

The background of the page features a large, semi-transparent watermark of the University of Cincinnati seal. The seal is circular and contains the text "UNIVERSITY OF CINCINNATI" around the top edge and "LET THERE BE LIGHT" around the bottom edge. In the center of the seal is a five-pointed star above an open book with the letter "A" on its cover.

**A FRAMEWORK FOR
INDUSTRY/UNIVERSITY
COLLABORATIVE RESEARCH**

About Us

Our Mission

To improve the environmental quality and energy efficiency of buildings by providing timely, unbiased information on building technologies and design and operation techniques.

Our Approach

We believe that research about energy and the indoor environment must go hand-in-hand in order to create transformational change in the building industry. We study promising new energy conserving strategies and technologies, along with how people use and interact with buildings.

We actively participate in the development of new standards and guidelines to remove barriers to effective building technologies, and to speed their implementation. We also provide tools, guidance and training for design, building and operations.

Industry Collaborations

The Center for the Built Environment was founded in 1997 under the National Science Foundation Industry/University Cooperative Research Center program.

CBE is guided by an Industry Advisory Board (IAB) that meets semi-annually to discuss research, approve annual budgets, and plan future research. The IAB represents the diversity of the building industry, including manufacturers, building owners, facility managers, contractors, architects, engineers, government agencies, and utilities.

Our Research

The Center for the Built Environment's research portfolio is based on industry partner feedback, and represents relevant and timely topics in building science research. Our key areas of research are:



Indoor Environmental Quality

We have developed new methods to measure the performance of buildings in terms of occupant comfort, energy efficiency and operations, and we are testing new approaches to providing energy-efficient comfort.



HVAC Systems

We are a leader in HVAC systems research, and are investigating topics such as advanced integrated building systems, underfloor air distribution, radiant systems, and new methods for performance monitoring.



Human Interactions

We are studying how new digital technologies can improve information exchange between building occupants and managers, and influence commercial building occupant behavior in positive ways.



Envelope Systems

We are developing tools and criteria for evaluating facade performance in terms of occupant comfort and energy efficiency. We are evaluating the impact of operable windows, controllable building features, and mixed-mode strategies.



Sustainability and Whole Building Energy

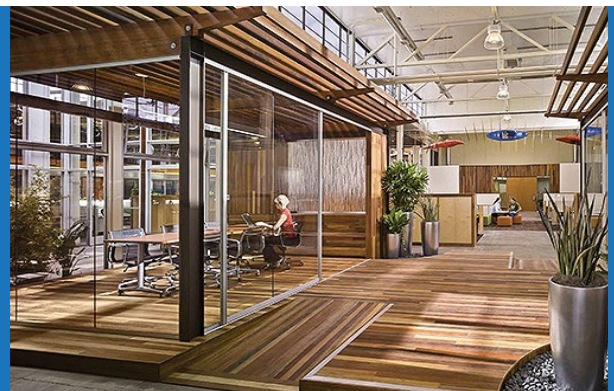
We are providing useful feedback to commercial building designers and operators through comprehensive case studies that utilize the full range of CBE's research capabilities.

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CBE provides us with **immediate, usable and innovative technical value**, while extending our professional network to a uniquely diverse cross section of professionals. **No other organization consistently expands our horizons like CBE.**

Phil Williams, Vice President, Delos Living

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Clif Bar Headquarters
2012 Livable Buildings
Award Winner

Arch: ZGF Architects
MEP: Integral Group
GC: DPR Construction

Collaborations

CBE welcomes firms and organizations to become involved through membership in our industry consortium. This consortium is a rare opportunity to identify information needs and advance research in directions to benefit your organization, without the high costs of in-house research.

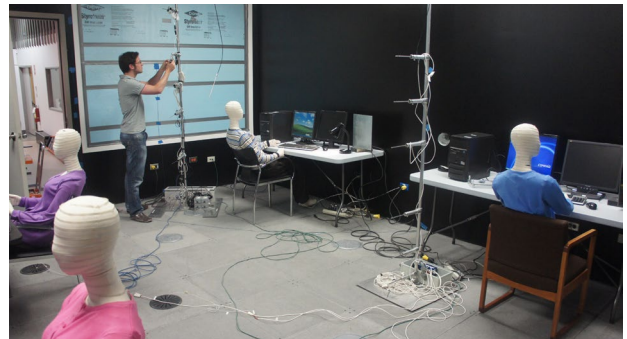
Benefits of membership

- Participation in semi-annual Industry Advisory Board Conferences (April and October).
- The ability to direct research in areas relevant to your business, and opportunities to directly participate in high-impact research efforts.
- Access to specialized design and performance tools, including occupant surveys (four free per year).
- Networking opportunities with diverse sectors of the building industry.
- Priority access to specialized research tools, facilities, and staff, and the ability to recruit highly trained graduates.
- Advance review of internal reports and research results.
- Acknowledgment in CBE reports, websites, and publicity materials.
- Members' investments are greatly leveraged through research grants from institutional and governmental sources.

