The First Cleantech Accelerator

Unique insights presented by the next generation of cleantech leaders

Annual Symposium
December 6, 2019

Spieker Forum, 6th Floor, Chou Hall
Haas School of Business
University of California, Berkeley
Welcome to the C2M Symposium!

The Haas School of Business is dedicated to reducing our carbon footprint and Chou Hall is a Zero Waste building. We need your help to reduce, reuse, recycle, and compost. There are no landfill bins in Chou Hall except for small receptacles in the women's restroom.

If you have questions, please ask building staff or caterers. If you bring in anything that you need to dispose of in a landfill bin, please dispose of it before you enter Chou Hall or pack it out to a landfill bin in the Haas Courtyard.
Agenda

8:00am  CHECK-IN & NETWORKING WITH LIGHT BREAKFAST

9:00am  WELCOME REMARKS

   Brian Steel, Director, Cleantech to Market
   Rich Lyons, Chief Innovation and Entrepreneurship Officer,
   University of California, Berkeley

9:30am  MORNING PRESENTATIONS

   9:30    Takachar
   10:00   Cypris Materials

10:30am MORNING BREAK & NETWORKING

11:00am MORNING PRESENTATIONS

   11:00   PARC
   11:30   Noble Thermodynamics

12:00pm LUNCHTIME KEYNOTE

   Janea Scott, Vice Chair, California Energy Commission

12:15pm LUNCH & NETWORKING

1:15pm  AFTERNOON PRESENTATIONS

   1:15    Brimstone Energy
   1:45    EnZinc
   2:15    Noon Energy

2:45pm  AWARDS VOTING & PRESENTATIONS

3:00pm  RECEPTION

4:00pm  PROGRAM CONCLUDES
Dynamic Partnerships

Cleantech to Market (C2M) is a partnership between graduate students, entrepreneurs, researchers, and industry professionals to help accelerate the commercialization of emerging cleantech. In the process, C2M also develops the next generation of innovative cleantech leaders.

Entrepreneurs & Researchers
C2M first identifies promising cleantech solutions from (1) existing startups, (2) accelerators & incubators such as Cyclotron Road and Cleantech Open, (3) government-sponsored programs, including those funded by the U.S. Department of Energy and the California Energy Commission, and (4) top-tier universities such as UC Berkeley, Stanford, Caltech, Princeton and MIT.

Graduate Students
C2M then handpicks graduate students from over 20 UC Berkeley disciplines, including business, engineering, science, law, policy, and the Energy and Resources Group. C2M strategically matches their academic and work experience with each project, forming teams of four to six students.

Cleantech Professionals
C2M supports the teams with leading cleantech professionals who bring deep subject matter expertise (e.g., batteries and related components and controls, electric grid operations, economics, early-stage venture). They help guide the students as speakers, mentors, and contacts.

Innovation in Action!
The result is 1,000 hours of technology evaluation and market assessment for each project. Students experience the rewards and challenges of taking cleantech innovations to market; entrepreneurs and researchers gain valuable market feedback on their technologies and business plans; and professionals engage with fresh talent and new ideas.
THANK YOU
Sponsors & Partners

Berkeley Haas
Energy Institute at Haas

The Bernstein Family

The Bullard Family

The Crousse Family

Rebekah Helzel

Cristian Sjogren

Cyclotronroad

Lawrence Berkeley National Laboratory

State of California Energy Commission

Clean Tech OPEN

LACI

Berkeley Energy & Resources Collaborative

Department of Energy, United States of America

CalSEED

arpa-e

Saratoga Energy

California Clean Energy Fund

Cleantech Group

CITRIS Foundry

Wilson Sonsini
Brian Steel is Lead Director of the Cleantech to Market program to which he brings 30 years of business innovation and leadership experience. He is a repeat member of the Haas "Club of 6" for teaching excellence. Brian is a member of the external advisory board of the Innovation Incubator (a Wells Fargo/NREL joint venture). He is also a member of the investment advisory board of the Commonwealth Energy Fund.

In addition, Brian continues to serve as an advisor to the Department of Energy, working on both renewable energy financing and solar initiatives. Previously, he was Senior Advisor to the Renewable Energy Trust and an advisor to the Berkeley Startup Cluster. Prior to joining the UC Berkeley faculty, Brian was Vice President of Corporate Strategy & Development for PG&E Corporation, where he led the energy industry’s first tax-equity solar project financing by an investor-owned utility, investing $400 million in nearly $1 billion of photovoltaic assets from 2010-2011.

