

Institute for the Preservation of Cultural Heritage - Sustainability Action Plan

Sustainability at Yale

Yale University is dedicated to an integrated, comprehensive approach to policy and operations that balances ecosystem health with human health and economic viability in order to demonstrate that sustainability is both feasible and affordable. To accomplish this goal the University integrates sustainable practices into the fabric of institutional decision-making at all levels.

Each unit on campus has a unique cultural context. Successful implementation of sustainability tactics will rely on efforts to refine tools and tactics to suit this diversity of disciplines and perspectives.

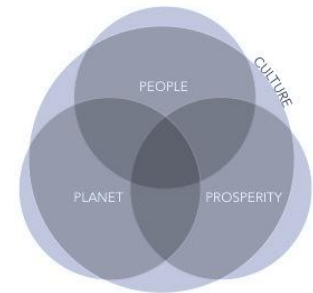


Figure 1: Sustainability values

Yale Sustainability Strategic Plan 2013-2016

The *Yale Sustainability Strategic Plan 2013-2016* contains 25 ambitious-yet achievable goals divided into five categories:

Energy & Greenhouse Gas Emissions: Yale is committed to comprehensive reduction of energy consumption. This includes both designing and updating buildings to be efficient and educating members of the community to use less energy. It also incorporates a robust renewable energy portfolio and efforts to increase fuel efficiency.

Natural and Built Environment: Yale values its natural and built environment, and is managing the campus in ways that improve the quality of natural resources and help ensure a healthy and vibrant community.

Materials Management: Purchasing of supplies and their eventual disposal are directly connected. Considering the two in parallel provides a systemic approach that focuses on better-quality products while minimizing waste.

Food and Well-Being: Whether it is through the food choices offered, the cleaning products used, or the community support offered, the health and well-being of the people who study and work at Yale are directly connected to the campus and benefit from sustainability efforts.

Sustainability Leadership & Capacity Building: Yale has established itself as a global sustainability leader. This is enhanced by efforts to incorporate principles of sustainability into everyday behavior, operational practices, and research and teaching.

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The Plan is available online in full at
http://sustainability.yale.edu/sites/default/files/sustainabilitystrategicplan2013-16_0.pdf

This Document

As a component of leadership and capacity building, the Yale Sustainability Strategic Plan commits to establish and implement sustainability action plans for each of the professional schools, cultural properties, institutes and major departments. These plans are intended to support the Yale-wide goals while reflecting the physical constructs and constraints of each property as well as the intersection of each discipline with sustainability.

This document offers overarching context for sustainability and cultural preservation and then suggests a brief set of initiatives related to the operations and mission of the Institute for the Preservation of Cultural Heritage (IPCH). Once this plan has been launched, the Office of Sustainability will communicate with key members of IPCH on a regular basis to determine and facilitate progress on the Action Items below. The Office will also convene a summit of cultural properties representatives at least once per year to encourage knowledge transfer and collegiality.

About IPCH

The Institute for the Preservation of Cultural Heritage is dedicated to advancing the field of heritage science by improving the science and practice of conservation in a sustainable manner. At the crossroads between science and art, the Institute is home to state-of-the-art research, conservation, and digitization laboratories and seeks to serve the conservation community through research, education and training, on both a local and global scale.

Among the research priorities of the Institute's groups and laboratories are developing environmentally sensitive, sustainable and effective strategies of preservation, understanding aging and weathering kinetics, technical studies on cultural artifacts, physico-mechanical and non-destructive testing from the built heritage to the lens media field.

The ambition of the Institute is to become a reference institution beyond Yale for other cultural heritage organizations going "green". It can be achieved by strategic collaboration with faculty at Yale College and Schools by using Yale as a laboratory for solving multidisciplinary problems of the international conservation community. Involvement of Yale students is equally important, as they can participate in solving interesting problems which will significantly contribute to their professional and career development.

IPCH as Center of "green" competence and sustainable conservation

Cultural spaces and artifacts define how humans interact and have interacted with one another and the world around them. When planning for and engaging in the preservation of cultural heritage, the environment must be a top consideration. Environmental changes can be seen as both a threat to heritage and a topic for research around management of heritage properties. Consideration

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should guide internal operations, in terms of optimal investment of resources for preservation, use of systems, and provide a general approach to conserving cultural property. At Yale, several prominent cultural properties benefit from the IPCH expertise especially in terms of sustainable climate control and energy efficiency, thus positioning these buildings and operations as key opportunities for exploring new collaborative approaches to conservation and preservation.

