



## Supporting Equitable Decarbonization

It's my pleasure to introduce the Fall 2023 edition of the Building Technology & Urban Systems (BTUS) newsletter! This edition will update you on our award-winning (literally! multiple times in this newsletter alone) research and activities. And while it goes without saying, the contents of this newsletter are another testament to the world-class research and technical assistance activities within our division.

It's particularly wonderful to read about the great work we are doing to support the nation's communities to realize the environmental, health, and economic benefits of energy efficiency. Highlighted in this newsletter is BTUS's leadership in the Department of Energy's (DOE's) Efficient and Healthy Schools Campaign. Within the Building and Industrial Applications department, we are taking a leading role in the DOE's **Clean Energy to Communities** program and supporting Low and Moderate Income housing **adopt 50001 Ready** (developed and administered by Berkeley Lab in collaboration with DOE). Adapting our work to include a focus on communities and equity has not always been easy, but what makes me proud to be a member of BTUS is how we took on these challenges in earnest knowing that equitable decarbonization is a must.

The seeds for some of what you will read below were planted many years ago and sometimes by previous generations of BTUS staff. Research takes time to grow and evolve into deployable solutions. But that is where I think BTUS is at its best — dedicating ourselves throughout the RD&D cycle to bring to fruition technologies and solutions that efficiently and sustainably meet our energy demands. And where we may not have always had the foresight then to know what would be needed now, I am reminded of the Chinese proverb: The best time to plant a tree was twenty years ago, the second best time is today.

Happy reading!

Prakash Rao, Department Head, Building & Industrial Applications, BTUS Division

## NEWS

Help Schools Improve Their

## Energy Use and Indoor Air Quality

High-quality indoor air in the classroom is linked to better health and academic outcomes for students and teachers. The **U.S. Department of Energy's Efficient and Healthy Schools Campaign** is here to help our schools improve classroom air quality and cut building energy costs. The campaign provides participating schools with expert technical support and learning resources, and includes staff from Lawrence Berkeley National Laboratory's (Berkeley Lab) Energy Technologies Area who help design and administer this program.



The campaign is made possible by local volunteers, designers, engineers, consultants, service providers and program implementers. These supporters encourage local schools to participate, provide direct technical assistance to school staff, deliver supporting materials about energy performance and retrofits, and participate in a nationwide network of organizations focused on school facility upgrades. Last year, our program **recognized** 17 schools and districts from 15 states for achieving substantial energy savings and learning environment upgrades. **View the current list** of participating schools and supporters.

[Click here to join the campaign!](#)



### Monitor-Based Commissioning Can Cut Commercial Building Energy Use and Peak Demand

Monitoring-based commissioning (MBCx) is a process which monitors building system operations to identify and correct inefficiencies and thereby improve building energy performance over time. The process can optimize HVAC set points and locate and address problems such as stuck ventilation dampers or systems that needlessly operate when buildings are unoccupied. **Berkeley Lab research** found that energy savings pay back the costs of MBCx in an average of about two years. Many utilities and other efficiency program implementers are looking for new ways to save large amounts of energy as savings from lighting programs decline due to the rapid adoption of LED lighting. MBCx, often implemented with fault detection and diagnostics (FDD) technologies can help fill this gap.

Read more on the American Council for an Energy-Efficient Economy (ACEEE) **blog post** and **SmartEnergyAnalytics.org**.

### CalTestBed Solicitation Opens October 27!

CalTestBed accelerates the pipeline from innovation to commercialization by awarding entrepreneurs vouchers worth up to \$300,000 to test and de-risk their

technologies at one of more than 70 test beds across eight University of California campuses and Berkeley Lab. Since 2020, Berkeley Lab has received \$2.7M+ in funding from vouchers innovators have received to test their technologies. Applications for the next solicitation will be open from October 27th to November 22nd, 2023.



[Click here to apply!](#)

## Recently Launched Smarter Small Buildings Campaign

Small and medium sized buildings served by packaged rooftop HVAC units (RTUs) comprise the majority of commercial buildings in the United States. The recently launched **Smarter Small Buildings Campaign**, led by Berkeley Lab, offers technical assistance and recognition opportunities for adoption of RTU controls.



The Smarter Small Buildings Campaign helps building owners improve energy performance and occupant comfort through improved HVAC control and monitoring. If you are a building owner/manager looking to add controls or to enhance your use of existing controls, or if you are interested in gaining recognition for your achievements, Berkeley Lab wants to support you. We also partner with control technology vendors, utilities, HVAC contractors, and other organizations to promote scaled deployment of improved RTU controls. Check out the Campaign [website](#), and enroll [here!](#)



## Yuan Gao Places in SLAM Competition

Congratulations to Research Scientist **Yuan Gao**, who took home 3rd prize in the annual Berkeley Lab Research SLAM competition for **his presentation on Zero Energy Windows**.

