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Berkeley Lab’s Latest Achievements in Energy Efficiency & Building Technologies

In this issue, we celebrate Berkeley Lab's achievements in advancing energy efficiency, sustainability, and building technologies. September's 2024 CalFlexHub Symposium, held at Berkeley Lab, brought together over 330 participants worldwide, including utility leaders, researchers, and advocates. Berkeley Lab experts were also integral to the U.S. Department of Energy’s (DOE) EAS-E Prize initiative, designed to make home electrification more accessible, and released the powerful MOSTCOOL 2.0 software to optimize data center cooling efficiency.

The Smarter Small Buildings Campaign launched new resources, including case studies and guidelines for sustainable heating, ventilation, and air conditioning (HVAC) controls. We wrapped up the fiscal year with the technology commercialization program IMPEL’s impactful contributions to building tech innovation and an exciting new 2025 cohort, advancing decarbonization efforts nationwide.

Berkeley Lab leaders also presented developments in commissioning and controls at the Building Commissioning Association’s annual conference. We’re also leading new projects on panel capacity, interoperable systems, and virtual power plants, aiming to bolster future building resilience.

Finally, we honor Berkeley Lab’s award-winning teams and individuals who continue to drive groundbreaking work, including recipients of the Alliance to Save Energy's Star of Energy Efficiency and the American Council for an Energy-Efficient Economy (ACEEE) Champion of Energy Efficiency awards. Explore our recent publications as we work toward a sustainable, equitable future.

Vi Rapp, Deputy Department Head, Building & Industrial Applications, Building Technology and Urban Systems (BTUS) Division

NEWS

2024 CalFlexHub Symposium

Hosted at Berkeley Lab

The 2024 CalFlexHub Annual Symposium, hosted on September 23, was a hybrid event with 45 speakers, 20 sessions, and over 330 participants who joined in person at Berkeley Lab and remotely via Zoom.

This year's symposium had a domestic and global reach with remote attendees from 23 countries around the world including Brazil, South Africa, Japan, Great Britain, Denmark, France, and New Zealand. Participants represented over 175 companies, public agencies, academic institutions, social justice organizations, nonprofits, advocacy groups, and other organizations. California's public-interest investment in advancing the state of this sector is moving the needle in California, nationwide, and abroad.

The event brought together utility and industry leaders, academics, government representatives, workforce development professionals, community-based organizations, and researchers.

Sessions, recordings, and presentations can be **found here**.

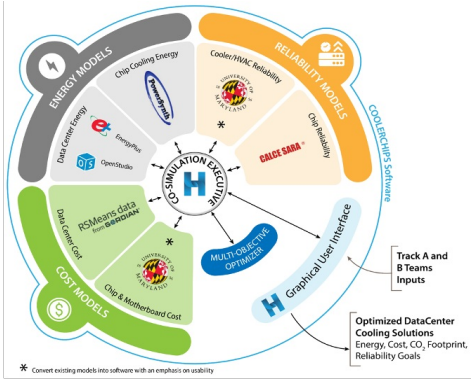
Join the mailing list to stay updated on all CalFlexHub news.

Department of Energy Announces Winners of the Home Electrification Prize

BTUS staff members **Brennan Less** and **Iain Walker** led the development of prize rules and contributed to the selection of winners for DOE's Equitable and Affordable Solutions to Electrification (EAS-E) prize, together with our colleagues **Rich Brown** and **Jordan Shackleford**. The prize is intended to make home electrification easier and more affordable. The Berkeley Lab team is now working on a second version of the prize with a greater focus on hardware development.

Read the full announcement to learn more about the winners.

MOSTCOOL Software Version 2.0 Officially Released



The MOSTCOOL software version 2.0 was officially released on Github in September and is open for testing to COOLERCHIPS awardees (not open to the public yet). The MOSTCOOL (Multi-Objective Simulation Tool for Cooling Optimization and Operational Longevity) project, funded by Advanced Research Projects Agency-Energy Cooling Operations Optimized for Leaps in Energy, Reliability, and Carbon Hyperefficiency for Information Processing Systems (ARPA-E COOLERCHIPS) program, aims to develop an integrated co-simulation software toolset that can

be used to optimize the design of data centers, including their data, power, and thermal management systems, for lower cooling energy demand, a lower CO2 footprint, and lower cost, while maintaining high reliability and availability.

