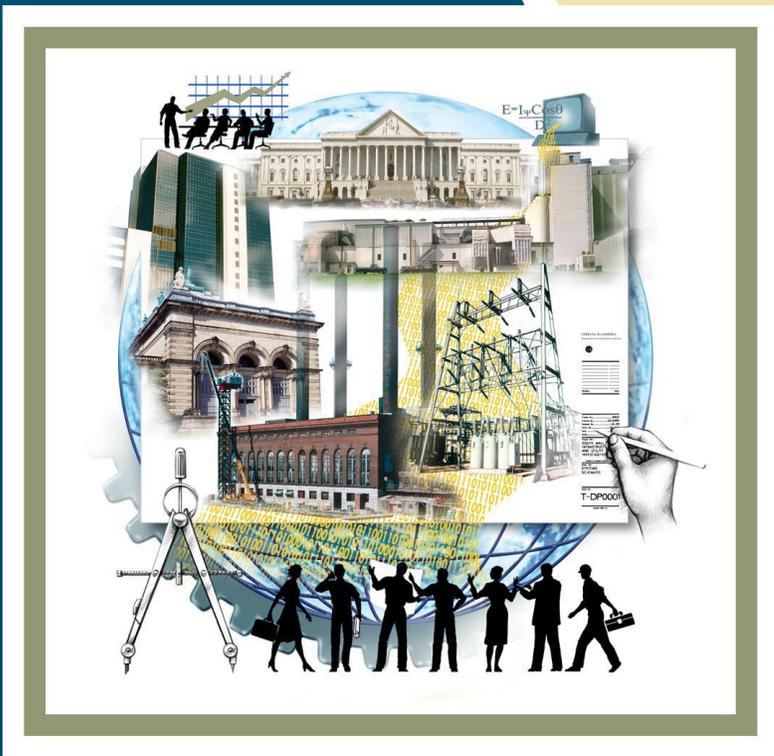


# Municipal Energy Management Strategies



May 2006

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## **Table of Contents**

<b>Executive Summary .....</b>	<b>1</b>
<b>Municipal Energy Management Strategies .....</b>	<b>3</b>
<b>Energy Visibility .....</b>	<b>3</b>
<b>Community Education .....</b>	<b>6</b>
<b>Centralized Energy Management Programs .....</b>	<b>7</b>
General Duties .....	8
<b>Decentralized Energy Management.....</b>	<b>10</b>
<b>Energy Conservation .....</b>	<b>11</b>
<b>Contracting.....</b>	<b>13</b>
<b>Energy Procurement.....</b>	<b>14</b>
<b>Deregulation .....</b>	<b>15</b>
<b>Renewable Energy .....</b>	<b>16</b>
<b>Air Emissions.....</b>	<b>17</b>
<b>Conclusion .....</b>	<b>18</b>
<b>Common and Best Practices .....</b>	<b>19</b>
<b>Appendix A: Survey Questions.....</b>	<b>20</b>
<b>Appendix B: Energy Program Summaries .....</b>	<b>24</b>
Akron, OH .....	24
Austin, TX .....	24
Baltimore, MD.....	26
Chicago, IL .....	30
Cleveland, OH .....	32
Dallas, TX.....	34
Denver, CO .....	35
Des Moines, IA.....	36
Fort Worth, TX .....	38
Madison, WI .....	40
Milwaukee, WI .....	42



# Report Title

## *Table of Contents*

Milwaukee County, WI.....	44
Minneapolis, MN .....	46
Phoenix, AZ .....	50
Portland, OR .....	52
<b>Appendix C: Municipal Program Contacts .....</b>	<b>55</b>
<b>Appendix D: Municipal Energy Policies .....</b>	<b>58</b>



## ***Executive Summary***

Rising and increasingly volatile energy prices have caught the attention of municipalities across the nation. Whether prodded by state legislation, mayoral leadership, or budgetary squeezes, cities are paying more attention to energy costs and finding ways to reduce energy consumption. This report compiles the results of surveys from officials in fifteen cities across the United States.

Cities are making a real commitment to energy management. Half of the cities surveyed have a formal energy policy, and four others are under development. Public participation is important, with more than half of those cities with an existing or developing strategy inviting public comment. Four cities have set up special task forces to consider energy strategies. The US Green Building Council's Leadership in Energy and Environmental Design (LEED) standard has been adopted, either formally or informally, by more than half of the cities surveyed. Several cities participate in aggregated purchasing programs and other forms of price hedging, but cities are generally very conservative when it comes to employing market-based tools.

It appears the trend in municipal energy management is towards centralization. Half of the cities interviewed had a centralized energy manager and one additional city is considering adopting a similar structure. Nearly all of the cities that do not have a formal centralized energy management structure engage in some type of coordination of energy management activities.

More than half of the cities interviewed maintain sufficient staff expertise to manage and perform energy efficiency projects internally. Of those that contract for that work, four use the Energy Service Company (ESCO) model to perform the work. Monitoring and verification of energy savings is gaining visibility, especially in the cities that use ESCOs.



## Report Title

### *Executive Summary*

Cities are beginning to realize the value of their energy consumption data. All of the centralized energy management programs have a formalized data gathering and monitoring program and three of the cities without a central program have some sort of data platform to track consumption. Cities use the data for a variety of functions, including benchmarking buildings, verifying energy savings, aggregating demand for purchasing partnerships, budgeting, checking for billing errors, and even for real-time demand response programs.

While most cities have focused their energy management efforts on natural gas and electricity, several are beginning to include other utilities, such as chilled water, steam, and motor fuels. As motor fuel prices become increasingly volatile and expensive, more cities may include the fuels in energy management programs.

All cities interviewed are deregulated with respect to natural gas. Four of the cities interviewed are deregulated with respect to electric supply while another is moving toward electric deregulation. Of all cities involved with open market natural gas purchases, only five are engaged in price hedging. Two additional cities are considering price hedging for electricity.

Many cities are adopting renewable energy technology and at least two cities have found renewable energy to be cheaper than conventional power in some cases. The renewable energy sources used include wind, solar, biogas, hydroelectricity, ethanol and biodiesel.

Cities are looking beyond their own facilities when dealing with energy management. Nine of the cities surveyed had some form of community education, such as leading by example, adopting building codes, and requiring specific energy efficiency strategies in projects that receive city funds.

Increasing expense is not the sole motivation for cities to examine their energy use. Most cities surveyed were also concerned with the air emissions related to energy generation and consumption. Half of the cities interviewed have signed on to the US Mayors Climate Protection Agreement.

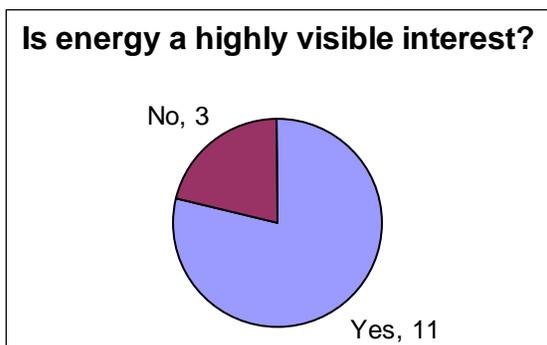


## ***Municipal Energy Management Strategies***

In March 2006, the City of Minneapolis commissioned a study, conducted by Sebesta Blomberg and Associates (Sebesta), to survey and compare the energy management strategies of 14 cities across the United States with the City of Minneapolis. City of Minneapolis responses are italicized throughout this document for comparison purposes. The cities surveyed were Akron, OH; Austin, TX; Baltimore, MD; Chicago, IL; Cleveland, OH; Dallas, TX; Denver, CO; Des Moines, IA; Fort Worth, TX; Madison, WI; Milwaukee, WI; Milwaukee County, WI; Portland, OR; and Phoenix, AZ. Officials in Buffalo, NY; Duluth, MN; Seattle, WA; and St. Paul, MN were also contacted but declined to participate. The Sebesta team conducted phone interviews with city officials to learn about their energy management strategies. This report makes no attempt to rank municipal programs; cities ranked themselves when asked value questions. Appendix A lists the survey questions, Appendix B provides a summary of each city’s energy management program, Appendix C lists the officials interviewed, and Appendix D lists municipal energy policies available online.

### ***Energy Visibility***

Eleven of the cities interviewed rated energy and the environment as a highly visible interest. The remaining three cities rated energy and the environment as



moderate concerns. One city has a long history of concern for energy and the environment, beginning with its response to a state law requiring all municipalities to adopt a comprehensive plan that addressed growth, development, zoning, and

other responsible land use concerns that affected energy and the subsequent adoption of a formal energy policy in 1979. Another has had an energy plan in place for the past 25 years. One city’s municipal utility energy conservation program has saved the equivalent of a 500 MW power plant (called their



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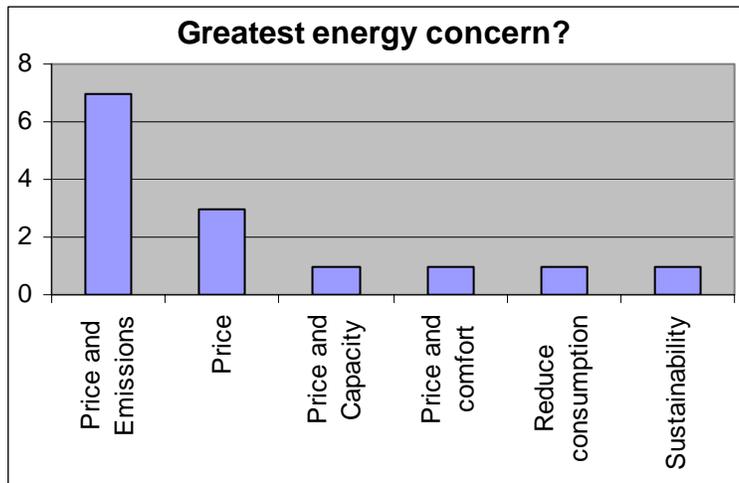
## Energy Visibility

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“conservation power plant”) over the years.

*Energy and the environment have been a high priority in Minneapolis for a long time. The city has been working on energy-related issues for more than fifteen years.*

When asked to describe their greatest concern regarding energy, twelve cities cited increasing and volatile prices. Seven of those cities were equally concerned about air emissions associated with energy production and use, one city was concerned

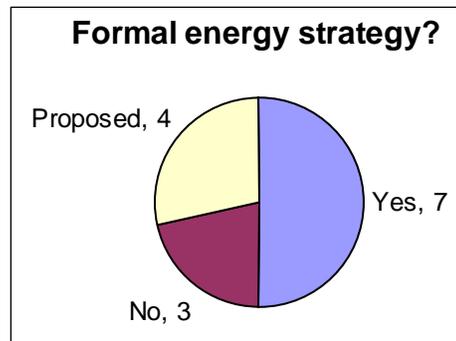


with generation and transmission capacity, and one was concerned with employee comfort and productivity. Of the two remaining cities, one was solely concerned with reducing energy

consumption and another said sustainability was their most important issue—that, in their view, prices were not high enough to “serve as clear price signals to encourage the wise use of energy and to instill a need to invent new ways of sustainable energy and environmental progress.”

