



**CALIFORNIA ENERGY  
RESEARCH CENTER**  
CSU BAKERSFIELD™

# **Carbon Management and Energy Innovation Technical Symposium**

**PROGRAM AND AGENDA**

**April 12, 2024**

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**CSU BAKERSFIELD**

# Carbon Management and Energy Innovation Technical Symposium

**HOSTED BY THE**



**CALIFORNIA ENERGY  
RESEARCH CENTER**  
CSU BAKERSFIELD™

**MAIN EVENT**

**April 12, 2004, 8:00 am – 3:00 pm**

**HYBRID EVENT**

Limited In-Person Participation and FREE LIVE WEBINAR

**TO VIEW THE WEBINAR:**

**<https://csub.zoom.us/j/89497517128>**

For more information contact Tony Rathburn at  
arathburn@csub.edu or Liaosha Song at lsong1@csub.edu

## **SYMPOSIUM ORGANIZING COMMITTEE**

Dr. Anthony Rathburn, California Energy Research Center

Dr. Liaosha Song, Department of Geological Sciences

Dr. Jane Dong, Dean of School of Natural Sciences, Mathematics and Engineering

Dr. Kristen Watson, Chief of Staff and Dean of Extended Education and Global Outreach



The California Energy Research Center (CERC) at California State University, Bakersfield, in partnership with the Livermore Lab Foundation, is proud to host the 2024 CERC Carbon Management and Energy Innovation Symposium. A wide range of sponsors are helping to make this annual event possible, including presenting sponsor, Chevron.

Once again this year, we have organized an exciting, diverse array of speakers and panelists to address carbon management issues and energy innovations of regional and national importance. The CERC Carbon Management and Energy Innovation Symposium will feature panels of experts that will discuss topics associated with California's Direct Air Capture (DAC) Hubs, the challenges of regional subsurface storage and company strategies to decarbonize. Dynamic Symposium speakers will cover issues that include the costs and benefits of carbon removal, gas infrastructure transport from source to storage, community benefit plans, carbon management policies and carbon mineralization. Speakers and panelists will include experts from academia, the private sector and government.

CERC is involved in a broad spectrum of projects in the region, including those associated with microgrids, battery minerals, biofuels, community education about climate change and the energy transition and CO<sub>2</sub> and hydrogen storage, among many others. For the CERC Symposium, we want to continue to expand our coverage of important, diverse, energy-related innovations, opportunities and challenges that are relevant to the Central Valley and beyond.

# AGENDA

Friday, April 12, 2024, Student Recreation Center

**8:00 am** **Welcome and Continental Breakfast**

**8:00 am - 2:30 pm** **Poster Session - CSUB Student Research**

Booths showcasing regional organizations and companies.  
*Location: Solario de Fortaleza*

**8:15 am** **Welcome and Introductions**

Dr. Liaosha Song, Director of California Well Sample Repository  
Dr. Jane Dong, Dean of Natural Sciences, Mathematics and Engineering, CSUB  
Dr. Vernon B. Harper Jr., Interim President, CSUB  
*Location: Student Rec Center*

**8:40 am** **Keynote Session: Roads to Removal: A Comprehensive Assessment of Carbon Dioxide Removal Options in the United States**

Speaker: Jennifer Pett-Ridge, Lawrence Livermore National Lab

**9:20 am** **Panel - Storage Underground: Innovations, Challenges and Opportunities**

Panelists: Matt Herman (CSUB), Rob Trautz (Electric Power Research Institute), Mike Umbro (Premier Resource Management)  
Moderator: Lisa Alpert (Aera Energy)

**10:00 am** **Coffee Break / Networking / Poster Session Presentations / Booths**

Posters sessions and booths available for viewing.  
*Location: Solario de Fortaleza*

**10:30 am** **Panel - DAC Hubs: Innovative Energy Solutions**

Panelists: Jonathan Dethloff (Aera Energy), Ken Haney (California Resource Corporation), Louise Bedsworth (UC Berkeley), Alexei Vyssotski (Chevron New Energies) Moderator: Preston Jordan (Lawrence Berkeley National Lab)

**11:10 am** **Presentation: Building Together: Advancing Community Benefits in California**

Speaker: Ann Rogan, Edge Collaborative

**11:30 am** **Panel: Energy Innovations and Decarbonization: Internal and External Company Strategies**

Panelists: Melinda Palmer (Kern Energy), Meghan Kenny (CarbonCapture Inc.);  
Moderator: Nyakundi Michieka (CSUB)

