

October 27-28, 2016 Colorado School of Mines Golden, CO





October 27, 2016

Greetings:

On behalf of the State of Colorado, it is my distinct pleasure to welcome you to our state for the 2016 Energy Africa Conference.

Access to affordable, reliable, and clean energy is essential to Africa's economic growth. By bringing together some of the best minds in the energy technology area, this conference has extraordinary potential to foster creative opportunities for sustainable development across the African continent.

This year's conference will focus on creating a resilient electrical grid for Africa to connect African communities and commerce. We are confident the thriving spirit of innovation and collaboration that exists in Colorado makes our state the perfect venue for this type of dialogue.

Once again, welcome to Colorado for this important event. We wish you the best for a productive and impactful conference, and we hope you enjoy your stay here.

Sincerely,

John W. Hickenlooper

Governor

Welcome to Colorado and the 2016 Energy Africa Conference.

Colorado is one of the leading states in the nation in developing and disseminating clean energy policies and practices. We hope to share this experience with the conference participants.

Holding the conference in Golden at the Colorado School of Mines and adjacent to the National Renewable Energy Laboratory is ideal as these institutions are home to some of the best minds and students in the energy technology area. Colorado is also a focal point for many companies active in the responsible development of natural gas resources.

This year's Energy Africa Conference, under the theme "Creating a Resilient Grid for Africa", will focus on how Africa can deploy an energy infrastructure that is accessible, affordable, reliable and sustainable over the years to come. A major lesson from the extended drought that gripped many parts of the continent is how susceptible the African energy systems, largely based on hydroelectric power, are to changes in climatic conditions. Access to affordable and reliant energy is essential to accelerating economic development in Africa and enhancing the living standards of its citizens. The synergy between renewable energy technologies and the unexploited extensive natural gas resources promises a cost effective, environmentally friendly and sustainable approach for Africa to meet its energy needs.

The Energy Africa Conference brings together business executives and thought leaders from the public, non-government organizations and research institutions to discuss and encourage work needed to leverage the synergy between natural gas and renewable energy sources in Africa.

We hope this conference inspires you to think bigger and more broadly about energy related opportunities, to expand your horizons, to grow your businesses and to help make the world a better place.

We want to express our appreciation to the Colorado School of Mines and its Presidents Dr. Paul Johnson and all faculty and staff for their cooperation, hospitality and allowing us to hold the conference at Mines. We hope to expand and continue this partnership in the future.

We would also like to thank our sponsors for their generous support without which this conference would not be possible.

Energy Africa Conference Committee

DAY ONE: THURSDAY, OCTOBER 27

All Day Registration

7:30-4:30 PM: Breakfast/Networking Coffee

8:00-8:15 AM: Welcome and Introductory Remarks

Speakers: Luka Powanga, Professor Regis University and Conference

Chairman, Energy Africa Conference

Derrick Hudson, Associate Professor, Colorado School of

Mines

Thomas Boyd, Acting Provost, Colorado School of Mines

8:15-9:30 AM: Panel 1 - Making Energy Affordable and Accessible to All

Description: This session focuses on the role of renewable energy sources in providing affordable and accessible energy in Africa and offers a menu of policy and regulatory reforms needed to accomplish the objective.

Moderator: Luka Powanga, Professor, Regis University and Conference

Chairman

Speakers: **Johnny Weiss**, Co-founder, Johnny Weiss Solora Consulting

Sam Booth, Section Manager for Project Development, National

Renewable Energy Laboratory (NREL)

Terri Walters, President, Katevan Consulting

Paula Glover, President and Chief Executive Officer, American

Association of Blacks in Energy

9:30-10:00 AM: Key Note Address: Re-Building and Re-Energizing Detroit-Lessons for Africa

Detroit-Lessons for Africa

Speaker: Carla Walker-Miller, Founder and President, Walker-Miller

Energy Services

10:00-10:30 AM: Networking Break

10:30-11:45 AM: Panel 2 - The Future of the Electrical Grid

Description: The session highlights the variability in renewable energy power systems focusing on wind, geothermal, solar, hydro and biogas and how microgrids and combinations of different renewable energy sources could be leveraged to provide resilient and sustainable energy supply. In addition, the session will discuss how Africa could utilize new disruptive technologies to raise grid resilience and leap frog the old technologies.

Moderator: Rocio Perez, President and Chief Executive Officer, Inventiva

Consulting

Speakers: **Everod Samuel**, President, Samuel Engineering

Nathan Adams, Business Development and Technology

Applications, ABB North America

Peter Lilienthal, Chief Executive Officer, Homer Energy **Sharrieff Mustakeem**, President and Chief Executive Officer,

MCX Environmental Energy Corp.

11:45-12:30 PM: Lunch Break

12:30-1:00 PM: Luncheon Key Note Speaker: Kevin Chika Urama, Senior Advisor to the President of the African Development Bank, African Development Bank/ Mahama Kappiah, Executive Director, Economic Community of West African States' Center for Renewable Energy

1:15-2:15 PM: Panel 3 - Country Focus: Nigeria's Gas Sector

Description: Nigeria has the largest economy in Africa, but it is highly dependent on oil and gas. The total carbon emissions in the energy sector are projected to increase annually. However, under Vision 2030, Nigeria plans to reduce these emissions by diversifying its energy portfolio. This session discusses the objectives of the 22nd session of the Conference of the Parties (COP 22) to the United Nations Framework on Convention on Climate Change (UNFCC) and some technologies that could help Nigeria meet its objectives.

Moderator: Chip Comins, Chairman and Chief Executive Officer, American

Renewable Energy Institute

Panelists: Wiley Rhodes, Chief Executive Officer, Newpoint Companies

Ken Losch, Chief Executive Officer, ZHRO Power and ZHRO

Solutions

Continued on page 5...

Muazu Magali, Vice President and Head, Energy Division, Platinum Vault Group

Kevin Chika Urama, Senior Advisor to the President of the African Development Bank, African Development Bank

2:30-3:45 PM: Panel 4 - Gas to Power

Description: This session addresses the technical, regulatory and market challenges of deploying successful gas-to-power and or gas exports/local utilization projects whether operating in a country with established gas production or one with newly discovered reserves.

Moderator: Jason Nagy, Founder, Mainspring Innovation, LLC

Panelists: Michael Farina, Director, Market Development, Global Gas to

Power, GE

Azra Tutuncu, Director, Unconventional Energy Natural Gas

Institute, Colorado School of Mines

Muazu Magali, Vice President and Head, Energy Division,

Platinum Vault Group

Ravi Vora, Former Advisor-International Programs, Renewable Energy Grid, National Renewable Energy Laboratories (NREL)

3:50-5:00 PM: Panel 5 - Regional Electrical Grid Integration

Description: This session discusses regional African initiatives to improve the electrical grid resilience throughout Africa, and how the private sector could be engaged to advance regional energy solutions.

Moderator: Bai Blyden, Senior Engineer, Southern Nuclear Services

Panelists: Kevon Makell, Chairman, Chief Executive Officer and

President, SEWW Energy

Kenneth Strzepek, Research Scientist, MIT Joint Program on

Science and Policy of Global Change

David Renne, President, International Solar Energy Society **Sam Booth**, Section Manager for Project Development, National

Renewable Energy Laboratory (NREL)

Ravi Vora, Former Advisor-International Programs, Renewable Energy Grid, National Renewable Energy Laboratories(NREL)

5:00-7:30 PM: Poster Presentations by Students from CSM, Columbia University and MIT/Reception

DAY TWO: FRIDAY, OCTOBER 28

All Day Registration

7:30-4:30 PM: Breakfast/Networking Coffee

8:00-8:15 AM: Introductory Remarks

8:15-9:30 AM: Panel 6 - Renewable Energy Project Finance

Description: This session discusses how companies and countries could take advantage of public funds available from the U.S. Government and multilateral development banks to fund their projects and what governments need to do to attract private funds into energy projects. The discussion will also cover private financing and how to mitigate risk.

Moderator: Gabe Shumba, Chief Executive Officer, Group Shumba, LLC

Panelists: Kadi Konate, Director, Planning, Strategy and Business

Analysis, Rio Tinto Minerals

Mark Richard Dagel, Chairman and Chief Executive Officer,

IConnect Capital Investments

Ralph Cleveland, Founder and Chief Executive Officer,

Cleveland and Associates

9:30-10:00 AM: Key Note Address: A Conversation with Paula Glover, President and Chief Executive Officer, AABE

Description: Discusses the role of development organizations in delivering energy.

Speakers: Paula Glover, President and Chief Executive Officer,

Association of American Blacks in Energy (AABE)

Carla Walker-Miller, Founder and President, Walker-Miller

Energy Services

10:00-10:30 AM: Networking Break

10:30-11:30 AM: Panel 7 - Driving Prosperity in Rural Off-Grid Communities

Description: Rural off-grid communities present a significant challenge for utilities economically and operationally. Renewable off-grid technologies

are emerging as a resource for grid resiliency through their ability to serve household and communities locally. This session will look at the impact of solar lanterns, solar home systems, and community mini-grids in driving prosperity in these communities by increasing income, improving affordability, driving educational outcomes, impacting health improvements, and fostering entrepreneurship.

Moderator: **David Gibson**, Consultant

Panelists: Katherine Steele, Deputy Coordinator (acting), USAID (Power

Africa).