Museums and libraries are predominantly located in historic buildings, which—combined with the aim of providing strict climate control for the preservation of collections—results in high energy demand. Consequently, the collections belong to the least energy-efficient institutions at Yale. As shown on figure 1, a comparison of energy consumption at Yale museums and libraries with other international institutions shows a great potential for optimization.

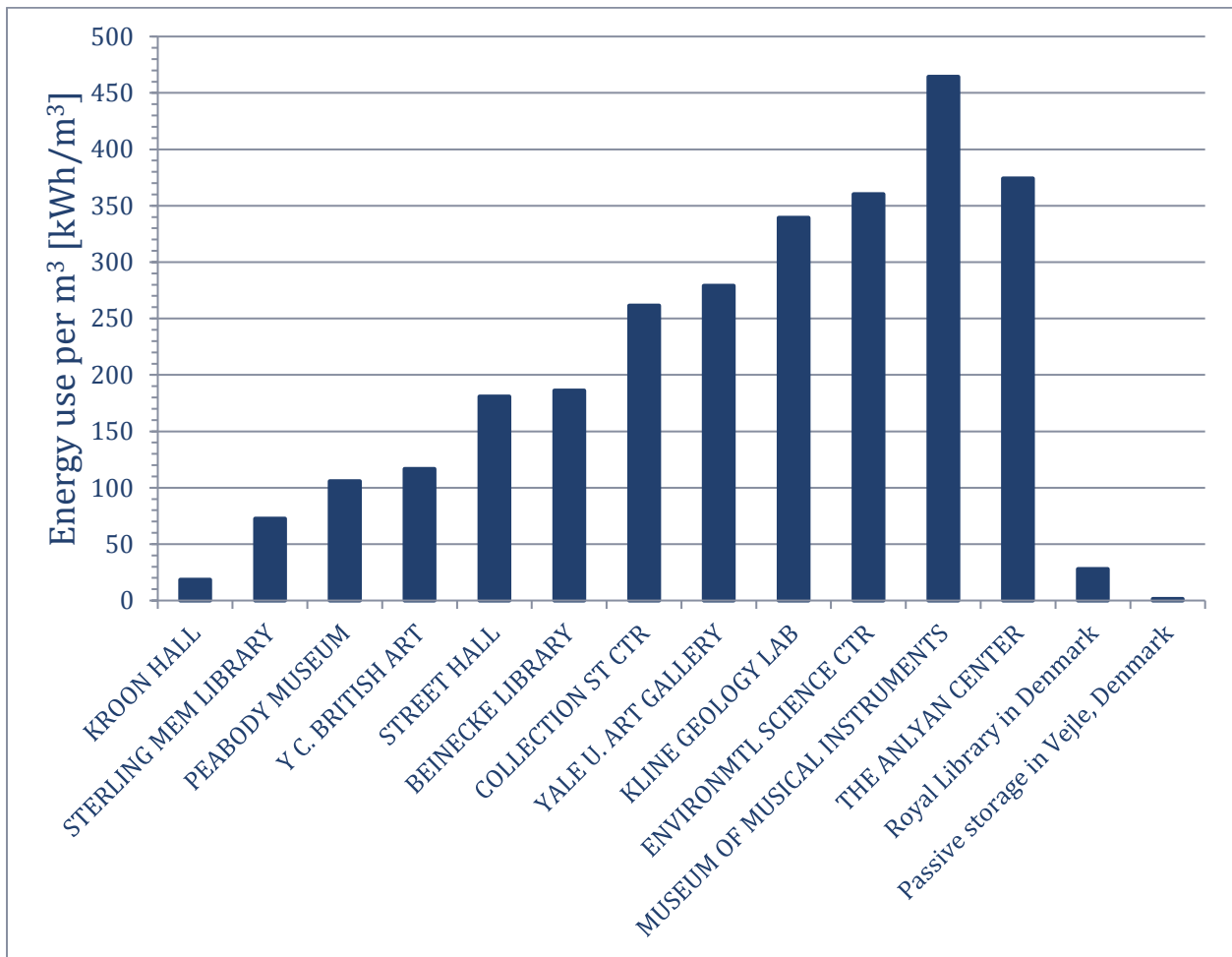


Figure 1. Yearly energy consumption per unit volume of selected Yale cultural properties is compared with international reference institutions.