*Minneapolis rates environmental concerns and the need for local, renewable energy as its greatest driver, but is also concerned about rising and volatile prices.*

Seven cities have a formal energy plan in place, and three of those have been formalized into rules. One city formalized their energy plan in an Administrative Bulletin. Another city’s energy





management program was established by ordinance and a third city adopted both the 1990 Energy Policy and the 2001 Global Warming Plan by resolution.

Four cities are in the process of adopting a formal energy plan. In one city, the city council created a Green Building Task Force charged with studying the application of high-performance, sustainable guidelines and standards to public and private construction and renovation projects. Another city hired a sustainability manager who, along with a steering committee comprised of city officials and local environmental and sustainability organizations, is examining city-wide energy efficiency potential, coordinating sustainability initiatives and developing an energy management program. A third city's Mayor created a Task Force on Energy Conservation and Environmental Preservation, made up of city officials, businesses, and residents. The Task Force is charged with considering energy conservation (with a goal of a minimum 10% reduction in energy use), improvements to indoor air quality; use of environmentally friendly and renewable building materials; LEED certification, and environmental education needs in the city. In a fourth city, the Mayor created an Energy Task Force in 2003 that studied energy issues, culminating in a 2005 report. That city is now working to formally implement the report's recommendations.

*Minneapolis does not have a formal energy plan.*

Five cities have some form of policy or ordinance relating to energy consumption and two cities have informal goals. Policies and ordinances include:

- Requirements to reduce energy consumption
- Requirements to implement energy management improvements with a payback of up to fifteen years
- Requirements for all new municipal buildings to be built to LEED or US EPA Green Building standards (two cities require LEED Silver certification)



# Report Title

## Community Education

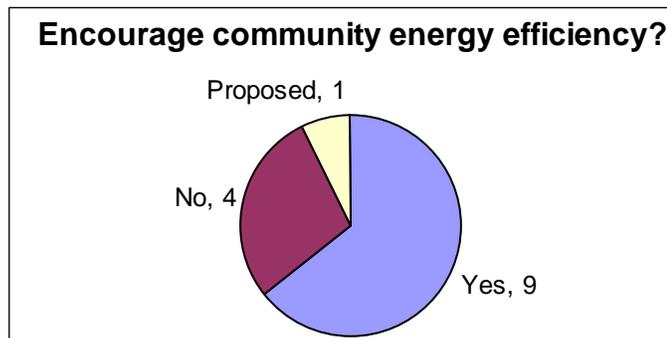
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- Requirements for all new office equipment to meet Energy Star standards
- Designation of a formal energy manager
- Renewable energy standards (such as requiring 10% of all energy consumption to be supplied by renewable energy by 2006 and 20% by 2010)

*Minneapolis adopted a set of 21 Sustainability Indicators, three of which relate to energy. Those indicators include goals for emission reductions, renewable energy use and alternative transportation. The indicators were developed in partnership between city officials and the Citizen’s Environmental Advisory Committee. Minneapolis has also informally adopted guidelines for green building, Energy Star equipment requirements, and energy conservation goals.*

### Community Education

Nine cities also attempt to encourage energy efficiency among citizens and businesses. One is developing an effort to do so. Cities have generally used three



tactics to encourage community energy efficiency: ordinances, incentives and education. Five cities use ordinances to encourage energy efficiency. Four of those

cities have adopted their own building codes. A fifth city encourages sustainability through planning, land use, zoning, and transportation management.

Two cities have tied monetary incentives to energy efficient building. One city’s sustainability manager has worked with community economic development agencies to include efficiency in their programs and this year the community development housing program will offer a \$5,000 bonus to builders for Energy Star certified housing low- and moderate-income units and is conducting an



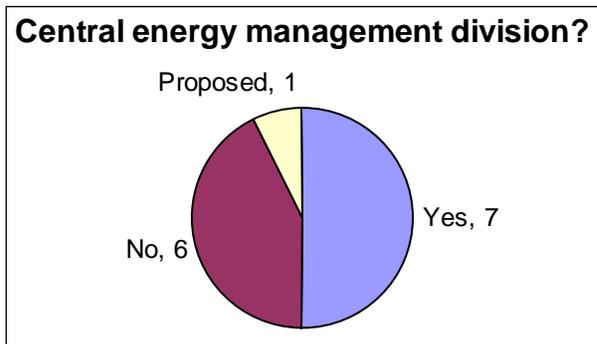
additional pilot for LEED certified housing. Another city requires any building that receives public funding to have a green roof and is discussing ways to encourage LEED buildings via incentives.

Four cities use education to promote community energy efficiency. One city encourages its citizens to build to LEED standards and to use daylighting to reduce artificial lighting requirements. Another city educates municipal employees and the general public through the “Tighty Lighty” program, which featured a cartoon character helping to promote energy awareness and efficiency. A third city established a “Green Team,” which is a collaboration of business leaders, government officials and citizens. The Green Team’s website includes information on green building, managing stormwater, energy efficiency, and renewable energy as well as a calendar of events. The final city’s municipal utility has an extensive public outreach and education program, which includes workshops, on-line energy analysis tools, product and technology guides, rebates, low-interest loans, a renewable energy choice program, and free home energy improvements for income-qualified citizens.

*Minneapolis does not have a formal energy-related community education program for its citizens, but it leads by example and intends to develop a program.*

### Centralized Energy Management Programs

To manage energy consumption, seven cities have a central energy management program that covers all city facilities and departments, and one city is considering



creating such a program. Program budgets range from \$100,000 to \$5.5 million, with funding from a variety of sources. Four cities rely on General Funds. Another city receives General Funds as well as a surcharge on each agency’s energy consumption, not to

## Report Title

### *Centralized Energy Management Programs*

exceed \$15,000 annually per agency. A third city is funded by a surcharge on each Department's energy budget, and another city's program was started with bond money and is sustained by a revolving loan fund.

*Minneapolis takes a decentralized approach to energy management.*

Program staffing ranges from one coordinator plus designees from each department to a program with 32 employees. In one city, energy management is performed by the Office of Sustainability, which is a cabinet-level office that reports directly to the Mayor. Two energy management programs are within the Public Works Department and two are housed within the General Services Department. Another energy management program is within the municipal utility, while the final city has an Office of Sustainable Development within the Commission for Public Affairs.

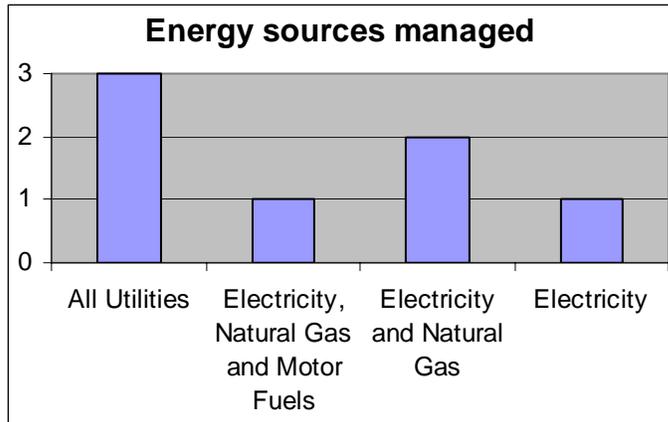
Six of the centralized programs use specialized software to track energy consumption in buildings. Three cities have custom-built software, two cities use Utility Manager Pro, one city uses EnergyCAP, and one city uses Engage Networks. Another city uses data from its custom financial software. All programs use the software to track progress on energy efficiency projects and three of the cities use the data on a daily basis to make real-time decisions regarding energy consumption and peak-shaving. Data is also used to look for billing errors, compare building performance among city facilities, and make budget forecasts.

### **General Duties**

All central energy management programs have responsibility for energy conservation improvements. One city's program is able to control energy use and efficiency implementation because it acts as the landlord for all city buildings. Another city's program has authority over other departments' energy use and accounts payable, while the five other programs take a consulting role. None of the programs have a formal regulatory role, but one city's program regularly testifies in front of city and state commissions and the programs in two other cities may

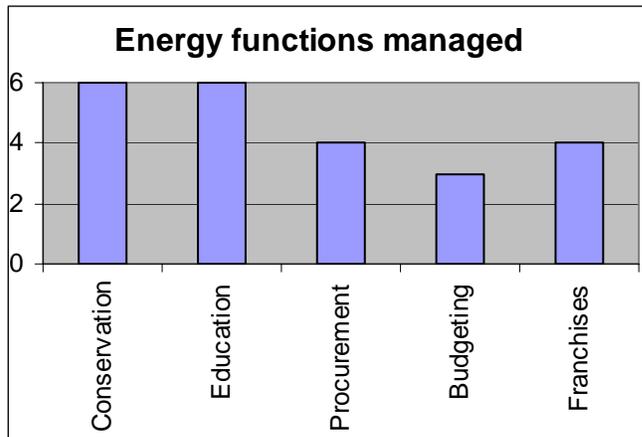


intervene in utility rate cases on behalf of the city.



Three programs manage all utilities (including chilled water, steam, and sewer); one covers electricity, natural gas, and motor fuels; two others manage electricity and natural gas; and one focuses solely on electricity.

Three programs perform energy budgeting for all city departments, while the other cities provide advice upon request. Four of the programs also manage energy procurement and one other city's program is considering assuming that responsibility. Four programs manage the cities' energy franchises, while one program plays a secondary role and two others are not involved.



All programs are responsible for managing capital improvements associated with energy projects. Six of the programs include an educational program. One of those programs offers training seminars on HVAC, boilers, motors, and other issues to city technicians. Programs in three of the cities also provide city-wide energy efficiency services to residents and businesses, in addition to their programs for city buildings and employees.

## ***Decentralized Energy Management***

In the seven cities that do not have central energy management programs, energy management is usually done separately by each department. However, six of those cities do have some form of coordination among departments. One city has hired a Sustainability Manager who heads a team with a representative from each department. Another city's Building Services division consolidates energy information from each department. In a third city, energy management is coordinated through the Parks' department. A fourth hired an energy conservation specialist who compiles information from each department and serves as an advisor to the various departments. In another city, the Architectural, Engineering, and Environmental Services Division provides energy consulting to other city departments. In the sixth city, department heads meet monthly to review energy data and discuss issues, with coordinating support from the Engineering division.

*Energy management is performed separately by each department in Minneapolis, but the departments coordinate their activities through the Environmental Coordination Team, which has seven work teams that address separate energy-related areas.*

For the six cities that have some coordination, staffing levels are generally low, ranging from part of several staffers' time to one full-time position. Three of the coordinators play a role in energy budgeting and two also handle energy procurement.

