Stakeholder Working Groups

Financial Working Group

Purpose and Scope

The Financial Working Group is tasked with vetting certain data inputs and assumptions to be included in the financial model. Additionally, this team will also be asked to research and find certain data points to use in the model. The financial model will include information on the operations of a municipal utility, including debt structures. The model will also take inputs from other sources, such as the resource modeling tool, and provide, at a minimum, the following outputs to test certain charter requirements of forming a municipal utility:

- Total cost of service, average cost per kwh
- Debt service coverage ratio
- Comparison to Xcel Energy's average cost per kwh

The financial model will be a 20-year forecast of cash flows with the ability to calculate financial attributes above and beyond the charter requirements mentioned above. This model is the base tool for supporting any possible future financing. Therefore it will include several financial tests to meet rating agency tests. In addition, the model will be a tool to determine various trade-offs for where policy makers may want to shift their financial resources over time to achieve the goals.

The city hired a financial advisor whose expertise lies in municipal utility finance. Questions that arise from the financial working group as they relate to the financial assumptions can be sent to the financial advisor and then discussed with the working group.

Data and assumptions to be vetted by this group are limited to the following areas[1]:

- Operations of a municipal utility (examples: various scenarios for operating a utility, functions required to operate a distribution system)
- Financial parameters assumed in the model (examples: how net present value is calculated, debt service coverage, debt structures and parameters, growth and inflation)
- Economic benefits and/or detriments of owning and operating a municipal utility (example: jobs, economic development)

WORK PRODUCT:

[1] This group will not be discussing assumptions and strategies related to acquisition of the assets or stranded costs as these topics are confidential and privileged attorney client matters. Additionally, this group will not be discussing the metrics as they relate to the charter requirements under discussion with City Council in November.

The work product of this group is a complete set of data with documented assumptions on utility operations, financial parameters, and economic attributes to be included in the financial model. Once this data is integrated with results from the other work plan areas, the financial model will show, at a minimum, the impact of strategies on the charter requirements. As mentioned above, the model will also include other financial test metrics.

Working Group Meetings

This group will meet formally approximately once a month for four months. Meetings are expected to commence in early November and continue through March. Other tasks and updates in between meetings will take place via e-mail and through the Basecamp web application. The following meeting dates have been scheduled: Nov. 7, Dec. 11, Jan. 9, and Feb. 13.

Current Working Group Members

COMMUNITY MEMBERS
Jim Barret – Community member
David Becker – EFAA
Alison Burchell – Geologic consultant
Lynda Gibbons – Gibbons White
Steve Pomerance – Community member
Dan Powers – Western Disposal Services
Joshua Putterman – Community member
Nick Rancis – CU Cleantech
Frank Selto – University of Colorado
Sam Weaver – Cool Energy, Inc.

STAFF
Yael Gichon – Residential Sustainability Coordinator
Kelly Crandall – Sustainability Specialist
Sarah Huntley – Media Relations/Communications Coordinator

Working Group Member Bios

JIM BARRET

Jim has 14 years of experience working in the nexus of climate change, energy efficiency and economics and has written extensively on the role of efficiency in achieving environmental and economic goals. He was Executive Director of Redefining Progress, a public policy think tank dedicated to promoting a healthy environment, a strong economy, and social justice. Prior to joining Redefining Progress, he was an economist at the Economic Policy Institute, senior economist on the Democratic staff of the Joint Economic Committee, and staff economist at the Institute for Biological Energy Alternatives. Jim earned his B.A. in economics from Bucknell University and his M.A. and Ph.D. in economics from the University of Connecticut.

DAVID BECKER

Work and Education:
Emergency Family Assistance Association (EFAA), Finance Director, 2012-present
Fairview High School, Girls Basketball Coach (JV), 2001-present
SolarGlass Window & Door, President, 1986-2006
Storage Technology Corp., Assistant to the Chairman, 1983-1986
University of CA, Berkely, MBA 1983
D. Becker & Sons, Purchasing & Controller, Philadelphia, PA, 1977-1981
Wharton School of Business, University of Pennsylvania, B.S. 1977

Volunteer Activities:
CareConnect Fix-It Handyman
Eco-Cycle Block Leader
Boulder Montessori School Board President
HOA Board
Youth Basketball Coach

Boulder resident since 1984. Married to Ruth. Two children: Lisa (25) and Pete (23)

ALISON BURCHELL

Alison Burchell is a geologic consultant whose clients include the business and non-profit sectors, Federal Land Managers and stakeholder groups involved in a range of national and international projects including: mapping and geochemical surveys, coral reef and wetland assessment, mined-lands reclamation, volcanic hazards, renewable-energy site-assessment, public health- and environmental- related legislation. She is also an adjunct geologic field-techniques instructor at Ft. Lewis College, Durango.

Her undergraduate work was in Chemistry with a minor in Environmental Sciences and Planning. She received her graduate degree in Volcanology and Isotope-Geochemistry under a US Department of Interior - US Geologic Survey Fellowship at the University of Arizona. She also holds advanced certificates in Multispectral and Synthetic Aperture Radar Remote Sensing Analysis and Image interpretation, Database Design, Geographic Information Systems Analyses, Advanced Scuba and EPA hazardous materials sampling, detection and calibration.

Her current research is focused on understanding and quantifying the mechanisms and kinetics of Natural Terrestrial Sequestration (NTS, the naturally occurring geologic, biologic and hydrologic variables that influence natural terrestrial carbon sequestration) and quantifying the remediation, environmental and economic benefits to governments, businesses and communities as carbon markets mature.

This work includes collaboration with Colorado officials and US Federal Land-Managers and Agencies (EPA, BLM, USGS, USDA) to implement a "Natural Terrestrial Sequestration Reclamation Management Program for the San Juan Public Lands – Natural Resource Management Plan and to help establish the San Juan Mountains ecosystem as a terrestrial base-station for long-term research, climate monitoring and modeling.

The NTS research has led her towards an integrative, global-systems approach to researching complex, multi-scale, terrestrial issues that she calls bio-geo-mimicry. She is co-convener of the NTS Group, a collaborative interagency-academic-stakeholder-student-private sector research group, which funded and launched the Rocky Mountain NTS Pilot Project. The work of this group has demonstrated both a higher reclamation potential and, consequently, a higher NTS potential and economic value for N. A. soils than may be accounted for in past climate and mitigation models.

Her civic engagements include: collaboration with the OSU - Environmental and Natural Resources Law Program, the Presidential Climate Action Project and various US rural communities to advance the principles of Environmental Justice and a Natural Resources Trust in the US; former assistant curator, the Sonora Desert Museum where she taught earth sciences to Native American, Hispanic and youth groups; co-founder, UN-affiliated Mountain Studies Institute; convener and co-director of RenewablesYes (RY) and the Statewide Coalition on Colorado's Renewable Energy Future.

Since moving to Boulder, she has served on the board of several city working groups and non-profits tasked with modeling and mitigating a range of environmental problems or working to promote both public education and clean energy alternatives, including: the City of Boulder, South Boulder Creek Hydrology Advisory Panel (HAP) joint with CU, UDFCD, NOAA and FEMA; the CU Collaboratory – Carbon Management Program, advisory group; Clean Energy Acation (CEA); the Center for Resource Conservation CRC), the Boulder Renewable Energy and Energy Efficiency – Working group (BREEE), the Amendment 37 campaign, the Boulder Climate Action Plan (CAP), the Boulder Climate Action Network (BCAN), the City of Boulder Energy Future (BEF) - Task Force, the Renewables-Yes Steering Committee Finance and Energy Resource Modeling Teams, the RY 2B and 2C campaigns and the BEF Resource Modeling Group.

LYNDA GIBBONS

Lynda graduated from U of C in 1978 with a degree in Molecular Biology (MCDB). She founded Gibbons White, a commercial real estate management and brokerage firm, in 1986. Gibbons White specializes in asset management, property management, development consulting, leasing, acquisitions and dispositions of commercial property in the Boulder area and the Front Range. Gibbons White currently provides institutional quality management services for over $1.6Million sq ft of industrial, office, retail, and medical properties including the majority of medical buildings on the Longmont United and Boulder Community Hospital campuses.

STEVE POMERANCE

BA - Harvard University Mathematics
MA - University of Colorado Mathematics
MS - Stanford University Civil Engineering
Boulder City Council 1986-93, 95-97
Steve has worked on Boulder's solar access ordinance, raw water master plan, and carbon tax.

DAN POWERS

Dan Powers is the Community Relations Coordinator for Western Disposal Services, a 43-year old trash hauling and waste minimization company serving Boulder and Broomfield Counties. Prior to recently joining Western in 2011 he spent 7 years as the Community Affairs Manager of the Boulder Chamber. He has been an active participant and advocate in numerous regional and Boulder policy/regulatory issues. He has an MBA Certificate in Sustainable Business Leadership from Green Mountain College and a BA in Environmental Conservation from CU-Boulder.

JOSHUA PUTTERMAN

Former Operations and Research Officer with the World Bank, known for specialty in development finance initiatives, as well as standard economic development projects. One of 288 authorized service providers listed on the World Bank's carbon finance website. Created independent consultancy in 2003 and presently serving clients worldwide. Recent projects include: author of SNL Financial Energy's White Paper on Carbon Finance in 2011; an alternative energy capital campaign for the Imagine! organization's Smart Home for adults with cognitive disabilities; advising on the implementation of emissions reduction program in Quito, Ecuador and international legal due diligence projects. Considered a specialist in international law, political economy and international development finance instruments such as grants, loans and bank participations.

NICK RANCIS

Nick serves as the Director of Partnerships at CU Cleantech, focusing on providing commercial value to faculty and corporate partners through public and private collaboration. Nick comes from academia and private industry working on a wide variety of water and energy related companies, both renewable and conventional. By working closely with multidisciplinary public/private teams, he is skilled at generating intellectual property and university growth through these unique partnerships. He also operates as a Senior Scientist at BioVantage Resources in Golden, CO, commercializing bioremediation treatment systems while generating value added biomass. In parallel, Nick serves as managing partner at Tierra Verde Consulting, focusing on reclamation of nutrients from waste material, water reuse and sustainable biofuel production. . He holds a BS in Microbiology from Colorado State University and serves on the board for Bereka Inc., creating sustainable franchises for restaurant supply chain management and product creation sourced through local markets.

FRANK SELTO

Frank Selto is Professor of accounting at the University of Colorado, Boulder, where he has taught management accounting at all levels since 1985. He earned BSME, MSME, MBA and PhD degrees – before the availability of personal computers. His first computer was an Apple II, and he still prefers Apple products.

His teaching always includes a heavy use of spreadsheet modeling and analysis. He is a co-author of an intermediate level cost management text (McGraw-Hill) that has been adopted

internationally. He is a co-author of an advanced management accounting text that is in production (Pearson Ed). He has published widely in areas of management accounting in leading international academic and professional journals. He has served on several editorial review boards.

He has consulted with leading (and some lagging) industrial firms, entrepreneurs, colleges, and citizen groups in areas of costing, management control, balanced scorecards, and financial feasibility.

SAM WEAVER

Sam Weaver is President, CEO and a co-founder of Cool Energy, Inc., a power conversion equipment company located in Boulder, CO. The main applications of Cool Energy's products are waste heat recovery, solar power, and biomass power, and the scale of the equipment is intended for on-site and remote power generation. Sam serves on the Board of the Colorado Solar Energy Industries Association, and is a member of the City of Boulder Planning Board and the Colorado Clean Energy Development Authority. Sam is actively involved in the Colorado technology and business communities, having previously co-founded one other Colorado-based company. Previous to his time as an entrepreneur and in start-up businesses, Sam worked for ten years as a professional researcher in the electrical engineering department at CU-Boulder. He is an active member of numerous energy and renewable energy industry trade groups, and has served his community as a volunteer fire chief and Boulder County advisory board member. Sam holds a B.S. degree in engineering and applied science from the California Institute of Technology and is an inventor named on fifteen issued U.S. patents.

Decision Analysis Working Group

Purpose and Scope

The Decision Analysis Working Group is tasked with reviewing the framework of the decision analysis and with vetting data and assumptions to be included within it. It is intended to be a small team of experts with significant academic and/or career experience related to decision analysis and risk assessment. The city has hired a decision analysis consultant who will be providing overall project guidance, and this group would both evaluate aspects of that consultant's work and carry out aspects of it by providing research support and expert feedback. This group may help prepare materials for and/or review materials from the other working groups, who are the subject matter experts in their relevant project areas. This group will not be discussing assumptions and strategies related to acquisition of assets or stranded costs as these topics are confidential and privileged attorney-client matters.

WORK PRODUCT:
The work products for this group are primarily based on review and research. This group will review materials for the working groups and from the decision analysis consultant. The outputs from this group will be used to inform the decision analysis model, which will be either probabilistic analysis software or augmented financial model.

Working Group Meetings

This group will meet formally approximately three times from December through March. Other tasks and updates in between meetings will take place via e-mail and through the Basecamp web application.

Current Working Group Members

COMMUNITY MEMBERS
Pete Baston – IDEAS, LLC
Tom Feiler – Clipper Windpower, Inc.
David Kline – National Renewable Energy Laboratory
Tom Leifer – QI Path
Frank Selto – University of Colorado
Zane Selvans – Clean Energy Action
JoAnn Silverstein – University of Colorado
Edith Zagona – University of Colorado

CONSULTANTS
Greg Hamm – Stratelytics, LLC

STAFF
Heather Bailey – Executive Director of Energy Strategy and Electric Utility Development
Kelly Crandall – Sustainability Specialist

Sarah Huntley – Media Relations/Communications Coordinator

Working Group Member Bios

PETE BASTON

Pete, the founder of IDEAS, is a Senior Executive Consultant with over 25 years of Quality Assurance experience at the highest level of operations. This experience encompasses:

- Immersion in best practices and workflow deployment using advanced digital technology systems for business development, business turnaround and risk management
- Due diligence for financial institutions, foundations and re-insurance companies
- Project development and best practices implementation in multiple industries including energy systems, engineering and construction, manufacturing, healthcare, petrochemical, information technology, telecommunications, and many more.

