

# Exhibiting Leadership: A Proven Approach to Ambitious and Effective Action on Sustainability and Climate Change by Australian Museums

by Andrea Spencer-Cooke, Jenny Newell,  
Carmel Reyes and Zehra Ahmed

**A**ndrea Spencer-Cooke MA (Edin) MEM (Imp) MAICD is an international sustainability expert, published author and co-ordinator of the influential concept of the triple bottom line. She is Founding CEO of One Stone Asia Pacific, a sustainability advisory firm that works with business, government and not-for-profit organisations, with a special focus on cultural institutions, to develop sustainability strategies and advance the 2030 Agenda.

**J**enny Newell (PhD) is Curator for Climate Change at the Climate Solutions Centre of the Australian Museum in Sydney. She works to advance understanding and engagement in the climate and ecological crises, through exhibitions, events, publications and community collaborations. With a background in environmental history and a focus on the Pacific and Australia, her curatorial roles in London, Canberra, New York and Sydney have explored and advanced positive human-nature relationships.

**C**armel Reyes is Climate Action and Sustainability Manager at the Powerhouse Museum in Sydney, where she leads the development and delivery of Powerhouse's inaugural Climate Action Plan. She has extensive experience in leading sustainable outcomes in the context of the built environment and co-chairs Sydney's Sustainable Destinations Partnership, supporting the cultural, entertainment and accommodation sectors to improve environmental performance and build Sydney's reputation as a leading sustainable destination.

**Z**ehra Ahmed is Sustainability, Accessibility Projects Coordinator at the Australian Museum in Sydney. She is responsible for the development, launch and management of the AM's Sustainability Action Plan and Accessibility and Inclusion Action Plan (AIAP). Under her leadership the AM became a Climate Active (carbon neutral) organisation. A passionate community advocate, she has volunteered on community projects in the Torres Strait Islands studying the effects of sea-level rise and climate change.



**A** company logo spraypainted across a classic Australian painting. Soup splashed on an iconic Van Gogh in London. Hands glued to the glass of a Monet in Stockholm. In recent years, major museums and galleries have become a platform of choice for climate activists and protestors determined to seize attention and demand meaningful action of society (Suliman 2022). The co-option of invaluable cultural heritage items in such demonstrations is controversial, but it also underscores the powerful place cultural institutions hold in contemporary public dialogue, shining a spotlight on their role in caring for the present and the future as well as the past. In response, the International Council of Museums (ICOM) issued a statement in November 2022:

Following the recent climate activism actions in museums, ICOM wishes to acknowledge and share both the concerns expressed by museums regarding the safety of collections and the concerns of climate activists as we face an environmental catastrophe that threatens life on Earth. ICOM sees the choice of museums as a backdrop for these climate protests as a testament of their symbolic power and relevance in the discussions around the climate emergency. (ICOM 2022, n. page)

[A] growing number of museums are recognising that as trusted institutions and sources of knowledge they have an urgent responsibility to address the intertwined crises of climate change, ecological destruction and erosions of social justice.

Museums hold more than symbolic power. They can also drive real change as ‘key actors in initiating and supporting climate action with their communities’ (Ibid.). Through their primary functions of preservation, research, communication and education (UNESCO 2015), museums possess multiple touchpoints for addressing the deepening challenges in the Anthropocene (Crutzen 2002; McKenzie 2023) which underpin the current activism. A change in gear from symbolism to action is urgently needed. According to Nick Merriman, a consequence of the separation between nature and culture in museums has been ‘our slowness in confronting the enormity of the environmental and ecological challenges facing the planet at the moment’ (Merriman 2023, n. page), affirming critic Robert Janes’ observation that most museums are ‘asleep at the wheel’ (Janes 2023, n. page). With six out of nine planetary boundaries — the earth resilience processes that ‘define a safe operating space for humanity’ (Richardson *et al.* 2023, n. page) — now breached, the stakes could not be higher.

In response, a growing number of museums are recognising that as trusted institutions and sources of knowledge, they have an urgent responsibility to address the intertwined crises of climate change, ecological destruction and erosions of social justice (Newell 2020; Merriman 2023). Examples of emerging practices of care include working to support foundational paradigm changes by reuniting the Western conceptual divide between nature and culture, creating ‘ecological museums’ being guided by Indigenous approaches, advancing decolonisation, participating in the circular economy and challenging the growth model, as well as inviting more collaborative engagement with communities (Wehner 2016; Newell *et al.* 2017; Merriman 2023; Muir *et al.* 2020; Cameron 2015).

Such efforts can be seen as manifestations of ICOM’s desire for museums to ‘reach their full transformative potential’ for sustainable development and be ‘allies in facing the common threat of climate change’ as expressed in its 2022 *Statement: Museums and Climate Activism* (ICOM 2022). They can also be viewed as a tangible demonstration of the United Nations Education, Science and Culture Organisation (UNESCO)’s aspiration of ‘unleashing the power of culture’ as a catalyst for sustainable development and the vital role of culture and creativity as enablers for achieving the Sustainable Development Goals (SDGs) (Hosagrahar 2017; UNESCO 2023).

Through the 2030 Agenda and 17 SDGs adopted by UN Member States in 2015, the world set out a shared vision of the ‘future we want’ (United Nations 2015). All stakeholders have a role to play in realising this ambitious, transformative roadmap, including museums. Among the 169 targets underpinning this agenda, several address culture and cultural institutions directly, such as SDGs 4.7, 8.9 and 11.4. SDG 4.7, for example, seeks to ensure learners can promote sustainable development by acquiring knowledge and skills, including in sustainable lifestyles, human rights and an ‘appreciation of cultural diversity and culture’s contribution to sustainable development’ (United Nations 2015).

Developing and implementing policies to promote sustainable tourism that creates jobs and promotes local culture and products is the focus of SDG 8.9 and 12.b, while SDG 11.4 aims to strengthen efforts to protect and safeguard the world’s natural and cultural heritage. In addition, there are a broad range of other goals and targets — including around diversity, inclusion, resource efficiency and climate action — where museums can and must make a meaningful contribution, by effectively managing their positive and negative impacts.