*Minneapolis' efforts are supported by part of several staffers' time. The work teams are each headed by separate leaders and there is no central coordinator.*

Six of the cities have found their departments willing to coordinate energy management, although budgetary issues can be touchy. Obtaining buy-in and cooperation from all employees, especially on issues regarding building temperature and lighting, can be more difficult. One city found success by seeking out janitorial cooperation in turning off personal space heaters, coffeemakers, and room lights.



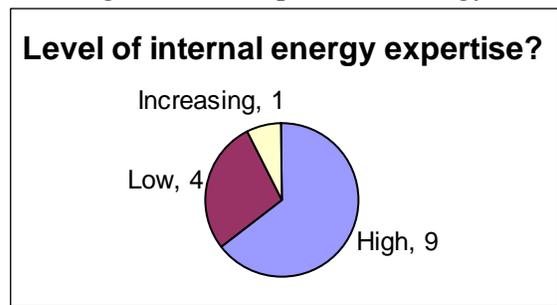
*Minneapolis has found the departments are very willing to cooperate in the Environmental Coordinating Team.*

None of the cities with decentralized energy management use formal energy management software. Two cities track activity using an Excel spreadsheet, and one of those has issued an RFP for a formal software package. One city uses the data for aggregated purchasing. Another uses it for budgeting and prioritizing buildings for energy efficiency projects and may use it in the future to develop a system to create incentives for facility managers to improve energy efficiency.

*Minneapolis does not have formal energy tracking software. It is able to obtain high-level energy data from utilities, but does not have the staff time to track and analyze energy costs in a comprehensive manner.*

## Energy Conservation

Nine cities, including all of the cities with a central energy management program, have high internal expertise in energy efficiency. Another city with a decentralized



program currently has moderate expertise but has an aggressive training program in place. The remaining four cities contract out much of their energy efficiency work.

*Minneapolis has high internal expertise within separate departments, but that expertise is not always readily available across departments.*

Ten cities said energy efficiency activity is continuing at a high rate. Completed projects include energy audits of city facilities, lighting retrofits, HVAC replacements, implementation of building automation controls, replacement of traffic lights with LEDs, commissioning and recommissioning of facilities, and LEED certification for new buildings. A majority of the cities manage energy efficiency projects internally, but a few use ESCOs or other outside contracts for

## Report Title

### Energy Conservation

some of the management. Four cities have a master list of all major energy using equipment in the city and one city is working on developing such a list. The inventory lists are also used for preventative maintenance. One city even maintains the list on the internet, so it is easily accessible by all employees. In five additional cities, inventory lists are maintained by each department.

*Minneapolis has been very active in identifying and installing energy improvements in municipal facilities. Projects have included energy audits, HVAC improvements, conversion of traffic signals to LEDs, control strategies for water processing and pumping, lighting upgrades and recommissioning facilities. Individual departments maintain inventory lists that are used to determine high energy consuming equipment and develop action plans.*

Funding sources for energy efficiency projects vary widely. Sources include general fund money, operations & maintenance budgets, capital investment programs, bond issues, ESCO model (paid through savings), state revolving loans, state grants, corporate grants, negotiated utility funds, and community organization grants. Several years ago, one city developed a unique funding source for their energy efficiency programs, using rebate funds. Through this “rebate reinvestment enterprise,” energy efficiency rebates are re-invested into future energy efficiency projects. This enterprise is now into its 6th tier of energy efficiency improvements funded by rebates from previous projects.

*Minneapolis can access four different funding sources for energy projects: the Capitol Improvement Program, cash reserves, revenue bonds, or the operating budget. The funding source chosen depends on the size of the project and the department.*

Nine of the cities regularly take advantage of energy efficiency rebates for their projects, but several of those cited onerous paperwork burdens that can be a disincentive to use the rebate. Revenue from rebates is either funneled back to the general fund, used to pay back that particular energy efficiency investment, or, in the case of one city, invested in future energy efficiency projects.



*Minneapolis monitors utility provider incentive programs and participates whenever possible.*

Eleven of the cities perform some monitoring and verification (M&V) of their energy efficiency improvements and one city plans to do M&V through the ESCOs that perform future projects. Of the eleven cities, eight perform M&V using energy data to verify savings. One city also produces an annual report for the city council that compares year to year energy data weighted by heating degree days. Two cities rely on ESCOs for their M&V and one city is putting less emphasis on M&V now that they have several years of experience verifying the savings of energy efficiency projects.

*Minneapolis does not regularly perform monitoring and verification. The city can perform high-level assessments of buildings based on comparisons of annual energy consumption.*

## **Contracting**

Thirteen of the cities contract out some portion of their energy management duties. Services contracted for include energy audits, training, design, commissioning, re-commissioning, project management, and energy procurement. Four of those cities use Energy Service Companies (ESCOs) to perform their energy projects under a performance contracting model. Under this model, an ESCO develops, installs, and finances energy improvement projects with the cost of the project paid for out of the savings of the project generally over a seven to ten year period. ESCOs generally act as project developers for a wide range of tasks and assume the technical and performance risk associated with the project.

*Minneapolis generally manages projects internally, but tends to use contractors for audit, design, equipment specification, and, in some cases, project implementation. Minneapolis has explored the ESCO model, but has not yet entered into such a contract because they prefer to utilize their own financing through tax-free bonds.*



### Energy Procurement

All of the cities handle energy procurement internally, with two cities also using external consultants for advice. In one of those cities, the consultant is also responsible for monthly balancing and nominations and periodic bidding for suppliers. In six cities, the energy management division or energy coordinator is responsible for energy procurement. In three cities, energy procurement is handled through the finance department, and two cities have municipal utilities that procure the energy.

*In Minneapolis, departments procure their energy separately.*

Five of the cities surveyed are deregulated. The number of electric and natural gas suppliers ranged from two to eight. In eight of the cities, the utilities assign specific account managers to the city and one utility holds annual meetings to update the city on energy issues.

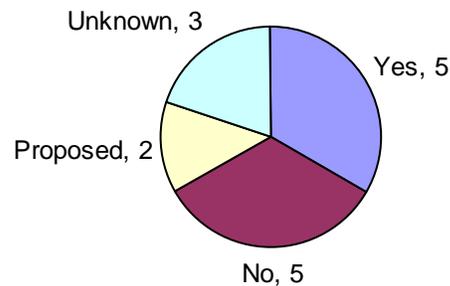
*Minneapolis is regulated and is served by one electric and one natural gas supplier. The utilities assign specific account managers to the departments.*

Six cities participate in aggregated purchasing, with partners including schools, colleges, universities, counties, and other cities. Four cities are investigating aggregated purchasing.

*Minneapolis does not currently participate in any large scale aggregated purchasing partnerships, but is interested in exploring the concept for fuels and natural gas.*

Five cities use some form of price hedging for their natural gas supply. Four hedge directly and one hedges through their aggregated purchasing program. The four that hedge directly, rely upon purchasing futures or long-term fixed contracts; no cities

**Does the city hedge energy prices?**





interviewed purchase options or other derivatives. Two other cities are investigating hedging for electricity.

*Minneapolis engages in limited cost management practices through electrical peak load management, dual fuel strategies for natural gas and agreements to not exceed a maximum limit of peak consumption for steam and chilled water, regardless of the temperature, but does not formally hedge energy prices.*

## **Deregulation**

Electric deregulation generally means the generation portion of electricity service is open to competition, giving customers the opportunity to choose their electric generation supplier while still receiving the power through their local supplier. The decision to deregulate the sector is made at the state level. Four of the cities interviewed are deregulated and one is in the process of becoming deregulated.

Deregulation does not seem to materially affect municipal energy management programs. For the most part, trends for deregulated cities are very similar to those for all the cities as a whole. For the five deregulated cities:

- Four rate energy and the environment as a highly visible interest (compared to 11 out of 14).
- Three rate price and emissions as their greatest energy-related concern, while two cited only price as their greatest energy concern (compared to 7 citing price and emissions and three citing price only out of 14).
- Two have a formal energy plan and two are developing such a strategy (compared to 7 formal and 4 proposed out of 14).
- Two cities encourage community energy efficiency and one is developing such a program (compared to 9 programs and one proposal out of 14).
- Two have central energy management programs and one is considering centralization (compared to 7 central programs and 1 proposal out of 14).



# Report Title

## Renewable Energy

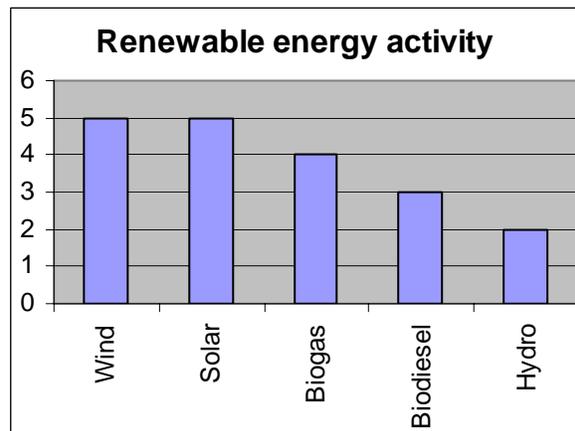
- There were no difference in trends among staff and duties of central or decentralized energy management programs between cities that are deregulated and those that are still regulated.
- Three cities said energy efficiency work continues at a high pace (compared to 10 out of 14).

Deregulated cities' energy management programs did differ in a few areas:

- All five deregulated cities perform monitoring and verification of their improvements (compared to 11 of 14).
- Deregulated cities have a higher trend of using ESCOs for their energy project work – three of the five use ESCOs (compared to 4 out of 14).
- Deregulated cities have a higher number of electricity providers, showing that they generally do take advantage of retailer choice.
- Three cities hedge natural gas prices (compared to 5 out of 14).
- Three cities have renewable initiatives and two are considering such investments (compared to 9 current and 3 potential programs out of 14).

### Renewable Energy

Nine cities currently have renewable initiatives and another three cities are considering such initiatives. Of those nine, seven cities use multiple sources of renewable energy. Wind is used by the majority of the cities, and three cities are expanding beyond renewable electricity to include biodiesel in their motor fuel. One city has a goal of obtaining 20% of its electricity from renewable resources by 2006. Another city plans to obtain 100% of its





electricity from wind resources by 2010, and may reach that goal by 2007. A third city has switched the majority of the city's "General Fund" accounts to 100% green power through the municipal utility's "Green Choice" Program. Two cities are investigating fuel cells.

*Minneapolis has several solar energy projects and is investigating wind energy. The city uses E85 and biodiesel blends in its fleet.*

## **Air Emissions**

When asked what issues were of greatest concern regarding energy, eight cities included air emissions in their response. While implementation of energy efficiency and adoption of renewable energy both serve to reduce air emissions, several cities have undertaken additional efforts.