Pete was born in England and raised from the age of four in Rhodesia, Africa. He served intermittently as a conscript in a logistics and transport division of the Rhodesian citizen army from 1965 to 1979. During that time, he acquired four college degrees and formed his first business, an independent subsidiary of the Ajax Group, a Rhodesia-based commercial and military construction conglomerate. His consulting firm was the chief troubleshooter and quality assurance auditor for the conglomerate, resolving engineering, project management and materials acquisition problems. In 1975, Peter Baston Consulting established a subsidiary in South Africa, which expanded its client base to include a number of South African and international clients, including Fluor, Soros, Maurabeni, Hyundai, Asea Brown Boveri, Bechtel and others. At the same time, its project base expanded to include design and construction of petrochemical and power plants as well as large commercial structures.

His experience in Africa, where a shortage of resources absolutely required that engineering projects be done right the first time because there were no additional funds available to correct mistakes, gave Pete an enduring passion for "doing it right in the real world" and a reputation for accomplishing the seemingly impossible with minimal resources. Shuttling between England and Africa, he often says, meant learning to operate in perfectly opposed environments: how to get nothing done with lots of resources, or how to get everything done with minimal resources. This has translated into a life-long commitment to Quality Assurance as applied engineering. For Pete, Quality Assurance is the anchor for everything that a company does, and the key to consistent and enduring profitability. Deming's 14 points are the manifesto that has accompanied him all over the world, and which he has integrated into field implementation and operations on every project he's managed.

In 1979, with Rhodesia fast descending into political, military and economic chaos, Peter left Rhodesia with what he was allowed to carry out: $1,000 in cash and two suitcases. After a year and a half doing free-lance consulting throughout Europe, Pete was recruited to the US by the California division of Fluor Engineering to provide Quality Assurance oversight and expertise on assignment to a variety of teams. For a number of years he served as a troubleshooter and market development consultant for the Fluor Power Services Division and its research arm, Buildings of the Future, as well as for Nation's Bank. In this capacity, he was certified as a quality auditor and

performed due diligence reviews and construction project audits on billion dollar construction projects. After the oil market crash, his assignment expanded from servicing petrochemical and power plants to creating and marketing new, advanced products and services for Fortune 500 companies in a broad variety of industries. He developed and implemented the US marketing, design and deployment strategy for newly-formed subsidiary J.M. Group, incorporating rigorous Quality Assurance practices to protect profitability and taking the subsidiary from $0 to $232M annual sales in three years. In 1986, Pete founded his own manufacturing, design and service firm, Monkradle, to develop, manufacture and market advanced support equipment and systems to promote best practices and Quality Assurance in the utility, petrochemical, aerospace, civil engineering, defense and other industries.

In the early 1990s, as it became apparent that computers and information technology would eventually drive Quality Assurance and all of the industrial design and maintenance industry, he sold his company and took an extended sabbatical to learn digital technology from the ground up at the University of California San Diego, Northwestern University, the University of British Columbia and MIT. Pete pursued an independent and eclectic course of studies that eventually led to a list of technical certifications as long as his arm. In 1996, on a visit to Los Alamos National Labs and the Santa Fe Institute, he decided to settle in New Mexico. Over the following decade, Pete took on a number of large technical concept development, Quality Assurance and problem-solving projects with government agencies and private companies. In 2010, IDEAS moved its base of operations to Boulder, Colorado, a center for development of the most advanced parametric technology in the world. Pete believes parametric technology will be the cornerstone for future development of advanced best practices using digital workflow. IDEAS is already developing this type of technology as part of its integrated intelligent QA management systems (*iQA*™).

Pete is a frequent speaker and lecturer on Quality Assurance and the integration of technology into QA and business systems.

TOM FEILER

EMPLOYMENT HISTORY

- Director, Business Development, Clipper Windpower, Inc., 2002-present
- Managing Director of Research and Consulting, Rocky Mountain Institute, 1999 - 2002
- Independent Consultant, Feiler and Associates, Boulder, CO, 1993-1999
- Senior Consultant, Cambridge Energy Research Associates, Inc., Cambridge, MA,
- 1990-1993
- Associate, Cambridge Energy Research Associates, Inc., Cambridge, MA, 1988-1990
- Energy and Utility Analyst, The Energy and Environmental Policy Center, Harvard University, Cambridge, MA, 1987-1988
- Teaching Fellow, Harvard University, Cambridge, MA, 1987-1988

EDUCATION

- The Fletcher School of Law and Diplomacy, MA, Law and Diplomacy, 1987
- University of Denver, BA, Political Science, 1984
- University of Denver, BA, Philosophy, 1984

PROFESSIONAL EXPERIENCE

Mr. Feiler leads Clipper Windpower's development activities in the Midwest United States. He manages a portfolio of more than 8,000 MW of assets. He is responsible for all activities associated with the origination and development processes including: market analysis, prospecting, land acquisition, wind resource assessment, transmission planning, siting and permitting, customer relations, and sales. Mr. Feiler also has broad responsibilities in turbine marketing and sales including strategic business planning, market and customer intelligence, government relations, and regulatory affairs.

Nationally recognized as an expert on energy policy, Mr. Feiler is a frequent speaker and author of many publications related to the electric power, natural gas, and other regulated industries, including strategic planning, industry trends, regulatory policy analysis, market developments, risk analysis, integrated resource planning, and technology development. He has also provided expert testimony and litigation support to a number of state and federal government agencies including the United States Senate and the Federal Energy Regulatory Commission. Mr. Feiler was recognized by The Economist for having co-authored "The Economist 2002 Book of the Year" *Small Is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size*.

SELECTED CONSULTING PROJECTS

Ford/GE Plug Power. Mr. Feiler led a team of engineers, economists, and regulatory experts to develop the business model for fuel cell-based electricity generators in distributed applications. The analysis included detailed computer simulation modeling of electricity distribution systems, financial modeling of "options" values for electric energy and capacity, engineering cost savings, product design, utility grid interconnection, power electronics for generation and load control, and internet-based network systems for integration.

Optima Energy: For the largest electric generating company in Australia, Mr. Feiler designed and implemented pool-based bidding strategies, including design of sophisticated bulk power market simulation models, financial planning, and resource optimization models. Recent evidence from all pool-based bulk power markets, as well as other competitive commodity markets, was used to design scenarios for sensitivity analysis and financial planning.

AEP Resources: Mr. Feiler conducted a market valuation study of the hydroelectric generating resources that were privatized by the Federal government of Brazil.

Author of ***Retail Power Market in the U.S.,*** featured prominently in Congressional and Administration policy discussions regarding costs of electric industry restructuring – cited on the front page of the *Wall Street Journal*. The study provided an in-depth assessment of retail and wholesale electricity markets, estimated the potential stranded investment for all 3,200 electric utilities, and analyzed which electric utility companies will be competitively positioned and which will be vulnerable in more open and competitive markets.

Transmission Markets in the United States. Authored an in-depth analysis of the transmission network in North America and how transmission costs and constraints will affect the competitive markets for electricity.

City of San Francisco: Led team in preparing a comprehensive "energy resource investment strategy" (ERIS). The Strategy was used to guide long-term energy initiatives, including municipalization of the electric distribution utility, as well as the expenditure of the $100 million renewable energy bond fund. The Strategy prioritized the City's electric resource options based on cost, performance and environmental impact.

PUBLIC POLICY AND REGULATION

United States Senate. Mr. Feiler managed the *National Energy Policy Initiative* to help break the impasse on national energy policy and develop a stakeholder-based national energy policy. The Initiative convened a highly respected and diverse group of national energy industry executives, government leaders and policy experts to develop a set of guiding principles, overarching objectives, and specific policy proposals to deliver to the American people the desired energy services in ways that are secure, reliable, affordable, safe, clean, and fair. The effort is cosponsored by senior Democratic and Republican leaders in Congress.

State Legislatures of Colorado and Alaska. Mr. Feiler conducted independent studies of the economic, legal, and regulatory issues associated with restructuring the electric power industries in each state. These comprehensive studies analyzed a broad range of issues including affordability, universal service, employment, taxes and fees, stranded investment, access to transmission and distribution facilities, service quality standards, renewable energy sources and the environment, and impacts on rural communities and customers.

PUBLICATIONS

- Small is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size, RMI, 2002.
- Cleaner Energy, Greener Profits: Fuel Cells as Cost-Effective Distributed Energy Resources, Rocky Mountain Institute, 2001.
- The New Playing Field for HVAC Services, E Source, 1998.
- Protecting Consumers in Deregulated Markets, The Competition Policy Institute, 1997.
- A New Era of Competition in Gas Markets, The Interstate Natural Gas Association of America Foundation, 1996.
- Energy Choices in a Competitive Era, Center for Energy and Economic Development, 1995.
- Transmission Markets in the U.S. 1995. Resource Data International, Inc., October.
- The Competitive Effects of Restructuring. 1995. *Electric Utility Fortnightly*, July 15.
- Finding Success after Utility Deregulation. 1995. *Coal Magazine*, April.
- Electric Stranded Investment: Not as Much as You Think. 1995. *Public Utilities Fortnightly*, January 15.
- Retail Power Markets in the U.S. 1994. Resource Data International, Inc., December.
- The New Era of Competition Could Cost Billions. 1994. *Coal Magazine*, September.
- Utility Coal-Supply Contracts Could Strand Billions. 1994. *Public Utilities Fortnightly*, September 15.

- Bright Future for Coal Power in the West. 1994. *Public Utilities Fortnightly*, July 15.
- Power-Purchase Contracts Could Strand Billions. 1994. *Public Utilities Fortnightly*, November 15.
- Breaking the Future Trap: Strategic Planning in an Uncertain Future. 1993. Electric Power Research Institute.
- North American Electric Power Trends. 1992. Cambridge Energy Research Associates and Arthur Andersen Worldwide Organization.
- European Electric Power Trends. 1992. Cambridge Energy Research Associates and Arthur Andersen Worldwide Organization.
- Quiet Revolution: Integrated Resource Planning and the Future of U.S. Electric Power. 1992. Cambridge Energy Research Associates.
- Integrated Resource Planning Practices: State-by-State Variations. 1992. Cambridge Energy Research Associates.
- The Generation Gap: Electric Power and Natural Gas in the 1990s. 1991. Cambridge Energy Research Associates.
- Lightening the Load: The Electric Power Industry and Demand-Side Management. 1991. Cambridge Energy Research Associates.
- The Bull Market for Gas Turbines. 1991. Cambridge Energy Research Associates.
- A Nuclear Power Renaissance in the U.S.? Opportunities and Obstacles. 1991. Cambridge Energy Research Associates.
- European Electric Power Trends. 1991. Cambridge Energy Research Associates and Arthur Andersen Worldwide Organization.
- Warning Light: New England and the Electricity Future. 1990. Cambridge Energy Research Associates.
- Electric Power Trends. 1989. Cambridge Energy Research Associates and Arthur Andersen Worldwide Organization.

DAVID KLINE

David M. Kline, Ph.D. has more than thirty years experience in the analysis of public policy toward energy research and development, demonstration and deployment, focusing for the last 21 years on renewable energy technologies at the National Renewable Energy Laboratory (NREL). Since 1999, his work has focused on market-oriented strategies for the transfer of clean energy technologies from developed to developing countries. He currently works primarily with partners in China, where he manages a portfolio of cooperative projects on renewable energy policy, planning, deployment, technology development, and standards. He has published and presented extensively on public policy on renewable energy, technology change and adoption, oil markets, and natural gas transportation networks. David also manages the Markets and Policy Impacts Analysis Group, which provides a wide range of analysis to support energy decision makers in the U.S. and abroad.

Prior to NREL, David led natural gas planning and forecasting for the California Energy Commission (CEC), where he coordinated a large-scale energy modeling effort to inform California Public Utility Commission policy on natural gas transmission into the state. He served as one of CEC's expert witnesses in the relevant docket, which was decided in favor of the position advocated by CEC.

David holds a BA in Mathematics, and an MS and Ph.D. in Management Science and Engineering from Stanford University, where his research focused on the resource economics of world oil markets.

David participates on the Decision Analysis working group as a private citizen. None of his contributions should be construed as reflecting the opinions or analysis of NREL or any other organization.

TOM LEIFER

Tom founded QI Path originally in 2003. He designed the QI Path FMEA system while conducting improvement projects as a consultant for a hospital client in Colorado in 2006. With more than 20 years of professional experience in strategy development, systems design and process improvement, Tom has applied his drive, energy and cross-industry experience to improving quality and safety in healthcare since 2002. He has held management positions at Thomson Micromedex (now Thomson Reuters), DigitalMed, Inc. (a Tenet Healthcare company), and Qwest Communications. His recent engagements include work with hospitals and health systems in Massachusetts, New York, Pennsylvania, Colorado, Oregon and California.

FRANK SELTO

Frank Selto is Professor of accounting at the University of Colorado, Boulder, where he has taught management accounting at all levels since 1985. He earned BSME, MSME, MBA and PhD degrees – before the availability of personal computers. His first computer was an Apple II, and he still prefers Apple products.

His teaching always includes a heavy use of spreadsheet modeling and analysis. He is a co-author of an intermediate level cost management text (McGraw-Hill) that has been adopted internationally. He is a co-author of an advanced management accounting text that is in production (Pearson Ed). He has published widely in areas of management accounting in leading international academic and professional journals. He has served on several editorial review boards. He has consulted with leading (and some lagging) industrial firms, entrepreneurs, colleges, and citizen groups in areas of costing, management control, balanced scorecards, and financial feasibility.

ZANE SELVANS

EXPERIENCE

2012-2013 Clean Energy Action Boulder, CO

Assistant Research Director

- Research state and local policy options related to energy and climate change, including financing for building energy efficiency, carbon taxes, and feed-in-tariffs for renewable energy generation.