## Universal Strategy Phases Relevant Cultural Institution Tools and Frameworks

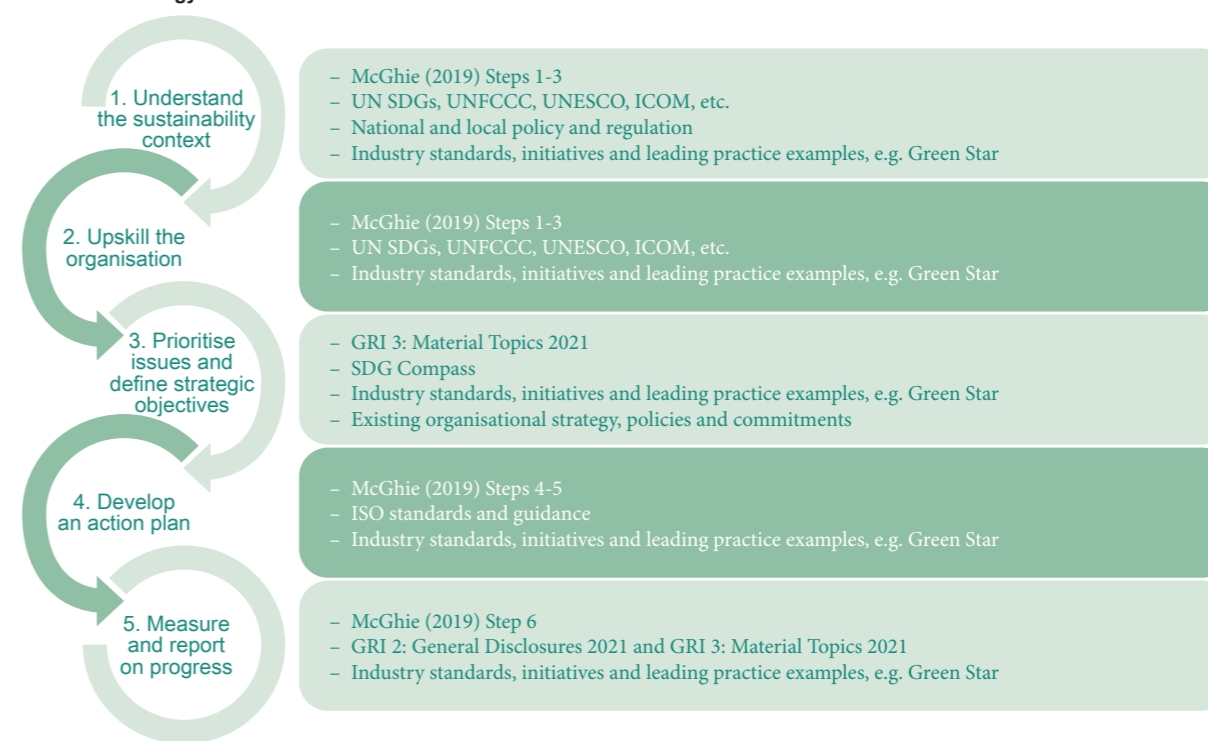


Fig. 1. The Universal Sustainability Strategy Cycle helps cultural institutions ensure their actions are meaningful, impactful and aligned with community needs and expectations (2023). © One Stone Asia Pacific

The role of museums within the 2030 Agenda has been cogently articulated by Henry McGhie in his guide to implementing SDGs for the museum sector (2019) and handbooks *Mainstreaming the Sustainable Development Goals* (2021) and *Localising the SDGs through museums and libraries* (2023). McGhie unpacks the relevance of the SDGs for museums and identifies seven core activities which they could engage in to have a meaningful impact, from wide-ranging objectives such as ‘protecting and safeguarding the world’s cultural and natural heritage’ to more focused ‘enabling SDG-aligned research’ (McGhie 2019, n. page). Through preserving heritage, promoting learning and awareness, enabling cultural inclusion and participation, and contributing to economic prosperity and reduced inequalities, museums make an intrinsic contribution to sustainable development. They can also directly impact the SDGs by running their organisations to enhance positive and reduce negative impacts. Accordingly, step 5 of McGhie’s six-step process calls on museums to do the following:

Develop an action plan to enhance positive contributions to the SDGs and reduce negative contributions... spanning the gap between ‘where you are now’ and ‘where you want to get to’. Incorporate this into your organisational development,

monitoring and reporting cycle, and communicate it both internally and externally. (McGhie 2019, n. page)

But whereas sustainability issues have long been part of the broader remit of museums — for example as a theme within broader programming — their approach to sustainability challenges in an operational setting has been largely *ad hoc* and focused on harm minimisation rather than transformation. As a result, there are few examples of museums taking structured, measurable action on the climate challenge and 2030 Agenda. As significant cultural entities, however, realisation is growing that museums have a responsibility to leverage their extensive influence, authority and credibility to engage the community and ‘empower the global society to collectively imagine, design and create a sustainable future for all’, while managing their own social, economic and environmental footprints in an integrated, strategic and impactful way (ICOM 2019).

Within Australia, this has manifested in a groundswell of interest among major cultural institutions in more formal approaches to managing sustainability that unite the organisation around a common purpose and clear objectives, as well as holding it accountable. The result has been the pioneering adoption, especially by New South Wales

(NSW) state cultural institutions, of climate and sustainability action plans — namely tailored blueprints committing the organisation to bold sustainability performance improvement objectives. Since 2018, such plans have been developed by Sydney Opera House, the Australian Museum, the Powerhouse and the Art Gallery of New South Wales, among others.

While management plans are nothing new, what differentiates this suite of plans is their integrated ‘triple bottom line’ approach, which goes beyond direct environmental footprint to embrace social and economic impacts too (Spencer-Cooke 1995; Elkington 1995; SustainAbility Ltd *et al.* 1996). As well as reflecting the holistic spirit and indivisible nature of the 2030 Agenda, this approach enables cultural institutions to fulfil their transformative potential for sustainable development across many impact areas, delivering a wider range of co-benefits for stakeholders in the process. The plans are rooted in ambitious strategic ‘stretch’ objectives of driving negative impacts (such as waste and emissions or incidences of modern slavery) towards zero, while amplifying positive measures (such as use of renewable energy, implementation of responsible sourcing or demonstrating respect for human rights) towards 100 per cent fulfilment, with interim targets to spur

and track progress. The underlying rationale is that by modelling positive behaviours and demonstrating measurable mitigation and positive change, the museums can help inspire and become more effective partners in changing the living culture through programming, outreach and education.

Building on McGhie (2019), this case study showcases how two NSW State cultural institutions in particular, the Australian Museum and Powerhouse,

are taking an integrated approach and factoring sustainable development goals into organisational purpose and plans to reduce harm and grow positive impacts. Through relatable storytelling and public conversations with an increasingly well-mapped range of audiences, both institutions are conveying pathways to action for system transition.

By sharing their learnings, these institutions hope to encourage all museums to step up to UNESCO's vision

## The Australian Museum and Powerhouse

Established in Sydney in 1827, the Australian Museum (AM) was Australia's first public museum. Its internationally recognised collection of over 22 million cultural and scientific objects — the largest in the southern hemisphere — represents a timeline of the environmental and cultural histories of the Australian and Pacific regions. Through the Australian Museum Research Institute (AMRI), the museum plays a leading role in taxonomic and systematic research and is a valued global leader in scientific discovery and conservation. The museum's dedicated Climate Solutions Centre (CSC), launched in 2021, promotes understanding and engagement in the climate crisis, while its First Nations division is advancing crucial truth-telling through exhibitions and programs curated with communities, working to decolonise museum practice. The AM has a wide reach, achieving 1 million visitors onsite and 6.7 million website users in 2022, as well as further audiences reached through national and international touring exhibitions (Australian Museum 2023b).

The AM's environmental leadership journey began formally in 2018 with the launch of its first Sustainability Action Plan (Australian Museum 2018). Running from 2019-2021, this three-year plan set out 33 actions across four strategic priority areas:

1. Reducing operational impacts on the environment
2. Future-proofing the infrastructure
3. Engaging our people, and
4. Educating visitors and stakeholders.

With a primary focus on environmental resource efficiency and 'getting its house in order', key actions included achieving 4 star Green Star rating for its buildings, implementing an environmental management system, achieving carbon neutrality, communicating solutions to climate change and advocating for behavioural change. Using the takeaways from this plan, the museum leveraged its next strategy cycle to integrate sustainable development objectives into the organisation at the highest level and develop a more ambitious and holistic follow-up plan (2023-2025). Against a backdrop of polarised public conversation around climate change in Australia, the new plan included greater focus on science-based outreach, storytelling and co-creativity to help transform living culture.

The largest museum group in Australia, the Powerhouse is a public museum operated by the New South Wales State Government. Established in 1879 following the Sydney International Exhibition, it is Australia's premier museum of excellence and innovation in applied arts and sciences. Today it is custodian to over half a million objects of national and international significance and plays a critical role in engaging communities with contemporary ideas and issues.

Powerhouse is uniquely placed to take a leadership position on sustainability and positive climate action by showcasing the role that technology, engineering, science and design can play in addressing current challenges. Around 2018 it embarked on a significant renewal program through the creation of Powerhouse Parramatta, expansion of Powerhouse Castle Hill, digitisation of the Powerhouse Collection, and the

of cultural institutions as catalysts for a sustainable future, use the SDGs as a framing for 'inside' and 'outside' action (Worts 2024, n. page) grow the effectiveness of their sustainability initiatives to make a demonstrable contribution towards shared 2030 outcomes and contribute more energetically to evolving sector and public conversations.

renewal of Powerhouse Ultimo. This offered a once-in-a-generation opportunity to embed low-carbon solutions into Powerhouse infrastructure to reduce its operational footprint and improve its responsiveness to climate, season and sustainability. This infrastructure renewal program has been supported and enhanced through the development of the organisation's inaugural Climate Action Plan.

