

MEMORANDUM

TO: Members of City Council

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DATE: Dec. 11, 2012

SUBJECT: Study Session: Boulder's Energy Future

I. PURPOSE

The purpose of this study session is to discuss with City Council the updated work plan for activities related to Boulder's Energy Future and Climate Action, including:

- The city's ongoing exploration of municipalization
- Boulder's Climate Commitment and the next generation of climate action efforts, and
- Energy efficiency initiatives, including priorities for CAP tax expenditures in 2013

The study session comes just over a year since the narrow passage of two ballot initiatives to authorize and fund next steps in the exploration of municipalization as a path to achieving Boulder's energy goals, and one month after voters overwhelmingly approved extension of the CAP tax to support energy efficiency programs and initiatives to help reduce greenhouse gas (GHG) emissions. The information presented in this memo outlines the work efforts currently underway and planned for 2013 that will respond to these critical community priorities.

II. QUESTIONS FOR COUNCIL

1. Does council have questions or comments on the municipalization exploration work plan (Section A)?
2. Does council have questions or comments on the Climate Commitment progress and next steps (Section B)?
3. Does council have questions or comments on the energy efficiency policy and program priorities for 2013 which will be funded in large part by the CAP tax extension (Section C)?
 - commercial energy efficiency initiatives
 - residential energy efficiency programs
 - market innovations competition
 - new tracking and reporting process

III. EXECUTIVE SUMMARY

Boulder has long been a leader in climate action and environmental stewardship. The end of 2012 marks ten years since the city adopted the Kyoto Protocol goal to reduce its GHG emissions, and five years since Boulder voters became the first in the country to impose a local carbon tax to pay for GHG reduction efforts.

In the intervening years, a great deal has been learned about the challenges of climate action. In Boulder, the primary focus of these efforts has been in the area of energy use in buildings, the largest source of GHG emissions. Some of the key lessons learned include:

- **It's a community-wide effort.** While the city has a key role to play in leading climate action initiatives, everyone in the community must do their part.
- **The CAP tax is important, but climate action is a lot more than that.** The CAP tax supports one small part of the city's climate action efforts; we are mitigating and reducing GHG emissions in many ways across the city organization and in the community.
- **We need to change our energy supply.** Achieving meaningful GHG reductions in Boulder will require significant changes in the source of our energy supply, which is the single largest source of current emissions. This will require a shift toward low carbon and renewable resources.
- **We need to work with building owners to improve the energy efficiency of existing buildings.** While standards for new construction can help reduce the growth in energy demand, dramatic efficiency improvements in existing buildings are needed to have a real impact on emissions.
- **It pays to be green.** While climate action is an environmental prerogative, it can also save money, create jobs and help secure Boulder's long term economic vitality.
- **There are obstacles between knowledge/desire and action.** Many residents and businesses understand the benefits and want to make a change, but still face significant obstacles to making the necessary investments and behavior changes.

- **A combination of carrots and sticks can spur action.** A combination of incentives and regulations can spur action and investment at much higher levels than incentives alone; but incentives are key to making a regulatory approach workable.

These lessons, and others, have helped improve the effectiveness of Boulder’s energy efficiency programs and led to initiatives such as SmartRegs (to address the “split incentive” in rental housing) and the design and launch of EnergySmart (to provide a full service energy efficiency program for both residents and businesses). These efforts have dramatically increased the scope and impact of local energy efficiency investments, and have quickly become a national model.

Additionally, the in-depth analysis of Boulder’s climate action initiatives played a central role in highlighting the necessity of changing the source of the city’s energy supply, leading to the work on “Boulder’s Energy Future” in the past two years, and the exploration of municipalization as a potential path for achieving community energy goals. These goals include providing customers with greater choice and control, exploring local and distributed generation opportunities, and the central idea of approaching energy as a service instead of energy as a commodity.

As the city’s energy and climate teams conclude 2012 and prepare for 2013, specific work priorities include:

- **Next Steps in Exploring Municipalization** (*pages 6 to 14*). The city’s work in 2011 helped define the community’s energy future goals, and completed an initial analysis of options for achieving those goals. Following voter approval in November 2011, the city focused its 2012 “energy future” work efforts on exploring municipalization. The work plan for 2013 will continue those efforts, and help inform key decisions by City Council regarding next steps.
- **Next Steps in Boulder’s Climate Commitment** (*pages 15 to 20*). In 2012, the city team began work to reframe city-led climate action efforts to capture the full range of city initiatives and investments, and to create a more integrated and dynamic system to support data-driven decision making, transparency and improved program effectiveness. This section of the memo provides an update on these efforts, including work to establish new GHG reduction targets in relevant departmental master plans, programs, and services, as well as a new generation of data tracking and reporting tools to provide more timely feedback on progress and transparency on tax-funded investments. It also provides an update on the city’s work to reduce energy use in city facilities, serving as a leader in efficiency and conservation.
- **2013 Priorities for Energy Efficiency Initiatives** (*pages 21 to 30*). Based on consultant input and previously established direction from council, this section of the memo outlines the work plan priorities for 2013 energy efficiency initiatives, including an update on the renewed focus on commercial energy efficiency initiatives; continued residential programs and services; a new “market innovations” initiative; and development of new planning, tracking, and reporting tools.

City Council has received updates and provided input on these activities throughout 2012 at several study sessions, including:

- Jan. 31, 2012 -
Proposed 2012 work plan, including next steps in the analysis of potential municipalization and planning for the next generation of Boulder's climate action initiatives;
- May 22, 2012 -
Potential long-term climate action goals, discussion about whether to extend the existing CAP tax and considerations related to a commercial energy efficiency strategy;
- July 24, 2012 -
Update on work done since the May 22 study session, including municipalization exploration, CAP tax, commercial energy efficiency strategies and building code changes; and
- Aug. 28, 2012 -
Municipalization exploration draft work plan, project budget and draft metrics.

The Dec. 11, 2012, study session provides council an opportunity to review and discuss the proposed 2013 plan in each of these interrelated areas.

IV. UPDATED WORK PLANS

This section contains the following three segments:

- A. Next steps in exploring municipalization
- B. Next steps in Boulder's Climate Commitment
- C. 2013 priorities for CAP-tax funded initiatives

A. Next Steps in Exploring Municipalization

This section presents and seeks council feedback on the update to the municipalization exploration work plan and provides an update on the project budget.

Work Plan Overview

1. Metrics

The draft municipalization metrics were brought to council for approval on Oct. 16. Due to questions raised by council and the public, staff extended the work effort and rescheduled the item for a public hearing on Nov. 15, where they were approved. Much of the discussion about the metrics centered on whether the measurements are sufficiently inclusive and specific enough to inform council as to whether the city should municipalize. To briefly summarize, the metrics are based on the City Charter provisions only and will be used to establish a floor or baseline that must be met before the city can move forward with municipalization. The strategies that staff will present to council in the first quarter of 2013 will be based on a 20-year outlook and incorporate much more than what is measured by the charter metrics. Based on council discussion, staff is continuing to incorporate more detailed analysis and metrics into the evaluation of strategies that provide the basis for a “should we municipalize” decision.

What’s been done since last update:

- ✓ Draft metrics developed based on City Charter goals
- ✓ Municipalization Charter requirement working group formed, reviewed and modified draft metrics (For more information on the working group, including the scope of work and list of members, see **Attachment M-1**)
- ✓ Extended stakeholder input
- ✓ Approved final charter metrics

Next steps:

- Incorporate charter metrics into modeling and analyses

2. Financial

The goal of this area of the work plan is to refine the existing cost model to accept even more complex inputs and provide more complete outputs to inform council about the financial viability of proposed strategies. The financial tool is the work plan’s backbone as it is expected to integrate cost data from other work plan areas to test the charter requirements. Additionally, the financial tool will serve as a base model for supporting any possible future financing. Therefore, it will include several financial tests to meet rating agency criteria and requirements. Lastly, the model will help determine various trade-offs where policy makers may want to shift financial resources over time to achieve goals.

What’s been done since last update:

Since the last update to council, the following tasks are underway or completed:

- ✓ Selected tool for modeling the cost impacts of various municipalization strategies. The tool built upon the cost model used in the 2011 feasibility study by the city. The tool was modified to:
 - Interface with a separate resource modeling tool (HOMER) in order to model the financial impact of various resource costs and energy load scenarios
 - Forecast a 20-year time period
 - Calculate monthly cash flows including reserves and debt service coverage ratios on a monthly basis
 - Set up utility operations inputs to have the ability to model various scenarios
 - Set up average cost per kWh rate calculations by major customer segment (residential, commercial, and industrial)
- ✓ Formed and convened a financial working group
 - The working group is tasked with vetting certain data inputs and assumptions, as well as providing further research and analysis to be included in the model. The group is primarily focusing on utility operations, financial parameters, economic attributes, and the interface with the resource modeling effort. (For more information on the working group, including the scope of work and list of members, see **Attachment M-1.**)
- ✓ Collecting data to expand model analysis to 20 years
 - The 2011 model and feasibility study provided a 10-year forecast of total cost of service. The model is being expanded to include a 20-year forecast revenue requirement to better inform decisions with the ability to run sensitivity analyses to explore the impact of decisions on the project goals over a longer period of time.
- ✓ Working with financial advisor to incorporate public power financial criteria into the model and process
 - The financial advisor is collaborating with staff and the working group to ensure the model includes various tests that meet rating agency criteria.
- ✓ Running financial scenarios to test the model and charter requirements
 - As the modeling tool is refined, various scenarios are being run to test functionality and the outputs as they relate to the charter requirements. The model will undergo quality assurance tests and refinements through this process.