**12:00 pm** **Presentation - Carbon Mineralization in California**

Speaker: Briana Schmidt, Lawrence Livermore National Laboratory

(continued on next page)



# AGENDA (continued)

**12:20 - 1:30 pm**    **Lunch Break / Networking**

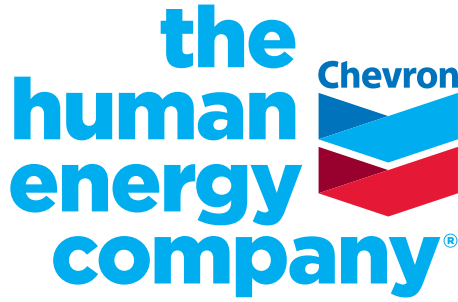
**1:30 pm**    ***Panel: Hydrogen Storage: Innovation, Challenges and Opportunities***  
Panelists: Wesley Lien (Novohydrogen), Nico Bouwkamp (GTI Energy)  
Mallika Mukundan (Chevron New Energies, Hydrogen)  
Moderator: John Thompson (California Council of Science and Technology)

**2:00 pm**    ***Presentation: Quantifying and Reducing Subsurface Risk in CO<sub>2</sub> Storage Projects***  
Speaker: Creties Jenkins, ROSE Subsurface Assessment

**2:20 pm**    ***Presentation: The Role of Connective Infrastructure for Carbon Management***  
Armando Infanzon, Southern California Gas Company

**2:40 pm**    **Closing Remarks**  
Dr. James Rodriguez, Interim Provost and Vice President for Academic Affairs, CSUB  
Dr. Liaosha Song, Director, California Well Sample Repository

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## Jennifer Pett-Ridge

*Distinguished Member of the Technical Staff, Lawrence Livermore National Laboratory*



Jennifer Pett-Ridge is the lead author of Roads to Removal [roads2removal.org], a comprehensive assessment designed to help the United States identify pathways and opportunities to reach carbon neutrality by 2050. She is a distinguished member of the technical staff at Lawrence Livermore National Laboratory (LLNL), a federally-funded, multi-disciplinary science and research facility in California. She is also an adjunct professor at the University of California, Merced and a principal investigator of the University of California, Berkeley Innovative Genomics Institute. Dr. Pett-Ridge studies the microbiology and biogeochemistry of soil carbon cycling, and how to achieve CO<sub>2</sub> removal (CDR) in agricultural soils. In her research, she uses advanced metagenomics, stable isotope tracing and computational modeling to make quantitative

estimates of ecosystem processes. She leads multiple team projects for the US Department of Energy, including the Microbes Persist Soil Microbiome Scientific Focus Area, the DOE Terraforming Soil Energy Earthshot Research Center and the LLNL Carbon Initiative.

## Ann Rogan

*Founder/CEO, Edge Collaborative*



Ann currently leads Edge Collaborative—a civic incubator whose mission is to invest in community ventures that build a more participatory, inclusive economy. Edge operates a wide-ranging portfolio across workforce, climate and community wealth. Most recently, Ann served as a senior advisor in local government in Stockton, CA. During her three years at city hall, she led an economic innovation team that built new capabilities inside the city and community—setting Stockton, CA on a course to marshal \$60M+ in public sector investments focused on climate. Her past work in emerging markets has spanned sectors including education, healthcare, clean energy and digital identity. Previously, Ann co-founded two companies in renewables and additive manufacturing. In 2016, she served on the Government of Estonia's e-Residency Advisory Group

to advance digital entrepreneurship. Prior to that, she led the team responsible for global product strategy at a tech incubator in Silicon Valley. Ann earned a B.A. from McGill University in International Development and English Literature.

## Briana Schmidt

*Group Leader, Energy & Carbon Management, Lawrence Livermore National Laboratory*



Briana's focus areas include geologic sequestration of carbon dioxide and carbon mineralization. She is PI of the first and largest-of-its-kind DOE-funded field trial of carbon mineralization of ultramafic mine tailings, at the former KCAC asbestos mine in San Benito County, CA. Briana has over a decade of experience working at the intersection of science and public policy, including work to advance climate solutions while reducing environmental impacts. Briana's background is in petroleum geology, where she worked on projects including shale gas, tight gas sands and CO<sub>2</sub>-enhanced oil recovery.

