# Naperville
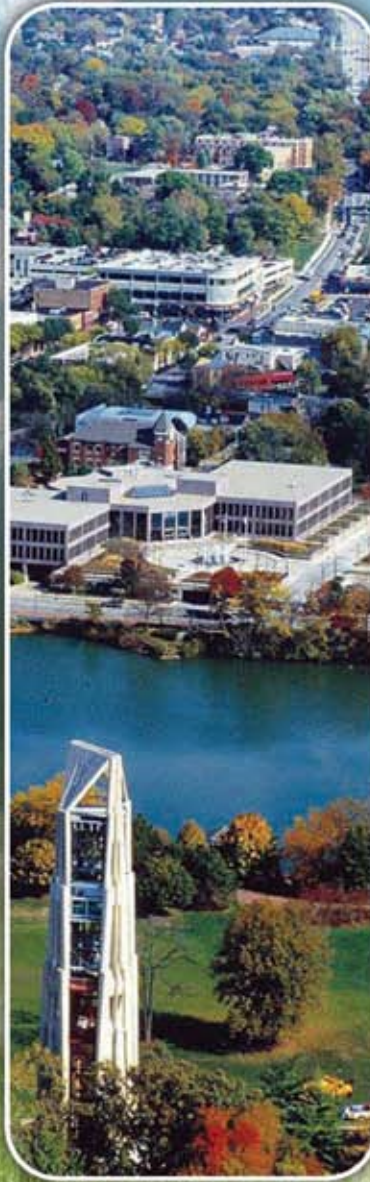
# GREENHOUSE GAS EMISSIONS INVENTORY & BEST PRACTICES FOR EMISSIONS REDUCTIONS

MAY 22, 2009

CDM
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# *Contents*

# Greenhouse Gas Emissions Inventory

As part of the City of Naperville's ongoing leadership in sustainability, the city conducted a 2005 Baseline Greenhouse Gas (GHG) Emissions Inventory with the assistance of the environmental consulting firm Camp Dresser and McKee Inc. (CDM). The GHG inventory includes emissions calculations for city operations – municipal government facilities and vehicle fleet – and community-wide emissions which encompass all private sector – residential, commercial, and industrial – sources within the city limits. This report summarizes the results of the 2005 Baseline GHG Inventory and provides recommendations of best practices for reducing GHG emissions.

The purpose of this GHG inventory project is to establish a baseline of GHG emissions to measure progress, support future decision making, and identify target areas for environmentally responsible action. The 2005 Baseline GHG Emissions Inventory highlights the major GHG emissions sources within the city. The second phase of this project includes analysis and recommendations for a prioritized list of best management practices for emissions reduction in both the municipal and community sectors.

## GHG Inventory Tool

CDM prepared the 2005 Baseline GHG Emissions Inventory using a customized Excel spreadsheet tool. The inventory tool includes several components and is organized to facilitate navigation and transparency for the user. Worksheets are color coded by content and summarized in the "Navigation" tab. All raw energy activity data, emissions calculations, and emissions factors are included, separated by municipal operations and community worksheets (see example calculation on the following page).

Due to the time required to be able to identify trends in energy use and GHG emissions, it is recommended that the city conduct GHG inventories no more frequent than every other year in order to be able to track their progress. CDM will provide hands-on training for Naperville staff to complete future inventories, as well as telephone and on-line support as needed for the 2007 GHG Emissions Inventory.

*GHG Emissions Calculations for Community Electricity Use, GHG Inventory Tool:*

| | Step 1 | Step 2 | | | Step 3 | | |
|---|---|---|---|---|---|---|---|
| Year: CY 2005 | A | B | | | C | | |
| | Activity Data: Electricity Usage | $CO_2$ emission factor | $CH_4$ emission factor | $N_2O$ emission factor | Indirect $CO_2$ emissions in metric tons | Indirect $CH_4$ emissions in metric tons | Indirect $N_2O$ emissions in metric tons |
| | | | | | C = A * B / 1,000,000 | | |
| Facility / source description | kWh | grams per kWh | | | metric tons | | |
| Residential | 582,504,000 | 697.179 | 8.27E-03 | 1.17E-02 | 406,109.36 | 4.82 | 6.79 |
| Commercial | 546,069,000 | 697.179 | 8.27E-03 | 1.17E-02 | 380,707.66 | 4.52 | 6.37 |
| Industrial | 282,399,000 | 697.179 | 8.27E-03 | 1.17E-02 | 196,882.56 | 2.34 | 3.29 |
| Step 4: Sum emissions (in metric tons of $CO_2$, $CH_4$, and $N_2O$): | | | | | 983,699.57 | 11.67 | 16.45 |
| Step 5: Sum $CO_{2e}$ emissions (in metric tons): | | | | | 989,045.59 | | |

## Methodology

The 2005 Baseline GHG Emissions Inventory was conducted following the standards laid out in the Local Government Operations Protocol (LGOP), which was developed in partnership by some of leading GHG quantification organizations in the United States, including: the California Air Resources Board, the California Climate Action Registry, ICLEI-Local Governments for Sustainability, and The Climate Registry. The LGOP is based on methods recommended in the World Resources Institute and World Business Council for Sustainable Development Greenhouse Gas Protocol, as well as those recommended in the Intergovernmental Panel on Climate Change standards and methodologies for national GHG inventories.

Activity data – energy used over an annual period – were calculated by emissions factors to determine annual GHG emissions for the baseline inventory. Activity data, including electricity, natural gas, mobile sources and solid waste were gathered with extensive assistance from City of Naperville employees, the utilities serving the city, and the operator of the Livingston landfill which receives the city's waste. The activity data were converted to emissions from the three major GHGs, carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$), through the use of activity and equipment-specific emissions factors as provided in the LGOP. The total $CH_4$ and $N_2O$ were converted to carbon dioxide equivalents ($CO_2e$) using global warming potentials (GWP), then added to the total $CO_2$ emissions. A GWP represents the ability of each individual gas to trap heat in the atmosphere and is the ratio of the heat trapping ability normalized to that for $CO_2$ (i.e., $CO_2$ has a GWP of 1). The GWP values from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report were used in the 2005 Baseline GHG Emissions Inventory. While these are not the most up to date GWP values available, they are the values currently recommended for use by LGOP and other accounting protocols.

| Greenhouse Gas | GWP Values |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 21 |
| $N_2O$ | 310 |

## Solid Waste Emissions

To calculate GHG emissions from solid waste, the LGOP approach recommends determining the amount of landfill gas that is captured and combusted as well as fugitive emissions from the landfill. These calculations are based on the amount of landfill gas that is captured at the Livingston Landfill in Pontiac, IL which is the recipient of all of the city's solid waste. Landfill gas captured and emitted was converted into metric tons of $CH_4$ and $CO_2$, then $CO_2e$. A percentage of total waste in the Livingston Landfill that was attributable to the City of Naperville was determined using the amount of solid waste generated in Naperville and the total amount of waste delivered to the Livingston landfill in 2005. This percentage was applied to the total annual GHG emissions from the Livingston landfill to determine community-wide GHG emissions attributed to solid waste disposal. In accordance with the LGOP, only $CH_4$ and $CO_2$ are quantified since $N_2O$ emissions from waste are difficult to determine and no default emission factor exists at this time.

