Powering the Future: Insights from Transforming Energy

Learnings from JB and Pilio

Executive Summary

Transforming Energy is a pioneering programme uniting over 100 cultural organisations taking action, together, on the climate crisis. It delivers impact through strands: Building Net Zero Energy and Capital Investment Readiness.

Capital Investment Readiness Programme

Across two cohorts, 22 organisations including Watershed, London Transport Museum, Glasshouse, Birmingham Museums Trust, The Met and Brighton Dome, are accelerating their journey to decarbonisation by 2030. With expert guidance and peer learning, they're galvanising board support, crafting ambitious capital funding bids and lighting the way for other cultural buildings to follow.

The initiative is part of a rich programme of support to the cultural sector led by Julie's Bicycle (JB), and funded by Arts Council England. With expert partner Pilio, JB is providing practical training and resources to decarbonise on the pathway to the net zero. From historic theatres to vital community hubs, these buildings are more than bricks and mortar, they are catalysts for change. This is a critical moment, specifically for capital investment in cultural buildings, which include some of our most precious heritage and community spaces. Despite growing momentum within the sector, there is inadequate investment to electrify buildings in order to meet the UK's legally binding net zero target by 2050 and interim carbon budgets.

Transforming Energy shows what's possible when need meets high ambition meets tailored support. The sector is ready. The roadblocks are structural. This is the moment for funders and policymakers to match the sector's energy with the future facing investment needed to unlock a sustainable cultural infrastructure for the next generation and beyond.

The following summary captures learning from the entire Transforming Energy journey to date.

It is intended for policy makers, public and private funders, local authorities and sector support organisations who shape the capital and policy landscape for the cultural sector. It is also relevant to strategic leads within cultural organisations, including directors and trustees who are planning for long term sustainability and capital investment.

Introduction

The Julie's Bicycle Transforming Energy programme, a cornerstone of Arts Council England's Environmental Programme, is driving decarbonisation efforts within UK cultural organisations. The programme so far has shown that progress in the sector is evident. Plans are sharper, enthusiasm is high and tools like the Capital Investment Readiness template are proving effective. However, for some buildings, a significant gap remains between being ready for retrofit and actually implementing change. While barriers to large-scale impact include a range of issues, from limited capacity to a lack of board level support for focusing on capital investment, a recurring theme is the need for substantial funding that goes beyond quick wins like tap aerators or LED lighting, and instead supports deep, systemic upgrades.

Recent government funding announcements are encouraging: £85 million via Arts Council England will be available this summer for urgent capital works to "keep venues across the country up and running," alongside £3.3 million through the MEND (Museum, Estate and Development Fund) for vital museum infrastructure projects. A further £67 million has been committed to nine cultural buildings and projects through the government's 'Levelling Up' funding.

While these investments are a welcome step, they are likely to benefit organisations that are already capital ready i.e. those with completed audits, larger estates, or pressing maintenance needs. There is a risk that this moment may turn into a series of short term fixes. While addressing issues like leaky roofs and ageing gas boilers is essential, it doesn't go far enough in supporting the sector to upgrade buildings in ways that ensure long-term sustainability, climate resilience, and adaptability for the next 20 to 30 years. For now, the full scale of investment needed to meet this challenge remains unclear.

This Brief reflects on the insights gained from participating organisations in the Transforming Energy programme, identifies key challenges and offers actionable recommendations to accelerate decarbonisation in buildings. It also highlights how capital investment readiness can be strengthened to ensure organisations are well prepared for successful implementation, with access to infrastructure that supports transformation, proven concepts (for buildings of all ages) and reliable solution providers.

Key insights

- Cultural organisations are ready to act, but lack access to strategic, futureproof capital funding that enables deep, sustainable upgrades.
- High upfront costs, volatile electricity pricing (plus poor payback terms) and uncertainty around technologies are stalling momentum, especially for older or historic buildings.
- Transforming Energy is working. Peer support, training and practical tools are accelerating action, however there is still a shortage of specialist providers who understand the unique complexity of cultural spaces.
- JB's Capital Investment Readiness programme has equipped participating organisations with clear next steps and viable business cases. What's needed now is targeted funding to deliver on that groundwork.