The complex, systemic nature of sustainability challenges means these need to be addressed holistically and collaboratively, using the best available science and insight into what 'good' looks like.

## A universal strategic approach

Engagement with the natural world and celebration of human ingenuity are at the heart of the museums' respective mandates, so addressing sustainability challenges has been a natural evolution. What differentiates their approach is a robust, impact-driven methodology that offers a useful model for other collecting organisations (see Fig. 1.). It fuses McGhie's (2019) six-step process with established sustainability management and reporting good practices such as those set out by the International Organization for Standardization (ISO)'s 14000 family of environmental management system standards and relevant guidance, and the Universal Standards of the Global Reporting Initiative (ISO 2015; GRI 2021). The result is a simple yet universal strategy development cycle which any cultural institution can follow. Combined with appropriate tools and frameworks, this methodology helps museums ensure that their actions are meaningful, impactful and aligned with community needs and expectations (One Stone Asia Pacific 2023). Each of these five phases is described in more detail below.

### Understanding the sustainability context

Acknowledging the institution's wider global and local operating contexts is a cornerstone of effective strategy. The complex, systemic nature of sustainability challenges means these need to be addressed holistically and collaboratively, using the best available science and insight into what 'good' looks like. An important foundational step for museums is therefore to cultivate awareness of key global trends and drivers, policy and regulatory frameworks and relevant industry tools, standards and initiatives. This is valuable in determining where the organisation needs to be and evaluating its current state — and the extent of the gap between these.

For both the Powerhouse and the Australian Museum, understanding their broader context started with leveraging One Stone's expertise to identify the museum sector's most material issues and to undertake detailed mapping of their organisational objectives and activities to the shared global vision of the 2030 Agenda and specific SDG targets. This enabled each institution to identify where they could make a significant positive difference as well as mitigate

negative impacts. Equipped with this insight and recognising the SDGs as 'the blueprint to achieve a better and more sustainable future for all', the AM identified six goals where it believed it could make a significant difference: SDGs 4 Quality Education, 8 Decent Work and Economic Growth, 11 Sustainable Cities and Communities, 13 Climate Action, 14 Life Below Water, and 15 Life on Land (Australian Museum 2023a). In addition, wherever relevant, SDG targets were used to define SMART targets and outcomes within the action plans.

As significant state cultural institutions, New South Wales and Federal Government regulations, policies and commitments were also of core relevance. In line with the UN Paris Agreement, the NSW Government has committed to take action on climate change through its Net Zero Plan Stage 1: 2020-2030. Priority 4 of this plan is to 'ensure the NSW Government leads by example' by driving continuous resource efficiency, leveraging government purchasing power and setting targets for solar energy and low emission vehicles (NSW Government 2020). As NSW Government agencies, advancing these objectives and delivering on Articles 4, 6 and 12 of the UN Framework Convention on Climate Change (UNFCCC) relating to Action for Climate Empowerment (ACE) were especially important (UNFCCC 1992). Other relevant sustainability-related government regulations, policies and strategies such as the *NSW Modern Slavery Act 2018*, *NSW Government Circular Economy Policy Statement*, *NSW Government Resource Efficiency Policy* and *NSW Waste and Sustainability Materials Strategy 2041 Stage 1: 2021-2027* were also considered in setting long-term and interim performance targets.

Relevant industry standards, local government and sector initiatives provide additional context for strategic planning. For the Powerhouse — with its strong focus on infrastructure renewal — the Green Building Council of Australia (GBCA)'s industry-leading, internationally recognised Green Star rating system and *Climate Positive Roadmap for the Built Environment 2030* were pertinent in establishing performance requirements for 'healthy, resilient, positive buildings and places' (GBCA 2020 and 2021). Designing its

infrastructure and environmental targets around this proven framework made it easier to measure and verify impacts and outcomes from its renewal program. In addition, the Powerhouse took into consideration local government frameworks including the *City of Sydney Environmental Strategy 2021-2025*, *City of Parramatta Environmental Sustainability Strategy 2017* and *Revised Draft Central City District Plan of the Greater Sydney Commission*.

Collaborative initiatives like GLAM Peak — a collective of representative bodies for Australia's galleries, libraries, archives and museums which has endorsed priorities for the SDGs (GLAM Peak 2020) — were further valuable reference points, along with the Sustainable Destination Partnership (SDP), which works to enhance environmental performance of Sydney's tourism, accommodation and entertainment sectors by improving energy, water and waste efficiency of local buildings, increasing uptake of renewable energy and engaging with major environmental policy and regulatory issues. Through such initiatives, museums open themselves up to the exchange of learnings, good practice and shared challenges with other institutions, which can be a useful catalyst and benchmark for strategy-setting, sparking healthy competition and a 'race to the top'.

In 2019, for instance, Sydney Opera House (SOH) became the first major Australian arts institution to publicly adopt and commit to the SDGs (Keck 2019; Sydney Opera House 2019). This leadership was influential in encouraging other Australian cultural institutions, such as the Art Gallery of New South Wales, to develop sustainability strategies aligned with the goals. Peer influence also extends internationally. The British Natural History Museum's 2031 'planetary emergency' strategy and vision of 'creating advocates for the planet' also helped to raise the bar, opening the way for museums to be bolder (Natural History Museum 2019, n. page). Their use of the word 'advocates' in their mission was significant in encouraging others, including the Australian Museum, to move beyond neutrality.

While there had been reticence within the AM about stepping into politically-charged terrain, in its





Fig. 2. The Australian Museum's Sustainability and Climate Action Plan 2023-2025 builds on the foundations of its first action plan (2023). © Australian Museum

2021-2023 Corporate Strategic Plan (CSP) the museum took the decision to enshrine action on climate and sustainability as core strategic priorities, along with being an advocate for First Nations history. Framed by its mission to 'ignite wonder, inspire debate and drive change' (Australian Museum 2021a, n. page), the AM corporate plan set out a vision:

To be a leading voice for the richness of life, the Earth and culture in Australia and the Pacific. We commit to transform the conversation around climate change, the environment and wildlife conservation; be a strong advocate for First Nations' culture; and continue to develop world-leading science, collections, exhibitions and education programs. (Ibid.)

Through its corporate strategy the AM commits to 'demonstrate leadership through science and public engagement to highlight societal and environmental challenges' and lead by example on sustainability to enable transition to a

fairer, more regenerative future. This sets a clear mandate at the highest level of the organisation, providing institutional recognition and reinforcement of what scientists at AMRI were bearing witness to through their work with Pacific nations and cultures — namely that the twin climate and biodiversity emergencies were already impacting every aspect of the museum's work. It also provided coherence for the development of the AM's next *Sustainability and Climate Action Plan 2023-2025 (SCAP)*, building on foundations from the first action plan of 2019-2021 (see Fig. 2.).

Capturing the broader sustainability operating context of museums early in the strategy process is incredibly valuable to ensure alignment with broader obligations and related outcomes during the subsequent phases explored below.

#### Upskilling the organisation

Understanding the museum's sustainability context — Phase One of the Universal Strategy Cycle — goes hand-in-hand with building staff capacity and

competence in sustainable development. Many talented and passionate people work within cultural institutions who feel deeply about environmental and social issues but may not have had the opportunity or bandwidth to develop relevant know-how. For good decision-making and effective organisational and behavioural change to happen, people need to be consulted, upskilled and empowered. Early in the strategy process it is therefore vital to engage people from across the organisation to become inspired and committed changemakers.