Austin, Baltimore, Chicago, Denver, Des Moines, Madison, and Portland have all signed on to the US Mayors Climate Protection Agreement, which commits the cities to strive to meet or beat the Kyoto Protocol targets in their own communities; to urge their state governments and the federal government to enact policies and programs to meet or beat the Kyoto Protocol greenhouse gas emission reduction target for the United States; and to urge the U.S. Congress to pass bipartisan greenhouse gas reduction legislation, which would establish a national emission trading system.

Another city is also a charter member of the Chicago Climate Exchange, committing to decreasing their carbon footprint by one percent each year. Other programs to reduce air emissions include an anti-idling policy for city vehicles and free bus passes for city employees, and two cities have purchased hybrid vehicles for the city fleets.

*Minneapolis also included air emissions as its greatest energy-related concern. The city is a signatory to the US Mayors Climate Protection Agreement. Minneapolis has purchased hybrid vehicles for its fleets and will begin tracking all emissions.*



### ***Conclusion***

The cities interviewed have implemented numerous energy-saving projects and several cities with older programs are finding additional savings by revisiting earlier projects. Higher energy prices are making more projects cost-effective and are making renewable energy alternatives more competitive as well. Most cities are coordinating their energy management efforts, either through a formal, centralized energy management program or an informal team of city officials.

While high and volatile prices were the major drivers for most programs in the beginning, concerns about air emissions are helping to continue the focus.

Reducing energy use and switching to renewable sources can reduce air emissions from fossil-fuel-generated electricity plants. Several cities are also adopting renewable fuels in their fleets.

Many of the cities are looking beyond their government facilities and initiating community-wide energy efforts, including passing stricter building codes and offering incentives for sustainable building practices.

Energy management is clearly a growing concern for municipalities. Most of the cities have chosen to respond to high and volatile prices by either reducing their consumption through energy efficiency projects or using alternative energy sources, such as wind and solar energy. Six of the cities participate in aggregated purchasing partnerships. Only four of the cities actively hedge their energy risk, and do so only through fixed-price, long-term contracts. There seems to be an opportunity for more cities to capture additional savings through energy price risk management as well as energy conservation and adoption of alternative energy sources.



## ***Common and Best Practices***

Based on the primary trends garnered from the analysis of municipalities participating in this survey, the following recommendations are set forth for the City of Minneapolis:

- Combine all energy management efforts for internal city operations into one central program (7 centralized programs and 1 proposal out of 14) with dedicated staff.
- Include electricity, natural gas, chilled water and steam in the program's scope (3 of 7).
- Manage conservation (6 of 7), education (6 of 7), procurement (4 of 7), and franchises (4 of 7). Take informal, consulting role on budgeting (4 of 7).
- Purchase formal energy software and dedicate staff time to tracking energy costs and monitoring and verifying energy improvements (6 of 7).
- Use general fund money to sustain the program (5 of 7). Explore using franchise fees to supplement the general fund money.
- Consider aggregated purchase partnerships for natural gas (6 partnerships and 4 exploring out of 14).
- Begin hedging natural gas prices through long-term contracts and futures purchases (5 out of 14).
- Participate in an energy-related community education and outreach effort (9 programs and 1 proposal out of 14).
- Continue renewable energy efforts (9 initiatives and 3 proposals out of 14) and consider biogas as a source of renewable energy (4 out of 9).
- Continue emissions reductions efforts (8 out of 14).



### Appendix A: Survey Questions

1. General Background
  - a. Generally is energy and environment a highly visible interest for {City}?
  - b. Does {City} have a formal energy strategy?
    - If so, how is it developed?
    - Who is responsible for its development?
    - Has it been formalized as an ordinance?
  - c. How is energy monitored?
  - d. Does {City} have a data platform to track energy consumption and cost?
    - If {City} uses a data platform what system is being used?
    - Who uses it?
    - How is it being used?
  - e. How are energy cost budgeted?
  - f. What is the size of the energy budget?
2. How is energy managed?
  - a. Does {City} have an Energy Management Division? (if not, skip to b)
    - i. Where does the division reside or report to in the organizational structure?
    - ii. Does this division have authority over other departments in {City} as it pertains to being accountable for energy consumption, conservation, etc.?
    - iii. How is the division funded (i.e. taxes, rate surcharge)?
    - iv. What is the staffing level/model/and FTE? Can {City} share an org chart?
    - v. Are there job descriptions to share?
    - vi. What is the overall operating budget for department?



- vii. What is the overall budget for energy procurement? (For the commodity or for obtaining the commodity?)
- viii. What are the general responsibilities of the Department?
  1. Electric, gas, coal, liquid fuels, other utilities?
  2. Regulatory responsibilities (emissions, rates, customer complaints)?
  3. Producer/generator and/or municipal utility?
  4. Internal (city operations)
  5. City-wide services to residents and businesses?
  6. Manage energy accounts payable?
  7. Manage energy budgeting?
  8. Manage conservation programs?
  9. Manage energy procurement and/or contracting?
  10. Manage franchise agreements?
  11. Purchase, invest in, or develop renewable energy?
  12. Capital improvements associated with energy?
  13. Educational and PR programs? Internal or City-wide?
- b. If there is no Energy Management Division, how are energy management issues addressed?
  - i. Who is responsible?
  - ii. Describe staffing?
  - iii. How is energy accounting/budgeting managed?
  - iv. How is energy procurement managed?
  - v. How is energy consumption managed?
  - vi. What is the level of focus on energy?
  - vii. Are departments willing to coordinate energy related activity?



# Report Title

## Appendix A: Survey Questions

- viii. How are results measured?
3. How are electricity and natural gas procured?
    - a. Is {City} regulated in their jurisdiction?
    - b. How many providers serve {City}?
    - c. Who are they?
    - d. Do they assign specific account managers to {City}?
    - e. Does {City} participate in aggregated purchasing partnerships?
    - f. Does {City} hedge energy pricing?
    - g. Does {City} hedge directly or through suppliers?
    - h. Does {City} operate under any specific balancing/pooling strategies?
    - i. Is procurement done internally or outsourced?
  4. How is energy consumption managed?
    - a. What is the internal expertise/capability?
    - b. How much focus is placed on energy conservation?
    - c. What is the rate of activity in the area of energy improvements?
    - d. Do inventories of major energy-using devices such as large motors, pumps, street lights, HVAC, etc. exist?
    - e. Are projects internally managed or outsourced?
    - f. How are projects funded?
    - g. How are rebates/incentives managed?
    - h. How are the results of energy conservation programs measured and verified?
  5. What service areas does {City} typically outsource?
    - a. What skills set is sought from consultants?
    - b. How are consultants selected?
    - c. What type of contract is used?



- d. What is the duration of contract?
- e. How are consultants measured?
- 6. What types of policies or ordinances does {City} have in place associated with energy management?
- 7. What issues are your greatest concerns for your energy needs?
- 8. Are there any current initiatives underway in the areas of renewable energy?
- 9. Does {City} encourage citizens and business toward energy efficiency through initiatives, planning, zoning, incentives or education to provide energy and environmentally progressive development and new construction?
- 10. Are there any current initiatives underway to reduce emissions associated with energy production and utilization?
- 11. Are there any current initiatives underway to change ordinance or code associated with energy use?
- 12. Would {City} like a copy of the resulting report?

## **Appendix B: Energy Program Summaries**

### **Akron, OH**

Energy and the environment are a concern in Akron, with price volatility the major issue driving activity. However, a comprehensive energy management program has not been implemented. Energy management activities are conducted by each Department, with varying levels of focus. The comptroller's office handles all energy procurement, budgeting, and payment.

First Energy provides electricity and Dominion provides natural gas to the city. The city participates in aggregated purchasing for natural gas with the county and a local university.

Akron has hired consultants for energy management projects, but details about the scope were not available.

Akron does not currently have any initiatives regarding emission reductions or renewable energy (a former MSW to energy project was shut down due to the need for costly emission control upgrades).

### **Austin, TX**

Energy conservation and the environment have been very high priorities in Austin since the 1980s. The City's Energy Manager and Municipal Energy Conservation Program (MECP) are housed within the municipal owned utility, Austin Energy. The main drivers for the energy management program are to reduce the city's energy consumption, to reduce operating costs, to delay the need for new generation capacity, and to lessen the environmental impact on the community. As a result, the utility's energy conservation programs are evaluated annually for cost effectiveness by comparing program costs to the cost of building new generation capacity.

An Administrative Bulletin in February 2005 established Austin Energy as the



City's Energy Manager and mandated that each department develop its own energy efficiency plan. The Administrative Order also mandated that all new office equipment shall be Energy Star compliant, building temperatures and humidity levels will be compliant with ASHRAE Standard 55 - 1992, and all buildings will be designed, constructed, renovated and maintained in accordance with the International Energy Efficiency Code (IECC), and shall accomplish a minimum rating of LEED Silver.

The MECP is staffed by one full-time employee and several other employees that devote part of their time to the effort, with an annual budget of approximately \$400,000, including approximately \$249,000 for projects. In the beginning, energy efficiency projects were funded with bond money, but are now funded through several methods including annual operating funds and outside sources like the State of Texas LoanSTAR Program (low interest loans).

The City's Energy Manager and the MECP monitor energy use with Utility Manager Pro software and plan to use the data in quarterly "report cards" issued to each Department. The MECP manages all city-related energy efficiency activities, including monitoring and verification, and conducts a public awareness campaign for city employees. Each city department does their own budgeting, but may consult with the MECP for forecasting advice if they plan to expand.

Austin's electricity budget is \$25 to \$28 million annually. Austin Energy, the municipal utility, provides electricity. Texas Gas Service provides natural gas; however, budget and usage details are not available. Austin is currently negotiating a contract to study the natural gas accounts and determine the most cost-effective procurement mix between vendors and the Texas General Land Office. Procurement and accounts payable for the city are all handled through a different department within Austin Energy.

To date, Austin has spent approximately \$10 million to install energy retrofits. Apart from lighting projects and other small projects which are designed and implemented internally, the City's energy efficiency projects are typically bid out

## Report Title

### *Appendix B: Energy Program Summaries*

to contractors. Currently an internally managed program is being developed that will design and implement projects through ESCOs. Consultants are chosen either through an RFP/RFQ process or from a rotating list managed by the Public Works Department. Austin is currently negotiating three energy performance contracts, which will include M&V and savings guarantees.

In addition to energy conservation, Austin also has a strong focus on renewable energy. The city has a long history with wind energy and photovoltaic systems, and as of January 2006, the majority of city “General Fund” accounts have been switched to 100% green power through Austin Energy’s “Green Choice” Program. The Green Choice Program’s fuel charge and resulting energy rates are cheaper than conventional power due to the volatility of natural gas prices over the last couple of years.