Next steps:

- Data collection and vetting of assumptions
 - New data is being collected, current data is being verified, and all assumptions and sources are being vetted and documented in preparation for a third-party review.
 - Staff will work with other utilities to identify best practices and test cost assumptions.
- Develop rate design formula (if more granular data becomes available)

- Integrate work plan outputs from other work groups
 - As outputs from other work groups are available, they will be integrated into the financial model to paint a complete financial picture and provide the ability to run sensitivity analyses and develop scenarios.

Additionally, outputs from the financial model will be incorporated into the decision analysis tool (see section 3.).

3. Decision Analysis

The goal of the decision analysis component of the work plan is to make sure that the ultimate recommendations to council are based on understandable and useful information that is generated and analyzed through a credible process. This section of the work plan is being supported by Dr. Greg Hamm of Stratelytics, LLC.

Potential commitments of resources, such as decisions to build generation or underground the distribution grid, will be identified in each area of the municipalization exploration work plan. This means that there are a large number of potential decisions that could be made and uncertainties that could impact them, ranging from gas prices to legal costs. Those legal, technical, financial, and resource decisions can be packaged together to create strategies, each of which may lead to different risks and opportunities. Accordingly, integrating decision analysis principles into the municipalization exploration process will help to reveal the best strategies—those that would not only meet the floor of the charter requirements, but would add value by helping achieve the community’s broader Energy Future goals.

What’s been done since last update:

- ✓ Assembled decision analysis working group composed of volunteers with significant academic and/or career experience in risk assessment and decision support (For more information on the working group, including the scope of work and list of members, see **Attachment M-1.**)
- ✓ Evaluated existing financial and resource models and selected a decision tool that will interact effectively and allow additional probabilistic analysis

Next steps:

- Develop framework for evaluating “value adds” of municipalization and non-municipalization strategies
- Identify key decisions by work plan area
- Identify risks and opportunities associated with decisions
- Assemble strategies through decision trees, influence diagrams, etc., and test them internally and with working groups
- Identify additional data needs
- Refine framework to convey eventual recommendation(s) to City Council and the public

4. Legal

The legal team is responsible for overseeing all litigation and work that may ultimately support future legal activities related to condemnation and regulatory filings. Because of this, engineering and financial consultant contracts are being managed by the legal department and are included as tasks in this section.

What's been done since last update:

- ✓ Hired PFM as the city's financial advisors
- ✓ Hired Exponential from Fort Collins and Schneider Electric as engineering consultants for separation and reliability issues
- ✓ Directed Federal Energy Regulatory Commission (FERC) legal team to begin analysis
- ✓ Represented city at two-week Public Utilities Commission (PUC) hearing on Xcel Energy Resource Plan (ERP)

Next steps:

- Coordinate identifying specific assets to be acquired
- Oversee inventory appraisal process
- Work with bond counsel on legal issues affecting financing
- Work with financial advisor to develop options for short and long term financing
- Continue PUC work
- Work with FERC legal team to make recommendations on options

5. Resource Modeling

The resource modeling effort will help inform planning for the optimal resource mix of a potential municipal utility. Planning for resources typically involves developing and assessing alternative scenarios based on a range of growth rates, resource costs, capital costs, types of generation resources, energy efficiency programs, levels of emissions, water usage and other considerations. The planning process also involves projecting future needs, assessing the existing assets available to meet those needs and identifying any resource gap so that the utility can continue to provide reliable and affordable electricity. The various alternative resource plans can then be compared on the basis of cost, environmental characteristics and other factors.

Staff has initiated a comprehensive resource modeling effort to test actual resource plans, which include transmission constraints and opportunities, reserve margins, and portfolio optimization strategies. To perform the modeling, staff and the working group have selected HOMER energy as the software tool. HOMER simulates thousands of different user-defined systems for every hour of a year. It then ranks them by financial performance and technical feasibility.

The software's sensitivity analyses allows for the consideration of inputs such as price volatility, availability and the creation of a balanced portfolio. This aspect is critically important, as the modeling must properly consider the relevant attributes of the different renewable resources, in addition to conventional supply-side and demand-side options.

To ensure that the model inputs are accurate, staff is working with EPSIM Corp. to review and update Boulder's load projections. An updated load profile includes a Boulder peak demand forecast between 2005 and 2035, and will include specific load details for the various rate classes.

What's been done since last update:

- ✓ Formed working group (For more information on the working group, including the scope of work and list of members, see **Attachment M-1.**)
- ✓ Selected resource modeling tool and consultants and have begun data input
- ✓ Updated load growth projections and expanded to 20 years
- ✓ Incorporated energy efficiency and demand-side management into resource projections and coordinating with climate action programs
- ✓ Updated distributed resource potential

Next steps:

- Develop resource mix scenarios
- Integrate resource plan with separation and reliability assumptions

6. Asset Inventory, Separation and Reliability

This work includes the evaluation of the distribution, transmission, and customer premise assets to determine the most cost effective separation plan under various criteria, such as geography, system configuration, stranded costs, damages to the remaining system, capital costs of improvements, and reliability. The reliability evaluation will include the existing Xcel electric utility system and options to increase reliability and sustainability of a new city-owned electric utility. Reliability is a combination of physical and process requirements to ensure that the electric system meets both federal and regional reliability requirements, meets customer demands for uninterrupted service, and meets or exceeds existing Xcel Energy reliability.

What's been done since last update:

- ✓ A substantial portion of the information available on the existing electric system has been mapped and will be used to develop an asset inventory. This will minimize the need for field inventory work.
- ✓ Initiated Smart Grid system inventory and evaluation
- ✓ Developed a Request for Proposals for engineering services related to asset inventory, separation and reliability. Based on these proposals, scopes of work with the consulting engineers were negotiated, contracts signed, and work initiated.
- ✓ Established Reliability Working Group team of experts and hosted first meeting on Nov. 8 (For more information on the working group, including the scope of work and list of members, see **Attachment M-1.**)
- ✓ Reliability Working Group provided input to the reliability considerations and tasks that will be incorporated into the reliability analysis.
- ✓ Met with key business facilities management personnel to determine existing and future electrical generation capabilities and needs

Next steps:

- The existing electric system maps will be used for asset inventory, condition assessment and valuation purposes as part of the scope of engineering services.
- Complete the development of separation plan options and associated reliability analysis
- Analyze options for construction of new facilities combined with acquisition of existing facilities
- Coordinate with Resource Modeling Working Group to define appropriate reserve margin requirements and to ensure reliability for all resource mix scenarios
- Finalize reliability strategies and capital requirements
- Coordinate with Public Safety and IT departments to determine what communication needs would exist if a new utility were to be formed
- Develop organizational plans to support ongoing operations and maintenance, monitoring, control, dispatch and emergency response, should a new utility be created
- Continue to meet with key commercial and industrial consumers to identify reliability issues and needs

7. Communications and Outreach

Communications and outreach related to Boulder’s Energy Future have maintained a consistent pace since the approval of the work plan on Aug. 28. The team is providing updates and information in advance of the Dec. 11 study session. In addition, public meetings to present draft strategy recommendations at the end of January are being planned. While the format of this public outreach is still under development, the goal will be to inform the community about the analysis and results to date and to seek input about possible recommended strategies to be presented to City Council at the end of February.