## Creties Jenkins

*Partner, Rose Subsurface Assessment*



Creties Jenkins is a geological engineer with ROSE Subsurface Assessment and has over 35 years of global experience in petroleum exploration, appraisal and development. Over the last three years, he and his colleagues have focused on CCS subsurface risk analysis resulting in 1) the deployment of a project risking tool called CarbonSureRA, 2) a published paper titled "Long Term Risk Assessment of Subsurface Carbon Storage: Analogues, Workflows, and Quantification" and 3) the development of a new training course called Quantifying Risk, Uncertainty and Chance in CO<sub>2</sub> Storage.

## Armando Infanzon

*Director of Clean Energy Business Development, Southern California Gas Company*



Armando Infanzon has served as director of clean energy business development for Southern California Gas Company since June 2020. Mr. Infanzon is responsible for advancing several low carbon initiatives including carbon capture, utilization and sequestration, renewable natural gas, distributed energy resources, microgrids and research, development and demonstration. Prior to joining SoCalGas, Mr. Infanzon served as director of operations for Peru at Sempra Energy International between 2014-2020. Between 2011-2014, Mr. Infanzon was smart grid policy manager for San Diego Gas & Electric working on several grid modernization initiatives including energy storage. Mr. Infanzon joined Sempra in 1998 and had several positions of increasing responsibility.



**MORNING PANEL:****Storage Underground: Innovations, Challenges and Opportunities****Matt Herman**

*Assistant Professor in Department of Geological Sciences, CSU Bakersfield*



Dr. Matt Herman's research interests are in using the tools of geophysical observations and geodynamic modeling to understand the processes that deform the Earth, from naturally occurring tectonics to human activities. Energy sits at the intersection of these disciplines, as the formation and evolution of geological structures are major factors in how energy resources can be safely obtained and stored. Dr. Herman received his B.A. in geology and physics from Amherst College, and his M.S. and Ph.D. degrees in geosciences from Pennsylvania State University.

**Rob Trautz**

*Senior Technical Executive, Electric Power Research Institute (EPRI)*



Rob is a senior technical executive with 40 years of experience in hydrogeologic research associated with transport and underground storage of CO<sub>2</sub>, natural gas and hydrogen, radioactive-waste disposal, vadose zone and groundwater remediation and geothermal energy production. He leads EPRI's underground CO<sub>2</sub> storage program and co-leads the Low Carbon Resources Initiative (LCRI) Technical Subcommittee for Delivery and Storage of Alternative Energy Carriers (AECs). The LCRI is a multi-year, \$1 SOM industry-funded research initiative focused on large-scale deployment of CCS and AECs in hard-to-decarbonize sectors of the economy beyond 2030. As the Principal Investigator for several past and present CO<sub>2</sub> storage demonstration projects, Rob has extensive experience leading large, diverse research teams and managing multi-million-dollar, DOE-funded research grants.

**MORNING PANEL:****Storage Underground: Innovations, Challenges and Opportunities****Mike Umbro***CEO, Californians for Energy & Science; Partner, Premier Resource Management*

Mike was born and raised in San Diego where he currently enjoys living the beach life with his awesome wife and three kiddos. Mike is an environmental leader, geothermal energy developer and proud Californian.

Mike founded FieldView Capital in 2008, which supports domestic energy projects with investment banking services. In 2018, Mike partnered with Premier Resource Management in Bakersfield, CA. PRM is developing a 400MW Geological Thermal Energy Storage (Geo TES) project on the west side of the San Joaquin Valley.

Mike founded Californians for Energy & Science in 2022 to study the environmental and economic benefits of locally-produced energy.

**Lisa Alpert***Senior Geologist, Water Resources Management, Aera Energy LLC*

Dr. Lisa Alpert has worked at Aera Energy as an asset geologist and exploration geophysicist since completing her Ph.D. in 2012. She also has been working in the regulatory space since 2018. Her current focus is hydrogeology and groundwater monitoring and management—as well as regulatory support for Aera's field assets and carbon team, support for outside consultants involved in SGMA and basin plan amendments. Dr. Alpert is an adjunct professor at CSUB and Chaffey Community College. The future of the San Joaquin Valley lies in the conversion of the focus of infrastructure and expertise from hydrocarbons to renewable resources and CCS projects. Dr. Alpert sees her role in this transformation as a technical bridge between the reservoir and the regulator.

