



BERKELEY CLIMATE MAP – Buildings FEB 2025

We encourage your inquiries, edits, and questions at bruceriodan@berkeley.edu and 510.306.0130

First	Last	Primary Affiliation	Summary	Selected Projects/Reports/Classes
Ed	Arens	CED - CEDR, CBE	<p>Director, Center for the Built Environment an industry/university cooperative research center focusing on commercial/institutional buildings.</p> <p>Arens has been principal investigator for a large number of state, federal, and industry grants addressing building energy performance, indoor environmental quality criteria, field monitoring procedures, and architectural aerodynamics.</p>	1) Health effects of high temperatures indoors 2) New devices and design techniques for increasing the use of fans for cooling building occupants 3) Protocols for measuring the performance of buildings, thermal comfort
Elliott	Campbell	Engineering	Campbell studies sustainable building technologies and the environmental impacts of urban infrastructure, with a particular focus on reducing the carbon footprint of buildings.	
	Center for Environmental Design Research (CEDR)	CED - CEDR	<p>Gail Brager, Director</p> <p>Building science is the largest of CEDR's programs. Its mission is to increase the scientific knowledge used in building design and operation. At Berkeley, building science specializes in environmental aspects of design-how to provide comfortable, healthy and productive conditions for the occupants in economical and energy-efficient buildings.</p>	

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			<p>CEDR supports several projects and centers, including:</p> <ul style="list-style-type: none"> • Center for the Built Environment (CBE): • Center for Resource Efficient Communities (CREC) • The Green Building Research Center (GBRC): • International Association for the Study of Traditional Environments (IASTE) 	
	Center for Resource Efficient Communities (CREC)	CED- CEDR	<p>Louise Mozingo, Director</p> <p>CREC is dedicated to supporting California's climate change and resource efficiency goals through interdisciplinary research, public communication, and professional outreach.</p> <p>CREC conducts cutting edge of climate change mitigation, energy efficiency, and water efficiency. Though focused on California, our work has implications for resource efficient planning everywhere.</p>	<p>Feasibility Study for Zero Carbon Buildings and Communities</p> <p>In Collaboration with UC-Berkeley Department of Civil and Environmental Engineering; Fehr and Peers; Resource Refocus; Energy Solutions; City of Richmond, CA</p> <p>Phase I of this project assesses the feasibility of building-scale transportation, water, solid waste and operational energy management strategies to supplement existing zero net energy (ZNE) goals to achieve zero carbon building in California. For each of six building types (single-family residential, multi-family residential, large office, strip mall, school, and warehouse), the research team quantified the potential for each identified building-scale strategy to reduce greenhouse gas (GHG) emissions below anticipated future baseline levels and then assembled those strategies as graphical “wedges” in a dynamic spreadsheet tool that can quantify zero carbon building potential for any location in California.</p> <p>Phase II will extend this analysis to include community-scale energy, transportation, water and waste strategies,</p>

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				<p>as potentially implemented in Richmond, CA, to analyze the feasibility of zero carbon communities in California.</p> <p>Evaluation of Transformative Climate Communities Program Investments</p> <p>In Collaboration with UCLA Luskin Center for Innovation and the California Strategic Growth Council</p>
	Center for the Built Environment	CED - CBE	<p>Ed Arens, Director</p> <p>CBE was founded under the National Science Foundation (NSF) Industry/University Cooperative Research Center program. The Center is supported and guided by a consortium of building industry leaders, including manufacturers, building owners, contractors, architects, engineers, utilities, and government agencies.</p>	<p>Embodied Carbon in the Built Environment</p> <p>Applying life-cycle assessment and other tools to advance the rapid decarbonization of buildings. Funded by the ClimateWorks Foundation. This project will provide design guidance, tools, and knowledge to building industry stakeholders and policymakers to support the rapid and wide adoption of strategies to reduce embodied carbon in the building sector.</p> <p>Mapping Commercial Building Electrification</p> <p>Case studies with a focus on electrification of large existing commercial buildings. The goals of this project are to: 1) develop an interactive map for tracking electrification projects throughout the world; 2) identify common attributes of retrofit and new construction projects; 3) identify best practices and the most salient challenges associated with electrification projects; and 4) facilitate industry outreach and information sharing among design and construction professionals pursuing electrification projects.</p>
Renee	Chow	CED	<p>Dean, College of Environmental Design</p> <p>CED includes 3 departments:</p> <ul style="list-style-type: none"> • Architecture • City + Regional Planning 	<p>Suburban Space: The Fabric of Dwelling (2002)</p> <p>Changing Chinese Cities: The Potentials of Field Urbanism (2015).</p>