Carla Walker-Miller, Founder and President, Walker-Miller

Energy Services

Doug Vilsack, Executive Director, Posner Center for

International Development

Ellen Morris, Faculty, Columbia University and President,

Sustainable Energy Solutions

11:30-12:15 PM: Lunch and Poster Presentation Recognition

12:15-12:45 PM: Luncheon Keynote Speaker: Honorable LaDoris "Dot" Harris, Director, Office of Economic Impact and Diversity, US Department of Energy

12:45-1:15 PM: Key Note Address: Gas, Renewables and Power

Description: Discusses how natural gas and renewables in combination can provide off grid power in rural and informal settlements in urban areas including power for the urban and industrial grid.

Speaker: Bryan Willson, Professor and Executive Director, Energy

Institute, Colorado State University

1:15-2:45 PM: Panel 8 - Universities as Centers for Technology and Sustainable Energy Development

Description: Successful energy development depends fundamentally on people with knowledge to conceive and implement projects. This session considers the essential roles that universities play in building this expertise. Universities also provide a platform to demonstrate how smart grids can efficiently connect and manage energy supplies and needs.

Moderator: **Bryan Willson**, Professor and Executive Director, Energy

Institute, Colorado State University

Panelists: Ramona Graves, Professor and Dean, College of Earth

Sciences and Engineering, Colorado School of Mines

Azra Tutuncu, Director, Unconventional Energy Natural Gas

Institute, Colorado School of Mines

Rachel Hauser, Manager-Foundations and Partnerships, National Center for Atmospheric Research (NCAR)/University

Corporation for Atmospheric Research (UCAR).

Ellen Morris, Faculty, Columbia University and President,

Sustainable Energy Solutions

Les Makepeace, Founder and Chief Operating Officer, Ekonx.io

Elias Towe, Ethel Grobstein Professor, Carnegie Mellon

University

3:00-4:30 PM: Panel 9: Leveraging US Government Agencies to do Business with Africa

Description: Learn how firms of all sizes are utilizing the US government agencies such as Small Business Administration, Export Import Bank, Overseas Private Investment Corporation, US Export Assistance Center, Millennium Challenge Corporation other resources such as the World Trade Center to do business with Africa.

Moderator: Martha Butwin, Senior International Trade Specialist, US

Department of Commerce

Panelists: Paul Bergman, Director, US Export Assistance Center, US

Department of Commerce

Bryson Patterson, Regional Trade Finance Specialist, Small

Business Administration (SBA)

Kevin Chika Urama. Senior Advisor to the President of the African Development Bank, African Development Bank

Honorable LaDoris "Dot" Harris. Director, Office of Economic

Impact and Diversity, US Department of Energy

Robert Sexton. Director. Renewable and Clean energy finance.

OPIC (Overseas Private Investment Corporation) Kelly Kemp. Regional Director, Export Import bank

4:30-4:35 PM: Closing Remarks

SPEAKERS



Nathan Adams
Business Development and Technology Applications

Nathan Adams leads business development and technology applications for ABB's North American microgrid and distributed energy group which focuses on providing microgrid solutions for high renewable penetration applications. Prior to joining ABB, Nathan was Vice President of Strategy and Development for

Green Mountain Power where he developed solar and microgrid projects for the utility. Before Green Mountain Power, Nathan led the corporate development group at Puget Sound Energy where he developed a number of wind, solar, natural gas and energy storage projects. Nathan holds a BA from the University of Vermont and an MBA from the University of Michigan.



Bai BlydenSenior Engineer, Southern Nuclear Services

Bai K Blyden currently serves as a Senior Engineer with Southern Nuclear services under the Calculations Design Basis Validation Program for Configuration Management on the 2 x 940 MW Plant Hatch Nuclear plant. Over his career he has contributed his expertise to over forty major and minor power plant projects

and their associated interconnections in various capacities of electrical systems design, operations planning, project development and construction management.

Among his more notable assignments, Mr. Blyden served as Project Manager on the team, which planned the Calpine 70,000 MW development program. Within this scope he also served as onsite Construction Manager for the California Emergency Peaker Program which planned and managed the construction and commissioning of eleven (11x 45 MW) General Electric LM6000 gas turbine units under California executive order D-26-01 issued to protect the grid around Silicon Valley at the peak of the 2001 California energy crisis. Mr. Blyden has also worked on large Nuclear, hydro and mid to small distributed energy systems as well as having held senior technical consulting and staff positions with various utilities and AE firms such as TVA; Pacific Gas & Electric; The New York Power Authority, Texas Utilities, ABB among others.

An early advocate of an Integrated African Grid, Mr. Blyden has presented a conceptual framework and technical analysis for a centralized African Power pool with links to North Africa at the first IEEE Region 8 conference held in Nairobi, Kenya, December 1983. Since then authored numerous papers on African Energy Development with a particular emphasis on the strategic role of Micro Grids and Knowledge development.

Mr. Blyden earned an MS.EE from Moscow Energetics Institute in Power Systems, Generation and Industrial Distribution Systems and is a member of the IEEE International Practices Subcommittee. Fluent in multiple languages Mr. Blyden brings a multicultural mindset and an exceptional relationship building acumen. He is a Senior Member of the IEEE and serves as Chair of the IEEE PES International Practices subcommittee for Africa. He is also an advisor to Centric Ltd a commercial startup focused on the development of sustainable Green Housing and general building systems and to the strategic consulting group BBRM.



Sam Booth
Section Manager for Project Development, National
Renewable Laboratories

Sam Booth is a Section Manager for Project Development at the National Renewable Energy Laboratory (NREL). He has over ten years of experience in the clean energy industry working on renewable energy, micro grids, energy efficiency, and finance. He

is currently leading work to support the Power Africa Beyond the Grid Program and has worked on numerous other international projects such as off grid feasibility studies in Indonesia, renewable energy development in Haiti, and island energy planning in Brazil. He is also currently helping Marine Corps installation Miramar to build the most advanced installation scale micro grid in the United States Department of Defense and recently helped the installation commission and test a 100% renewable building level micro grid. Prior to joining NREL Sam worked in energy and aerospace research and development engineering. He has B.S. degrees from the University of Colorado in Chemical Engineering and Environmental Engineering and a Masters of Business Administration (MBA) from Boston University.



Thomas BoydActing Provost, Colorado School of Mines

Dr. Boyd received his baccalaureate and masters degrees in geophysics from Virginia Tech. While at Tech he worked on high-resolution earthquake location techniques with application of better defining the Wadati-Benioff zone geometry underneath Peru. He then continued his educational activities at Columbia

University, working on a variety of issues related to the seismicity of the Aleutian arc, constraining earthquake kinematics from far-field seismic observations, and in defining the three-dimensional structure of the upper mantle along the Aleutian arc. After serving post doctoral and research faculty appointments within the Department of Geophysics at the Colorado School of Mines, Tom was hired by the Department as an an assistant professor in 1993. While a professor in the Department, Tom was selected by the Department's graduating seniors as outstanding faculty member seven times, and

graduated three PhD students and eight Masters students. After receiving promotion and tenure (1998), Tom did a one-year sabbatical at NCAR where he served as Manager of Technical Development for the DLESE (Digital Library in Earth System Education) Program Center. In this role, Tom was a member of the DLESE leadership team and oversaw the infrastructure development for the digital library. Upon returning to Mines, Tom has served in a number of administrative positions including: continued work with NCAR as Outreach Coordinator for the DLESE Program Center, Associate Graduate Dean, Graduate Dean, and Associate Provost. Tom currently holds the position of Associate Provost and Dean of Graduate Studies.



Ralph Cleveland
Founder and Chief Executive Officer, Cleveland and
Associates

Ralph has more than three decades of project, corporate and community development experience. He founded the CED Group and developed Cleveland & Associates to close the gap between company executives, top management, and employees,

unleashing the potential for success with values-driven programs and employee engagement at every level, resulting in a culture of high-performance and successful outcomes. Ralph's illustrious career began with Mobil Oil Company, as an engineer and plant superintendent. He spent the next fifteen years in a variety of high-level operations and management positions with Atlanta Gas Light Company/AGL Resources where he rose to Executive Vice President and Chief Executive Officer/President of several AGL Resources subsidiaries, including \$2.1 billion a year revenue generator Nicor Gas in Northern Illinois. In various roles, he was responsible for improving, developing, and delivering more than \$2.2 billion in assets and had responsibility for the firm's nearly \$1.4 billion supply chain. During his tenure as an AGL executive, Ralph worked tirelessly to improve his community through service on a variety of non-profit, community, and industry boards and advisory councils. He served as Human Rights Commissioner for the City of Virginia Beach, where he was instrumental in promoting respect and understanding among individuals to improve human relations and identify best practices for addressing human rights issues. He also served as Chairman of the Fulton County (Georgia) Workforce Investment Board, where his vision and leadership encouraged the development of a sustainable workforce with viable incomes and benefits. In his work with the Metropolitan Atlanta Chapter of the American Red Cross, Ralph served as Vice Chairman of Diversity and member of the Executive Committee. Other positions include. Secretary of the Board of Trustees, and as a member of the Executive Committee for the Georgia Conservancy, Vice Chair, Chairman, and Chief Executive Officer of the North American Energy Standards Board, 1st Vice Chairman and as Chairman of the National Board of Directors of the American Association of Blacks in Energy, Chairman of the Board of Trustees of the American Institute for Managing Diversity, Inc.