A good place to start is with the senior decision-makers. As well as setting the tone, modelling core values and leading by example, this group of executives is responsible for determining strategic direction, managing risk, approving key programs and setting budgets within the museum. Without their endorsement, sustainability initiatives may struggle to gain traction and resourcing, which means cultural transformation will not stick. A helpful first step in engaging the leadership is to secure an executive sponsor. This is a committed senior team member who can champion sustainability within the museum as well as providing governance oversight of sustainability initiatives and programs.

Ensuring the museum's Director or Chief Executive Officer is supportive of proposed sustainability efforts and is kept informed as projects evolve is critical to achieving approvals and ongoing ownership. In the case of the AM, this was aided by the fact that its Director and CEO, Kim McKay AO, had a long track record of environmental activism and awareness having previously co-founded and run Clean Up Australia Day. As McKay stated in her foreword to the new SCAP:

The Paris and Glasgow Agreements have established a framework for a zero-emissions future.

The Australian Museum will play an active role in our nation's transition. This will occur, firstly, through sound sustainability practice and, secondly, through our scientific research, collections management, education, programming and exhibitions to improve public awareness of climate change and the solutions we can all help to advance. (Australian Museum 2023a, n. page)

Leadership support can be greatly enhanced by raising the sustainability literacy of senior team members, many of whom may have little relevant background. At the Powerhouse, for example, communicating the Plan's objectives to the Powerhouse Board of Trustees and socialising key components — such as the net-zero pathway and Green Star as robust frameworks to support and verify future outcomes — were key to ensuring that intent and ambition were neither diluted nor reduced.

With senior support at the outset, sustainability strategy is far more likely to succeed. In addition, it requires input and engagement from across the organisation. Sustainability issues are complex and cross-disciplinary, touching on all facets of museum activity. This makes it critical to engage key functions in designing and implementing the sustainability strategy and plan. Both the AM and Powerhouse created dedicated working or steering groups to lead their strategy process, with representation from curatorial, programming, communication and facilities, among others.

Representatives from each of the AM's departments were selected to join the SCAP Steering Committee; they were closely involved in developing the Plan and continue to be consulted on implementation. As well as fostering project champions and connections across the organisation, such groups help to break down silos, create learning and sharing opportunities, and distribute responsibility for sustainability implementation throughout the museum.

Having a dedicated Sustainability Manager is a huge advantage. Both museums were fortunate to have dedicated Sustainability Managers to act as a focal point, drive initiatives and build capacity of the wider team. However, no individual can deliver organisation-wide transformation alone: sustainability needs to become part of every role and training needs to be provided.

A very effective way to upskill initially is through externally facilitated workshops for key staff involved in the strategy development process, to ensure everyone is on the same page, and then periodically according to the needs of specific functions. When conversations started at the AM about the risk of damage to the building from

extreme weather events, for example, it became clear that the staff's knowledge of sustainability was essentially limited to recycling, and climate change impacts were poorly understood. The AM ran a series of staff workshops on climate risk and adaptation, and understanding is now much more nuanced. In addition to giving people confidence, capacity-building reinforces cross-departmental responsibility for sustainability which is vital for effective integration.

Informally, one of the more effective means to boost change that Sydney's cultural institutions have discovered is regular staff coffee meet-ups. The Sydney Cultural Institutions for Climate Action (SCICA) group was formed after staff from several institutions identified a shared desire to advance climate programming and sustainable practice after separately attending the School Strikes 4 Climate. Monthly coffee conversations have created a warm group of colleagues and friends who share news, support, inspiration, ideas and camaraderie. SCICA has staged a webinar targeting museum professionals and has a LinkedIn presence. In a sector where the number one challenge is being under-resourced, SCICA provides a really valuable peer-to-peer learning forum where advice can be freely shared and synergies created.

Recognising that not all cultural institutions have the ability to develop sustainability resources from scratch, a key focus of the AM's SCAP is empowering others. Action 4.2, for example, is to 'Share AM good practice and lessons learned with other cultural institutions and through the SDP' by developing 'open-source sustainability tools and stories to share with small/regional cultural institutions and sector peers' (Australian Museum 2023a). With support from an external funder, the AM also facilitated a free 'Pathways to Net Zero' workshop for small to medium-sized institutions in late 2023.

If museums are to reach their 'full transformative potential' for sustainable development the importance of educating and empowering staff, volunteers, suppliers and contractors on sustainability cannot be understated (ICOM 2022, n. page). This includes understanding which impacts are most material — or most important — to the sector.

#### Prioritising issues and defining strategic objectives

The principle of materiality, as defined by the Global Reporting Initiative (GRI), is firmly established as a credible foundation for meaningful sustainability strategy and reporting. With so many possible issues and impacts to act and report on, organisations have to prioritise which of their many impacts on people, the environment and the economy are most significant. These are their 'material' topics; to determine these, GRI standards stipulate 'ongoing identification and assessment of impacts [by] engaging with relevant stakeholders and experts' (GRI 2021, n. page). This can be done in a variety of ways.

Having mapped their sustainability context in detail and conferred with experts, the AM and Powerhouse undertook extensive informal consultation with internal and external stakeholders to validate their material issues and identify strategic priorities. The AM, for instance, conducted an anonymous all-staff online survey confirming that taking action was 'extremely important' to most respondents (Australian Museum 2021c). It also identified that purchasing 100 per cent renewable energy, increasing the amount of waste diverted from landfill and reducing exhibition materials and waste were the top three priorities for AM staff.

In addition to being core to the AM's CSP, tackling climate change was confirmed by the survey as being 'extremely' or 'very' important to over 89 per cent of respondents, reinforcing the conviction that achieving net zero emissions, becoming carbon positive, managing climate risk and sharing climate solutions must be a signature focus of the SCAP (Australian Museum 2021c). While museums on the whole are not heavy carbon emitters, climate change is among their most positive and negative impacts: on the one hand, the constant pressure for museums to grow their collections and exhibitions has a negative upward impact on emissions. On the other, climate curation that helps the public understand existing solutions can help to drive them down.

Empowered with this data and insights from its first action plan, the AM could focus its SCAP on key areas knowing it had a strong organisational mandate. With the expert support of



the NSW Government's Sustainability Advantage Program and One Stone, a series of Steering Committee workshops were held to sense-check survey findings, brainstorm key impacts and group these into logical categories. The result was five aspirational outcomes around which the museum's new Action Plan was structured (Australian Museum 2023a):

**Reduce operational impacts by:**

- Reducing energy and emissions (SDG 13.3)
- Reducing waste and resource use (SDG 12.2, 12.4 and 12.5)
- Embedding sustainable procurement practices (SDG 8.3, 8.9 and 12.7)
- Managing and reporting on performance outcomes (SDG 12.6)

**Future-proof the AM by:**

- Embedding sustainability best practices at all sites (SDG 12.6)
- Achieving 5 to 6 star Green Star certification for new developments (SDG 8.4 and 12.6)
- Preparing for and adapting to climate change (SDG 11.4, 13.1 and 13.3)

**Empower our people by:**

- Building awareness and action (SDG 4.7 and 12.8)
- Developing skills and training (SDG 4.4)
- Embedding sustainability into roles and processes (SDG 4.7 and 12.6)

**Engage stakeholders by:**

- Telling the AM's story (SDG 11.4 and 12.6)
- Partnering for change (SDG 17.6 and 17.17)
- Sharing climate solutions and empowering our stakeholders (including the public) to make sustainable choices (SDG 4.7, 12.8 and 13.3)

**Lead for climate action by:**

- Translating discoveries into real world outcomes (SDG 11.4, 13.1, 13.3, 14.2, 15.5, 15.9 and 17.6)
- Being a trusted sharer of First Nations knowledge (SDG 4.7, 10.2, 11.4 and 15.6)

For Powerhouse, decarbonising operations and raising awareness of climate solutions were also the primary strategic focuses. Its most significant current opportunity to embed

sustainable, decarbonised operations is to build low-carbon solutions into infrastructure through energy efficiency, generation or purchase of renewable energy and elimination of fossil fuels. Currently under construction, Powerhouse Parramatta is the largest cultural project being undertaken in Australia. From day one, Powerhouse Parramatta building operations will have net zero carbon emissions.