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			<ul style="list-style-type: none"> • Landscape Architecture + Environmental Planning • Institute of Urban and Regional Development <p>Chow's Research: Metropolitan challenges of the 21st century — water volatilities, resource scarcities, and equitable communities — require solutions that are locally rooted. Chow has developed analytic and generative design tools for integrating local urban and architectural systems across sites and individual buildings.</p>	
Galen	Cranz	CED - Architecture	Professor Emerita of Architecture. Her research includes the sociology of design, with a focus on sustainable building practices and how architectural design can contribute to energy efficiency and climate resilience.	
Carlos	Duarte	CED – CEDR, CBE	Duarte's research interest includes radiant heating and cooling, occupant behavior impact on building energy consumption, and the development of tools that help various building stakeholders.	<p>Currently working on a project aimed to standardize semantic descriptions of equipment, control points, and locations along their relationships to make it easier to extract actionable information from the wealth of data that buildings' systems produce.</p> <p>He is also involved in projects that leverage existing IoT devices and sensor networks to minimize indoor air pollution inside homes.</p>
Paul	Fennell	Engineering – Mechanical Engineering	Fennell's research focuses on energy systems in buildings, particularly on improving the energy efficiency of heating, ventilation, and air	

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			conditioning (HVAC) systems, and integrating renewable energy sources into building designs.	
Ashok	Gadgil	Engineering	Gadgil works on energy efficiency in buildings, particularly in low-income settings, and is known for developing technologies that reduce the energy demand of buildings while addressing climate change.	
Marta	Gonzalez	Engineering	Gonzalez's research focuses on the energy consumption of urban systems, including buildings, and how data-driven approaches can optimize energy use to mitigate climate change.	
	Green Building Resource Center (GBRC)	CED - CEDR	<p>Edward Arens, Co-Director David Lehrer, Co-Director</p> <p>The GBRC was created to advance and promote sustainable building design and operation on the Berkeley campus and provide resources to aid other universities in similar efforts across California.</p> <p>The primary goals are to:</p> <ul style="list-style-type: none"> • Advance the University's educational mission in green building design. • Identify and advance opportunities for green building design and operation on campus. • Increase the availability of green building literature that addresses the unique needs of university campuses. 	

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Maria Paz	Gutierrez	CED - Architecture	<p>Gutierrez's research focuses on materials invention and cultures across scale lengths in regions under severe water stress and flood risk. Gutierrez has developed extensive multisectoral fieldwork in over fifteen countries of the Americas centered on advancing sustainability, health, and equity in construction.</p> <p>Bakar Fellows Program</p>	2023 UCOP Proposal: Biomass and Living Materials (BALM) for Regenerative Prefabricated Homes
Zoe	Hamstead	CED -- City and Regional Planning	<p>Hamstead's work focuses on environmental planning, sustainability, urban governance, and environmental justice, particularly in the context of climate change.</p> <p>Current and past research projects, practice, and service-learning courses include analysis of access to urban parks and ecological amenities, urban resilience scenario development, engaged community solar planning, and climate-exacerbated extreme heat management</p> <p>Climate Equity Environmental Justice Core Faculty</p>	<p>In Sensing and Sensitivity, she integrates experiential data on people's perceptions, subjectivities, capacities, and adaptive practices with objective measures of urban radiative temperature and other thermal indicators to understand residential thermal insecurities.</p> <p>2023 UCOP Proposal: Enhancing Climate and Housing Security in the cities of Richmond and Stockton</p> <p>Her recent co-edited volume entitled Resilient Urban Futures describes the processes of developing long-range planning capacities for climate resilience in 9 cities across Latin America, the Caribbean, and North America through six years of coordinated participatory scenario workshops.</p> <p>Teaching: CYPLAN 290 - Topics in City and Metropolitan Planning: Climate Justice Seminar SPRING 2022</p>
Tianzhen	Hong	LBNL -- Building Technologies and Urban	Deputy Head of the Building Technologies Department. He leads the Urban Systems Group and a team with research on data, methods, computing, occupant behavior, and policy for	<p>Projects:</p> <p>(1) Enhancing utility operations during heatwaves through large-scale sensing and data fusion,</p>

