articulate human activities around limited energy resources, a necessary exercise to promote new cultural rituals more consistent with the contemporary climatic conditions.

Read the full case study here:

RESOURCES AND FURTHER READING:

Powerful Thinking Guide provides event professionals with up-to-date knowledge and practical resources to help manage temporary energy smartly, reducing environmental impacts and fuel bills.

Transitioning to Net Zero (Julies Bicycle and Pilio)

Putting a Price on Carbon: Briefing Paper (Julies Bicycle)

Biofuels Factsheet (Julies Bicycle)

Gallery Climate Coalition

Good Energy Guide to Buying Green Power

Carbon Brief

Energy Saving Trust

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