Key recommendations

- Invest in audits that look beyond immediate savings or urgent work to long-term decarbonisation.
- Support "beacon" decarbonised buildings as proof points for deeper retrofit and innovation.
- Fund scalable sector specific training in retrofit, the basics of energy management and pathways to capital project planning.
- Funders need to support future-fit, sustainable and decarbonised buildings
- Create a national supplier register for decarbonisation products and services suited to culture.
- Enable joint procurement for low carbon technologies such like heat pumps, renewables and energy efficiency technologies (e.g. LED lighting).

Introduction

JB's Transforming Energy programme, a cornerstone of Arts Council England's Environmental Programme, is curated by Julie's Bicycle to ignite a step change in how UK cultural organisations approach decarbonisation. We are building momentum. Organisations are leaning in, enthusiasm is high and tools like the Capital Investment Readiness template created by our partners, Pilio, are helping buildings to be ready for vital funding. But readiness is only half the story.

For many cultural buildings, especially those with historic fabric or complex needs, there remains a daunting gap between ambition and implementation. There is substantial need for funding that goes beyond quick wins like tap aerators or LED lighting, and instead supports deep, systemic upgrades.

Recent government investments, like the £85 million via Arts Council England, alongside the £3.3 million through the MEND (Museum, Estate and Development Fund) and the £67 million through Levelling Up, are welcome signals of commitment. However, it seems these pots will likely favour those already capital ready, with surveys in hand and pressing infrastructural needs. There is a risk that this moment may turn into a series of short term fixes. While addressing issues like leaky roofs and ageing gas boilers is essential, it doesn't go far enough in supporting the sector to upgrade buildings in ways that ensure long term climate resilience and adaptability for the next 20 to 30 years. For now, the full scale of investment needed to meet this challenge remains unclear.

This brief distills the insights, challenges and recommendations emerging from the Transforming Energy programme. It's a call to action for funders, policy makers, organisational strategic leads and trustees, to ensure the sector's commitment is met with the investment, infrastructure and imagination it deserves.

About the Transforming Energy programme

JB's Transforming Energy programme stands as a pioneering force, guiding UK cultural organisations toward decarbonised buildings and net zero energy goals, woven into Arts Council England's Environmental Programme until March 2027. Launched in April 2023, it builds on the achievements of the Spotlight programme (2018-2023) for 29 large arts organisations, which resulted in 19% less electricity and 32% less gas usage across participants.

The Transforming Energy programme is a bold, hands-on response to the urgent need for pathways to capital investment, skills development and sector specific solutions. It unfurls through two distinct strands, each tailored to meet organisations where they are, whether laying the groundwork or moving towards deeper decarbonisation.

Buildings Net Zero Energy (The Foundation Programme)

This strand casts a sector wide net, targeting those just beginning or eager to deepen their energy efficiency efforts. It equips a diverse array of building based organisations with three training sessions on Building Energy Management, an Energy Management Scorecard, online films, written resources and case studies, bolstered by expert support from technical partner Pilio. Engagement has been strong with over 100 participants enrolled, expressing a clear hunger for more practical training, particularly to empower energy managers further in their roles. This has prompted a sharper focus on demonstrating return on investment, showing how environmental action can align with financial savings. Critically, we're helping organisations to frame this work as part of a just transition, centering the broader social and planetary benefits beyond the financial case.

In contrast, the **Capital Investment Readiness** strand takes a bespoke, intimate approach, nurturing 22 National Portfolio Organisations (NPOs) already striding toward energy reduction, including 2025's cohort including Hampshire Cultural Trust, Tullie House Museum and Art Gallery, New Wolsey Theatre, SS Great Britain, Birmingham Museums, Oxford Playhouse, The Hall For Cornwall, Brighton Dome & Festival, The Met and Almeida Theatre. They receive three one-on-one sessions, three cohort workshops, peer learning and a Capital Investment Readiness business case template. This strand sharpens strategic planning, steering groups toward costed decarbonisation plans and retrofit solutions for large scale electrification by 2030, despite wrestling with sector specific provider shortages and financial tightropes.