What’s been done since last update:

- ✓ Established Communications and Outreach Working Group (For more information on the working group, including the scope of work and list of members, see **Attachment M-1**.)
- ✓ Gave presentations to various organizations, including Boulder Tomorrow, the Clean Energy Action group, the Boulder Area Rental Housing Association and Commercial Brokers of Boulder (scheduled for Dec. 10), and held ongoing monthly meetings with Chamber representatives
- ✓ Continued publication of monthly newsletter and maintenance of Energy Future website, and included Energy Future as category in new InspireBoulder.com collaboration site
- ✓ Kicked off annexation outreach with HOA leader meetings and letter to all residents in Area II
- ✓ Published op-ed in Daily Camera from Heather Bailey explaining the work plan

- ✓ Provided 10 updates to 481 community members who have signed up for e-mail alerts

Next steps:

- Coordinate with media and use existing city platforms to provide updates on project, especially during period between Dec. 11, 2012, and Feb. 26, 2013, study sessions
- Conduct monthly meetings with Communications and Outreach Working Group and determine best ways for implementing new ideas or approaches
- Launch city neighborhood outreach initiative that will include e-mail correspondence to neighborhood group leaders and an offer to make presentations about the project at neighborhood meetings or in neighborhood publications
- Assist with Alternatives to Municipalization white paper
- Schedule and plan public input process for review of recommended strategies – anticipated to occur sometime between Jan. 21 and Jan. 31, 2013

Other Activities

In addition to the work described above, staff is:

- Developing a white paper that outlines potential ways in which the city and Xcel could work together
- Meeting with state and federal legislative support teams to identify any issues and areas to monitor

Budget Update

The draft work plan described in this memo represents a significant undertaking. In particular, the legal and technical work necessary to determine the final costs for potential acquisition of the local distribution system and launch of a municipal utility represent a considerable investment. Recognizing this, city voters approved an increase to the Utility Occupation Tax in the amount of \$1.9 million a year. The use of this tax revenue has been allocated to the following categories:

- Legal Services (Condemnation and FERC Counsel)
- Consulting Services related to possible municipalization and separation of Xcel Energy's system (Engineering and Appraisal Services)
- Executive Director of Energy Strategy and Electric Utility Development (Salary & Benefits)
- Purchased Services and Supplies (Office Space and Supplies)

The 2012 total budget of 2,226,047 is funded from the Utility Occupation Tax, plus prior carryover and environmental funds. Expenditures have been within the limitations of this budget. To date, we have spent \$758,971 and have committed \$989,808 for the remainder of the year. We anticipate the projected balance to carryover to 2013.

The 2012 sources and uses for this effort are provided in the chart below. In the uses section, staff identified uses paid as well as contract commitments and agreements

through December 2012. Since the update in August, the budget has been adjusted to reflect signed contracts for consulting services and an update to purchased services.

2012 Municipalization Budget					
<u>2012 SOURCES:</u>					
Utility Occupation Tax	1,900,000				
Environmental Fund	251,047				
Carryover	75,000				
Total 2012 Sources	2,226,047				
<u>2012 USES:</u>					
	<u>Budget</u>	<u>Paid</u>	<u>Committed</u>	<u>Projected</u>	<u>Balance</u>
Personnel	491,047	187,582	51,911	0	251,554
Legal Services	800,000	309,453	490,547	0	0
Consulting Services	420,000	104,384	245,500	0	70,116
Purchased Services & Supplies	515,000	157,552	201,850	0	155,598
Total 2012 Uses	2,226,047	758,971	989,808	0	477,268

The [2013 Recommended Budget](#), including funding for Energy Strategy and Electric Utility Development, was approved on Oct. 16, 2012 by the City Council. Staff will provide council with an update of the sources and use chart in an information packet on a quarterly basis beginning in 2013.

Other staff resources assigned to this effort have been allocated within existing budgets and separate from the \$1.9 million Utility Occupation Tax revenue. This is in alignment with the overall priority of this effort and existing roles, responsibilities and funding, as well as the approach historically taken with other significant and cross-departmental city projects. As a reminder, an organizational chart showing those assigned to this project and their areas of focus is included as **Attachment M-2**. In response to a request from City Council, a list of staff working on this effort, the percentage of time spent during 2012 and associated budget allocation is provided as **Attachment M-3**.

Dec. 11 Study Session Question:

Does council have questions or comments on the municipalization exploration work plan?

B. Next Steps in Boulder's Climate Commitment

Boulder's Climate Commitment is the next generation of the Climate Action Plan (CAP) first adopted in 2006. The CAP has rallied Boulder residents and businesses to action and precluded GHG increases since its adoption. However, continued success depends on more effectively integrating the full range of GHG reduction and mitigation activities in city policies, programs and services, and providing a clearer structure for planning, tracking, and reporting. The new Climate Commitment strategy will shift climate action planning from a static plan document to an integrated and dynamic process—one that is conducted with transparency, accountability, and shared purpose. This section describes progress on the Climate Commitment and two key projects that underpin it—the development of a city organization GHG inventory¹ and an updated methodology for the communitywide GHG inventory.

1. Progress on the Climate Commitment

In practice, the Climate Commitment means the city will be integrating GHG emissions targets consistently across departmental master plans, programs and services. It also means that the city will improve progress reports to be more timely and user-friendly and continually refine and improve programs and policies.² While initial implementation is city-focused, central to the Climate Commitment is fostering community partnerships that clarify the roles of residents, businesses and other entities as well as the city.

The graphic included in **Attachment CC-1** depicts the approach to the Climate Commitment and its six focus areas, which represent GHG emissions sources, such as building energy use and transportation. Each focus area is connected to one or more master plans, within which strategies will be developed and implemented to reduce GHG emissions in the community and the city organization. The master plans will include one-year program targets as well as five-year GHG emission reduction goals that are based on program targets and other trends. Tracking tangible units—like units compliant with SmartRegs, in addition to GHG emissions—will provide Boulder residents and businesses with a more complete understanding of progress in key areas of action.

The Climate Commitment also will include a long-term goal for GHG reduction. This is a cornerstone of the plan, as science indicates that the developed world must decrease GHG emissions by more than 80 percent below 1990 levels by no later than 2050 to avoid irreversible damage to the global climate. Even more aggressive targets like carbon neutrality—where GHG emissions are mitigated and then reduced to net-zero through carbon sequestration and other strategies—may be required to effectively address the risk of climate change.

¹ A GHG inventory is an annual estimate of the amount of GHG emissions attributable to activities by an organization or in a geographic area, contributed from various sources, such as energy, waste, water and transportation.

² This will differ from the current annual CAP progress reports by centralizing information and providing more frequent updates in areas where it is feasible, such as in solar photovoltaic installations or businesses participating in the Eco Pass program.

To accomplish Boulder's Climate Commitment, the city is strategically focusing on the areas of energy and transportation, as they represent 97 percent of communitywide GHG emissions currently tracked. These areas will pilot the integrated approach and improved data tracking and reporting, the latter of which is discussed in subsection 3.

2. Lead by Example - City Operations GHG Inventory

The city organization has taken action to reduce GHG emissions through strong sustainability and climate action programs, including setting goals for reducing energy demand and improving performance for its own buildings, vehicles and waste operations. As part of the performance improvement strategy, the city has upgraded numerous city facilities through an energy performance contract, and has completed a 2008 baseline GHG emissions inventory for the city organization. This inventory follows generally accepted emissions accounting practices, as set forth in the International Council for Local Environmental Initiatives (ICLEI) Local Government Operation Protocol, and aims to translate a multitude of business processes and sustainability initiatives into equivalent GHG emissions impacts. Based on this protocol, the city inventory accounts for buildings' energy use, employee commutes, vehicle fleet, business travel, materials, government-generated solid waste, and water treatment.

At the Dec. 11 study session, staff will present an overview of the inventory and emissions reductions achieved in city operations between 2008 (the baseline year) and 2011. Of the 66 city buildings that had energy improvements, buildings have increased in efficiency on average by 45 percent. In addition, the city's Energy Performance Contractor, McKinstry, is rating the energy performance or energy use intensity (EUI) of 28 facilities (representing 82 percent of city facility energy consumption) using ENERGY STAR Portfolio Manager software. This is the same tool being tested for the energy rating and reporting pilot program currently underway with a voluntary sample of commercial properties in Boulder.

3. Communitywide GHG Inventory

Boulder's communitywide GHG inventory was developed in 2009. In the years since, GHG inventory protocols have improved in both accounting methodology and functionality, and the city will be updating its approach accordingly to make the results more complete, accurate and accessible. While the city organization inventory accounts only for GHG emission sources that the city owns, operates or controls (such as city facilities), the communitywide inventory estimates the GHG emissions reasonably attributable to the actions of all residents, businesses and other entities within Boulder.