- Communication of energy policy options, climate science, and issues related to the legislative and regulatory environment to the public and policymakers.

2012-2013 City of Boulder Boulder, CO
Transportation Advisory Board Member

- Advise Boulder City Council on matters related to transportation.
- Research and outreach related to the implementation of a maintenance fee to fund operations and maintenance of the city's transportation infrastructure.
- Explore possible revisions to city-wide parking policies and goals.
- Participate in the revision of the city's Transportation Master Plan.

2011-2012 Selvans Analytics, LLC Boulder, CO
Chief Scientist

- Public education and outreach in support of the Boulder Light and Power ballot initiatives. Participated in debates and discussion fora, contributed editorials and online commentary.
- Performed coal cost modeling and analysis for Bardwell Consulting in support of various Colorado Public Utility Commission (CPUC) dockets. Used USGS, US EIA data, CPUC filings and spreadsheet-based models to evaluate and analyze Xcel Energy resource plans.

2010-2013 Community Cycles Boulder, CO
Volunteer Instructor and Facilitator, Advocacy Committee Member

- Taught workshops on a variety of utilitarian cycling topics including winter cycling and bicycle touring.
- Repaired donated bicycles for sale in the Community Cycles showroom.
- Provided mechanical guidance to members working on their own bicycles in the shop.
- Back-end technical support of the Community Cycles website.
- Repaired bicycles for children in low-income neighborhoods throughout Boulder as part of the Rolling Bicycle Clinics program.
- Attended public meetings and design charettes representing the organization and Boulder cyclists in general.

2002-2009 Laboratory for Atmospheric and Space Physics Boulder, CO
Research Assistant

- Investigated the history of tidally-induced tectonics on icy satellites in the outer solar system.
- Created digital maps of geologic features on Jupiter's moon Europa based on imaging from NASA's Galileo spacecraft.
- Developed a closed-form model of Europa's frequency-dependent response to a time-varying gravitational potential, treating the icy shell as a Maxwell viscoelastic material.
- Tested the statistical significance of geometric correlations between tectonic features and tidal stresses using Monte Carlo methods and a specialized metric of shape similarity based on the Hausdorff distance.

- Devised novel algorithms for inferring temporal relationships within complex networks of intersecting geologic units, representing the mapped units and their ambiguous superposition relations as weighted directed acyclic graphs.
- Prepared and delivered oral and graphical presentations summarizing research at professional meetings as well as at smaller departmental seminars and colloquia.
- Provided support and documentation for software releases.
- Provided text, analysis and figures in support of successful NASA grant proposals.

2003-2004 Boulder Housing Coalition Boulder, CO
Board Member

- Played an advising role, representing persons interested in market-rate equity housing cooperatives.
- During this period the board oversaw the successful acquisition of the organization's second property, financed with tax-exempt bonds valued at over one million dollars, issued in cooperation with the City of Boulder.

EDUCATION

- **2002-2009 Ph.D., University of Colorado Boulder, CO:** *Geological Sciences*
- **1993-1998 B.S., California Institute of Technology Pasadena, CA:** *Engineering & Applied Science*

SKILLS

- Programming in Python and C. Scripting in Perl and Unix shells.
- Familiar with object-oriented design principles.
- Scientific computation including Monte Carlo statistical sampling, efficient multi-dimensional parameter space search, vectorized calculation, heuristic graph algorithms, construction of heuristic fitness functions.
- Quantitative analysis using Scientific Python. Plotting and data visualization with Matplotlib. Network analysis using NetworkX.
- Mathematical background including calculus, linear algebra, ordinary and partial differential equations, graph theory, probability and statistics.
- Broad background in the physical and earth sciences including thermodynamics, geophysics, cosmochemistry, atmospheric physics, isotopic geochemistry.
- Mapping and geospatial analysis using ESRI ArcGIS, qGIS and the open source geospatial (OSGEO) libraries.
- Communication of technical and quantitative concepts to both expert and lay audiences, through writing, presentations, and hands-on workshops.
- Financial modeling employing concepts such as discounted cash flows, net present value, internal rates of return, portfolio asset allocation, efficient frontiers, decision trees and real options pricing.
- Basic fluency in spoken and written Spanish.

JoAnn Silverstein

JoAnn Silverstein is Professor in the Department of Civil, Environmental, and Architectural Engineering at UCB, Director of the Program in Environmental Design, and Director of the Residential Academic Program, Sustainable by Design. She has received a BA degree in Psychology (Stanford University), BS, MS and Ph.D. degrees in Civil Engineering from the University of California at Davis. Dr. Silverstein came to UCB as an Assistant Professor in 1982, and her research and teaching area is Civil/Environmental Engineering. She has taught 20 different courses from freshman to advanced graduate level on these topics and carried out more than 25 funded research projects focused on the application of microbial processes to remove contaminants from water and wastewater, treat wastewater for beneficial reuse, and restore damaged environmental sites. She and her students have developed statistical methods for evaluating reliability and resilience of wastewater treatment systems and methods for comparison of centralized and decentralized wastewater collection and treatment facility networks. Dr. Silverstein participated in the development of a new graduate certificate in Civil Engineering at CU, "Managing Water Utilities." Dr. Silverstein has written over 60 articles in refereed journals, proceedings, and books and has advised 24 Ph.D. students who have graduated since 1989, 13 of whom now hold academic positions in the US, Korea, Turkey, Saudi Arabia, and Kuwait. She currently serves on Executive Committee of the Mortenson Center in Engineering for Developing Communities, the Research Advisory Board of the National Water Research Institute, and is a member of the American Academy of Environmental Engineers.

Edith Zagona

Research Professor, Department of Civil, Environmental and Architectural Engineering
Director, Center for Advanced Decision Support for Water and Environmental Systems
University of Colorado

EDUCATION

- University of Colorado, Boulder, CO: Ph.D. in Civil and Environmental Engineering, 1992, Water Resources concentration.
- Colorado State University, Ft. Collins, CO: M.S., Civil Engineering, 1983: Hydrualics concentration.
- University of Arizona, Tucson, Arizona: B.S. Civil Engineering 1978 ; B.A. Philosophy, 1975

PROFESSIONAL APPOINTMENTS

- Research Professor, Department of Civil, Environmental and Architectural Engineering, University of Colorado. Appointed 2010.
- Director, Center for Advanced Decision Support for Water and Environmental Systems, Department of Civil, Environmental and Architectural Engineering, College of Engineering and Applied Sciences, University of Colorado at Boulder (CU-CADSWES), 2001 to present.
- Research Associate, CU-CADSWES, 1992-2000
- Professional Research Assistant, CU-CADSWES, 1989-1992
- Graduate Research Assistant, CU-CADSWES, 1988-1989

- U.S. Bureau of Reclamation Design and Planning Coordinator, Central Arizona Projects Office, 1986-87
- U.S. Bureau of Reclamation Hydraulic Engineer, Engineering and Research Center, 1978-84

PROFESSIONAL ACCOMPLISHMENTS

Specialist in development of decision support tools for water resources management. PI and principal inventor of RiverWare®, used by major water resources management, consultants and institutions for managing river and reservoir systems. Extensive experience in needs analysis, design, development, testing and deployment of DSS tools for river and reservoir management with TVA, Bureau of Reclamation and U.S. Army Corps of Engineers, the three largest water management agencies in the U.S. Experience with development of training materials for DSS tools, and training managers and end users. Hands-on software and model development; use of many existing modeling tools; management of software development by team of professional developers. Advisor to modelers and managers of river systems in U.S. and abroad. Development of DSS tools for hydropower modeling and optimization of hydropower scheduling for large utilities. Director of academic research center and lead investigator for $1.5 million per year contracts and grants; collaborations with other faculty and guidance of graduate student research projects. Developing and teaching technical classes at University. Several years experience as hydraulic engineer in public sector and experience with design of large projects and public involvement in large projects. Technical advisor to Nile Basin Initiative DSS. Member of DOE Peer Review Panel for Wind and Water Power Program.

TEACHING

- **Academic Courses**: Applied Fluid Mechanics, Open Channel Hydraulics, Dam Engineering, Water Resources Development
- **Outreach Courses**: RiverWare training courses, taught at CADSWES and elsewhere; reservoir management, a senior-level course using RiverWare

GRADUATE STUDENT RESEARCH

Directed or co-directed graduate student research on following topics: A methodology for assessing the value of integrating hydropower and wind generation; Midterm Probabalistic Forecasting in the Colorado River Basin; Future Reliability of Environmental Flows in the Colorado River Basin; Modeling Groundwater-surface water interactions in an operational setting by linking RiverWare and Modflow; Intra-annual to inter-decadal variability in the Upper Colorado hydroclimatology: diagnosis, forecasting and implications for water resources management; Analysis of coordinated operation of Lakes Powell and Mead under low reservoir conditions; Network stochastic programming for valuing reservoir storage; Interannual variability of the North American Monsoon Hydroclimate and application to water management in the Pecos River basin; Using large-scale climate information to forecast seasonal streamflow in the Truckee and Carson Rivers; An operations model for temperature management in the Truckee River below Reno.

SELECTED PUBLICATIONS AND SOFTWARE

- Magee, T., M. Clement and E. Zagona, RiverWare Model Development for Integrated Hydropower and Wind Generation Analysis on the Columbia Basin, Final Report to UT-Battelle/Oakridge National Laboratory, December, 2011.
- Zagona, E., (PI and principal inventor), W. Oakley, T. Magee, P. Lynn, P. Weinstein, D. Neumannd, N. Wilson, RiverWare® software, copyrighted, and licensed through the University of Colorado Office of Technology Transfer, copyright 1998-2012. http://cadswes.colorado.edu/riverware.
- Regonda, S., E. Zagona and B. Rajagopalan, Prototype Decision Support System for Operations on the Gunnison Basin with Improved Forecasts, *J Water Resources Planning and Management*, 137 (5), 2011.
- Nowak, K., B. Rajagopalan and E. Zagona, Wavelet Auto-Regressive Method (WARM) for multi-site streamflow simulation of data with non-stationary spectra, *Journal of Hydrology*, 410 (1-2) 1-12, 2011.
- Valerio, A., H. Rajaram and E. Zagona, Incorporating groundwater-surface water interaction into river management models, *Groundwater*, 48 (5): 661-673, 2010.
- Zagona, Magee, Frevert, Fulp, Goranflo and Cotter. RiverWare. Chp 21 of Watershed Models, edited by V.Singh and D. Frevert, CRC Press, 2005.
- Zagona, E.A., Fulp, T.J., Shane, R., Magee, T. and Goranflo, H.M "RiverWare: A Generalized tool For Complex Reservoir System Modeling," *J Am Water Resources Assoc*, AWRA 37(4):913-929, 2001.
- Zagona, E., Balaji, R., Setzer, S., RiverWare Decision Support Tools for Planning Sustainable River Development with Hydropower." In *Proceedings of the High-level International Forum on Water Resources and Hydropower*, October 16-18, Ministry of Water Resources, Beijing, China. 2008.
- Neumann, D. W., Zagona, E. A., and Rajagopalan, B., A Decision Support System to Manage Summer Stream Temperatures. Journal of the American Water Resources Association,42(5):1275-1284, 2006.
- Carron, J., E. Zagona, and T. Fulp (2006), Modeling Uncertainty in an Object-Oriented Reservoir Operations Model, Journal of Irrigation & Drainage Engineering, 132 (2): 104-111.
- Frevert, D., T. Fulp, E. Zagona, G. Leavesley, and Harry Lins (2006), Watershed and River Systems Management Program - An Overview of Capabilities, J of Irrigation & Drainage Engr, 132(2): 92-97.

PROFESSIONAL AFFILIATIONS AND MEMBERSHIPS

- American Geophysical Union, American Society of Civil Engineers, American Water Resources Association, Colorado Foundation for Water Education, Colorado River Water Users Association , International Water Resources Association, Universities Council on Water Resources

PROFESSIONAL REGISTRATION State of Colorado, since 1983.

Resource Modeling Working Group

Purpose and Scope

The Resource Modeling Group is tasked with vetting the reliability issues associated with the city's municipalization exploration work plan.

The role of the Resource Modeling working group is to provide industry-specific expertise about a variety of resource options and help vet assumptions that the resource model will use to develop possible portfolio scenarios. This group will be tasked with the following types of responsibilities:

- Research and evaluate the economic and technical feasibility of a number of technology options, accounting for variations in costs and energy resource availability.
- Evaluate critical inputs to the model including resource availability, energy efficiency and demand-side management, transmission constraints and local generation potential.
- Recommend resources and strategies for managing future risks and to assure adequate supplies of electric energy will be available at affordable prices.
- Explicit consideration of energy efficiency and load management programs as alternatives to wholesale power purchases.
- Consideration of environmental factors as well as direct economic costs.
- Analysis of the uncertainties and risks posed by different resource portfolios and by external factors.
- Identification of the barriers to developing and securing electric resource and generating assets necessary for Boulder's energy future and evaluate possible policy changes. Some of these may require legislation; others may require Colorado Public Utilities Commission action.

Working Group Meetings

It is anticipated the working group will meet approximately once each month for four to five months. Meetings are expected to commence in early November and continue through March. Other tasks and updates in between meetings will take place via e-mail and through the Basecamp web application.