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		Systems Division	design and operation of low energy buildings and sustainable urban systems.	(2) Clean Energy to Communities , (3) Modeling and simulation of city building stocks to prioritize strategies to decarbonizing buildings .
Arpad	Horvath	Engineering -- Civil and Environmental Engineering	<p>Head of the Energy, Civil Infrastructure and Climate Graduate Program, Director of the Transportation Sustainability Research Center, and Director of the Engineering and Business for Sustainability Certificate Program.</p> <p>Horvath's research focuses on life-cycle environmental and economic assessment of products, processes, and services, particularly answering important questions posed about civil infrastructure systems and the built environment. He has conducted studies on the environmental implications of various products, processes and services, in particular, transportation systems, water and wastewater systems, buildings, concrete and other construction materials, pavements, and biofuel.</p>	<p>2023 UCOP Proposal: Life Cycle Analysis and Strategies for decarbonizing California Buildings with consideration to (and in light of) racial equity and housing affordability.</p> <p>CE268E Environmental Life-cycle Assessment (Fall 2023) CE11 Engineered Systems and Sustainability (Spring 2024)</p>
Charlie	Huizenga	CED -- CBE	<p>Thermal comfort/physiology modeling</p> <p>Personal comfort systems for energy efficiency and heat stress reduction</p> <p>Building energy use and efficiency</p>	<p>Establishing Maximum Thermal Conditions for California Residential Dwellings</p> <p>Policy Recommendations (developed with the UCB Center for the Built Environment) were delivered to the CA Legislature Feb 2025</p> <p>Recommends 82°F as the maximum safe indoor air temperature for CA residential buildings</p> <p>Recognizes the importance of air movement (e.g., fans) in allowing higher air temperatures</p>

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				Proposes consideration of new building standards, incentivizing passive and low-energy cooling strategies, and using future weather models for energy analysis
	Institute for Urban Infrastructure and Development (IURD)	CED -- City and Regional Planning	<p>Kristina Hill, Program Director.</p> <p>The Institute of Urban & Regional Development is an interdisciplinary academic and research unit dedicated to prioritizing justice in initiatives to understand, mitigate, and adapt to climate change.</p> <p>As a research hub, IURD acts as a catalyst for public and private investments in adaptation and resilience, and foster new models of community-engaged research with tangible outcomes.</p> <p>We seek outcomes that provide actionable insights for decision makers that increase environmental justice and social equity, and enhance the value and co-benefits of public investments over time.</p>	IURD's Kristina Hill is working with Mark Stacey (Engineering) to support City of San Rafael and the Canal Alliance to address sea level rise in the Canal District. This includes translation of research information.
Chris	Jones	RCNR - Energy and Resources Group	<p>Chris Jones is Director of the CoolClimate Network, a university-government-industry partnership at Berkeley. He also serves as faculty lecturer in the Haas School of Business, and Program Chair (13th year) of the Behavior, Energy and Climate Change Conference.</p> <p>Jones is a leading expert in carbon footprint analysis, the design of behavior-based programs and regional climate policy. In 2005, he published the first comprehensive carbon</p>	<p>CoolClimate Calculator: California Local Government Policy Tool: https://coolclimate.org</p> <p>UCOP Climate Action Award: Climate Action Planning Tools: Empowering Equitable Transitions for CA Communities FUNDED</p> <p>CoolClimate develops and evaluates programs to engage, educate, motivate and empower individuals to</p>

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			footprint calculator, which accounts for the greenhouse gas emissions of all transportation, energy, food, goods and services purchased by U.S. households. Versions of CoolClimate software have since been adopted by governments, businesses and non-governmental organizations throughout the United States and internationally. The research underlying these tools helps inform community and state-level climate policy. promising climate solutions.	take climate action. Examples include the Cool Campus Challenge and the CoolCalifornia Challenge. MBA/EWMBA 292T.14 - Carbon Footprint Analysis for Innovation FALL 2022
Dan	Kammen	RCNR – ERG	Works on renewable energy, energy efficiency, and climate change mitigation strategies, including energy systems in buildings. He has also led efforts to integrate clean energy technologies into building designs and urban environments.	
Tom	Kirchstetter	LBNL -- Energy Analysis & Environmental Impacts Division	<p>Director, Energy Analysis & Environmental Impacts Division</p> <p>EAEI conducts research on energy consumption and related impacts to inform policy, standards, and decision-making for the benefit of society and the environment.</p> <ul style="list-style-type: none"> • Environmental Science and Technology • Healthy and efficient buildings • Cal THRIVES toolkit • Technoeconomic and lifecycle modeling • Energy efficiency • Energy markets and policy • Renewable energy • Transportation systems • Research Facilities 	2023 UCOP Proposal: Wildfire Forest Recovery and Air Pollution Monitoring/Mitigation Using a Scalable Infrastructure