## MORNING PANEL: DAC Hubs: Innovative Energy Solutions

### Ken Haney

*Strategic Advisor, Carbon Management, California Resources Corporation (CRC)*



Ken Haney is the strategic advisor on carbon for California Resources Corporation (CRC). Ken has 37 years of experience in upstream exploration and production with CRC, Chevron, Occidental Petroleum and Texaco. He has worked as a technical engineer, manager and asset VP on projects and reservoirs in California, West Texas, New Mexico, Alberta (Canada) and Columbia. His breadth of technical focus includes miscible and immiscible gas injection, thermal EOR and primary operations in shale, elastic and carbonate reservoirs.

Specifically related to carbon management, Mr. Haney was the Reservoir Management Team Leader overseeing the Elk Hills CO<sub>2</sub> target reservoirs for the 2010-12 Hydrogen Energy California (HECA) Carbon Capture, Utilization and Storage (CCUS)/EOR joint project between Occidental Petroleum and SCS Energy LLC. Ken has worked in his current role, developing CRC's carbon management business and energy management transition opportunities, since January 2018.

Mr. Haney holds a B.S. in geology from California State University, Bakersfield and an M.S. in petroleum engineering from the University of Southern California.

### Jonathan Dethloff

*Carbon Strategy & Technology Manager, Aera Energy*



Jonathan Dethloff is the carbon strategy and technology manager for Aera Energy, with over 15 years of experience in the California oil and gas industry. He oversees Aera's carbon project portfolio and strategic initiatives, including the Aera Direct Air Capture (DAC) Hub and the Carbon Frontier carbon capture and storage (CCS) projects in Kern County. Through pursuing DAC, CCS, and solar at its assets, Aera hopes to advance its goals of continuing to provide needed oil and gas to California in a lower carbon manner, while also providing energy transition services critical to the state's climate goals.

## MORNING PANEL: DAC Hubs: Innovative Energy Solutions

### Louise Bedsworth

*Executive Director at the Center for Law, Energy and the Environment,  
University of California, Berkeley*



Louise Bedsworth is the executive director at the Center for Law, Energy, and the Environment (CLEE) at the University of California, Berkeley, where she also serves as a senior advisor to the California China Climate Institute. Before joining CLEE, she spent nearly a decade working for the State of California, most recently as the executive director of the Strategic Growth Council. This cabinet-level state institution brings together multiple agencies and departments to support sustainable communities, emphasizing strong economies, social equity and environmental stewardship. While with the state, Louise also served as the deputy director of the Office of Planning and Research in Governor Jerry Brown's office. Louise is a member of the Board on Energy and Environmental Systems at the National Academy of Sciences. She was a Commissioner

on the California100 Commission and served as an inaugural policy fellow at Elemental Excelsior's Policy Lab. Louise received a Science in Public Service Award from the California Council on Science and Technology in 2020. Prior to her work with the state, Dr. Bedsworth was a research fellow at the Public Policy Institute of California, where her work focused on climate change adaptation, local government action on climate change and transportation. She has also held positions at the Union of Concerned Scientists, Redefining Progress and the International Institute of Applied Systems Analysis.

Louise received a B.S. in earth, atmospheric, and planetary sciences from the Massachusetts Institute of Technology and an M.S. in environmental engineering and Ph.D. in energy and resources from the University of California at Berkeley.



## MORNING PANEL: DAC Hubs: Innovative Energy Solutions

### Alexei Vyssotski

*General Manager, Carbon Capture, Utilization and Storage, Chevron New Energies*



Alexei V. Vyssotski is a general manager of Carbon Capture, Utilization and Storage (CCUS) for Chevron New Energies. In this role, he leads a team focused on deploying CCUS solutions to accelerate progress toward the lower carbon ambitions of Chevron and its customers. Alexei has a keen interest in the environment, safety and has a high regard for practical science that improves the quality of life. Alexei is often described as a “strategy translator,” as he adeptly leads teams to convert aspirational goals into reality while working with complex technical, business and geopolitical challenges. Over Alexei’s 23-year career with Chevron, he has held numerous leadership and technical positions in exploration, appraisal, asset development, operations and strategy, with assignments in the United States and overseas. His experience includes Gulf of Mexico deep water assets, conventional and shale and tight assets in the Permian Basin, waterfloods and CO<sub>2</sub> floods,

asset development of heavy oil in Venezuela, as well as exploration and appraisal across multiple geographies. Alexei joined Chevron in 2000 as a geologist in Houston, Texas. He has a bachelor’s degree in geology from Sam Houston State University and a master’s degree in geology from Rice University. Today, Alexei finds his role with Chevron New Energies to be a perfect intersection of the environment, practical science and complexity as he works to help advance a lower carbon future.

