Boulder City Council
STUDY SESSION

June 14, 2011
6-9 PM
Boulder's Energy Future

City Council Chambers
Municipal Building
1777 Broadway

Submit Written Comments to City Council
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HOW TO USE THIS MEMO

This memo and its attachments provide detailed information regarding technical, legal and financial analyses completed to date for the energy future project. Staff has provided a relatively high level summary of key points in the cover memo, with much more detailed results provided in the relevant attachments. While council members and others will want to read the memo and its attachments in their entirety, staff is aware that many members of the public may not have as much time to spend on all the documents. Following is a suggested roadmap:

- ***If you have 10 to 15 minutes to digest the key points…***
  Focus on reviewing the key points outlined in the Executive Summary on pgs. 4-11.

- ***If you have an hour or two to get more in depth…***
  Focus on reviewing the complete staff memo, using the Table of Contents to guide your reading to those areas of greatest interest or concern.

- ***If you want to spend a lot more time understanding the analysis…***
  Delve into the attachments that contain the consultant reports and other detailed information. A complete list of attachments is in the Table of Contents, and they are referenced as appropriate in the text of the staff memo.

Additionally, you can access all of the project's prior reports and other relevant information on the project website: www.BoulderEnergyFuture.com.

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MEMORANDUM

TO: Mayor and Members of City Council

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DATE: June 14, 2011

SUBJ: Study Session: Boulder's Energy Future

I. PURPOSE

The purpose of this study session is to continue the presentation and discussion of findings related to Boulder's energy goals and supply-side energy options. It builds on the work of the past year regarding Boulder's "energy future"—a community-wide effort to define and articulate the community's energy goals in a rapidly changing energy world, and to test the viability of alternative paths toward achieving those goals.

Preliminary key findings were presented to council on May 10, 2011. In the intervening weeks, additional analyses have been completed, as outlined in this memo. These include:

- A refined baseline data report;
- Additional analysis of local energy options;
- Continued development of ballot language options; and
- Refinement of the financial feasibility model for creation of a local utility.

The memo also provides responses to questions raised at the May 10 study session (**Attachment A**); discusses the standard Xcel Energy (Xcel) franchise agreement in

relation to the city's energy goals; and speaks in further detail to the legal, technical and financial feasibility of a local utility.

Why Have this Conversation?
Boulder's Energy Future is a community effort to examine options for providing Boulder's customers with cleaner, reliable and competitively priced energy. The conversation was initiated through the city's discussions with Xcel—the electric utility that serves Boulder—regarding potential renewal of the company's 20-year franchise agreement with the city. Given Boulder's commitment to reducing its carbon footprint; the difficulty of accomplishing this without addressing supply side (i.e., energy generation) issues; the rapid changes taking place in the energy industry; and a number of other questions and issues raised during the franchise discussions of 2010, council decided not to renew the previous franchise agreement and to spend time considering the community's energy options.

Subsequently, the city initiated "Boulder's Energy Future" project to clearly articulate the community's energy goals and objectives, and to define and analyze alternative paths for achieving those goals. A statement of the community's goals and objectives, adopted by council on March 1, 2011, is summarized under the heading "A Vision for Boulder's Energy Future" below.

Additional background information regarding the origins and history of Boulder's current energy conversation was provided in the May 10 Study Session memo to council. That memo can be accessed online at www.boulderenergyfuture.com. The relevant background section begins on pg. 6 of that memo.

II. A VISION FOR BOULDER'S ENERGY FUTURE

The Changing Context of Energy
Over the past 200 years, the world's industrialized countries have built economic wealth using cheap and widely available fossil fuels. Rapid growth in the consumption of these energy sources has fueled national economies, but also created unprecedented environmental damage: from air and water pollution to greenhouse gas emissions that are triggering changes in the planet's climate.

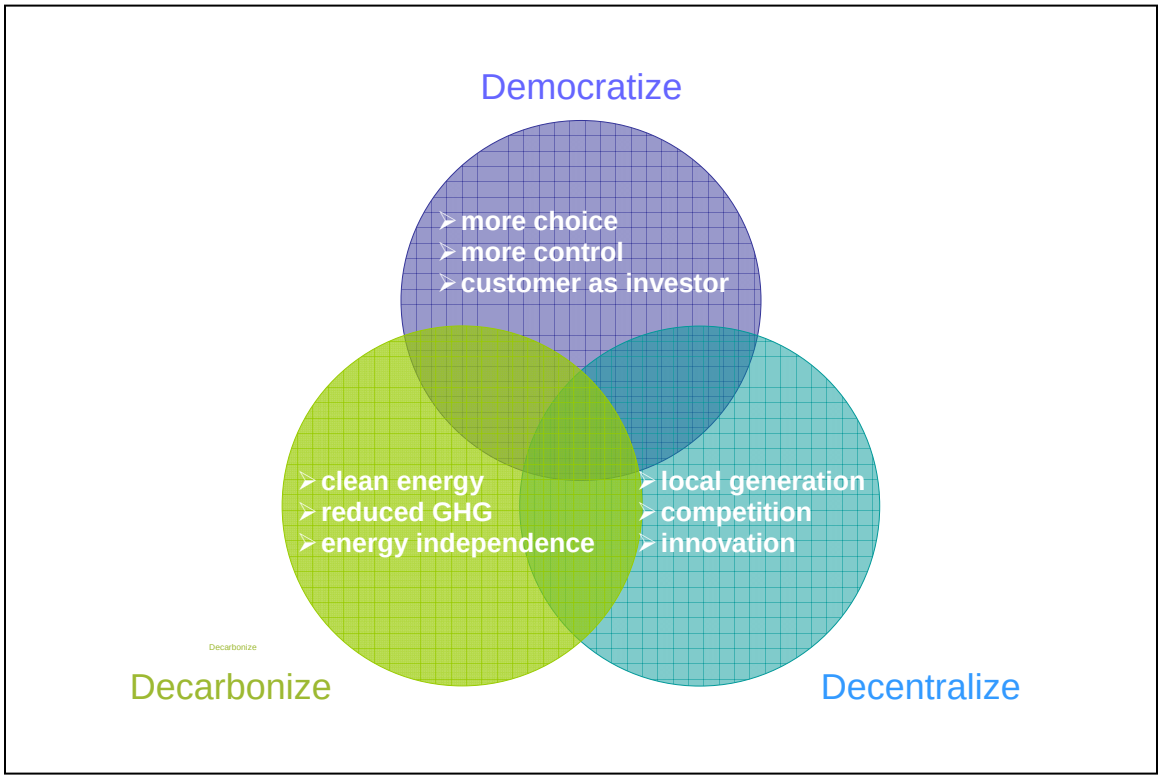
Increasingly, the very availability of fossil fuel supplies is in question. As worldwide economic growth moves more people into the middle classes, and societies demand more and more energy, the world's energy vocabulary has expanded to include terms like "peak oil" and "energy security."

These forces—an industrialization model that pits economic expansion against environmental protection; a mounting climate crisis that is increasingly dire; and a dwindling supply of fossil fuels to meet growing energy needs—are the context for Boulder's discussion of its energy future. They represent conditions and forecasts never faced before; and they require a thoughtful, strategic and powerful response.

Boulder's Energy Future: Strategic Framework, Goals and Objectives
Like many communities around the country and the world, Boulder is deeply concerned about climate change. Boulder's voters have emphasized their commitment to acting responsibly in the face of this threat. Boulder is also a community that has built a vibrant local economy based in no small part on its investments in environmental protection. Boulder's open space lands, greenways, alternative transportation options and environmental awareness are significant factors in the city's economic success. The community also benefits from the powerful innovation that comes with having a top-notch university and federal labs within its boundaries—all of which are doing important work related to renewable energy, new energy systems and climate change. "Economy vs. environment" is viewed by many as a false choice in Boulder. This community has shown repeatedly that one does not need to suffer for the other to prosper.

Drawing on these values, the Boulder community articulated its vision of a different energy future during public meetings over the past eight months. What community members described is an energy future in which local energy needs are met through a fundamentally different approach than what we rely on today. It is not a vision that will be achieved tomorrow, or next year, or in five years; but rather a vision that will be realized over time, driven by a clear set of goals to guide incremental decision-making. Those goals were adopted by City Council earlier this year, and are summarized on pg. 11. They were also included in their entirety in Attachment B of the May 10 Study Session memo. Together, the goals establish a framework for "energy localization."

Boulder's Energy Localization Framework



The community's goals and objectives underscore the intention that Boulder's energy future should begin to transform the existing energy system that relies primarily on the combustion of fossil fuels in large, inflexible generation plants. Instead, Boulder's energy future envisions a resilient network of small-scale generation facilities distributed through the local area, using renewable fuel sources to the maximum extent possible, linked by an intelligent grid that can balance fluctuating demand with variable generation and responsive back-up to ensure a high level of efficiency and reliability.

Boulder's energy future envisions a customer-driven energy system, in which energy-literate consumers can make informed decisions about their energy options and investments, becoming managers of their energy use in partnership with their utility. It also envisions an active and energy-conscious community of residents and businesses, who help shape decisions about energy to achieve their energy goals.

Lastly, Boulder's energy future envisions a competitive marketplace for energy services, in which both large, experienced companies and small, nimble start-ups can identify consumer energy needs and develop innovative solutions that are tested here, and then exported everywhere.

These energy future ideas—which together create Boulder's localization framework—are not far-fetched. They exist in various forms in various places around the world already. But they have not been implemented anywhere in a comprehensive, integrated manner. The city realizes that achieving these goals in a systematic way in Boulder won't happen overnight; nonetheless these objectives help articulate the future that this community is striving to achieve. It is these objectives that will inform the decisions that council and the voters will make in the coming months about the preferred path to move Boulder in the direction it wants to go.

III. EXECUTIVE SUMMARY: KEY FINDINGS TO DATE

This memo summarizes the analysis and key findings as of early June 2011 regarding Boulder's options for achieving its energy goals. The four "paths" currently under consideration include:

1. **A Standard Franchise Agreement with Xcel.** This would establish a new franchise agreement with Xcel under the terms negotiated in 2010. The discussion of this path begins on pg. 12.

2. **A New Partnership with Xcel.** This would establish a new form of partnership with Xcel (beyond what would be included in a standard franchise), to help achieve the community's energy goals. On June 6, while this memo was being finalized, the company indicated it will present its concept to council on June 7. As a result, this path is discussed only briefly, on pg. 15. City staff and consultants are committed to conducting a thorough analysis and presenting detailed findings about this alternative in the weeks to come, with results to be presented in advance of the July 19 public hearing on potential ballot items.

3. **Maintaining the Status Quo.** At the end of 2010, the city's prior franchise agreement with Xcel ended. The company now operates in the public rights of way in Boulder under the terms of a revocable permit, similar to how other utilities (cable providers, for example) operate in the city. The previous franchise fee paid by the utility was replaced by a "utility occupation tax," per voter approval in November 2010. This path could continue for another four years, at which time the utility tax will expire. This option is further discussed on pg. 17.

4. **Creating a Local Utility.** This path would create a publicly owned and operated electrical utility in Boulder. It would involve the purchase of the local distribution system from Xcel, creation of a local utility operation, and power purchases from either Xcel or independent power providers to meet Boulder's energy needs. Because this path represents the most significant change from current conditions, it has been the focus of the most significant work effort. Details about this path are discussed starting on pg. 18.

Key Findings

Standard Franchise Agreement with Xcel

This path would require voter approval of a new 20-year franchise agreement with Xcel. Under that agreement, Boulder would receive energy rates and services consistent with the rest of Xcel's Colorado service territory, under the regulatory framework established by the Colorado Public Utilities Commission (PUC). Several key findings discussed more fully on pgs. 12-15 of this memo, and detailed in the baseline energy analysis prepared for the city (**Attachment B**) include:

- **Rates.** Xcel's 2009 average rates were in the middle of the pack compared to national averages, and the company's rates ranked 18th lowest out of the 58 Colorado utilities. Xcel's rates are expected to increase 4 percent in constant dollars by 2020 (33 percent adjusted for inflation) and by about 8 percent by 2030 (78 percent after inflation).
- **Reliability.** Xcel's system in Boulder provides better reliability than the national average, but lower reliability than municipal utilities in Fort Collins, Longmont and others. However, these reliability measures are for the Boulder region, including low density mountain areas where reliability is more challenging. The city does not have access to Xcel's reliability measures specifically for the city's service area.
- **Renewable Energy.** By remaining part of Xcel's Colorado service territory, the city (along with other cities in the service territory) would receive at least 30 percent of its energy from renewable sources by 2020 at the latest, but possibly as early as 2012 given recent announcements from Xcel. This will primarily be from large-scale wind purchases.
- **Distributed Generation.** While small-scale energy generation will expand, it will continue to be a small portion of the overall energy mix in Xcel's Colorado service area. Proposed changes to Xcel's incentives for solar installations are

expected to have an adverse impact on manufacturers and installers of small-scale solar systems.