Council has requested that Boulder's communitywide inventory be comparable to those of other cities, and that it be adequately comprehensive to support appropriate policy making (rather than being based on minute data that is not necessarily useful to the overall picture). Therefore, staff is considering using ICLEI's recently released U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions in the update of Boulder's communitywide GHG inventory. This would be compatible with the city operations inventory and inventories being completed by other Colorado local

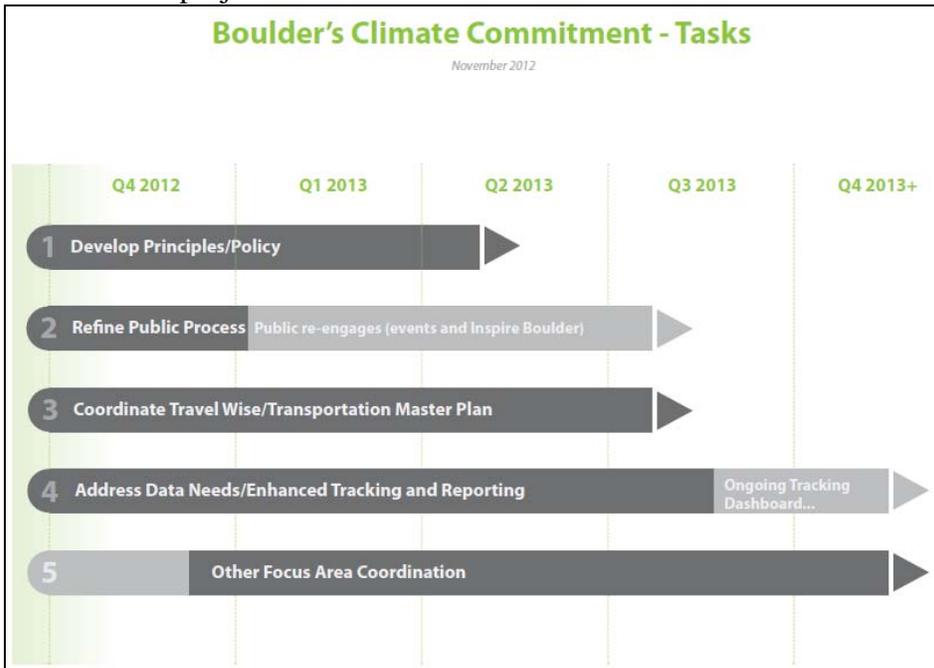
governments. It is also expected to generate a more complete picture of GHG emissions attributable to the Boulder community by including, for example, regional transportation. Staff is seeking consulting services to determine the appropriate GHG inventory methodology, develop a new baseline, and recommend how to incorporate trend data, such as weather, and programmatic data, such as EnergySmart upgrades. Care will be taken to ensure that the updated inventory (which includes a more comprehensive set of emissions sources) can be compared to the city’s previous inventory so that trends and achievements can be tracked from the previous period into the present.

The GHG inventory will be developed with interdepartmental input to ensure that relevant GHG emissions are accounted for effectively. Staff proposes to work with regional partners, such as the Colorado Climate Network, to coordinate a state protocol for local community inventories, thereby helping to ensure consistency and ability to compare results.

Communicating the results of the updated communitywide inventory effectively will be key. By 2014, the city plans to develop an online “dashboard” that tracks key areas of action, such as electricity and waste, and allows the community to monitor, analyze and visualize progress in reducing emissions.³ The dashboard will provide accurate and current reports from multiple emissions sources. This is part of a larger process to develop a “one stop shop” eco-portal that will help Boulder residents and businesses quickly access sustainability services online.

4. Climate Commitment Project Status

The graphic below provides an overview of recent and future tasks for the Climate Commitment project.



³ For an example of a community sustainability dashboard, please see the website for the City of Surrey, British Columbia: <http://dashboard.surrey.ca/>.

5. 2012 Code Updates

As part of the 2012 work program, a staff team has been reviewing the city's building codes and identifying recommended updates for consideration by Planning Board and Council. During the last code update a 30 percent improvement in the energy code efficiency levels was incorporated. Now that the 2012 energy code has attained similar energy efficiency levels it must be determined if energy efficiency levels should be further improved and if so by how much. The city has retained The Brendle Group to support the necessary data analysis to determine the optimal energy efficiency levels for incorporation in the 2012 code update. Recommendations will be presented in the second quarter of 2013.

6. Summary of Progress and Next Steps

What's been done since last update:

Planning and Integration:

- ✓ Developed preliminary “guiding principles” for the Climate Commitment project, to be discussed with EAB and the public in 2013
- ✓ Continued interdepartmental coordination and integration, particularly on scoping the Transportation Master Plan and Zero Waste Master Plan to ensure they will incorporate climate action strategies, including annual targets, consistent with the overall Climate Commitment
- ✓ Within the “Better Buildings” focus area of Boulder’s Climate Commitment (Attachment CC-1) the city has hired the Brendle Group to determine the cost premium of energy code amendments that will result in energy efficiency levels greater than the base 2012 energy code.

Tracking and Evaluation:

- ✓ Completed 2011 city organization GHG inventory
- ✓ Researched and identified approaches to improve tracking and reporting on energy efficiency and renewable energy programs
- ✓ Researched and identified generally accepted protocols to update the communitywide GHG inventory to meet current best practices
- ✓ Introduced new “at-a-glance” EnergySmart quarterly progress reports
- ✓ Rated the energy performance of city facilities through the city’s EPC with McKinstry

Next steps:

Planning and Integration:

- Refine Climate Commitment guiding principles and directions with public input
- Develop annual targets and five-year goals in the climate action focus areas, beginning with energy, transportation, and waste, potentially with consultant assistance
- Apply the results of the Brendle above-code energy efficiency cost premium research and the public input from the code update process to develop an energy code recommendation for council consideration in the second quarter of 2013

Tracking and Evaluation:

- Develop a new communitywide GHG emissions inventory and baseline, with consultant assistance
- Implement a coordinated and ideally automated process for tracking and reporting on sustainability progress, starting with energy programs and GHG emissions, with consultant assistance
- Develop, in stages, a web-based “eco-portal” for sustainability policies and programs
- Work with McKinstry to assess overall observations and analyze the energy ratings and EUI scores for city facilities

Public Engagement:

- Continue to engage the community in the Climate Commitment and action planning, including:
 - Tap into expertise in the Boulder community and Rocky Mountain region
 - Foster discussion at events and on InspireBoulder.com about climate action goals and programs

Dec. 11 Study Session Question:

Does council have questions or comments on the Climate Commitment progress and next steps?

C. 2013 Priorities for CAP Tax Funded Initiatives

With approval of the CAP tax extension last month, staff is preparing to advance the city's climate action initiatives and programs consistent with City Council's support at the July 24 study session. This includes initiatives in the following four priority areas:

1. **Ramp Up Commercial Energy Efficiency Initiatives** – This strategy focuses on the commercial sector, since analysis shows it to be the most cost-effective with the highest potential carbon and cost savings in the long run. This includes development of a commercial energy rating and reporting (formerly called “benchmarking and disclosure”) ordinance, revisions to the “10 for Change” program and continuing and enhancing commercial EnergySmart in close collaboration with Boulder County. In addition, this includes ongoing city organization efforts to “lead by example.” Approximately 55 percent of 2013 CAP tax revenues will be invested in commercial energy efficiency initiatives.
2. **Enhance Residential Programs** – This strategy focuses on the residential sector, and consists of continuing and enhancing residential EnergySmart and the implementation of SmartRegs. The advisor services will continue to be provided by Populus as part of the EnergySmart program administered by Boulder County. Approximately 18 percent of 2013 CAP tax revenues will be invested in residential programs.
3. **Stimulate Market Innovation** – This new program will solicit proposals for reducing GHG emissions and is intended to spur strong local market innovation and economic vitality. Approximately 16 percent of CAP tax revenues will be invested in this new initiative.
4. **Improve Program Tracking and Evaluation** - This area of work is focused on developing a more systematic, transparent and consistent data tool for tracking the results and performance of climate action programs and initiatives. It will help inform not only what programs should receive ongoing funding but also how to most efficiently manage and refine programs moving forward. Approximately 11 percent of 2013 CAP tax revenues will be invested in this strategy area.

1. Ramp Up Commercial Energy Efficiency Initiatives

Since the beginning of the city's Climate Action Plan (CAP), the city has set aggressive goals to increase energy efficiency in Boulder's commercial building stock, as this sector consumes over 80 percent of the city's electricity. (See **Attachment CE-1** for a breakdown of Boulder's overall commercial building stock.) In an attempt to achieve these goals, the city has implemented a variety of services to support energy efficiency in the commercial sector, including voluntary services such as EnergySmart. These efforts have evolved and have contributed to the reduction of energy use throughout the city. However, the city lacks sufficient energy data for commercial buildings to accurately measure progress and design effective programs. Additionally, many building owners

lack comprehensive energy data to help them assess how and where they could make the most beneficial improvements.

On May 22, 2012, City Council discussed moving forward with a three-phase Commercial Energy Efficiency Strategy (CEES) that includes: expanded voluntary, incentive-based programs; a regulatory policy that would require commercial energy rating and reporting; and eventually, prescriptive energy efficiency measures and/or performance standards if needed.

