CEM at Phipps: Welcoming the World to Our Net-Positive Future

Phipps Conservatory and Botanical Gardens, a treasured icon of Pittsburgh’s industrial past, is now home to three of the greenest buildings in the world. On Thursday, September 22, Phipps invites the attendees of the Clean Energy and Mission Innovation Ministerials to visit our Living Campus, where three of the greenest net-positive energy buildings in the world function together in an interconnected complex, addressing climate change by eliminating fossil fuel dependency in the built environment. When President Obama’s White House selected Pittsburgh to host the 2009 G-20 Summit, Phipps’ forward-thinking sustainability efforts of the era made it a perfect fit for the welcome reception and first working dinner, but the Conservatory’s sustainability journey was only beginning. Today at Phipps, we can see what acting on our climate commitments really looks like — beautiful, efficient and completely in harmony with nature.

Upon passing through gorgeous botanical displays inspired by the art of Claude Monet, guests will have the opportunity to partake in an open-house tour of Phipps’ three revolutionary net-positive energy buildings, each representing a different construction type: the Center for Sustainable Landscapes (new construction), Nature Lab (modular) and Exhibit Staging Center (adaptive reuse) will all be open with stationed docents to give an inside look at the strategies and technologies that prove that any type of building can be one of the greenest in the world. The Living Campus is breathtakingly compelling and leaves its guests with the inspiration to act now, to keep the precious momentum of the CEM-MI conference going all the way to COP27 and beyond.
Net-Positive Energy
Center for Sustainable Landscapes – 2012

Phipps’ education, research and administration facility is the first and only building to meet seven of the highest green certifications.

- World’s only building to achieve **Living Building Challenge**, **LEED Platinum**, **WELL Building Platinum**, **Zero Energy Certification**, **SITES Platinum**, **Fitwel 3 Star** and **BREEAM Outstanding In-Use**.

- **Net-Positive Energy** - new construction - three-floor, 24,350-square foot building
- Produces all of its own renewable energy on-site from the sun and wind
- Uses 14 geothermal wells to efficiently heat and cool the building
- Uses 75% less energy than a typical office building (EUI=18)
- Generates enough electricity annually to power 12 homes
- Captures, treats and reuses all sanitary and rainwater on-site with 80,000 gallons of underground storage.
- Manages 3.25 million gallons of storm water yearly, enough for five Olympic swimming pools
- Sanitary water cleaned by constructed wetlands = 79,000 gallons per year
- Uses 90% less potable water than a typical office building
- Features over 100 native plant species
- A former Brownfield site now provides food sources and shelter for local wildlife, including turtles and fish that live in the campus’ 4,000-square-foot rainwater-capture lagoon
- Houses a dedicated classroom for Phipps’ science education programs for over 5,000 children per year
Net-Positive Energy
Nature Lab at Phipps – 2015

Inspired by a concern that modular classrooms are unhealthy places for children, the Nature Lab maximizes student wellness and potential, showing what healthy spaces look like for young people.

• Awarded Living Building Challenge Petal Certification for achieving five imperatives: Place, Water, Energy, Equity and Beauty

• Net-positive energy – modular construction - uses sun for power

• One of the nation’s first sustainable, modular classroom spaces

• Emphasizes natural daylight and ventilation

• Rainwater collected for classroom use and toilet flush water

• All mechanical, electrical and plumbing systems exposed, making the classroom an interactive learning tool

• Sanitary water cleaned by a constructed wetland

• Constructed from non-toxic materials

• As a home of Phipps’ science education programs — along with internship classes for high school students, field trips, citizen science initiatives, and professional development opportunities for teachers — the Nature Lab sparks scientific engagement.
Net-Positive Energy
Exhibit Staging Center – 2018

A 1960s public works building rehabilitated to be a building of groundbreaking efficiency, the Exhibit Staging Center proves that any building can be one of the greenest and healthiest buildings in the world.