Powerhouse leveraged industry specialists and conducted extensive consultation with internal teams during the development of its Climate Action Plan (Fig. 3.). Workshops and team meetings were held to ensure that impact areas across the organisation were considered, that objectives would support better outcomes in programming and operations, and that its Community Reference Group was involved. Based on these discussions, the Powerhouse Plan was structured around three key current impact areas of the organisation — referred to as 'directions' — with 12 primary objectives (Powerhouse 2022):

**Powerhouse infrastructure:**

To prioritise resource efficiency in construction, reduce upfront carbon emissions and net zero carbon emissions in renewal of buildings, precincts and operations through the following objectives:

- Practice responsible stewardship (SDG 12.6)
- Decarbonise Powerhouse precincts (SDG 11.b and 13.3)
- Standardise zero waste approach to exhibition construction and museum operations (SDG 12.2, 12.4 and 12.5)
- Integrate water harvesting and reuse in property operations (SDG 6.4 and 12.2)

**Powerhouse programmes:**

To prioritise leadership in sustainable museum practice, collection management and programming focused on climate action through the following objectives:

- Embed sustainable practices in museum collection management (SDG 11.4, 12.6)
- Prioritise collaboration and research with climate science thought leaders and industry (SDG 13.3, 17.6 and 17.17)

- Reduce carbon emissions associated with exhibition design and program development (SDG 13.3)
- Collaborate with community to develop and support access to Powerhouse education programmes and exhibitions (SDG 4.7, 11.4 and 17.17)

**Powerhouse operations:**

To improve ways of working and develop workforce capabilities to track against targets, achieve commitments and ensure accountability through the following objectives:

- Integrate sustainability principles into ways of working (SDG 4.7 and 12.6)
- Build capacity and knowledge to support sustainable practices (SDG 4.7 and 13.3)
- Participate in industry leading collaborations and programs (SDG 17.6 and 17.17)
- Monitor and report on progress (SDG 12.6 and 16.6)

Underpinning the Powerhouse Plan is a foundational focus on First Nations. New Caring for Country Principles were developed, based on emerging priorities of continuing to build authentic and enduring relationships with Traditional Custodians and community and indigenising by establishing a meaningful understanding of the Powerhouse and its activities as an 'Acknowledgement of Country in practice'. The Principles were developed in collaboration with First Nations community representatives of the Country on which Powerhouse sites are located, including Dharug, Deerubin and Gadigal communities, under the guidance of an international authority on Indigenous Cultural and Intellectual Property.

With their high-level strategic objectives and foundational principles determined, the museums could move on to tactical planning — namely articulating the specific steps and actions required to deliver on their goals.

**Developing an action plan**

The action plan is where all preceding strategy phases come together in a roadmap that reflects the broader sustainability context, engages and empowers the organisation, focuses on priority impacts and outcomes and lays out what the organisation will do during the current strategy period to realise its objectives.

To embed sustainability best practices, for each strategic priority and high-level objective included in its plan, a cultural institution should define a corresponding desired outcome or measure of success. These are the results it wants to achieve over the strategy period and when possible will be framed as 'SMART' targets. Shorthand for 'specific, measurable, achievable, relevant and time-bound', SMART targets are commonly acknowledged as an effective way for organisations to articulate the degree of change they intend to achieve by clearly stating what they intend do by when. Through the action plan, SMART targets can be further unpacked into sequential steps needed to move towards the desired outcome, who will be responsible for these, by when, and what metric or Key Performance Indicator will be used to measure progress. Action plans usually have a timeframe of between two and five years. Where strategic objectives stretch beyond this — for example out to 2030 — the plan needs to break these down into interim targets or milestones towards that long-term outcome.

Individual action plans vary in the level of detail they provide about how objectives will be implemented, but the general rule is that the more specific they are, the more likely they are to be executed. In its latest plan for example, which comprises 85 actions, the AM has chosen to include actions, targets, responsibilities and timeframes within the public-facing document to hold the organisation accountable. Organisations may also choose to keep such details internal, for instance in a supporting document or spreadsheet. Naturally there is a balance to strike between communicating clearly and providing enough detail without overwhelming the reader.

Many of the actions in the AM Plan correlate directly to commitments the museum has made, for example to being certified as 'Climate Active'. Retaining its carbon-neutral status



Fig. 3. Powerhouse Museum's Climate Action Plan 2022-2025 sets out 12 primary strategic objectives for the organisation (2022). © Powerhouse Museum. Photo credit: David Moore, Sydney Harbour from 20,000 feet (1992) (detail). © Lisa, Michael, Matthew and Joshua Moore

requires certain measures — such as increasing waste diversion from landfill and embedding carbon-neutral requirements into procurement tenders — which are captured in the SCAP. From a starting point of 33.5 per cent waste diversion in 2015-16, the AM has set a goal to divert 75 per cent by 2025 and 90 per cent by 2030 towards a long-term objective of zero waste to landfill from 2030. As a practical illustration, Project Discover — the AM's \$57.5M building upgrade completed in 2020 — achieved over 90 per cent diversion of construction waste to landfill, with hardwood flooring removed from the Pacific Collection stores reused in the touring exhibition hall, and stair balustrading repurposed in signage. Another illustration of a SMART target to reduce AM operational impacts is its commitment to 'develop a 10-year Hybrid/EV replacement plan for AM vehicle fleet' by

December 2024. Led by the COO, CFO and Head of Building Infrastructure, the plan targets 50 per cent Hybrid/EV procurement by 2026 and 100 per cent by 2030 (Australian Museum 2023a, n. page).

To develop its Plan, Powerhouse undertook a high-level, informal comparative analysis across similar cultural institution environmental/sustainability plans locally and internationally. This confirmed varying maturity across the sector, with most plans concentrated primarily on environmental impacts and very few peer institutions setting net-zero carbon pathways.

As reflected in its title, climate is a primary focus of the Powerhouse Plan. To ensure a robust foundation, Powerhouse worked with experts, with support from the NSW Government



Net Zero and Sustainable Government programmes, to accelerate mitigation by developing a net-zero operations pathway according to the Greenhouse Gas Protocol, a recognised global methodology for calculating organisational emissions. This process helped to prioritise areas for improvement, while baseline data collated through energy and water audits and review of waste services was used to establish environmental targets. These tie in closely to the ambition of achieving a 6 Star Green Star Buildings rating for Powerhouse Parramatta, representing international leadership in design and construction. Powerhouse has joined the World Green Building Council's Net Zero Carbon Buildings Commitment and is aiming to achieve net-zero carbon building operations by 2025. As well as reducing energy consumption by 20 per cent from a 2018-2019 baseline, the museum is transitioning all sites to solar photovoltaic systems, introducing building analytics and monitoring and purchasing 100 per cent renewable electricity. In total the Plan includes 41 actions aimed at embedding sustainability into ways of working. This pioneering strategy approach was recognised in the Sustainability Project category at the Museum and Galleries National Awards in May 2023 for alignment with Australian and international best practices in addressing the global climate crisis. As an inaugural plan, a primary focus has been to create strong foundations, develop effective systems and prioritise mitigation, but, going forward, commitments such as 'creating a curatorial role focused on climate change science and sustainability' will foster deeper, longer-term transformation (Powerhouse 2022, p. 26).

Linking actions in the plan directly to industry benchmarks or certification outcomes, as both museums have done, is a good way to keep them grounded and demonstrate tangible improvement. It can also lead to innovation: as part of its consultations with the GBCA around Climate Positive Pathways, Powerhouse initiated development of cultural institution sector-specific credits (standards) to give recognition to significant industry-leading initiatives and support future uplift in standards across the sector.