## Community Mobile Source Emissions

The U.S. Environmental Protection Agency (EPA) MOBILE6.2 software was used to calculate a $CO_2$ emission factor specific to vehicles traveling in Illinois based on data input files provided by the Illinois Environmental Protection Agency (IL EPA). The $CO_2$ emission factor which was generated in this model was applied to the vehicle miles traveled data from Illinois Department of Transportation to determine $CO_2$ emissions from vehicles traveling within the City of Naperville.

Carbon dioxide is the most prevalent GHG from the combustion of fossil fuels – including gasoline and diesel fuel. As such, $CH_4$ and $N_2O$ emissions from vehicles were omitted from this inventory. $CH_4$ and $N_2O$ are emitted in extremely small quantities when a fossil fuel is burned and their emissions are dependent on the engine type and age. In order to calculate $CH_4$ and $N_2O$ emissions from vehicles, according to the LGOP, data needs include the number of miles traveled, the vehicle model year, and vehicle type. This information, particularly for community-wide vehicle emissions is unavailable or extremely difficult to gather. When $CO_2$ emission factors for gasoline are compared to those of $CH_4$ and $N_2O$ in terms of $CO_2e$, they represent 0.02% and 0.17% of the total respectively, demonstrating that the impact of these emissions on the overall inventory would be insignificant.

## Community Fuel Oil Emissions

Fuel oil usage data for the residential, commercial and industrial sectors are not readily available as there is not a central vendor or tracking system. To estimate fuel oil consumption, statewide consumption totals from by the U.S. Energy Information Administration (EIA) were obtained and used to extrapolated community-wide usage based on the city's 2005 population.

## Summary of Results

In 2005, GHG emissions from municipal operations totaled 37,449 metric tons of $CO_2e$. Community-wide GHG emissions totaled 2,298,901 metric tons or approximately 16.2 tons per capita based on 2005 population estimates from the U.S. Census Bureau. The per capita emissions rate provides a sense of how high Naperville's GHG emissions are compared to other communities. Communities vary greatly in population, income levels, and land use patterns among other factors which all affect GHG emissions.

> **Municipal emissions:**
> 37,449 metric tons of $CO_2e$
> **Community-wide emissions:**
> 2,298,901 metric tons of $CO_2e$

Comparatively, Naperville's emission rate is higher than the City of Chicago's 2000 emissions per capita rate of 12 tons and the City of Dallas 2005 emissions rate of 14.24 tons. However, it is lower than other major metropolitan areas such as Denver which calculated an emissions rate of 19 tons per capita and Cambridge, Massachusetts which calculated an emissions rate of 17.1 tons per capita. Compared to the 2000 national per capita average of 24.3 tons, Naperville's GHG emissions rate is much lower.

For both the municipal operations and community emissions inventories, electricity is by far the largest source of GHG emissions, accounting for 87% of the municipal operations emissions and 43% of the community-wide emissions.

| Source | 2005 City Operations GHG Emissions | | |
| --- | --- | --- | --- |
| | Metric tons $CO_2e$ per year | Metric tons $CO_2e$ per employee | Metric tons $CO_2e$ per sq. ft. |
| Electricity | 32,378 | 31.81 | 0.0261 |
| Stationary Sources (Natural Gas) | 1,291 | 1.27 | 0.0010 |
| Mobile Sources | 3,780 | 3.71 | 0.0031 |
| **City Operations Total** | **37,449** | **36.79** | **0.0302** |

**2005: City Operations Greenhouse Gas Emissions By Source**
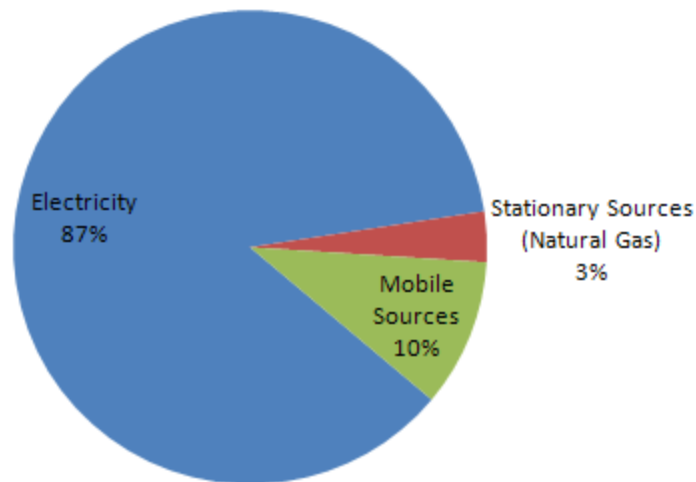
As the chart below demonstrates for the community-wide GHG emissions, natural gas accounts for 25% and mobile sources accounts for 28% of the community-wide GHG emissions. Less than 1% of the community-wide GHG emissions are from solid waste. Solid waste emissions result from the amount of landfilled waste generated in Naperville. Energy consumption in residential, commercial and industrial buildings (electricity and natural gas) accounts for the majority of GHG emissions community-wide.

| Source | 2005 Community-Wide GHG Emissions | | |
| --- | --- | --- | --- |
| | Metric tons $CO_2e$ per year | Metric tons $CO_2e$ per capita | Metric tons $CO_2e$ per sq. mile |
| Electricity | 989,046 | 6.96 | 28,258.45 |
| Natural Gas | 569,704 | 4.01 | 16,277.27 |
| Fuel Oil | 101,407 | 0.71 | 2,897.35 |
| Mobile Sources | 633,416 | 4.45 | 18,097.61 |
| Solid Waste | 5,328 | 0.04 | 152.22 |
| **Community Total** | **2,298,901** | **16.17** | **65,682.89** |