Austin Energy’s major sources of power generation are a combination of natural gas, coal, and nuclear sources. Austin Energy is currently planning improvements in their coal plant that will reduce power plant emissions. The city is investing in solar energy systems for its buildings, partially as a community education tool. Austin is also a signatory to the US Mayors Climate Protection Agreement.

Community education and outreach are performed through a different department within Austin Energy and are very robust.

### **Baltimore, MD**

Energy and the environment are a high priority for the City of Baltimore. High energy prices and air emissions are the drivers for the City’s energy management program. While there is no current formal energy strategy, the Energy Conservation Office (ECO) identified a simple process to be implemented in two distinct phases with cost reduction goals (and in turn, energy efficiency goals) of 5–10% for the community. The city council appointed a “Green Building Task Force” in 2005 to study the application of high-performance, sustainable guidelines and standards to public and private construction and renovation



projects. The Task Force issued a draft report in March 2006, which recommended the implementation of a Green Building program, including the adoption of LEED as the primary standard for commercial projects.

Energy is managed through the ECO, which was established two years ago and is housed in the Public Works Department. ECO monitors city energy use with EnergyCAP software and uses the program to monitor energy use, check for billing errors, index energy use, and compare buildings' energy consumption. ECO is funded from a percent of each department's energy budget and is staffed by the director, 4 engineers, 1 accountant, and 1 secretary, with an operating budget of approximately \$500,000. Baltimore uses the energy and operational savings to pay for energy improvements.

ECO monitors energy use, conducts employee awareness campaigns (emails and posters), performs energy budgeting and manages energy efficiency work through ESCOs. ECO engineers review the ESCO project plans and negotiate pricing terms. Currently, the Finance Department handles energy purchasing and accounts payable, but ECO may assume some of those functions in the future.

Baltimore's energy budget, including electricity, natural gas, steam, and chilled water, is about \$42 million annually. Electricity is provided by PEPCO, Baltimore Gas & Electric, Reliant Energy, and Constellation Energy. Natural gas is currently provided by Washington Gas, but the supply will be going out to bid soon. The city currently participates in aggregated purchasing for electricity with surrounding counties, cities, and school systems and is just beginning to participate in aggregate natural gas purchasing as well. The Baltimore purchasing department recently began a hedging program that consists of buying blocks of energy for a fixed price through the aggregate purchasing partnership.

Baltimore has a very active energy management program. ECO uses a process called A-B-C: Alternatives-Billing-Conservation. Alternatives focused on changing the way the city does business in regards to energy and facilities. This opened the scope for outsourced supply, bulk purchasing, performance

# Report Title

## *Appendix B: Energy Program Summaries*

contracting, and a host of additional opportunities to apply innovative private sector ideas and technology. The Billing portion of the policy addresses the opportunities to capture savings and information by close scrutiny of existing accounts. Through application of detailed analysis, the City has already seen benefits in better understanding their energy use and trends that will lead to direct changes and reductions in consumption in the future. Already more than \$500,000 have been saved through simple billing scrutiny and re-application of proper rates based on actual consumption. The final piece of the plan is Conservation. Coupling an education program with checklists, the use of CitiStat (a community wide information system), and improvements in maintenance/operations practices in City buildings has provided a solid baseline of improvement on which to build for the future. In particular, the use of CitiStat has provided a venue to focus managers on actions and results regarding energy efficiency programs. This accountability program has provided the “fuel” and incentive to maintain a continuous vigilance to identify, pursue, and capture opportunities to improve effectiveness and reduce costs to the community.

ECO has already addressed 4 million square feet of City buildings through this plan with solid results. These facilities are improved in terms of lighting, HVAC systems, building envelope and control systems to inject new technology and extract energy efficiency and savings to fuel future growth and improvements. Most recently three of the City’s buildings were awarded Energy Star ratings for their improvements in energy efficiency and the City is in the process of implementing light emitting diode (LED) traffic signals throughout the city.

ECO has also provided their assistance and experience to the Baltimore City Public School System to undertake a comprehensive energy efficiency and facility renovation program funded through guaranteed energy savings contracts at approximately 136 facilities. This program is projected to save the school district in excess of \$4 million dollars annually and is expected to fund \$50 to \$60 million worth of much needed facility improvements. School facility improvements include high efficiency lighting systems and controls, leading technology HVAC



systems, complete energy management controls, and building envelope improvements that provide significant and measurable reduction in energy consumption while improving learning and working environments for students and teachers.

To date, the City has installed more than \$7 million dollars of improvements with an additional \$5 million in facility improvements slated for 2006 in more than 33 city facilities without the need to raise taxes or alter existing budgets. These projects will result in the net savings of more than 43,000,000 kWhs and significant air emission reductions. The City has saved more than \$3 million with new programs expected to deliver and additional \$1 million in savings annually over the next several years. The city does check for rebates for energy efficiency retrofits, but has had mixed success, due to the extensive paperwork and follow-up requirements. The city monitors the results of its retrofits using the EnergyCAP software.

Baltimore chooses ESCO companies from the state of Maryland's contract and enters into contracts for approximately 18 months for projects with a 12 – 15 year payback. Consultants are measured annually, must submit energy savings reports that ECO verifies with the Energy Cap software, and must provide a savings guarantee bond.

Baltimore captures wastewater digester methane, which provides renewable electricity to the City and captures a waste stream for useful application. The city also participates in green power purchasing, focusing mostly on wind energy. Baltimore is concerned about air emissions and has invested in hybrid cars for its fleet. The City installed several systems in fire stations that collect and filter exhaust and fumes from the fire trucks in stations. These filters greatly affect the health of fire fighters and contribute to cleaner environment and City.

## Report Title

### *Appendix B: Energy Program Summaries*

A recent pilot project retrofitted the exhaust systems of three load packers to reduce harmful emissions. The effort was successful, and the city will retrofit another 110 load packers and hopes to retrofit 20 dump trucks and fire equipment. Baltimore is a signatory to the US Mayors Climate Protection Agreement.

ECO has worked to educate the community, as well as the public servants, on methods to conserve energy in conjunction with implementing facility enhancements that also reduce energy use. ECO focuses a laser effort of behavior modification within City facilities and employees. The City took an innovative approach to education of employees and the general public through the “Tighty Lighty” program which featured a cartoon character helping to promote energy awareness and efficiency.

### **Chicago, IL**

Energy and the environment have been a high priority in Chicago since the mid-1990s. With full deregulation looming, high and volatile prices are the main drivers for Chicago’s energy management program, but the city also has a strong desire to increase sustainability. In 2001, the city published an Energy Plan, which included goals such as purchasing 20% of its electricity from renewable energy sources within five years, requiring existing coal-fired power plants to meet the same emission standards as new coal-fired plants and providing 1.7 billion kWh by 2010 through smart energy management. City policy also calls for all new city facilities to be LEED certified and all new purchases to be Energy Star certified.

Chicago’s energy use is managed centrally by a Deputy Commissioner for Energy, located within the Department of General Services. Using their accounting software, Chicago is able to track electricity and natural gas use per building per month. The energy management function is funded by the General Fund and is staffed by seven employees. The Department of General Services owns most of the city buildings and functions as the landlord, so the energy program has a high degree of control over energy use and energy efficiency improvements. Generally,



the energy program is responsible for energy procurement, energy efficiency, and renewable energy. It also manages budgeting and accounts payable. The energy program has an extensive educational component, including technical training on HVAC, motors, boilers, and other technologies.

Chicago's budget is approximately \$100 million for electricity and \$35 million for natural gas. The City is moving toward full deregulation in electricity and is currently served by two companies, ComEd and Exelon. Chicago has participated in aggregated purchasing partnerships with the Power Alliance, which includes the Chicago Transit Authority, the Chicago Park District, the Chicago Public Buildings Commission, public schools, and area colleges. Chicago sources natural gas from five or six suppliers and works with a consultant to periodically bid supply and handle monthly nominations and balancing. Chicago does hedge some natural gas, depending on their feel for the market, through purchasing future contracts, not options.

Chicago's energy management program has been very active. They have audited roughly one-quarter of the city's 450 eligible facilities and implemented many retrofits. Chicago is currently negotiating a contract to retrofit all buildings with a web-based global building energy management system. This system will connect all buildings and will allow the program to remotely monitor and control each building's energy consumption from one location. Energy management projects are funded from a variety of sources, including corporate donations, grant monies and a franchise settlement with ComEd. Currently, there are no rebates available for Chicago energy projects.

Chicago generally contracts out for energy audits but performs the actual retrofits with in-house technicians. Chicago may either use an RFP system or select their contractors directly, depending on the source of energy management funds, and uses a standard, open-ended city contract. Chicago grades all contracts quarterly, rating their satisfaction with the contractors' work.

Chicago also has an active renewable energy program. Chicago's Energy Plan

## Report Title

### *Appendix B: Energy Program Summaries*

called for 20% of its electricity to come from renewable resources and the city is already more than halfway towards meeting that goal. The city has installed more than 1 MW of solar photovoltaic energy, as well as 30–40 solar thermal systems and several geothermal systems. The city is also a charter member of the Chicago Climate Exchange. As a charter member, the city committed to decrease its carbon footprint by one percent per year and expects to surpass that goal and sell the excess credits. Chicago is a signatory to the US Mayors Climate Protection Agreement.

Chicago is trying to lead its citizens and businesses to greater energy efficiency through education and example, but is looking at offering incentives for energy efficient strategies, such as LEED certification and Energy Star purchasing. Currently, Chicago requires all building projects that receive city funding to include a green roof and has passed its own energy code.

### **Cleveland, OH**

Energy and the environment are a high priority for Cleveland. Volatile energy prices are the main driver for Cleveland's sustainability program, but air emissions are growing in priority as well because the city is in non-attainment for PM and NOx/ozone. The city hired a sustainability manager in mid-2005.

For the most part, energy is managed separately by each Department. The sustainability manager's responsibilities include coordinating energy management for city facilities. The sustainability manager is housed within the Water Department, which has historically been the most active and is looking to hire its own energy manager. The Water Department is installing PowerNet software to monitor its energy use and other Departments are developing monitoring strategies. Each department receives energy consumption information from Cleveland Public Power (the municipal utility), but accounts payable is performed by the Fiscal Control Department, so facility managers aren't necessarily aware of their energy consumption or budget. In the past, Cleveland has not taken



advantage of rebates but plans to begin investigating their availability for future projects.

Electricity is provided by either Cleveland Public Power or First Energy. Cleveland Public Power hedges electricity for the city through its purchasing contracts and the city hedges natural gas through long term (24 month) fixed price purchase contracts. Natural gas procurement is managed by the Finance Department and service is currently provided by Dominion.

Cleveland is planning to release an RFP for a firm to help them design the energy management program, perform energy audits, and increase energy monitoring. Once the program is set-up, Cleveland plans to perform work internally. The sustainability manager will work with a team of energy managers from each department.