With an action plan in place, SMART targets set and implementation underway, the next phase in the strategy cycle is to measure progress towards objectives and report on performance.

### Measuring and reporting on progress

Museums are great storytellers, and can have substantial cultural impact by sharing their climate and sustainability achievements and challenges. Being open about what is going well and what is difficult builds public trust in museums as partners in change and helps the sector as a whole to move towards sustainable development.

As major state cultural institutions, both the AM and Powerhouse have minimum regulatory reporting obligations under the NSW Government Resource Efficiency Policy, along with data requirements associated with industry partnerships, certifications and standards such as the SDP, Green Star and Climate Active. In addition to necessary disclosures there is a need for general public communication on sustainability commitments and performance.

Effective reporting starts internally, supported by robust management systems and tools that enable accurate setting of baselines, ongoing data collection and meaningful dashboards of key metrics for decision-makers. Both the AM and Powerhouse plans include multiple actions related to monitoring and reporting on progress, from establishing a 'centralised reporting platform' and setting 'expectations for standards and sources of data and other reporting inputs' to ensuring that 'real time performance data is available in a usable and engaging format for staff' (Australian Museum 2023a, n. page; Powerhouse 2022, p. 31).

Measuring impact on living culture is harder, but there are useful proxies. In partnership with a social research consultancy, the AM has run audience surveys to gauge the impact of exhibition content on visitor interest and comprehension — including information on climate change. These surveys showed that the museum's existing audience has a high degree of interest in exhibitions about nature conservation and climate solutions, and identified the main questions audience members have about climate change. Annual 'Climate Compass'

surveys by The Sunrise Project have also proved helpful for shaping messages aligned to the values of particular climate audience segments, creating greater likelihood of engagement (The Sunrise Project 2020; Richardson *et al.* 2022). Audience research around the AM's *Future Now* travelling exhibition, including focus groups and observations of visitor behaviour, have also provided insights into the messaging and exhibition design that create the most active engagement, informing development of future programs and exhibitions.

With sound data collection and reporting systems in place, and a growing understanding of their role and agency in co-creating change, museums can tell their story externally. Being honest and transparent is paramount. Sustainability and audience engagement challenges are complex and organisational change is hard: nobody expects you to get everything right the first time and to kick every goal. What matters is to start talking publicly about sustainability challenges and solutions in museums and society at large. Museums enjoy extraordinary public reach and have — through their collections, multiple communication channels and talented teams of educators and communicators — all the resources they need to elevate the conversation about sustainability and climate action. As well as dedicated sections in annual reports and website stories, they can make use of social media, events and conferences to share their progress.

### Empowering public engagement

Beyond reporting on its own performance, a museum's most powerful amplifier for climate and sustainability engagement is its programming and collections. Both the AM and Powerhouse are already actively leveraging these for greater impact.

In 2020, several curatorial and executive staff at the Australian Museum collaborated to design a climate communications initiative, including consulting with the Yale Program on Climate Change Communication and Climate Outreach (UK), social researchers and special interest groups such as regenerative farmers. Launched in 2021, the AM's Climate Solutions Centre (CSC) gathers and disseminates 'powerful stories for positive futures' to advance public understanding and engagement with



Fig. 4. The Australian Museum's *Spark: Australian Innovations Tackling Climate Change* Exhibition featured an Indigenous 'Cultural Burning' section celebrating First Nations knowledge and solutions (2021). © Anna Kučera

the climate and ecological crises through existing solutions (Australian Museum 2021b, n. page). As well as showcasing the seriousness of the challenge that humanity has created, the CSC aims to empower people by shining a light on the many exciting technological, nature- and community-based solutions that exist.

The CSC's theory of change proceeds from the understanding that communications about climate solutions which chime with the values of specific communities are more successful at sparking awareness and learning than generalised climate communications. By prompting audience members to see the benefits of taking action for self and community, values- and needs-aligned communication is more likely to inspire the desired increase in conversation and behaviour change. With a primary focus on addressing 'climate-alarmed', 'climate-concerned' and 'climate-cautious' audiences in Australia, the CSC's outreach includes exhibitions, talks, conversations, workshops, digital productions, education programs and a small collection with artworks and samples of clean energy technologies which work onsite and online, as well as off-site in schools, shopping centres, libraries and other civic venues around Australia.

In 2021 the CSC created *Spark: Australian Innovations Tackling Climate Change*, a temporary exhibition in the museum's main hall highlighting ten top climate change solutions. Popular with audiences of all ages, the featured solutions included collective action; First Nations approaches to caring for Country with videos from the Firesticks Alliance about cultural burning; clean technologies like Australia's first electric motorbike and printed solar films; biotech demonstrated by an algae bioreactor; samples of Earth-friendly concrete; and dioramas of regenerative agriculture (Fig. 4.). An augmented reality capture of *Spark* means the exhibition can continue to be explored on the AM's website, with over 26,300 visits logged since the 1st of June 2021. This digital twin of the *Spark* exhibition was also showcased in the Australian Pavillion at COP28.

Similarly, while sustainability-related themes have been part of the Powerhouse story for many years, the museum has significantly expanded the climate-related content and performance of exhibitions. Conceived to inspire action on the most critical issue of our time by presenting an evidence-based and empowering vision of the future, its *100 Climate Conversations* (2022-23) exhibition showcased 100 visionary Australians, from regional farmers

sequestering soil carbon and Traditional Owners managing Country through cultural burning, to architects building carbon-neutral homes and entrepreneurs leading the world's most ambitious renewable energy projects. As Catherine Polcz, Curator of *100 Climate Conversations* and Science Program Curator at Powerhouse explained in informal discussion with the authors:

When we were developing *100 Climate Conversations*, we were hoping to create a program situated in the context of the Powerhouse and responsive to where Australia was on its post-bushfire decarbonisation path. The collection includes innovation across science, technology and design and, from this starting point, we determined that the program would be solutions-focused, deeply engaged in industry, science and culture and would champion work and diverse voices in climate.

Hosted by the nation's most respected journalists and recorded live at the Powerhouse, the program brought together audiences to hear directly from climate leaders, with each conversation offering an inspired narrative of invention, community and resilience. Video and transcripts were uploaded to the museum's website, a weekly podcast



Fig. 5. The award-winning and certified carbon neutral '100 Climate Conversations' Exhibition showcased visionary Australians with empowering narratives for the future, including Atlassian cofounder Mike Cannon-Brookes on 'Investing in a carbon neutral Australia' (2022). © Zan Wimberley

co-produced with Spotify and records of the 100 conversations were archived within the collection for future generations. The material created over its lifespan records a sample of the work happening in Australia in this pivotal and historic moment, with the aim of creating a bridge between the public and the many on-the-ground climate solutions across Australia today. According to Polcz, working with leaders every week and hearing their stories of perseverance personally provided a real antidote to the sense of doom and climate anxiety we are apt to feel and it is hoped it can have that impact for audiences too.

This milestone exhibition was the Powerhouse's first to be certified carbon neutral through Climate Active, enabling new targets to be set as part of its efforts to reduce emissions along its value chain. In recognition of its impact, 100 Climate Conversations won the category of Interpretation, Learning and Audience Engagement at the Museums and Galleries National Awards in May 2023.

As well as enhancing their public outreach on climate action and sustainability solutions, both museums will use the data and insight generated through their action plans to inform decision-making, review strategic priorities and reassess their ongoing relevance and importance ahead of their next strategy cycles from 2025 — when the process will begin again.

Through this case study, two leading international museums have shared how they are adopting a structured, leading-practice approach to embed climate action and sustainability into organisational strategy and planning, set meaningful objectives and actively engage the community through programming and curation. While it is too early to gauge the full impact of their current action plans, the strategic and holistic way in which they are integrating sustainability — and the SDG targets — into ways of working marks a shift in museum practice.