Brian’s prior roles include Chairman, International, Pandora Media – the world’s leading Internet radio company; President, International, Overture Services – building a billion-dollar division of Yahoo! with operations in 20 countries; President and CEO, Idealab Silicon Valley and Managing Director of Idealab; and President and COO, On Command. Previously, Brian was Senior Vice President and co-head of the Real Estate Merchant Banking Group at Shearson Lehman Brothers. He has served on the boards of more than 20 early-stage technology companies, several of which went public, and many of which had successful acquisition exits. His separate private investments include Back to the Roots (Haas-founded startup), Bay Area Panera restaurants, Birdies, LiveOps, and Powerset (sold to Microsoft). Brian holds a BA magna cum laude in Economics from Duke University, where he was an Angier B. Duke Scholar.
William Shelander joined the C2M faculty in 2016 after serving as an advisor and mentor to the program since 2010. Bill brings hands-on proficiency at the earliest stages of emerging technologies and venture funding. He is also developing and teaching the Environmental Entrepreneurship and Innovation program at Stanford University’s School of Civil and Environmental Engineering.

The Environmental Entrepreneurship and Innovation program introduces methods and insights to conceive and implement economically viable enterprises enabling environmentally sustainable systems.

Bill was a commercialization expert for LBNL (2010-2015), working with researchers in fundamental energy science to utilize discoveries in new business activities. He helped create and obtain external funding for dozens of start-ups involving diverse technologies (from industrial-scale microbiology and DNA diagnostics to thin film oxides and high performance supercomputers).

In 2013, Bill served on a White House Office of Science & Technology Policy panel to improve technology transfer of basic research. Between 1986 and 2007, he was a managing director of venture capital funds from the U.S., Japan, Taiwan and China (IRR exceeding 65%, generating returns of over $600,000,000). He has served on the boards of NASDAQ-listed companies and helped early stage ventures develop business plans and obtain first round funding. As an entrepreneur, Bill is currently a co-founder of three start-ups involving molecular biology detection and treatment of Alzheimer’s disease.

Bill holds an MBA from Stanford University, an MS Engineering from West Virginia College of Graduate Studies, and a BS Systems Engineering from the Georgia Institute of Technology.
David Charron is a member of the professional faculty of UC Berkeley’s Haas School of Business. Dave has held several leadership positions at Haas, including Executive Director of the Berkeley Innovative Leadership Development Initiative (BILD) and Executive Director of the Berkeley Haas Entrepreneurship and Innovation program.

At Berkeley Haas, Dave teaches many MBA level courses including Business Model Innovation and Entrepreneurial Strategy, Entrepreneurship, Problem Finding Problem Solving, Case Studies in Entrepreneurship, Workshop for Startups and others. He is also active in executive education with the Venture Capital Executive Program, Bio-entrepreneurship and several innovation and leadership programs. Dave started UC Berkeley’s NSF I-Corps program as Faculty Lead and continues to teach scientists customer development skills through I-Corps.

Dave is an entrepreneur, having been a founder of Scientific Learning Corporation, the first successful neuroplasticity company. He has also started several other ventures and consults to startups, inventors and entrepreneurs. He has been an angel investor in several companies and is on the board of Impact Carbon, a non-profit developing carbon credit projects. He has worked in and studied the field of technology commercialization and entrepreneurship for 25 years. Dave's experience in this field has been at corporations such as Xerox PARC, academic institutions including MIT, Stanford, UC Berkeley and UCSF, and the national labs such as LBNL, LLNL and Sandia. He has also been a principal member of the faculty team for Intel Corporation’s Global Technology Entrepreneurship Education project teaching international faculty how to teach entrepreneurship and create entrepreneurial ecosystems. With that program he has traveled extensively in Europe, Asia, South America and Africa. He holds a BS degree in Mechanical Engineering from Stanford University and an MBA from UC Berkeley.
Beverly Alexander is the Founding Director of the Cleantech to Market program, and has been involved in energy and environmental innovation for almost 30 years. Bev serves as an advisor to the Berkeley Energy & Resources Collaborative, and won the 2013 Berkeley Haas Best Case award for a cleantech commercialization case study.

Bev is also a member of the Haas "Club of 6" for excellence in teaching and serves on UC Berkeley's Innovation Council and new Environmental Resilience Accelerator.

As a Senior Vice-President at Pacific Gas & Electric Company, she was in charge of customer services and the largest energy efficiency, solar, and demand response programs in the United States. Those programs moved $1.2 billion into the California economy and won over 75 awards, including the United States Department of Energy's Energy Star Sustained Excellence award. Bev also held Director, Chief Counsel, and Vice President positions in generation, transmission, distribution and customer services, with a focus on leadership development and strategic planning.

