FORMAT			
1. Name of resource	The carbon footprint of museum loans: a pilot study at Amgueddfa Cymru - National Museum Wales		
2. Location	https://www.researchgate.net/publication/232859572_The_carbon_footprint_of_museum_loans_a_pilot_study_at_Amgueddfa_Cymru_-_National_Museum_Wales		
3. Alternative location	https://cimam.org/documents/148/The_carbon_footprint_of_museum_loans_a_pilot_study_at_Amgueddfa.pdf		
4. Author[s]	S. Lambert and J. Henderson		
5. Publisher/producer/host	Museum Management and Curatorship		
6. Year	2011		
7. Suggested citation	Simon Lambert & Jane Henderson (2011). The carbon footprint of museum loans: a pilot study at Amgueddfa Cymru – National Museum Wales, Museum Management and Curatorship, 26:3, 209-235, DOI: 10.1080/09647775.2011.568169		
8. Languages in which available	English		
9. Geographic area resource relates to	Wales, United Kingdom, but with global relevance		
10. Does the resource relate to a specific time frame?			
11. Type	Report		
	Toolkit/Framework/Roadmap	X	
	Sign-post to other resource (database)		
	Case studies	X	
	Other		
12. If this is part of an initiative, what is the initiative?			
COLLECTIONS AND COLLECTIONS-BASED INSTITUTIONS			
13. Explicit links to collections	Yes		
14. Explicit links to museums/libraries/archives	Yes		
15. Types of institutions the resource covers	Museums	X	
	Archives	X	
	Libraries	X	
	Other	X	
16. Does the resource relate to specific disciplines?	Arts, humanities and social sciences: philosophy, psychology, religion, social sciences, law, politics, language, arts and recreation,	X	

	architecture, literature, history, geography and ethnology, anthropology, archaeology	
	Science, natural history, technology, medicine, engineering, manufacturing	X
17. If no explicit links to collections, justification for inclusion		

HOW IT CONTRIBUTES TO SUSTAINABLE DEVELOPMENT

18. Collections-related activities the resource relates to	
Develop collections to protect and safeguard wider cultural and natural heritage more effectively, for example by targeting collecting to threatened forms of heritage in strategic ways	
Use collections to promote learning and educational opportunities that contribute to sustainable development more effectively, for example education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development and/or skills development relating to collections	
Use collections to promote cultural participation/social inclusion more effectively, for example by reducing barriers to participation, to ensure no-one is 'left behind'	
Use collections to promote sustainable tourism more effectively, for example by developing new products based on local cultural heritage, and/or considering the rights of stakeholder groups in relation to collections	
Use collections to support research that contributes to sustainable development (including all forms of personal and self-directed research at all levels that make use of stored collections) more effectively, for example by providing effective facilities, collections and information to meet researchers' needs	
Make decisions around collections that contribute to sustainable development more effectively	
i. employment (recruiting, staff training, staff safety)	X
ii. energy consumption, greenhouse gas emissions, reduction, monitoring and reporting	X
iii. waste management and reduction of waste	X
iv. transport (forms of transport, energy use)	X
v. commercial activities including copyright and IP	X
vi. governance and management	X
vii. security, disaster preparedness and risk reduction	X

Direct external leadership, partnerships and collaborations towards sustainable development more effectively, for example by developing impactful partnerships	X
19. Does the resource relate clearly to any international conventions (mark all that apply)?	
Culture conventions:	
1952, 71 Protection of Copyright and Neighbouring Rights	
1954 Protection of Cultural Property in the Event of Armed Conflict	
1970 Fighting Against the Illicit Trafficking of Cultural Property	
1972 Protection of the World Cultural and Natural Heritage	
2001 Protection of the Underwater Cultural Heritage	
2003 Safeguarding of the Intangible Cultural Heritage	
2005 Protection and Promotion of the Diversity of Cultural Expressions	
Rio Conventions:	
Convention on Biological Diversity (CBD), Convention to Combat Desertification (UNCCD), Framework Convention on Climate Change (UNFCCC)	X
AIMS AND CONTENT	
20. What issues does the resource aim to address?	"Global awareness of climate change is on the rise and a growing number of sectors are being engaged including museums. The museum sector in the United Kingdom (UK) has begun to expect improvements in the environmental friendliness of the exhibitions industry (Mellor 2008; National Museum Directors' Conference 2009), and its professionals are asking for tools to measure sustainability (Museums Association 2009, 8). In the years to come, this demand is likely to extend worldwide as museums recognize their responsibility to limit the collateral effects of their activities on the environment. The 'carbon footprint' is a simple metric that shows how an activity contributes to climate change. It takes into account carbon dioxide (CO_2) and other greenhouse gases (GHGs) such as methane and nitrous oxide. A museum's complete carbon footprint should reveal how all its operations affect climate change. It is reasonably easy for museums to measure on-site activities, such as gas and electricity use, by using online tools or specialized auditing agencies. However, this represents only part of their impact. Little information exists to help museums measure off-site, complex operations such as loans. The aim of this article is to suggest a new carbon footprinting methodology designed specifically for museum loan activities. It also includes a performance indicator for the environmental impact of loans (EIL) to