Tianzhen Hong is the Berkeley Lab principal investigator, and **Kaiyu Sun** leads the technical work. The overall project is led by the University of Maryland with partners Berkeley Lab, the National Renewable Energy Laboratory, University of Arkansas, and Trane.

New Resources From the Smarter Small Buildings Campaign

The **Smarter Small Buildings Campaign** has published four new resources. Three are case studies on the **organizations recognized in 2024** — LUSH, Sheetz, and Bakersfield College — for their excellence in rooftop HVAC controls. The fourth is a **Setpoints and Scheduling** guidance document to help create a more energy-efficient thermostat setpoint schedule and operational policy. The Smarter Small Buildings Campaign is a Berkeley Lab program that offers free technical assistance and recognition opportunities for facility teams who install ready-now controls technology for their portfolio.

Click here to join the campaign!

IMPEL's Year-End Wrap-Up: Innovation in Building Tech

We're celebrating another successful fiscal year in IMPEL's journey of innovation, collaboration, and impactful solutions! From showcasing top-tier decarbonization technologies at public and private events to welcoming our new 2025 cohort, IMPEL continues to drive groundbreaking advancements toward a net-zero built environment that promotes equitable wellness for all. Dive deeper into our highlights, including the **IMPEL National Showcase at the DOE Building Technologies Office**, **Greentown Labs Building Sector Pitch Day**, and the announcement of **IMPEL Cohort 6**.

Join IMPEL's Mentor Network

Become a mentor with IMPEL and make a lasting impact in the building tech ecosystem. With over $150 million in follow-on funding secured by previous innovators, IMPEL offers a powerful network of experts and resources to support the next generation of building tech. Ready to make an impact?

Fill out the form here

(L to R) : IMPEL National Showcase at Department of Energy Building Technologies Office
HUD Innovative Housing Showcase at the National Mall in Washington DC
Greentown Labs & IMPEL Building Tech Pitch Day

Researchers Engage Commissioning Practitioners to Drive Innovation

Berkeley Lab researchers presented at the **Building Commissioning Association's 2024 Annual Conference** in October in Las Vegas, Nevada. **Eliot Crowe** hosted a panel discussion on **monitoring-based commissioning** (given the tremendous benefits, why isn't everyone doing it?). Also at the conference, **Guhan Velmurugan** shared newly commercialized technology and **ongoing work** to automate the functional tests and resolution of controls-related commissioning measures.

Newly Awarded Projects on Panel Capacity Limiting, Interoperable Controls, and Virtual Power Plants

The Building Technology department has been actively pursuing and advancing industry connections through new funding and collaborations over the past quarter. Berkeley Lab researcher **Marco Pritoni** received a DOE Building Energy Efficiency Frontiers & Innovation Technologies (BENEFIT) award with **Stepwise** to develop a system of modular hardware to dynamically control static loads in homes without requiring costly electric panel upgrades. The research team also won two California Energy Commission grants under the Electric Program Investment Charge Program's Grant Funding Opportunity 23-309: one project to develop and showcase an interoperable control system for large commercial buildings in collaboration with eight industry partners led by Marco Pritoni and **Jessica Granderson**. In another grant we will support the development of a community-based virtual power plant for demand flexibility, efforts led by **Jingjing Liu** as a subcontractor to **MCE**.

Wide Spectrum of BTUS Research at ACEEE Summer Study

Nearly 30 BTUS staff and other Berkeley Lab researchers were major technical contributors at the ACEEE's 2024 Summer Study for Energy Efficiency in Buildings. BTUS alone accounted for 27 oral presentations, plus several posters and informal sessions. Division talks spanned demand flexibility, smart controls, energy management, securing energy savings for households, and making the grid more resilient against disasters and outages.

In line with the conference theme of Equity and Climate Action: Time to Deliver, several BTUS presenters also highlighted technological advancements and analyses aimed at helping low- and moderate-income households cut energy costs and weather outages.

To access these and other ACEEE conference papers, visit the **Summer Study Proceedings**.