Cleveland is also investigating renewable energy. They have an off-shore wind monitoring site on Lake Erie and the municipal utility interconnected a 225 kW wind turbine located at the Science Museum and is working on a utility-scale wind project. The city is also working on a demonstration project with a phosphate-based fuel cell company and is working toward changing their coal-fired steam district system into a cogeneration system. Cleveland has begun a pilot program to run its fleet on 5% biodiesel and has implemented an anti-idling policy. 50% of Cleveland's fleet are flexible fuel vehicles, so they are looking at installing an E85 refueling station, but are waiting for approval from the regional air board.

Cleveland is mainly trying to lead its citizens to greater energy efficiency through example, but is beginning to incorporate energy efficient strategies through other departments' programs. For example, in 2006 the Community Development low- and middle-income housing program will offer a \$5,000 per unit builder bonus for Energy Star certification and are working on an additional pilot incentive for units that are LEED certified.

### **Dallas, TX**

Energy and the environment are a high priority for Dallas. The city's energy management program began in response to the Texas state goal to reduce electricity consumption by 5% per year for the 5-year period of 2001 through 2006 and will continue due to high energy prices and air emission concerns. Dallas requires all new city facilities larger than 10,000 square feet be LEED Silver certified.

Dallas is considering a proposal to consolidate energy management functions within one central office, but currently energy management is performed separately by each department and is coordinated through the Equipment and Building Services Department (EBS). EBS receives energy consumption information from each Department and maintains that information in an Excel database, which is used for aggregated purchasing. Each Department pays its own bills and does the first pass at budgeting. EBS then validates the numbers and works with the Departments if it has questions or suggestions.

Dallas' annual electric bill averages approximately \$77 million. The city is deregulated and is served by four providers: TXU, Constellation NewEnergy, Sempra Energy, and Reliant Energy. Dallas participates in aggregated purchasing for electricity with 120 other Texas members, including other cities, counties and school districts. Procurement is managed internally, through EBS. The city currently does not hedge electricity, but is investigating long-term contracts that are not based on natural gas prices.

Dallas' energy management program is very active. The city currently has three energy performance contracts in place and is pursuing additional HVAC retrofits. Projects are normally financed through the energy savings, although general funds may also be used.

Dallas has mainly contracted out its energy management work to ESCOs. The ESCOs are chosen through an RFP or RFQ process and adhere to the standard AIA contract, generally for a period of 18 to 24 months. ESCOs are responsible



for obtaining any relevant rebates and performing monitoring and verification. Dallas measures its consultants by their performance and the realized energy savings.

Dallas is beginning to implement several biogas projects.

Dallas does not have a formal community outreach program for energy, but the city has adopted the 2002 International Energy Conservation Code.

## Denver, CO

Energy and the environment have been a high priority in Denver for decades. The main drivers have been high energy prices and environmental concerns. Denver has a cohesive energy strategy, which includes recommendations to build to LEED and/or US Environmental Protection Agency Green Building Standards, but the strategy has not yet been formalized into an ordinance. The strategy is developed by the Utilities Division, in conjunction with the Mayor's Sustainability Development Initiative.

Energy management is centralized under the Utilities Division of the Department of General Services. The Division tracks city-wide energy use with the help of a custom-designed software package. The Division is funded through the General Fund and is staffed by four employees whose duties include energy management. The overall operating budget for the energy management portion, including procurement, is approximately \$100,000.

The Utilities Division has authority for all utilities, including electricity, natural gas, chilled water, steam, water, and sewer. The Division does not have any regulatory responsibilities, but is responsible for energy budgeting, accounts payable, procurement, and franchise agreements. The Division is also responsible for the energy conservation program and associated capital improvements.

Denver's annual electricity and natural gas budget is approximately \$25 million. Denver is regulated and is served by Public Service Company of Colorado. Denver

## Report Title

### *Appendix B: Energy Program Summaries*

also purchased a large amount of transport gas. Denver does not formally participate in any aggregated purchasing partnerships, but occasionally schools and others will tag onto Denver's natural gas bids. Denver engages in a limited amount of hedging but does not "play the market." Instead, Denver contracts natural gas supply for a one-year term, including both fixed-price and indexed volumes.

Denver's energy management program has a long and active history. The city pioneered the use of LED traffic signals, retrofitting all signals in the city/county area and saving nearly \$800,000 per year in energy, labor, and maintenance costs. Denver has also installed energy retrofits in many buildings and has won national awards for its projects.

Denver handles all energy management, audits, retrofits, and procurement in-house and does not contract for any energy-related services.

Denver also has a robust renewable energy program. The city purchases green power, mostly from wind sources, produces hydroelectricity and biogas and is planning a 2-MW solar photovoltaic power plant, with additional locations possible. Denver created the first Green Fleets program in the nation in the early 1990s by investing in alternative fuel vehicles for the city fleet. Denver is a signatory to the US Mayors Climate Protection Agreement.

### **Des Moines, IA**

Energy and the environment are high priority issues in Des Moines, driven mainly by high and volatile prices. In 2006, the Mayor appointed an Energy Task Force to examine energy issues in the city. The Task Force is charged with targeting a minimum 10% reduction in city energy use. The Task force will also study energy conservation and reduction, improvements to indoor air quality; use of environmentally friendly and renewable building materials; LEED Certification, and environmental education needs in the city.



Energy management is performed separately by each Department but is coordinated through the Parks and Recreation Department. Parks & Recreation coordinates energy efficiency audits and improvements and manages energy budgeting and procurement for major buildings, such as City Hall. In general, Des Moines has found the Departments are willing to cooperate but individual employees may not be willing to participate in turning lights off and keeping temperatures lowered. Des Moines has countered that problem by making a concerted effort to recruit the janitorial staff to turn off individual appliances, keep lights off, and check temperature levels. The Parks & Recreation Department gathers energy cost and usage data for city facilities from the accounting department and uses the data to create an annual report on city energy consumption for the City Council. A former contractor also maintains a web-based database of energy consumption for a few of the city buildings that have been audited.

Des Moines spends approximately \$500,000 on electricity and \$1 million on natural gas annually. The city is regulated; electricity is provided by MidAmerican Energy and Cornerstone Energy recently was selected to supply natural gas to the city. The city is investigating future aggregated purchasing with county facilities, but doesn't currently participate in any partnerships. Through its new natural gas supplier, Cornerstone Energy, Des Moines plans to hedge prices via long-term contracts.

Des Moines currently budgets approximately \$30,000 annually from the Capital Improvement Program for energy management improvements. Despite its limited budget, Des Moines' energy management program has been very active. The city has completed two phases of audits for city buildings and implemented a number of retrofits.

Des Moines manages its projects internally but contracts out for energy audits and procurement. The city chooses its contractors through an RFP process and uses a fixed price contract, generally for a short term of four to six months. The city does

## Report Title

### *Appendix B: Energy Program Summaries*

not have a formal consultant measurement program, but generally measures satisfaction with the consultant's performance.

Des Moines is also involved in renewable energy, producing electricity from biogas at its wastewater treatment facilities and landfill. The city considered geothermal heat pump retrofits for some buildings, but the geology was deemed incompatible. The Mayor's Energy Task Force will examine further opportunities for renewable energy. Des Moines is a signatory to the US Mayors Climate Protection Agreement.

Des Moines does not currently have a formal community outreach or education program, but the Energy Task Force will study the issue.

### **Fort Worth, TX**

Energy management is not a highly visible priority at the City of Fort Worth. While this has been of concern since the energy crises of the 1970s, the City's recent energy management programs are fashioned in response to Texas Senate Bills 5 (SB5) and 7 (SB7). SB7 set up the deregulation of supply-side energy procurement while SB5 focused on demand-side energy conservation. The City committed to SB5's goal to reduce electricity consumption by 5% per year for the 5-year period from 2001 through 2006. Fort Worth is finalizing a municipal energy management plan to comprehensively address both supply- and demand-side issues. Recent energy market volatility, resulting in sharp price increases, has raised the visibility of these issues.

Fort Worth does not currently have a formal centralized energy management program. Energy demand-side management issues are the responsibility of the City's Conservation Specialist within the Department of Transportation and Public Works' (TPW) Facilities Management Group. Electricity supply-side management issues, such as budgeting, accounting, and procurement, are the responsibility of the City's Utilities Manager within the Department of Budget and Management Services. Due to the contract nature of deregulated electricity, all costs are



managed in the City's Non-Departmental General Fund. Conversely, natural gas costs are management by each department, as necessary, in a disaggregated fashion.

The Conservation Specialist gathers energy cost and consumption data from the Utilities Manager, the Department of Finance's Accounting Division and the local utilities in order to compile information for project development. Recent projects have been developed as Energy Savings Performance Contracts (ESPCs) through the City's contracted ESCO. These projects include M&V plans based on the International Performance Measurement & Verification Protocol's Option C, whole building analysis. Quarterly reports are submitted to the City with potential auditing by a 3rd-party consultant.

Fort Worth's fiscal year 2005 energy bill totaled approximately \$25 million (\$23 million for electricity plus \$1.7 million natural gas). The City's current retail electricity provider is Reliant Energy Solutions while their transmission/distribution utility is TXU Electric Delivery. Atmos Energy is the City's natural gas supplier. The City does not participate in any aggregated purchasing partnerships or price hedging for energy.

Fort Worth's SB5 goal activities have proceeded at an increasingly rapid pace. In 2005, Fort Worth used 22.5 percent less electricity than in 2001. Fort Worth achieved these savings through a number of projects, including lighting, HVAC, control and water system improvements in four large city buildings. Future projects include these same improvements to several other major city buildings and the conversion of traffic signals to LEDs.

Energy conservation project construction has been funded through low-interest state loans, tax-exempt municipal leases and an environmental reserve fund. Loan and lease payments are made from accumulated saving to the non-departmental general fund resulting in net-neutral cash flow for the City. M&V services are paid through TPW's budgeted funds.

## Report Title

### *Appendix B: Energy Program Summaries*

Fort Worth's Conservation Specialist is highly trained in supply- and demand-side energy issues. The Conservation Specialist coordinates the development of energy projects, with much of the auditing, implementation and M&V done with the assistance of a competitively solicited ESCO. The City's Utilities Manager is also highly trained in energy conservation issues and possesses strong supply-side electricity procurement credentials.

Fort Worth regularly examines renewable energy options, including the potential for solar energy systems. The City assesses such options as part of its interest in sustainable energy through the US Green Building Council's Leadership in Energy & Environmental Design (LEED) program. Fort Worth does not currently have a community outreach and education program.

### **Madison, WI**

Energy and the environment are a high priority for Madison, driven by concerns about high and volatile prices as well as environmental impacts of energy production and use. The city has a climate protection plan and a 2005 Energy Task Force produced a report, which a new Sustainable Design and Energy Task Force is charged with implementing. Madison also has an ordinance requiring the use of 10% renewable energy by 2006, which doubles to 20% by 2010.