### Preston Jordan

*Principal Scientific Engineering Associate, Lawrence Berkeley National Laboratory*

Preston’s research focus is deep subsurface fluid engineering, including geologic carbon sequestration, well integrity, well stimulation, underground gas storage and, recently, underground hydrogen

storage. He has published on well and fault leakage risk and co-authored risk reviews of geologic carbon sequestration, well stimulation and underground natural gas storage, the last two for the State of California. His risk assessment of one of the world’s first commercial-scale geologic carbon storage projects led to a reduction of its injection pressure. The California Air Resources Board adopted his methodology for estimating the methane mass from the well SS-25 blowout in the Aliso Canyon natural gas storage field. The Board also adopted most of the recommendations he co-authored for its geologic carbon sequestration protocol. He reviews components of geologic carbon sequestration project certification applications for the Air Resources Board and Class VI permit applications for the U.S. Environmental Protection Agency.



## MORNING PANEL: Energy Innovations and Decarbonization: Internal and External Company Strategies

### Melinda Palmer

*Vice President, Regulatory and Public Affairs, Kern Energy*



Melinda Palmer is the vice president of regulatory and public affairs for Kern Energy and has been with the Kern Energy team since 2011. She is one of California's leading experts on renewable, low-carbon fuel production and a trusted voice that recognizes the importance of building partnerships that drive industry innovation, support job creation and improve the environment. As vice president, she develops strategy and leads advocacy and engagement with agencies, elected leaders, trusted community partners and organizations.

Prior to joining Kern Energy, Palmer served in regulatory compliance positions with Shell Oil and Big West of California, leading a team of health, safety and environmental professionals responsible for the development and implementation of compliance strategies. Palmer also oversaw internal audits on the effectiveness of compliance policies and served as a liaison between leadership, personnel, agencies and key stakeholders.

Palmer currently serves on the California State University, Bakersfield (CSUB) Foundation board, the Board of Trustees for the Bakersfield Ronald McDonald House, is an active member of the AB617 Arvin-Lamont Community Steering Committee and has been a Runner Alumni Mentor Program mentor for CSUB.

### Meghan Kenny

*Director of Strategy & Projects, CarbonCapture Inc.*



Meghan is the director of strategy and projects for CarbonCapture Inc., a direct air capture (DAC) technology and project development company. She is focused on project deployment and CarbonCapture's energy strategy. In prior positions, Meghan has worked as both a management consultant for Bain & Company and as a chemical process and project engineer for Johnson Matthey.

## MORNING PANEL: Energy Innovations and Decarbonization: Internal and External Company Strategies

### Nyakundi Michieka

*Associate Professor, Department of Economics, California State University, Bakersfield*



Dr. Nyakundi Michieka is a professor in the department of Economics at California State University, Bakersfield (CSUB). He also serves as the director for the Center for Economic Education and Research at CSUB. His primary research involves energy, environmental economics and regional economics. Nyakundi has presented his work at various conferences and has more than 33 research publications appearing in *Energy Economics*, *The Applied Energy journal*, *Energy Policy journal*, *The Economic Modelling journal* and *The Economic Analysis and Policy journal*. He also has three book chapters and several working papers.

Nyakundi's current work looks at the long- and short-run effects of oil prices on Kern County's economy. Other research areas focus on the energy-water nexus. He also reports on current economic trends in Kern County in CSUB's *Kern Economic Journal*. Nyakundi has worked with faculty to raise \$1.4 million for research-related activities for CSUB, and is currently working with several students on these projects.

Nyakundi grew up in Kenya before coming to the U.S. He obtained his undergraduate degree in mechatronic engineering from Jomo Kenyatta University of Agriculture and Technology in Kenya before pursuing a masters degree from East Stroudsburg University of Pennsylvania. He then received his Ph.D. in natural resource and environmental economics from West Virginia University. Nyakundi was the recipient of the 2019 Promising New Faculty Award and is a E. Kika De LaGarza Fellow.

## AFTERNOON PANEL:

## Hydrogen Storage: Innovation, Challenges and Opportunities

## Wesley Lien

*Senior Director of Business Development, NovoHydrogen*



Wes is a climate tech professional with ten years of experience developing, financing, constructing and operating renewable energy facilities around the world. Prior to joining the hydrogen industry he worked at leading renewable energy developers, during which time he successfully financed and constructed close to 1,000 megawatts of wind, solar and transmission assets, at a total value of over \$1 billion, in the United States, Canada, Mexico and Japan. Wes has spent the past two years focused on green hydrogen project development in North America. He brings to the emerging hydrogen sector a deep skillset in power and infrastructure, and is leveraging his expertise to lead the commercial deployment of novel climate solutions to decarbonize hard-to-abate sectors.