Current Working Group Members

COMMUNITY MEMBERS
Tom Asprey – Community Modeling Team
Alison Burchell – Community Modeling Team
David Corbus – NREL
David Cohen – Evolution 7

Brad Davids – Enernoc
Steve Drouilhet – Sustainable Power Systems
Gregg Eisenberg – Eisenberg Energy
Leslie Glustrom – Clean Energy Action
Joshua Kuhn – Community Member
Puneet Pasrich – Colorado State University
Ken Regelson – Five-Star Consultants
David Rhodes – Southwest Generation
Debra Sandor – NREL
Andrea Watson – NREL
Sam Weaver – Cool Energy
Ted Weaver – First Tracks Consulting

CONSULTANTS
John Glassmire – HOMER
Peter Lilienthal – HOMER
Nils Tellier – EPSIM Corp

STAFF
Heather Bailey – Executive Director of Energy Strategy and Electric Utility Development
Andrew Barth – Communications Specialist
Yael Gichon – Residential Sustainability Coordinator
Jonathan Koehn – Regional Sustainability Coordinator

Working Group Member Bios

TOM ASPREY

Work History
1978 - 1979 NMSU Computer Center Part-Time Student Intern
- Developed software for university academic and business departments

1980 - 2004 Hewlett Packard Company Design Engineer
- Internal test equipment software and hardware design, verification, installation and customer relations for internal manufacturing
- Integrated circuit design, verification, test and characterization, including logical and electrical debug
- Development of software tools for integrated circuit interconnect and circuit path timing design and optimization
- Mentoring, recruitment and leadership of design teams
- Patents

2004 - 2005 Intel Corporation Design Engineer
- Integrated circuit design and verification
- Development of software tools for integrated circuit design focused on circuit path timing verification and system frequency

2006 - 2012 Retirement, Travel and Independent Study

- Achieved Intel early retirement theough credited years of service in acquisition by Intel of HP lab in Fort Collins
- Visited 6 continents and self-studied French, Spanish and Italian languages
- Informal independent study in Chemistry, Physics, Math and Smart Grids through Stanford, MIT and CU audits
- Member of RenewablesYES citizen modeling and finance teams modeling and anlysis of feasibility of a Boulder electric utility
- RenewablesYES Steering Committee supporting a Boulder electric utility assessment and, if feasible, implementation

Education

1976 - 1979 BSEE from New Mexico State University

Other Relevant Skills

- Computer application development (COBOL, Fortran, machine language, APL, Basic, Forth, Pascal, Perl, C++, UNIX, html, PC, Mac)
- Website development
- Modeling energy systems with HOMER and custom developed spreadsheets

ALISON BURCHELL

Alison Burchell is a geologic consultant whose clients include the business and non-profit sectors, Federal Land Managers and stakeholder groups involved in a range of national and international projects including: mapping and geochemical surveys, coral reef and wetland assessment, mined-lands reclamation, volcanic hazards, renewable-energy site-assessment, public health- and environmental- related legislation. She is also an adjunct geologic field-techniques instructor at Ft. Lewis College, Durango.

Her undergraduate work was in Chemistry with a minor in Environmental Sciences and Planning. She received her graduate degree in Volcanology and Isotope-Geochemistry under a US Department of Interior - US Geologic Survey Fellowship at the University of Arizona. She also holds advanced certificates in Multispectral and Synthetic Aperture Radar Remote Sensing Analysis and Image interpretation, Database Design, Geographic Information Systems Analyses, Advanced Scuba and EPA hazardous materials sampling, detection and calibration.

Her current research is focused on understanding and quantifying the mechanisms and kinetics of Natural Terrestrial Sequestration (NTS, the naturally occurring geologic, biologic and hydrologic variables that influence natural terrestrial carbon sequestration) and quantifying the remediation, environmental and economic benefits to governments, businesses and communities as carbon markets mature.

This work includes collaboration with Colorado officials and US Federal Land-Managers and Agencies (EPA, BLM, USGS, USDA) to implement a “Natural Terrestrial Sequestration Reclamation Management Program for the San Juan Public Lands – Natural Resource

Management Plan and to help establish the San Juan Mountains ecosystem as a terrestrial base-station for long-term research, climate monitoring and modeling.

The NTS research has led her towards an integrative, global-systems approach to researching complex, multi-scale, terrestrial issues that she calls bio-geo-mimicry. She is co-convener of the NTS Group, a collaborative interagency-academic-stakeholder-student-private sector research group, which funded and launched the Rocky Mountain NTS Pilot Project. The work of this group has demonstrated both a higher reclamation potential and, consequently, a higher NTS potential and economic value for N. A. soils than may be accounted for in past climate and mitigation models.

Her civic engagements include: collaboration with the OSU - Environmental and Natural Resources Law Program, the Presidential Climate Action Project and various US rural communities to advance the principles of Environmental Justice and a Natural Resources Trust in the US; former assistant curator, the Sonora Desert Museum where she taught earth sciences to Native American, Hispanic and youth groups; co-founder, UN-affiliated Mountain Studies Institute; convener and co-director of Renewables_Yes (RY) and the Statewide Coalition on Colorado's Renewable Energy Future.

Since moving to Boulder, she has served on the board of several city working groups and non-profits tasked with modeling and mitigating a range of environmental problems or working to promote both public education and clean energy alternatives, including: the City of Boulder, South Boulder Creek Hydrology Advisory Panel (HAP) joint with CU, UDFCD, NOAA and FEMA; the CU Collaboratory – Carbon Management Program, advisory group; Clean Energy Acation (CEA); the Center for Resource Conservation CRC), the Boulder Renewable Energy and Energy Efficiency – Working group (BREEE), the Amendment 37 campaign, the Boulder Climate Action Plan (CAP), the Boulder Climate Action Network (BCAN), the City of Boulder Energy Future (BEF) - Task Force, the Renewables-Yes Steering Committee Finance and Energy Resource Modeling Teams, the RY 2B and 2C campaigns and the BEF Resource Modeling Group.

DAVID CORBUS

David Corbus is the Program Manager for Electricity Systems at the National Renewable Energy Laboratory (NREL). At NREL, Mr. Corbus currently works on a host of projects in energy systems integration including both distribution level and bulk power projects. Mr. Corbus was the project manager for the Eastern Wind Integration and Transmission Study (EWITS) and several wind and solar grid integration projects in Hawaii. These studies analyzed the operational grid impacts of high penetrations of variable wind and solar technologies as well as both AC and DC transmission expansion alternatives.

Previous to working in energy systems integration, Mr. Corbus worked at NREL as a test engineer, field engineer (from Alaska to Antarctica), and systems modeler at the National Wind Technology Center (NWTC) and conducted tests on a wide variety of generation and end use systems including hybrid power systems with various load controls, advanced inverter systems, and battery systems. Dave also conducted wind turbine certification tests and modeling for some

of the first variable speed wind systems during this time of widespread commercialization of the wind industry. Before working at NREL, Mr. Corbus worked for 5 years at Parsons Brinckerhoff engineering firm in the field of environmental engineering and power systems. He holds a Masters degree in applied science/mechanical engineering from New York University.

DAVID COHEN

David A. Cohen, CEO. Mr. Cohen is chief operating officer and co-founder of Evolution7 which is currently developing smart EV charging software and hardware within solar MicroGrid ecosystems. He has over 25 years of management, product development, business development, and marketing experience for emerging renewable energy technology companies. He has specialized in the areas of renewable energy, telecommunications, and software. He has co-founded four start-up companies and has initiated and completed numerous R&D joint ventures, and partnerships in the US, Europe, Latin America, Middle East, and Australia. He has developed, launched, and commercialized over 20 energy-related software products, and is nationally renowned for his pioneering work in distributed energy and SmartGrid software applications.

David recently developed the industry's first Building-to-Grid managed services platform as COO of Pacific Controls Smart Grid Services. Prior to co-founding Pacific Controls Smart Grid Services, David was CEO and co-founder of Infotility. At Infotility, he pioneered the development of the Community Energy Manager platform to enable management of solar sharing in communities. As well, he developed a platform that was spun off to Evolution7 for smart charging of Plug Electric Vehicles integrated with solar and smart building Microgrids. He pioneered the development of the SmartGrid industry's first, intelligent agent-based software infrastructure for electric grid software applications as well as a real-time publish/subscribe software platform for automating demand response and real-time information tracking of metered data implemented at APX, BP, Sempra, Cubic Defense, Roche Bioscience, Bank of America, Stanford Linear Accelerator, and other clients. The GridAgents software platform was deployed and tested by Verizon in NYC, Con Edison in Manhattan, PG&E in California, and Marin County in California. As well, the GridAgents platform has been tested at the National Renewable Energy Laboratory in Golden, Co, in Sydney Australia at CSIRO, in Newcastle Australia, as well as the Integral Renewables project in Holland with European Union partners. The GridAgents platform was seed funded by the U.S. Department of Energy's Office of Electricity and EERE programs.

David was a co-founder and VP of the Distributed Energy Products Division of Silicon Energy, a leading provider of Enterprise Energy Management (EEM) software and solutions. He managed the development and market launch of Silicon Energy's industry leading Distributed Energy Manager™ (DEM) product, a web-based software platform for networking, managing, and controlling distributed energy resources, part of Silicon Energy's EEM Suite™. While at Silicon Energy, David's division deployed the Distributed Energy software at major utilities and energy companies worldwide including DTE Energy, ABB, GPU, ConEdison, Pan Canadian, and Capstone Turbines directly contributing to sales over a 3 year period exceeding $11 million and was responsible for the first multi-million dollar sale with the company. He was co-developer of the Virtual Utility project with ABB. David was a founding team member at Silicon energy

where he initially led the business development and marketing operations as Director of Business Development. He was instrumental in helping to grow the European and Latin American sales and markets working with clients such as Vattenfall, Enel, E.On, EDF, Provincial Electric Authority (PEA) of Thailand, and EletroPaulo. David helped to grow the organization to over 250 employees, was involved in raising over $40 million in venture capital, filing for a $6M IPO, and assisting in the sale and merger of Silicon Energy to Itron for $71 million. Prior to Silicon Energy, David was a principal with ICF International and ICF Energy in Washington, D.C. which sold to Nexant Software for $25M. David held other positions at Strategic Renewables, Architectural Energy Corporation, Highland Energy Group, The Joint Center for Energy Management, and Green Technologies

David is a founding member of the GridWise Architecture Council (GWAC). While on the GWAC, David was instrumental in helping to write the SmartGrid language used in the ENERGY INDEPENDENCE AND SECURITY ACT OF 2007, Title XIII-Smart Grid, Sec. 1301, Statement of Policy on Modernization of the Electricity Grid. He served on the board of directors for both Green Building Studio, Inc., and Aura Renewable Energy Corporation. Green Building Studio was sold to AutoDesk for $7M in 2009. He was also an original member of the DOE Modern Grid Initiative. He served on the Energy Committee of the Silicon Valley Leadership Group (SVLG), is currently a member of the American Council on Renewable Energy (ACORE) CEO Council. Formerly, he served as the vice president of the Solar Energy Industry Industries Association (SEIA), and was a co-founder of the Colorado Renewable Energy Society (CRES).

David received his M.S. Engineering and his BA in Environmental Studies from the University of Colorado with a focus on Computer Science, Energy Analysis, GIS, and Artificial Intelligence.

BRAD DAVIDS

SUMMARY: Extensive sales, marketing, and management experience focused on products and services related to energy efficiency and utility end-use services, including senior roles in business development, strategic planning, product development, and marketing within high-growth, entrepreneurial companies — combined with a strong technical background, and excellent communication and general management skills.

EXPERIENCE

5/07 – present ENERNOC, INC., BOULDER, COLORADO
3/09 – present **Vice President, Utility Solutions**
5/07 – 3/09 **Senior Director, Utility Sales**
Responsible for expanding EnerNOC's demand response and energy efficiency business with utilities in North America and internationally. Manage utility-focused marketing and sales teams to achieve revenue and profitability goals, working closely with EnerNOC's regulatory affairs, commercial/industrial sales, and operations groups. Personally developed and sold more than $50 million in new utility business in 2009; directed team that closed more than $380 million in new utility contracts in 2010-11.

5/06 – 4/07 ENERGY INSIGHTS (AN IDC COMPANY), BOULDER, COLORADO
Vice President, Business Operations
Helped facilitate IDC's acquisition of EPRI Solutions' Market Intelligence division in May 2006, resulting in formation of expanded research-based advisory and consulting services company focused on technology and business developments impacting the energy industry. Responsible for overall product quality, delivery, and development, along with management of marketing activities, events, and budgeting/forecasting.

1/05 – 5/06 EPRI SOLUTIONS, INC., BOULDER, COLORADO
Vice President and Division Manager
Directed corporate marketing activities for this $35 million engineering services, business consulting, and information products firm, along with overall management of the company's Market Intelligence business unit. (Primen, Inc. was merged into EPRI Solutions in 2005.) As part of senior management team, was instrumental in achieving revenue results in 2005 that exceeded plan by 14%.

9/00 – 12/04 PRIMEN, INC., BOULDER, COLORADO
12/02 – 12/04 **President and CEO**
9/00 – 12/02 **Vice President, Marketing and Product Development**
Opened and staffed Boulder regional office for this research and information company, an affiliate of the Electric Power Research Institute (EPRI), created to develop and deliver market research, analysis, data products, and consulting services for the electric power industry and related companies. Responsible for all sales, marketing, and business development activities. As CEO, implemented restructuring initiatives in 2003 leading to profitable financial performance in 2004, compared to $1.7 million loss in 2002.

1/00 – 9/00 DOUBLECLICK, INC., BROOMFIELD, COLORADO
Associate Vice President, New Markets
Recruited to lead a new initiative within the Abacus Direct division focused on expanding DoubleClick's business into the energy/utilities vertical. Primary responsibilities included sales and business development for database products and services, targeted email solutions, and Internet advertising, along with determining overall market strategy and product development objectives.

4/92 – 10/99 E SOURCE, INC., BOULDER, COLORADO
1/98 – 10/99 **Senior Vice President**
4/92 – 12/97 **Vice President, Marketing & Member Services**
Co-founded this syndicated research and information services company in 1992, and helped manage its acquisition by Financial Times Energy in 1999. Directed all sales, marketing, customer service, and product development efforts during first five years of company operation, resulting in revenue growth of over 950%, placing the company #276 on the 1997 *Inc. 500* list of fastest-growing private companies in the U.S. In 1998, exceeded new product revenue target by over 100%, for overall corporate revenue growth of approximately 80%, to over $8 million.