New Partnership with Xcel

Xcel recently outlined a potential new proposal to council, staff and the community that, if approved, would bring significant additional renewable energy online in response to Boulder's renewable goals. The result would be that 70 percent of Boulder's electricity demand would be met by renewable energy sources beginning in 2013, growing to 90 percent of demand by 2020 as Xcel continues to green its overall fuel mix in Colorado. The proposal's structure would require that the city enter into a 20-year power purchase agreement with a wind energy provider. The proposed financial arrangements, as outlined, would seek to replicate the financial costs and benefits were the city to make a large wind purchase on its own: initial costs would be higher than Xcel's base rate for its Colorado customers, but as natural gas prices increase, Boulder's rates would be lower than for the rest of Xcel's Colorado customers. Averaged over 20 years, the rate impact could be negligible, or even beneficial. As presented by the company, implementation of this proposal would be coupled with renewal of the franchise agreement.

The city's staff and consultants have just begun to review the proposal's structure, assumptions and calculations. At this point, there are more questions than answers. Analysis and further discussion will take place during the coming weeks, with results to be presented in advance of the July 19th public hearing on potential ballot items. Additional information about this proposal is provided on pg. 15.

Maintaining the Status Quo

Another path that council and the community can consider at this time is "the status quo." This would involve no action at this time, and instead direct staff to continue exploring options for consideration at a future date. Xcel would continue to provide electricity service in Boulder; but would do so outside of a franchise agreement. The Utility Occupation Tax approved by voters in November 2010 would continue for five years; at which time it would expire or need to be extended. All of the bullet points listed under the Standard Franchise Agreement with Xcel would hold true under this option as well; but there would be no new 20-year agreement and the city could opt to request voter approval of other options at any time. This option is discussed further on pg. 17 of this memo. It remains a viable option should City Council and the community decide that none of the current options under consideration are developed enough or responsive enough to Boulder's energy goals.

Creating a Local Utility

This path would involve acquisition of the local distribution system and formation of a publicly owned power utility in Boulder; a process referred to as municipalization. Because it represents the most significant change from the current utility arrangement, it has been the focus of the most significant work effort and, therefore, is the focus of the bulk of this memo. Key findings from analysis of this path's feasibility include:

- **Overall Feasibility.** Creation of a local utility is technically, financially and legally feasible. Feasibility for this purpose is defined as the ability to deliver a similar fuel mix (percent renewables) as that provided by Xcel (both currently and through 2020 under their statewide Renewable Portfolio Standard resource plan) with similar reliability, and at rate parity (for both current and projected rates).
- **Municipalization Case Studies.** There are more than 2,000 municipally owned and operated electric utilities in the US, with 29 located in Colorado (including nearby communities such as Longmont, Lyons, Loveland and Fort Collins). Recent municipalization efforts around the country vary in scope and outcome, with some achieved through negotiated settlements and others through condemnation. A summary of key themes from the case studies is provided on pgs. 18-19, with full summaries in **Attachment C**.
- **Utility Formation.** The process of forming a local utility begins with a vote of the people, granting the necessary authorities to acquire the local distribution system and operate the utility. The memo outlines the necessary steps and options associated with each step beginning on pg. 19.
- **Pre-Acquisition Efforts.** To prepare for acquisition of the local distribution system, the city would need to complete detailed work, including a complete survey of existing Xcel facilities, review of cost data and preparation of a full appraisal of the system. Based on experiences elsewhere, the city's consultants have estimated that pre-acquisition costs (for legal and engineering) would likely be in the range of $3 to $6 million. See pg. 19.
- **Acquisition Options.** The ease of acquiring the assets of a utility is highly dependent on the willingness of the selling utility. The vote of the people who would be served by the new utility is critical. Following a vote in favor of municipalization, the city would still have the option of entering into a franchise or other agreement with Xcel, if that agreement could meet the community's energy goals, or it could enter into a public/private partnership with Xcel for power purchases and/or operation of the local system (allowing the city to become a wholesale power customer). Alternatively, it could negotiate an acquisition price for the system, or enter into condemnation proceedings. These options—and in particular the condemnation process and its challenges—are discussed on pgs. 20-22 as well as in **Attachment D**.
- **Governance and Operations.** A local utility can be operated and governed under a number of different models. The city currently operates its water, wastewater, flood control and storm water management utilities through its Utilities Division, under the direction of the City Manager. City Council provides policy direction, sets rates, and ensures the system is responsive to public concerns. This model could be replicated for a new electric utility, or could be varied (the option of an independent utility board is also discussed in this memo). For operations, the utility could be operated as a department or division within the city, or could be contracted with a third-party service for some or all of the utility's functions (line maintenance, meter reading, billing, etc.). These governance and operations options are discussed on pgs. 22-23 of the memo, and in **Attachments D and E**.

A sample draft of a Utility Development Plan is also included in **Attachment D**, providing an overview of the primary tasks required to establish a local electric utility's capabilities.

- **Financial Feasibility.** The cost model analysis performed by the city's consultant, Robertson-Bryan, Inc. (RBI), and confirmed through detailed review by the city's expert advisors, shows that it is financially feasible for the city to own and operate a local electric utility serving Boulder. A summary of the cost model is included in **Attachment F**. The cost model incorporates conservative, realistic assumptions (validated by several expert advisors) related to facility acquisition, power purchase, operating costs and debt service. It incorporates funding to replace "public purpose programs" (e.g., energy efficiency and solar rebates) and industry-standard cash reserves ($50 million is budgeted in the cost model).

- **Rate Parity.** The cost model calculates a 10-year rate forecast for a local utility. As energy costs in the long run are speculative, a 10-year analysis is reasonable. The analysis shows that a local utility could provide rate parity with Xcel's current and projected rates over the 10-year period in all customer classes, delivering the same fuel mix as that currently being offered by Xcel. Rate projection comparisons are provided on pgs. 27-29, with complete results by sector are included in **Attachment G**.

- **Short-Term Financing.** Until a local utility starts operations, there are no utility revenues to cover expenses. Therefore, it is necessary to identify funds to cover costs incurred during the transition period (from the time of a vote up to the beginning of actual operations). The best estimate at this time is that these expenses will be approximately $1 million a year, for a period of one to five years. Options identified to cover these costs include reallocation of existing fund sources (from either the CAP Tax Fund or General Fund); a short-term increase in the Utility Occupation Tax; or issuance of short-term bonds (not recommended by staff given financial risks involved). Both extension of the CAP Tax (which currently expires in April 2013) and an increase in the Utility Occupation Tax would require voter approval. These options are discussed on pgs. 29-31.

- **Long-Term Financing.** There are two types of expenses a local utility would incur at start-up: system acquisition costs, which must be financed using taxable bonds; and other start-up costs (funds for initial power purchases, cash reserves, etc.) that can be financed using tax-exempt bonds. The estimated annual debt service cost for both bond types based on current assumptions in the cost model is $25 million. Long-term financing is discussed on pg. 31 of the memo, and in the Feasibility Study (**Attachment G**).

- **Reliability.** Reliability of the electric system is determined by generation reserves, transmission system capacity, distribution system capacity, system operating and maintenance practices, and ongoing capital investment in system improvements. All utilities in the US must comply with strict reliability standards put in place by the North American Electric Reliability Corporation, or NERC. Municipal utilities have a strong record of providing high levels of reliability.

They are highly accountable to their local customers, and tend to invest in system improvements such as local undergrounding that enhance reliability. Also, public power utilities typically coordinate with other nearby utilities in the event of major outages or emergencies. With public power utilities in Longmont and Fort Collins—both of which have very high reliability ratings (higher than Xcel's reliability rating for the Boulder region), staff is confident that a local utility would similarly deliver very high reliability in Boulder. A more thorough discussion is on pgs. 32-36**.**

Localization Opportunities

To better understand Boulder's options for achieving greater levels of energy independence and higher levels of renewable energy generation within the local and regional area—taking into account existing technical, financial and legal constraints—the city contracted with the firm of Lower Power, Inc. (LPI) to prepare a "localization" report that would identify and quantify specific opportunities. An overview of preliminary results from this study was provided at the May 10 study session. Since then, LPI has delivered a more detailed report outlining more specific findings and recommendations. These findings are not intended to provide an actual resource plan for the city or strategy for implementation, but rather to inform the community's energy future discussion with better ideas about what might actually be achievable. A summary of the latest report's findings is provided on pgs. 37-41**,** and the complete report is in **Attachment H**. Key findings include:

- **An innovative, aggressive energy efficiency program** could reduce forecasted electricity demand by 20 percent by 2020, utilizing advanced energy monitoring equipment and communications technologies, energy management software, and on-bill financing—retrofitting *every* building in the city, with savings exceeding investment after 7 years, and a net benefit of $280 million at 20 years.
- **Robust renewable energy options exist in the local area**, including waste-to-energy and waste-to-heat options; enhanced hydropower facilities; expanded solar installations; and potential biomethane integration with natural gas balancing units at Valmont plant.
- **Enhanced smart grid applications** could support energy efficiency and demand dispatch options, and facilitate **plug-in electric vehicle technologies**.

Additionally, LPI has identified significant opportunities to reduce greenhouse gas emissions and stabilize costs by focusing on the city's natural gas use and the potential creation of shared heat districts as part of a comprehensive energy strategy. These districts and related strategies could be pursued regardless of the outcome of the city's discussions with Xcel regarding the electric power supply system.

Lastly, but importantly, LPI has conducted analysis to develop a new concept for Boulder—that of a *Localization Portfolio Standard*, or LPS. Similar to—but more complex than—a Renewable Portfolio Standard, initial analysis suggests the potential to establish and achieve a 30 percent LPS for Boulder for 2020, in which 30 percent of electric power demand would be met locally, with two-thirds of this being

provided by energy efficiency improvements and a third from local renewable power generation.

Ballot Measures

In November 2011, Boulder voters may be asked to choose their preferred path to achieving Boulder's energy goals. While renewal of a standard franchise agreement is fairly straightforward in terms of ballot language, creation of a local utility and its bonding authority presents several options for consideration. Establishment of a new partnership with Xcel could also present new options for consideration, but cannot be determined until the utility's proposal is analyzed fully. This memo and its attachments therefore focus specifically on ballot measure options to create and grant bonding authority to a local utility, including options for:

- **City Charter Language** that would establish the purpose and values of the utility; its governance structures; and basic operating principles (see pg. 42 and **Attachment I**).
- **Bonding Authority** to fund the possible launch of a municipal utility, for which three options are outlined, one focused specifically on revenue bonding and two incorporating varying degrees of a general obligation pledge (see pg. 43 and **Attachment I**).
- **Interim or Short-Term Financing** to provide funds during the initial transition period. Two options are presented for consideration: an increase and extension of the existing Climate Action Plan Tax (**Attachment I – Option One**) and an increase and extension of the existing Utility Occupation Tax (**Attachment I – Option Two**).

Community Outreach and Feedback

The city's staff and consultant team has been transitioning from an effort focused on raising awareness to one focused on educating residents and businesses about the options under consideration and key findings. These efforts have included extensive outreach activities and development of both "quick read" materials to provide a brief overview of the options, and more detailed materials to provide answers to key questions. A large community forum was held on June 2, and another is planned for June 28. A number of business outreach activities are also underway, and a community survey is planned for early to mid-July. These activities underscore the city's commitment to provide accurate and objective information on the city's energy options and analysis results to inform both the council's and community's decisions about Boulder's energy future. A complete overview of community outreach activities is provided in **Attachment J**.

Next Steps

During the coming weeks, city staff and consultants will focus on a number of critical work tasks to help the council and community evaluate and consider the alternative paths for achieving Boulder's energy goals. These include:

- Ongoing outreach, education and media relations, including a large public forum on June 28**.**

- Thorough analysis of the new proposal recently introduced by Xcel, including analysis of its potential rate impacts and benefits, GHG emissions, financing options, and relationship to the city's localization goals.
- Continued refinement of other analyses.
- Preparation of ballot language options based on input from Council and the city's bond counsel.
- A random sample survey of Boulder voters to gauge community perspectives on the options under consideration.
- Preparation for first reading of potential ballot issues related to Boulder's Energy Future at City Council's July 19th meeting.