• **Living Building Challenge** in pursuit; **LEED® Platinum** achieved April 2022; **WELL Platinum** achieved June 2021

• **Net-positive Energy** – adaptive reuse of an existing building - solar panels on the roof power the building

  • Uses direct DC current from solar panels and batteries to efficiently power all lights
  
  • Uses geothermal wells to efficiently heat and cool the building by harnessing the natural energy from the earth’s consistent 55-degree internal temperatures

  • Nana Walls are used to increase sunlight and air flow on warm days

  • Prioritizes the health and well-being of all staff members; features a yoga room, fitness room and meditation room for staff to encourage mental and physical wellness

  • Primary occupants are maintenance and grounds crew, whose well-being is often overlooked

  • Building materials are free from Living Building Red List toxic chemicals

  • Biophilic design elements and art, including a vegetative living wall, add to the healthy impact of the building on occupants and guests

  • Green roof over the vestibule helps to manage storm water
Highlights from Our Journey

Phipps Conservatory and Botanical Gardens didn’t become a worldwide green leader overnight. Here are some of the milestones that shaped our comprehensive approach to addressing climate change.

2005  Welcome Center opens, first LEED-certified visitor center in a public garden
     Switched to 100% renewable electricity campus-wide
     Organic lawn care and reduced irrigation
2006  First LEED-certified production greenhouses (Platinum)
     Tropical Forest Conservatory opens – among most energy-efficient in the world
     Plastic disposable café service ware eliminated
     All food waste composted
2009  Disposable bottled water eliminated
2010  Begin to annually offset all carbon produced from heating our buildings
2011  Soda, junk food and factory farm meat eliminated from café
2012  Center for Sustainable Landscapes opens – Our first Net-positive Energy building
2015  Nature Lab opens, a Net-positive Energy modular classroom
2015  Divested from fossil fuel investments
2017  Investment portfolio shifted to socially responsible investments
2018  Exhibit Staging Center opens, a Net-positive Energy adaptive reuse of existing building
2019  More than 70% of café menu now vegetarian or vegan
2020  Launched The Climate Toolkit to help gardens, museums and zoos address climate change
2022  Developed a plan for a 40% reduction in fossil fuel derived steam heat by the end of 2023
For its groundbreaking efforts in sustainable leadership, Phipps is the recipient of more than 80 awards.

Awards

2022
- Gold Award, Urban Design and Architecture Awards, Architecture Press Release

2021
- Top Project Award, Environment + Energy Leader
- BREEAM Award, Commercial Projects – In-Use
- BRE Global Champion for Sustainability
- Carnegie Science Awards
- Second Award, Global Future Design Awards, Architecture Press Release
- Finalist, Global Energy Awards
- S&P Global Platts Shortlist, Environment Award

2020
- Gold Award, Project Leadership Awards
- Construction Owners Association of America Governor’s Award for Environmental Excellence
- Pennsylvania Department of Environmental Protection Sustainability Excellence Award, Programming Category
- American Alliance of Museums

2019
- Government Award for Environmental Excellence
- Pennsylvania Department of Environmental Protection Sustainability Excellence Award, Programming Category
- American Alliance of Museums

2018
- Intensive Commercial / Industrial / Institutional Award of Excellence
- Green Roofs for Healthy Cities Initiative Award, Sustainability in Historic Preservation
- Preservation Pennsylvania
- Second Award, World Design Awards
- The Architecture Community
- Award of Merit, Mid-Atlantic Best Projects
- Engineering News-Record Finalist, Building Excellence Awards
- Master Builders’ Association of Western Pennsylvania Environmental Initiative Award
- The SEAL Awards

2017
- National Institute of Building Sciences
- Honorable Mention, Stephen R. Kellett Biophilic Design Award
- International Living Future Institute Leadership in Green Power Education
- United States Environmental Protection Agency and Center for Resource Solutions
- Katherine Coffey Award, Mid-Atlantic Association of Museums