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			<ul style="list-style-type: none"> Tools <p>Kirchstetter's current research interests in air pollution science and technology include the evaluation of in-use performance of vehicle emission controls, environmental impacts of freight x and decarbonization, inventing and benchmarking air pollution sensors, air pollution monitoring in communities, climate and air pollution footprints of municipal solid waste-to-energy, and the drivers of airborne transmission of SARS-CoV-2.</p>	
Christian	Kohler	LBNL -- Building Technologies and Urban Systems Division	Kohler is the department head for Building Technologies. For over 20 years he has been involved in all aspects of building energy efficiency research such as simulation, measurement and technology development.	Kohler has been deeply engaged in software development for various windows related tools, e.g., THERM, WINDOW, and Optics5. He has also led the development of new technologies for highly insulating and dynamic windows.
Ronnen	Levinson	LBNL -- Building Technologies and Urban Systems Division	Levinson is the Leader of the Heat Island Group at LBNL. Within his research portfolio he develops cool roof, wall, and pavement materials; improves methods for the measurement of solar reflectance; and quantifies the energy and environmental benefits of cool surfaces.	
Paul	Mathew	LBNL - Building Technologies and Urban Systems Division	Paul Mathew is Department Head of Whole Building Systems at LBNL, where he conducts applied research and market transformation activities on energy use in buildings. His current work is focused on integrated building systems, energy epidemiology, benchmarking tools, and	

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			energy-related risk analysis for building valuation and resilience	
Alan	Meier	LBNL	His work includes research on energy use in appliances and buildings, energy efficiency, and strategies to reduce energy demand through smart technologies	
	Office of Sustainability and Carbon Solutions	Campuswide	Office of Sustainability and Carbon Solutions The Office of Sustainability serves as a leader for sustainability initiatives on campus. Established in 2008, the Office of Sustainability has motivated concern for environmental stewardship to actualized improvements. Because of our efforts via education, outreach, and committees focused on promoting awareness and engagement, sustainability principles now inform campus choices pertaining to building projects, water and energy savings, transportation, food offerings, supply purchasing, and more.	Berkeley Clean Energy Campus Berkeley is committed to surpassing the carbon reduction mandates set by California state regulations by achieving at least a 90% reduction in total emissions (scopes 1,2, and 3), relative to a 2019 baseline, by 2045. Berkeley's goals align with the 2023 update to the UC Sustainable Practices Policy, which has embraced more robust climate action targets. These revised goals emphasize direct emissions cuts and curtail reliance on carbon offsets. With target dates of 2028 for phase one and 2030 for phase two, Berkeley has a plan to replace their natural gas powered cogeneration plant with a new clean and green resilient energy system. This forward-thinking initiative will phase out fossil fuel use for powering, heating, and cooling campus. The new reproducible, scalable Berkeley Clean Energy Campus system will demonstrate state-of-the-art technologies and exemplify creative financing such that other campuses and public institutions can replicate Berkeley's model. For decades, Berkeley has led the world in climate solution technology and policy research. Now, the campus will begin transitioning to an energy system that sets the standard in sustainable, resilient infrastructure.

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Mary Ann	Piette	LBNL -- Building Technology and Urban Systems Division	<p>Division Director, Building Technology & Urban Systems (LBNL)</p> <p>Oversees Berkeley Lab's building technology research activities for the U.S. DOE which covers appliance standards, technology analysis and tools to accelerate deployment, new building technologies, modeling and analysis, commercial and residential building systems integration, grid interactive communications, and integration with EVs, storage and PVs.</p> <p>BTUS works closely with industry, government and policy makers to inform and develop building technology and urban systems that increase energy efficiency, save money and improve health and safety for building occupants. We engage in innovative and creative research to advance energy efficiency in the built environment, one of the world's most critical energy and environmental challenges because buildings are the world's largest energy-users.</p>	<p>Piette's most recent work is exploring how to accelerate decarbonization while ensuring equity and affordability.</p> <p>Programs: Windows and Daylighting FLEXLAB Lighting and Electronics Modeling and Simulation Indoor Air Quality High Tech and Industrial Design Science Energy Analytics Grid and Demand Response Cool Roofs and Walls Energy Financing</p>
Paul	Raftery	CED - CEDR, CBE	<p>Raftery's overarching purpose is to reduce carbon emissions from buildings, primarily focusing on HVAC systems. Deep hands-on experience in a range of areas: HVAC engineering, energy modeling, building automation systems and controls, fault detection and diagnosis, full-scale laboratory experiments, measurement and verification, machine learning, and software development.</p>	<p>Currently a Principal Investigator on two CEC research projects: one on reducing carbon emissions from existing commercial building HVAC systems and one on the low carbon affordable multifamily housing</p>