6/89 – 3/92 PUGET ENERGY SERVICES, INC., BELLEVUE, WASHINGTON
Marketing Director
Managed the marketing and corporate business development activities for energy services subsidiary of Puget Sound Power & Light Company (now Puget Sound Energy). Responsibilities included development of new business opportunities and coordination of regional sales efforts to utilities and major corporations nationwide, as well as marketing activities, economic analysis, and contract negotiations. Developed comprehensive financial model to facilitate pricing decisions; prepared proposals to utilities and facility owners resulting in awards of over $12 million in contracts.

3/84 – 6/89 SOUTHWALL TECHNOLOGIES INC., PALO ALTO, CALIFORNIA
Marketing and Sales Director
Directed marketing, sales, technical support, and customer service functions for Southwall's main product line, an energy-conserving window glass component. Major areas of responsibility included advertising, sales, public relations, market research, and product strategies; overseeing major customer accounts; and acting as liaison with numerous industry associations and government agencies. During these five years, product sales grew from $1.5 million to over $8 million despite rapidly increasing competitive pressure.

9/82 – 3/84 ALPEN, INC., BOULDER, COLORADO
Vice President
Managed regional office for manufacturer of high performance insulating glass. Formulated corporate marketing, sales, and public relations strategies. Responsible for direct architectural sales to eastern Colorado. During this 18-month period, sales volume more than tripled.

EDUCATION

1981 - 1982 STANFORD UNIVERSITY. M.S., MECHANICAL ENGINEERING.
Concentration in Applied Thermodynamics and Energy Systems. Additional coursework in marketing, management, and financial analysis, including several classes at Stanford's Graduate School of Business.

1977 - 1981 STANFORD UNIVERSITY. B.S. WITH DISTINCTION, MECHANICAL ENGINEERING.
Broad-based curriculum within Engineering program. Included two quarters of study in Florence, Italy.

ADDITIONAL INFORMATION

- Accomplished public speaker and author, with dozens of published papers and articles, and numerous speeches and presentations to industry conferences and corporate seminars.
- Completed "Stanford Program on Market Strategy for Technology-Based Companies," October 1987.
- Participant in expert team on *Greening of the White House* project, July 1993.
- Registered Professional Engineer, State of California

STEVE DROUILHET

EDUCATION

1985-88 University of California, Berkeley. Master of Engineering in Mechanical Engineering.

1980-81 Von Karman Institute for Fluid Dynamics, Brussels, Belgium. Master of Science in Fluid Dynamics.

1975-79 Brown University, Providence, Rhode Island. Bachelor of Science in Mechanical Engineering.

EMPLOYMENT HISTORY

2002-Present Managing Director, Sustainable Power System LLC (formerly Sustainable Automation). The company specializes in the design and manufacture of high penetration wind and solar hybrid power systems for community and industrial scale applications.

1994-2002 Senior Engineer, National Wind Technology Center, National Renewable Energy Laboratory. Was responsible for the laboratory's program to develop advanced wind-diesel hybrid power systems. Designed, built, and commissioned the high penetration wind-diesel hybrid power system in Wales, Alaska.

1990-1994 Senior Engineer, CPM Division of Ingersoll-Rand. Controls and mechanical design of feed production equipment.

1988-1990 Independent engineering consultant. Performed machine design and control system design for various industrial clients. Product areas included high vacuum coating systems, automated woodworking machinery, and material handling systems.

1983-1985 Project Engineer, Airco Coating Technology. Mechanical design engineering and system engineering on large high vacuum glass coating systems

1981-1983 Field Test Engineer, U.S. Windpower Inc. Instrumented prototype wind turbines and conducted field tests and failure analysis on the first commercial wind farm in Altamont Pass, California.

PROFESSIONAL AFFILIATIONS

Registered Professional Engineer in State of California (M23642). First registered in

1984. Corporate Member, American Wind Energy Association.

Member, American Solar Energy Society.

PUBLICATIONS

Drouilhet, S.; Shirazi, M. (2002). Wales, Alaska High Penetration Wind-Diesel Hybrid Power System: Theory of Operation. 77 pp.; NICH Report No. TP-500-31755.

Drouilhet, S. (2001). Preparing an Existing Diesel Power Plant for a Wind Hybrid Retrofit: Lessons Learned in the Wales, Alaska, Wind-Diesel Hybrid Power Project. 13 pp.; NICH Report No. CP-500-30586.

Bialasiewicz, J. T.; Muljadi, E.; Nix, R. G.; **Drouilhet**, S. (2001). Renewable Energy Power System Modular Simulator: RPM-SIM User's Guide (Supersedes October 1999). 172 pp.; NICH Report No. TP-500-29721.

Flowers, L.; Baring-Gould, I.; Bianchi, J.; Corbus, D.; **Drouilhet**, S.; Elliott, D.; Gevorgian, V.; Jimenez, A.; Lilienthal, P.; Newcomb, C.; Taylor, R. (2000). Renewables for Sustainable Village Power. 12 pp.; NICH Report No. CP-500-28595.

De Broe, A. M.; **Drouilhet**, S.; Gevorgian, V. (1999). Peak Power Tracker for Small Wind Turbines in Battery Charging Applications. IEEE Transactions on Energy Conversion. Vol. 14(4), December 1999; pp. 1630-1635; NICH Report No. 28227.

Drouilhet, S. (1999). Power Flow Management in a High Penetration Wind-Diesel Hybrid Power System with Short-Term Energy Storage. Windpower 1999 Conference Proceedings, 20-23 June 1999, Burlington, Vermont. Washington, DC: American Wind Energy Association; 10 pp.; NICH Report No. 32326.

Bialasiewicz, J. T.; Muljadi, E.; **Drouilhet**, S.; Nix, G. (1998). Modular Simulation of a Hybrid Power System with Diesel and Wind Turbine Generation. 12 pp.; NICH Report No. CP-500-24681.

Gevorgian, V.; Corbus, D. A.; **Drouilhet**, S.; Holz, R.; Thomas, K. E. (1998). Modeling, Testing and Economic Analysis of Wind-Electric Battery Charging Station. 12 pp.; NICH Report No. CP-500-24920.

Holz, R.; Gervorgian, V.; **Drouilhet**, S.; Muljadi, E. (1998). Wind-Electric Icemaking Project: Analysis and Dynamometer Testing, Volumes I and II. 255 pp.; NICH Report No. TP-500-24010.

Drouilhet, S.; Johnson, B. L. (1997). Battery Life Prediction Method for Hybrid Power Applications: Preprint. 16 pp.; NICH Report No. CP-440-21978.

Baring-Gould, E. I.; Barley, C. D.; **Drouilhet**, S.; Flowers, L.; Jimenez, T.; Lilienthal, P.; Weingart, J.; Soetendro, H.; Gultom, D. P. (1997). Diesel Plant Retrofitting Options to Enhance Decentralized Electricity Supply in Indonesia. 12 pp.; NICH Report No. CP-440-23237.

Drouilhet, S.; Meiners, D.; Reeve, B. (1997). High-Penetration Wind-Diesel Hybrid Power System Pilot Project in Northwest Alaska. Power Quality Solutions / Alternative Energy: Official Proceedings of the Ninth International Powersystems(TM) World '96 Conference and Exhibit, 7-13 September 1996, Las Vegas, Nevada. 14 pp.; NICH Report No. CP-500-26090.

Shirazi, M.; **Drouilhet**, S. (1997). Analysis of the Performance Benefits of Short-Term Energy Storage in Wind-Diesel Hybrid Power Systems. Collection of the 1997 ASME Wind Energy Symposium Technical Papers Presented at the 35th AIAA Aerospace Sciences Meeting and Exhibit, 6-9 January 1997, Reno, Nevada. Washington, DC: American Institute of Aeronautics and Astronautics; pp. 138- 148; NICH Report No. 23280.

Drouilhet, S.; Muljadi, E.; Holz, R.; Gevorgian, V. (1995). Optimizing Small Wind Turbine Performance in Battery Charging Applications. 13 pp.; NICH Report No. TP-441-7808.

GREGG EISENBERG

LESLIE GLUSTROM

Leslie Glustrom is trained as a biochemist with an emphasis on the Laws of Thermodynamics and the movement of energy and materials through living systems. Inspired by the elegance of living things and their ability to minimize the production of disorder by careful management of the flows of energy and materials, she has dedicated her life to trying to get human economic systems to incorporate the principles that have made life on this planet so remarkably successful.

Leslie has over 30 years of experience working at the interface of science and society and on a variety of environmental and public health issues. In 2004, Leslie resigned from her job managing a protein structure laboratory at the University of Colorado-Boulder to work full time on climate change and clean energy issues. She is a co-founder of Clean Energy Action (www.cleanenergyaction.org) and is presently serving as the Director of Research and Policy for that organization.

Leslie has intervened extensively at the Colorado Public Utilities Commission including in several rate cases and resource planning dockets related to Xcel. She works with citizens and organizations from many states on issues related to coal cost and coal supply and has spoken on these topics around the country.

Leslie has won a variety of awards for her work on clean energy including awards from the Colorado Solar Energy Industry Association, the Colorado Renewable Energy Society, PLAN Boulder and the Rocky Mountain Peace and Justice Center. She has authored a number of reports on US coal supplies and costs and is a co-author on the Harvard “Full Cost Accounting for the Life Cycle of Coal” study published in 2011.

JOSHUA KUHN

EDUCATION

Antioch University **Keene, New Hampshire**
Master's of Science in Environmental Studies **2010-2012**
Professional Science Master's Degree
Capstone Project focused on analysis and development of state policy related to customer-generated electricity from renewable resources

University of Colorado **Boulder, Colorado**
Bachelor of Science in Communication **1999-2004**

National Outdoor Leadership School (NOLS) **Lander, Wyoming**
Certificate in Leadership and Outdoor Education
2006

Teton Science Schools Graduate Studies Program **Kelly, Wyoming**
Certificate in environmental education **2009-2010**

EXPERIENCE

Institute For Environmental Solutions **Denver, Colorado**
Social Media Marketing and Fundraiser **2012**
Responsible for social media content and outreach
Contributes with development of fundraising strategies

Center for Resource Conservation **Boulder, Colorado**
Data Intern **2012**
Assist with data analysis aimed at reducing residential water consumption

Southwest Region Planning Commission **Keene, New Hampshire**
Intern **2012**
Designed, implemented, and analyzed a qualitative survey related to travel demand management
Regional coordinator for *Commute Green, New Hampshire*- a regional effort to promote alternative and low carbon emitting modes of transportation options
Developed and presented a presentation on the nexus between sustainability and land-use patterns at the 2012 Monadnock Earth Day Celebration
Created a charter for the regional travel management association
Completed short-term projects for the regional travel management association

Clean Air-Cool Planet **Keene, New Hampshire**
Consultant **2011-2012**
Conducted a greenhouse gas inventory for the town of Chesterfield, NH.
Synthesized results and generated a report of findings

Monadnock Sustainability Network **Keene, New Hampshire**
2011-2012

Designed, implemented, and analyzed a qualitative survey of the 10% Challenge- a regional program aimed at assisting local businesses in reducing their carbon footprint Presented findings as well as recommendations for future improvements to the board of directors
Developed a communication plan to better promote the 10% Challenge

Four Corners Office for Resource Efficiency **Durango, Colorado**
Intern **2011**
Organized and facilitated a regional sustainability symposium
Developed and presented the concept of a community solar project to stakeholder's of Breen, Colorado
Created a new informational organizational brochure

Southeast Sea Kayaks **Ketchikan, Alaska**
Sea-Kayak Guide **2009**
Guided clients on thematic sea-kayak adventures- trips focused on gaining a better appreciation and understanding for the cultural and natural history of southeast Alaska
Taught basic kayaking skills and maintained safety for a wide-variety of diverse clientele from around the world

Pitkin County, Open Space and Trails **Aspen, Colorado**
Ranger **2008**
Worked with trail users to ensure and enforce compliance of all open space laws
Responsible for maintenance of a safe network of trails

Aspen Center for Environmental Studies **Aspen, Colorado**
Environmental Educator **2007-2008**
Designed interpretative snowshoe/ ski tours in the winter focused on local ecology and natural history
Led thematic summer hikes also focusing on ecology and natural history of the Roaring Fork Valley
Designed environmental education lessons for children aged 4 to 12

The Land Trust for Tennessee **Nashville, Tennessee**
Intern **2007**
Information architect for new website
Organized legal documents for conservation easement baseline reports
Planned celebration events honoring recently protected properties
Conducted site visits to ensure legal compliance

PUNEET PASHRICH

Puneet Pasrich is a program manager in Colorado State University's Powerhouse Energy Institute. His focus is within the electrical grid research and education program. Puneet has a background in engineering, R&D, and analytics. With a Master's degree in Electrical Engineering as well as 14 years of experience as a practicing engineer, he focuses his efforts on

accelerating the transformation of the electric power sector and systems optimization to serve society's 21st century needs.

Puneet's areas of expertise include optimal renewable energy siting, integration of renewable and distributed generation, energy storage, integrated resource planning, transmission planning and rate design, smart grid applications, and project management. He has performed in-depth analysis in the following fields: electricity energy and ancillary service markets, unit commitment strategies, transmission tariffs, plug-in hybrid vehicles, demand side management, automated energy monitoring, and communications systems. He was the lead editor & co-author of a Smart Grid overview and recommendations white paper to the Colorado Governor's Smart Grid task force in 2010. He has given invited talks at international conferences as well authored several peer-reviewed papers.

KEN REGELSON

Ken founded Five Star Consultants in 1989 to help clients develop, analyze, and implement the products, policies, and programs needed to create a more sustainable energy future. Areas of expertise include utilities, net metering, modeling of renewables in an electric grid, municipalization, renewable energy, energy efficiency, and city and state policies and programs in renewable energy and energy efficiency..

Ken has intervened at the Colorado Public Utilities Commission numerous times.

Ken has worked at Bell Telephone Laboratories and Precision Visuals, Inc. Since 1989 he has helped clients apply technology well as an independent consultant.