## 2005: Community GHG Emissions by Source
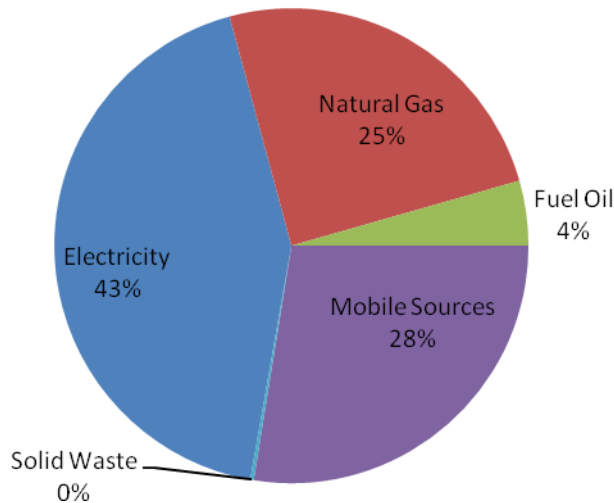


When considered a sector within the larger community-wide inventory, municipal GHG emissions (those from municipal operations only) account for just 1.6% of the entire "carbon footprint." A carbon footprint is the environmental impact of human activities that contribute to climate change in terms of the amount of GHG produced. This is typical of community GHG emissions inventories – despite representing a small percentage of GHG emissions, local governments have the opportunity to directly

control these emissions and set an example for the private sector.  Community-wide, the commercial and industrial sector represents the largest GHG emissions source, contributing 37% of the emissions within the City of Naperville.

| 2005 Emissions by Sector | Metric tons CO2e per year |
|---|---|
| Municipal | 37,449 |
| Residential | 791,324 |
| Commercial/ Industrial | 868,833 |
| Transportation | 633,416 |
| Solid Waste | 5,328 |
| **Total** | **2,336,351** |

## 2005: Total GHG Emissions by Emissions Sector
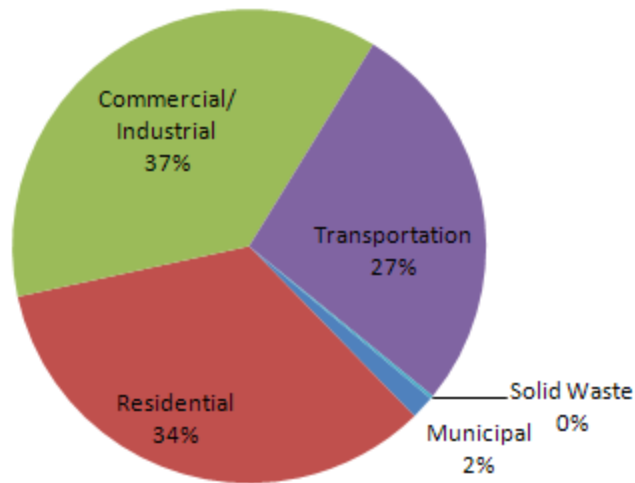
## Next Steps

The 2005 Baseline GHG Emissions Inventory can be used as a benchmark for tracking progress in meeting the city's energy, environmental and sustainability goals.  It is recommended that the city conduct future inventories every other year to evaluate the impact of Naperville's best management practices for GHG emissions reduction.  Additional emissions sources such as contractor emissions and employee commuting may be included in the GHG inventory if there is sufficient interest, but are not required.  While these emission sources are optional, their inclusion may provide considerable insight into emission sources where the city may effectively focus their GHG mitigation efforts.   Additional emissions sources should be selected based on ease of data collection and degree of control over those activities.

In addition, the inventory may reveal best practices and opportunities for GHG emissions reductions that do not affect the municipal and community-wide GHG emissions.  For instance, community participation in the city's Renewable Energy Program supports the development of renewable energy in Illinois but does not affect the community's GHG emissions.  The GHG reduction benefits are dispersed regionally since the renewable energy is delivered to the Illinois electric grid and not directly to Naperville customers.  The electricity generation mix in Naperville is unchanged.  While the city cannot take credit for the emissions reductions in their inventory, the action is significant in reducing regional GHG emissions.

# Best Practices for Emission Reductions

Significant opportunities exist for the City of Naperville to save money, reduce energy use, and promote environmental stewardship at the local level. With energy costs on the rise and impacting everyone, the city will directly benefit from developing a plan of action to both reduce emissions from its own operations as well as encourage the community at large to take their energy use, solid waste, and transportation choices into account.

The City of Naperville has already taken the first step to reduce GHG emissions--assessing its GHG emissions, or "carbon footprint." The 2005 Baseline GHG Emissions Inventory is enables the city to measure and benchmark GHG emissions and determine key opportunities for emissions reductions.

## Selection Criteria

Using the data from the inventory and input from key stakeholders, the city developed a list of potential best practices for emissions reductions. During a facilitated discussion, an engaged stakeholder group established selection criteria to rank each best practice according to the city's sustainability goals and priorities. The top selection criteria ranked by the stakeholder group included:

- **Measureable:** the best practices need to be quantifiable and based on accessible data;

- **Cost-effective:** the best practices should be relatively inexpensive to monitor without diminishing the effectiveness or quality of the data, offer high pay-back potential to the city over a short time frame, and/or positively affect the triple-bottom line;

- **Supports other city initiatives:** the best practices must relate to the goals and targets developed by the city;

- **Visible:** the best practices and results must be visible and offer educational potential to city employees and the community at large; and

- **Proven:** the best practices must be results oriented and based on proven success in other communities.

These criteria were then used by the city and stakeholders to select a group of prioritized best practices for recommendation and further action. The group selected a total of twenty recommended best practices for both municipal operations and community-wide emissions reductions. These best practices include recommendations for projects, policies, studies and outreach initiatives. While the best practices address energy, transportation, waste management and land-use emission sources, the majority of strategies focus on municipal electricity consumption and community-wide electricity and natural gas consumption as these areas are the most significant sources of emissions in Naperville.

Although the goal of this project is to recommend methods for reducing GHG emissions, each best practice provides additional significant benefits such as reduced air pollution, financial savings on energy bills, resource conservation, and other less quantitative benefits.  Each best practice summary page in the following section includes a description of the proposed measure, the annual GHG emissions savings, implementation costs and financial savings where measureable, additional benefits, current achievements, and success stories from similar communities.  The following is a list of the ten municipal and ten community-wide recommended best practices:

## Best Practices for Reducing GHG Emissions in Municipal Operations

1A. Conduct a comprehensive building energy audit for the top ten largest energy consuming municipal facilities and perform energy retrofits;

2A. Upgrade to more energy efficient streetlights and traffic signals;

3A. Implement a City Energy Challenge for municipal employees to reduce building energy use and costs;

4A. Establish an Energy and Environmental Coordinator Position within city government;

5A. Establish an Energy Efficiency and Conservation Program for all municipal facilities for continual performance improvement & tracking;

6A.  Reduce municipal energy use by 10% through efficiency upgrades, lighting retrofits, weatherization and other energy efficiency measures for new construction and major renovations;

7A. Implement and adhere to an Environmentally Preferable Procurement (EPP) Policy;

8A. Implement an Electric Energy Supply Policy to purchase renewable energy for 20% of all municipal operations;

9A. Institute policies and training to encourage facility managers to improve heating, cooling and lighting; and

10A. Develop mandatory rules for construction and demolition recycling for city-supported projects.