At the July 24, 2012, study session, staff proposed a pilot program for the fourth quarter of 2012 to inform development of the commercial energy rating and reporting ordinance and program. In addition to a pilot program for private sector commercial buildings, the city is leading by example and rating city facilities (as discussed in section B, part 2, above). The following section provides updates on two voluntary, incentive-based programs – EnergySmart and 10 for Change – and summarizes the commercial energy rating and reporting ordinance work plan and pilot program.

a. Voluntary Commercial Energy Efficiency Programs

Commercial EnergySmart Program

On Nov. 15, 2012, City Council received a [memo](#) with a third quarter update on the EnergySmart program. The commercial EnergySmart program is experiencing high levels of participation by the business community, particularly the advising services and rebates. Available funding for Commercial EnergySmart rebates for energy efficiency improvements were exhausted in July 2012. However, as part of the ongoing partnership and commitment to fund EnergySmart, Boulder County has proposed funding (to be finalized in December) for basic residential and commercial services countywide after the Recovery Act/Better Building funding ends in May 2013.

Highlights of program accomplishments through the third quarter of 2012 are:

- Nearly 1,500 unique businesses have participated in receiving EnergySmart services.
- Over 2,200 services have been provided through EnergySmart to businesses and building owners.
- Boulder businesses and building owners have received nearly \$800,000 in commercial rebates, including \$300,000 in CAP tax funded rebates and incentives.
- EnergySmart services for businesses have avoided 5,100 mtCO₂ (metric tons of carbon dioxide); according to EPA calculations—this is equivalent to the emissions avoided by 1,000 cars not being driven for a year.

The intention is to continue the highly successful advisor model, with EnergySmart advisors working directly with participants to identify energy efficiency and money-saving opportunities. As discussed previously, a strategic component of the advisor service will include assisting Boulder’s businesses and building owners to track and rate their buildings’ energy performance with Portfolio Manager. Continuing to work collaboratively with Boulder County Public Health in their role as the commercial

EnergySmart service provider allows the city to focus on ordinance development and identifying the necessary incentives to support the energy rating and reporting efforts.

10 for Change

The 10 for Change program was co-founded in late 2008 through a public-private partnership of the City of Boulder, Cleantech Solutions, and Hogan Lovells to encourage businesses to reduce energy use by 10 percent annually. Since the program's initiation, 10 for Change has expanded in scope to address other sustainability areas (e.g., waste, water, transportation and employee education/outreach) in response to the needs, interests and desires of member businesses.

With the CAP tax renewed, the end of the year approaching and the Commercial Energy Efficiency Strategy moving into its second phase (rating and reporting), the program is now assessing its strengths and challenges. Businesses were surveyed to gauge their impressions of 10 for Change to help identify areas for improvement. The survey was completed by both member and non-member businesses and included questions relating to: business sustainability goals, resources (staff/money) for sustainable initiatives, and topics of interest.

Feedback from the survey informed the following five proposed programmatic changes:

1. Shift focus to behavior change rather than capital improvements.
2. Develop a program with goals and membership criteria relating to Climate Commitment areas.
3. Leverage internal city resources, programs and outreach.
4. Improve program tracking and evaluation.
5. Utilize member events to help drive change.

These programmatic changes will be prioritized and implemented in 2013 in collaboration with the 10 for Change partners, with progress and impacts tracked accordingly to ensure continued success and program effectiveness.

b. Commercial Energy Rating and Reporting Ordinance Work Plan

The development, adoption and implementation of a rating and reporting program will assist the city in:

- Collecting commercial building energy data (and potentially water data)
- Evaluating comparative performance ratings
- Measuring changes in energy consumption over time
- Providing performance data to commercial building owners to help owners identify and evaluate upgrade opportunities

This information will enable the city to measure and document progress towards the community's goals. It will also facilitate the development of city programs, incentives and/or technical support to effectively encourage and support building owners in making energy efficiency improvements to their properties.

Objectives

The anticipated result of a rating and reporting program is a regulation that requires building owners to report useful energy performance information through a system that is not overly cumbersome.

The proposed rating and reporting ordinance would require commercial building owners to establish a baseline rating for their building's energy performance by entering one year (and each year thereafter) of past energy use and building data into a software tool and report the rating to the city and the public.

Process/Timeline

The commercial energy rating and reporting ordinance work plan is split into three phases (see proposed process timeline in **Attachment CE-2**). Initial research and identification of issues is underway and will continue through January 2013. The second phase (January through July 2013) involves refining approaches and developing ordinance options. During the final (third) phase of the work plan (July through September 2013), City Council will provide direction on the ordinance and consider its adoption.

Pilot Program

A pilot program was launched in September 2012 to inform the development of an energy rating and reporting program by understanding how commercial buildings of different types and sizes use energy and to begin determining the most efficient and effective process for obtaining and sharing that information. Staff conducted extensive stakeholder outreach with local building and energy consultants to design and develop a pilot program focused on gathering and evaluating:

- Feasible processes for rating and reporting
- Detailed feedback from participants on the rating and reporting process, costs, time and access to energy use data

The city contracted with third-party energy coaches who have been certified in commercial building systems, including using the ENERGY STAR Portfolio Manager™ (Portfolio Manager) rating tool. This allows the city to work with an organized group of professionals to provide energy rating services and streamlined program administration. For details about the pilot process, see **Attachment CE-3**.

By the end of the year, the city anticipates up to 50 private-sector commercial buildings, representing a cross-sample of Boulder's commercial building stock, will have participated in the pilot program. The city will receive quantitative information from the shared Portfolio Manager data and qualitative feedback from the surveys completed by building owners, tenants and energy coaches. A report on the pilot findings will be sent to council in the first quarter of 2013.

Engagement

Community outreach and engagement is an integral part of the commercial building energy rating and reporting work plan. The community outreach and engagement

process began in 2012 and will continue through 2013. In 2012, the focus has been on targeted outreach to key stakeholder groups. Beginning in 2013, the process will include a series of working group meetings, focus group meetings, public meetings and stakeholder surveys. It is designed to fulfill the following objectives:

- Keep the affected community informed about the current and future work on the ordinance so that building owners know how and when to participate.
- Ensure that major stakeholders (specifically, commercial building owners) have accessible and meaningful opportunities to get information, provide input, express concerns, and propose solutions.
- Educate the community about the reasons for the ordinance (i.e., commercial buildings are the largest source of energy use and GHG emissions) and the need to collect accurate data about the actual, aggregated commercial building energy use to:
 - o Support Boulder's energy efficiency goals
 - o Help building owners determine where energy efficiency improvements could be most beneficial
 - o Report back to the community how CAP tax dollars are being spent to address commercial energy efficiency
- Document the process and public feedback and share this information with the staff team, Environmental Advisory Board (EAB), City Council and other interested government and community entities.

Working Group and Focus Group Roles and Responsibilities

After the completion of the pilot program, staff will assemble a working group comprised of a variety of stakeholders. The working group will meet throughout the process to act as a sounding board on the components of the rating and reporting ordinance (e.g., evaluation criteria for ordinance options; benefits, costs and impacts to building owners; draft ordinance options). Input from the working group will be considered as the ordinance is developed and included in materials provided to the EAB and to City Council.

Members of this working group will likely include representatives from community groups as well as groups interested in commercial energy such as pilot program participants, private commercial building owners and tenants, and the Boulder Chamber.

In addition to convening a working group, focus groups will be held periodically to gather input on key components of a rating and reporting ordinance. A focus group is a form of qualitative research in which selected participants are asked about their perceptions and opinions. The focus group participants will vary (i.e., not all focus groups will have the same members) and will be selected based on the topic(s) to be addressed.

What's been done since last update on Ramp Up Commercial Energy Efficiency Initiatives:

- ✓ Developed a detailed work plan for an energy rating and reporting program and ordinance development process, including a community engagement and stakeholder process
- ✓ Designed and implemented an energy rating and reporting pilot program, with 33 buildings participating (as of Nov. 27, 2012)
- ✓ Identified proposed programmatic changes for the 10 for Change program with goals and membership criteria relating to Climate Commitment areas
- ✓ Provided City Council with a third quarter update on the EnergySmart program

Next steps for Ramp Up Commercial Energy Efficiency Initiatives:

- Convene the working group for the commercial energy rating and reporting program and move forward with the proposed work plan
- Continue work through the PUC on streamlining data access for whole building energy use data in the commercial sector
- Analyze the results of the private sector rating and reporting pilot, including participant surveys
- Work with Boulder businesses to refine the proposed enhancement of 10 for Change; launch the improved program in February 2013
- Continue assisting businesses and building owners through the EnergySmart program to identify and implement energy efficiency improvements by providing a suite of services that provide access to information, resources, incentives and financial tools to make cost-effective improvements to their business operations and buildings

2. Enhance Residential Programs

The two programs in this category include the Residential EnergySmart Program and Implementation of Residential SmartRegs requirements for rental housing. Previously funded largely by a federal grant received by the city in collaboration with Boulder County, Residential EnergySmart has been providing quick installs and rebates for energy efficiency upgrades in owner-occupied and rental housing for two years. The grant funding expires in spring 2013. While the county plans to continue Residential EnergySmart, the proposed budget would support up to 1,000 participants countywide. Based on current rates in this first-come, first-served program model, the City of Boulder can project approximately 70 percent, or 700 participants, within the city. Because this is significantly lower than the current yearly average of about 2,500 per year, the city can choose to enhance the program by adding capacity for more participants within the city limits.