Education and Awards

•M.S, in Electrical Engineering, 1979, Stevens Institute of Technology.
•2004 CoSEIA President's Award for net metering advocacy.
•2005 Center for Resource Conservation ReWard for sustainable energy advocacy
•2006 - 2011 honorary membership in COSEIA.
•2006 Wirth Chair Community Award for passage of and rulemaking for Colorado's renewable energy standard - Amendment 37.
•2011 COSEIA Sunny Award.

DAVID RHODES

DEBRA SANDOR

I have been working in the renewable and alternative energy field for the last 18 years, as an analyst, systems integrator/engineer, technical writer, and currently, as a technical project leader for in NREL¹s Strategic Energy Analysis Center. Prior to my renewable energy endeavors, I gained six years experience as a chemical process engineer in the aerospace and pharmaceutical industries. I have a Masters of Engineering degree in Engineering Management from the

University of Colorado and a Bachelor of Science in Chemical Engineering degree from the University of Florida.

ANDREA WATSON

SAM WEAVER

Sam Weaver is President, CEO and a co-founder of Cool Energy, Inc., a power conversion equipment company located in Boulder, CO. The main applications of Cool Energy's products are waste heat recovery, solar power, and biomass power, and the scale of the equipment is intended for on-site and remote power generation. Sam serves on the Board of the Colorado Solar Energy Industries Association, and is a member of the City of Boulder Planning Board and the Colorado Clean Energy Development Authority. Sam is actively involved in the Colorado technology and business communities, having previously co-founded one other Colorado-based company. Previous to his time as an entrepreneur and in start-up businesses, Sam worked for ten years as a professional researcher in the electrical engineering department at CU-Boulder. He is an active member of numerous energy and renewable energy industry trade groups, and has served his community as a volunteer fire chief and Boulder County advisory board member. Sam holds a B.S. degree in engineering and applied science from the California Institute of Technology and is an inventor named on fifteen issued U.S. patents.

TED WEAVER

First Tracks President Ted Weaver has over 30 years of experience in the energy industry, including management positions with the consulting firm Barakat & Chamberlin, Inc. and the national energy service company PG&E Energy Services. Mr. Weaver founded First Tracks Consulting Service in 2000 to provide strategic consulting services to clients in the utility, energy service, and energy technology industries.

Mr. Weaver is a nationally recognized expert in the areas of integrated resource planning, energy efficiency, and sustainable energy regulation. Mr. Weaver has developed over a dozen integrated resource plans and energy efficiency plans for clients throughout North America, and also helped clients procure resources for over 2,000 MW of generation supply and dozens of energy efficiency programs. He has testified over a dozen times before state public utility commissions, and taught training courses on integrated resource planning for the Electric Power Research Institute, the Canadian Electrical Association, and private clients.

Over the past few years, Mr. Weaver has helped the City and Boulder and Boulder County on projects related to repowering the Valmont plant, the Energy Smart residential retrofit program, commercial Climate Smart loans, and a variety of issues related to creating a municipal electric utility.

JOHN GLASSMIRE

POSITION: Senior Energy Systems Engineer
HOMER TEAM MEMBER SINCE: December 2010

KEY QUALIFICATIONS: John Glassmire is a mechanical/electrical engineer with extensive experience in the modeling and design of both distributed and traditional energy supply systems. He has led and worked on a wide-variety of energy research and consulting projects including cost-to-society environmental and economic impacts of clean energy technologies for grid planning, integrated resource planning for energy infrastructure, ex-post financial analysis of demand management programs, and monitoring and evaluation frameworks for energy efficiency and distributed energy programs. John's recent focus has been in the analysis of diverse distributed generation technologies in both microgrid and large-scale power systems. He has conducted research into smart grid technologies, with a focus on the impact of renewable technologies. John has performed extensive electrical grid modeling for systems ranging from small isolated systems, to Pacific and Carribbean islands, to US and Australian interconnected grid systems. John has led training workshops on the technical hurdles for integrating technologies into electrical grids for clients worldwide.

John has field experience with a number of infrastructure projects throughout Central America and Mexico. He served as project manager for a distributed infrastructure project with Engineers Without Borders-USA in Mexico, provided in-country consultant services for a monitoring and evaluation project in Honduras, traveled as a team engineer in Guatemala, and provided on-site consulting services for a solar energy system in Nicaragua. In addition to international field work, John has led workshop sessions in South America and Indonesia.

RECENT HOMER PROJECTS:

- *World Bank* - Co-led a training workshop for the Indonesian national utility's regional energy planners. The workshop in Jakarta focused on the technical benefits and challenges for integrating distributed renewable technologies in isolated and islanded microgrids.
- *International Energy Agency* - Renewable Energy Technology Deployment (IEA-RETD)
- Co-authored a report on policy recommendations to promote renewable energy in remote areas.
- *National Renewable Energy Laboratory (NREL)* - Created models of island power systems for the U.S. Virgin Islands and the island of Kauai.
- *Military Contractor* - Modeled renewable energy and storage options, performed power options analysis, for military CONUS and forward operating bases.
- *Various Young Companies and Start-Ups* - Modeled storage and other power options for developing new storage and renewable power technologies.
- *USAID* - Evaluated the economic and environmental impacts of adding renewables to distributed power systems for rural health clinics. This project was part of the President's Emergency Plan for AIDS relief that built clinics in 13 countries, including Haiti.
- *University of Colorado at Boulder (CU)* - Researched the impacts of utility rate structures on solar photovoltaic and distributed energy generation technologies.

EDUCATION:

2006 M.S., Mechanical Engineering, Northwestern University, Evanston, Illinois
2003 B.S., Mechanical Engineering, Rice University, Houston, Texas

SELECTED PUBLICATIONS:

Glassmire, J., Komor, P., and Lilienthal, P., "Electricity demand savings from distributed solar photovoltaics," *Energy Policy*, vol. 51, no. 0, pp. 323–331, Dec. 2012.

Kroposki, B., Burman, K., Keller, J., Kandt, A., Glassmire, J., and Lilienthal, P., 2012, *Integrating High Levels of Renewables into the Lanai Electric Grid*, National Renewable Energy Laboratory, Golden, CO, http://www.nrel.gov/docs/fy12osti/50994.pdf.

Trama TecnoAmbiental, Meister Consultants Group, HOMER Energy, Renewable Energies for Remote Areas and Islands (REMOTE), 2012, International Energy Agency - Renewable Energy Technology Deployment (IEA-RETD), http://iea-retd.org/wp-content/uploads/2012/06/IEA-RETD- REMOTE.pdf.

Komor, P., Glassmire, J., Electricity Storage for Island Power, 2012, International Renewable Energy Agency (IRENA), http://www.irena.org/DocumentDownloads/Publications/Electricity%20Storage%20and%20RE%20for%20Island%20Power.pdf

Burman, K., Keller, J..,Kroposki, B., Lilienthal, P., Slaughter, R., Glassmire, J., 2011, *Renewable Power Options for Electrical Generation on Kaua'i: Economics and Performance Modeling*, National Renewable Energy Laboratory, Golden, CO, http://www.osti.gov/bridge/servlets/purl/1029422.

Burman, K., Olis, D., Gevorgian, V., Warren, A., Butt, R., Lilienthal, P., Glassmire, J., 2011, *Integrating Renewable Energy into the Transmission and Distribution System of the U.S. Virgin Islands*, National Renewable Energy Laboratory, Golden, CO, http://www.edinenergy.org/pdfs/51294.pdf.

Daly, J.G., Glassmire, J., Langham, E. & Paddon, M. 2010, Clean Technology Applications in Tourism Accommodation, Sustainable Tourism Cooperative Research Centre, Sustainable Tourism Cooperative Research Centre, Griffith, pp. 1-184, http://publications.apec.org/publication- detail.php?pub_id=1038.

Glassmire, J., Christie, S., Dunstan, C. 2009, Distributed Energy in Western Australia: Options and Opportunities, CSIRO, Institute for Sustainable Futures, UTS, Sydney, Australia, http://igrid.net.au/sites/igrid.net.au/files/images/WA%20Background%20Paper_reduced.pdf.

Dunstan, C., Glassmire, J., Ison, N., Langham, E., 2009, Evaluating Costs of Distributed Energy: D-CODE (Description and Cost of Distributed Energy), CSIRO, Institute for Sustainable Futures, UTS, Sydney, Australia. [Model and Working Paper], available at http://www.igrid.net.au/.

Glassmire, J., Riedy, C., Mason, L., 2009, Monitoring and Evaluation Plan for the Green Loans Program, Dept. of Water, Heritage and the Arts (DEWHA), Australian Federal Government, Institute for Sustainable Futures, UTS, Sydney, Australia.

Retamal, M.L., Glassmire, J., Abeysuriya, K.R., Turner, A.J. & White, S. 2009, The Water-Energy Nexus: Investigation into the Energy Implications of Household Rainwater Systems, CSIRO, Institute for Sustainable Futures, UTS, Sydney, Australia.

SELECTED PRESENTATIONS:

Rural Microgrid Training Workshop, World Bank, PLN, Jakarta, Indonesia, April 2012

The Online Introduction to HOMER, Online, 2011-2012.

Sustainable Development Guest Lecturer, University of Colorado, Boulder, CO, USA, November 2010

Clean Energy and Technologies for Tourism Accommodation in the APEC region, MINCETUR, Cusco, Peru, April 2010

Emcee, Pathways to Development (P2D) for EWB-Australia, Sydney, Australia, October 2009

PRIOR PROFESSIONAL EXPERIENCE:

2010 to Present: Senior Energy Systems Engineer, HOMER Energy LLC.

John manages HOMER consulting projects, and provides technical consulting, modeling, and training services to HOMER customers.

2010 to March, 2012 (concurrent with HOMER Energy): Research Consultant, Renewable and Sustainable Energy Institute, University of Colorado, Boulder, CO.

John researched the co-impacts and relationship between distributed energy microgrids and the smart grid.

2008 to 2010: Research Consultant, Institute for Sustainable Futures, University of Technology Sydney, Sydney, NSW, Australia.

John provided technical consulting services for energy and water infrastructure. His consulting and research work promoted sustainable outcomes in infrastructure design, governance, and technology. Clients included local and federal governments, major Australian utility providers, and many diverse private and governmental agencies.

Selected project list:

- *Asia Pacific Economic Cooperation (APEC)* - Project manager and coauthor for AU$50k APEC research grant on the application of renewable and distributed energy technologies in tourism accommodation. Results were presented at a workshop in Cusco, Peru.
- *Australian Commonwealth Scientific and Research Organization (CSIRO)* - Developed the Description and Cost of Distributed Energy (D-CODE), a long-term economic planning tool to compare overall costs of various renewable energy technologies, including costs of generation, costs of transmission and distribution, and costs of greenhouse gas emissions.
- *Australian Commonwealth Scientific and Research Organization (CSIRO)* - Technical specialist and co-author of report to model and analyze impacts of distributed water systems on energy infrastructure. Work pioneered the CSIRO's research into the water-energy nexus.
- *ActewAGL (Canberra) and a consortium of Melbourne-area utilities* - Analyzed demand management (DM) programs to quantify the financial considerations and improved environmental impacts within municipal districts.
- *Australian Federal Government* - Managed $50k project to develop monitoring and evaluation (M&E) plan for federal Australian program promoting household energy efficiency and distributed renewable energy

2006 to 2008: Mechanical Engineer, Sargent & Lundy, LLC, Chicago, IL.
John provided technical expertise and analysis for the design and development of thermal generation power plants. In this role, John authored a wide range of technical assessments for clients, including feasibility of combined heat and power, combined cycle repowering efficiency upgrades, and optimal energy generation selection. John served as Technical Specialist for combined cycle repowering on a project for Xcel Energy and performed economic payback analysis and technical feasibility studies for investments in industrial efficiency.

PROFESSIONAL ASSOCIATIONS AND REGISTRATIONS:

- Engineer-in-Training (EIT) for the Texas Board of Professional Engineers
- Engineers Without Borders - USA (EWB-USA)
- American Society of Mechanical Engineers (ASME)
- Institute of Electrical and Electronics Engineers (IEEE)
- American Society of Civil Engineers (ASCE)

PETER LILIENTHAL

POSITION: Chief Executive Officer; Renewable Energy Expert
HOMER TEAM MEMBER SINCE: May, 2009

KEY QUALIFICATIONS: Dr. Peter Lilienthal is the Founder and CEO of HOMER Energy, LLC. Previously, Peter served as Senior Economist with the International Programs Office at the U.S. DOE's National Renewable Energy Laboratory (NREL). He has been active in the field of renewable and distributed energy and energy efficiency since 1978. This has included project development of distributed power projects and consulting to industry and regulators. Dr. Lilienthal's technical expertise is in utility modeling and the economic and financial analysis of renewable and distributed power projects. Peter was the lead analyst and one of the creators of NREL's International and Village Power Programs, and the original developer of NREL's HOMER® hybrid power optimization software. He has consulted for hundreds of for-profit and non-profit entities, government agencies, and international financial institutions.

Many of Dr. Lilienthal's projects, such as recent ones in the US Virgin Islands, Anguilla, Bermuda, and Hawaii, have involved modeling small conventional utility systems (5-100 MWs) for economic analysis of renewable and other options to reduce diesel fuel use. Peter worked on a World Bank project to develop proposals for hybrid mini-grid systems for remote villages. At NREL, Peter was a country manager for projects in the Philippines. These included analyzing diesel retrofit opportunities for numerous isolated grids throughout the Philippines. Earlier, he had played a similar role for NREL's activities with the World Bank in Argentina and Indonesia.

EDUCATION:
1993 Ph.D., Management Science and Engineering, Stanford University, Palo Alto, California
1986 M.S., Engineering-Economic Systems, Stanford University, Palo Alto, California
1985 M.S., Resource Economics, University of Vermont, Burlington, Vermont
1978 B.A., International Studies, Reed College, Portland, Oregon

SELECTED PUBLICATIONS:

Glassmire, J., Komor, P., and Lilienthal, P., "Electricity demand savings from distributed solar photovoltaics," Energy Policy, vol. 51, no. 0, pp. 323–331, Dec. 2012.