## Best Practices for Reducing GHG Emissions in the Community

1B. Develop a program for residential and commercial energy audits;

2B. Undertake an aggressive education and public relations campaign to promote energy conservation;

3B. Expand the curbside recycling program, including expansion of recycling in the commercial sector;

4B. Expand the Weatherization Program to provide assistance with weatherization-related home improvements;

5B. Study property tax incentives and other innovative financing mechanisms to encourage investment in renewable energy;

6B. Develop a Home Energy Program to educate homeowners on energy saving appliances;

7B. Examine building and zoning codes for opportunities to improve energy performance and remove obstacles;

8B. Implement a commercial waste franchise program to decrease truck traffic and vehicle miles traveled;

9B. Expand the Pedestrian and Bicycle System Enhancement Program to improve infrastructure for walking and cycling; and

10B. Expand the Renewable Energy Program so that 15% of electricity customers are participating by 2015.

# Best Practice 1A: Energy Audits for Top 10 Buildings

**Sector:** Municipal operations

**Emission Sources Targeted:**  Electricity and natural gas used in ten largest energy consuming city facilities

## Description and Intent

Conducting comprehensive energy audits on the top ten largest energy consuming facilities in municipal operations is a great place to start focusing on opportunities to reduce energy use and GHG emissions. Comprehensive energy audits aid in the determination of energy efficiency and renewable energy measures appropriate for each building – not just the low-hanging fruit, but also the larger projects with higher upfront costs and longer-term benefits.  The city can partner with and/or contract with outside organizations that have a more holistic approach to energy use in the built environment, to ensure a comprehensive audit identifies the best combination of opportunities for these top 10 energy consuming facilities.

> **Status:**   Proposed
> **Implementation Costs:** Comprehensive energy audits costs are relatively low, cost of implementing changes will depend on financing mechanisms

## Key Actions & Roles

- Responsible Department:  Energy and Environment Coordinator (see Best Practice 4A), Procurement Services and the Department of Public Works
- All departments will be responsible for conducting energy audits and implementing retrofits

## Additional Benefits

- Saves tax payer dollars
- Good opportunity for city to lead by example
- Educates city staff about opportunities for reducing energy use in public facilities
- Opportunity for training and professional development for city staff

## Success Story

Toledo, Ohio (population 309,000), completed comprehensive energy audits and retrofits of twenty city buildings and facilities with the goal to concurrently reduce energy usage and comply with air quality standards. Through these retrofits, Toledo achieved a reduction of 5,823,000 kWh and 5,250 tons of $CO_2$, for a total cost savings of $710,208 in the first year of the program alone. The program was made available through an innovative financing scheme, whereby the city sold bonds to finance the program and the contracted systems control company guaranteed the energy savings would pay back the bonds.

# *Best Practice 2A: Upgrade Streetlights and Traffic Signals*

**Sector:** Municipal operations

**Emission Sources Targeted:** Indirect emissions from electricity use in city traffic signals and streetlights.

## Description & Intent

Public streetlighting comprises a large percentage (over 15%) of electricity use in city operations. Upgrading these streetlights with higher efficiency lighting, preferably light-emitting diode (LED) technology, which is substantially more energy efficient and lasts longer than incandescent lighting, can significantly reduce electricity use and GHG emissions.  Also, continuing the replacement of incandescent bulbs in current traffic signals with LED will further reduce GHG emissions and energy savings. Calculations assume that LED traffic signals are 85% more efficient than incandescent bulbs and there is a 70% maximum reduction potential in energy usage from streetlights.  Costs saving estimates assume constant electricity costs from 2005 to 2015; this is a conservative estimate since increases in costs are likely and would result in higher cost savings.

**Status:**  Proposed
**Implementation Costs:**  Low compared to short payback period
**Annual GHG Savings by 2015**:  4,739 metric tons of $CO_2e$ per year, once all streetlights and traffic signals have been converted to LED
**Annual Financial Savings by 2015**:  At least $500,000 per year, once all streetlights and traffic signals have been converted to LED technologies. Savings will increase as electricity costs rise.

## Key Actions & Roles

- Responsible Department: Procurement Services, Transportation, Engineering and Development, Finance, and Energy and Environment Coordinator (see Best Practice 4A)
- LED streetlights may need to be pilot tested in limited areas for public approval before large-scale implementation

## Additional Benefits

- Saves tax payer dollars
- Good opportunity for city to lead by example
- Reduced need for maintenance and bulb replacement
- Reduces air and water pollution

## Success Stories

In 2007, Ann Arbor, Michigan (population 114,000), began the process of installing a total of 1,045 LED streetlights over a two-year period, with the goal to convert 100% of its downtown streetlights to energy-efficient LED technology. LED lights typically burn five times longer than the bulbs they replace and require less than half the energy. Each fixture draws 56 watts and is projected to last 10 years, replacing fixtures with bulbs that use more than 120 watts and last only two years.  Each globe streetlight that is retrofitted to LED will save $107 per year in energy and maintenance costs, for a total savings of approximately $112,000 per year. The city anticipates a 3.8-year payback on its initial investment. Once all the streetlights have been retrofitted, the city expects to cut its public lighting energy use in half and reduce GHG emissions by 2,425 tons of $CO_2$ per year – the equivalent of taking 400 cars off the road for one year.

# Best Practice 3A: City Energy Challenge

**Sector:** Municipal operations

**Emission Sources Targeted:** City facilities emissions from electricity and natural gas

## Description and Intent

Implementing a City Energy Challenge would help to encourage municipal employees to conserve building energy use and reduce costs through promoting behavioral changes.

A City Energy Challenge could establish a goal of a 5% reduction of energy usage by 2015 through individual reduction practices rather than mechanical upgrades. These practices include turning off computer monitors, adjusting heat and air conditioning controls depending on peak and off-peak usage, and turning off lights.

> **Status:** Proposed
> **Implementation Cost:** Low Cost
> **Annual GHG Savings**: 1,619 metric tons of $CO_2$e
> **Annual Financial Savings in 2015:** $95,200

## Key Actions & Roles

- Responsible Departments: Energy and Environment Coordinator (see Best Practice 4A) and all departments
- Establish an overall energy use reduction goal
- Create an Energy Plan and identify a City Energy Challenge Champion for each facility/building
- City departments will be responsible for reducing energy consumption in their buildings

## Additional Benefits

- Saves tax payer dollars
- Good opportunity to lead by example
- Educates city staff about energy efficiency and environmental responsibility
- Ensures employee buy-in

## Success Stories

In 1991, the City of Portland, Oregon (population 550,000) created the City Energy Challenge Program to cut energy use in city operations. The program is a response to the City Energy Policy, which was adopted in August 1979 and updated in April 1990. The policy's goal is to "promote a sustainable energy future by increasing energy efficiency in all sectors by ten percent by the year 2010." The city already has exceeded that goal. Between July 1991 and December 2001, the program saved $9.46 million. Currently, the savings equal $2 million per year - more than 15% of their energy bills.