Before PG&E, Bev specialized in emerging environmental law and policy. The National Law Journal recognized her as one of the top 40 attorneys under the age of 40 in the United States for her pioneering work. After PG&E, Bev consulted on clean energy solutions, including sustainable communities. Bev received her BA in Environmental Studies from UC Santa Cruz and her JD from UC Berkeley, where she was Editor-in-Chief of Ecology Law Quarterly, and clerked on the United States Ninth Circuit Court of Appeals.
Rich Lyons is UC Berkeley’s first Chief Innovation and Entrepreneurship Officer. In his new role, he will work with campus partners to further develop and communicate Berkeley’s rich portfolio of innovation and entrepreneurship activities to the benefit of our students, faculty, staff, and startups. He will also be responsible for developing strategies to raise the visibility of these activities internally and externally, and to create high-value partnerships with stakeholders.

Rich, a Professor of Economics and Finance, was Berkeley’s former Dean of the Haas School of Business. He held this role for eleven years, during which time he devoted his energy, enthusiasm, and collaborative spirit to advancing both the Berkeley Haas’ and the campus’ larger innovation and entrepreneurial ecosystem. Among his many accomplishments as Dean of the Haas School of Business, Rich helped launch the Management, Entrepreneurship, & Technology (M.E.T.) dual-degree program in partnership with the College of Engineering. He also initiated the Biology + Business dual degree program with Molecular & Cell Biology and revitalized the Berkeley-Haas Entrepreneurship Program (BHEP). In collaboration with leadership in the Office of Research and College of Engineering, Rich helped the campus to launch the Berkeley SkyDeck startup accelerator in 2012 and served on its Governing Board.

A Cal Bear, Rich, first came to Berkeley to pursue his Bachelor of Science in Business and Finance. He later earned his PhD in Economics from MIT. Before joining the Berkeley faculty, Rich was on the faculty at Columbia Business School for six years. His research and teaching expertise is in international finance and his top applied interest is the “how and why” of setting strong cultures in organizations. His most recent research explores how leaders drive innovation and set behavioral norms and culture. As Dean, Rich anchored the culture of Berkeley Haas with four defining principles: Question the Status Quo, Confidence Without Attitude, Students Always, and Beyond Yourself. These principles have served to differentiate Berkeley Haas from its peers, and shape its students as they learn to become the innovative leaders of the future.
Janea Scott is serving in her second term on the California Energy Commission. She was appointed Vice Chair in 2019. Janea is one of five commissioners on the Energy Commission, which is the state's primary energy policy and planning agency. Janea was appointed by Governor Edmund G. Brown Jr. in February 2013 and reappointed by Governor Brown in January 2016 to serve as the Energy Commission's public member.

Janea is also leading the 2019 Integrated Energy Policy Report. She serves as the chair of the Western Interconnection Regional Advisory Body, she is a member of the Western Interstate Energy Board, and also serves on the DOE Hydrogen and Fuel Cells Program Technical Advisory Committee.

Before joining the Energy Commission, Janea worked at the U.S. Department of the Interior in the Office of the Secretary as the Deputy Counselor for Renewable Energy and at Environmental Defense Fund in the New York and Los Angeles offices as a senior attorney in the climate and air program. Vice Chair Janea was also an AmeriCorps member working at the San Francisco Urban Service Project from 1996 to 1997. She earned her juris doctorate from the University of Colorado Boulder Law School and her master’s of science and bachelor’s of science in earth systems from Stanford University.
Takachar is focused on dramatically increasing the amount of waste biomass economically transformed into marketable products around the world. Using a novel concept called oxygen-lean torrefaction, Takachar is simplifying reactor design to enable small-scale, portable, and decentralized biomass conversion, creating more economical uses for raw biomass.

**Website**
cyclotronroad.org/takachar

**Founders**
Kevin Kung

**C2M Student Team**
Tommy Larson, MBA, Team Lead
Alison Lui, PhD Chemical Engineering
Stephanie Rank, MBA
Amaani Hamid, MDP
Alberto Gutierrez Garcia, MBA
Tzipora Wagner, MS Energy and Resources

**Notes**
Cypris Materials was founded to reinvent color. The founders’ vision is to bring structural color to the market as a sustainable solution to global energy inefficiencies, an alternative to toxic dyes and pigment, as well as a new paradigm for controlling the flow of light. They are working on applying their paintable photonics platform to solve major challenges in a number of industrial verticals.