In the absence of grant-funded EnergySmart rebates, a strategic approach to motivating residents to enroll in the program and make energy efficiency upgrades will be needed. Lessons learned by city and county staff regarding the most effective ways to drive EnergySmart participation gathered over the past two years are being used to refine

outreach plans and methods moving forward. These lessons, as well as current research, support the need to shift towards more direct outreach through existing social networks using targeted messaging for different communities, rather than a single message for all city residents. This type of strategy is currently being tried through a year-end EnergySmart campaign using door-to-door outreach to specific neighborhoods with “social norming” messaging, which indicates how many of their neighbors have enrolled in EnergySmart. These methods integrate knowledge from behavioral science to improve the effectiveness of the city’s engagement efforts.

The Residential EnergySmart program also is a critical support for continued implementation of the residential SmartRegs requirements for rental housing. In fact, a large part of participation in EnergySmart is attributable to property owners working towards SmartRegs compliance. With the continuation of EnergySmart, support for rental property owners will still be available; however, it will be a lower level of support than that provided in the initial two years of implementation. Services at this level are expected to include general support in answering landlord/inspectors questions and troubleshooting. As funding priorities for 2013 are better defined, the city may choose to increase the level of funding available for assistance specific to rental units seeking compliance. On the administrative side of SmartRegs implementation, the extended CAP tax funding will maintain the current SmartRegs application processing, data entry, tracking and reporting, inspector trainings, and technical support.

Due to lower levels of funding for residential programs, benchmarks that were set for the SmartRegs program when adopted in 2010 will need to be adjusted. Moving forward, participation will rely more on regulatory requirements than on rebates and incentives. This is consistent with the city’s repeated efforts to encourage impacted property owners to start the process early as rebates were for a limited time. Incentives and rebates will still exist, they will be more limited in nature and will likely be strategically targeted to achieve the maximum impact in terms of GHG reductions, leveraging private sector investment and other rebate funds, and/or to spur program participation in key areas.

What’s been done since last update:

- ✓ SmartRegs compliance is on track to reach goals set for this year.
- ✓ EnergySmart program staff has tested many different types of outreach and rebate strategies over the two years of implementation.
- ✓ A fall outreach campaign was launched in the City of Boulder to increase owner-occupied enrollment in EnergySmart.
- ✓ Evaluation of the EnergySmart program and its current structure with partners and consultants, to inform 2013 contracts and agreements
- ✓ Evaluation of existing SmartRegs business process to streamline application processing, data collection and updates to the rental license database

Next steps:

- Revise SmartRegs business processes and leverage internal resources to integrate into existing rental licensing program, reducing the need for contracted SmartRegs support in 2013

- Work with Boulder County staff and Populus to refine existing EnergySmart program structure
- Develop 2013 funding plan and revised program goals
- Evaluate outreach methods less focused on financial incentives, as well as behavior change models and tactics
- Develop a strategic plan for residential program enrollment and ongoing behavior change related to energy efficiency

3. Stimulate Market Innovation

As discussed with council at the July 24 Study Session, the recommended investment package resulting from the Brendle Group’s analysis of a variety of program options included what has been described as “Local Innovation,” or a “competition for GHG Reduction Initiatives.”

With the passage of the CAP tax extension, staff has begun to solicit feedback on the program design. This program is estimated to receive approximately 16 percent of the 2013 CAP tax revenues, or approximately \$285,000. Council raised concerns at the July 24 study session regarding the program oversight and criteria for evaluation. While staff has started to consider program design options, there are a number of key issues that will need to be addressed prior to program launch, anticipated in mid-2013. These key issues represent staff’s preliminary thoughts and are subject to change with additional research and public input:

- **Submittals:** The program is intended to solicit proposals for ways to reduce GHG emissions. Selected projects or programs would likely be required to achieve the same or increased cost effectiveness as programs already in place (or about \$5 per ton of reduction over a 10-year lifetime). Staff is proposing that the initial round of submissions be limited to energy-related efforts, with a goal to spin out to other climate action areas, like transportation, as the program matures. Student and youth submissions will be encouraged, as well as submissions that show how existing city programs could be improved.
- **Evaluation:** Broadly, submissions are likely to be evaluated using the quantitative estimates and the five evaluation criteria developed during the Brendle Group’s analysis of existing programs: efficiency, effectiveness, equity, externalities, and certainty. It may be necessary to select submissions and evaluate results using a third party or through a public process.
- **Distribution of funds:** Staff is proposing that, rather than funding one large project with the entire budget, there be micro-grant and large grant categories to allow for a larger numbers of awards and more submittals.

Next steps:

- Solicit stakeholder input to more fully develop and evaluate program options. This will include working with the Clean Energy Tech Team and selected community partners to develop program parameters, scope, evaluation criteria and process for soliciting proposals.
- Return to council in second quarter 2013 prior to soliciting proposals

4. Improve Program Tracking and Evaluation

Prior to the July 24 study session, both RMI and the Brendle Group consultants recommended improved tracking and evaluation for city programs, and in July, city staff in multiple departments started formally working together to begin to develop better data tools to track and report data related to energy and climate. Staff also has been identifying how to use data more effectively through existing or new processes and tools (for instance, by sharing databases and working interdepartmentally to develop indicators and dashboards). Over the past several months, three goals for sustainability data management have emerged:

1. Increase accuracy and consistency of data;
2. Promote flexibility in program planning and management; and
3. Ensure transparency and accountability to the community.

This project supports the overall transparency and accountability component of the Climate Commitment, described in the prior section. By early 2013, staff will reorganize the planning and reporting function for sustainability data management related to the Climate Commitment and CAP tax-funded energy programs. A centralized team structure is being developed that will divide responsibilities among city staff to accomplish tasks including but not limited to maintaining the communitywide GHG inventory, developing cost parameters for energy efficiency advising contracts, and keeping a dashboard current and effective. Therefore, 2013 will be a bridge year toward rolling out enhanced tracking and reporting.

Dec. 11 Study Session Question:

Does council have questions or comments on the energy efficiency policy and program priorities for 2013 which will be funded in large part by the CAP tax extension (Section C)?

- *commercial energy efficiency initiatives*
- *residential energy efficiency programs*
- *market innovations competition*
- *new tracking and reporting process*

V. NEXT STEPS

City Council will hold a study session on the municipalization exploration on Feb. 26, 2013. A study session on the Climate Commitment and commercial rating and reporting work will be scheduled for the second quarter of 2013. Additional steps or refinements to the next steps outlined in this memo may occur based on council feedback at the Dec. 11 study session.

VI. ATTACHMENTS

Municipalization Attachments:

- M-1 Stakeholder Working Groups
- M-2 Boulder Energy Future Organizational Chart
- M-3 Staffing Resources

Climate Commitment Attachment:

- CC-1 Boulder's Climate Commitment Framework

Commercial Energy Attachments:

- CE-1 Commercial Buildings
- CE-2 Commercial Energy Rating and Reporting: Process & Timeline
- CE-3 Pilot Process

Attachment M-1

Stakeholder Working Groups

Municipalization Charter Requirement Working Group

Purpose and Scope

To review proposed metrics developed by staff and to make changes or additions, as needed. To more clearly quantify the criteria approved by council. The goal is to have a diverse set of perspectives assist in developing the criteria or metrics that will form the parameters used to evaluate the strategies for possible municipalization of Boulder's electric service. The metrics will be quantitative measures of the goals and guiding principles defined in the Charter and approved by council for this project.

Working Group Meetings

The group met on Aug. 6, Aug. 21 and Sept. 12 and worked with staff to draft and refine the metrics.

Current Working Group Members

COMMUNITY MEMBERS

Peter Baston – IDEAS, LLC
Alison Burchell –Geologic consultant
Angelique Espinoza – Boulder Chamber of Commerce
Jenny Hampton – Navigant Consulting
Steve Pomerance – Community
Dan Powers – Western Disposal
Brad Queen – Center for Resource Conservation
Nick Rancis – CU
Susie Strife – Boulder County
John Tayer – Public Affairs Center

STAFF

Heather Bailey – Executive Director of Energy Strategy and Electric Utility Development
Jonathan Koehn – Regional Sustainability 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*TM).

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

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-convenor 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; convenor 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 Action (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.

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.

JENNY HAMPTON

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.

BRAD QUEEN

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.

SUSIE STRIFE

JOHN TAYER

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 areas¹:

- 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:

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.

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.