# Best Practice 4A: Energy & Environment Coordinator

**Sector:** Municipal operations

**Emission Sources Targeted:** Natural Gas, electricity, vehicle fleet, and solid waste emissions

## Description and Intent

Establish an Energy and Environment Coordinator position within Naperville City Government to support the city in achieving GHG emission reduction goals across all sectors. The Energy and Environment Coordinator is proposed to develop and implement GHG reduction initiatives and projects throughout the city. The Coordinator position may evolve further to incorporate community-wide energy and environmental initiatives responsibilities as well.

**Status:** Proposed
**Implementation Costs:** Mid-level city employee salary
**Payback Period:** Coordinator's salary should be paid back several times over through energy cost savings

## Key Actions & Roles

- Engage all city departments on projects and initiatives related to energy and environment
- Coordinate energy and environmental initiatives for municipal operations
- Develop metrics, measure and track progress in municipal operations

## Additional Benefits

- Creates a point person for energy and environment initiatives to facilitate progress within the city, to the Community, and beyond
- Reduces duplicative efforts and allows departments to learn from each other and from other successes around the country
- Provides leadership for achieving short-term and long-term goals and objectives

## Success Story

The City of Minneapolis, Minnesota (population 377,000), has two personnel on staff to coordinate energy, environmental, and sustainbility initiatives. The city takes a holistic approach to energy and environmental initiatives, involving memebers of all 18 city departments, and measuring goals through 25 sustainability indicators at the department level. To date, the staff has lead successful programs which increased the use of renewable energy and tree planting, adopted an anti-idling policy and green building ordinance, promoted alternative modes of transportation, and created a GHG emissions inventory.

# Best Practice 5A: Municipal Energy Efficiency & Conservation Program

**Sector:** Municipal operations

**Emission Sources Targeted:** Natural Gas and electricity emissions

## Description and Intent

Establish an Energy Efficiency and Conservation Program for all municipal facilities to establish goals, identify priorities, execute projects, encourage behavioral changes, and continually monitor and track progress.

**Status:** Proposed
**Implementation Costs:** Costs for program development. Implementation of energy saving projects and activities should save significant $$ annually

## Key Actions & Roles

- Responsible Entities: Energy and Environment Coordinator (see Best Practice 4A)
- Create a partnership between the city, Nicor, and certified energy auditing firms to provide energy audits at city-owned buildings
- Install energy consumption monitors on retrofitted buildings to track energy reductions
- Craft better than standard building codes for all major renovations and new construction of public facilities

## Additional Benefits

- Saves tax payer dollars by reducing energy expenses in the general fund utility accounts
- Good opportunity to lead by example and track progress in public facilities
- Educates city staff about energy efficiency and environmental responsibility
- Energy monitors may display results online or in stationary kiosks for community education purposes

## Success Story

Baltimore, Maryland (population 637,000), established a utility billing database for every city agency to determine consumption patterns and establish baseline energy consumption. In addition, an employee awareness program was created to encourage employees to conserve energy where possible. As of 2007, these simple measures have saved the City of Baltimore $700,000. In addition, Baltimore has undertaken multiple energy reduction projects at city-owned facilities, including various HVAC upgrades and replacing traffic lights with LED's. Baltimore expects to save over $80 million dollars as a result of these retrofits. The city lacked the capital funds for many of the energy and cost saving projects; therefore, some initiatives in Baltimore are funded through energy performance contracting partnership with the contractors, where the costs are paid back through energy savings over a fixed period of time.

# Best Practice 6A: Reduce Municipal Electricity Use by 10%

**Sector:** Municipal operations

**Emission Sources Targeted:** Indirect emissions from electricity use in municipal facilities and operations

## Description and Intent

In order to achieve the highest level of energy efficiency in municipal facilities, the City of Naperville should consider developing a policy for high performance building standards for new construction and major renovations of public facilities. These standards can be developed in accordance with standards required for LEED (Leadership in Energy and Environmental Design) certification or other guidelines available for high performance buildings. In addition, the city could specify that all new construction, renovations, repairs, replacements, maintenance and operations of public buildings must employ cost-effective, energy-efficient, green building practices to the maximum extent possible. It is widely accepted that with a stronger focus on energy efficiency, building stock in the U.S. could achieve at least a 10% reduction in energy use. Because Electricity is the largest contributor to GHG emissions in municipal operations, this could greatly reduce GHG emissions for public facilities. These calculations are based on 2005 electricity use and costs.

> **Measure Status:** Proposed
> **Annual GHG Savings by 2015**: 3,234 metric tons $CO_2$e
> **Annual Financial Savings by 2015**: $190,400

## Key Actions & Roles

- Responsible Department: Energy and Environment Coordinator (see Best Practice 4A), Procurement Services and the Departments of Public Utilities and Public Works
- All departments will be responsible for encouraging energy conservation and supporting high efficiency building and rehabilitation projects

## Additional Benefits

- Saves tax payer dollars
- Supports energy efficiency economic development
- Good opportunity for city to lead by example
- Reduces air pollution emissions

## Success Story

Through applying a host of smart lighting choices to its municipal facilities, the Lexington-Fayette Urban County Government (LFUCG) in Kentucky (population 279,000) reduced its energy consumption and GHG emissions. Specifically, LFUCG installed sensor activated lighting controls for office space at the Adult Detention Center, for an estimated energy savings of over 18,000 kWh/year, $CO_2$ emissions reductions of over 16 tons per year, and cost savings of $1,100 per year. LFUCG also installed LED Exit signs, which should result in savings of approximately $5,000 per year and reduction in GHG emissions of 104 metric tons per year.

# Best Practice 7A: Environmentally Preferable Procurement

**Sector:** Municipal operations

**Emission Sources Targeted:** Contractor operations, electric equipment, vehicle fleet, and supply chain emissions

## Description and Intent

Develop an Environmentally Preferable Procurement (EPP) policy to support Strategic Plan goals and improve environmental performance in multiple categories of procurement including buildings and construction, cleaning, electronics, vehicle fleets, food services and office supplies. EPP means selecting "products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose." Implementing an EPP policy can help to reduce GHG emissions from city owned equipment and outside contractors, such as solid waste hauling and construction services.

