FORMAT		
1. **Name of resource**	**IPI's Methodology for: Implementing Sustainable Energy-saving Strategies in collections environments**	
2. Location	https://s3.cad.rit.edu/ipi-assets/publications/methodology_guidebook/methodology_guidebook_all.pdf	
3. Alternative location		
4. Author[s]	IPI (Image Permanence Institute)	
5. Publisher/producer/ host	IPI (Image Permanence Institute)	
6. Year	2017?	
7. Suggested citation	IPI (2017). Methodology for: Implementing Sustainable Energy-saving Strategies in collections environments. IPI, Rochester, NY	
8. Languages in which available	English	
9. Geographic area resource relates to	Worldwide	
10. Does the resource relate to a specific time frame?		
11. **Type**	Report	
	Toolkit/Framework/Roadmap	Yes
	Sign-post to other resource (database)	
	Case studies	
12. Part of an initiative?	Yes, accompanies IPI's Guide to Sustainable Preservation Practices for Managing Storage Environments	
COLLECTIONS AND COLLECTIONS-BASED INSTITUTIONS		
13. Explicit links to collections	Yes	
14. Explicit links to museums/libraries/archives	Yes	
15. **Types of institutions relevant to**	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, 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 (mark all that apply)	
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	X
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	X
i. employment (recruiting, staff training, staff safety)	
ii. energy consumption, greenhouse gas emissions, reduction, monitoring and reporting	X
iii. waste management and reduction of waste	
iv. transport (forms of transport, energy use)	
v. commercial activities including copyright and IP	
vi. governance and management	
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	
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)	
AIMS AND CONTENT	
20. What issues does the resource aim to address?	**"The implementation of sustainable preservation programs in cultural institutions has often required the involvement of outside consultants throughout the process – from documentation and data-gathering through testing, implementation, and maintenance. Institutions, while interested, have been limited by the availability of grant funding or their own capacity to afford external assistance. By providing a clearly written methodology, with step-by-step processes, tips, resources, and tools, the hope is that institutions will be empowered to take greater ownership of implementing sustainable preservation practices." (p.1-2)** **"Our hope is that the methodology and resources provided here will allow institutions to implement sustainable practices and achieve optimal preservation environments on their own." (p.1)**
21. Intended audience of resource	**Collections-based institutions. The resource notes that a wide range of role types are involved in determining and managing the climate in collecting institutions, including those who provide/create the collections environment, those responsible for preservation of collections, those working in and around collections, those responsible for administration and finances, those who direct sustainability mission and goals. (p.5)**
22. Process of development	"In 2012, the Image Permanence Institute (IPI) published IPI's Guide to Sustainable Preservation Practices for Managing Storage Environments as part of a successful National Endowment for the Humanities (NEH) Education and Training grant to present information about defining

	and achieving optimal and sustainable preservation environments. This program, the first of three funded through NEH, enabled IPI to reach hundreds of institutions around the United States and the world via a series of workshops and webinars, exposing collections professionals and allied colleagues to research and strategies that could allow for the achievement of the preservation mission while also participating in institutional sustainability efforts. However, conversations and field experience soon revealed that the Guide to Sustainable Preservation Practices was only one of the necessary resources – while it addressed the "what you need to know" and "what you need to do" aspects of sustainable preservation, the critical aspect of "this is how you do it" was still missing… In 2013, IPI applied to IMLS with a proposal to create a second, companion resource to the 2012 guide that would walk libraries, archives, museums, and other cultural organizations through the risk-laden process of exploring energy-savings work in collections-holding facilities. The proposal was successful, and IMLS provided funding for a demonstration project entitled "Demonstrating a Sustainable Energy-Saving Methodology for Library Environments" through the National Leadership Grants for Libraries program. The premise was simple – to take the successful consulting and field work practices developed at IPI with our partners and formulate them into a written methodology, the "how to do it," based on experience." (p.1)
23. Organisation/structure/contents	Introduction: introduction, safety precautions, HVAC basics Framework (see below) Acknowledgments: about the Image Permanence Institute, acknowledgments, next steps
FRAMEWORKS	
24. Framework structure	The framework includes both a methodology for assessing collections areas, and a set of suggested energy-saving strategies **Methodology:** 1. Documentation, with documentation worksheets to document the building; mechanical systems relating to heating, ventilation and air conditioning (HVAC), and lighting; and storage and exhibition spaces, together with a process for meetings and roles to assess these. 2. Gathering Environmental Data, with documentation worksheets, and options for data collection instruments, with pros and cons of each type. The methodology includes guidelines for logging environmental data, guidelines for