Each Department is responsible for its energy consumption, but the Engineering Division within the Public Works Department coordinates activities. Department heads meet monthly to discuss energy issues and review usage. The Engineering Division obtains energy consumption data from building management systems and the utilities and uses the data to help Departments create budgets and prioritize energy efficiency retrofits and retro-commissioning. The Division uses an Excel spreadsheet to track consumption, but is in the process of selecting custom energy management software. Madison is also considering using the data to develop incentives for Departments based on energy savings. The city's Comptroller's office handles energy budgeting, accounts payable and franchise agreements. The



Comptroller also is responsible for energy procurement.

Madison's annual electric bill is \$4.3 million and the city pays about \$1.1 million for natural gas. Madison is regulated; Madison Gas & Electric (MG&E) provides natural gas and some electricity, with the remainder of the electricity provided by Alliant Energy. The city has taken a less active role with procurement, relying mainly on the energy providers for that task.

Madison has been fairly active in implementing energy efficiency retrofits. The utility has provided the city with some low-level audits, and Madison has implemented lighting retrofits, switched traffic lights to LEDs, improved pumping motor efficiency, increased insulation when re-roofing buildings, and has built a new LEED-certified building. The projects were funded by a combination of state grant money and the capital budget. In general, Madison does not take advantage of rebates, with the exception of one lighting project. Madison does not have a formal plan for measuring and verifying the results of its energy conservation efforts, but did use the Excel database to track and verify the energy savings from switching traffic lights to LEDs.

In the past, Madison contracted out much of its energy work but is now embarking on an aggressive training program and expects to complete all future energy-related work in-house.

Madison is also active in renewable energy. The city will install a solar thermal water heating system at a new bus depot and has researched using methane from closed landfills, but found there was not enough supply to be viable. Renewable energy activity is expected to increase, as the city has entered into a partnership with MG&E where the utility will invest \$1.8 million in green energy projects over next 8 years.

Madison is also investigating other means of reducing air emissions. They have reached an agreement with MG&E (a heavily coal-dependent utility) to stop burning coal in Madison by 2010. Madison also uses biodiesel in city vehicles and



## Report Title

### *Appendix B: Energy Program Summaries*

SEBESTA BLOMBERG

offers free bus passes to city employees. Madison is a signatory to the US Mayors Climate Protection Agreement.

Madison does not have a formal community education or outreach program, but that may be under consideration by the Sustainable Design & Energy Task Force. In the meantime, Madison city officials are committed to leading by example.

### **Milwaukee, WI**

During the past year, energy efficiency within the Milwaukee city government has become a high priority. Concerns about sustainability have been the main driver of activities. In fact, the city believes energy prices are too low and do not serve as clear price signals to encourage the wise use of energy and to instill a need to invent new ways of energy and environmental (sustainable) progress. While it has always been important, more urgency has been given to the issue with the Mayor's initiation of the "Green Team" addressing energy and environment within city government and the community. The Office of Sustainability is now a cabinet level department that oversees the plan for the City providing a heightened level of focus.

The Department of Public Works drives the "nuts and bolts" initiatives to accomplish a 10% reduction in energy units used. It is the central resource for other departments, assisting them with information and advice on energy budgets as part of departmental budgets, and provides experienced architects, engineers, and technicians for work on projects that are identified through approval and implementation. Energy is monitored with Engage Networks. The system is used primarily by technicians, students from the Milwaukee School of Engineering and management. The data is used for overall tracking as well as real time dispatch and peak shaving.

Milwaukee's annual energy budget, not including street lighting or fuels, is \$3 million. Electricity and natural gas are provided by We Energies, although the office also purchases some natural gas through Constellation NewEnergy. The city



does not currently participate in aggregated purchasing partnerships, but is investigating options. The city does not currently hedge energy prices.

The Department has been very active in energy efficiency projects and has reduced the city's building energy consumption to 0.34 watts/sq. ft. The city maintains a central inventory of over 1800 pieces of equipment and the inventory is not only part of preventative maintenance plans but also is used to exercise and calibrate equipment to ensure peak performance. Commissioning of buildings has also been a major initiative and Milwaukee has trained many outside visitors. Maintenance and energy monitoring systems are integrated. The combination of experienced staff and support systems are strong points of the City's effort. Rebates are used when they are easy to document, however sometimes the cost of doing the paperwork exceeds the rebate itself. Milwaukee analyzes this balance prior to applying for rebates. They will also apply for grants as they are available. All projects are measured and verified for results through commissioning.

The City also relies on vendors and consultants to bring specific expertise and product knowledge since it does not have its own research and development capabilities. By working through these experts, the City learns and progresses in its capabilities. Vendor relationships may be long partnerships while consulting is a shorter obligation based on the project. Local colleges also partner with the City to provide experience for students and resources to assist the City in realizing successful projects.

Wisconsin has strong state organizations, such as "Focus of Energy" and the Wisconsin Energy Center, to educate the public and to provide support and incentives. The City works with them as well as with We Energies to ensure that residential and commercial patrons obtain support and education on energy issues. As a leader in responsible building methods using LEED standards, the city also serves as a role model.

### **Milwaukee County, WI**

Supervisors of the County of Milwaukee are becoming increasingly concerned about the cost of energy, especially as it affects the services supplied by the County. High and volatile energy costs are bringing renewed awareness of energy efficiency from within Milwaukee County government. Energy efficiency and cost reduction has been an underlying theme for many years and has been generally accepted as the way to do business however, currently there is not a formal program focused on energy and environment. Initiatives of the 1980s have been accomplished, but a new focus on energy savings is emerging at the County Board Supervisor level, carried out through the County Executive Office. It is anticipated that a strategic energy plan may be the result longer term.

Energy management is the responsibility of each department of the county. The departments are supported by the Department of Transportation and Public Works with technical expertise provided by the Division of Architecture, Engineering, and Environmental Services (AE&ES). Departmental budget (operations and capital) requests are developed, submitted, revised, and finally approved by the Board of Supervisors. AE&ES serves each department by helping them develop and manage capital and major maintenance projects, many of which have energy components. Energy is monitored separately by each Department, using the utility bill. There is also an “Inventory and Assessment Program” which provides information on facilities and equipment so each department can track maintenance and it provides information that can influence energy decisions. All of these inputs help determine budgets and opportunities. Capital General Obligation Bonds may also be used to accomplish large projects. Large facilities such as the airport have been more active in incorporating efficiency. However, their budgets are supplemented by additional revenues such as fees, leases, and grants, such as those through the FAA.

WE Energies provides electricity and natural gas to the county. The county also has the ability to purchase renewable power from third-party suppliers and has purchased some wind energy. The county has the ability to participate in aggregate



purchasing partnerships but is not currently active. We Energies has contact with each department and may have different account managers serving that department to assist them. The county may investigate outside procurement help in the future.

The County is active in energy efficiency opportunities when building and remodeling to approach “Green Building” design. LEED building recommendations are used as guidelines. New construction is not as prevalent now; however, remodeling is quite active. Guaranteed Energy Savings Performance Contracting is being advanced to help fund energy efficiency measures. Paybacks through performance contracting only take into consideration actual energy savings and do not include operational savings. Lighting and HVAC upgrades as well as occupancy sensors and more efficient motors are being used. Daylighting is incorporated as opportunity arises and one project uses a new chiller with Lake Michigan used as a heat sink, taking advantage of “geothermal” opportunities. While energy efficiency is important, another priority is employee comfort and productivity, so energy measures must maintain or enhance the work environment.

While county staff is very qualified, outside assistance will be obtained for projects under the direction of staff. “Quality Based Selection” tools are used to select qualified consultants and technical assistance. Design skills and some project management capabilities are the most sought-after needs. Contract length depends on the project but is usually for one year duration. Multiple year engagements will have fees renegotiated annually. Large projects may require hiring construction management firms, however all projects are under the direction of staff. AIA or EJCDC forms are used as the basis for contracts. Consultants are measured using a score sheet that is communicated at the on-set and completed by the County’s project manager for assessment at completion. While this may not occur for every project, the frequency of use is increasing.

Environmentally, the County is concerned with normal municipal responsibilities. Run-off into Lake Michigan is a unique issue that the County faces. Hazardous



## Report Title

### *Appendix B: Energy Program Summaries*

waste disposal is a common issue but is addressed with regular “clean sweep” efforts every two years where citizens and businesses can bring in their wastes to be properly disposed. A project using natural gas to fuel airport shuttles is being initiated and hopefully expanded.

With Milwaukee County being totally incorporated by city governments, the public does not have as many opportunities to interact with county government as with city government. Zoning and building compliance is a city responsibility. When opportunity arises, the county does cooperate with the cities and villages as well as with the State of Wisconsin through “Focus on Energy” and other similar energy conservation programs.

### **Minneapolis, MN**

Energy and the environment have been a high priority in Minneapolis for a long time, driven mainly by concern and stewardship for the environment and more recently the desire for more local, renewable energy. Higher prices are also a motivating factor, but the city has historically been able to offset a large portion of the cost increase by conserving energy. However, with the rapid increase of prices, it is likely that conservation alone will not be enough in the future. The city has an Environmental Coordinating Team (ECT) that has coordinated city response to environmental issues for the past fifteen years. Public input is received through the Citizens Environmental Advisory Committee. In 2006, Minneapolis adopted a set of 21 Sustainability Indicators that measure various aspects of city life, from affordable housing to water quality. The energy or environment-related indicators include:

- Reduce Municipal Operations carbon dioxide emissions by 12% by 2012 and by 20% by 2020.
- Reduce City wide carbon dioxide emissions by 12% by 2012 and by 20% by 2020.

- Increase the use of alternative transportation modes to the single occupant vehicle to 67% by 2013.
- Increase renewable electrical to 10% above renewable energy supply by Xcel for Municipal buildings and fleets by 2008 and at that time set a longer term target.
- Increase renewable energy usage to 10% above state/federal mandates City wide by 2015.
- Minneapolis is working toward modifying ordinances, which would support public participation in achieving these goals.

The city has several informal energy-related policies, such as building to the Minnesota Sustainable Design Guidelines (used for 8 new facilities) and purchasing Energy Star certified equipment. Energy is managed separately by each department, but coordinated through the ECT. The ECT meets quarterly and has seven work teams - green buildings (design/construction), green energy, green fleets, green neighborhoods, green purchasing, green transportation, and green operations (energy conservation measures). Staffing is accomplished through a portion of several peoples' time – including the heads of each of the work teams. The Departments have been very willing to coordinate their efforts through the ECT, but some cost-effective projects may not be done because they are lower on a particular Department's priority list. Minneapolis is able to obtain high-level energy data from utility providers but does not have specialized software or staff time to track and analyze energy costs in a comprehensive manner. The city investigated EnergyCAP software, but has not made a final decision.