> **Status:** Proposed
> **Implementation Costs:** Staff effort to develop and implement new policy

## Key Actions & Roles

- The Procurement Department will need to lead this initiative and involve other departments in the development of the EPP policy
- All departments will be responsible for implementing EPP practices
- Tools and resources for developing and implementing an EPP policy are available from the U.S. Environmental Protection Agency's EPP Program

## Additional Benefits

- Saves taxpayer dollars
- Good opportunity for the city to lead by example
- Encourages a market for green products and jobs
- Provides a healthier work environment for city employees
- Educates city staff about energy efficiency and environmental responsibility

## Success Story

In 1998, Metropolitan King County, Washington (population 1.8 million), saved an estimated $600,000 by purchasing recycled materials such as toner cartridges ($300,000), re-treaded tires ($77,000) and shredded wood-waste for temporary road surfaces, landscaping and erosion control ($65,000).  Their Environmental Purchasing Policy reflects a long-term commitment to the purchase of environmentally preferable products. The Environmental Purchasing Program provides county employees with information to help them identify, evaluate, and ultimately purchase, economical and effective environmentally preferable products and services. In 2007, King County agencies purchased $41 million dollars worth of these products, saving $875,000 compared to the cost of conventional products.

# Best Practice 8A: Electric Energy Supply Policy

**Sector:** Municipal operations

**Emission Sources Targeted:** Electricity emissions from all city facilities

## Description and Intent

This best practice entails the adoption of an Electric Energy Supply Policy to purchase renewable energy for 20% of all city facility's electric demand on an annual basis. Through the Department of Public Utilities' Renewable Energy Program, the city can purchase blocks of 200 kilowatt hours of renewable energy for $5 each in addition to monthly electricity billing. The purchased renewable energy is delivered to the Illinois electric grid. Calculations assume electricity demand will increase by 2% annually through 2015 and costs will remain the same. This policy requires that the city incur annual costs to meet its GHG reduction target, and to promote new renewable energy generation within the state. The annual costs are a conservative estimate as it assumes no improvements in energy efficiency for city facilities. In conjunction with other energy conservation measures, the annual costs are likely to decrease, depending on the rising costs of electricity.

**Status:** Proposed
**Annual GHG Emissions Savings:** 7,770 metric tons of $CO_2e$
**Annual Implementation Costs:** $277,140

## Key Actions & Roles

- Responsible Department: Procurement Services, Department of Public Utilities, Finance
- All departments will be responsible for encouraging green power purchasing within their annual budgets

## Additional Benefits

- Creates a market for renewable energy in Illinois
- Good opportunity to lead by example
- Reduces criteria air pollutant emissions
- Promotes local and independent sources of electricity
- Limits local dependence on foreign energy supplies

## Success Story

In 1999, the City of Santa Monica, California (population 84,000), became the first city to switch all city facilities to 100% green power. The 5 MW purchase is sourced from a variety of renewables such as wind, biomass and geothermal. The city pays a 5% premium or about $140,000 more annually than for conventional electricity. In addition to its municipal purchases, Santa Monica plans to initiate a public education campaign to encourage residents and businesses to become more energy efficient and to switch to a green power provider.

# *Best Practice 9A: Energy Efficiency Training*

**Sector:** Municipal operations

**Emission Sources Targeted:** City facility and operations emissions

## Description and Intent

Institute policies and training that encourage city facility managers to improve heating, cooling and lighting. Attention to operating and maintenance of building for energy conservation purposes can help to significantly reduce energy use.

**Status:** Proposed
**Implementation Costs:** Staff training and certification, annual refresher training

## Key Actions & Roles

- Responsible Staff: Energy and Environment Coordinator (see Best Practices 4A)
- Identify staff needing training and opportunities to incorporate energy into facility management training
- Explore opportunities to certify appropriate staff in energy management programs

## Additional Benefits

- Maximizes energy savings
- Shortens the payback period for investments in upgraded facilities and equipment
- Ensures employee buy-in
- Extends building life and reduces maintenance cost
- Professional development opportunities for municipal employees

## Success Story

The Louisville, Kentucky (population 256,000), Energy Alliance was formed in response to Mayor Jerry Abramson's launch of the ENERGY STAR Challenge to the community, which promotes energy efficiency as a primary means of reducing greenhouse gas emissions. Participants benchmarked buildings in the Portfolio Manager (PM) provided by ENERGY STAR in throughout 2008. Training sessions were provided to participants in order to increase collective awareness and skills. The program also included an energy management contest open to all Louisville commercial building. By the end of 2008, the number of ENERGY STAR Partners in Louisville had doubled from 7 to 14, and the number of labeled buildings had also doubled from 5 to 10. As of December 2008, 232 buildings were registered to participate in the 2009 Louisville Kilowatt Crackdown. In addition, in the first three quarters of 2008, the number of ratable buildings benchmarked in PM increased 120% from 92 to 212.

# Best Practice 10A: Construction and Demolition Recycling

**Sector:** Municipal operations

**Emission Sources Targeted:** Landfill gas emissions, emissions from waste collection and disposal operations

## Description and Intent

Develop rules and guidelines for construction and demolition recycling for public facilities and city-supported projects.  Recycling solid waste as opposed to sending it to the landfill reduces GHG emissions by avoided the emissions generated from decomposition in the landfill.

> **Status:** Proposed
> **Implementation Costs:** Staff efforts for rule development, and public outreach and education.

## Key Actions & Roles

- Responsible Department: Procurement, City Manager, and TED (Transportation, Engineering and Development)
- All departments will be responsible for maintaining compliance with new policies and rules and ensuring the compliance of outside contractors
- To maximize buy-in from the construction industry, the city may want to solicit public feedback and opinion for the proposed new rules or ordinances

## Additional Benefits

- Supports green building and sustainability practices
- Educates vendors, contractors, city's staff about conservation and environmental responsibility
- Reduces waste and conserves landfill space
- Reduces raw material consumption (such as brick, concrete, steel, and wood)
- Provides a greater level of accountability for city-sponsored projects

## Success Stories

The City of Portland, Oregon (population 576,000) has a construction recycling initiative which all projects over $50,000 to recycle 75% of its construction or demolition waste.  This program is effective in reducing the city's waste and contributes to the city's estimated 63% recycling rate.  The City of Portland requires that contractors source-separate and recycle designated recyclable materials.  Contractors can be fined if found violating this rule.  Chicago and Sacramento also have similar rules which designate that certain recyclable construction and demolition materials be recycled.  Chicago mainly targets commercial or multi-family construction projects, while Sacramento targets projects over $250,000.  Recyclable construction and demolition debris that have been diverted from landfills includes cardboard, steel, concrete, brick, glass, landscape materials, untreated wood, and used pallets.  Costs for this program have been offset by permitting or planning fees from construction.

# *Best Practice 1B: Community Energy Audit Program*

**Sector:** Community-wide

**Emission Sources Targeted:** Residential and commercial energy based emissions

## Description and Intent

Develop a program to provide energy audits for Naperville residents and small businesses through the municipal electric utility with the goal of reducing electric consumption and utility bills for the Naperville community.