Boulder's Energy Goals and Objectives
The following goal areas were defined based on community input, and adopted by City Council on March 1, 2011. Each goal area includes several specific objectives. The topics of each objective are listed below. They can be read in their entirety at *www.BoulderEnergyFuture.com.*

Goal 1 **Ensure a stable, safe and reliable energy supply.**
- **1a** System management, maintenance and customer care
- **1b** System redundancy, supply quality and load management
- **1c** Fuel source stability
- **1d** System reliability

Goal 2 **Ensure competitive rates, balancing short-term and long-term interests.**
- **2a** Rate competitiveness
- **2b** Rate transparency and predictability
- **2c** Technology investment and managing price volatility

Goal 3 **Significantly reduce carbon emissions and pollutants to improve environmental quality.**
- **3a** Reduction of greenhouse gas emissions
- **3b** Reduction of toxic pollutants

Goal 4 **Provide Boulder energy customers with a greater say about their energy supply.**
- **4a** Democratizing local decision making
- **4b** Democratizing local ownership

Goal 5 **Promote local economic vitality.**
- **5a** Support for local business innovation
- **5b** Economic competitiveness

Goal 6 **Promote social and environmental justice.**
- **6a** Energy equity
- **6b** Impacts to vulnerable populations
- **6c** Energy literacy

IV. QUESTIONS FOR COUNCIL

1. Does council have questions or feedback regarding:
   a) The memo's discussion of supply side options with Xcel —whether under a "standard" franchise agreement, a new partnership or the status quo?
   b) The memo's discussion of supply side options under municipalization and the presentation of findings from the local utility feasibility study, including the conclusion that creation of a local utility is technically, financially and legally feasible?
   c) The refined information and analysis provided regarding Boulder's current electrical system in the final Nexant report and the evaluation of local renewable energy generation opportunities provided by Local Power, Inc.?

2. Does council have specific direction for staff in preparation for potential ballot measures in July, including:
   a) City Charter language option;
   b) Interim revenue ballot measure options;
   c) Long-term financing ballot measure options; and
   d) A new Xcel partnership.

V. SUPPLY SIDE ENERGY OPTIONS

Partnership with Xcel

This section of the memo describes three scenarios that would continue the city's relationship with Xcel as Boulder's primary provider of electricity. None of these scenarios include condemning Xcel's distribution infrastructure.

1. Standard Franchise Agreement with Xcel

A franchise agreement is, fundamentally, an agreement by which a city grants a private company the right to use city streets, alleys, rights-of-way and other public places. It provides the terms and conditions under which the occupation of these areas may occur. In the case of the city's former franchise agreement with Xcel, it also provided benefits such as the 1 percent undergrounding fund for the relocation of distribution lines underground and the 3 percent franchise fee.

If the city were to enter into a standard franchise agreement with Xcel, such as the agreement negotiated during the summer of 2010, Xcel would continue to provide both gas and electric service to the city, its residents and businesses under the terms of that agreement. The Baseline Energy Report (**Attachment B)** includes detailed information regarding Xcel's current energy mix, the Renewable Portfolio Standard (RPS), and Xcel's historic and projected rates and reliability. Staff has previously provided council with information regarding the regulatory environment (memo titled, "Public Utilities Commission 101," dated Sept. 24, 2010). This portion of the memo will summarize some of the key information previously provided in an effort to describe Boulder's Energy Future within a standard franchise agreement.

i. Energy Mix

If Boulder enters into a standard franchise agreement with Xcel, Boulder's energy mix would be identical to Xcel's energy portfolio. Nexant, the city's baseline energy consultant, summarized Xcel's historic and projected energy mix as follows (Table 1):

Table 1

	PERCENT OF TOTAL ENERGY BY YEAR						
Fuel Source	**1995**	**2000**	**2005**	**2009**	**2012**	**2015**	**2018**
Coal	77.85	70.65	64.71	52.30	54.91	51.61	44.17
Oil and Gas	20.41	25.93	30.10	35.95	32.42	27.43	31.48
Wind	0.02	0.96	2.05	9.99	10.81	16.00	18.27
Solar	0.00	0.00	0.00	0.05	1.25	4.35	4.23
Hydro	1.65	2.00	2.20	1.67	0.62	0.62	1.84
Other	0.06	0.46	0.94	0.05	0.00	0.00	0.00
Total[1]	100.00	100.00	100.00	100.00	100.00	100.00	100.00

ii. RPS standard

Xcel is required by state statute to include 30 percent renewable energy in its fuel mix by 2020. According to Xcel's recently filed 2013 RPS compliance plan, the company expects to meet its "30 percent renewable energy by 2020" goal by the middle of 2012 – just one year from now.

It appears that Xcel will need 8.7 million renewable-energy credits (RECs) annually. It will meet most of these with wind (about 1,752 MW of peak capacity is expected to be online by mid-2012) and utility-scale solar (about 163 MW of peak capacity is expected to be online by mid-2012). Only 11 percent of the RECs will come from distributed solar sources, split evenly between retail (mostly residential) and commercial (small PV farms) sources. About 76 MW of distributed solar power are already in place.

iii. Rates

Boulder rates are approximately 10 percent lower than the average rate in Colorado. This is due to the higher concentration of business customers in Boulder, which have lower average rates than average residential rates as a result of higher volume and higher load factors.

[1] Rounded to the nearest percent.

At about 8 cents per kilowatt-hour, Xcel's 2009 average rates are in the middle of the pack, both below the highest rates in the country (>15 cents per kWh) and higher than the lowest rates (<5 cents per kWh)[2]. Xcel rates are close to the median among all investor-owned utilities and close to the median among Boulder's benchmark cities.

Average rates were stable in nominal terms throughout the 1990s, but have increased by more than 50 percent since 2002. Adjusted for inflation, 2010 average rates were approximately 9 percent below 1990 levels.

Compared with other Colorado utilities (a mix of municipal, cooperative and investor-owned), Xcel ranked 18th lowest out of 58 Colorado utilities. Municipal rates tend to be lower because they serve fairly compact areas, while cooperative rates tended to be higher since they serve relatively dispersed, rural areas.

Xcel's rates are projected to increase by about 4 percent in constant dollars by 2020 (33 percent after inflation) and by about 8 percent by 2030 (78 percent after inflation). If carbon taxes are imposed, these rates may be increased by about 18 percent. These forecasts are based on Xcel's assumptions concerning the cost of building new natural gas and renewable generation plants, as well as the future prices of coal and natural gas.

iv. Electric System Reliability

When 2008 and 2009 reliability data was compared with that of other medium-sized utility regions, Xcel's Boulder Region (which includes more than the City of Boulder, such as the mountains to the west) was somewhat less reliable than the Denver Region and two other west coast regions, but still more reliable than the national average. Municipal utilities tend to be more reliable. This observation may be explained by pro-active measures taken by municipal utilities to maintain their distribution systems. According to the Baseline Energy Report (**Attachment B**), Fort Collins and Longmont have two of the most reliable systems in Colorado.

v. Regulatory Environment

Under Colorado law, investor-owned utilities like Xcel are regulated by the PUC. Xcel files its tariffs with the PUC for its approval. The tariffs include the rates customers are charged for electricity, as well as the related rules and regulations.

[2] Xcel's Residential Rates (2010 Q4) were 8.794 cents/kwh for winter and summer Tier-1 (Below 500 kwh) and 13.254 cents/kwh for Summer Tier-2 (Usage above 500 kwh). Xcel's updated Electric Commodity Adjustment rate went into effect on April 1. The rate for this rider went from 2.8 cents/kwh to 3.4 cents/kwh, resulting in a 5.22 percent increase in overall rates not reflected above.

City staff has been actively involved in dockets before the PUC that affect Boulder ratepayers. These dockets have included issues such as renewable energy standards, demand side management plans, privacy rules, changes to the Solar*Rewards rebates, and regulations filed to limit Xcel's exposure to claims related to hazardous materials it may encounter while working on a customer's property.

There are pros and cons to continued involvement at the PUC. Staff members from the Local Environmental Action Division and the City Attorney's Office actively monitor dockets and alert other communities when Xcel files proposed changes that affect local governments. Boulder, along with others who intervene in these dockets, like Boulder County and Western Resource Advocates, presses Xcel to increase its renewable energy portfolio and reduce its carbon footprint. Boulder advocates for rules that permit local governments to obtain aggregated energy data so they can analyze the effectiveness of their energy programs. In other words, Boulder is a leader among local governments and actively participates in PUC dockets to try to move Xcel's entire service territory towards lower energy use and greener energy consumption. On the other hand, this is a time-consuming process for staff – time that might be spent on other city projects. The PUC does not regulate municipal utilities, except when the utility provides service outside the jurisdictional limits of the municipality.

2. New Partnership with Xcel

Xcel recently presented the outline for a new proposal that would involve the city potentially partnering with Xcel in a new way. This utility-community partnership—if approved by council, Boulder voters and the PUC—may present an opportunity to bring significant new renewable energy online in the near future through a large wind power purchase agreement.

Description of Proposal

Xcel has offered to arrange for a new wind farm development in eastern Colorado in conjunction with the City of Boulder. Boulder residents would obtain the "hedge" benefits (against a rise in natural gas prices) associated with the energy produced by this facility and would own the Renewable Energy Credits (RECs) produced by this farm.

Xcel estimates that the renewable energy credits produced from this wind farm, in conjunction with the renewable energy in Xcel's system supply, would provide Boulder with approximately 70 percent renewable energy by January 1, 2013 and 90 percent by 2020. Xcel has indicated this proposal is contingent upon voter approval of a 20 year franchise agreement with Xcel this November.

The agreement as proposed would be structured such that the actual energy from the wind farm feeds onto Xcel's regional grid, while the Renewable Energy Credits from the wind farm accrue to Boulder. Once the wind contract price is established, the arrangement would be structured so that Xcel's price for the energy would be at a discount ($2 per MWH) off of their system wide "avoided energy cost." The cost of integrating the wind

would also factor into the avoided energy cost determination (i.e., the avoided energy cost would be reduced by the cost of integrating this wind farm).

The difference between Xcel's payment and the wind contract price would be paid by Boulder as the price for the RECs. Xcel indicated the company has been able to find a wind developer that can construct these new wind facilities at a location that requires no new transmission investment in time to qualify for the current federal production tax credits, which are due to expire on December 31, 2012 (unless renewed by Congress). These tax credits enable the wind developer to reduce the price of wind (energy plus RECs) that will be paid jointly by Xcel and Boulder by approximately 30 percent to 40 percent. As a result, Xcel has forecasted that the avoided energy cost (net of integration cost) paid by the company would be below the wind contract price in the early years and above the contract price in the later years. This means that to the extent Xcel's fuel cost estimates reflect future fuel costs, during these later years Boulder could obtain RECs for a *negative* cost (i.e., obtain the RECs and money back).

It is the relationship between Xcel's avoided cost and the wind contract price that could potentially create the fuel price hedge for Boulder residents. If natural gas prices rise more quickly than anticipated, then Boulder's cost for the RECs decreases more quickly than anticipated. Conversely, if gas prices do not rise as projected, Boulder's cost for RECs could be considerably higher. Boulder would assume the risk of the difference between the locked in wind costs and the unknown fossil fuel prices. The city would also be responsible for paying the cost of integrating the wind into the system and the cost of the wind producer curtailing its production when Xcel is not able to integrate it into its system.

To fund the early years of the agreement, the city would probably need to issue bonds. The debt service on the bonds could be funded by the climate action plan tax that Xcel currently collects for the city on its utility bills to city residents. The city could use the payments in the latter portion of the contract period to stabilize rates as the price of natural gas increases, and/or to fund local energy programs.

In addition to being conditioned on the passage of a new 20-year franchise, the new partnership would require several additional contracts between Xcel, Boulder and the wind developer. To offer this deal, Xcel will also need a number of approvals:

- Boulder voters would need to approve both the Xcel 20-year franchise and the bonds to pay for the wind contract agreement.
- Xcel would need PUC approval for the agreement with the wind developer, which would be acquired outside of a competitive procurement in a Resource Plan. Xcel would need to demonstrate clear benefit for non-Boulder customers. The agreements would need to be negotiated prior to filing with the PUC and would contain conditions precedent that included: PUC approval, Council approval, and voter approval.

- Xcel would need approval of the franchise agreement from the PUC. Both PUC approvals (franchise and PPA) would need to be obtained prior to the November 2011 vote.

If council believes this concept is worth exploring further, staff will commit resources to developing and analyzing the details of the concept plan, including opportunities for public input and making recommendations to council regarding how best to structure potential ballot measures. Staff will also need to receive direction from Council to negotiate the partnership documents so that they can be filed with the PUC and available for public review.

3. The Status Quo

The city's franchise agreement with Xcel terminated on Aug, 3, 2010. Upon termination, the city entered into a revocable permit agreement that incorporated the terms and conditions of the franchise agreement. The revocable permit agreement terminated at midnight on Dec. 31, 2010.

State law provides that a "utility maintains the right and obligation to serve a municipality within its service territory after the expiration of any franchise agreement." This means Xcel has an obligation to continue to provide electricity even if it has no franchise agreement with the city.

Most people may not have even noticed that Xcel no longer has a franchise in the city. Lights still turn on when they flip the switch. The franchise fee was replaced by the Utility Occupation Tax so the city has been able to continue to provide services previously paid for by the franchise fee.

There are pros and cons to the city's current relationship with Xcel. We are not locked into a 20-year franchise agreement. However, the city has moved from a private contract-based relationship with Xcel to a relationship based on state and local laws. This means that, even though Boulder's ordinances cover most franchise matters, sometimes day-to-day operations are slightly less clear than they were with a franchise agreement in place. For example, there is no agreement regarding how long a company project to provide new or modified service to city facilities may take. This could mean that any disagreements between Xcel and the city regarding these day-to-day operational issues are more likely to end up in enforcement proceedings. Litigating what a commercially reasonable time to complete a project can be more difficult than interpreting an agreement that gives Xcel 180 days to accomplish the task.