He earned his undergraduate degree in mechanical engineering from the Georgia Institute of Technology; pursued graduate studies in mechanical engineering at Rice University and earned his master's in business administration from Tulane University.



Chip Comins
Chairman and Chief Executive Officer, American Renewable
Energy Institute

Chip Comins is the Chairman and CEO of the American Renewable Energy Institute, (AREI, Inc), Founder of the AREDAY Summit, Expo and Film Festival, Managing Director of American Spirit Productions, President and CEO of WEnergy, Inc. and

Co-founder of the Green Girl Minute. He has produced and directed both long and short form documentary films for educational and broadcast television markets, including The National Renewable Energy Laboratory, DOE Wind Powering America, PBS, Link TV and BET.

A long-time advocate of developing and implementing renewable energy resources to abate green house gases and climate change, Comins advocates a business approach to solving both the economic and environmental crisis. In 2009 he produced 13 official side events at the UNFCCC COP 15 in Copenhagen and is now producing the 11th Anniversary AREDAY Summit featuring President Jimmy Carter "Accelerating Solutions for the Great Transition" August 10-13, 2014.



Mark Richard Dagel
Chairman and Chief Executive Officer, I-Connect Capital
Investments

Mark Richard Dagel, the Co-Chairman and President of LINK Global Group is a veteran structured finance professional with a wealth of international private sector experience with a strong interest in waste to energy, wind, and other alternate power

strategies.

With its enormous resources and professional set up, Mark has been able to expand the Group's interests in real estate, energy and commodities trading, power generation, construction and oil and gas. LINK is currently building power plants throughout Brazil. LINK also represents, as the investment bank, several pharmaceutical companies in which it has in excess of \$100 million USD in capital. LINK acts as both financier as well as lead operator for most LINK projects by providing both the debt and equity to the transactions that it chooses to participate in.

Since 1996, Mark has been a Senior Managing Director at Capital Mortgage, Incorporated where he helped run a 37 year old asset based lending company located in Atlanta, Georgia, which closed in an average year in excess of \$350 million in commercial real estate first mortgages. From 2008-2012 he was Managing Director of Synergy Capital and Redevelopment Company, LLC, which was set up to act as the principal in adaptive

reuse of older facilities throughout the USA. The company developed a turn-key concept that can take a distressed vacant building and turn it into performing assets. It has now merged its operations within the LINK Group of companies.

His career highlights include being the principle in over one hundred real estate development and construction projects in which he has financed directly or indirectly in excess of \$3 billion USD. In addition, he has donated tens of millions of dollars in products, services, expertise and capital to charity. In particular he played a major role in the construction of a 176 unit apartment complex in Canton Georgia that acts as the only battered women and children shelter of its kind. Other charitable activities include having designed and built a ranch for children of special needs; having donated tractor trailers full of books and computers to a local library system; having donated capital, food and trailers full of Christmas toys for impoverished children; and having built several churches.



Michael Farina Director, Market Development, Global Gas to Power, GE

Michael Farina has extensive global energy industry expertise centered around gas and power markets with consulting expertise across natural gas value chains in North America and around the world. More recently he has been active in gas to power project development in Africa, Southeast Asia, and Latin America. Prior

to his current position, Michael was one GE's senior analysts on the global fuels market landscape. He was Leader of GE's Fuels Center of Excellence (COE) and part of GE's Corporate Strategy and Analytics team. His work helped senior leadership understand how fuels markets impact GE's long-term business strategy and technology investments. Michael has been in the energy industry for almost two decades, primarily focusing on natural gas and power markets economics, technology, and policy. Prior to joining GE, he was Director, North America Natural Gas, at Cambridge Energy Research Associates (CERA). Mr. Farina holds a BA degree in Economics from Colorado State University and a Master's degree in Economics from the University of Colorado.



David Gibson Consultant

David Gibson is currently serving as an Energy Access Consultant – with a focus on solar PV solutions in rural off-grid communities. Current assignments include business development work for AMEC Foster Wheeler for USAID Power Africa in Nigeria and a Millennium Challenge Corporation project for NRECA International

in Ghana. Mr. Gibson also has international development work in rural Haiti – including the design/construction of a permanent dental clinic, expansion of a vocational school, community water/sanitation surveys, construction of composting toilets, and delivery of medical missions.

Mr. Gibson's professional background also includes more than 30 years' experience in utility energy efficiency programs and the design/construction of mission critical facilities. His skills/contributions are focused on program/project management, creating and delivering innovative solutions, and advocating for sustainable practices.

David is a degree candidate for a Master of Liberal Arts in Sustainability and Environmental Management at the Harvard Extension School with an expected graduation in May 2017. He is currently completing his thesis research – which looks at the integration of social/financial impact evaluation into solar home system (SHS) pay-as-you-go (PAYG) mobile money platforms. Mr. Gibson's undergraduate degree is a Bachelor of Science in Electrical Engineering from Virginia Tech. He is a Registered Professional Engineer.



Paula R. Glover
President and Chief Executive Officer, Association of Blacks in Energy

Paula R. Glover is President and CEO for the American Association of Blacks in Energy, a non-profit professional association whose focus is to ensure that African Americans and other minorities have input into the discussions and development of energy policy,

regulations, and environmental issues. In this role, she is responsible for managing the national office, and provides strategic direction and leadership for the organization.

Prior to her current role, Ms. Glover served as the association's Vice President of Operations and also served as the organization's Director of Communications. Ms. Glover's experiences include 15 years in the energy industry for both electric and natural gas distribution companies. During that time she has built a stellar reputation working with state legislators and regulators in her roles as Manager of Government and Regulatory Affairs. Ms. Glover commands a clear understanding of the consumer and community sides of the business as well having held industry positions in Community Outreach and Economic Development.

Ms. Glover is a seasoned non Profit professional. Prior to her position at the AABE, Ms. Glover was the Community Awareness Director for the Regional YMCA of Western Connecticut where she was responsible for the organizations' marketing, communications, community and government relations and public relations functions.

In March 2014 Ms. Glover was appointed to the National Petroleum Council by U.S. Secretary of Energy, Dr. Ernest Moniz. Ms. Glover received her B.S. in Marketing Management from the University of Delaware. She is the recipient of the Bring it Home to Hartford Award; the Clarke Watson Chairman's Cup; the Award of Distinction by the Videographer Awards and the Platinum Achievement Award from the Cooperative Developmental Energy Program at Fort Valley State University. She is a 2003 graduate of Leadership New Haven and has contributed to an article on work life balance in *Take Pride* magazine.



Ramona Graves

Professor and Dean of the College of Earth Resource Sciences & Engineering (CERSE), Colorado School of Mines

Ramona is Director of the Laser/Rock Interaction and Co-Director of the Center For Earth Materials, Mechanics, and Characterization (CEMMC)

Petroleum engineering, contrary to the common assumption, is not a narrowly focused engineering discipline. A petroleum engineer must have a good understanding of chemistry, physics, geology, economics, statics, thermodynamics, strength of materials, fluid behavior, rock behavior, the interaction between fluid and rock, and other fields. Graduate studies are therefore an excellent avenue by which to further investigate the relationships between any of these fields, or to gain a better understanding of the complexities of petroleum reservoirs.

My primary research is in the area of reservoir characterization and laser/rock interaction. To best develop and exploit a petroleum reservoir, an engineer must understand the flow, capillary, and mechanical properties of a porous media. Our research wing contains the reservoir characterization lab, which is equipped with state-of-the-art rock measuring systems. Permeabilities (ability of a porous media to transmit fluid) can be measured on reservoir rocks that look and behave like concrete to those that look and behave like beach sand. The mechanical properties measured are used to predict reservoir compaction and surface subsidence, as well as how easily the rock will fracture.

Most of these rock properties can be used to predict and remediate environmental problems and to predict groundwater movement. Because measurements can be made on any rock type, I am currently working with very low permeability rocks which might be used as underground storage for hazardous waste. Many students from other departments on this campus make use of this equipment, either as an independent project or working in conjunction with a petroleum engineering graduate student. There is broad application of this research outside of the petroleum industry.

These areas of research are truly interdisciplinary. The student must apply statics and dynamics, rock and fluid properties, wave theory, and strength of materials to specific petroleum engineering problems. My goal for a student under my supervision is that the student learns to formulate a problem, find a path to the solution, integrate many disciplines to solve the problem, and finally, be able to communicate the problem and the solution to a variety of audiences. This specific type of research (theoretical or experimental, computer oriented or not, basic or applied) is secondary to the importance of a student gaining the ability to question, to answer, and to communicate.



Honorable LaDoris "Dot" Harris
Director, Office of Economic Impact and Diversity, US
Department of Energy

The Honorable La Doris "Dot" Harris brings over 30 years of leadership and management experience as the Director of the Office of Economic Impact and Diversity at the U.S. Department of Energy (DOE). She ensures that minorities and historically

underrepresented communities are afforded opportunities to actively participate in the Department's programs.