Therefore, there is an acute need for reduction of energy consumption and lowering CO₂ emissions in Yale museums and libraries while at the same time maintaining high standards of collection care, and successfully implementing the idea of “green” cultural institutions.

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Yale IPCH with its research labs is especially well prepared for assisting museums and libraries in optimizing their energy use. One of the primary research objectives of the Sustainable Conservation Lab is addressing gaps in existing knowledge around the environmental impact on heritage materials and objects when developing more intelligent, and therefore more energy-efficient, climate control strategies in collections, especially those located in historic buildings. There are also opportunities to explore innovative approaches to museum lighting through the work in the Ageing Diagnostics Lab. Laboratories dedicated to conservation (Built Heritage), digitization (Lens Media) and further research (Technical Studies), integrate sustainability on a regular basis.

IPCH aims to engage in cutting-edge research projects with museums, libraries, the Office of Sustainability, Yale Facilities, the various professional schools and institutes (e.g. Yale School of Architecture, School of Engineering and Applied Science, Yale Climate and Energy Institute, School of Forestry and Environmental Studies), in order to develop sustainable and innovative solutions for the cultural heritage field while positioning Yale at the forefront of this “green” initiative. At the same time, the research carried out at IPCH should stimulate and cross-fertilize energy efficient solutions at Yale itself.

In addition, IPCH advocates in its research, education and training for a broad and inclusive concept of sustainability and the integration of cultural heritage preservation in national and international sustainability initiatives. It considers cultural heritage as a key component of human sustainability in environmental systems subject to global change. IPCH furthermore proposes to link cultural heritage preservation to the 17 UN Sustainable Development Goals ¹ and its inclusion in the development of climate risk indicators. Sustainable preservation also requires including local communities and stakeholders in emergency preparedness and disaster response planning.

IPCH Sustainability Successes To-Date

IPCH has already made progress toward sustainability; the following list presents key accomplishments. Each of the successes listed here is labeled with the meta-categories listed in the *Yale Sustainability Strategic Plan 2013-2016*. As completion of the Collection Studies Center takes place and IPCH usage expands, it is important to keep sustainability at the forefront of both operations and occupant behavior.

Energy & Greenhouse Gas Emissions:

- Completion of audit and recommendations by an Energy Services Company (ESCO)
- Research lab expansion currently taking place within some spaces to improve energy efficiency (e.g. variable volume ventilation, valve exchange)

¹ <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

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- Analysis of environmental conditions at Yale Peabody Museum of Natural History with the aim to design scenarios for reduction of energy use and climate control, while maintaining good standards of collection care

Natural and Built Environment:

- Placement of offices in spaces that maximize use of natural light
- Employees are encouraged to take advantage of the Yale Shuttle and other active transportation options
- Analysis of energy consumption in Yale collections and libraries
- Designing the expansion of lab space to promote connectivity of spaces and relationship between IPCH staff and adjacent programs

Materials Management:

- Reuse of furniture and equipment during relocation of occupational spaces
- Collection and recycling of materials throughout IPCH in line with Integrated Pest Management Guidelines (e.g. coffee and tea containers)

Food and Well-Being:

- Building occupants are encouraged to take advantage of the West Campus Nature Trails, Urban Farm, etc.
- Implement regular all-staff meetings with team-building elements

Sustainability Leadership & Capacity Building:

- IPCH employees have received Building Occupancy Training
- IPCH will host the UN Global Colloquium for University Presidents in 2016 with the UN Secretary General, which will focus on the topic of the Preservation of Cultural Heritage. Sustainability, global climate change and their impact on conservation of cultural heritage are key topics of the colloquium.
- IPCH integrates sustainability aspects in training and dissemination initiatives (e.g. the short course on Conservation of Archaeological Sites in Cuzco, Peru, August 2015).
- IPCH was designated in 2015 by the U.S. Environmental Protection Agency as an official monitoring site in the International Cooperative Programme on Effects of Air Pollution on Materials, including Historic and Cultural Monuments (ICP Materials Programme), under the Working Group on Effects established by the Convention on Long Range Transboundary Air Pollution (CLRTAP) of the United Nations

Sustainability Action at IPCH

IPCH is committed to the integration of sustainability into its core efforts. Key activities strive to improve IPCH operations, integrate sustainable practices, and support the University's sustainability goals. The institutional goals included here are selected. Please see the full plan online for all 25 goals.