monitoring in various types of space (collections stores, exhibition spaces etc), monitoring inside air handling units, using blueprints and BMS, and outside weather data.
3. Data Analysis: including guidelines for making data analysis easier, working with graphs, understanding temperature, relative humidity (RH) and dew point. Guidelines for making analysis easier. Recognizing inefficiencies.
4. Experimentation and implementation: testing and experimenting with optimization strategies. Evaluation: identifying potential risks, Know what areas are impacted. Know the collection: risks to the collection, risks to the facility. Stakeholders. Know your equipment: risks to mechanical equipment. Potential gains. Design experiment.
5. Assessment and maintenance

Energy-saving strategies
Six energy-saving strategies are presented. Each explores the description of the potential of the intervention, requirements, critical data points, pre-testing, regulatory considerations, selection criteria/variables that impact potential, test periods, implementation and maintenance, evaluating test results.
1. System shutdowns (to use risk-managed mechanical system shutdowns to achieve significant energy savings while minimizing the impact on the preservation environment.)
2. System setbacks (to use appropriate, risk-managed mechanical system set point setbacks in temperature or relative humidity to achieve energy savings with minimal impact on the preservation environment.)
3. Adjusting fan speed (to use a variable speed drive (VSD) or variable frequency drive (VFD) to reduce the speed of fans on an air handling unit to achieve energy savings when occupancy is low with minimal impact on the preservation environment.)
4. Seasonal set points (to use appropriate seasonal temperature and relative humidity settings to improve the preservation environment and reduce energy impacts)
5. Outside air reductions (to use only the amount of outside air necessary to prevent the build-up of gases that can pose risks for collections and human health, and keep spaces properly pressurized to reduce the load at the AHU for energy savings and potential increase in preservation quality)
6. Light reduction (to improve preservation and achieve energy savings by altering the duration of time that lights

		are used, the type of lighting used, and altering light use habits.)
	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)	X
Peace	X
Partnerships	

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	The resource is closely linked to SDG 11.4 (protecting and safeguarding cultural and natural heritage), and upgrading energy use of infrastructure, contributing to SDGs and targets around reducing energy wastage (7.3, 9.1, 9.4, 12.2, 13.3), benefitting climate action.
35. SDGs and SDG targets the resource helps advance	
SDG 7. Ensure access to affordable, reliable,	

sustainable and modern energy for all 7.3 By 2030, double the global rate of improvement in energy efficiency	Reduction in energy use. Upgrade of old equipment to more efficient equipment. Uptake of renewable sources of energy.
SDG 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation 9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	Development of research-useful collections to support reliable, sustainable and resilient use by researchers and others. Number and proportion of collections facilities and stores that support economic development and human well-being. Number and proportion of collections facilities and stores that provide affordable and equitable access for all. Investment in collections facilities. Inclusion of collections information in regional and transborder initiatives, notably via digital access for discoverability.
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 11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage	***11.4.1 Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage*** Plans, policies and procedures in place for the safe use of collections for a variety of purposes, protecting and safeguarding both collections and those who use them. Plans, policies and procedures in place for the identification, safeguarding and protection of cultural and natural heritage at risk. Collecting programmes in place to protect, safeguard and make use of cultural and natural heritage, addressing the needs of communities and stakeholders, and ensuring that collections can be an effective resource for sustainable development. Number and diversity of educational, awareness-raising, research programmes, and partnerships that aim to strengthen protection of cultural and natural heritage.
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 13. Take urgent action to combat climate change and its impacts 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	Plans in place to enhance positive contributions to addressing climate change through use of collections. Plans in place to ensure collections, collections institutions and broader society can adapt effectively to climate change. Plans in place for effective education and awareness raising 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.

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	