Affiliation with UC Berkeley gives CBE's research a high level of credibility within the industry. Industry partners benefit from this research, by using empirical results to influence clients and regulators, and through recognition of their commitment to promoting sustainability and improving our built environment.



CBE's Industry Advisory Board guides research towards relevant and current topics, and provides a unique opportunity for collaboration.



Our research team uses simulation, lab, and field study methods. Above, researchers prepare for tests in Price Industries' lab.



Our research team is testing new ideas for simultaneously improving energy efficiency and comfort in workplace environments.

Photo: Jeremy Bittermann



Packard Foundation Headquarters
2014 Livable Buildings
Award Winner

Arch: EHDD
MEP: Integral Group
GC: DPR Construction

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The design and construction industry fundamentally needs to take a more **rigorous, science-based approach** to designing and operating buildings that really work for our clients. **CBE is leading the way on this critical transformation.**

Scott Shell, Principal, EHDD

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Research Portfolio 2019-2020

Our portfolio is based on the interests and feedback of CBE's industry partners. Below we provide an overview of our fiscal year 2017-2018 portfolio. Asterisks indicate match funding (see below).

Mechanical Systems Research

- Building Performance Evaluation Tools*
- Ceiling Fan Integrated Air Conditioning
- Advancing Best Practice System Designs for High Thermal Mass Radiant Cooling
- Skewering the Silos: Using Brick to Enable Portable Analytics, Modeling, and Control*

Workplace and Occupant Experience

- Person-Place Fit in the Workplace
- Development and Publication of a Large-Scale Building/Occupant Level Database
- Acoustical Intervention Study in Wurster Hall
- Personalized Sound and Air Quality Sensing
- CBE Occupant Survey Data Filtering Tools

Match-Funding For EPIC Projects

Partial research funding for the projects noted above with asterisks are applied as match funding for these projects funded by California's Electric Program Investment Charge (EPIC) Program.

- Integrating Smart Ceiling Fans and Communicating Thermostats to Provide Energy-Efficient Comfort (EPIC, 3 years, \$1.9M)
- Skewering the Silos: Using Brick to Enable Portable Analytics, Modeling, and Control (DOE, 3 years, \$1M)
- Using A Wide-View Infrared Biometric Sensor to Improve Comfort and Reduce Overcooling via Closed-Loop HVAC Control (DOE, 3 years, \$1.5M)

Indoor Environmental Quality

- Development and Pilot Testing Protocol for a Targeted 'Right-Now' Survey Program
- Lab Testing to Support Fan Design Tool Development*
- Using Infrared Thermography for Occupant-Centric Building Control*
- Development and Pilot Testing of Sensing Protocol for IoT Devices in Open Plan Workplaces

Envelope Systems

- View Quality: View Access Index Development
- Climate Change and Resiliency: Validating Future Weather File Methods



Warren J. Baker Center for Science and Mathematics
2017 Livable Buildings
Award Winner

Arch: ZGF Architects
MEP: Integral Group
GC: Gilbane, Inc.

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CBE has been a leader in the development and application of POE surveys which Armstrong has found to be very influential in directing owners, designers, engineers and architects **towards the design of better buildings.**

*Ken Roy, Sr. Principal Research Scientist
Armstrong World Industries*

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Our Partners

CBE's partners are leading organizations across the spectrum of the building industry. Partners (as of August 2019) include:

Sustaining Partners

Armstrong World Industries	Lear Corporation
Big Ass Fans	Pacific Gas & Electric Company
California Energy Commission	REHAU
Daikin	Saint-Gobain
Ford Motor Company	Southern California Edison
Genentech	U.S. Department of Defense
Google, Inc.	Viega
Ingersoll Rand	Wells Fargo

Small Business Members

Delos Living

Architecture, Engineering and Construction Partners

Affiliated Engineers, Inc.	PAE Engineers
Arup	Quinn Evans Architects
Charles M. Salter Associates	RMW Architecture & Interiors
DIALOG	Rudolph and Sletten
HGA Architects and Engineers	Sanken
HOK	Skidmore, Owings, & Merrill
Integral Group	SmithGroup
Interface Engineering	Stantec
KieranTimberlake	Syska Hennessy Group
LPA Inc.	TEECOM

Architecture, Engineering and Construction Team Partners

<i>SERA Team:</i>	<i>Taylor Team:</i>
SERA Architects	Taylor Engineering
CPP	Atelier Ten
EHDD Architecture	TRC Solutions
P2S Engineering	Western Allied Mechanical
Perkins+Will	WRNS Studio



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