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Carolina	Reid	CED - IURD	Reid specializes in housing and community development, with a specific focus on access to credit, housing and mortgage markets, urban poverty, and racial inequality.	<p>Current projects with the Turner Center include research to understand the rising costs of construction in California, the benefits of affordable housing for low-income families, and the role of inequalities in mortgage lending post-recession on the racial wealth gap</p> <p>2023 UCOP Proposal: Housing Policy is Climate Policy: Aligning Affordability and Sustainability Goals</p> <ul style="list-style-type: none"> • Housing, land use policy and intersections with climate • The role of land use and housing policy in shaping GHG emissions, from embodied carbon to land conversion and transportation implications, including residential mobility • Building decarbonization, including benefits/risks to renters and low-income communities • Insurance, housing stock vulnerability to climate hazards • Linkages between climate and homelessness
Stefano	Schiavon	CED - Architecture, CEDR,	<p>Schiavon's research is focused on finding ways to reduce energy consumption in buildings while improving occupant health, well-being and productivity. He has researched sustainable architecture, air conditioning and occupant satisfaction.</p> <p>Recent research on use of fans to reduce AC demand and cool non-AC building spaces</p>	<p>CBE Thermal Comfort Tool is a free online tool for thermal comfort calculations</p> <p>Heat stress — a Python library for thermal comfort and heat stress calculations,</p> <p>Building energy use and efficiency — metrics for the design and assessment of resilient buildings, air distribution, radiant systems</p> <p>Building Energy Simulations ARCH 246 001 FALL 2021</p> <p>Arch 140 Energy and Environment SPRING 2024</p>

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Kenichi	Soga	Engineering - Civil and Environmental Engineering	The Soga Research Group is a multi-disciplinary organization with expertise in infrastructure monitoring & resilience, computational geomechanics, city-scale modeling, and artificial intelligence as it applies to construction and infrastructure management.	Sustainability and Resiliency Engineering for ALL Proposal for Smart Infrastructure Center – a holistic collaborative environment with the water industry for infrastructure, water supply, climate change, water and wastewater operations, and emergency/community preparedness. UCOP \$100M Climate Action LOI lead – January 2023 Climate Resilient Watershed Management for Multiple Benefits
Margaret	Taylor	Haas, LBNL	Research Scientist at the Haas School of Business and LBNL. She investigates policy and innovation for energy efficiency in buildings and has worked on how technologies and policies interact to reduce energy consumption and greenhouse gas emissions in the built environment.	
Neyran	Turan	CED-Architecture	Turan's work draws on the relationship between geography and design to highlight their interaction for new aesthetic and political trajectories within architecture and urbanism. Her current work speculates on the role of architectural representation in relation to climate change and on new conceptions of the ordinary and the familiar in architecture.	
Max	Wei	LBNL - Energy Analysis and Environmental Impacts Division	Wei's projects are with the Energy Efficiency Standards Group, as well as with the Sustainable Energy Systems Group.	Wei is conducting a multi-year study of extreme heat in Fresno vulnerable communities. Wei and LBL have developed CAL-THRIVES – A California Toolkit for Heat Resilience in Underserved Environments.

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Catherine	Wolfram	Haas	Professor at the Haas School of Business and faculty affiliate at the Energy Institute at Haas. Her work includes studying energy efficiency in residential and commercial buildings and the economic impacts of energy policies aimed at reducing carbon emissions.	
Junqiao	Wu	Engineering-Materials Science and Engineering	The Wu group at UC Berkeley / LBNL is focused on manipulation and optimization of thermal energy at large scales, such as in buildings. We develop material coatings that keep a surface cool in the summer and warm in the winter at zero consumption of electricity and natural gas.	New smart roof coating enables year-round energy savings.
Nan	Zhou	LBNL- China Energy Group, Building Technology & Urban Systems Division	<p>Zhou is Head of the International Energy Analysis Department, and Lead of the China Research Program at LBNL.</p> <p>Zhou is also the Technical Program Lead for the Net Zero World Action Center, an initiative launched by the U.S. government to work with countries to implement their climate ambition pledges and accelerate transitions to net zero, resilient, and inclusive energy systems. In addition, she is a Co-Chair of the Academic Advisory Committee of California -China Climate Institute.</p>	Zhou received the Outstanding Research and Contribution Prize for her 2019 publication in Applied Energy entitled, A roadmap for China to peak carbon dioxide emissions and achieve a 20% share of non-fossil fuels in primary energy by 2030, led a Berkeley Lab team.