Nominated by President Barack Obama and confirmed by the U.S. Senate on March 29, 2012, Director Harris serves in an Assistant Secretary level position at the Department of Energy. She leads the agency's offices of Minority Economic Impact, Minority Education and Community Development, Minority Business and Economic Development, Diversity and Inclusion, and Civil Rights. Additionally, Director Harris spearheads the DOE's Minorities in Energy Initiative; serves as the DOE lead of White House initiatives in support of My Brother's Keeper and the Council on Women and Girls; oversees the corporate funding strategy for minority institutions; develops and implements minority business contracting opportunities; and advocates and protects the civil rights of employees and recipients of multi-billion dollar funding vehicles from the DOE.

Director Harris and her staff have participated in over 300 events across the country focused on promoting public engagement in energy economic development, science, technology, engineering and math (STEM) education, and research and development programs. Through publications and community outreach, she and her staff have reached over 80 million people on the topic of diversity, economic development, and sustainability in the STEM workforce.

Director Harris recently received the 2015 Women of Color President's Award; the 2015 Minority Business Development Agency's National Director's Special Recognition Award; the 2014 Diversity Journal "Women Worth Watching" Award; the 2014 EmpowHer Institute PathMaker Award; the 2014 Fort Valley State University Platinum Achievement Award; and the 2013 Black Business Association Chairperson's Award. She was featured on the covers of the October 2015 edition of Diversity Women's Inclusion magazine and the October 2015 edition of the US Black Engineer magazine. Additionally, she was highlighted in Essence Magazine's 2014 editorial feature, 'Game Changers: The Power List'.

Prior to her appointment, Director Harris was Co-founder, President and CEO of Jabo Industries, LLC, a successful minority-woman owned engineering management consulting firm concentrated primarily in the energy, information technology, logistics, and healthcare industries. Director Harris' leadership in Corporate America ranged from engineer to corporate officer. She served as an executive at General Electric Company (GE) and held a number of leadership positions in GE's Energy and Industrial Systems businesses. Before joining GE, Director Harris was the first African American female officer, Vice President of Operations & Production at ABB, Inc., the world's largest electrical engineering firm. She, also, spent twelve years as a Field Services Engineer and Services Manager with Westinghouse Electric Company where she was the named youngest manager in the history of the Nuclear Services Division of Westinghouse.

Director Harris holds a B.S. in Electrical Engineering from the University of South Carolina and a M.S. in Technology Management from Southern Polytechnic State University. She received honorary doctorate degrees from Chicago State University and Clark Atlanta University



Rachel Hauser

Manager, Foundations and Partnerships, National Center for Atmospheric Research (NCAR)/University Corporation for Atmospheric Research (UCAR)

Rachel is UCAR's Manager of Foundations and Partnerships, as well as the Operations Manager for NCAR's Capacity Center for Climate & Weather Extremes(C3WE). In these roles, she identifies,

develops, and promotes collaborations and development opportunities between UCAR, NCAR, NCAR's C3WE team, and other research institutions, as well as with government, non-governmental and for-profit organizations. Rachel has worked in the geosciences and technology realm for almost 20 years focusing on relationship and business development. She holds a bachelor's degree in Geography, and an MSc in Environmental Studies focused on climate policy.



Derrick HudsonAssociate Professor, Colorado School of Mines

Dr. Hudson is a Teaching Associate Professor of International Relations in the Division of Liberal Arts and International Studies, where he teaches undergraduate courses in International Relations, African History and in the LAIS Graduate program. He earned his PhD in International Relations from the Josef Korbel

School of International Studies at the University of Denver. He specializes in religion and politics in Africa, with particular expertise on the role of prophetic Christianity as an agent for social change in selected historically deeply divided societies. His teaching interests also includes the role of truth commissions as societies are in transition from authoritarian to democratic rule and will teach a course on power and leadership in the McBride Honors Program at CSM. Prior to coming to Mines, Dr. Hudson was an Assistant Professor in the Department of African and African American Studies at Metropolitan State College of Denver in which he gained valuable experience in teaching African American Studies, Social Movements, and Kenyan Politics and Culture. He developed and led a team of students for a one-month study abroad experience in Kenya in 2007. Prior to earning his doctorate, Dr. Hudson has worked with several Denver-based nonprofit organizations as a Program Director, Academic Director, and served as an affiliate faculty member at Colorado Christian University in which he developed a program in Urban Studies and Leadership. His field work has been conducted in numerous countries, most notably South Africa, Kenya, Sudan, and Guatemala. He is currently finishing an article that explores the common patterns of resistant spirituality amongst Indigenous people in Mesoamerica and Afro-Caribbean peoples in the Caribbean. His next major project will explore the transition processes as southern Sudan declares its independence in 2011. Prior to his academic career, Dr. Hudson served as an Air Weapons Controller with the Airborne Warning and Control System (AWCS) in the United States Air Force in Saudi Arabia, Egypt, western Europe, and Puerto Rico.



Mahama Kappiah

Executive Director, Economic Community of West African States' (ECOWAS) Center for Renewable Energy

Mahama Kappiah is the Executive Director of the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE). He was eminent in the establishment of the Centre which aims to ensure increased access to reliable, affordable and clean energy in the

West African region. Under his leadership, ECREEE has attained international recognition as a unique regional renewable energy and energy efficiency promotion agency in sub-Saharan Africa, with other regional economic communities such as the EAC and SADC seeking to emulate.

Prior to the establishment of ECREEE in 2010, Mahama Kappiah was Head of the ECOWAS Energy Division. Some of his achievements include the creation of the West African Power Pool (WAPP) and the ECOWAS Regional Electricity Regulation Authority (ERERA). Before joining the ECOWAS Commission, he worked in the Planning and Development Department of the Volta River Authority (VRA) of Ghana, where he served in various capacities.

Mahama Kappiah is a member of the REN21 Board. He holds a Master of Science degree in Electromechanical Engineering from the Kharkov Polytechnic Institute, Karkov, Ukraine. He has over 20 years of experience working on issues related to energy, environment, climate change and sustainable development in West Africa and internationally.



Kadi Konate

Director of Planning, Strategy and Business Analysis, Rio Tinto Minerals

Kadi Konate is a Finance business leader with 15+ years of experience in Enterprise and Project Risk Management. Her focus has been on helping large and medium size companies in Energy, Real Estate and Mining sectors design and implement strategies to

define, understand and effectively mitigate key business and project risks. More recently, as the Controller and Acting CFO of a \$20B Iron Project in Guinea (Simandou), she was responsible for overseeing all aspects of financial management as well as leading risk management efforts for the Project. Kadi is currently Director of Planning, Strategy and Business Analysis for Rio Tinto Minerals in Denver. She is also the Executive Director of the Elite Coalition for African Project Delivery, a global not for profit organization established to act as a key enabler in the design, financing and timely implementation of capital projects in Sub Saharan Africa.



Ken LoschChief Executive Officer, ZHRO Power and ZHRO Solutions

Ken is a founding member and CEO of ZHRO Power and ZHRO Solutions which are collectively focused on commercializing a suite of "green" technologies for use in the heavy truck transportation, stationary power generation and oil and gas markets. Specifically, for heavy truck and stationary power, the

ZHRO Fuel Injector System is currently being commercialized, removing the need for diesel fuel as the injector system runs exclusively on natural gas without any compromise to any engine; full horsepower and torque efficiency. Additionally, the oil and gas markets will take advantage of the ZHRO flare solution, a technology which takes associated gas from oil production and turns it into 90%+ pure methane. This 1MW-5MW System is also being commercialized for US and international locations. The focus of Mr. Losch and ZHRO is to use the advantage of each of these world changing technologies to leverage the use of natural gas, the bridge fuel to renewables.

Mr. Losch also has more than 25 years of real estate development experience in both the United States and Canada included being the co-founder and principal of two real estate companies in Tempe, Arizona. His companies have collectively purchased, developed, constructed, financed, and property managed close to 10,000 units and 2,000,000 square feet of commercial space, totaling more than \$2.0 billion in aggregate value for their direct account.

Mr. Losch is also a founding board member of the TRACares Foundation, an entity that supports worthy causes locally and globally with the passion statement of "Empowering Community."



Muazu Magali

Vice President and Head, Energy Division, Platinum Vault Group

Engr Muazu Magaji begins his career as an engineer with NNPC after which he was employed by Kano state (the most populous Nigerian state) Civil Service also as an engineer. After 10 years with the Civil Service he moved to the private sector where he

joined Royal Dutch Shell and BG. He was working with Shell International in Houston and Egypt before been called into public service in 2010 and was appointed as the Technical Adviser to the Federal Government of Nigeria on Energy in the Presidential Task Force on Power (PTFP – Gas to Power Team) under the administration of President Goodluck Ebele Jonathan.

He also served as the Head, Pace Setter Projects under the Office of the Special Adviser to the President on Technical Matters, and also as the Programme Manager/Technical Adviser to the Subsidy Reinvestment and Empowerment Programme (SURE –P) under

the Presidency. Muazu voluntarily resigned from the Presidency in December 2013 and in January 2014, he was appointed by Governor Rabiu Musa Kwankwanso as the Senior Special Assistant on Projects to the Executive Governor of Kano State where he assists and advise the Governor in managing projects and programs being executed by the Government till May, 2015. Engr Muazu Magaji ran unsuccessfully for the gubernatorial elections under the umbrella of the ruling All Progressives Congress.