Lilienthal, P.; (2007) High Penetrations of Renewable Energy for Island Grids. Power Engineering, November 2007.

Letendre, S.; Denholm, P.; Lilienthal, P.; (2006) Electric and Hybrid Cars: New Load or New Resource. Public Utilities Fortnightly, December 2006, pp. 28-37.

Givler, T.; Lilienthal, P. (2005). Using HOMER Software, NREL's Micropower Optimization Model, to Explore the Role of Gen-sets in Small Solar Power Systems; Case Study: Sri Lanka.

Flowers, L.; Baring-Gould, I.; Wallace, B.; Lew, D.; Lilienthal, P.; Taylor, R. (2004). Lessons Learned: NREL Village Power Program Pilot Projects. 2004 IEEE Power Engineering Society General Meeting, 6-10 June 2004, Denver, Colorado. Piscataway, NJ: Institute of Electrical and Electronics Engineers (IEEE) Vol. 2: pp. 2093-2097; NREL Report No. CP-500-35484.

Lilienthal, P.; Lambert, T.; Gilman, P. (2004). Computer Modeling of Renewable Power Systems. Cleveland, C. J., editor-in-chief Encyclopedia of Energy. Elsevier Inc.

Baring-Gould, E. I.; Flowers, L.; Jimenez, T.; Lilienthal, P.; Lambert, T. (2001). Opportunities for Regional Rural Electrification Using Hybrid Power Systems. Wind Power for the 21st Century: The Challenge of High Wind Power Penetration for the New Energy Markets. Proceedings of the International Conference held 25-27 September 2000, Kassel, Germany.

Lilienthal, Peter and Greacen, Chris. (2000). Chapter Four: Wind/PV/Diesel Village Hybrid System for China. In Assessment of Integrated Rural Energy and Village Power Programs for Potential Collaborative Projects (EWG 06/98). (APEC Publication number: APEC#00-RE-01.9)

Lilienthal, P. D. (1998). Rural Electrification Options Analysis. WINDPOWER '98. Proceedings. Annual Conference & exhibition of the American Wind Energy Association. 27
Apr.- 1 May 1998, Bakersfield, CA.

Baring-Gould, E. I.; Barley, C. D.; Drouilhet, S.; Flowers, L.; Jimenez, T.; Lilienthal, P.; Weingart, J.; Soetendro, H.; Gultom, D. P. (1997). Diesel Plant Retrofitting Options to Enhance Decentralized Electricity Supply in Indonesia. 12 pp.; NREL Report No. CP-440-23237.

Lilienthal, Peter. (1997) NREL Technical Assistance to Argentina. Village Power '97. Proceedings. 14-15 April 1997, Arlington, VA.

Logan, D.M.; Neil, C.A.; Taylor, A.S.; Lilienthal, P. (1995) Integrated Resource Planning with Renewable Resources. Electricity Journal, v. 8, n. 2, 1995. pp. 56-66.

Logan, D. M.; Baylor, J. S.; Taylor, A.; Lilienthal, P. (1993). Modeling Renewable Energy Resources in Utility Planning Models. Proceedings of the National Regulatory Conference on Renewable Energy, 3-6 October 1993, Savannah, Georgia.

Faruqui, A; Kuczmowski, T; Lilienthal, P. (1990) Demand Forecasting Methodologies - An Overview for Electric Utilities. ENERGY, v. 15, n. 3-4, Mar-Apr 1990. pp. 285-296

SELECTED PRESENTATIONS:

Rural Microgrid Training Workshop, World Bank, PLN, Jakarta, Indonesia, April 2012.

Remote Microgrids are the First Smart Grids, Microgrid Virtual Summit, Online, March 2012.

Invited speaker, International Renewable Energy Agency meeting on renewable energy for the Pacific Community, December 2011.

Smart Micro-grids, Boulder County Business Report Green Summit, Boulder, CO, June 2011.

The Synergy of Plug-in Vehicles in Micro-grids, Automotive Research Center Conference, May 2011.

The Economics of Wind-Diesel Microgrids, 2011 International Wind-Diesel Workshop, Girdwood, Alaska, March, 2011.Software for Distributed Renewable Energies: Optimizing Performance and Efficiency, AGRION Business Network for Energy Cleantech, Sustainable Development, February 2011.

Analyzing High Penetration Renewables in Micro-grids with HOMER, University of Colorado at Boulder, December 2010.

Analyzing Storage and Renewables in Micro-grids with HOMER, Battery Power, Dallas, TX, USA, October 2010.

Analyzing Distributed Resources in Micro-grids with HOMER, Utility Wind Interest Group, Quebec, Canada, October 2010.

PROFESSIONAL EXPERIENCE:

2009 to Present: CEO, HOMER Energy, Boulder, CO.

Dr. Lilienthal is the founder and head of HOMER Energy, a company that provides software and services to small utilities and other power providers that are interested in adding renewable or distributed power to their systems.

2007 to 2009: CEO, Green Island Power, Boulder, CO.

Dr. Lilienthal provided economic analysis on renewable micro-grid applications to various international clients.

Selected project list:

- Government of Anguilla - Developed a long term strategic plan for Anguilla to transition away from dependence on diesel fuel. Analyzed economic viability of renewable energy options for the nation of Anguilla. Developed an RFP for a 3 MW wind project.
- Evaluated prospective system and provided technical assistance to new utility service offering to deploy distributed renewable energy systems.
- Government of Mongolia - Developed a World Bank-funded rural electrification program using hybrid renewable power systems for the Government of Mongolia.

1990 to 2007: Senior Economist, National Renewable Energy Laboratory, Golden, CO.
Led a model development team that created HOMER and other distributed generation and electricity planning models used by over 55,000 individuals in 193 countries. Developed strategic plans and rural electrification programs in Bolivia, Argentina, Chile, Brazil, South Africa, Indonesia, China, Sri Lanka, Pakistan, the Maldives, Alaska, and the Philippines. These plans assessed the viability of solar, wind, biomass power, and hybrid power systems, including the technical and non-technical requirements for successful deployment. Peter also developed training programs for in-country energy professionals. Other assignments included developing new collaborations with Winrock, ESKOM, New World Village Power, Piceance Natural Gas, Citizen's Utilities, and VRB Power Systems, Inc. These projects developed new applications for renewable power and energy planning tools.

1989: Research Assistant, California Public Utilities Commission, San Francisco, CA.
Modeled utilities' integrated resource plans and the potential role of non-utility generators.

1988: Consultant, Applied Decision Analysis, Menlo Park, CA
Reviewed models for integrated resource planning. Incorporated decision analysis into resource planning models.

1986 to 1988: Project Developer, International Power Technology, Palo Alto, CA
Developed 3-5 MW cogeneration projects. These projects were distributed power projects at sites such as hospitals, food processing facilities, university campuses and industrial parks.

1986 to Present: Instructor and Guest Lecturer, various.
Taught and supervised at the graduate and undergraduate level at seven different universities.

PROFESSIONAL ASSOCIATIONS AND REGISTRATIONS:
1984-1990 Energy Modeling Forum, Stanford University

NILS TELLIER

Nils E. Tellier, P.E.
Principal and Founder – EPSIM Corporation

Mr. Tellier is a licensed professional engineer with 10 years of experience in wholesale power trading and electric utilities operations. He is the Principal and Founder of EPSIM, Corp.

Mr. Tellier has participated in the planning and start-up of a Joint Power Authority in 2004. He has led the day-to-day operations for the new JPA as well as a pre-existing one, representing a total annual operating budget of $60 million. In 2009, Mr. Tellier led the development of an electric market for which he still directs operations.

Prior to founding EPSIM, Corp., Mr. Tellier was a Principal at Robertson-Bryan, Inc. following a career in cryogenic fluid processes. He has authored two US Patents in the field of industrial gases. He holds a Bachelor of Science in Mechanical Engineering from the University of Colorado – Boulder, and a bachelor degree in math and physics from the University of Caen –

France, where he pursued a master in pure math before serving in the French Navy as a reserve officer and platoon leader.

Reliability Working Group

Purpose and Scope

The Reliability Working Group is tasked with vetting the reliability issues associated with the city's municipalization exploration work plan.

Reliability is a combination of physical and process requirements to ensure that the electric system meets both federal and regional reliability requirements, customer demands for uninterrupted service and meet or exceed existing Xcel Energy reliability. Because reliability is such a high priority, the staff team is including a major task focused on the various aspects of achieving this objective.

The goal of the working group is to help city staff identify what is required to meet the expected reliability requirements and associated costs. Considerations will include not only reliability in the design, operations and maintenance of the system but in the delivery of power from suppliers.

The city intends to hire an engineering consulting firm with specialized expertise to perform primary analysis work. The working group will be asked to help inform the scope of this analysis and review consultant work products and vet assumptions with respect to reliability driven costs.

Reliability will be an important aspect in determining the best method of separating from Xcel. However, the separation analysis is confidential and is not included in scope of the working group.

Working Group Meetings

It is anticipated the working group will meet approximately once each month for four to five months. Meetings started in early November and are expected to continue through March. Other tasks and updates in between meetings will take place via e-mail and through the Basecamp web application.

Current Working Group Members

COMMUNITY MEMBERS
Pete Baston – Ideas iQA
Burrell Eveland – Western Area Power
Jim Look - IEEE
Jack Mason – Mason Energy
Rohan Verghese – Recent CU graduate

STAFF
Andrew Barth – Communications Specialist
Bob Harberg – Utilities Planning and Project Management Coordinator

Working Group Member Bios

PETE BASTON

Pete, the founder of IDEAS, is a Senior Executive Consultant with over 25 years of Quality Assurance experience at the highest level of operations. This experience encompasses:

- Immersion in best practices and workflow deployment using advanced digital technology systems for business development, business turnaround and risk management
- Due diligence for financial institutions, foundations and re-insurance companies
- Project development and best practices implementation in multiple industries including energy systems, engineering and construction, manufacturing, healthcare, petrochemical, information technology, telecommunications, and many more.

Pete was born in England and raised from the age of four in Rhodesia, Africa. He served intermittently as a conscript in a logistics and transport division of the Rhodesian citizen army from 1965 to 1979. During that time, he acquired four college degrees and formed his first business, an independent subsidiary of the Ajax Group, a Rhodesia-based commercial and military construction conglomerate. His consulting firm was the chief troubleshooter and quality assurance auditor for the conglomerate, resolving engineering, project management and materials acquisition problems. In 1975, Peter Baston Consulting established a subsidiary in South Africa, which expanded its client base to include a number of South African and international clients, including Fluor, Soros, Maurabeni, Hyundai, Asea Brown Boveri, Bechtel and others. At the same time, its project base expanded to include design and construction of petrochemical and power plants as well as large commercial structures.

His experience in Africa, where a shortage of resources absolutely required that engineering projects be done right the first time because there were no additional funds available to correct mistakes, gave Pete an enduring passion for "doing it right in the real world" and a reputation for accomplishing the seemingly impossible with minimal resources. Shuttling between England and Africa, he often says, meant learning to operate in perfectly opposed environments: how to get nothing done with lots of resources, or how to get everything done with minimal resources. This has translated into a life-long commitment to Quality Assurance as applied engineering. For Pete, Quality Assurance is the anchor for everything that a company does, and the key to consistent and enduring profitability. Deming's 14 points are the manifesto that has accompanied him all over the world, and which he has integrated into field implementation and operations on every project he's managed.

In 1979, with Rhodesia fast descending into political, military and economic chaos, Peter left Rhodesia with what he was allowed to carry out: $1,000 in cash and two suitcases. After a year and a half doing free-lance consulting throughout Europe, Pete was recruited to the US by the California division of Fluor Engineering to provide Quality Assurance oversight and expertise on assignment to a variety of teams. For a number of years he served as a troubleshooter and market development consultant for the Fluor Power Services Division and its research arm, Buildings of the Future, as well as for Nation's Bank. In this capacity, he was certified as a quality auditor and performed due diligence reviews and construction project audits on billion dollar construction projects. After the oil market crash, his assignment expanded from servicing petrochemical and

power plants to creating and marketing new, advanced products and services for Fortune 500 companies in a broad variety of industries. He developed and implemented the US marketing, design and deployment strategy for newly-formed subsidiary J.M. Group, incorporating rigorous Quality Assurance practices to protect profitability and taking the subsidiary from $0 to $232M annual sales in three years. In 1986, Pete founded his own manufacturing, design and service firm, Monkradle, to develop, manufacture and market advanced support equipment and systems to promote best practices and Quality Assurance in the utility, petrochemical, aerospace, civil engineering, defense and other industries.

In the early 1990s, as it became apparent that computers and information technology would eventually drive Quality Assurance and all of the industrial design and maintenance industry, he sold his company and took an extended sabbatical to learn digital technology from the ground up at the University of California San Diego, Northwestern University, the University of British Columbia and MIT. Pete pursued an independent and eclectic course of studies that eventually led to a list of technical certifications as long as his arm. In 1996, on a visit to Los Alamos National Labs and the Santa Fe Institute, he decided to settle in New Mexico. Over the following decade, Pete took on a number of large technical concept development, Quality Assurance and problem-solving projects with government agencies and private companies.

In 2010, IDEAS moved its base of operations to Boulder, Colorado, a center for development of the most advanced parametric technology in the world. Pete believes parametric technology will be the cornerstone for future development of advanced best practices using digital workflow. IDEAS is already developing this type of technology as part of its integrated intelligent QA management systems (*iQA*™).

Pete is a frequent speaker and lecturer on Quality Assurance and the integration of technology into QA and business systems.