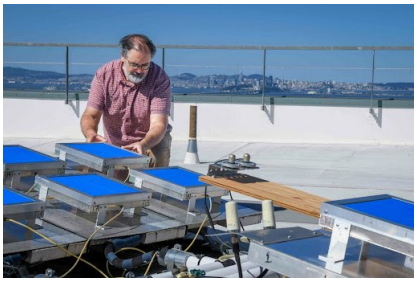
AWARDS

Berkeley Lab Team Received Alliance to Save Energy Star of Energy Research Award

Andy Satchwell, **Jared Langevin**, and team received the **Alliance to Save Energy** Star of Energy Efficiency award for their **building decarbonization study**! Over 300 leaders in the energy industry, policymakers, and advocates gathered to celebrate the innovative efforts of individuals and organizations dedicated to energy efficiency.

Nan Zhou Awarded 2024 ACEEE Champion of Energy Efficiency Award

Nan Zhou won a 2024 ACEEE Champion of Energy Efficiency in Buildings award in the energy policy category. An ACEEE Board of Directors' committee selected Nan from an impressive slate of professionals who were nominated by their peers.



Howdy Goudey Receives 2024 R&D 100 Technician of the Year Award

Howdy Goudey, a senior scientific engineering associate at Berkeley Lab, was **recognized** for his vast technical expertise and inventiveness that has enabled leading-edge research and development in efficient building technologies, as well as his engagement with his community. He supports an extensive array of testing facilities, engineers, and scientists within the BTUS Division. His abilities to envision and fabricate test equipment, design and execute experiments, guide researchers, and mentor junior staff have allowed him to play a significant role in many high profile projects including an **infant warmer**, **national energy performance ratings for window attachments**, vacuum-insulated window glazing, and gas-filled panels for high-performance thermal insulation. In addition, Goudey serves as the electrical safety officer for the Energy Technologies Area, and beyond his lab responsibilities, he is a mentor and prolific volunteer within his community.

Thin Triple Window Team Wins 2024 Lab Director Award

Charlie Curcija, **Howdy Goudey**, **Robert Hart**, and Brendon Smith of the Thin Triple Window Team won a 2024 Tech Transfer Lab Director Award for Exceptional Achievement for shepherding thin triple windows from early stage concept to mass production at multiple U.S.-based facilities.

The **Director's Awards** program recognizes the significant achievements of Lab employees. Each year, these awards are given for accomplishments, leadership, collaboration, multi-disciplinary science, cross-divisional projects, and commitment to excellence in support of the Lab's mission and strategic goals.

PUBLICATIONS

- Malik, J., Hong, T., Wei, M., Rotmann, S. (2024) "Prioritize energy sufficiency to decarbonize our buildings." **buildings.lbl.gov/publications/prioritize-energy-sufficiency**
- Srinivasan, P., Esram, N., Chen, H., Singh, R. (2024) "A Proposed Evaluation Framework for New and Emerging Low Embodied-Carbon Concrete Technologies." **buildings.lbl.gov/publications/proposed-evaluation-framework-new**
- Casquero-Modrego, N., Venkatraman, M., Walker, I.S. (2024) "The Costs of Decarbonizing Multifamily Buildings in DACs and Rural Areas." **buildings.lbl.gov/publications/costs-decarbonizing-multifamily**

Above is a sample of our recent publications. To find more, please visit **buildings.lbl.gov/publications**.

Jobs in BTUS @ Berkeley Lab!

Take your career to the next level or ask your networks to join us in our quest to develop science solutions for the world.

Building Technology & Urban Systems | Energy Technologies Area | Berkeley Lab

Jessica Granderson, Division Director, Building Technology & Urban Systems
Tianzhen Hong, Deputy for Research Programs

1 Cyclotron Road, Berkeley, CA 94720

See also: Department of Energy **Building Technologies Office**

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Lawrence Berkeley National Laboratory (Berkeley Lab) is located in the Berkeley Hills near University of California (UC) Berkeley and conducts scientific research on behalf of the United States Department of Energy (DOE). The Laboratory overlooks the UC Berkeley.

*Berkeley Lab addresses the world's most urgent scientific challenges by advancing sustainable energy, protecting human health, creating new materials, and revealing the origin and fate of the universe. Founded in 1931, Berkeley Lab's scientific expertise has been recognized with 14 Nobel prizes. The University of California manages Berkeley Lab for the U.S. Department of Energy's Office of Science. For more information, visit **www.lbl.gov**.*

*DOE's Office of Science is the single largest supporter of basic research in the physical sciences in the United States, and is working to address some of the most pressing challenges of our time. For more information, see **science.energy.gov**.*