The Utility Occupation Tax, which presently adds $4.1 million per year to the city's general fund, is authorized to run until Dec. 31, 2015.[3] If the city decides to continue with the status quo, the council will need to consider methods of replacing this revenue stream upon expiration or implement budget reductions to correspond with the decreased revenue.

[3] Chapter 3-13, "Utility Occupation Tax," B.R.C. 1981.

Creating a Local Utility

If the city decides to create a municipal utility, it would be one of the biggest decisions of the recent past. It would affect many future generations of Boulder's residents and its current and future businesses and institutions. To understand the breadth of this decision, this section builds on the May 10 study session information on the technical and legal feasibility of a municipal utility, and includes a summary of the municipalization efforts of other communities, the steps the city would need to complete if it decides to go in this direction, the financial feasibility of creating a local utility, short- and long-term financial considerations and system reliability.

Municipalization Efforts in Other Communities

Municipal-owned and operated electric utilities are in more than 2,000 communities throughout the United States. In Colorado alone, there are 29 municipally run utilities, some in close proximity to Boulder. Longmont, Loveland, Fort Collins, and Lyons are all municipal utilities. The reasons for their creation and existence are as varied as the communities they serve, but historically these have involved issues with customer service, cost of service, reliability, or some combination. A synopsis of more recent experiences from communities that have undertaken the process of municipalization is provided below to illustrate the breadth of communities seeking to own and operate an electric utility. See **Attachment C** for summaries of these municipalization efforts.

- Jefferson County, Washington. Public Utility District No. 1 of Jefferson County (JPUD) serves as a water and wastewater utility for portions of the county. The voters authorized JPUD to acquire the electric facilities owned by Puget Sound Energy that serve Jefferson County because they were dissatisfied with the rates offered by Puget Sound Energy and wanted to localize the jobs involved in operating a municipal utility. In July 2010, under threat of condemnation, JPUD negotiated the purchase of the electric distribution assets of Puget Sound Energy that serve Jefferson County.
- Lubbock, Texas. Lubbock, Texas, is a city of approximately 270,000. Lubbock has operated an electric utility for more than 80 years. In parts of the city the municipal utility operated in competition with Southwest Public Service Company (Xcel). In 2010, Xcel and Lubbock negotiated the acquisition by Lubbock of Xcel's electric distribution assets in the city. It appears that this disposition of assets provided Xcel an opportunity to remove a high cost area from its overall service territory.
- Winter Park, Florida. Winter Park, Florida is a city of approximately 27,000 residents located near Orlando. The main issue driving municipalization from Progress Energy was reliability. Progress Energy purchased the system in 2002. With no improvement in reliability seen, voters approved a buyout in 2003, as well as bonding authority. While the original effort was divisive, the city and Progress Energy have a series of agreements together, providing energy and home wire services.
- Hermiston, Oregon. This city of approximately 15,000 residents is in eastern Oregon and began its operations on Oct. 1, 2001. The city acquired its electric

facilities from PacifiCorp. The catalyst for considering municipalization was PacifiCorp's intention to close a local service center, depriving the city of any local utility presence.

- Las Cruces, New Mexico. In 1991, the City of Las Cruces City Council voted to establish a municipal utility in an attempt to municipalize the electric utility assets of El Paso Electric serving Las Cruces. The city began condemnation proceedings based on an estimated purchase price of $30 million. The city issued bonds and expended funds to build an electric substation in anticipation of acquiring the utility assets. Following acrimonious legal and administrative proceedings over a nine-year period, the City of Las Cruces learned that the cost of acquisition would be much higher than it had estimated. Efforts to municipalize were terminated in early 2000.
- Long Island Power Authority. In 1986, the State of New York began efforts to municipalize electric service on Long Island in response to Long Island Lighting Company's proposal to build a nuclear power plant in Long Island. Following 10 years of negotiations and protracted legal proceedings, the Long Island Power Authority purchased a controlling interest in the stock of Long Island Lighting Company.

Several key themes arise. They can be summarized as follows:

- Factors driving municipalization efforts are often related to local issues and concerns such as reliability, local presence, customer service, source of energy, and cost of service. Many of the same factors are articulated in the Energy Future Goals and Objectives.
- The transition from a utility company to a city-owned utility is much smoother when local governments have the ability to plan and prepare for the actual utility operations.
- A community with a clear understanding of its goals and objectives can better provide the guidance needed to complete a potentially lengthy process that may be vigorously contested by the incumbent utility.

Forming a Local Utility

If Boulder voters approve municipalization, several steps would need to be completed before the municipal utility could open for business. These include determining pre-acquisition costs, how the utility will be run or governed, and who will actually run the utility -- the city or a third-party contracted service. The purpose of this section of the memo is to describe some of the steps that would need to be completed prior to the first day of operations.

Following a vote, two key options would remain to efficiently complete acquisition of the utility assets: negotiated acquisition and condemnation. An acquisition achieved through negotiation often yields the best results, offering a more managed transition to a new utility. The city should, therefore, enter into negotiations with Xcel immediately following any decision approving condemnation. Concurrently with such negotiations, the city could begin preparing for utility operations, hiring staff, arranging for supply

contracts and other start-up activities. If negotiations failed, condemnation would likely be the only viable way to achieve acquisition of the assets.

Acquisition Efforts: Preparation

The pre-acquisition cost would depend in large part on whether the city is able to acquire the utility assets through negotiation with Xcel or whether it must institute and prosecute a condemnation proceeding. Decisions would need to be made on the assets the city would want to purchase from Xcel or from other parties.

The city would need to accurately and completely develop estimates for acquisition costs. This requires the services of engineers and appraisers. Engineering costs include surveying existing facilities, a review of Xcel cost data including initial cost and accumulated depreciation on its electric plant and facilities in Boulder, a full appraisal of the system, and related load data, among other items.

City consultants have estimated, based on previous experience, that pre-acquisition activities such as legal and engineering would likely range between $3 and $6 million. Legal and expert witness costs could be higher to the extent the condemnation action is more protracted.

Acquisition Efforts: Negotiation or Litigation

The ease of acquiring the assets of a utility is highly dependent on the willingness of the selling utility. A review of other cities' experiences indicates that the acquiring municipality must have an electorate and governing body that is committed to achieving the goal of municipalization. The vote of the people that will be served by the new utility demonstrates that the utility customers want change. Utilities that are unwilling sellers will often employ tactics intended to increase the costs to the acquiring municipality. Condemnation proceedings can be time consuming and expensive.

Acquisition Efforts: Options and Alternatives

The city's acquisition of Xcel facilities is not limited to one option. A number of municipalities have been able to achieve their energy goals short of condemnation. Options range from franchise development and/or negotiation of an agreement pursuant to which the city could purchase the facilities with Xcel operating the utility on behalf of the city, to full purchase through negotiation and the development of a municipal electric utility operation.

As with any purchase, it is good practice to start with negotiation. In the event that negotiations failed, the city could thereafter start the process of municipalization. Some specific options that could be pursued are as follows:

1. Franchise or Other Agreement. A vote in favor of establishing a municipal utility does not preclude the city from considering a franchise or other form of agreement with Xcel that could meet the city's energy future goals and objectives. With voter authorization to create and bond a local utility, the city could move forward with acquisition or choose to negotiate a new agreement. For any such

negotiations to be successful, Xcel would need to meet the city's energy future goals and objectives for electric utility services.

2. Public/Private Partnerships. A variety of options exist for an innovative community-utility partnership with Xcel. For example, Xcel recently agreed to provide full wholesale power requirements to Lubbock Power and Light (LPL) for serving the power requirements for the City of Lubbock, Texas. This arrangement was made as part of the sale by Xcel of certain of its distribution assets in Lubbock to LPL. In addition, the parties entered into a long-term wastewater purchase agreement whereby Xcel purchases wastewater for operation of Xcel's generation facilities. This is but one example of creative options that could be explored with Xcel. Any arrangement could be customized to best meet the city's energy future goals.

   A municipal utility could also have a role in a public/private partnership. The city, as a municipal utility, could become a wholesale power customer of Xcel or other power providers, rather than the existing amalgamation of retail power customers that purchase power from Xcel, the regulated monopoly. State law authorizes the PUC to approve contracts to provide utility services to a specific customer without reference to its tariffs on file with the commission.[4] In other words, the city as a wholesale power customer could contract to buy power from Xcel outside of the constraints imposed by PUC tariffs. The municipal utility would then sell that power to its retail customers.

3. Negotiated Acquisition. The city and Xcel could enter into an asset purchase agreement under which the city would acquire the Xcel facilities for a negotiated price. Negotiating a price to which both parties can agree could save both the city and Xcel the expense of a condemnation proceeding. In addition to the sale of assets, the parties could enter into other mutually beneficial arrangements with respect to operations, power supply acquisition, and utility services, among others. The parties could structure a transition agreement that would provide for an orderly transition of the operation of the facilities to the city's utility operations.

4. Condemnation. One option available to the city would be the use of eminent domain to obtain Xcel's electric utility facilities. As was reported to the City Council at the May 10, 2011, study session, staff has concluded that the city has the legal authority to both create a local electric utility and use its condemnation authority. Both the Colorado Constitution and the city's home rule charter provide the legal support to establish a local power utility.

   A number of tasks would need to be completed to acquire the electric utility assets of Xcel through condemnation. The following list outlines the activities that would be completed:

[4] C.R.S. § 40-3-104.3

i. Inventory the assets associated with the local distribution system
ii. Determine the assets needed to purchase
iii. Value the assets
iv. Enter into good faith negotiations
v. Determine whether the city wanted to take immediate possession or litigate the value of the system.
vi. Issue bonds / raise capital
vii. Litigate the condemnation lawsuit.

Stranded Costs

The city will need to compensate Xcel for its stranded costs, if it has any, under the Federal Energy Regulatory Commission (FERC) rules. Xcel has provided the city with an estimate of such costs. The staff will be discussing the stranded costs matter with its outside counsel to help formulate an appropriate response to Xcel's estimate. Ultimately, if the city and Xcel cannot agree on the stranded cost amount, if any, then the matter is litigated before the FERC. A discussion of the stranded cost issues can be found on pg. 25.

Governance

The city would need to develop a governance model for the utility. Governance is described on pg. 42. The staff has developed charter language based, more or less on the existing city manager – city council form of government. An option related to an independent utility board was developed as well. See **Attachment I.** Presently, the city operates water, wastewater, flood control and storm water management utilities through the Utility Division and may wish to continue with a similar governance model.[5]

A municipal utility can be operated and governed under a number of different models. The governance model chosen often depends on the culture of the municipality, the existence of other municipal utility services in the city at the time of acquisition, and the manner in which the municipality chooses to operate the utility (e.g., either as an independent utility function or more closely responsive to city government).

The general philosophy for governance for the municipal utility will be guided from the beginning on whether it is operated under the authority in the existing City Charter or by amending the Charter.

Operations

In Colorado, many of the public utilities are operated as a department or division of the city. For example, Longmont and Fort Collins, both home rule cities, use the city manager-city council form of government in the operation of its utilities. The city manager is responsible for hiring a utility director, who then hires utility staff. The City Council acts as the board of directors, provides oversight, sets rates, and establishes the policy direction for the utility. For more information on utility operations see the Business Plan (**Attachment E**) and the Feasibility Study (**Attachment G**). Many of Colorado's municipal electric utilities use this model.

[5] For example, see Charter Sec. 67(b) related to the creation of the department of utilities.

In some communities, the municipality engages the services of a third-party service provider to operate the utility. Outsourced municipal utility operations can include everything from operation, maintenance, meter reading, billing and customer service to some portion of these utility functions. In circumstances where the utility operation is provided by a third party, the municipality often chooses to have one employee to oversee the utility's operation on behalf of the municipality. This manager of the utility usually reports to the city manager.

Preparation for Utility Operation

After the decision is made to create the local electric utility, the city would need to begin planning for taking over the provision of electric service to the city. This would be important to providing a smooth transition from Xcel to the city. While the acquisition efforts continue, the city would plan for the actual creation of an electric utility operation.

A sample draft Utility Development Plan is provided in **Attachment D**. It provides an overview of the principal tasks required to establish the city's electric utility capability. It is provided to give the City Council an outline of key tasks, not as an exhaustive checklist. Among the tasks to be planned for and undertaken, the city's electric utility would need to evaluate:

i. Any immediate system improvements that are needed (including work necessary to accommodate separation from Xcel's remaining facilities);
ii. The city utility infrastructure and facility needs;
iii. Planning documents, policy formulation, and development;
iv. Emergency conditions and response procedures; and
v. Acquisition of operating equipment and materials.

The feasibility analysis performed by RBI (**Attachment G**) has accounted for this period of "start up" and included a funds to accomplish these tasks in the estimate for bond financing.