Currently, he is a Vice-President of the Platinum Vault Group where he heads the Energy Division of the group. Magaji is also a registered member of the Nigerian Society of Engineers, Society of Petroleum Engineers (London), Fellow Nigerian Institute of Commerce; Fellow Institute of Human and Natural Resources and an honoured recipient of the United Nation Peace Advocate (UN-Pad).



Kevon MakellFounder, Chairman, Chief Executive Officer and President, SEWW Energy

Kevon Makell is the founder and Chief Executive Officer at SEWW Energy Inc., where he leads the company's operations to develop and deliver sustainable, smart macro and micro-grid solutions globally. Mr. Makell has over 30 years of experience in the energy

industry: the majority with FirstEnergy (a Fortune 500 Utility), managing utility planning, governmental affairs, operations, new ventures, alternative energy, and regulatory compliance. Prior to starting SEWW Energy he was the Vice President & General Manager at PureNERGY Renewables Ltd, a sustainable energy technology company featuring hybrid Renewable Energy solutions for island nations, ranging from 1.5 kilowatts to 1 megawatt.

It was through Mr. Makell's personal experience living on the island of Bermuda that the vision for SEWW Energy was born. Island nations have been the most significantly impacted by global climate change and severe weather conditions, resulting in energy reliability issues. When Kevon was faced with these issues, he leveraged his vast experience in Renewable Energy, Energy Efficiency, Energy Consulting, Energy Services and Electric Utility to build a smart micro-grid islanded solution to power his own home and provide energy security for him and his family. It was through this effort that he realized he wanted to provide similar solutions for other, less fortunate populations that suffer from energy access challenges.

Throughout his career Mr. Makell has successfully completed both large scale (\$6.4Billion) and small scale energy projects throughout the United States; and Internationally in Bermuda, the Caribbean, Latin America and Africa. He earned his Bachelor of Science degree in Business Management with an emphasis in engineering from Bucknell University in Lewisburg, Pennsylvania.



Les MakepeaceFounder and Chief Operating Officer, Ekonx.io

Les Makepeace is Navy veteran and experienced entrepreneur. He's currently a founder and the COO for Ekonx.io. He has periodically served as Adjunct faculty in the Daniels College of Business

Les founded Ekonx.io with Kevin Johansen to meet the need for entrepreneurial communities to be supported electronically, virtually, and globally. Ekonx.io approaches entrepreneurship not as a series of transactions to plug into, but rather as a process that is most benefited by the interaction of likeminded community members.

Prior to founding Ekonx.io, Les was a program manager at Syncroness, a "for hire" product development firm. At Syncroness Les led teams that fielded innovative software, firmware, and hardware product in multiple industries.

Prior to joining Syncroness, Les spent several years immersed in new technology commercialization leadership and finance. He led a University of Colorado spin out for hybrid propulsion, he led an automotive power technology startup, he ran a nano-material manufacturing operation, and supported a Houston based investment banking operation focused on commercialization of technology coming out of Federal laboratories.

When Les first left active duty, he worked directly with NAVAIR on evaluation and commercialization of new technologies. Supporting a small office at NAVAIR, he led the initial requirements, system integration, and program support efforts for the IRST program, aligning the interests of two major defense prime contractors and the Navy. Les' Navy career spanned 20 years and included combat operations in Iraq, Kuwait and the former Yugoslavia. He earned two Master's degrees from the Naval Postgraduate School, and served as an Aerospace Engineering Duty Officer fielding satellites, aircraft and weapons.

Les has a Master's degree from the Naval Postgraduate School and an MBA from the University of Denver.



Ellen Morris

Faculty, Energy and Environmental faculty, Columbia University and President, Sustainable Energy Solutions

Ellen teaches Energy and Enterprise Development at Columbia University's School of International and Public Affairs and is a Faculty Affiliate at the Center on Global Energy Policy. At Columbia, Ellen serves as a mentor in the Women's International Leadership

Program and is the faculty advisor for the Women in Energy student group at SIPA. Ellen is an Ambassador for The Clean Energy Education and Empowerment Initiative that was launched by the Clean Energy Ministerial to close the gender gap in STEM fields. In addition to her faculty appointment, Ellen is the President and Founder of Sustainable Energy Solutions, an international consulting services company that promotes the increased use and deployment of clean energy technologies and services as a means to support economic development and reduce poverty in developing countries. She was also a founder of Embark Energy, a social enterprise that trains and mentors energy entrepreneurs and Arc Finance, a non-profit that links microfinance and clean energy.

Ellen serves as an advisor and Board Member for social enterprises focused on clean energy, including Simpa Networks (India), Earth Spark International (Haiti), and Empowered by Light (Zambia) and is the Energy Program Advisor for the Clinton Global Initiative. She started her career in clean energy working for the National Renewable Energy Laboratory, in the geothermal program. In the early part of her career, she worked as a Fellow on the Science, Space and Technology Committee of the U.S. Congress and was an exploration geophysicist for Texaco. She holds a Bachelor of Science degree in geophysical engineering from the Colorado School of Mines and a doctoral degree in marine geophysics from the University of Rhode Island.



Robert Mulverhill

Chairman of the Board and Executive Director, Standard Alcohol Company of America

Recognized executive and business leader known for crafting the requisite strategic vision to achieve business goals maximizing value. He has built a number of technology enterprises that have consistently delivered results by innovating and aligning strategic

initiatives with business goals while improving performance with a reputation for judicious use of resources and effective cost management. He is recognized for extensive knowledge and expertise in International affairs primarily in China and the EU and is often called upon to advise corporate and governmental agencies on enterprise structure and technology advancement. He has built and managed multiple global companies and organizations raising millions in private equity, delivering hundreds of millions in shareholder value.

Robert is currently Chairman and Executive Director, Standard Alcohol Co. of America, Inc., President and CEO of Delta Geophysical, LLC (Oil & Gas Services). He was founding President and CEO of Ascend Geophysical, Inc. and President and CEO of the International Seismic Company, LLC. His career includes extensive leadership and management roles which began at Honeywell Corp. and the Cobham Group plc. He has served as President and CEO of five companies (one IPO, three acquisitions) and currently serves on four Boards of Directors. He is a graduate of Millikin University with advanced studies completed at Arizona State University and the American University, Washington DC Philip became the General Manager for Sustainable Development and Community Relations in the Shell Petroleum Development Company of Nigeria from January 2012, overseeing social performance, sustainable development, social investment, community relations and relations with the state governments in the Niger Delta. Most recently he was appointed as the Regional Communications Manager for West Africa



Sharrieff Mustakeem
President/Chief Executive Officer, MCX Environmental
Energy Corp.

Sharrieff Mustakeem is President and Chief Executive Officer of MCX Environmental Energy Corp., based in Atlanta, Georgia. Mr. Mustakeem, the company's founder, has developed MCX as a forward-thinking, environmentally conscious entity with emphasis

on a clean, sustainable energy paradigm. Mr. Mustakeem founded MCX after extensive successful careers in sales and financial services. Mr. Mustakeem is or has served on the boards of the International Power Institute [Morehouse College], Organic High Yield, The African-American Alliance [Newnan, GA] and Southface Energy Institute. Mr. Mustakeem is also a founding member and Co-Chairman of the Sustainable Community Technologies Consortium [SCTC]. In 2013 Sharrieff was appointed to the Fulton County Sustainability Commission. Mr. Mustakeem, a Pittsburgh native, holds a bachelor's degree in Business Management, with minor emphasis in Philosophy, from Fordham University, in New York.



Jason Nagy
Founder, Mainspring Innovation, LLC

Jason Nagy founded Mainspring Innovation, LLC (Member, Posner Center for International Development) in Colorado as an international business and economic development enterprise providing consulting services and innovative programs to advance infrastructure development, technology transfer, skills

development, job creation, economic/social justice, environmental stewardship and sustainability. Jason is also Director, Public Sector Engagement for Africa Finance and Advisory Partners, LLC, a company established to revolutionize how American businesses engage the African Continent. AFAP's approach blends the best from the public and private sectors, which is important given the available monies and strategic partners having both developmental and profit-seeking motives.

Jason led USTDA's Africa office (2008-2014) and served on Ex-Im Bank's sub-Saharan Africa business development, policy and program team. He identified and crafted over \$70mn of USTDA program funding primarily in clean energy, transport and ICT projects. In 2013, he launched the US-Africa Clean Energy Development and Finance Center and supported the launch of President Obama's Power Africa Initiative. He has an MA International Affairs from American University with concentration in international economic policy and international business, and a BA in Journalism and Political Science from Indiana University. Jason is a passionate promoter for innovation, education and collaboration!



Rocío Alicia Pérez President and CEO, Inventiva

Executive with 20 years of experience in the private and public sectors.

Rocío Pérez is the Principal of Inventiva Consulting, LLC. Ms. Pérez is an expert with more than 20 years in developing talent

and energizing teams, designing and executing business & marketing strategies. Ms. Pérez helps companies design a strategic and profitable future by saving them time, energy and money while increasing their productivity and profits. She is the former President and CEO, Definitive Marketing, LLC, a multicultural marketing consulting firm.

Ms. Pérez's core competency and experience includes:

- Guiding leaders through change management process
- Coaching leaders and individuals with their professional development needs
- Assessing organizational needs and implementing innovative solutions
- Creating strategic and congruent marketing strategies

Ms. Pérez holds the following degrees: a B.S. in International Business (University of Colorado), a Dual MBA in International Business and Marketing (Regis University), and a Certificate in International Entrepreneurship (University of Colorado).