## Nico Bouwkamp

*Business Development Manager H2, GTI Energy*



Nico Bouwkamp has spent more than 19 years contributing his extensive knowledge of hydrogen and fuel cell-related issues to GTI Energy, Frontier Energy and CaFCP/H2FCP's strategic leadership, stakeholder facilitation, and public education efforts. Nico is skilled at managing cross-functional project teams, and communicating complex, technical concepts to diverse audiences. He works effectively with energy, automotive, trucking, government, and fuel cell technology sector clients. He also performs technical and regulatory data analysis and helps develop resources to support automotive, stationary, energy and fueling industry client initiatives. He earned a M.S. in business management, management of mechnology and innovation from the Erasmus University Rotterdam, the Netherlands.



## AFTERNOON PANEL:

## Hydrogen Storage: Innovation, Challenges and Opportunities

## Mallika Mukundan

*Mallika Mukundan, Commercial Manager, Hydrogen, Chevron New Energies*



Mallika Mukundan began her career over fifteen years ago as a fuels research engineer. Over the course of her career, she has grown into positions of increasing responsibility in technical/ analytical, strategic and commercial capacity within Chevron. She has broad experience in fuels, applying corporate finance principles and performance benchmarking to oil/gas extraction projects. More recently, her roles have taken on challenges and opportunities in Chevron's lower carbon and energy transition journey, first in the corporate strategy and sustainability group building out Chevron's carbon management program, then as a key advisor supporting the Chevron Shipping Company managing IMO carbon compliance. Mallika is currently the commercial manager supporting the Chevron New Energies business in building a lower carbon business in hydrogen. Mallika received her bachelor's degree in mechanical

engineering from Maharaja Sayaji Rao University (India) and her master's degree, also in mechanical engineering, from Texas A&M University. She has an MBA from the Wharton School of Business at the University of Pennsylvania. Prior to Chevron, she has brief experience as a performance engineer with the Cummins Engine Company. In her free time, Mallika likes to explore San Francisco Bay Area hikes with her kids and dog.

## John Thompson

*Senior Science Officer, California Council of Science and Technology (CCST)*



John Thompson is a senior science officer with the California Council on Science and Technology covering partner engagement. In this role, John works closely with CCST's 12 academic and research partner institutions, connecting the expertise at these institutions to CCST's science services and elevating their cutting-edge research within the policymaking community. He also supports the CCST team in the delivery of its science services, including expert briefings, workshops and other convenings.

Prior to working for CCST, John was a consultant with the Senate Office of Research, where he provided research support for the California State Senate on a wide variety of topics, including banking, cannabis, occupational licensing, taxation and technology. He was previously a CCST Science and Technology

Policy Fellow in the office of Assemblymember Jay Obernolte. John received his Ph.D. in materials science and engineering from Northwestern University.



## CALIFORNIA ENERGY RESEARCH CENTER CSU BAKERSFIELD™

### **The California Energy Research Center (CERC)**

CERC expands the capabilities of CSUB faculty, research scientists, post-doctoral researchers and students to conduct research on sustainable and affordable energy production and its impacts in the region, the state of California and beyond. CERC convenes energy experts in interdisciplinary teams to conduct research relevant to carbon and hydrogen storage, water, wind, solar, petroleum and biofuel in Kern County. Additionally, CERC provides information to the community about energy and water issues in the Central Valley.



Founded in 1952, Lawrence Livermore National Laboratory (LLNL) is a Department of Energy multi-disciplinary science and research facility providing solutions to our nation's most important national security challenges. The Lab's Carbon Initiative focuses on innovations and opportunities in climate resiliency and carbon management. In 2020, LLNL's seminal report, *Getting to Neutral*, set the stage for how California might reach carbon neutrality by 2045. In December 2023, LLNL, along with scientists from a dozen institutions, released *Roads to Removal*, a comprehensive assessment as to how the United States could chart a path to net-zero by 2050. The Livermore Lab Foundation, a 501(c)(3) nonprofit, serves as a primary philanthropic partner to LLNL, supporting the Lab's fundamental science, research, community partnerships, and outreach programs.





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