Integration of Tasks in Utility Formation

Many tasks discussed in this section could and would be completed at the same time. Other tasks, such as the valuation efforts, are critical to pursuing different options such as negotiations or condemnation. Managing these utility development efforts in coordination with the asset acquisition activities would be important for a smooth transition from Xcel to the city's locally owned and operated electric utility. While the activities outlined in the Utility Development Plan are fairly complex and involve specific expertise, it should be noted that these activities are well understood and performed every day by all types of utilities. It is anticipated that completion of these tasks would take between one to three years.

Financial Feasibility

Financial feasibility is determined through information in a detailed cost model prepared by the city's consultant, Robertson-Bryan, Inc. (RBI). The model provides a financial analysis of a local utility and compares it to current information the city has on Xcel's operations serving Boulder. The information about Xcel's operations comes primarily from the Baseline Energy Analysis (**Attachment B**). The results presented in this section represent findings from the first phase of this analysis process. Should council and the voters choose to create a local utility in Boulder, the cost model will be further refined and updated. However, the level of detail and data available at this time are more than adequate to address the key questions of feasibility.

The current analysis shows that it is financially feasible for the city to own and operate a local electric utility serving the city with average rates comparable to those charged by Xcel. A summary of the cost model and supporting detail can be found in **Attachment F** As discussed in the May 10 study session memo, there are four basic cost areas involved in the acquisition and operation of a utility:

1. Facility Acquisition
2. Purchasing Power Supply
3. Utility Operations
4. Financing

The Feasibility Study (**Attachment G**) prepared by RBI shows a net present value (NPV)[6] of $115.5 million over a 10-year period should the city acquire and operate the electric facilities owned by Xcel. More simply, the city can acquire the assets of Xcel that currently serve the city and operate its own electric utility at rates that are comparable to the rates Boulder customers now pay Xcel for electric service.

In assessing the feasibility, staff used data and figures that are supportable based on industry standards and independent investigation and analyses. Specifically, city staff utilized conservative assumptions for the costs associated with the utility operations; and appropriate and reasonable assumptions for the initial asset acquisition.

Xcel owns generation, transmission, and distribution systems throughout Colorado. This study looks at the feasibility of purchasing only the distribution assets serving Boulder. Data available from the baseline energy analysis shows an estimate of Xcel's 2010 Colorado electric expenses and financing costs by asset type (**Attachment B)**. The table below shows that approximately 76 percent of Xcel's 2010 annual costs from its Colorado electric operations supported its generation and transmission systems, 14 percent of the costs went toward its distribution system, and 10 percent were attributable to general operations. When compared to an allocation of costs for Boulder's local municipal utility, it appears that Xcel has a higher share of costs in generation and transmission functions, while the municipal utility has a higher share in distribution costs,

[6] Net Present Value(NPV) is a standard method for using the time value of money to appraise long-term projects. NPV is the present value of future cash flow.

primarily because it is a newly purchased asset and the bond financing covers start-up costs including engineering and capital expenditures for severance.

Table 2: Allocation of expenses and financing costs for local utility compared to Xcel (Colorado)

Expense	Local Utility	Xcel: Colorado-wide
Power supply/generation & transmission*	70 percent	76 percent
Distribution**	19 percent	14 percent
Operations	11 percent	10 percent

* For the local utility, power supply equals the expense to purchase power and transmission. For Xcel, it equals their expenses and financing costs for investor-owned generation, purchased power and transmission.

** For the local utility, distribution represents debt service on the distribution assets serving Boulder.

Detail on the costs used to arrive at this allocation is included in the feasibility study (**Attachment G**). The principal assumptions used to arrive at the cost model's NPV of $115.5 million are:

1. Facility Acquisition - $121.3 million
   The facility acquisition price includes the cost of purchasing the electric system distribution assets currently serving the city. Facility acquisition can also include stranded costs: money owed to the incumbent utility in recognition of prior investments that were made in anticipation of continued service to the municipal customers.

   The facility acquisition price presented in this memo represents the city's position about the value of Xcel's electric facilities serving the city. While this figure is likely to be contested by Xcel, it is calculated based on a widely accepted methodology. Every utility has a component in its rates that represents the cost of its facilities. The cost of acquiring Xcel's assets would be the city's facility cost. The facility acquisition cost of $121.3 million is derived from a well-established engineering methodology for determining the value of a utility's facilities. The methodology, **described in Attachment G**, is referred to as Replacement Cost New Less Depreciation (RCNLD). It involves estimating the cost of replacing the existing facilities serving the city less a depreciation factor. RCNLD is the methodology courts often use to determine the value of utility assets during condemnation proceedings. The valuation is based on data available to the city on Xcel's facilities in Boulder. The key assumptions included in this acquisition price valuation involve valuing both stranded costs and the smart grid assets at zero. Both of these valuations are explained below:

   Stranded Costs - The stranded cost obligation of an acquiring municipality is based upon a formulaic approach adopted by FERC. On June 3, staff received Xcel's estimate of stranded costs. Xcel estimates that the city's stranded cost obligation is $335,698,000. The city staff's consultants will be reviewing Xcel's estimate. The stranded cost estimation process allows the city 30 days to respond and then the parties try to work together to reach a mutually

agreeable figure. This presents a mixed question of law and fact. There is a legal question whether Xcel is entitled to stranded costs at all. Most previous stranded costs decisions involve investments made prior to FERC's 1996 order requiring open transmission. Xcel is seeking compensation for investments it made knowing full well that some customers could leave. This will be a question of first impression for FERC, if the city decides to litigate over stranded costs. There are also significant factual disputes. The city's position is that Xcel's reasonable expectation of service was significantly curtailed or even eliminated when the city started looking at municipalization options in the early 2000's. Xcel bases its estimate on an assumption that it would continue serving Boulder customers for another 20 years. This assumes the existence of a 20-year franchise. There are other significant factual issues that will need to be explored through this process. As a result, staff views Xcel's stranded cost estimate as too speculative for inclusion in the cost model at this time.

Smart Grid – No value has been assigned to smart grid assets that have been installed by Xcel. This is because no determination has been made yet regarding which, if any, of the *SmartGridCity* assets should be acquired by the city. If there is a change in the city's position on this, the creation of a local utility would still be financially feasible.

2. Purchasing Power Supply - $59.1 million

The power supply costs are the annual costs to provide power to meet the utility's electricity requirements. The $59.1 million figure is the power supply cost estimated for one year. The model incorporates the average power supply costs derived by the current market indices for power supply (the costs that a city utility would actually pay if it started up its utility today). The power supply costs include the cost of transmission discussed in the May 10 study session memo.

Under this scenario, Boulder's fuel mix would be comparable to Xcel's current mix and projected resource portfolio. If a local utility is created, local decision making would impact future decisions on renewable energy. It would be the city's intention to increase renewables over time. In the near term, most of the city's renewable energy would be from power purchases on the open market. Over time, investment in local generation opportunities could shift the percentage of external purchase and local generation assets.

It is important to note that Xcel's current customer programs such as Solar Rewards rebates and demand side management incentives would sunset on the first day the city began utility operations. To replace these programs, the city would need to identify new replacement programs and services to go into effect on the same day. A public purpose program fund is factored into the cost model at a level equal to Xcel's spending in Boulder plus the Climate Action Plan tax currently used to supplement Xcel's DSM programs in Boulder.

3. Utility Operations - $13 million
   The costs associated with operating and managing a local utility include general administration, customer service, maintenance, billing, metering, scheduling and distribution system repair and replacement. The cost used for utility operations is derived from industry averages for similarly sized and situated utilities. Consultants have developed a plan for the costs associated with operating the city's utility and have compared that amount to industry averages to determine the value used. This valuation is conservative. Importantly, there are operating cash reserves of roughly $50 million included in the feasibility study. These amounts are incorporated in the cost model to assist the utility in meeting operational crises that could be brought about by storms, equipment failures, etc.

4. Financing - $24.7 million[7]
   Financing costs, or annual debt service, represent the annual amortized value of the acquisition costs, start-up costs, debt costs, and debt issuance costs. Consultants to city staff are estimating that the utility's financing needs could be met by taxable bonds of approximately $229 million and non-taxable bonds of approximately $57 million. Further information on both long-term and short-term financial considerations is presented on pg. 29.

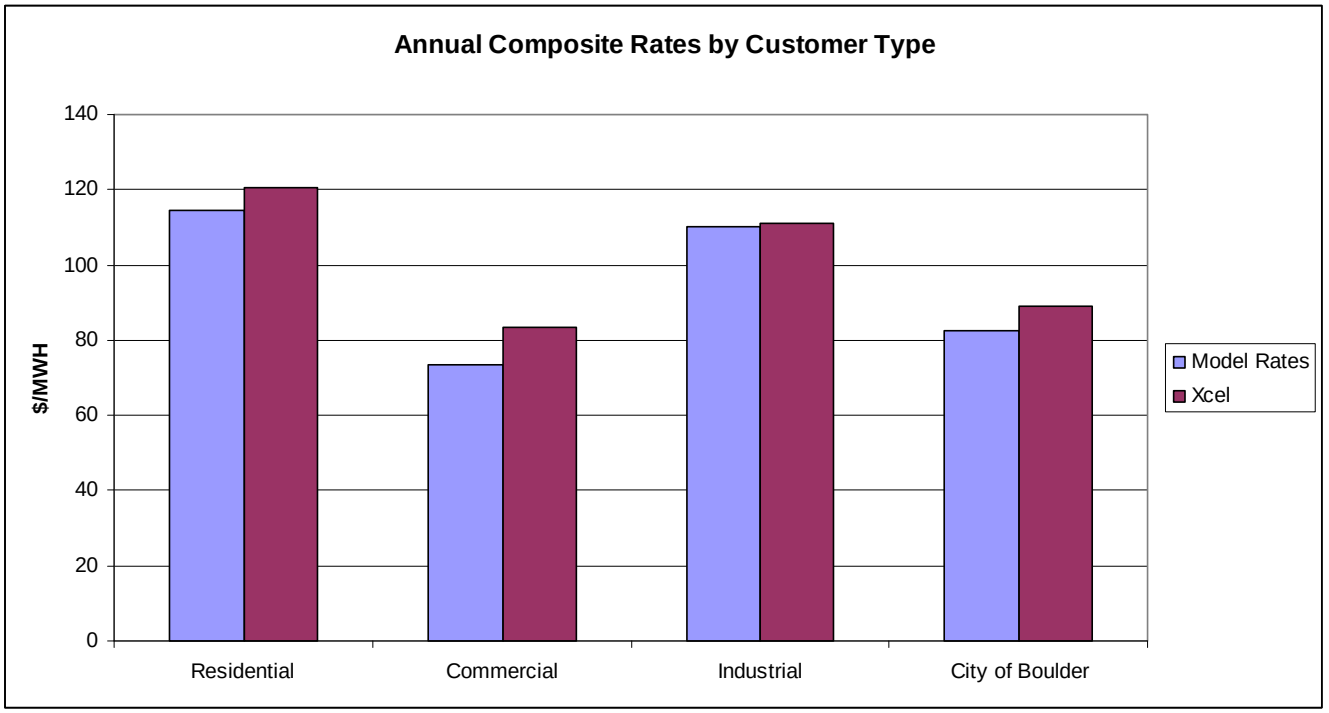
   The cost model includes starting annual financing costs in year three of operations. Until year three of utility operations, the city utility would pay only the interest cost of financing as a way to ensure revenues are flowing and any unanticipated start-up costs are able to be covered. The annual amount of both interest and debt repayment is estimated at $24.7 million. The financing costs would be costs associated with paying the city's "mortgage" for the acquisition price of the electric facilities purchased from Xcel, having the required level of bond reserves, utility operating cash reserves, and certain utility start-up expenses.

Rates

Modeled average retail rates for the local utility are calculated based on the total operating cost and the energy load. These rates are compared to Xcel's projected average retail rates across a mix of residential and business customers and taking into account the average actual usage across all customers. The average retail rates for Xcel also include riders and taxes and the final Clean Air-Clean Jobs Plan rates approved by the PUC. The cost model calculates a 10-year rate forecast for the local utility. As energy costs in the long run are speculative; a 10-year analysis is reasonable. Rate comparisons have been further calculated by customer class and are shown below in Figure 1 for year one.

[7] This represents an annual cost beginning in year three.