Luka PowangaProfessor and Energy Africa Conference Chairman, Regis
University

Dr. Luka Powanga is a professor in the School of Management at Regis University and the Executive Director of the Global Commerce Forum. He is also the Managing Editor of the Journal of Global Commerce Research and the Journal of Current

Research in Global Business. He is currently the US correspondent for CargoNews Asia a trade magazine based in Hong Kong.

He holds a BSC degree in Metallurgy and Mineral Processing, Masters and PhD degrees in Mineral Economics from Colorado School of Mines with a minor in Finance from the Graduate School at Denver University. He also holds a Masters degree in Computer Information Technology and Graduate Level Certificate in Object Oriented Programming from Regis University. His industry and academic experience spans over thirty years at middle and senior management levels. He consults in mining and international business management. He worked in the mining and telecommunications industry at middle and senior management level within and outside the United States. He taught at Colorado School of Mines before transitioning to Regis University. He has written a textbook in economics published by McGraw-Hill.



David RennePresident, International Solar Energy Society

Since 1991, Renné developed and managed programs on renewable energy resource assessment and analysis, and the integration of resource data into GIS at the National Renewable Energy Laboratory (NREL). He retired from NREL in 2012 and now holds an Emeritus position there. His consulting firm, Dave Renne

Renewables, provides support to both the public and private sector in planning and developing domestic and international renewable energy programs.

Renne has been President of the International Solar Energy Society since 2010. He continues to serve as an Associate Editor of the Solar Energy Journal in the field of solar resource assessment.

Renné's other current professional activities include a Senior Consultant to Clean Power Research, a small U.S. Company that develops resource assessment and analytical software tools to support large-scale grid connected solar energy systems, and a Consultant to the World Bank's Energy Sector Management Assistance Program's (ESMAP)'s Resource Mapping Project.



Wiley Rhodes
Chief Executive Officer, Newpoint Companies

Wiley Rhodes, Founder of One Step In Foundation, a non-profit whose focus is to promote common ground between environmental and energy innovators. Wiley is proficient in project development, market strategy and sales with a strong interest in preserving our environment for future generations and conserving

our natural resources. Wiley is also the CEO of Newpoint Companies, founded in 1999. Newpoint designs and manufactures a full range of modular gas processing and treating units. Wiley has insured the success of Newpoint with an emphasis on Standard Module Engineering and new process innovations. He has a wide range of international experience as well as over 30 years of experience in the oil and gas industry.



Everod Samuel, P.E.President / Project Sponsor, Samuel Engineering Inc.

Everod Samuel is a Registered Professional Engineer with over 25 years of project management, design, design management, and construction / commissioning experience for large industrial projects in the mining, electric utility, oil & gas, power generation & transmission, chemical, and mineral refining industries.

As President, Everod is excellent at building high performance teams that are committed to achieving project goals. He anticipates problems before they occur and ensures corrective actions are implemented.

As Vice President of Engineering and Project Operations for a large world-class engineering company he directed Project Managers, Project Engineering, CAD and MIS, Procurement, Estimating, Project Controls and Construction Management departments.

As Engineering Manager, Everod has been responsible for directing all design engineering disciplines and for coordinating the design engineering functions for large projects to ensure the innovative, correct and timely preparation of designs, drawings and specifications.

As the Principal Electrical Engineer for large engineering companies, Everod designed, supervised, developed standards and started up projects involving large motors (up to 24,000 hp), generators, Variable Frequency Drives (VFDs) up to 21,000 hp, 15 kV switchgear, 230 kV / 120 MVA substations, 90,000 Amp DC transformer/rectifiers etc.

As a Project Manager, he has executed fixed price and reimbursable projects all within budget and schedule.



S. Gabriel Shumba
Chief Executive Officer, Group Shumba, LLC

Gabriel has over 17 years' experience in banking, structured finance, private equity, and business venture development. He is an astute negotiator, deal structuring expert and business operations strategist, and he has advised Fortune 500 corporations, asset management firms and international financial

institutions in North America and Africa. His experience includes work at PWC, Goldman Sachs, Barclay Capital, KPMG, and GMAC (now Ally Bank). He is an inspirational leader who speaks on various corporate, community and economic platforms on the subjects of frontier investing and personal financial independence. He volunteers on many levels and is passionate about developing African communities, poverty alleviation, and about alternative energy explorations. As the Founder & CEO of Group Shumba, LLC, he dedicates most of his time in developing ventures in frontier geographies for listing on developed financial markets.



Katherine SteeleDeputy Coordinator (Acting), USAID (Power Africa)

Dr. Kate Steel joined USAID's Power Africa in late 2014, where she leads the Energy Sector team in providing technical and policy expertise to create the right enabling environment for private sector investment in Africa.

Before coming to AID, she focused on renewable energy and energy access investments in Africa and South Asia at Google. Dr. Steel began her post-academic career working in energy system development at the World Bank, having been selected to the Young Professionals Program. As a manager of Lighting Africa, she helped grow the program from pilots in Kenya and Ghana to a global initiative with activities across sub-Saharan Africa and Asia.

Early in her career, Dr. Steel consulted on energy access projects in South Africa, Tanzania and Kenya. She received a PhD in Engineering Systems from the Massachusetts Institute of Technology, a MS in Engineering-Development Technologies from University of Melbourne, and a BS in Mechanical Engineering from Stanford University.



Kenneth Strzepek
Research Scientist, MIT Joint Program on Science and Policy of Global Change

Kenneth Strzepek has spent 30 years as a researcher and practitioner at the nexus of engineering, environmental and economics systems, primarily related to water resource planning and management, river basin planning, and modeling of

agricultural, environmental, and water resources systems. His work includes applications of operations research, engineering economics, micro-economics and environmental economics to a broad range applications: from project scale to national and global investment policy studies. He has worked for a range of national governments as well as the United Nations, the World Bank, the USAID. He is Professor Emeritus of Civil, Environmental and Architectural Engineering at the University of Colorado at Boulder. and recently a Visiting Professor of Economics and Affiliated Professor in College of Architecture and Planning at the University of Colorado at Boulder. He is a Visiting Senior Research Fellow at the International Food Policy Research Institute as well as an International Fellow at the Center for Environmental Economics and Policy for Africa and Examiner in the Department of Agricultural Economics at the University of Pretoria, South Africa. He has been an contributing author to the Second IPCC assessement, the Millennium Ecosystem Assessment, the World Water Vision, and the UN World Water Development Report. He is currently the USAID Scientific Liaison Office on Water and Climate Change to the CGIAR. Prof. Strzepek has a PhD in Water Resources Systems Analysis from MIT, an MA in Economics from the University of Colorado and is currently a PhD candidate in the Department of Economics at the University of Hamburg, Germany.



Elias ToweEthel Grobstein Professor, Carnegie Mellon University

Elias Towe is currently the Albert and Ethel Grobstein Professor at Carnegie Mellon University in Pittsburgh, Pennsylvania, USA. He teaches in the Department of Electrical and Computer Engineering, and in the Department of Materials Science and Engineering. His research interests are in photonics and micro-

electronics for information and communication technologies. He is also interested in biophotonics for biomedical imaging and sensing.

Prof. Elias Towe was educated at the Massachusetts Institute of Technology, Cambridge, Massachusetts, where he received his S.B., S.M., and Ph.D. degrees from the Department of Electrical Engineering and Computer Science. He was also a Vincent Hayes Fellow at MIT. He is a recipient of several academic and professional awards that include the US National Science Foundation Young Investigator, the Commonwealth of Virginia Scholar Award, the Young Faculty Teaching Award, the Outstanding Technical Achievement Award from the Office of the US Secretary of Defense, and the Honeywell Technology Award for Advancements in Photonics. He is a Fellow of the Institution of Electrical and Electronics Engineers (IEEE), a Fellow of the Optical Society of America,

a Fellow of the American Physical Society, and a Fellow of the American Association for the Advancement of Science. He currently serves as editor of professional journals in his field.

Prof. Towe has been and is a consultant to industry and governments. From February 1997 to March 2001, he was on leave of absence from the university, serving at the US Defense Advanced Research Projects Agency (DARPA), where he led the Agency's efforts in photonics. He and his students have published over 160 papers in professional technical journals.



Azra TutuncuDirector, Unconventional Natural Gas Institute, Colorado School of Mines

Dr. Tutuncu held various research and leadership assignments in Well Engineering, Rock Physics, Geomechanics and Subsurface R&D groups at Shell International Exploration and Production Company and Shell Oil Company in Houston and

in the Netherlands before joining Colorado School of Mines faculty. Her interest areas include rock-fluid interactions, integrated borehole stability, geomechanics, reservoir characterization and formation damage detection, mitigation and removal. Dr. Tutuncu has over fifty publications in peer reviewed journals and conference proceedings in addition to over sixty reports in research and implementation of novel technologies in Deepwater Gulf of Mexico, Unconventional gas and oil shale, heavy oil sands and carbonates integrated borehole stability, in situ stress and rock property determination, nonlinear rock deformation and failure, pore pressure and fracture gradient prediction, stimulation, drilling and drill in fluid design and compatibility analysis. She holds several patents on pore pressure prediction, attenuation and acoustic stimulation. Dr. Tutuncu is a member of SPE, SEG, Sigma Xi, ARMA, AADE and Pi Epsilon Tau and has been actively involved in SEG, SPE and ARMA organizations over twenty five years. She is currently members of technical review committees in all three organizations, a representative of SEG in AGI Environmental Geoscience Advisory Committee, and SEG Research and Global Affairs Committees in addition to being an Executive Board Member and Former President of American Rock Mechanics Association. Dr. Tutuncu is a member of the EPA Scientific Advisory Board on Hydraulic Fracturing Research since March 2013. She is licensed Professional Petroleum Engineer and Geoscientist in the State of Texas.