Why now? Why JB?

Transforming Energy is proving that sustainability can't be a side project, it must be embedded in core purpose. By reducing emissions and energy bills, this programme is enabling cultural organisations to take confident, practical steps towards the UK's 2050 net zero goals.

With JB's leadership, Pilio's technical expertise, and the dedication of our participating organisations, Transforming Energy is showing what leadership looks like in action: strategic, ambitious and rooted in collaboration towards deep, long lasting change.

What are the steps to decarbonising buildings to achieve net zero?

Decarbonising building energy use involves a multi-step approach to reduce carbon emissions and transition to sustainable energy systems:

1. First, improving energy efficiency is key, this includes retrofitting buildings with better insulation, energy-efficient lighting, and smart heating, ventilation, and air conditioning (HVAC) systems to minimise energy waste.
2. Next, electrifying building systems, such as replacing gas-powered heating with electric heat pumps, shifts reliance away from fossil fuels. Alternatively, if available, replacing a gas boiler by connecting to a district heating network can provide a low-carbon solution by utilising centralised renewable or waste heat sources. Integrating renewable energy sources, like rooftop solar panels, further reduces carbon footprints by powering buildings with clean electricity. There is the potential of a hydrogen infrastructure, but this requires policy drivers and large scale investment, therefore cultural organisations need to take steps within their sphere of control. Additionally, adopting low-carbon materials during construction or renovation, such as sustainable concrete or recycled steel, helps lower embodied carbon.
3. Finally, implementing smart building technologies, like automated energy management systems, optimises consumption and ensures long-term efficiency. Together, these steps create a pathway to net zero buildings, significantly cutting emissions while maintaining functionality and comfort.

Achieving decarbonisation of buildings requires organisations to have the staff with the skills and support in energy management otherwise efforts are piecemeal and opportunities missed.

Key findings from the Capital Investment Readiness programme

1. Accessing Financing Challenges

Organisations develop robust decarbonisation plans but lack the financial and structural backing to act on them. Awareness of net zero building requirements has grown, yet implementation will lag behind without sufficient capital funding to invest in sustainability, beyond urgent works.

- High upfront costs and limited access to funding deter action, particularly for retrofitting heritage and cultural buildings.
- Traditional investment models, such as local authority partnerships, remain complex and underutilised.
- Funding is often allocated based on short-term returns, making it difficult to prioritise sustainability unless tied to clear financial benefits.

2. Programme tools and guidance
The Capital Investment Readiness template has been instrumental, enabling organisations to structure decarbonisation strategies, set realistic goals (shifting from vague 2030/2050 targets), and advocate for board level investment.

3. Emerging advocacy
Collective action is gaining traction as organisations recognise the need for sector-wide pressure to secure investment and influence policy, with European models (e.g. Germany's energy framework) offering potential blueprints.

4.Scalability
Impact remains localised. Demonstrating sector wide benefits requires scalable solutions like digital resources and flagship decarbonised buildings, which can communicate their approaches and share learning.

5. Evidence deficit
The programme's Stories of Change demonstrates successes, but a comprehensive, data-driven narrative is essential to attract significant funding to support the sector's ambitions to decarbonise.

Outcomes from the programme

Julie's Bicycle Transforming Energy programme supports the cultural sector, igniting enthusiasm and marking out blueprints for decarbonisation across UK cultural organisations, yet there is a marked divide between readiness and reality. The Capital Investment Ready cohort model of peer insights and expert mentoring paves the way for clear investment pathways, and its impact echoes loudly: All participants affirm it clarifies their next steps, fuelling progress towards their net zero ambitions. Over the last two years, plans have taken shape within the participating organisations and a clearer vision of net zero buildings has emerged. Yet existing financial and structural scaffolds cannot support the weight of ambition, leaving some action stranded. The programme's capital evidence base illustrates the potential by supporting organisations in making the business case for investing in decarbonisation technologies: qualitatively, it weaves success in energy management and carbon literacy, internal advocacy and sector awareness, with participants feeding back on the usefulness of the frameworks and tools that demystify decarbonisation and templates that transform energy data and analysis into compelling investment cases.