Energy & Greenhouse Gas Emissions

University Goal: Reduce energy consumption and greenhouse gas emissions 5% below 2013 levels by June 2016.

Proposed IPCH Activities supporting optimization of energy use at other institutions:

- Develop of a new strategy of climate control for the Peabody Museum, Environmental Studies Centre and Kline Geology Lab, in collaboration with PM staff and Yale Facilities.
- Test several scenarios of climate control with the aim to optimize energy use in the Yale University Art Gallery by computer simulation, in collaboration with Professor Michelle Addington, Yale School of Architecture and YUAG staff.
- Analyze the potential impacts of converting Library Storage Facilities into passive and cool storage, by adopting solutions used in the museum depository in Vejle, Denmark. IPCH will aim to involve Yale undergraduate students in the project supervised by IPCH and YUL staff.
- The Collection Studies Center location at Yale West Campus offers the University's cultural properties a centralized locale for conservation and preservation activities. Given the energy intensity of these activities, and the fact that the space is shared with High Performance Computing Center and the new Energy Science Center, it will soon become the largest energy user at Yale. The IPCH with its expertise will offer help to all parties involved in the analysis of potential measures to reduce energy consumption at the CSC.
- Collaborate with West Campus administration to create financial mechanisms encouraging implementation of energy efficient solutions.
- Collaborate with Office of Facilities and other involved parties in design of the cool storage design at West Campus.

Proposed other IPCH Activities:

- Adopt ESCO recommendations for energy efficiency/ upgrades
- Identify and propose locations for lower air exchange rates

Natural and Built Environment

University Goals:

- Reduce single-occupancy vehicle use by 2% below 2013 levels by June 2016.

Proposed IPCH Activities:

- Promote use of the Federal Pre-tax Commuter Benefits Program amongst IPCH employees.
- Encourage employees to reduce the number of cars coming to campus by promoting use of shuttle and active forms of transportation.
- Encourage test application of innovative anti-collision systems for birds in the CSC Courtyard

Materials Management

University Goals:

- Reduce purchasing of paper and office supplies by 10% by June 2016.
- Achieve a 50% waste diversion rate via reuse, recycling, and/or composting strategies.

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Proposed IPCH Activities:

- Expand effective communication about recycling throughout building (improved signage, etc.)
- Promote reuse of furniture and equipment in offices and laboratories
- Use electronic signatures whenever possible
- Utilize at least 30% recycled content paper in all office transactions

Food and Well-Being

University Goals:

- Ensure that 37% of the food purchased and served by Yale meets one or more of the following sustainability criteria: local, eco-sensitive, humane, or fair.
- Increase the purchase and preparation of plant-based foods in Yale Dining by 15% over 2013 levels by June 2016.
- Reduce cleaning chemical usage on campus 30% from 2013 levels by June 2016.

Proposed IPCH Activities:

- Collaborate with West Campus partners to increase participation in health and nature related activities
- Promote team-building elements by organization of all-staff meetings
- Evaluate possibilities to replace currently used coffee and tee containers with the fully recyclable ones.

Sustainability Leadership & Capacity Building

University Goals:

- Establish sustainability action plans for professional schools by December 2013.
- Expand Green Certification Programs by June 2016.

Proposed IPCH Activities:

- Integrate sustainability and energy efficiency issues into training courses and classes led by IPCH staff, both at Yale and beyond. For example, the credited class “The Sustainable Preservation of Cultural Heritage: An Introduction to a Global Challenge of Our Time” in the Yale Global Summer Program
- Propose several projects for students aimed at optimizing energy use at Yale institutions while developing transferable skills contributing to their professional development curriculum
- Widely disseminate new knowledge gathered in the course of the research program in relevant journals, conferences and workshops
- Add sustainability to training for new staff members (utilize YUAG Occupancy Training guide)
- Add sustainability progress reporting to regular staff communications
- Establish regular information sharing opportunities between planners, operational staff and building occupants. Identify set goals and strategies to address collaboratively.

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