See more: [slam.lbl.gov](http://slam.lbl.gov)

## AWARDS

### ETA's Energy Management System Team Received the 2023 R&D Team of the Year

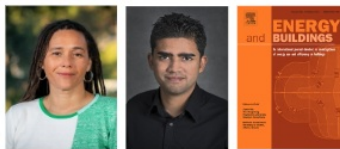
The Energy Management Systems Team received the R&D



100 Professional Team of the Year Award from R&D World for its ongoing international efforts to advance energy management business practices in the commercial, manufacturing, and institutional sectors. The team has collectively built on each other's strengths to make a profound impact in their respective fields. By leveraging their diverse academic and personal backgrounds, the team has created a technical program that reaches people working in all sectors of the economy. The team has published international standards, conducted original research, delivered technical assistance to organizations globally, developed professional workforce certification programs, and partnered with private and public sector organizations to accelerate the deployment of energy management business practices. The team's resources and practices have been adopted by tens of thousands of organizations worldwide, including large and small manufacturers, regional hospital groups, government agencies, schools and universities, and corporate and boutique hotel chains. To learn more about energy management system business practices, visit [50001Ready.lbl.gov](https://50001Ready.lbl.gov).



## Publication Awards & Recognition



### Best Research Paper Award

Jessica Granderson and Sam Fernandes received the Best Research Paper Award from the journal Energy and Buildings.

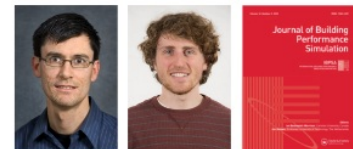
<https://doi.org/10.1016/j.enbuid.2017.11.039>



### Most Cited Article of All Time

Michael Wetter wrote the most cited article of all time in the Journal of Building Performance Simulation.

<https://doi.org/10.1080/19401493.2013.765506>



### Most Cited Article In The Last 3 Years

David Blum and Michael Wetter wrote the most cited article in the last 3 years in the Journal of Building Performance Simulation,

<https://doi.org/10.1080/19401493.2021.1986574>

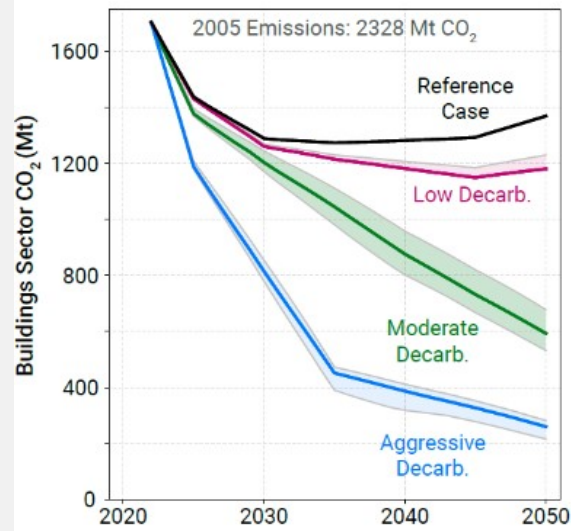
## FEATURED PUBLICATIONS

### Berkeley Lab & Brattle Chart Building Decarbonization Pathways to 2050

What would an efficient and decarbonized buildings sector look like in 2050? **A new study** from the U.S. Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Lab) quantified up to a 91% reduction in carbon emissions from buildings with a combination of energy efficiency, demand flexibility, electrification measures, and a decarbonized grid.

Learn more at [buildings2050.lbl.gov](https://buildings2050.lbl.gov)

## Building CO<sub>2</sub> Annual, Energy-Related



## PUBLICATIONS

- Langevin, J., Satre-Meloy, A., Satchwell, A., Hledik, R., Olszewski, J., Peters, K., Chandra-Putra, H. (2023) "Demand-side solutions in the US building sector could achieve deep emissions reductions and avoid over \$100 billion in power sector costs" [buildings.lbl.gov/publications/demand-side-solutions-us-building](https://buildings.lbl.gov/publications/demand-side-solutions-us-building)
- Hong, T., Malik, J., Krelling, A., O'Brien, W., Sun, K., Lambers, R., Wei, M. (2023) "Ten questions concerning thermal resilience of buildings and occupants for climate adaptation" <https://buildings.lbl.gov/publications/ten-questions-concerning-thermal>
- Gehbauer, C., Black, D., and Grant P. (2023) "Advanced control strategies to manage electric vehicle drivetrain battery health for Vehicle-to-X applications" [buildings.lbl.gov/publications/advanced-control-strategies-manage](https://buildings.lbl.gov/publications/advanced-control-strategies-manage)

Above is a sample of our recent publications. To find more, please visit [buildings.lbl.gov/publications](https://buildings.lbl.gov/publications).

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

**Jessica Granderson**, Interim Division Director, Building Technology & Urban Systems

**Tianzhen Hong**, Interim Deputy for Research Programs

1 Cyclotron Road, Berkeley, CA 94720

See also: Department of Energy [Building Technologies Office](#)

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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](http://science.energy.gov).

Energy Technologies Area, Berkeley Lab | Berkeley Lab, 1 Cyclotron Road, Berkeley, CA 94720

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