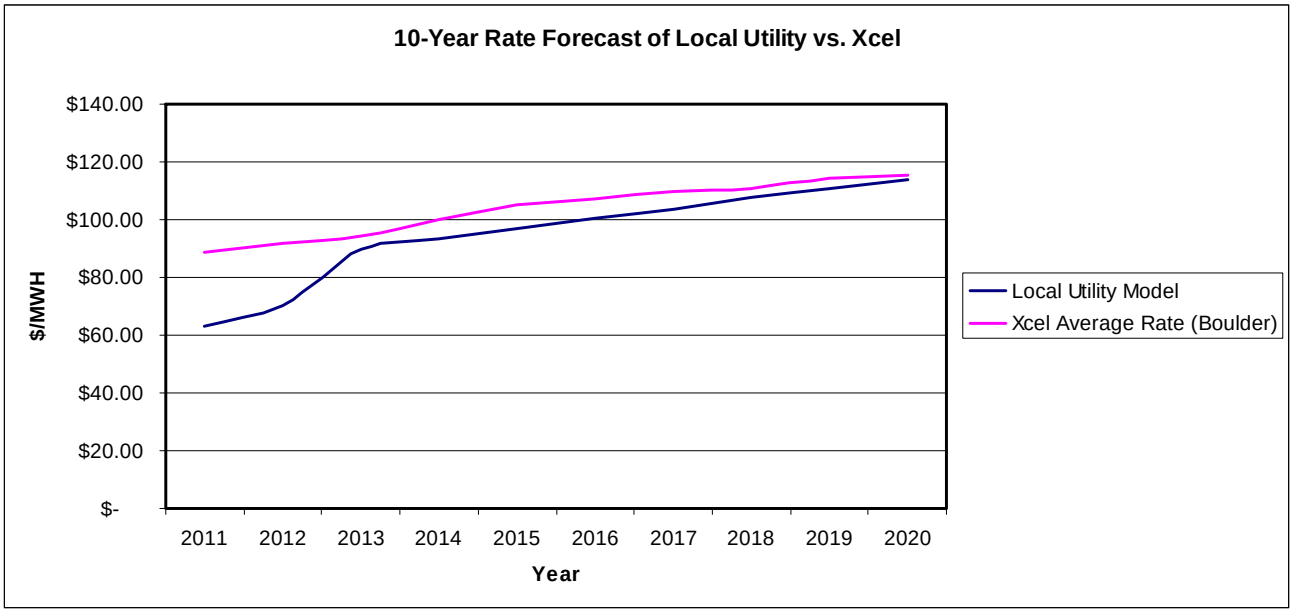
Figure 1: Year One Composite rates for local utility (model) compared to Xcel



This rate analysis was performed by customer class and by season (winter versus summer). The results are similar over a 10-year period. Complete results by sector can be found in (**Attachment G**.) For comparisons to other benchmarked cities, see the Baseline Energy Analysis (**Attachment B).** Future rate projections are not currently available for the benchmark cities, so they cannot be compared against the modeled rates for a local utility, but have been compared to historic rates for Boulder.

The following graph (Figure 2) shows average annual rate comparisons (for all customer classes) over a 10-year period. The results show rate stability over 10 years compared to Xcel's projected rates. For the first few years, the local utility rates could be much lower than Xcel's projected rates because the financing costs for the local utility would not have begun yet. However, a local utility could establish a rate stabilization fund to ensure more stable rates over time.

Figure 2: 10-Year Rate Forecast



In conclusion, based on the information available today, it is financially feasible to create a local utility. It is estimated that it would cost the city $121.3 million dollars to acquire the distribution system with annual debt service payments of $24.7 million. It would cost $72.1 million to purchase power and operate the system. With these assumptions, the rates would be less than Xcel's and the utility would be "profitable" (although, as a municipal utility, it would not retain a profit but instead either reduce rates or reinvest those funds in the utility based on local priorities). For more details on the financial information see the cost model summary (**Attachment F**).

Financial Considerations (Short Term and Long Term)

When looking strategically at the financial aspects of creating a municipal utility, there are both short-term and long-term considerations. The short term covers the interim period of time when costs would be incurred for legal, financing and other administrative costs leading up to the purchase of the assets. The long term includes the actual purchase of the assets. The ongoing operational aspects of the utility after the purchase of the assets are covered on pg. 22 in this memo.

1. Short Term

   Dependent on how the process unfolds, the short-term period could range from one to five or more years. The costs could range from a few hundred thousand dollars to one million annually. Ideally, the source for covering these costs would be flexible in time and amount. That is, the funds available could adapt to the level of costs incurred, would not begin until the funds are needed and would end at the time the city finalized the purchase of the assets or decided not to move forward with the purchase. The best estimate at this time is approximately $1 million per year, which may be needed for a period of one to five years.

The following options for the short term are provided for City Council's consideration:

Fund from existing revenues: This option would mean that priorities would need to be changed for uses of the Climate Action Plan (CAP) tax fund, the General Fund, or both. If the CAP tax were to be used to pay for any of the short-term costs, the voters would need to approve the extension of the tax (it expires April 1, 2013). The CAP tax produces about $1.6 million per year. If the CAP tax were renewed by the voters at current rates, approximately 60 percent of the tax would need to be reallocated for this purpose.

If General Fund revenues were to be used, $1 million per year would need to be reallocated. No ballot question would be needed but other city services would be significantly impacted.

A combination of the two sources could also be used so the reallocation would occur in both funds.

If the city purchased the assets and established its own electric utility, consideration could be given to having the utility pay back funds for the costs it incurred during this phase.

Increase the occupation tax by the amount needed: When the franchise agreement was not extended, a utility occupation tax was passed by the voters to replace the approximately $4.1 million that the franchise agreement generated for the General Fund. The voters could be asked to increase this tax by approximately 25 percent per year to generate the estimated $1 million per year that would be needed. The increase would end when the purchase of the assets was finalized or if it was decided not to purchase the assets.

Issue short-term bonds to pay for the short-term costs incurred: This concept would be for the city to issue bonds to cover the interim costs and the debt would be paid back from general revenues of the city or utility revenues once the utility begins to collect fees for service. Since the bonds would need to be issued prior to the utility collecting fees, the 1992 state constitutional amendment called the Taxpayer's Bill of Rights (TABOR) would require the voters to approve the sale of the bonds.

As a policy, the city has not issued debt to pay for operational costs. This option also has less flexibility than the other two options. Estimating how much would be needed and for how long makes this an especially challenging method to use. If the bond issue amount is set too low and interim costs exceeded the amount needed, another funding mechanism would be needed to pay for the additional costs. If the amount is set too high the city would be paying annual debt service payments it should not have incurred. If debt was issued and in the end the utility was not established the city would be paying

for debt for 20 or 30 years that was not needed. Due to these issues, this option carries the most financial risk and the least flexibility for interim financing. Therefore, staff does not recommend this option.

2. Long Term

Long-term financing includes funds required for the initial purchase of distribution assets as well as funds to cover utility start-up costs, initial power purchases and cash reserves. Acquisition of the distribution system can only be financed using taxable bonds, although a very small portion of the cost could potentially be financed using private activity bonds. Given the restrictions on private activity bonds, for the purposes of the current analysis, the entire acquisition cost has been calculated based on taxable bond rates. Staff will, however, continue to investigate the potential use of private activity bonds for some portion of the acquisition costs.

Taxable bonding (holders of the bonds pay state and federal taxes on the interest received from the issuers):

Bond counsel advised that the ballot title for bonding authority would require a statement of the amount to be borrowed, the projected interest rate and the total amount to be repaid over the life of the debt. The city has followed a best business practice of not issuing debt for a time period that would exceed the life of the assets (this avoids the chance of still paying off bonds when the assets purchased are no longer in existence). As a result, the city would need to have some idea of the weighted life expectancy of the assets in Boulder.

Taxable debt carries higher interest rates than tax exempt debt. Also, since the municipal utility would be a new enterprise without credit history, it is unlikely to enjoy the same bond rating as the city's existing utilities. Using current interest rates (and accounting for a possible rise in interest rates before the debt would be issued) and assuming 30-year debt, an "A" or "BBB" rating on taxable debt would result in an interest rate of 8 percent. The city and bond counsel have discussed ways of reducing this rate. One possibility would be to support the revenue bonds with a general obligation guarantee for some or all of the debt. That is, the city would pledge to raise taxes to pay off the debt if the municipal utility were unable to do so. Such a guarantee could reduce the interest rate to around 7 percent.

- The annual payment per $100 million of debt at 8 percent for 30 years is approximately $8.8 million.
- Twenty-year bonds would have a lower interest rate and have higher annual payments (due to the shorter payoff period). Based on current interest rates, it is estimated that 20-year bonds would require an annual payment of $9.4 million per $100 million of debt issued.

Reliability

One of the most frequent concerns voiced by Boulder stakeholders relates to the assurances that customers will have reliable service. The highest priority goal of Boulder's energy planning effort is to "ensure a stable, safe and reliable energy supply." All utilities in the US are required to maintain strict reliability standards put in place by the North American Electric Reliability Corporation (NERC). NERC has the legal authority to enforce compliance with its Reliability Standards, which it achieves through a rigorous program of monitoring, audits and investigations, as well as financial penalties and other enforcement actions for non-compliance.

Also, the electric utility industry has developed several performance measures of reliability based on outage duration, frequency of outages, system availability, and response time. System reliability depends on sustained interruptions and momentary interruptions. When comparing utility types on reliability performance measures such as SAIFI (System Average Interruptible Frequency Index), SAIDI (System Average Interruptible Duration Index) and CAIDI (Customer Average Interruption Duration Index) along with the electric continuity thresholds and electric restoration thresholds, results indicate municipal electric utilities are equally or, in some cases, more reliable than investor owned utilities.

An annual reliability study by the PA Consulting Group calculates the SAIDI index for investor-owned utilities and for public power and cooperatives combined. SAIDI measures the average length of time, in minutes, each customer can expect to be without power during a year. The PA Consulting Group's study consistently shows that customers of municipally run and publicly owned utilities are without power less than half as many minutes each year as are customers of investor-owned utilities.

This could be for a variety of reasons. Public power utilities can respond quickly to emergencies because local crews live in the community and are accountable to local officials, as well as to their friends, neighbors, and probably family members. Repair crews that are local possess expert knowledge of the system, allowing the problem to be identified quickly and allowing pre-emptive measures to be taken prior to extreme weather conditions.

Xcel showed exemplary service and support during the Four-Mile Canyon Fire. Some have asked, "Can a municipally run utility provide the same level of response during an emergency?" After interviewing several municipal utility officials, city staff believes that they can. In the event of a major outage or emergency that is potentially beyond the capacity of the utility, public power utilities coordinate with other nearby utilities for assistance. Public power utilities have access to hundreds of line crews from fellow public power utilities through mutual assistance programs.

Additionally, the essential elements to providing reliable service include:

1. Generation Reserves
   An important aspect to providing continuously reliable service relates to having sufficient generation reserves. In electric utilities, generation reserve or operating reserve is the generating capacity available to the system operator within a short interval of time to meet demand in case a generator goes down or there is another disruption to the supply. Most power systems are designed so that, under normal conditions, the operating reserve is always at least the capacity of the largest generator plus a fraction of the peak load.

   To maintain sufficient reserves, generating resources (whether traditional or non-traditional) must be conceived, designed, permitted and approved as part of the resource planning process. This is designed as a percentage above the total load. NERC and regional reliability councils set this minimum limit at 10 to 15 percent for meeting customer loads during planned and unplanned generation outages. All utilities, including municipal electric utilities, must meet or exceed this minimum limit.

2. Transmission System Capacity
   Once electricity has been generated, sufficient transmission system capacity must be maintained to carry bulk power from local or remote electric generators. Transmission system capacity must be maintained to provide power to local substations to meet the community load requirements. Adequate capacity must exist during planned and unplanned outages. System planners use various voltage levels to meet these standards, such as 115 kilovolt (KV), 230 KV, 345 KV and 500 KV.

3. Distribution System Capacity
   Along with transmission capacity requirements, sufficient distribution system capacity must be maintained to provide power to customers in their homes and businesses. As with transmission capacity, distribution system capacity must be maintained during planned and unplanned outages, especially during times of inclimate weather. System planners use various voltages, such as 13 KV, 25 KV and 35 KV, multiple tie points, conductor sizes, pole types, system protection schemes and voltage equipment to maintain high reliability levels. Planners also provide the ability for distributed generators such as, solar, wind and geothermal, to connect to the distribution system reliably and safely.

4. Electric System Operating and Maintenance Practices
   The ability of any utility to be effective in operating and maintaining complex electric systems is rooted in maintaining experienced technical personnel who understand all aspects of the planning design, engineering, construction, and integration of the components. These technical experts know how to safely operate and maintain the system for employees and the public. Industry requirements assure that personnel will keep abreast of technical upgrades, education enhancements, technical training and vendor/supplier training. Any

change in Boulder's utility distribution management would require the hiring and ongoing training of skilled utility professionals.

5. Capital Projects and System Improvements

   Many of the essential elements related to reliability are regulated by NERC. There are, however, many ways a utility can go beyond what is required to improve reliability, ensure quality customer service and maintain competitive rates. Utilities strike balances between capital projects and other expenditures and overall profitability.

   There is a striking difference between investor-owned utilities and municipal utilities in this area. Investor-owned utilities finance capital improvements through the rate base, meaning all customers in the service territory pay for the improvements. Because not all customers will benefit directly from particular enhancements, investor-owned utilities are challenged to invest in projects that are not part of improvements designed to maintain the system and meet basic utility standards.

   Public utilities, on the other hand, have tremendous flexibility in this area. Local utility boards can identify capital improvement projects and dedicated funds based on local priorities, such as site-based redundancy, energy storage opportunities, equipment improvements or any number of strategies to improve reliability and customer service.