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-convenor 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 Action (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 still under formation, and updates will be posted at www.BoulderEnergyFuture.com. Decision Analysis has been added as a separate working group from the financial working group due to the complexity of the task and because members of the existing working groups and new volunteers with relevant experience have stepped forward.

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 will 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 is anticipated to meet formally approximately two to 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

The list of participants is currently being finalized, but it is anticipated that the working group will include representatives from the existing working groups as well as community members who work at the University of Colorado, NREL, and in the private and nonprofit sectors.

STAFF

Kelly Crandall – Sustainability Specialist

Sarah Huntley – Media Relations/Communications Manager

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 through 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 analysis 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.

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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-convenor 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; convenor 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 Action (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.; Gevorgian, 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
Intern**

**Durango, Colorado
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
Sea-Kayak Guide**

**Ketchikan, Alaska
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
Ranger**

**Aspen, Colorado
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
Environmental Educator**

**Aspen, Colorado
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
Intern**

**Nashville, Tennessee
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 NREL's 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 Caribbean 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., Abey Suriya, 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*TM).

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.

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JULIE ZAHNISER

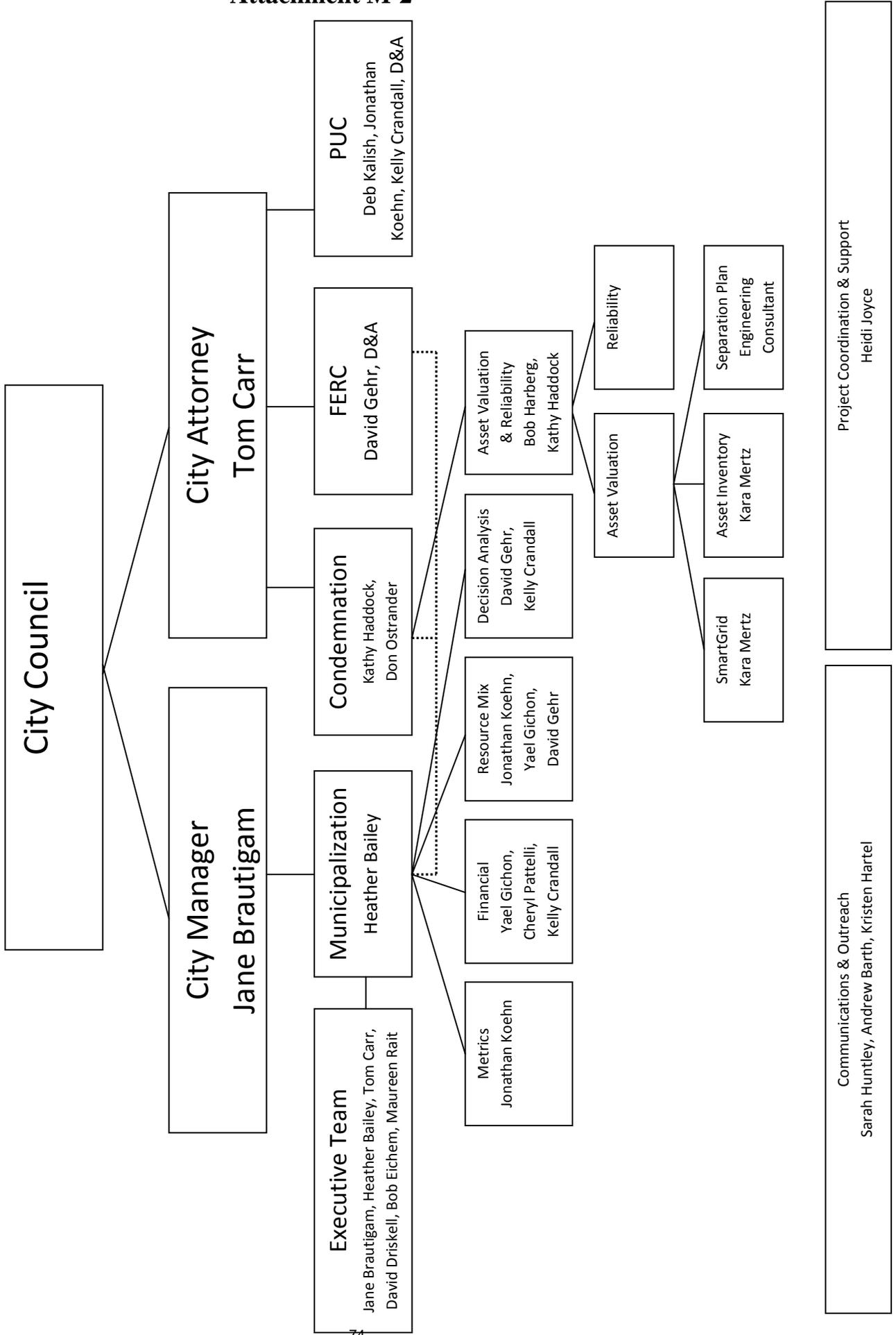
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Boulder Energy Future Organizational Chart

2013 Organizational Chart



Attachment M-3

Boulder's Municipalization Exploration Project 2012 Staffing Resources January - December, 2012

Executive Director	Source of Funding	% of Time
Heather Bailey	Utility Occupation Tax	100, beginning June
		<i>\$181,500 Utility Occupation Tax</i>

Executive Team	Source of Funding	% of Time
Jane Brautigam	CMO Budget	5.0
Tom Carr	CAO Budget	7.3
David Driskell	CP&S Budget	6.0
Bob Eichem	Finance Budget	5.0
Maureen Rait	PW Budget	6.8
Patrick Von Keyserling	Communications Budget	0.5
		\$58,900 Estimated Cost

Project Team	Source of Funding	% of Time
Kelly Crandall	CP&S (CAP Budget)	33.8
David Gehr	CAO Budget	14.7
Yael Gichon	CP&S (CAP Budget)	60
Kathy Haddock	CAO Budget	22.0
Robert Harberg	PW Budget	31.3, beginning Sept.
Sarah Huntley	Communications Budget	25
Heidi Joyce	CP&S/PW Budget (General Fund)	67.5
Deb Kalish	CAO Budget	12.6
Jonathan Koehn	CP&S Budget	62.5
Cheryl Pattelli	Finance Budget	11, beginning Sept.
Mary Ann Weideman	.15 Env. Fund	17
		\$367,800 Estimated Cost

Backfill	Source of Funding	% of Time
Backfill Attorney	.15 Environmental Fund	100, beginning June
		\$39,000 Estimated Cost

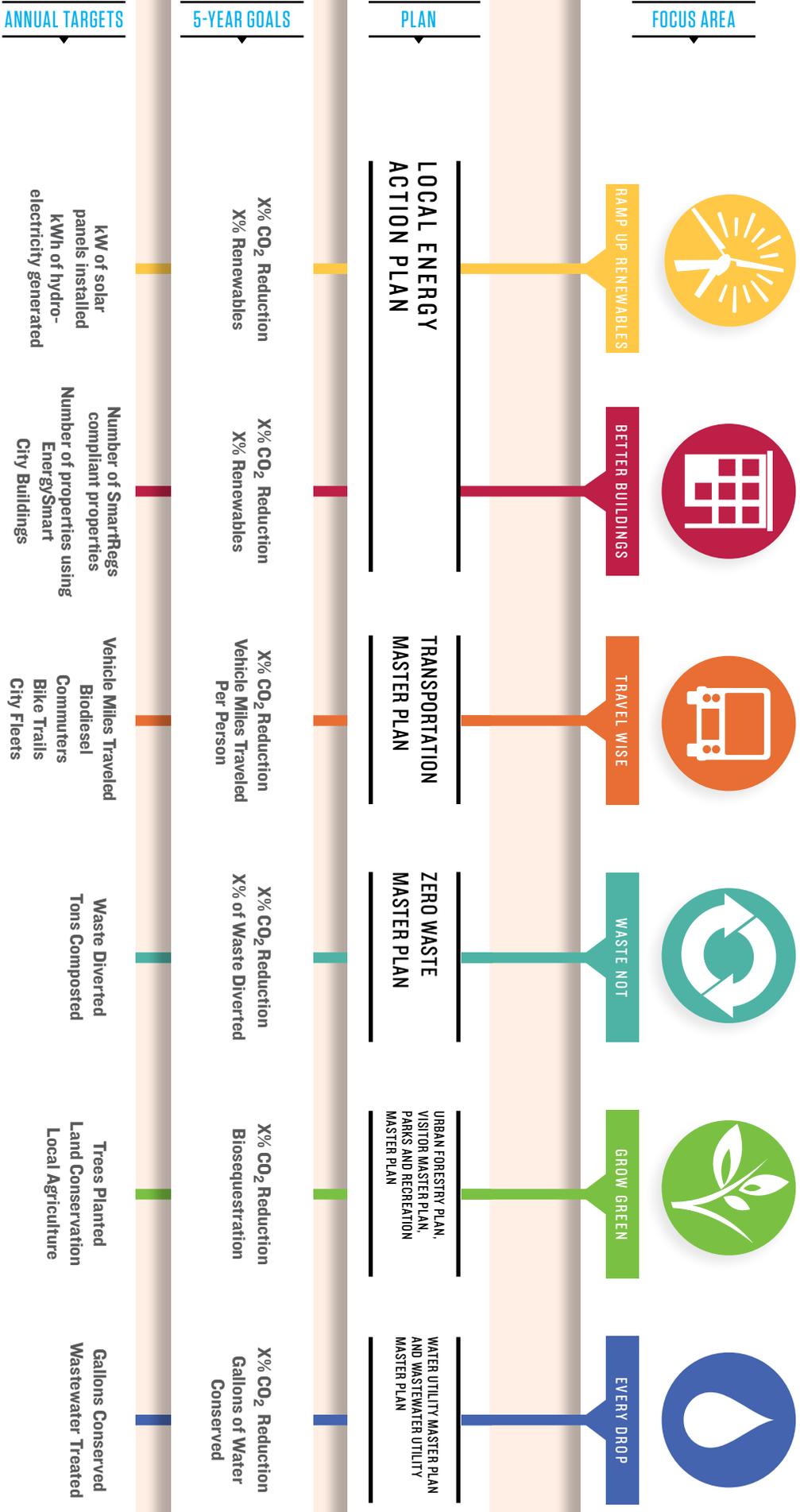
Support	Source of Funding	% of Time
Brenda Dageforde	PW Budget	5
Kara Mertz	CP&S (CAP Budget)	22.6
Sean Metrick	CP&S Budget	33.3, beginning Sept.
		\$42,200 Estimated Cost
		<i>\$507,900 Other Funding Sources</i>