Stories Of Change from participating organisations offer inspiration and learnings others can benefit from. For example, Watershed and Courtyard involved board governance to make decisions about capital investment; the London Transport Museum and Royal Opera House undertook detailed feasibility studies to assess the implementation of low carbon technologies, including consideration of connecting to a possible new district heat network the West End. Quantitatively, a third of organisations from the first cohort have managed to secure some funding for decarbonisation during the period they were part of the programme, but barriers prevail.

Conclusion

The capital needs of cultural organisations are clear, they require sharper business case templates and policy frameworks, met through workshops, cohort huddles and investment guidance. Knowledge gaps remain a barrier, cultural bodies need digestible technical guidance to interpret audits and rank investment priorities, supported through one-on-one sessions and expert clinics.

Scaling impact depends on collaboration. The cohort model supports momentum, and has strong potential for expansion. Board level support and ties to JB's broader leadership support programmes, like Boards Environmental Champions (BECs), create conditions for deeper decarbonisation drives led by governing bodies. From Courtyard's LED-lit stage to Unicorn's trustee bound plans, the programme responds to sector needs, yet the challenges remain; future facing funding must increase, expertise must be accessible and collective ambition must grow, to root long term sustainability in the cultural sector's core. To bridge capital funding gaps, new investment pathways must be developed, building partnerships with local authorities, alongside innovative business models and sponsorships. Additionally, existing schemes run by the likes of UK Research and Innovation hold the potential to unlock further support and solutions.

Within this landscape, the Capital Investment Readiness programme provides a structured foundation, supporting organisations as they map decarbonisation and rally boardroom backing, nudging them to set sharper, actionable goals from now to 2027. During the final session with the Capital Investment Readiness cohort one, a wave of sector wide advocacy emerged, with voices coming together to recognise that only through collective power can investment be unlocked and policy be reshaped. To draw deeper funding, the programme's impact must extend beyond individual outcomes, requiring scalable solutions, interactive digital tools to stretch past workshops, and fully funded pilot buildings to stand as decarbonised beacons. Yet, the story cannot progress without a stronger evidence base, shifting from isolated case studies to robust sector wide data is crucial.

Barriers to implementation and proposed solutions

1. Lack of funding for essential building audits

I.e: The sector isn't required to do ESOS (Energy Saving Opportunity Scheme); access to targeted funding for audits is a first step.

Proposed solution (S1): *Fund Building Energy Saving Audits* Launch a tender for basic and capital grade audits (£2,000–£5,000 each), managed by funders or a procurement directorate to select expert providers.

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2. High upfront and operational costs of new technologies

I.e: Heat pumps cost more in operational and initial outlay, making business cases tough.

Proposed solution (S2): *Joint Procurement*
Pool resources for a £5-10 million tender, enabling economies of scale for air-source heat pumps (ASHP), energy efficient equipment and lighting, fabric upgrades and onsite renewables.

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3. Payback challenges for crucial fabric improvements
I.e: Fabric improvements rarely justify payback but are vital for climate resilience.

Proposed solution (S3): *Fund Beacon Projects*
Prioritise fully electrified "beacon" arts buildings as proof of concept case studies, building confidence in the climate value of interventions that aren't financially driven.

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4. Low confidence in technology suitability and cost feasibility
I.e:There is a lack of evidence to demonstrate the suitability of technology solutions in cultural buildings

Proposed solution (S4): *Subsidies and Loans*
Create an evidence-base of success and learnings from installing and operating these technologies. Introduce zero-interest loans (via DCMS or similar) or a Cultural Sector Community Capital Fund to subsidise ASHP, solar (and other) technologies tailored to arts/heritage buildings.

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5. Skills and capacity gaps in project delivery
I.e: In-house knowledge and skills for net zero retrofits remains uneven across the sector; processes need streamlining.