> **Status:** Proposed
> **Implementation Costs:** $500,000 in start up costs

## Key Actions & Roles

- Responsible Department: Transportation, Engineering and Development, Department of Public Utilities, Energy and Environment Coordinator (see Best Practice 4A)
- Create a partnership between the city, the electric utility and certified energy auditing firms or individuals
- Seek out grants and funding for initial implementation costs
- Distribute educational materials and participant sign-up sheets regarding the energy audit program through customer's electric bills

## Additional Benefits

- Educates the community about energy efficiency and environmental responsibility
- Reduces utility bills for residents and businesses
- Reduces vulnerability to fuel price spikes
- Reduces community-wide greenhouse emissions
- Supports energy efficient economic development

## Success Story

The Cambridge Energy Alliance (CEA) is a collaboration between the City of Cambridge, Massachusetts (population 100,000), and foundations to create a non-profit organization with the mission of promoting and enabling the adoption of energy efficiency and clean energy throughout the private sector. This first of the nation model has formed public-private partnerships with the electric utility and energy audit firms to provide energy audits to residential, commericial, and institutional community members. Partners create an energy efficiency implementation and financing plan for participants to move forward with the projects. Initial start up funding was provided by foundations, with the goal to support CEA becoming a self-sustaining organization. Other cities are beginning to follow this model, including Cincinnati, Ohio, and Boston, Massachusetts.

# Best Practice 2B: Energy Outreach Campaign

**Sector:** Community-wide

**Emission Sources Targeted:** Residential and commercial emissions sources

## Description and Intent

Undertake an education and public relations campaign to build awareness of energy issues, provide opportunities for public dialogue, and to educate and empower citizens to take personal and civic action to promote energy efficiency, conservation and renewable energy use in Naperville.

**Status:** Proposed
**Implementation Costs:** Medium start up costs - would benefit greatly from a centralized Energy and Environment Coordinator Position and Program at the city

## Key Actions & Role

- Responsible Department: Mayor's Office, Community Relations, Energy and Environment Coordinator (see Best Practice 4A)
- Develop an energy curriculum for use by community organizations and businesses
- Develop an information clearinghouse as an outreach tool for organizations, businesses or community members who want to get involved, building off of other communities' successful programs
- Partner with community-based organizations and the private sector to develop outreach campaign and provide educational opportunities

## Additional Benefits

- Educates community about energy efficiency and environmental responsibility
- Aids homeowners in lowering utility bill costs
- Assists in the coordination of sustainability initiatives and facilitates joint efforts between the public and private sectors and community-based organizations
- Promotes voluntary initiatives in the private sector to reduce energy use and GHG emissions
- Creates community buy-in for city energy projects and initiatives

## Success Story

The City of Newton, Massachusetts (population 84,000), has been engaged in community energy outreach since 1998 through the City appointed Energy Commission, the electric utility, and the Green Decade Coalition, a community-based volunteer organization. Together, they have held workshops on home insulation, provided seminars for small businesses on reducing energy use, developed a Solar Shares program to help finance solar energy installations on public buildings, and developed educational modules for the public school system on energy use and the environment. This partnership between the local government and a volunteer-run organization has made energy outreach and education possible when few resources were available.

# Best Practice 3B: Commercial Recycling Program

**Sector:** Community-wide

**Emission Sources Targeted:** Landfill gas emissions from solid waste in the private sector

## Description and Intent

Expanding the existing curbside recycling program, including the expansion of recycling into the commercial and business sectors could significantly lower the amount of waste going to the landfill, therefore avoiding GHG emissions from solid waste. Building on an existing recycling framework at the city, this program will target some of the largest contributors of recyclable waste like commercial, retail, and business operations. Commercial recycling has been effective in other municipalities when combined with a uniform waste collection program.

**Status:** Proposed
**Implementation Costs:** High

## Key Actions & Roles

- Responsible Department: Procurement, Department of Public Works, Community Relations
- A community-wide effort will be needed to encourage cooperation from multi-family home owners and the business community

## Additional Benefits

- Reduces amount of waste per capita going to landfills
- Potentially lowers collection costs and increases savings from recycled materials
- Supports other city sustainability initiatives

## Current Achievements

Currently, the City of Naperville has a curbside recycling program targeted for single-family residences. In addition, the city offers additional drop-off recycling locations. The current recycling program reduces the amount of recyclable waste (such as paper, glass, metal, and plastics) sent to landfills or disposal from participating residences. At almost 85% participation, this residential recycling program has one of the highest rates in the country.

## Success Stories

Large volumes of recyclable waste are generated by institutional, commercial, business, and retail operations. The City of Portland, Oregon (population 576,000), has a recycling rate over 63%, mainly attributed by their largest waste sector (commercial and business which generate approximately 75% of that city's waste). The City of Portland requires businesses to recycle at least 50% of their waste, including food waste, landscaping (green waste) and paper waste which all contribute to landfill methane gas. Many other American cities have reduced GHG emissions from landfilled waste by diversifying the types of recycling programs and increasing the types of materials accepted for recycling. The City of Chattanooga, TN reports an estimated reduction of 35,745 metric tons of GHG emissions through expanded curbside recycling.

# Best Practice 4B: Home Weatherization Program

**Sector:** Community-wide

**Emission Sources Targeted:** Residential electricity and heating fuel (natural gas, fuel oil) emissions

## Description and Intent

Expand the Weatherization Program to provide assistance to a greater number of homeowners with weatherization-related home improvements, such as insulation, air sealing, and window replacement. Weatherization reduces energy costs by improving energy efficiency, also easing the burden of energy costs for low-income homeowners.

**Status:** Existing
**Implementation Costs:** Current City grant funding level for low-income participants is $5,000 per household

## Key Actions & Roles

- Responsible Department: Energy and Environment Coordinator (see Best Practice 4A)
- Distribute educational materials regarding the importance of weatherizing homes through utility bills and through the building permitting department
- Establish a fund or low-interest loan program to assist low-income residents to pay for weatherization materials

## Additional Benefits

- Educates the community about energy efficiency and environmental responsibility
- Promotes and creates a better sense of community
- Saves on utility bills and reduces vulnerability to fuel price spikes
- Reduces residential greenhouse emissions, up to 40% per home weatherized
- Supports energy management workforce development

## Current Achievements

The City of Naperville is making funds available to income-qualifying residents to improve their home's energy value. The city has partnered with the U.S. Department of Housing and Urban Development to provide the Weatherization Assistance Program. Grant funds will be distributed in amounts not to exceed $5,000 to eligible residents.

## Success Story

In August 2008, neighbors, contractors, City Councillors, and School Committee members formed the Home Energy Efficiency Team (HEET), a cooperative in Cambridge, Massachusetts (population 100,000). HEET holds monthly meetings at a volunteer's home and teach specific weatherization techniques and skills to make the home more energy efficienct. HEET members visit the volunteer's home prior to the meeting to create a weatherization plan for the home; homeowners are responsible for purchasing weatherization materials prior to the event, known as a "barnraising" while low income participants may receive materials from co-op funds. To date, HEET attracts up to 90 participants per barnraising event, each of whom provide the labor for the home weatherization. The model is now gaining traction in neighboring communities in MA, including Somerville, Arlington, Lexington, and Boston.