CLIMATE ACTION COMMITMENT



The City of Boulder, its residents, and local businesses will act to achieve carbon neutrality as quickly as possible

CARBON NEUTRALITY



ATTACHMENT CE-1
City of Boulder Commercial Buildings

Private Sector Commercial Building Breakdown: includes buildings classified as the following: church, hospital, hotel, Twenty Ninth Street, private owned commercial, and commercial condominiums

Size Category	Total SQFT	Number of Bldgs	% Total SQFT	% Total Number of Buildings	Proportion of total private sector buildings, square feet
< 1,000	35,344	69	0.10%	4.26%	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="border: 1px solid black; padding: 5px;">96% of sq. ft. 69% of bldgs.</div> <div style="border: 1px solid black; padding: 5px;">89% of sq. ft. 48% of bldgs</div> <div style="border: 1px solid black; padding: 5px;">77% of sq. ft. 29% of bldgs.</div> <div style="border: 1px solid black; padding: 5px;">66% of sq. ft. 18% of bldgs.</div> <div style="border: 1px solid black; padding: 5px;">56% of sq. ft. 13% of bldgs.</div> <div style="border: 1px solid black; padding: 5px;">49% of sq. ft. 9% of bldgs.</div> </div>
1,000 - 4,999	1,273,455	437	3.60%	27.01%	
5,000 - 9,999	2,449,221	340	6.93%	21.01%	
10,000 - 19,999	4,212,723	300	11.91%	18.54%	
20,000 - 29,999	4,198,069	173	11.87%	10.69%	
30,000 - 39,999	3,257,714	92	9.21%	5.69%	
40,000 - 49,999	2,540,362	57	7.18%	3.52%	
50,000 and above	17,390,654	150	49.19%	9.27%	
TOTAL	35,357,542	1,618			

Public Sector - City of Boulder*

Size Category	Total SQFT	Number of Bldgs
<1,000	3,713	7
1,000 - 4,999	56,165	19
10,000 - 19,999	251,900	20
20,000 - 29,999	174,066	7
30,000 - 39,999	103,876	3
5,000 - 9,999	87,108	14
50,000 and larger	732,436	6
TOTAL	1,409,264	76

* refined based on zoning and city limits

Other Public Sector - these buildings would not be included in any City of Boulder program

Type	Total SQFT	Number of Bldgs
Federal	319,735	5
State	37,917	7
County	770,925	16
RTD	77,449	2
UCAR	569,309	10
University - Private	74,336	2
University - State	8,367,921	75
TOTAL	10,217,592	117

Total Commercial Buildings

Type	Total SQFT	Number of Bldgs
Private Sector	35,357,542	1,618
City of Boulder	1,409,264	76
Other Public Sector	10,217,592	117
Total	46,984,398	1,811

Commercial Energy Rating and Reporting Ordinance - Process and Timeline Attachment CE-2

PHASE I		PHASE II		PHASE III	
ISSUES AND APPROACHES July 2012 – January 2013		REFINE APPROACHES AND DEVELOP OPTIONS January – June 2013		COUNCIL DIRECTION & ADOPTION July – September 2013	
Research, Issue Identification and Pilot Program Launch Continued Research and Outreach		Additional Data Gathering and Analysis Develop Options		Refine Ordinance Options Draft and Final Ordinances	
Staff: <ul style="list-style-type: none"> Conducts preliminary research of best practices for administering an energy benchmarking and disclosure program Develops pilot program to test processes, data collection methods Identifies main issues to be addressed and evaluation criteria for options Categorizes COB buildings by ownership, use, geographic area and size. Establishes focus group by identifying stakeholder participants 	Staff: <ul style="list-style-type: none"> Completes pilot program analysis Gathers data, including cost and other impacts to city and building owners/tenants Confirms main issues to be addressed and evaluation criteria for options 	Staff: <ul style="list-style-type: none"> Develops program/ordinance options and evaluates against criteria Develops preliminary enforcement options, responsibilities and costs Identify approaches to address issues/concerns 	Staff: <ul style="list-style-type: none"> Develops draft ordinance 	City Council Study Session – pilot program update and work plan overview Date: December 11 th	City Council 1st Adoption Date: September 3
Gather input from partner agency <ul style="list-style-type: none"> EPA DOE Boulder County 	Focus Group Meetings (2) Date: Week of Jan. 29; Week of Feb. 4	Working Group Kick-off Meeting (see work plan for focus group members) Date: Week of Jan. 7	City Council – provide direction on ordinance options Date: July 23	City Council 2nd Adoption Date: September 17	
Survey pilot program participants	Initiate Survey Date: Week of March 4	Working Group Meeting Date: Week of March 11	Working Group Meeting Date: Week of May 6	Launch communication strategy around policy options	
Working Group Kick-off Meeting (see work plan for focus group members) Date: Week of Jan. 7	Environmental Advisory Board update Date: April 3	Environmental Advisory Board – provide input on ordinance options Date: June 5	Public Meeting Date: Week of May 20	Public Meeting Date: Week of March 11	
Launch communications and outreach strategy <ul style="list-style-type: none"> Initial mailing to property owners Website launch Date: Week of Jan. 21	City Council update (Study Session) Date: April 23				
Public Meeting Date: Week of Jan. 21					

DRAFT - Revised November 20, 2012

ATTACHMENT CE-3
Energy Rating and Reporting Private Sector Pilot Program
Design & Implementation

Design: Staff developed the pilot program with significant input from local energy professionals, EnergySmart staff, and professionals and staff from other communities that currently have energy rating and reporting programs in place.

Implementation:

1. The city contracted with the Colorado Green Building Guild's Association of Building Energy Coaches to provide assistance to participating buildings. The energy coaches signed a non-disclosure agreement as part of the contract, and were compensated on a per building basis.
2. Boulder County Public Health is providing quality control/assurance on pilot participants as part of the EnergySmart contract with the City.
3. Staff reached out to prospective building owners through the following methods:
 - EnergySmart and 10 For Change participants
 - Economic Vitality contacts and past Flexible Rebate Program participants
 - Colorado Companies to Watch awardees
 - Press releases
 - Energy coach outreach
 - Staff presentations at outreach events:
 - Boulder Tomorrow
 - Commercial Brokers of Boulder
 - Boulder Area Realtor Association
 - Colorado Green Building Guild
4. Before a building owner applied for the program, the building was screened for eligibility based on the sizes and uses of the buildings already participating.
5. To streamline the pilot process, building owners were required to have complete participation of all tenants in the building in order for the building to be a part of the pilot.
6. Energy coaches then worked with the building owner and tenants to access energy use data in one of three ways:
 - Sign a utility consent to disclose form to give the energy coach access to the data
 - Provide hard copies of at least a full year of utility bills to the energy coach
 - Contact Xcel Energy's Business Solution Center to retrieve the data
7. To address privacy concerns, tenants were required to sign a form acknowledging that the Portfolio Manager energy rating and/or EUI score would be shared with the city.
8. The Portfolio Manager data must be shared with the city and surveys completed by the energy coaches, building owners, and tenants in order to complete the pilot process.