BURRELL EVELAND

1980-1981 Los Angeles Department of Water and Power - Substation Operator- Various
1981-1982 Los Angeles Department of Water and Power- Hydro Operator- Castaic Pumped Hydro
1982-1984 Los Angeles Department of Water and Power- HVDC Operator- 3100-MW Sylmar Converter Station
1984-1987 IBEW Local18- Assistant Business Manager 8,500 member union local
1987-1989 Los Angeles Department of Water and Power - HVDC Operator- 3100-MW Sylmar Converter Station
1989-1997 Los Angeles Department of Water and Power- System Operator (Load Dispatcher)
1997-2011 Los Angeles Department of Water and Power- Senior System Operator (Senior Load Dispatcher)
2011-present Western Area Power Administration -Instructor I Dispatcher

JIM LOOK

James Look spent his entire professional career in the energy industry. After graduating with a BS in Electrical Engineering from Michigan Technological University, he joined the Wisconsin – Michigan Power Company (subsidiary of WE Energy) in Appleton, Wisconsin, where he was assigned to the system planning group. During his time with Wisconsin-Michigan Power, he performed detailed system analysis duties including load-flow analysis, short circuit studies and transient analysis studies for a 300MW power system. He was also involved in the generation of system enhancement proposals and the economic evaluation of alternative capital projects. Simultaneously, he completed his MBA, with a specialization in Finance, and passed the licensing exams for his Professional Engineer's license.

In 1975 Jim moved to Houston, Texas, and took a position with ARAMCO Services Company, the U.S. subsidiary of the Arabian American Oil Company (ARAMCO). During his 5.5 years with ARAMCO Services, he performed a wide variety of engineering tasks of increasing responsibility, including supervising consultants who were doing system development studies for the bulk power system which was being constructed in the Eastern Province of Saudi Arabia (KSA), performing system planning for ARAMCO's Utilities Department in Dhahran, KSA, and working as project electrical engineer in large (over $250 million) capital projects.

His next move was a transfer to ARAMCO in Saudi Arabia, where he would spend the next 23 years. Over that period, he held a long series of positions in the technical, staff and management business areas, primarily in the Oil Operations Business Line. Jim's initial assignment was as an electrical utility engineer in the company's largest refinery. He then moved through a series of supervisory positions with the planning staff for the VP of Operations. The over the next 15 years was assigned to a progressive series of engineering supervisory and project management assignments. During much of this time, he was responsible for an engineering design team and the management of engineering divisions with engineers (120+ FTE) in the chemical, process, electrical, instrumentation, computer control, corrosion, structural analysis, laboratory quality control, field inspection and subsea pipeline specialties. These engineering groups directly supported daily operations in ARAMCO's world-class offshore oil and gas production facilities. Jim completed his career as the senior consultant to the VP of Northern Area Oil Operations in 2003.

After relocating to Boulder, CO, he became active as a volunteer in a large (over 400,000 members) non-profit organization, the Institute of Electrical and Electronics Engineers (IEEE). He also did consulting work for DOE and NREL. Jim currently holds the position of Vice President, Professional Activities for the IEEE-USA.

JACK MASON

- 40 years of energy industry experience; 30 years in the power utility segment operating, designing, and analyzing power plants and systems and managing, training, and consulting to electric utilities,
- Founder of 8 energy-related businesses, 6 as divisions or subsidiaries of larger companies, 2 standalone, 1 involved raising capital, 3 resulted in acquisitions

- President of a $40 million public energy services company providing management consulting, engineering, environmental services, and information technology to utilities, other industries, and the Department of Energy
- Founder and president of EnergyWindow, a provider of energy supply strategy and procurement services, including an online request/bid platform, to national end-user companies
- Work with more than 30 national multiple-facility companies in hotel, retail, restaurant, healthcare, property management, etc., developing or implementing their corporate energy and environmental strategies
- 24 major consulting/strategic planning engagements involving organizational performance improvement and restructuring for large public and investor owned electric utilities sponsored by senior executives
- Management, directly or indirectly, of more than 1,000 diverse energy projects
- ScD Engineering MIT, MS Management from Sloan School of Management, BS US Naval Academy
- Sloan Fellow, Sloan School, electric utility industry research in France, Germany, Japan and US
- Adjunct faculty member, Engineering Management and Global Energy Management programs at University of Colorado
- Teaching a graduate course in operations management, quality management, process reengineering, and performance improvement with emphasis on the energy and utility industries
- Specific reliability analysis experience
    - Reliability center maintenance program
    - Probabilistic risk assessment of power plants
    - Risk analysis of various system, for example, gas pipelines
    - Statistical (Monte Carlo) simulation of various energy related problems

ROHAN VERGHESE

I have completed my M.S. in Electrical Engineering at the University of Colorado, Boulder and graduated in August 2012. My area of specialization is Control Systems and I've also taken courses in power electronics and energy systems. I completed my undergraduate studies in Electronics and Telecommunication engineering in May 2010 from Mumbai, India and began my graduate studies in August 2010. My summer internship in May 2011 was with Tata Power at their Trombay facility in Mumbai. This facility has a combined capacity of nearly 1.6 GW, and services most of Mumbai's industrial customers, as well as a large number of residential customers. As an intern, I worked in the Instrumentation, the Electrical Automation and the Load Control departments. In addition to this, I have participated in training courses conducted by Rockwell Automation, ISA and ABB. As part of my graduate coursework, I have completed a lab course in which I designed a standalone 85 W PV system including the MPPT, battery storage and inverter, as well as the associated control circuitry. These courses in conjunction with my internship have given me a deeper understanding of the core concepts used in automation and Control Systems, as well as their application in the energy industry. I'm currently looking for career opportunities in the energy sector, and I would like to learn more

about, as well as contribute to the efforts underway in Boulder, as I feel it will be an invaluable experience.

Communications and Outreach Working Group

Purpose and Scope

The Communications and Outreach Working Group is tasked with providing strategic counsel to city staff about best practice and/or innovative ways of engaging a broad cross-section of the community in the ongoing discussion about whether the city should form an electric utility.

This group will be tasked with the following types of specific responsibilities:

- Vetting ongoing communications and outreach efforts to help ensure that we are reaching a wide and varied audience;
- Identifying and examining alternate strategies and low-cost tactics to expand our reach beyond those who are currently engaged in this issue; and
- Providing city staff with feedback from the public's perspective about what is and is not working in terms of communication related to the municipalization exploration effort.

Final determinations about the most effective strategies and the ability to implement them based on staff and other resources will be made by Heather Bailey and City of Boulder staff. Communications and outreach strategies and tactics will likely have to be adjusted and honed as the overall project team's recommendations to City Council become more clear.

Working Group Meetings

It is anticipated the working group will meet approximately once each month for 4-5 months. Meetings are expected to commence in early November and continue through March. Other tasks and updates in between meetings will take place via e-mail and through the Basecamp web application. Meetings will occur on Wednesday evenings from 5:30 to 7 p.m. The following meeting dates have been scheduled: Nov. 14, Dec. 5, Jan, 16, Feb. 13, and March 13.

Current Working Group members

COMMUNITY MEMBERS
Craig Cox – Lyghtco LLC
Angelique Espinoza – Boulder Chamber
Chris Hoffman – Organizational Development Consultant
Robert O'Herron - IBM
Jennifer Pinsonneault – Boulder Economic Council
Julie Zahniser – Clean Energy Action

CONSULTANTS
John Egan – Egan Energy Communications, Inc.
Robb Shurr – WaldenHyde

STAFF
Sarah Huntley – Media Relations/Communications Manager
Andrew Barth – Communications Specialist
Kristen Hartel – Program Coordinator

Working Group Member Bios

CRAIG COX

President, Lyghtco LLC

Craig Cox is the founder and president of Lyghtco LLC, a new clean energy consulting firm. A government affairs and public policy professional, Craig brings more than two decades of successful experience in strategic policy development, market development and stakeholder communications for clients in the public, private and non-profit sectors.

In 2002, Craig founded the Interwest Energy Alliance and served as its executive director until 2012. Interwest, a trade association and the western regional partner of the American Wind Energy Association, represents the nation's leading companies in the renewable energy industry. It conducts outreach and representational activities in state legislatures and regulatory commissions in Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming. In his decade at Interwest's helm, Craig grew the association from a shoestring budget to its current position as one of the West's leading renewable energy advocacy organizations.
In 2010 and 2011, Craig served as the "Wind Energy Technology Advocate" on the Scenario Planning Steering Group (SPSG), which works under the auspices of the Western Electricity Coordinating Council's (WECC) Transmission Expansion Planning Policy Committee (TEPPC) and is part of the U.S. Department of Energy-funded Regional Transmission Expansion Planning (RTEP) project. The SPSG provides strategic guidance to TEPPC on scenarios to be modeled in transmission planning studies, the modeling tools to be used, and key assumptions to be used in creating and reviewing the scenarios.

Craig has been a member of various energy and transmission task forces and working groups throughout the West in recent years, particularly those sponsored by the Western Governors' Association as well as by the State of Colorado.

In 2008, Craig received the first annual "Governor's Excellence in Renewable Energy" individual award from Colorado Governor Bill Ritter and in 2007 he received the Colorado Environmental Coalition's "Conservation Award." In 2005, he received the "Wind Advocacy Award" from the American Wind Energy Association.

Craig has been active in renewable energy public policy development since working for Congressman Dan Schaefer (R-Colo.) in Washington, D.C. in the 1990s. In 1996, he initiated establishment of the U.S. House Renewables and Energy Efficiency Caucus on Schaefer's behalf. This Caucus is an officially recognized bipartisan Congressional Member Organization that educates Members of Congress on clean renewable energy technologies.

A Colorado native, Craig graduated from Boulder's Fairview High School and received his Bachelor's degree from the University of Colorado at Boulder. He received his Master's degree from the George Washington University in Washington, D.C.

ANGELIQUE ESPINOZA

Angelique Espinoza is the Public Affairs Manager for the Boulder Chamber, a post she has held since May 2011. She has lived in Boulder since 1991 and completed an M.A. at the University of Colorado Boulder. Her husband also attended graduate school at CU in the early nineties and works in downtown Boulder. Their son, who currently attends his neighborhood BVSD middle school was born at Boulder Community Hospital a few blocks from their present home in a North Boulder cohousing community. Angelique has worked in Boulder for over twenty years, at both non-profit and for-profit organizations and startups. She served on the Boulder City Council from 2007 to 2009 and has volunteered for several local organizations. Her primary contribution to the Outreach and Communications working group will be to assist in forming an effective strategy for reaching the business community and getting their feedback and involvement.

CHRIS HOFFMAN

Chris Hoffman, M.Ed., M.B.A., L.P.C., is a counselor and organization development consultant specializing in organizations committed to sustainability. His background includes 23 years consulting within a Fortune 500 energy utility. He is the author of a number of professional articles in the areas of team development and organizational change as well as several books. Most recently he is the author of "Three Behaviors That Can Save Us: The Social Psychology of Planetary Survival." (More information at www.hoopandtree.org)

ROBERT O'HERRON

Environmental Affairs Manager at IBM
15 years at IBM, Boulder, CO

- Experience in Environmental Management, Quality Management, IT Outsourcing, Program and Process Management

Key skills: People Management, Environmental Management, Process Analysis, Project Management

Career history
05/1997 - to date - IBM

- Manage global Environmental and Hardware Compliance Management Systems

- Global program management for the standardization of processes across IT organizations
- Leader of Share-net Community of Practice for IT process practitioners
- Project Manager for implementing processes for IT outsourcing projects

04/1989 – 04/1997 - Clean Harbors Environmental Services, Braintree, MA
Regional Customer Service Manager

- Business Process Re-engineering
- Application of Federal environmental regulations - RCRA, TSCA, DOT - for industrial companies
- Data mining and marketing
- Expertise in Hazardous Waste Management and Environmental Chemistry

Education:
Bachelor of Arts, Environmental Studies, Middlebury College, Middlebury, VT 1985

JENNIFER PINSONNEAULT

Jennifer Pinsonneault is the Director of Research and Marketing for the Boulder Economic Council (BEC), an affiliate of the Boulder Chamber that plays a leading role in promoting economic vitality, creating a sustainable business environment, and supporting the establishment and growth of businesses in Boulder. Jennifer's work with the BEC includes economic and market research, strategic planning, business outreach and support, marketing and communications, and event management including an annual economic forecast and the Boulder Economic Summit. Prior to joining the BEC staff in 2007, Jennifer was regional marketing director for First Interstate Bank (now Wells Fargo) and founded a marketing research and communications firm. She is a member of the city of Boulder's Economic Vitality Team and serves on the CO-LABS Board, Colorado Companies to Watch Advisory Board, and Workforce Boulder County Board. Jennifer is a Colorado native who grew up in the north metro area and currently lives in Broomfield. She received her bachelor's degree in business from Colorado State University.

JULIE ZAHNISER

I am honored to work on the Energy Future Communications and Outreach Working Group and to help Boulder move toward cleaner energy and carbon reduction. My most recent and relevant experience is volunteer work as Communications Coordinator on the RenewablesYES.org Steering Committee for the 2012 2B2C and 2011 2B campaigns. In this capacity I became intimately familiar with Boulder's Municipalization project and issues surrounding it. I participated in "group brain" development of messaging concepts for the website and public educational materials; coordinated campaign e-distribution list communication; managed meetings; and drafted opinion pieces to increase public engagement and involvement.
For the past half dozen years, while working as volunteer board member of Clean Energy Action whose mission is accelerating the transition from fossil fuels to clean renewable energy, I focused on public outreach to foster citizen education, empowerment and activation. At CEA I have worked on CEA's speaker series, website, and social media. Through presentations at the PUC, CDPHE, and EPA on topics related to fossil fuel risks and clean energy opportunities, I

have developed a broad knowledge base as well as a collaborative relationship with many Boulder organizations and community groups.

Four decades of providing speech-language pathology services grounds my understanding of and compassion for the human communication process and gives me experience training, supervising, and developing educational materials for clients of all ages, as well as parents, graduate interns and program staff.