2016
- Top Ten Projects
- The American Institute of Architects Committee on the Environment (AIA COTE)
- Operability Sustainability Award
- American Public Gardens Association
- Regenerative Business Prize for a Not-for-Profit: The Regenerative Business Alliance

2015
- Award of Merit, Beyond Green Performance Building Awards
- Sustainable Buildings Industry Council, Washington, D.C.
- Sustainability Leadership Award
- Pennsylvania Resources Council
- Green Power Partner of the Year
- United States Environmental Protection Agency
- Finalist, Place by Design Awards
- SXSW Eco
- Clean Water Star Award
- Allegheny County Sanitary Authority (ALCOSAN)
- Winner, Elbie Awards
- Urban Green Council
- Sustainability Champion Award
- The Duquesne University Center for Green Industries and Sustainable Business Growth
- Designer of the Year, International Landscape Design Awards
- Association of Professional Landscape Designers

2014
- Legacy Award
- Green Building Alliance
- Who’s Who in Energy
- Pittsburgh Business Times
- Trustee Award
- Audubon Society of Western Pennsylvania
- Honorable Mention, Public Building Built
- Re-Thinking the Future Sustainability Excellence Award, Programming Category
- American Alliance of Museums
- Innovative Star of Energy Efficiency
- Alliance to Save Energy
- Global Best Project Award, Green Project Category Engineering News-Record
- Buildy Award
- Mid-Atlantic Association of Museums
- Catalyst Award
- Carnegie Science Award

2013
- Sustainable Project of the Year
- Engineers’ Society of Western Pennsylvania
- Civil Engineering Sustainability Award
- American Society of Civil Engineers, Pittsburgh Section
- Green Design Award
- USGlass Magazine
- Design & Build with FSC Award
- Forest Stewardship Council
- U.S. Forest Stewardship Council Award
- Design & Build with FSC Award
- Sustainable Building of the Year
- World Architecture News
- Green Design Citation
- American Institute of Architects, Pittsburgh Chapter
- Who’s Who in Energy
- Pittsburgh Business Times
- Green Good Design™ Award, Nonprofit Category
- Honorable Mention, Inspiration Awards
- Contract Magazine
- Excellence in Design Award
- EDC Magazine
- Energy Leadership Award
- Pittsburgh Business Times

2012
- Enviro-Star Award
- Allegheny County Health Department
- Bronze Level of Honor, Most Sustainable NGO Category
- International Green Awards
- Foodservice Sustainability Award
- Hobart Center for Foodservice Sustainability
- Living Building Challenge™ Heroes Award
- International Living Future Institute™
- Award of Merit
- Carnegie Mellon Steinbrener Institute
- Buildy Award
- Mid-Atlantic Association of Museums
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2011
- Green Power Leadership Club, Exemplary Green Power Procurement
- EPA Green Power Partnership

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- Green Power Leadership Club, Exemplary Green Power Procurement
- EPA Green Power Partnership
- First LEED®-Certified Welcome Center
- Green Building Alliance
- GreenSCENE Celebration Leadership Award
- U.S. Green Building Council

2009
- Leadership Award
- American Society of Interior Designers, Western Pennsylvania Chapter

2008
- Award for Excellence in the Environmental Field
- Carnegie Science Awards
- Evergreen Award, First Place, Commercial Category
- Eco-structure Magazine
- Finalist, Tropical Forest Conservancy
- Melbourne World Sustainable Building Conference, Australia
- Sustainable Buildings Challenge
- U.S. Green Building Council

2007
- Green Design Citation
- American Institute of Architects, Pittsburgh Chapter
- Award of Merit
- Carnegie Mellon Steinbrener Institute
- Green Power: Turn It On! Award
- Citizens for Pennsylvania’s Future
- Project of the Year Award
- Engineers’ Society of Western Pennsylvania
- Shades of Green Leadership Award
- Green Building Alliance
- Beyond Green High Performance Building Award
- Sustainable Buildings Industry Awards