Minneapolis spends approximately \$11 million annually on electricity and \$2 million for natural gas. The city is regulated and obtains its electricity from Xcel and natural gas from Centerpoint Energy. The city also purchases steam and chilled water for some of its buildings from a private supplier. Procurement is decentralized and not coordinated. Franchise agreements are negotiated by the

## Report Title

### *Appendix B: Energy Program Summaries*

finance department and the city attorney. The city does not participate in any large scale aggregate partnerships but is interested in exploring their options for fuels and natural gas. Minneapolis engages in limited cost management practices through electrical peak load management, dual fuel strategies for natural gas and agreements to not exceed a maximum limit of peak consumption for steam and chilled water, regardless of the temperature.

Minneapolis has been very active in identifying and installing energy improvements in municipal facilities. The city takes a cyclical approach, starting a new round of energy audits and project implementation about every ten years. The ten year cycle appears to give enough time for return on investment and the appearance of new generations of equipment. Minneapolis estimates they are still enjoying more than 10% savings in consumption from work done in the 1990s. Energy management efforts include energy audits, HVAC improvements, conversion of traffic signals to LEDs, control strategies for water processing and pumping, lighting upgrades and recommissioning facilities. Currently, Minneapolis is finishing a benchmarking program, which will measure 50 of its facilities against other public facilities of similar size and age.

Minneapolis can access four different funding sources, depending on the size of the project and the department. Major projects are usually funded through the Capital Improvement Program. Departments that receive fees for their services (such as solid waste collection, parking or water) may pay for projects with cash reserves or revenue bonds. Very small projects that are usually associated with daily maintenance, such as lighting upgrades, may be funded out of the operating budgets. The city also takes advantage of rebates offered by the utility providers. For example, they used Xcel's free lighting audits for small buildings to identify several projects that had 5 year paybacks and improved the quality of lighting. Minneapolis also used Xcel incentives for recommissioning facilities (Xcel paid for half of study costs). Rebates are managed separately by each department, which means some departments may not be monitoring rebate availability as closely as others and may not take advantage of some incentives. As with other



cities, Minneapolis has found that the paperwork associated with the rebates can be burdensome.

Minneapolis has good pockets of energy-related expertise, but opportunities to share that expertise across departments are currently limited. The city generally manages projects internally but tends to outsource the audit, design, and equipment specification functions. The city may implement small projects, such as lighting retrofits, internally but contracts out for major equipment upgrades. The city uses a formal bidding process for contractors and equipment purchases and Requests for Proposals process for consultants. Minneapolis has explored performance-based contracting but has not yet entered into such a contract because they prefer to utilize their own financing through tax-free bonds. The city does not have a formal consultant measurement program, but each department generally measures satisfaction with the consultant's performance.

Minneapolis is very committed to renewable energy and emissions reductions, having set goals for both through the Sustainability Initiatives. Minneapolis is benchmarking solar energy production through the installation of three different arrays. One array is a static system, a second array changes the angle of the panels, and the third is a fully automated tracking array. Minneapolis also is in the process of installing a pilot solar thermal system for domestic hot water. The city investigated a microturbine, but the system was not cost-effective. Minneapolis is currently investigating the purchase of wind energy.

The city also uses renewable energy in its transportation fleet, with an emphasis on E85. The city owns several flexible-fuel and hybrid vehicles and plans to purchase flexible fuel and hybrid vehicles exclusively, when possible, on a normal replacement schedule. Minneapolis currently is soliciting a contractor to build a city-owned E85 fueling station. City diesel vehicles use two- and five-percent biodiesel blends and the city is testing ten- and twenty-percent blends.

Minneapolis is a signatory to the US Mayors Climate Protection Agreement. Xcel Energy is planning significant emissions improvements by upgrading power plants



## Report Title

### *Appendix B: Energy Program Summaries*

located within the metropolitan area.

Minneapolis' community outreach and education programs currently focus on emissions and do not address energy, but the city does "lead by example" on energy issues. All three of the Sustainability Indicators related to energy include city-wide goals, so the city intends to increase its outreach efforts. Minneapolis staff participate in the Metropolitan Counties Energy Task Force, which examines long-term, strategic energy issues, such as energy supply and renewable energy, for the region.

### **Phoenix, AZ**

Energy management has been a high priority for Phoenix for over 25 years. Price is a driving factor for the city's efforts, but Phoenix is also concerned about the availability of electrical generation and transmission capacity. The City's energy plan has been established by ordinance, developed, and enhanced over those years. The City has a goal to increase the number of LEED projects and encourages businesses to do the same.

Energy management is centralized under the Office of Energy Management (OEM) that is part of the Metro Facilities Division of the Department of Public Works. OEM provides expertise and advice to independent departments within the City. OEM is staffed by nine employees, including the Superintendent, engineers, and an accountant/analyst, and funding comes from the City's administrative budget.

OEM serves as a consultant to help other departments to better control and optimize their energy resources. Energy data is maintained on a web-based system so anyone who needs the data can access it. Each department is responsible for their own energy usage so access is dispersed through all city departments. The system is used to monitor usage to make immediate responses as well as provide historical information for budgeting. Energy budgeting and accounts payable are handled separately by each Department.



The base municipal energy budget is over \$45 million, including Sky Harbor Airport. Arizona Public Service and the Salt River Project provide electricity, while natural gas is supplied by Southwest Gas. The city does not participate in aggregated purchasing programs or hedge energy prices. Procurement is handled internally.

Being in a warm climate, building efficiency is important. Many projects have been accomplished in the past. New projects and building profiles work toward LEED design standards. The City has participated in its own central chilled and district cooling water system. There are temperature guidelines in buildings however employee comfort affects productivity and is a priority. Projects are analyzed based on Life-Cycle Costs. Measurement and verification activities were more frequent in the first few years, but, once projects were documented and savings better understood, M&V was de-emphasized due to cost and time of follow-up. The interval data metering system has been used to promote energy conservation efforts more recently.

Phoenix will contract consulting when general assistance is required and uses vendors to accomplish many projects because their specific product knowledge is required. However, a key practice is to involve internal employees as much as possible and even rotate them into various projects to build a knowledge base. This has been very successful. The City also uses a program called the “Energy Assistance Design Program,” which pre-qualifies vendors so that a project can start more quickly once it is approved.

Phoenix has also been active in renewable energy. The city has landfill and waste water treatment plant biogas projects. Many believe photovoltaics would be a natural in Phoenix, but costs are still high and they are not cost effective without state or federal incentives.

The City encourages its citizens to also be responsible for energy efficiency. It works with APS and Salt River Project in initiatives as opportunities arise. The City’s leadership in meeting LEED standards for new construction is seen as an

example for the business community.

### **Portland, OR**

Portland has been active in sustainability and has had a comprehensive energy and environmental plan for many years. Since the early 1970s, the state of Oregon has required municipalities to develop comprehensive plans toward energy and environmental responsibility. The City has realized the linkage between an efficient city and global warming. From 1973 through today's Global Warming Plan that is the umbrella for today's sustainability efforts, the City has been active in making Portland an efficient and desirable place to live and work. Land use planning has put people near their places of work. The 1990 Energy Policy led to many projects reducing energy use and promoting wise use of energy resources. Now Portland is seen as a leader and this efficiency is the way business is conducted. A representative milestone project is that all of the City's energy requirements will be supplied by wind power by 2010 and probably sooner.

Energy use is tracked centrally through the Office of Sustainable Development (OSD), which is overseen by the Commissioner for Public Affairs. OSD serves as a consulting arm to educate, assist, and provide resources to each department where final decision-making and budgeting control reside. The office is staffed by 32 employees, including green building specialists, solid waste planners, and communications specialists as well as administrative support. Many times technical support may physically locate within the department to which they are assigned. OSD's overall operating budget is approximately \$5.5 million and is funded primarily through a combination of solid waste fees and outside grants and contracts, with less than 10% of the budget from the City's general fund. One FTE is supported by a 1% surcharge to each Bureau, based on energy use, with a \$15,000/year cap.

OSD is responsible for energy conservation and procurement programs for the city, as well as city-wide educational programs. The office serves a secondary,



consulting role in energy budgeting and negotiating franchise agreements. Each Bureau is responsible for its energy accounts payable function. OSD monitors city energy usage with an Access database, but is in the process of changing to the Utility Manager software. Energy data users include the Commissioners, Bureau management and those who need access to affect energy use such as architects, engineers, and technicians. The data is used for various decision making issues, forecasting and planning and helps support Bureaus as they budget.

The City's annual energy budget for electricity, natural gas, and transportation fuels is \$15.5 million. Portland General Electric, PacifiCorp, and NW Natural are the primary providers of electricity and natural gas. The city is able to obtain electricity from third party providers and will do this with an agreement from a wind farm located in eastern Oregon. The city has not participated in aggregated purchasing partnerships, but will aggregate its own accounts for wind energy purchases.

Many projects have been accomplished over the years and are documented through the City's web site, [www.portlandonline.com](http://www.portlandonline.com). Past projects have focused on lighting, motor efficiencies, renewable energy and biogas fuel cell power production. Per city policy, projects that can use energy efficiency measures with a return of less than 10 years must be included. Projects accomplished early in the City's efforts are being revisited to see if they should be updated with current technologies.

The City has significant internal expertise and capability. It has outsourced projects more often lately as the latest technologies are used and to accomplish major projects that are identified. Feasibility studies and some individual tasks are accomplished by resources outside city government. Standard professional/technical contracts are used and duration may vary greatly depending on the project. At this time procurement contracts are handled internally as are franchise negotiations with utilities.

Renewable energy and energy efficiency have been key components in the Global



## Report Title

### *Appendix B: Energy Program Summaries*

Warming Plan. Moving toward 100% wind generation for the City, hydro facilities, use of landfill and sewage gas for power production, land use planning, transportation initiatives all reduce carbon to the atmosphere. Influencing residential and commercial sectors of the community adds to this success. Urban sprawl has been minimized by this foresight in planning. Portland is a signatory to the US Mayors' Climate Protection Agreement.

The City is also seen as a resource for the community. In the commercial sector, it advises on energy code requirements but goes beyond that with training, a grant competition for innovative green building projects, commissioning of buildings, and the use of programs such as Energy Star and Green Lights. It also has supported tax incentives and assists with access to energy incentives through the 3% energy surcharge in Oregon which funds the "Energy Trust of Oregon." Residentially, its Multi-Family Assistance Program helps property owners access financial incentives to weatherize their properties. New construction must also meet state energy code requirements. The City is a source of educational resources.

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## Report Title

### Appendix C: Municipal Program Contacts

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## Report Title

*Appendix D: Municipal Energy Policies*

### ***Appendix D: Municipal Energy Policies***

[Baltimore City Green Building Task Force Final Report](#)

[Chicago Energy Policy](#)

[Madison Energy Policy](#)

[Milwaukee Energy Policy](#)

[Portland Energy Policy](#)