   The FortZED project[8], which aims to provide a zero-energy district in Fort Collins' downtown area (read more online at http://fortzed.com/) is a good example of a public-private partnership created by a municipal utility. Other innovative opportunities such as microgrids, feed-in tariffs and other local grid projects are possible by focusing on local energy goals and priorities.

   Public utilities can also identify specific funding reserves for specific system elements. One such area that a Boulder-specific utility might wish to consider is additional funds for undergrounding of the overhead distribution system. Boulder's distribution system is currently 80 percent or more above ground. While undergrounding power lines is much more expensive than overhead lines, undergrounding does have several noteworthy advantages:

   - There is the obvious aesthetic consideration. Except for an above-ground terminal here and there, they're out of sight entirely.

[8] FortZED stands for Fort Collins' Zero Energy District. A Zero Energy District is a distinct geographic area that produces as much energy as it uses. The FortZED boundaries include the Downtown area, Colorado State University's Fort Collins campus and the Poudre River area near Downtown. The combined area is served by two electric substations and acts as a distinct area for demonstration and testing.

FortZED is a set of active projects and initiatives, created by public-private partnerships, which uses smart grid and renewable energy technologies to achieve local power generation and energy demand management. FortZED, as conceived, will be the largest active net zero energy district in the world. FortZED is unique in that it is a community effort working to achieve net zero on an existing grid system.

- They are less vulnerable to airborne elements, such as wind and ice, thereby decreasing weather-related outages.
- In some areas, like downtown districts, they are often more practical than overhead lines.
- Finally, undergrounding the distribution of electricity potentially reduces magnetic field exposures.

If the appropriate strategies and implementation were achieved, Boulder could improve the local electric system reliability with prudent funding of infrastructure, such as distribution substations, system protection equipment and distribution transformers. In addition, an emphasis on electric circuit configuration and system restoration after unplanned outages could improve reliability.

Boulder's Current Reliability

A critical element of the Baseline Energy Analysis was to evaluate Boulder's current reliability, and that of comparable regions. To provide meaningful information, reliability data was collected from several utilities that include investor-owned utilities and public power companies in Colorado and outside of Colorado. Boulder's current reliability statistics are included in the Baseline Energy Analysis (**Attachment B**).

The Institute of Electrical and Electronics Engineers (IEEE) benchmark reliability indices were reviewed for a comparison against Xcel and other utilities across the nation. The American Public Power Association (APPA), an organization of 2,000 municipal and other publicly owned electric utilities, compiles reliability data for its members from data submitted to the U.S. Department of Energy, Energy Information Administration (EIA). In addition, publicly available APPA data which represents the mean of reliability indices for the 214 largest public power systems, was also reviewed. While lower values of these reliability indices generally indicate better system reliability, the numerical performance measures may not necessarily be significant by themselves. They are significant in terms of identifying a trend and relative performance when comparing a system against other utilities and industry average. To provide meaningful information, reliability data was collected from several utilities that include investor-owned utilities and public power companies in Colorado and outside of Colorado.

Xcel's reports to the Colorado PUC document the reliability of its electric distribution system, including statistics for nine separate operating regions. While this allows comparison of the Boulder region to other parts of Colorado, as well as to other utilities outside of Colorado, the comparisons should be used carefully. Because Xcel's Boulder region includes communities with less density surrounding the city—including mountain communities west of Boulder—reliability within the city itself is likely to be better than that for the whole region. Xcel did not provide the city with data on reliability for substations and feeders located within the city itself. As described in the Energy Baseline Analysis (**Attachment B**), the key findings related to current reliability include:

- Reliability for the service areas served by Xcel as a whole and for Xcel's Boulder region is better than median reliability reported for other medium-sized utilities in the US.
- Municipal utilities serving the cities of Longmont and Fort Collins, which serve urban service territories, have substantially better reliability than the Boulder region as a whole, which includes areas outside the City of Boulder.
- Among Xcel's nine operating regions, reliability for the Boulder region ranked within the lowest three from 2007 to 2010.

Most electric outages are a result of aging infrastructure, insufficient intelligent monitoring and control of transmission and distribution equipment, as well as a reliance on highly centralized generation that leaves customers vulnerable to breaks anywhere along the line. There are many resolutions to these problems using Smart Grid technologies, but two factors are most important: distributing power generation facilities at many points within the electrical grid and creating microgrids within larger grids. Distributed energy storage is another Smart Grid technology that promises to improve reliable delivery of electricity.

Smart Grid (SG) is envisioned to take advantage of all available modern technologies in transforming the current grid to one that functions more intelligently to facilitate a variety of grid enhancements. A number of these enhancements are intended to improve reliability, including:

- Better situational awareness and operator assistance.
- Autonomous control actions to enhance reliability by increasing resiliency against component failures and natural disasters, and by eliminating or minimizing frequency and magnitude of power outages subject to regulatory policies, operating requirements, equipment limitations and customer preferences. Such control actions can be more responsive than human operator actions.
- Efficiency enhancement by maximizing asset utilization.
- Resiliency against malicious attacks by virtue of better physical and Information Technology security protocols.
- Integration of renewable resources including solar, wind, and various types of energy storage. Such integration may occur at any location in the grid ranging from the retail consumer premises to centralized plants. This helps address environmental concerns and offers a genuine path toward global sustainability by adopting "green" technologies, including electric transportation.
- Higher quality of service – free of voltage sags and spikes as well as other disturbances and interruptions – to power an increasingly digital economy.

These are all modeled benefits. It is unclear how the Boulder Smart Grid, owned and operated by Xcel, is functioning in these areas. It is anticipated that the IBM Smarter Cities final report will share some insight into the actual reliability benefits achieved by the SmartGridCity project. The city will not be making any determination about the existing system until later in this process.

VI. LOCALIZATION PLAN

Central to Boulder's energy future discussion is estimating the actual potential for both reductions in local energy consumption through improved efficiency and conservation, and the expansion of local energy generation using renewable fuel sources.
The core questions that drive this part of the city's energy analysis include:

1. How far and how fast can Boulder realistically go toward achieving greater levels of energy independence and higher levels of renewable energy generation within the local and regional area, given existing technical, financial and legal constraints?

2. How might this long-term planning for the city's energy future stabilize the current energy cost trajectory?

Localization Report

To help answer these questions, the city contracted with the firm Local Power, Inc. (LPI) to conduct a preliminary study and develop the outline for a potential "energy localization plan." Their work considers a range of technical options for developing and enhancing local energy generation (including hydroelectric, solar, bio-gas, storage/backup and heat districts) as well as options for increasing the efficiency of energy use and management in the city.

The Localization Report **(Attachment H)** provides a description and analysis of resource options both within the existing "status quo" of PUC regulations (i.e., a renewed franchise agreement) and within a utility framework that either would not have to work within the confines of PUC-defined limits or could come about under a new form of partnership with Xcel. Under each of these scenarios, the analysis focuses on strategies that could be achieved while maintaining price parity with existing and projected utility rates (based on Xcel's current and projected electricity fuel mix and Colorado's natural gas market). Importantly, the results of LPI's analysis will inform development of specific components of the business plan cost model, and *vice versa*, as further data is developed and assumptions are refined.

The report covers the potential for the localization of electricity resources for Boulder's energy future. To avoid confusion, a separate report will be issued in mid-July for an energy localization displacing onsite natural gas combustion, although there is some overlap in both reports. The report outlines pathways for the City of Bolder to transform its energy supply along three overall themes, while maintaining competitive costs of service and grid reliability:

1. Democratizing energy decision making, so customers and the local community have more direct control and involvement in decisions about their energy;

2. Decentralizing energy generation and management, reducing reliance on external energy sources; and

3. Decarbonizing the energy supply, by using local renewable and clean fuel sources as much as possible.

Because of the interdependency between all of the strategies considered, and the effect the various authorities have on the scale of the potential implementation, both legally and financially, the sum of the whole portfolio is greater than the individual parts. These synergies are important to the overall outcome, and are described in the report.

Summary of Key Findings

The report identifies a range of technologies that could localize a significant portion of Boulder's energy supply. The scale of implementation possible, both legally and financially, is predicated upon the city having several key authorities. Key findings of the electricity localization report include opportunities for:

- **Energy efficiency and demand-side management**: This is the largest and most cost-effective local resource investment opportunity, with the potential to save up to 20 percent of forecast electricity demand by 2020 (measured against baseline year 2011). Energy efficiency programs are currently offered through Xcel, but local programs could likely achieve much more energy savings and reductions in customers' bills.

  The innovative program design proposed and modeled in this report leverages funds from the City of Boulder to retrofit *every* building with advanced energy monitoring equipment, communications, and energy management software, and, combined with on-bill financing, unlocks the potential for continuous energy management through Smart Buildings. The debt burden is largely shouldered by private investors, and the value of the portfolio savings and demand response outweigh the debt service in year seven, pay it off in year 12, and gain a net benefit of approximately $280 million by year 20.

- **Local distributed generation opportunities:** Technologies discussed in the report include *waste-to-energy and waste-to-heat generation,* using both non-recyclable municipal solid waste and regional biomass resources; the city's existing (or enhanced) *hydropower facilities,* including the potential for enhanced water storage in conjunction with small-footprint wind turbines near Barker Reservoir; and customer- and community-owned distributed *solar photovoltaics*, including solar gardens, on local commercial rooftops.

- **Intelligent grid technologies:** Enhancing the smart grid to support *targeted efficiency* and a variety of *demand dispatch options* (which turn appliances on or off in response to price or grid stability signals, and can support the integration of intermittent renewable generation). Additionally, smart-meter retrofits could support *plug-in electric vehicle technologies***,** such as vehicle-to-building (V2B) strategies, in which the vehicle battery also serves as a storage/back-up system for the building, and managed charging, in which the charging schedules of electric vehicles are aggregated and controlled in response to grid stability and power price signals for both customer and utility benefit.

- **Local natural gas and bio-gas generation:** Using the existing generation facility at the Valmont plant, natural gas could provide some capacity balancing for the intermittency inherent in local wind and solar generation. There is sufficient biomethane potential to supply the entire Valmont plant; however, this is not likely to be economic until either a) the price of natural gas rises to $8 per million BTU, or b) carbon costs are imposed on fossil fuel that are sufficiently large to create an equivalent price to $8 per million BTU.

- **Onsite renewable or combined heat and power generation:** Through partnerships with large commercial and industrial facilities, targeted on-site solutions could serve to enhance system reliability for large utility customers, and create a potential revenue source for them; however, this will require a careful balance between costs and the value of the energy streams to customers.

Not all of the available opportunities can or should be developed at the same time. Some are more expensive than others, and this will affect the timing that is optimal for deployment. As prices for conventional sources of power increase, more sources of renewable energy become cost effective. In addition, further analysis will be needed to develop a realistic and feasible resource plan, integrating local resource options with external power purchases. The purpose of this initial analysis is to frame the possibilities, providing a foundation for more targeted work as the path for Boulder's energy future is more clearly defined.

Natural Gas … A "New" Opportunity

The Energy Future Project has focused almost entirely on the opportunities and risks associated with the electricity supply. LPI has identified a significant opportunity that exists to reduce emissions and stabilize costs through heating (natural gas) options. Approximately three-quarters of buildings in Boulder are connected to natural gas pipelines; and natural gas supplies 77 percent of all energy used in Boulder's residential homes and 47 percent in commercial facilities, much of it for heating.

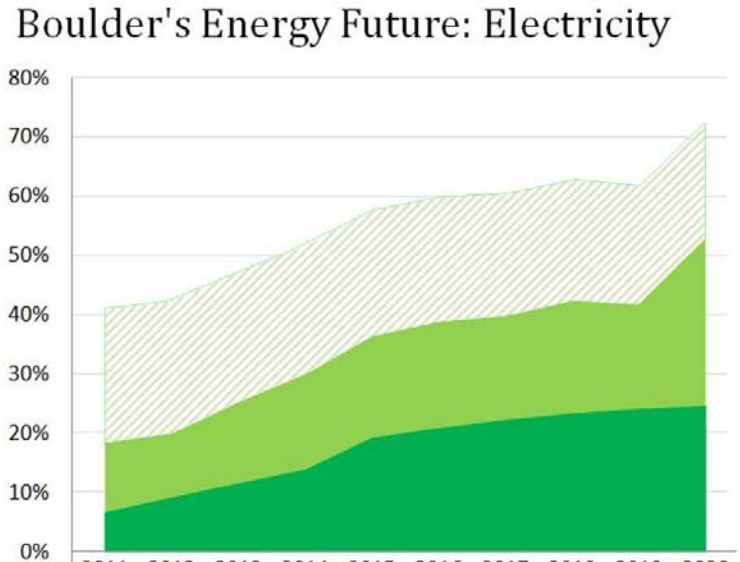
While the carbon savings from renewable electricity generation replacing coal-fired power far outweigh the savings from renewable heat generation replacing natural gas, the heat strategy outlined in a subsequent report being prepared by LPI (and available in mid July) may serve as a strong component of a customer-focused utility, or as a strong stand alone program that provides an additional source of revenue and marketing for Boulder's continuing energy localization efforts.