Kevin Chika Urama

Senior Advisor to the President of the African Development Bank, African Development Bank

Professor Kevin Chika Urama, is currently the Senior Advisor to the President of the African Development Bank on Inclusive and Green Growth. He is a development economist with extensive Africa-wide and global experience in inclusive green growth and

sustainable development. He holds a First Class Honors degree and a Master of Science in Agricultural Economics from the University of Nigeria, Nsukka, a Master of Philosophy degree with distinction and a Ph.D. in Land Economy from the University of Cambridge in the United Kingdom. He received the 2002/2003 James Claydon Prize for the most outstanding Ph.D. thesis in economics or related subjects at St. Edmund's College, University of Cambridge. In 2012, he was named the Technology Executive of the Year for the Africa Technology Awards, adding to many international prizes he has received for academic excellence and science policy leadership.

Professor Urama is a Fellow of the African Academy of Sciences (AAS), Deputy Chairman of the OMFIF Economists Network, an Extra-Ordinary Professor in the School of Public Leadership, Stellenbosch University, South Africa, an Adjunct Professor at the Sir Walter Murdoch School of Public Policy and International Affairs, Murdoch University, Western Australia, and a Visiting Professor of the University College London – Department of Science, Technology, Engineering and Public Policy, 2016 -2018.

He has held various positions including: the Executive Director of the African Technology Policy Studies (ATPS) Network, Senior Research Fellow at the Macaulay Land Use Research Institute in Aberdeen, United Kingdom; President of the African Society for Ecological Economics, and Lecturer at the Department of Agricultural Economics, University of Nigeria Nsukka, among others. More recently, Prof. Urama was the inaugural Managing Director of the Quantum Global Research Lab established in Switzerland to lead innovation in delivering macro-econometric models for inclusive growth and investment decision making in Africa, and a Senior Consultant for the African Development Bank, advising the President as a member of the Bank's Transition Management Team. His research experience covers trans-disciplinary subjects including green and inclusive development policy, investment decision analyses, integrated systems modelling, agricultural economics, climate change and energy policy, environmental and resource economics, science and innovation policy, and sustainability studies. He is widely published in various media and has served on / contributed to many international and inter-governmental Scientific panels/reports including the Intergovernmental Panel for Climate Change (IPCC); the International Resource Panel (IRP); the OECD Green Growth and Poverty Reduction Task Team; the UNESCO Governing Board of the International Research and Training Centre for Science and Technology Strategy (CISTRAT), Beijing, China; and the World Bank/GGGI/OECD/UNEP facilitated Green Growth Knowledge Platform (GGKP) Advisory Committee, among others.



Doug VilsackExecutive Director, Posner Center for International Development

Doug Vilsack is the Executive Director of the Posner Center for International Development (www.posnercenter.org) in Denver, Colorado, a shared workspace for international development organizations that engages over 100 Tenants and Members. He

is also the founder and Board Chair of Elephant Energy (www.elephantenergy.org), a social venture that distributes small scale renewable energy technologies in Southern Africa and the Navajo Nation in the USA. Doug is a trained lawyer in the practice areas of environmental law, Indian law, and renewable and alternative energy law, with his J.D. from University of Colorado Law School and B.A. from Colorado College.



Ravi Vora

Advisor-International Programs, Renewable Energy Grid, National Renewable Energy Laboratory-NREL

Ravi R. Vora is an experienced international energy executive with focus on clean energy. He has a successful track record in renewable energy (Solar, Wind, and Biomass), power generation, international electric utility, oil/gas industries (upstream,

mid-stream, LNG, refining, petrochemicals) and commercialization of disruptive clean technologies including energy storage. His career in the international energy spans from first of a kind global commercialization of synthetic lubricants for a major oil company to marketing, trading of clean fuels, natural gas liquids, natural gas as well as electricity covering both the physical and financial transactions.

He has comprehensive knowledge and relationships related to clean energy economy in North America (including Mexico), Southern Africa, South Asia and Middle East. He has led successful business models in clean energy both in private sector (Creation of a multi-billion dollar Suzlon-global leader in wind energy) to public sector (Advising Eskom on RE when South Africa's RE IPP attracted over \$17 Billion investment in less than five years and on creating a clean fuels /natural gas strategies and regulations). Leads and facilitates international energy conferences in workshops in USA, South Africa and India. He possesses in-depth experience and a proven track record in all phases of development, organization, financing and monetization (A to Z) of full life cycle based clean energy business ventures. He has a strong network of relationships with key stakeholders in the global clean energy markets especially in emerging economies. He has BS and MS in Chemical Engineering and Masters in International Management from USA and lives in Arvada Colorado with his partner.



Carla Walker-Miller Founder and President, Walker-Miller Energy Services

As founder, president and CEO of Walker-Miller Energy Services, LLC (WMES), Carla Walker-Miller is a savvy entrepreneur and a visionary leader determined to change lives through energy. Established in 2000, the Detroit-based firm develops and implements energy efficiency solutions for utility, residential and

commercial building owners.

Ms. Walker-Miller is a proud Detroit booster, and champions issues related to water affordability and the intentional recruitment, training and employment of black Detroit residents. Her firm has grown to more than 60 team members, and is on track to gross more that \$25 million in 2016 revenues.

An engineer by degree, Carla Walker-Miller led her business to double-digit growth after the recession, earning both local and national recognition as an innovative company. Over the past few years, WMES received several accolades, and most recently honored by the Women President's Organization (WPO) as one of the 50 Fastest Growing Women-owned business in America for 2016. Other recognitions include 2016 Inc. 5000 award, 2015 Best Small Business in Southeast Michigan by the Michigan Small Business Development Center (SBDC), the 2015 Michigan Small Business Administration (SBA) Woman-Owned Business of the Year, 2015 Inner City 100's fastest growing companies in an inner city, Business of the Year 2015 by Michigan League Conservation Voters (MLCV) and Crain's Detroit Business (2014) Cool Places to Work in Michigan-- Rank #18. In addition, WMES has been featured in national publications such as FORTUNE, EBONY, JET, Black Enterprise and Crain's Detroit magazines.

As a sought-after speaker on issues relating to energy efficiency and sustainability, she is determined to bring underserved populations into the important energy dialogue. Her goal is to help communities make informed decisions regarding their own energy destinies. In keeping with this objective, WMES was recently awarded a 2-year contract to implement residential energy efficiency programs in DTE Energy's Michigan service territory.

As part of her strong commitment to the Detroit community, she started a nonprofit organization in 2003 called The Water Access Volunteer Effort (WAVE) Fund. WAVE provides water bill assistance to low- income Detroit citizens and has distributed over \$2 million to help over 9,200 families. Carla currently serves as the organization's Founder and Executive Director.

In 2014, Carla was elected President for the Michigan Chapter of the American Association of Blacks in Energy (AABE). She also serves on the Board of Directors for various organizations including the Detroit Regional Chamber, TechTown Detroit, University of Detroit Jesuit High School, the Invest Detroit First Step Fund Committee, Wayne State University Physicians Board and Invest Michigan's Committee. Carla is a member of Alpha Kappa Alpha Sorority Inc., InForum Michigan, the Michigan Minority

Supplier Diversity Council (MMSDC), the National Association of Women Business Owners (NAWBO), the Women's Informal Network (WIN), and the NAACP. She is a former member of the Board of Water Commissioners for the Detroit Water and Sewerage Department, and a 2014 graduate of Detroit's Inaugural Cohort for Goldman Sachs 10,000 Small Business Program. She and her family reside and work in the City of Detroit.



Terri Walters President, Katevan Consulting

Terri Walters runs Katevan Consulting, LLC, a firm focused on clean energy projects, policies and markets. Her work has included advising the Clean Energy Solutions Center and international governments on clean energy policy and program design, developing guidelines for integrating renewable energy into Fed-

eral building construction, and feasibility reviews of commercial-scale renewable energy projects. Recently, Walters authored Policies to Spur Energy Access, a comprehensive report on regulatory and policy frameworks that can enable decentralized solutions to energy access and attract private sector investment.

Prior to consulting, Walters served the U.S. government on energy policy issues for 15 years. At the National Renewable Energy Laboratory, Walters worked with a range of governments on policy and programs to deploy clean energy technologies and joined with USDA to develop the Rural Energy for America Program to finance thousands of rural clean energy projects. At the U.S. Department of Energy, Walters was a co-author of the Clinton Administration's Sustainable Energy Strategy in 1995 and later served as chief of staff of the Office of Policy and International Affairs. Walters has also worked as a manufacturing engineer and a state- and national-level political consultant.