Suggested solution (S5): *Fund Retrofit Training & Advisory Support*
Create a national training programme for cultural sector-specific retrofit, energy management and capital project training

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6. Inaccessible capital funding mechanisms
I.e: Capital costs exceed means, how do organisations secure viable funding?

Suggested solution (S6): *Develop blended finance models*
Design accessible finance pathways, combining sustainability-focused public, private and philanthropic sources, with clear guidance tailored to the cultural sector.

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7. Lack of sector-specific, trusted supplier networks

I.e Organisations with buildings need access to a national database of retrofit providers with cultural building expertise.

Suggested Solution (S7): *Establish a National Supplier Register*

Capital successful organisations could develop and maintain a vetted database of providers with experience in arts and heritage retrofit, supported by reviews and case study outcomes to build trust and streamline procurement.

Further Recommendations

1. **Government bodies to unlock diverse funding pathways:**
   - Establish a dedicated Cultural Decarbonisation Fund, leveraging government schemes (e.g. UKRI, ESRC) and private sector partnerships (e.g. National Grid).
   - Pilot innovative financing models, such as green bonds, sponsorships, or energy performance contracts, tailored to cultural organisations.
   - Simplify access to existing grants, ensuring eligibility for small and medium-sized cultural entities.

2. **Funders to invest in scaling programme tools:**
   - Expand the Capital Investment Readiness template into a digital platform, broadening its accessibility and supporting real-time investment planning.
   - Develop interactive online resources to replace closed workshops, scaling training and engagement across the sector.
   - Commission a comprehensive study aggregating programme data, energy savings, cost reductions, and emissions cuts from the tools.

3. **Cultural beacons lead sector-wide advocacy:**
   - Amplify collective lobbying for policy reform and investment by creating a Cultural Sector Net Zero Alliance, drawing on European models like Germany's integrated energy strategies.
   - Partner with local authorities to streamline planning permissions and co-fund pilot projects.

4. **Funders, researchers and government bodies invest in scaling decarbonisation across the sector:**
   - Fund a cohort of flagship decarbonised cultural buildings (e.g. museums, theatres) as replicable exemplars, showcasing cost savings and emissions reductions.
   - Invest in a sector-wide impact assessment to quantify energy and financial benefits, and publish the progress made across the sector.
   - Demonstrate impact and advocate for further decarbonisation investment to crowd-in new sources of finance and innovation.

The Potential of Heat Pumps, if the Barriers are Overcome

Transforming Energy Programme

Heat pumps play a pivotal role in decarbonising building energy use by offering an efficient, low-carbon alternative to traditional fossil fuel based heating systems. Unlike gas boilers that burn fuel to generate heat, heat pumps extract ambient energy from the air, ground, or water and transfer it into buildings using electricity, ideally sourced from renewables like solar or wind. This process significantly reduces greenhouse gas emissions, as heat pumps can deliver three to five units of heat for every unit of electricity consumed, making them far more energy-efficient than conventional systems. In the context of decarbonisation, they support the electrification of heating, a critical step in phasing out natural gas and oil dependency in residential and commercial buildings. Their versatility allows them to provide both heating in winter and cooling in summer, enhancing year round efficiency. Moreover, advancements in heat pump technology, such as improved performance in cold climates, have broadened their applicability. By integrating heat pumps with smart grids and thermal storage, buildings can further optimise energy use, aligning with renewable energy availability and reducing strain on electrical systems. As a result, heat pumps are a cornerstone technology in achieving net zero emissions targets, driving sustainable building energy solutions worldwide.

Heat pumps are increasingly recognised as a vital technology for decarbonising heating in UK commercial buildings, yet their uptake remains limited compared to residential applications and lags behind government ambitions for a low carbon future. Commercial buildings in the UK, including offices, retail spaces, and industrial facilities, account for a significant portion of energy use and carbon emissions, with heating often reliant on gas boilers or direct electric heating. While precise data on heat pump installations in the commercial sector is less comprehensive than for residential settings, industry reports suggest adoption is growing slowly, driven by regulatory pressures like the UK's net zero target by 2050 and incentives such as the Public Sector Decarbonisation Scheme. However, the scale of deployment falls short of what's needed to meet climate goals, with estimates indicating that heat pumps currently meet only a small fraction of commercial heating demand, likely less than 10%, based on broader building sector trends reported by the International Energy Agency and UK government audits.