No two institutions are exactly alike and each must chart its own sustainability leadership path, but among the signature elements underpinning the approach these museums have taken are the following:

- Mapping at the outset the organisation's role and contribution within the 2030 Agenda, Paris Agreement and other pressing societal challenges;

- Proactive early involvement of stakeholders in the design and strategic intent of the plan via the creation of steering committees, rollout of employee surveys and community consultation;
- Identification of material topics and setting of strategic objectives across priority impact areas;
- Development and endorsement of Specific, Measurable, Achievable, Relevant and Timebound (SMART) organisational targets, with roles and responsibilities;
- Measuring and reporting publicly on progress and performance to hold the museum accountable and contribute to the conversation.

The five steps of the Universal Strategy Cycle (see Fig. 1.) are a journey any museum can take at any stage of sustainability leadership maturity to realise its 'full transformative potential' for sustainable development and become an ally in 'facing the common threat of climate change', as advocated by ICOM (2022, n. page). As these museums continue to make progress on their plans and 'get their house in order', emphasis is likely to shift from mitigation and management of operational impacts towards greater engagement and partnership to spur the deeper cultural changes that humanity — and the planet — so urgently needs.

One key takeaway from the experience of the AM and Powerhouse is that it is essential to start measuring impacts and set plans to minimise these.

There is much to learn from other industries and institutions, and there are many solutions at hand to reduce negative impacts and enhance positive influence.

Pulling together a cohesive approach lifts standards of operating and supports the organisation through these changes.

As climate-related emergencies increase in scale and size, cultural institutions will probably be among the first to be defunded so they have to play a more active role in helping the public, talking about the crisis and flagging solutions. Museums are well-placed to teach on adaptation and resilience and whatever their niche area, they can weigh in on what building for the future looks like. Our sincere call to action is to be courageous, take risks, be vulnerable and know there will be criticism. Connect with others and don't try to do it on your own.

To unleash the transformative power of culture, museums must play a part in reimagining a better version of the world, together. If this seems hard, remember that creating cultural change is actually the easy part. Living with climate change is much harder.

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#### REFERENCES

► Ahmed, Z. and Newell, J. 2024. 'Taking Action on Climate Change and Sustainability at the Australian Museum' in *Museums and the Climate and Ecological Crisis*. Edited by N. Merriman. Abingdon, Oxon and New York: Routledge.  
 ► Australian Museum. 2018. [Online]. *Australian Museum Sustainability Action Plan 2019-2021*. Available at: <https://media.australianmuseum/media/dd/documents/AM\_SustainabilityActionPlan\_2019-21.2246910.pdf> [Accessed 14 August 2023].  
 ► Australian Museum. 2021a. [Online]. *FY21-23 Corporate Strategic Plan - Australian Museum*. Available at: <https://media.australianmuseum/media/dd/documents/CSP2020.524da2c.pdf> [Accessed 14 August 2023].

► Australian Museum. 2021b. [Online]. *Climate Solutions Centre*. Available at: <https://australian.museum/learn/climate-change/climate-solutions-centre/> [Accessed 14 August 2023].  
 ► Australian Museum 2021c. All staff survey on Climate Change and Sustainability Action Plan. [Unpublished internal document].  
 ► Australian Museum. 2023a. [Online]. *Australian Museum Sustainability and Climate Action Plan (2023-2025)*. Australian Museum Trust. Available at: <https://australian.museum/about/organisation/reports/sustainability-action-plan/> [Accessed 15 August 2023].  
 ► Australian Museum. 2023b. [Online]. *Australian Museum Annual Report 2022-2023*. Australian Museum Trust. Available at: <https://australian.museum/about/organisation/reports/annual-reports/> [Accessed 18 August 2023].