Walters has also worked as a manufacturing engineer and a state- and national-level political consultant. Walters received her Mechanical Engineering degree with High Honors from the University of Texas at Austin.



Alfred Watkins Chairman, Global Solutions Summit

Alfred Watkins has more than 28 years of experience working in the field of science, technology and innovation capacity building for sustainable economic development. In May 2016, UN Secretary General Ban Ki-moon appointed him to the Governing Council of the Technology Bank for the Least Developed Countries. That

organization is expected to be formally established by the UN General Assembly this September or October.

Alfred Watkins is Chairman of the Global Solutions Summit (GSS). GSS 2016 will convene on December 13-14, 2016 at the William J. Clinton Presidential Library in Little Rock, Arkansas. The theme of GSS 2016 is "Daunting Challenges and Dazzling Opportunities: Scaleable Technology Deployment for Sustainable Development." The Summit is based on the belief that financing the large scale deployment of proven technology is the best way to help developing countries in Africa and elsewhere achieve the Sustainable Development Goals, generate wealth and high-quality jobs in emerging markets, and serve as a new engine of global growth. GSS 2016 builds on the widely-acclaimed inaugural Global Solutions Summit which convened in April 2014 at the US Department of State's George C. Marshall Conference Center. The Inaugural Summit showcased innovative pilot projects, business models and financing mechanisms for transferring clean energy. clean drinking water, food processing, and low cost high quality health care technology to emerging markets. The Summit also showcased innovative financial instruments and mechanisms that could enable pension funds, sovereign wealth funds, institutional investors, high net worth individuals, and, via crowd funding platforms, smaller investors from the Diaspora and local stakeholders to finance commercially viable energy, water, health, and food processing projects in emerging markets.

Prior to founding the Global Solutions Summit, he worked for more than 23 years in various positions at the World Bank and served for more than six years as the World Bank's Science and Technology Program Coordinator and head of the World Bank's Science, Technology and Innovation Global Expert Team. He has extensive on-the-ground experience leading science, technology, and innovation capacity building programs and projects in Africa, Asia, and various countries in the Former Soviet Union. He organized two World Bank Global Forums on Science, Technology and Innovation Capacity Building for Sustainable Development (one in 2007 and another in 2009). He is the author of Building Science, Technology and Innovation Capacity in Rwanda: Developing Practical Solutions to Practical Problems, (with Anubha Verma) and Science, Technology and Innovation Capacity Building for Sustainable Development and Poverty Reduction (with Michael Ehst), as well as numerous other World Bank publications and reports.



Johnny Weiss Co-founder, Johnny Weiss Solar Consulting

Johnny Weiss has over forty years in designing, reviewing, and building solar, wind, and water power system. He is particularly interested in solar electricity-generating projects (photovoltaics/PV) that are sustainable, green, international, and socially worthwhile.

Having consulted and collaborated with teams and Non-Governmental Organizations (NGOs) in more than 30 countries worldwide, and with Native American tribes, Johnny brings supportive, environmental and ecological ethics and understanding to team efforts.

In addition to technical expertise, clients benefit from his comprehensive approach to problem solving—Johnny engages and educates clients with the skills and knowledge needed to create and maintain successful, community-supported solar projects.



Bryan WillsonProfessor and Executive Director, Colorado State University
Energy Institute

Dr. Bryan Willson is Executive Director of the Energy Institute at Colorado State University (www.Energy.ColoState.edu), where he also serves as a Professor of Mechanical Engineering. He served as a Program Director at ARPA-E (Advanced Research Projects

Agency – Energy, (www.ARPA-E.energy.gov) from 2012-2016 and continues to serve as a consultant / advisor to the agency. Dr. Willson has worked for over 25 years to develop and deploy large-scale technology solutions related to energy, air quality, and human health. As an entrepreneur, Dr. Willson is co-founder of: Envirofit International (www. Envirofit.org), a global company that has developed solutions for clean mobility (direct injection retrofits for 2-stroke cycle engines) and is now manufacturing and distributing clean cookstoves in the developing world; Solix BioSystems (www.SolixBioSystems. com), a developer of large-scale production systems for algae-based fuels and specialty chemicals; and Factor(e) Ventures (www.FactorE.com), a venture development firm supporting early stage ventures working on access to energy in the developing world. In his university role, he has helped to launch or enhance numerous other companies. His research laboratory, the Engines & Energy Conversion Laboratory, has made important contributions in many areas, including: internal combustion engines, oil & gas production technology, advanced electrical grids, advanced biofuels, technology for the developing world, and advanced building technologies. Dr. Willson has worked in over 40 countries.

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The Denver Institute of Urban Studies and Adult College was established in 1996, when Denver Seminary and Colorado Christian University along with urban and non urban Christian leaders in Metro Denver came together to create opportunities for high quality integrated Biblical studies and Community Development for inner-city pastors and lay leadership. DIUS (Denver Institute of Urban Studies) is a non-profit, independent, nonpartisan organization devoted to research, analysis, education and faith-based community leadership that focuses on public policy issues in the interest of the urban poor. We seek to understand the civic role of religion and collaborates with congregations, academics, funders and faith-based organizations in creative ways. We promote a deeper understanding of democracy and how religion shapes the ideas and institutions of American society and public life. We facilitate effective grassroots organizations and empower faith-based community practitioners through a variety of technical assistance and capacity building initiatives. Through innovative courses, experiential learning, civic engagement, faith-based participatory action and urban international immersions, we partner the resources and expertise of the classroom with the needs of a diverse community.

Since our founding in 1996, we have established American Pathways University, American Global Academy(High School Diploma Program), Centre for Urban Research and Environmental Technology (CURE-T), Denver Green Jobs Initiative, The Urban Tikkun Centre, Urban World Graduate Institute for Environmental Studies, and have Educational ministries in Brazil, Senegal (West Africa), Haiti and Okinawa, Japan.

H. Malcolm Newton, Th.D., Ed.D.,

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INTRODUCTION TO THE REGIS UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS



Regis University's new College of Business and Economics (CBE) has set lofty goals: To imbue Jesuit values into business education by teaching students to place ethics at the heart of all business matters and operate according to Jesuit principles.

CBE was formed by combining the existing program from the Regis College Division of Business with the College for Professional Studies, School of Management and Master of Nonprofit Management. CBE opened this fall with Tim Keane as its founding Dean.

CBE plans to offer courses to undergraduate and graduate students as well as working professionals. Students can seek bachelor's or master's degrees, as well as academic certificates, in accounting, business administration, economics, finance, health industry leadership, human resources management, marketing, nonprofit management, operations management, organizational leadership, project management, public administration and strategic management.

Jesuit principles are at the core, among them service to humanity, self-reflection, positive engagement and combining practical skills with critical thinking skills.



The ZHRO 9000CMT Flare Gas Reformation System



ZHRO Power, an Arizona based technology company, is proud to introduce the ZHRO 9000CMT gas reformation system to the global market. ZHRO is executing contracts with large producers, including those in the African continent. This system eliminates flare gas and monetizes the waste stream.

The 9000CMT system takes wasted flare gas and reforms it into a consistent, reliable, pipeline quality stream of methane (90%+ pure), thereby eliminating toxic emissions. This reformed stream of methane creates the following advantages:

- · Eliminates/reduces high cost diesel fuel use
- Eliminates/reduces emission contaminants (Paris Accord)
- Provides for electrical power generation (on site/adjacent areas/power grid supply)
- Provides underground gas injection for oil lift
- Provides direct use for off-shore platforms (elimination/reduction of costly diesel fuel use)
- Relocates wasted natural gas liquids (NGLs) to areas of high diesel use or high electrical needs

Each mobile and modular system processes enough methane to service 1 - 5MW genset operation needs and can be paralleled to create a 100MW micro-refinery. Each 1MW 9000CMT system eliminates 9000 carbon metric tons of emissions annually when compared to diesel fuel use. The business model is based on leasing each unit to the end user, so there is no CAPEX to the customer.

The ZHRO 9000CMT monetizes your wasted flare gas to a higher and better use while eliminating your emissions problem with no CAPEX.

Robert Reifsnider
7030 West Oakland Street Chandler, Arizona 85226 USA • rreifsnider@zhro.com
www.zhro.com

MEET SAMUEL ENGINEERING, INC.



20 YEARS EST. 1996

Samuel Engineering Inc. (SE) is a Denver, Colorado USA based multi-discipline engineering, procurement and construction management (EPCM) company that was started by Claudia Samuel, MSEE in 1996. From SE's inception to the year 2000 Claudia focused the company on providing solutions to complex electrical and controls problems



SE Corporate Headquarters - Colorado USA

in the power, oil & gas, chemical, mining and government sectors.

In 2000, Everod Samuel, PE, MSEE, MBA who was functioning as the USA's VP of Engineering and Project Operations for a large ENR top 5, global EPCM company joined SE with the charter of converting SE to a unique multi-discipline EPCM company. This was achieved in 2001.

Since then, SE has grown to over 185 full time professionals and has successfully executed hundreds of projects in the USA, Canada, Central and South America, Europe and Africa. For the last 10 years, SE has focused on providing solutions to three primary heavy industrial sectors, namely; oil and gas, minerals & mining and power generation/distribution.

Beyond SE's center-of-excellence and corporate headquarters in the Denver Tech Center, are satellite USA offices in Durango, Colorado, Utah and Wyoming.

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