The Localization Portfolio Standard

LPI has quantified what is possible within each of the areas summarized above, and matched potential local investments to projected revenues from the business plan cost model. One key output of the attached report, in addition to informing the community's discussion of "how far, how fast" is the recommended Localization Portfolio Standard (LPS).

The Localization Portfolio Standard (LPS) is an idea LPI is developing for Boulder, and is conceptually similar to Colorado's Renewable Portfolio Standard (RPS). Qualifying projects are concentrated within the City of Boulder, and limited to within the County of Boulder. Below is a chart and table depicting the LPS in addition to other resources for Boulder's energy future (Figure 3):

Figure 3



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
RECs	23%	22%	22%	22%	21%	21%	21%	20%	20%	20%
Remote Renewables	12%	11%	14%	16%	17%	18%	18%	19%	18%	28%
Local Portfolio	7%	9%	12%	14%	19%	21%	22%	23%	24%	25%
Total	41%	42%	47%	52%	58%	60%	60%	63%	62%	73%

The LPS establishes targets for the development of localized energy investments (for generation or demand side strategies) at a "substantially higher" rate of renewables development. In essence, the LPS sets forth a step-wise approach to energy independence and the integration of local renewable energy sources, taking into account technical and financial realities, while ensuring that rates stay at or near current and projected levels.

LPI has also created a cost model of these localization technologies to quantify the economic potential for energy localization within the City of Boulder and Boulder County. This effort is described under the final section of the report. The "standard" is defined by technologies that either provide renewable power generation, energy efficiency, or renewable heat. The standard may also include local energy storage, particularly when used for supporting variable renewable energy output or balancing renewable generation with demand.

Overall, LPI proposes a Localization Portfolio Standard of 30 percent of electric power demand, with two-thirds of this being provided by energy efficiency improvements and one-third from local renewable power generation. While conceptually simple, the LPS is more complex than an RPS to design for technical and economic feasibility. The standard

itself could be met in a variety of ways, depending on which options turn out to be the most feasible and cost-effective.

There is considerable additional development potential; much depends upon future price trends in energy markets. If forecast trends are realized, it should be possible to reach 40 percent or even higher localization in the 2020s. A factor that could significantly accelerate the date of cost-effectiveness would be imposing a cost on carbon. A carbon price of $30 to $50 per ton would make more investments in green energy cost-effective and practical.

As mentioned above, local development and use of these resources depends in large part on the existence of a local authority that has the ability to fund and implement these opportunities. Many of these projects could in theory be developed in the status quo; however, these projects are often constrained and can languish for years as simply an idea that has no vehicle for implementation. Therefore, the report also identifies specific authorizations needed to facilitate these strategies.

VII. BALLOT MEASURES

Introduction

This section of the memo is intended to address some of the ballot measures that are associated with either a new partnership with Xcel or municipalization. Regarding municipalization, there are three basic issues to consider: governance, bonding for acquisition, and short-term start up revenue needs.

As the council is aware, the city is authorized under its Charter and the state constitution to create a municipal utility that provides electricity to Boulder customers.[9] The city can acquire the assets with eminent domain powers. Bonds used to purchase utilities are required to receive voter approval. The Charter also establishes a department of public utilities and allows the City Council to establish by ordinance all of the general powers and duties of any public utility.

The Charter provides that the city may purchase and take over the property and plant of a franchisee upon the payment of its fair valuation. The city may use the power of eminent domain to take those portions of the system the city deems necessary to start a municipality. The process can be initiated by the council or by the voters. Once the process has started, the Charter directs the city manager to investigate the property and report to the council the probable cost to acquire the property and any probable additional outlays that would be necessary to operate the utility.[10]

Charter provisions require that once the city takes over the utility operations, the books and accounts are separate from the general accounts of the city. The Charter requires that the financial picture of the utility is separated from the general financial picture of the city. The accounts are required to show the actual cost to the city of the public utility

[9] Colo. Constitution, Art. XX, Sections 1 and 6 and City Charter Section 2(d).
[10] City Charter Section 124.

owned; all costs of maintenance, extension, and improvement; all operating expenses; reserve funds; and the value of service provided to city departments. The accounts are also required to show reasonable allowance for interest, depreciation, and insurance, and also estimate the amount of taxes that would be chargeable against such property if owned by a private corporation. Finally, the accounts of the public utility are required to be annually audited.[11]

In short, there are a variety of authorizations, limitations, and guidance in the City Charter related to operation of public utilities. Boulder's Energy Future will require decisions that will have long-term impacts on the community, whether the final choice is a partnership with Xcel or the creation of a municipal utility. If a municipal utility is preferred, the voters would need to give consideration to how the utility is governed and the revenue measures to ensure that it is successful. If a renewed partnership with Xcel is the preference, the voters would need to determine if they are willing to commit to a long-term franchise agreement and/or some other type of partnership agreement.

In terms of the 2011 ballot regarding Boulder's Energy Future, council could choose to pursue ballot items around next steps for municipalization or to place a new franchise agreement or continued partnership agreement with Xcel on the ballot. If council wants to consider potential municipalization ballot language, there are a number of issues the council should take into account, including: the decision to municipalize, bonding authority, and the preferred governance structure for the utility. Details of these issues are discussed below.

A new proposal is expected from Xcel in the coming weeks. After considering the new proposal, council may decide to place a franchise agreement, other agreement, or advisory ballot item related to continued partnership on the ballot.

City Charter language related to governance

At its April 26 Study Session, the council appeared to express some support for an option that included a governance model based on the existing Charter, with some modifications. Council members suggested that additions to the Charter include some support for the Planning Board model, where the council exercises oversight authority over the board's decisions through call-up, but leaves the day-to-day decision making up to the board. Council members also mentioned other preferences, including: a utility board that was larger than the five-member boards anticipated by Charter Section 130; creation of the utility; and establishment of a utility department within the city.

Attached to this memo are possible new Charter articles related to governance. Both options contain a section that recites the values of the public utility. Those value statements have been informed by the objectives of the Boulder Energy Future Project and input provided by the council at its May 24, 2011, roundtable discussion. Option one (**Attachment I**) contains proposed Charter language based upon the council preferences described above. It is based on the current city council–city manager form of government; is tied to principles in the Charter related to auditing and accounting;

[11] City Charter Section 127.

provides for a public utilities board of seven members that is advisory to the council and the city manager; and allows the council to delegate additional responsibilities to the board by ordinance.

A second option is provided for purposes of comparison. Option two (**Attachment I**) contains proposed Charter language that would create a utility board that is independent of the City Council. It allows the council to serve as the board until the council determines that it is appropriate to turn it over to a new utility board. The new board would operate under the municipal powers of the city, but independent of any oversight by the city manager or the City Council. The board would have the authority to appoint its own chief executive officer and legal counsel.

Determining the governance structure is a matter of values. On the one hand, the city council–city manager form of government is very familiar and accountable to the voters. It also has the perspective of looking at the policies of a utility system in the context of a whole host of municipal services and values.

On the other hand, an independent utility is more removed from the political pressures of the elected body. Its board members have longer terms than the elected official, adding stability for the board. Also, an independent utility board, since it focuses on a single topic, has the opportunity to specialize and gain specific knowledge on the operation of an electric utility.

Bonding authority

The council also expressed support for requesting that bonding authority be a part of the measure. There was a consensus that bonding authority should be, to some extent, flexible in order to obtain more favorable financing rates. Staff reported that while flexibility is a desired outcome, some limitations or alternative arrangements - such as a general obligation covenant for a portion of the bonds - might be necessary. These issues will be clarified as staff continues to work with its bond counsel and financial advisors. In the interim, staff will also discuss approaches with our bond and financial advisors to develop a strategy to fund the start-up costs of the creation of the utility. This could be in the form of an interim tax, fund loan, or bond financing all of the costs up front.

City staff has worked with bond counsel, Kutak Rock, LLP, and financial advisors at Piper Jaffrey to develop ballot measure options related to raising the funds necessary to start a municipal utility. The ballot options represent good, solid, and conservative legal advice on how to go forward with financing municipalization efforts. Three options have been drafted. Those ballot titles can be found in **Attachment I**.

Long-term financing ballot measure options

- Revenue bonds
- Revenue bonds with a 10 percent general obligation pledge
- Revenue bonds with a general obligation pledge

The bonds types above are listed in order of higher interest rate bonds (at the top) to the lowest interest rates (at the bottom).

The principal and interest payments for revenue bonds are secured by revenues from the project or utility being financed. In some cases, revenue bonds can be backed by dedicated tax revenues such as sales taxes or property taxes. Bonds for utility services tend to represent relatively safe investments due to the fact that the utility delivers fundamental or essential services. Utilities tend to have a stable revenue source that is able to withstand multiple economic cycles.

General obligation bonds (often referred to as "G.O. Bonds") are secured by the full faith, credit and general taxing powers of the issuer. Principal and interest payments for general obligation bonds represent a promise by the issuing municipality to levy enough taxes as necessary, if necessary, in order to make timely and complete payments to investors.

The first option (**Attachment I – Option One**) is to request voter approval for revenue bonds. This is a straightforward approach. The downside to this is that since this would be the start of a new utility without a track record in the area of electricity, the electric utility, at least in the early years, may not have the very high bond ratings available to Boulder's other three utilities.

The next options include revenue bonds that would have a general obligation backing. Two options were explored, a partial general obligation backing (**Attachment I - Option Two**) and a full general obligation backing (**Attachment I**). The city financial advisors informed staff that a partial general obligation backing would probably result in a small margin in the interest rates. A full general obligation pledge would have the potential of moving the rating up in quality by the rating agencies. This could result in a much lower interest rate.

Interim or start-up revenue ballot measure options

The process of acquisition of the electric distribution system would require the city to create a value for the system and a process to acquire it. As previously described, it is anticipated that there would be costs associated with acquiring the assets for a municipal utility and that the city would need the services of engineers, attorneys, and financial advisors to get a municipal utility up and running. A revenue source would be needed to fund acquisition, which would require the services of condemnation and negotiation attorneys, appraisers, and engineers.

As described in more detail earlier in this memo, staff identified three potential revenue sources for these efforts. The first revenue source is existing revenues. If existing revenues are used, those funds would need to be diverted from existing programs and services.

Two other revenue sources that could be explored are included in **Attachment I**. One option (**Attachment I - Option One**) is an increase and extension of the Climate Action

Plan tax on electricity. Another option (**Attachment I – Option Two**) is an increase and extension of the city's utility occupation tax.

Xcel franchise ballot language
On June 7, 2011, the council will consider whether to introduce on first reading an ordinance that will place an Xcel franchise agreement on the ballot. At the time this memo was published, the council had yet to take any action on this item.

VIII. NEXT STEPS: EVALUATING BOULDER'S ENERGY OPTIONS

The June 14 Study Session is focused on the presentation of analysis results regarding the legal, technical and financial feasibility of creating a local electric utility in Boulder. It also provides an overview of ballot options for council consideration, as well as an updated report on the "localization" study that has been prepared for the city.

The critical next step is to help the council and the community understand the information that has been presented, and to make sense of it in relation to the goals that have been articulated. It is also critical that analysis of the new proposal from Xcel be completed in a timely and comprehensive manner to inform council and community consideration of this potential path.

With the various analyses completed, the resulting information will be used to inform a comparative evaluation of the different potential paths for achieving Boulder's energy goals. Staff is preparing a draft matrix format—simplified from previous versions—for use in presenting a summary of evaluative comments by goal area for each path under consideration.

Key work tasks planned for the remainder of June and into July, leading to the July 19 public hearing before council include:

- **Ongoing outreach, education and media relations.** Continue public outreach activities, media relations, and business community outreach, including the planned public forum on June 28.
- **Analysis of new Xcel proposal.** Conduct detailed analysis of the new proposal from Xcel (projected rate impacts and benefits, GHG emissions, financing options, relationship to localization goals, etc.) and prepare a summary of analysis results in time for the June 28 public forum (ideally) and/or July 19 public hearing (at the latest).
- **Continued refinement of other analyses.** Develop additional information and refinements as needed based on council's input and continued review by expert advisors and others.
- **Ballot language.** Continue to develop ballot language options based on input from council at the June 14 study session, as well as input from bond counsel.
- **Community survey.** Conduct a random sample survey of Boulder voters to better understand how well information is being communicated and gauge community perspectives on the options under consideration.

- **July 19 Public Hearing.** Prepare for and conduct a public hearing on July 19 as part of council's first reading of ballot language options.

ATTACHMENTS

A. May 10 Study Session Questions and Responses
B. Baseline Energy Analysis
C. Municipal Utility Efforts
D. Utility Development Plan
E. Business Plan
F. Cost Model Summary
G. Feasibility Study
H. Localization Report
I. Draft Ballot and Charter Language
J. Community Outreach and Feedback
K. Community Correspondence