- Cameron, F. R. 2015. 'Ecologizing Experimentations: a Method and Manifesto for Museums and Science Centres' in *Climate Change, Museum Futures*. Edited by F. R. Cameron and B. Neilson. New York: Routledge, pp. 16-33.
- Crutzen, P. 2002. [Online]. 'Geology of mankind', *Nature*, Vol. 23, No. 415. Available at: <<https://doi.org/10.1038/415023a>> [Accessed 31 January 2024].
- Elkington, J. 1995. 'Just Say No!', *Tomorrow Global Environment Business*, Vol. 5, No. 4, p. 46.
- GLAM Peak. 2020. [Online]. *GLAM Peak and the United Nation's Sustainable Development Goals*. Available at: <<https://glampeak.files.wordpress.com/2022/05/2020-08-31-glam-peak-sdg-priorities-endorsed.pdf>> [Accessed 18 February 2023].
- Green Building Council of Australia. 2020. [Online]. *Introducing Green Star: Together We Can Build a Sustainable Future*. Available at: <[https://www.gbca.org.au/uploads/91/2139/Introducing\\_Green\\_Star.pdf](https://www.gbca.org.au/uploads/91/2139/Introducing_Green_Star.pdf)> [Accessed 14 August 2023].
- Green Building Council of Australia. 2021. *Climate Positive Buildings & Our Net Zero Ambitions: Guidance for Green Star on The Use of Offsets and Renewables*. Sydney: Green Building Council of Australia.
- Green Magazine. 2023. [Online]. 'Melissa Leong Adds Voice to Global Cooksafe Coalition'. Available at: <<https://greenmagazine.com.au/global-cooksafe-coalition/#:~:text=Powerhouse%20Parramatta%20is%20currently%20under,operations%20with%20gas%2Dfree%20cooking>> [Accessed 16 August 2023].
- GRI. 2021. *GRI 1: Foundation 2021*. Amsterdam: Stichting Global Reporting Initiative (GRI).
- GRI. 2021. *GRI 3: Material Topics 2021*. Amsterdam: Stichting Global Reporting Initiative (GRI).
- Hosagrahar, J. 2017. [Online]. 'Culture: at the Heart of the SDGs'. *UNESCO Courier*, April-June 2017. Available at: <<https://en.unesco.org/courier/april-june-2017/culture-heart-sdgs>> [Accessed 16 August 2023].
- ICOM. 2019. [Online]. Resolution No.1 'On sustainability and the implementation of Agenda 2030, Transforming our World' in *Resolutions Adopted by ICOM's 34th General Assembly*. Kyoto, Japan. Available at: <[https://icom.museum/wp-content/uploads/2019/09/Resolutions\\_2019\\_EN.pdf](https://icom.museum/wp-content/uploads/2019/09/Resolutions_2019_EN.pdf)> [Accessed 31 January 2024].
- ICOM. 2022. [Online]. *Statement: Museums and Climate Activism, International Council of Museums*. Available at: <<https://icom.museum/en/news/icom-statement-climate-activism/>> [Accessed 14 August 2023].
- International Organization of Standardization. 2015. [Online]. *ISO 14001 - introduction to ISO 14001:2015*. Available at: <<https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100371.pdf>> [Accessed 14 August 2023].
- Keck, M. 2019. [Online]. 'The Sydney Opera House Just Pledged to Support the United Nation's Global Goals'. *Global Citizen*. Available at: <<https://www.globalcitizen.org/en/content/sydney-opera-house-global-goals/>> [Accessed 16 August 2023].
- McGhie, H. A. 2019. [Online]. *Museums and the Sustainable Development Goals: A How-to Guide for Museums, Galleries, the Cultural Sector and their Partners*. Curating Tomorrow. Available at: <<https://curatingtomorrow236646048.files.wordpress.com/2019/12/museums-and-the-sustainable-development-goals-2019.pdf>> [Accessed 21 July 2023].
- McGhie, H. A. 2021. [Online]. *Mainstreaming the Sustainable Development Goals: A Results Framework for Galleries, Libraries, Archives and Museums*. Curating Tomorrow. Available at: <[https://www.curatingtomorrow.co.uk/wp-content/uploads/2022/03/mainstreaming-the-SDGs\\_2021.pdf](https://www.curatingtomorrow.co.uk/wp-content/uploads/2022/03/mainstreaming-the-SDGs_2021.pdf)> [Accessed 8 January 2024].
- McGhie, H. A. 2023. [Online]. *Localising the SDGs Through Museums and Libraries: Making a Better Difference*. Curating Tomorrow. Available at: <[https://www.curatingtomorrow.co.uk/wp-content/uploads/2023/12/Localizing-the-sdgs\\_2023.pdf](https://www.curatingtomorrow.co.uk/wp-content/uploads/2023/12/Localizing-the-sdgs_2023.pdf)> [Accessed 8 January 2024].
- McKenzie, B. 2023. [Online]. 'Categorising museological responses to the Earth crisis' in *Medium*. Dec 29 2023. Available: <<https://bridgetmck.medium.com/categorising-museological-responses-to-the-earth-crisis-c9449a1ea42a>> [Accessed 31 January 2024].
- Merriman, N. (ed.). 2024. *Museums and the Climate Crisis*. Abingdon, Oxon and New York: Routledge.
- Merriman, N. 2024a. 'The Role of Museums and Galleries in Addressing the Climate and Ecological Crisis' in *Museums and the Climate Crisis*. Edited by N. Merriman. Abingdon, Oxon and New York: Routledge, pp. 3-16.
- Muir, C., K. Wehner and J. Newell. 2020. 'A Storm of Our Own Making' in *Living with the Anthropocene: Love, Loss and Hope in the Face of the Environmental Crisis*. Edited by C. Muir, K. Wehner and J. Newell. Sydney: NewSouth Publishing, pp. 1-13.
- Natural History Museum. 2019. [Online]. *A Planetary Emergency: Our Response Strategy to 2031*. Available at: <<https://www.nhm.ac.uk/content/dam/nhmwww/about-us/our-vision/strategy-to-2031.pdf>> [Accessed 16 August 2023].
- Newell, J., L. Robin and K. Wehner. 2017. 'Introduction' in *Curating the Future: Museums, Communities and Climate Change*. Edited by J. Newell, L. Robin and K. Wehner. London & New York: Routledge, pp. 1-17.
- Newell, J. 2020. [Online]. 'Climate Museums: Powering Action', *Journal of Museum Management and Curatorship*, Vol. 35, No. 6, pp. 599-617. Available at: <[10.1080/09647775.2020.1842236](https://doi.org/10.1080/09647775.2020.1842236)> [Accessed 8 January, 2024].
- Newell, J. and Ahmed, Z. 2024. 'Object Stories in Support of Sustainable Futures: Tackling Climate Change at the Australian Museum' in *Collections Management: A Critical Museum Practice*. Edited by C. Krmpotich and A. Stevenson. UCL.
- NSW Government. 2020. [Online]. *Net Zero Plan Stage 1: 2020-2030*. Available at: <<https://www.energy.nsw.gov.au/sites/default/files/2022-08/net-zero-plan-2020-2030-200057.pdf>> [Accessed 16 August 2023].
- One Stone Asia Pacific. 2023. [Online]. *Universal Sustainability Strategy Cycle*. Available at: <<https://onestoneadvisors.com.au>> [Accessed 16 August 2023].
- Powerhouse Museum. 2022. [Online]. *Powerhouse Climate Action Plan: 2022-2025*. Available at: <<https://maas-website-media.s3.amazonaws.com/maas.museum/uploads/2022/11/221116-Climat-Action-Plan-Brochure-WEB.pdf>> [Accessed 14 August 2023].
- Richardson, L. M., Machin, F. and Williamson, L. 2022. [Online]. *Climate Change: Concern, Behaviour and the Six Australias*, Monash Climate Change Communication Research Hub, Monash University, Melbourne. Available at: <<https://www.monash.edu/mcccrh/publications/reports/climate-change-concern,-behaviour-and-the-six-australias>> [Accessed 3 July 2023].
- Richardson, K. Steffen, W., Lucht, W. et al. 2023. [Online]. 'Earth beyond six of nine planetary boundaries', *Science Advances*, Vol. 9, Issue 37, pp. 1-16. Available at: <<https://www.science.org/doi/10.1126/sciadv.adh2458>> [Accessed 1 February 2024].
- Sydney Opera House. 2019. [Online]. *Inspiring Positive Change: Sydney Opera House and the Global Goals*. Available at: <[https://sydneyoperahouse.com/sites/default/files/collaborodam\\_assets/soh-global-goals.pdf](https://sydneyoperahouse.com/sites/default/files/collaborodam_assets/soh-global-goals.pdf)> [Accessed 14 August 2023].
- Spencer-Cooke, A. 1995. 'The Next Challenge in Corporate Environmental Reporting', *Environmental Accounting & Auditing Reporter*, Vol. 1, No. 3, pp. 4-7.
- Suliman, A. 2022. 'World's Museums Urge Climate Activists Targeting "Irreplaceable" Art to Stop', *The Washington Post*, 11 November 2022. Available at: <<https://www.washingtonpost.com/lifestyle/2022/11/11/climate-change-protesters-art-museums/>> [Accessed 21 July 2023].
- Sustainability Ltd and UNEP. 1996. *Engaging Stakeholders Volume 1: The Benchmark Survey*. London: SustainAbility Ltd, pp. 22-25.
- The Sunrise Project. 2022. [Online]. *Climate Compass 2022*. Available at: <<https://sunriseproject.org/compass/segmentation/>> [Accessed 3 July 2023].
- UNESCO. 2015. [Online]. *Recommendation concerning the protection and promotion of museums and collections, their diversity and their role in society*. Paris, France. Available at: <[https://www.unesco.org/en/legal-affairs/recommendation-concerning-protection-and-promotion-museums-and-collections-their-diversity-and-their-TSPD\\_101\\_Ro=080713870fab2000a7c0bd7076b631c33a139cc2f162f8fc67f2de6c9612bd611b4b3deb26b80a08160df62914300of77b2b516e4dca0599e29cbc74d39dc3bo62cde23ff941fc19fe73ee8f0612912faf94936b5a1fd79c6511272f0f5e7f](https://www.unesco.org/en/legal-affairs/recommendation-concerning-protection-and-promotion-museums-and-collections-their-diversity-and-their-TSPD_101_Ro=080713870fab2000a7c0bd7076b631c33a139cc2f162f8fc67f2de6c9612bd611b4b3deb26b80a08160df62914300of77b2b516e4dca0599e29cbc74d39dc3bo62cde23ff941fc19fe73ee8f0612912faf94936b5a1fd79c6511272f0f5e7f)> [Accessed 31 January 2024].
- UNESCO. 2023. [Online]. *Culture & Sustainable Development, UNESCO*. Available at: <<https://en.unesco.org/https%3A/www.unesco.org/en/sustainable-development/culture#:~:text=UNESCO%2C%20as%20the%20UN%20specialized,2030%20Agenda%20for%20Sustainable%20Development.>>> [Accessed 14 August 2023].
- United Nations. 2015. [Online]. *Transforming Our World: The 2030 Agenda for Sustainable Development*. A/RES/70/1. New York: Department of Economic and Social Affairs, United Nations. Available at: <<https://sdgs.un.org/2030agenda>> [Accessed 14 August 2023].
- United Nations. 1992. [Online]. *United Nations Framework Convention on Climate Change*. Available at: <<https://unfccc.int/resource/docs/convkp/conveng.pdf>> [Accessed 16 August 2023].
- Wehner, K. 2016. 'Towards an ecological museology: responding to the animal-objects of the Australian Institute of Anatomy Collection' in *Curating the Future*. Edited by J. Newell, L. Robin & K. Wehner. London & New York: Routledge, pp. 85-100.
- Worts, D. 2024. 'Museums as Catalysts of Cultural Adaptation: the 'Inside-Outside Model' in *Museums and the Climate Crisis*. Edited by N. Merriman. Abingdon, Oxon and New York: Routledge, pp. 50-71.