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Several barriers and challenges hinder widespread adoption of heat pumps in UK commercial buildings. First, high upfront costs pose a significant obstacle. Installing heat pumps, particularly ground-source systems, can involve substantial capital expenditure, ranging from £50,000 to over £200,000 for larger commercial properties, due to equipment, installation, and potential retrofitting needs like upgrading radiators or insulation. For air-source heat pumps, costs are lower but still exceed those of traditional gas boilers, and the return on investment can be slow without sufficient subsidies or long-term energy savings. The payback period for investing in heat pump technology varies widely depending on factors like building size, energy prices, and usage patterns, but typically ranges from 5 to 15 years in commercial settings. With energy savings of 50-70% compared to gas boilers (assuming renewable electricity use), payback can accelerate if gas prices rise or electricity costs fall, though high initial outlays and current price disparities often extend this timeline beyond what many businesses find acceptable.

Second, space constraints are a critical issue, especially in urban areas where commercial buildings may lack room for external units or boreholes required for ground-source systems. This is compounded by planning restrictions and aesthetic concerns, as bulky outdoor units can clash with building designs or local regulations. For cultural, heritage, performing arts, and museum buildings, these challenges are amplified. Many such structures are listed or located in conservation areas, where strict regulations limit external modifications, making it difficult to install air-source heat pump units without compromising architectural integrity. Inside, space for larger ducting or underfloor heating systems (often needed for heat pump efficiency) may be restricted by original layouts or preservation requirements, while noise from heat pumps can disrupt the quiet ambiance expected in museums or performance spaces.

Third, technical challenges arise from the diverse heating demands of commercial properties. Unlike homes, these buildings often require higher temperatures or simultaneous heating and cooling, which can strain standard heat pump systems unless advanced and costlier models are used. In heritage and cultural buildings, precise climate control is critical - museums, for instance, need stable temperature and humidity levels to preserve artifacts, while performing arts venues require consistent warmth for audience comfort. Standard heat pumps may struggle to meet these exacting standards without supplementary systems, increasing complexity and cost. Retrofitting older buildings (common in the UK's commercial stock, especially among heritage sites) adds further difficulty, as poor insulation and outdated infrastructure reduce efficiency, necessitating additional upgrades that delay payback and risk damaging historical features.

Fourth, the electricity-to-gas price differential in the UK disadvantages heat pumps, as electricity remains more expensive per unit than gas, inflating running costs and stretching payback periods despite their superior efficiency. This economic disincentive is particularly acute for businesses and cultural institutions focused on short-term budgets rather than long-term sustainability. Additionally, a lack of awareness and expertise slows progress. Many commercial property managers and owners, including those managing heritage or arts venues, are unfamiliar with heat pump technology, its benefits, or available funding, such as the Boiler Upgrade Scheme (which is less tailored to commercial needs). The supply chain also struggles with a shortage of skilled installers, while the UK has around 3,000 to 4,000 heat pump technicians, this pales against over 130,000 gas boiler engineers, limiting capacity for large-scale commercial projects, let alone specialised heritage retrofits. Consumer trust is another hurdle; misinformation or skepticism about heat pump reliability in cold weather or high-demand scenarios can deter adoption, despite technological advances proving their efficacy.

Finally, policy and market uncertainties create hesitation. The government's delay in clarifying hydrogen's role in heating, alongside inconsistent financial incentives for commercial properties, leaves businesses and cultural institutions wary of investing in heat pumps over familiar fossil fuel systems, further clouding payback projections. Overcoming these barriers requires targeted interventions - enhanced subsidies to shorten payback periods, rebalancing energy prices, streamlined planning permissions sympathetic to heritage constraints, workforce training, and tailored awareness campaigns. Without such measures, heat pump uptake in commercial buildings, particularly in culturally significant spaces, will not make a significant contribution to the UK's decarbonisation goals.