	encourage museums to balance their environmental responsibility with the growing demand for increased access and collections mobility. To design the methodology, initial data were collected at the Art Department of Amgueddfa Cymru – National Museum Wales" (p.210-211).
21. Intended audience of resource	[museum professionals working with loans]
22. Process of development	"The generous participation of Amgueddfa Cymru National Museum Wales in the pilot study has made it possible to test the eight-step carbon footprinting methodology and refine the data collection and calculation sheets to allow any museum to conduct its own carbon footprint assessment" (p.227)
23. Organisation/structure/contents	**Introduction** **Carbon footprinting and museums** Carbon footprinting **Carbon footprinting methodology for loans** Step 1: define the objective Step 2: express who manages GHG emisions Step 3: map operations Step 4: define exclusions and assumptions Step 5: select GHG conversion factors Step 6: calculate the footprint Step 7: evaluate environmental performance Step 8: report findings **Art Department of Amgueddfa Cymru National Museum Wales: pilot study (through Step 1-8 above)** **How to reduce the carbon footprint of a loans program** Reuse wrapping and packing materials Lease packing cases or refit old ones Use sea freight and rail freight, wherever possible Set upper limits for the number of objects in ground-shipped loans Share couriers and use them only when justified Avoid hand-carrying objects if an extra seat is required Insist that couriers travel with ground-shipped loans Encourage transport agents to measure fuel efficiency Introduce a sustainable procurement policy Plan exhibitions strategically and geographically Benchmark performance **Discussion** **Conclusion**
FRAMEWORKS	

24. Framework structure	The authors offer a carbon footprinting methodology for loans:
	  Step 1: define the objective
	  Step 2: express who manages GHG emisions

	Step 3: map operations Step 4: define exclusions and assumptions Step 5: select GHG conversion factors Step 6: calculate the footprint Step 7: evaluate environmental performance Step 8: report findings
25. Relevant policy considerations	Yes
26. Resources for implementation identified	Yes
27. Specific assessment points/indicators/milestones/action plan for monitoring	Yes

28. ASPECTS OF SUSTAINABILITY COVERED BY RESOURCE (mark all that apply)	
People (social sustainability)	
Planet (environmental sustainability)	X
Prosperity (economic sustainability)	
Peace	
Partnerships	X

29. CROSS-CUTTING CONSIDERATIONS COVERED BY RESOURCE (mark all that apply)	
Gender perspectives	
North and South perspectives	

HOW THE RESOURCE CONTRIBUTES TO AGENDA 2030 AND THE SDGs	
HOW AGENDA 2030 AND THE SDGs FEATURE IN THE RESOURCE	
30. SDGs and Agenda 2030 specifically mentioned?	No
31. SDGs specifically mentioned?	No
32. SDG targets specifically mentioned?	No
33. SDG indicators specifically mentioned?	No

SDGs AND SDG TARGETS AND LINKAGES	
34. Comments on SDG linkages	This resource can act as a tool to measure sustainability, supporting 12.6 (embracing sustainable practices and reporting), 16.6 (effective reporting of institutional performance) and to integrate carbon accounting supporting 16.7 (responsive decision-making).

	In responding to the effect of museum loans systems on climate change, this resource also supports SDG 13, including 13.1 (strengthening resilience and adaptive capacity to climate-related hazards), 13.2 (integrate climate change measures into national policies, strategies and planning) and 13.3 (improving institutional capacity on climate change mitigation and adaptation). Advocating the environmental responsibility of institutions supports several SDGs, especially SDG 12, including 12.2 (reduce fossil fuels), 12.4 (environmentally sound management of chemicals and all wastes), 12.5 (reduce waste generation), and 12.7 (sustainable procurement). Adopting reduction in greenhouse gas emissions and waste supports 9.4 (upgrade infrastructure and retrofit industries), 11.6 (reduce and eliminate waste), and 14.1 (reduce plastic waste). In advocating for conversations around sustainability with borrowers and shipping companies, this resource also supports 17.16 (public, public-private and civil society partnerships) and 17.17 (multistakeholder partnerships).
35. SDGs and SDG targets the resource helps advance	
SDG 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	Number and proportion of collections facilities that: 1.make efficient use of resources, with an ongoing drive for efficiencies and reductions in energy use and waste of all forms. 2. use clean and environmentally sound technologies, including climate-friendly energy sources and materials, with an ongoing commitment to reduce greenhouse gas emissions and waste of all forms. 3. adopt and/or prioritise collections-related processes and practices to reduce greenhouse gas emissions and waste of all forms.
SDG 11. Make cities and human settlements inclusive, safe, resilient and sustainable 11.6 By 2030, reduce the adverse per capita	Plans in place to reduce negative impacts on air quality, and volume and forms of waste.

environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	Plans in place to eliminate waste of all forms as soon as possible.
SDG 12 Ensure sustainable consumption and production patterns SDG 12.2 By 2030, achieve the sustainable management and efficient use of natural resources	Reduction of material footprint in terms of reductions in consumption of biomass, fossil fuels, metal ores and non-metal ores.
SDG 12 Ensure sustainable consumption and production patterns 12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	Quantities, and reduction in quantities, of chemicals of all kinds, including chemicals used in maintenance of collections facilities, and chemicals used in care and preparation of collections, and all wastes throughout their life cycle, reducing release to air, water and soil. Plans in place to eliminate the use and release of hazardous chemicals into the natural environment as soon as possible.
SDG 12 Ensure sustainable consumption and production patterns 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	Quantity and reductions in quantity of waste of all kinds, including avoidance/prevention of waste production, reuse, and recycling. Quantity of material recycled in comparison with quantity sent to landfill. Increases in recycling rate in comparison with landfill.
SDG 12 Ensure sustainable consumption and production patterns 12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate	Clear visions, strategies and plans in place for all aspects of sustainability – environmental, social and economic (people, planet, prosperity)- across all areas of activity.

sustainability information into their reporting cycle	Visions, strategies and plans relating to sustainability to be publicly available and incorporated into planning documents.
	Commitments to be in line with local, regional, national and/or international targets and ambitions.
	Incorporation of sustainability into reporting for funders and other stakeholders, including the public. Reporting to include commitments and progress towards targets.
SDG 12 Ensure sustainable consumption and production patterns 12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities	Incorporation of sustainability considerations into procurement, in terms of advertisement and invitation to tender, contracts, and selection criteria for suppliers.
SDG 13. Take urgent action to combat climate change and its impacts 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	Plans in place for near and longer term to actively adapt to climate-related hazards and natural disasters.
SDG 13. Take urgent action to combat climate change and its impacts 13.2 Integrate climate change measures into national policies, strategies and planning	National organizations, institutions and networks relating to collections and collections-based institutions to have integrated climate change measures into policies, strategies and planning relating to collections and collections-based institutions, including funding and other resourcing considerations.
SDG 13. Take urgent action to combat climate change and its impacts 13.3 Improve education, awareness-raising and human and institutional	Plans in place to enhance positive contributions to addressing climate change through use of collections

capacity on climate change mitigation, adaptation, impact reduction and early warning	Plans in place to reduce negative contributions of collections-related functions, e.g. measuring greenhouse emissions with plans and targets in place to reduce them.
SDG 14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development 14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	Number of collections-related programmes, for example research and education, that aim to reduce marine pollution. Quantity, and reduction, of waste of all sorts, with plans in place to eliminate waste of all sorts as soon as possible. Quantity, and reduction, of plastic waste, with plans in place to eliminate the production and release of plastic waste as soon as possible.
SDG 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. 16.6 Develop effective, accountable and transparent institutions at all levels	*16.6.2 Proportion of the population [audience/users/non-users] satisfied with their last experience of public services* *Access to information, and accountability policies and mechanisms, in place.* Effective institutional arrangements, both for own working and for working in partnership with other sectors, in place. Plans and arrangements in place for extraordinary circumstances such as natural and human-caused disasters. Effective arrangements in place to fulfil legal and social obligations and responsibilities. Effective arrangements in place for transparent communication and reporting of institutional performance. Effective arrangements in place for transparent decision-making and accountability.

SDG 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. 16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels	*16.7.1 Proportions of positions (by sex, age, persons with disabilities and population groups) in public institutions (national and local legislatures, public service, and judiciary) compared to national distributions* *16.7.2 Proportion of population [audience/users/non-users] who believe decision-making is inclusive and responsive, by sex, age, disability and population group* Decision-making addresses societal, environmental and economic challenges related to the community, considering short-term and long-term risks and opportunities. Decision-making draws on diverse backgrounds, viewpoints and interests, reflecting a broad base of stakeholders, and working to promote inclusion and provide effective services for all of society.
SDG 17. Partnerships for the goals 17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries	Number and/or increase in number, and diversity of global and international multi-stakeholder partnerships that share collection-related knowledge, expertise, technology and financial resources to address the SDGs, or that otherwise involve collections-based organisations and institutions. Number and/or increase in number, and diversity of global and international multi-stakeholder partnerships involving developing countries that share collection-related knowledge, expertise, technology and financial resources to address the SDGs
SDG 17. Partnerships for the goals 17.17 Encourage and promote effective public, public-private and civil	*17.17.1 Amount of United States dollars committed to public-private and civil society partnerships*

society partnerships, building on the experience and resourcing strategies of partnerships		Number and/or increase in number, and diversity of local, national and regional multi-stakeholder (public, public-private and civil society) partnerships that address the SDGs drawing on collections, or that otherwise involve collections-based organizations and institutions.			
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	