<table>
<thead>
<tr>
<th>Website</th>
<th>cyclotronroad.org/cypris-materials</th>
</tr>
</thead>
</table>
| Founders         | Ryan Pearson, COO  
                  | Matthew Ryan, CTO                               |
| C2M Student Team | Paula Moren, MBA, Team Lead  
                  | Chandler Sherman, MBA  
                  | Quinn Sure, MBA  
                  | Anqi Zhang, MS Civil and Environmental Engineering  
                  | Diana Tarrazo, JD Law  
                  | Eugene Kim, PhD Chemistry                           |

2019 Projects
A salt separation technology invented at PARC, a Xerox company, this innovation enables the separation of concentrated brines with no phase changes, a process for which only thermal processes have previously existed. Methods such as reverse osmosis or electrodialysis do not work at high concentrations or have serious operational limitations.

Website: parc.com

PARC Team:
- Eugene Beh, Technology Inventor
- Michael Benedict, Lead Engineer

C2M Student Team:
- Antonio Ciudad Casafranca, MBA, Team Lead
- Erin Sullivan, PhD Chemistry
- Sean Sullivan, JD Law
- Nick Clarke, MS/PhD Energy and Resources
- Syed Rasool, MBA
- Bree Soares, MBA

Notes:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Noble's core technology, the Argon Power Cycle, is a new power cycle by which the efficiency of current internal combustion engines is increased by up to 10% while generating zero air pollutants and capturing 100% of the generated carbon dioxide.

Website

noblethermo.com

Founders

Miguel Sierra Aznar
Robert Dibble

C2M Student Team

Lauren Greenwood, MBA, Team Lead
Bhaskar Chaturvedi, MSc Mechanical Engineering
Bogdan Cristei, M.Eng Industrial Engineering and Operations
Research + Entrepreneurship & Innovation
Laurel Dunn, PhD Civil & Environmental Engineering
Kate Tomlinson, MBA

Notes
Brimstone Energy has developed an electrolyzer technology that is able to co-produce sulfuric acid and hydrogen that is carbon-free and cost competitive with the cheapest hydrogen produced via steam methane reformation.

Website
brimstoneenergy.com

Founders
Cody Finke
Elizabeth Magnussen
Hugo Leandri

C2M Student Team
Eric Sorensen, MBA, Team Lead
Daniel Diaz-Brown, MBA
Sheena Louisia, PhD Chemistry
Mark Sheiness, MBA
Kersh Theva, PhD Molecular & Cell Biology

Notes
EnZinc has developed a 3-D zinc sponge electrode using US Naval Research Laboratory technology that delivers a nickel-zinc battery with the energy of lithium-Ion, the cost of lead-acid, and greater safety than either.

**Website**

enzinc.com

**Founders**

Michael Burz  
Dr. William Cogen  
Deborah Knuckey

**C2M Student Team**

Af Hernandez, MBA, Team Lead  
Nayef Derwiche, EW MBA  
Lucas Duffy, MDP  
Michael Galluzzo, PhD Chemical Engineering  
Nick Matcheck, MBA  
Julie Rose, JD Law

**Notes**
Noon Energy is pioneering a new class of battery technology which provides low-cost, energy-dense, long-duration electricity storage for scaling to 100% renewables. It utilizes very low cost storage media for an installed storage cost of less than $50/kWh, which enables it to turn intermittent solar/wind power into on-demand power at a cost that undercuts conventional fossil fuel power generation. Its high energy density—approximately three times that of lithium-ion for the full system—will enable longer range electric vehicles, trucks, ships, and aircraft.

<table>
<thead>
<tr>
<th>2019 Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:15pm</td>
</tr>
<tr>
<td>Noon Energy</td>
</tr>
</tbody>
</table>

Noon Energy is pioneering a new class of battery technology which provides low-cost, energy-dense, long-duration electricity storage for scaling to 100% renewables. It utilizes very low cost storage media for an installed storage cost of less than $50/kWh, which enables it to turn intermittent solar/wind power into on-demand power at a cost that undercuts conventional fossil fuel power generation. Its high energy density—approximately three times that of lithium-ion for the full system—will enable longer range electric vehicles, trucks, ships, and aircraft.

**Website**

cyclotronroad.org/noonenergy

**Noon Team**

Christopher Graves  
Kalee Whitehouse  
Soren Jensen

**C2M Student Team**

Deborah Tan, MBA, Team Lead  
Shelley He, PhD Energy and Environmental Economics  
Steven Wang, MBA  
Philomena Weng, PhD Chemical Engineering  
Joyce Yao, MBA