# Best Practice 5B: Study Financial Mechanisms

**Sector:** Community-wide

**Emission Sources Targeted:** Residential and commercial building energy use emissions

## Description and Intent

Study property tax incentives and other innovative financing mechanisms to encourage residential and commercial investment in renewable energy. The intent of this strategy is to develop alternative means of funding the expansion of non-fossil fuel based, localized renewable energy within the City of Naperville.

> **Status:** Proposed
> **Implementation Costs:** Researching potential incentives and financing mechanisms

## Key Actions & Roles

- Responsible Department: Transportation, Engineering and Development, Finance, Energy and Environment Coordinator (see Best Practice 4A)
- Identify potential property tax incentives that could be implemented in addition to existing federal and state tax incentives and grant programs
- Research alternative financing mechanisms that could be used to fund small renewable energy installations, including, but not limited to, public-private partnerships and low-cost loans to homeowners be paid back through a special tax

## Additional Benefits

- More homes and businesses are able to take advantage of and have access to renewable energy sources
- Lower energy emissions from residential and commercial buildings
- Opportunity to engage and educate the public on the benefits of using renewable energy
- Less demand on traditional energy infrastructure
- Improved air quality through the use of cleaner energy sources

## Success Story

The City of Berkeley, California (population 101,000) has created a solar financing program called Berkeley FIRST (Financing Initiative for Renewable and Solar Technology). This program allows property owners to borrow money from the city's Sustainable Energy Financing District to install solar photovoltaic electrical systems. Property owners can borrow a minimum of $5,000 and a maximum of $37,500 and repay the city with a special annual property tax at a current interest rate of 7.75%. If an owner were to borrow the minimum amount, the bi-annual payment amount would be $247.94 for 20 years and $1,859.53 for 20 years if the maximum amount were borrowed. The city will provide the funding for the program with special tax bonds, which are held by the financing partner. These are repaid semi-annually through the special property taxes paid by participating property owners. The pilot program accepted 40 applications in November 2008. During the pilot phase of the program, the city will evaluate the program and determine whether another round of funding can be made available.

# Best Practice 6B: Home Energy Program

**Sector:** Community-wide

**Emission Sources Targeted:** Residential electricity, natural gas and fuel oil emissions

## Description and Intent

Develop a Home Energy Program to educate homeowners on energy saving appliances and other energy saving measures such as caulking windows, compact fluorescent lighting, turning off and unplugging appliances and computers when they are not in use and planting shade trees to reduce air conditioning costs.

**Status:** Proposed
**Implementation Costs:** Events, communications and educational materials costs

## Key Actions & Roles

- Responsible Staff: Energy and Environment Coordinator (see Best Practice 4A) and community-based organizations
- Implement program to educate and inform residents of the benefits of using energy saving appliances and other energy saving activities in the home

## Additional Benefits

- Educates homeowners on the benefits of energy saving appliances and activities
- Lower utility costs for residents that participate in the program by incorporating the provided energy saving tips
- Less demand on traditional energy infrastructure, because there will be a decrease for energy needed from traditional energy sources
- Encourages the market for green products and jobs by encouraging citizens to purchase energy saving appliances, such as ENERGY STAR appliances

## Success Story

On May 19, 2007, Houston, Texas (population 2,017,000) launched the city's Power to the People Campaign. The campaign was first envisioned and staffed by dedicated volunteers who went door-to-door handing out 10,000 compact fluorescent light bulbs and educating the community about home energy conservation. The program has since grown and now includes displays at retail locations and a website that offers efficiency tips, energy calculators and information on available incentives. Funding for the program comes from the city's general fund and corporate sponsorship from Walmart and CenterPoint, the local transmission company.

# Best Practice 7B: Examine Development Ordinances

**Sector:** Community-wide

**Emission Sources Targeted:** Residential and Commercial Emissions

## Description and Intent

Examine development ordinances (including, but not limited to building and zoning codes) for opportunities to improve energy performance and remove obstacles to renewable energy. Creating clear guidelines on what energy efficient and renewable energy installations are allowed and permissible can help to remove a significant obstacle to better energy management in the community.

**Status:** Proposed
**Implementation Costs:** One time cost to research and update development ordinances and guidelines

## Key Actions & Roles

- Responsible Department: Transportation, Engineering and Development
- Create zoning and building guidelines and ordinances that encourage sustainable energy practices using existing examples such as the Rocky Mountain Land Use Institute's (RMLUI) Sustainable Community Development Code.

## Additional Benefits

- Removes obstacles for residents and developers who wish to use alternative sources of energy
- Sets clear guidelines for officials to use when reviewing applications
- Supports other city initiatives including existing sustainable ordinances and guidelines

## Current Achievements

The City of Naperville is already creating guidelines and codes that encourage sustainable development practices. The Planned Unit Development (PUD) Ordinance encourages a higher level of design and amenities, which lead to better quality developments. The Water Conservation Ordinance is another example of a codified sustainable practice, which conserves water, reduces the energy needed to treat and conveys water throughout the water distribution system. Other environmentally sustainable ordinances include the tree preservation ordinance, light and noise performance standards and the park donation requirements that require the donation of land for parks or a fee-in-lieu-of. The city is also working on Citywide Design Guidelines that include efforts that promote environmental sustainability.

## Success Stories

The City of Dallas, Texas (population 1,233,000), adopted a resolution for the implementation of the community-wide green building program ordinance in 2008. The program will be implemented in two phases. Phase 1 will begin in October 2009 and focuses on energy efficiency and water conservation requirements for all residential and commercial developments. Phase 2 begins in October 2011 and focuses on expanding the initiatives for new buildings into a comprehensive green building standard requirement. It is estimated that new residential and commercial buildings will be 15% more energy efficient than the 2006 International Energy Conservation Code (IECC) after the first phase. Phase 2 will require new construction projects to be LEED-certifiable, Green Built North Texas-certifiable or meet an equivalent minimum green building standard certified level. However, formal certifications will not be required.

# Best Practice 8B: Commercial Waste Franchise Program

**Sector:** Community-wide

**Emission Sources Targeted:** Commercial solid waste and vehicle emissions from waste collection trucks

## Description and Intent

The implementation of a commercial waste franchise program contributes to the city's greenhouse gas reduction goals through reductions in truck traffic and total vehicle miles traveled (VMT) for commercial waste collection. In addition to reduced VMT, a commercial waste franchise encourages lower and standardized commercial collection costs, improves recycling programs, reduces infrastructure improvement costs, and improves air quality, noise pollution, public health and safety. GHG emissions reductions result from reduced VMT and reduced quantity of landfilled waste.

**Status:** Proposed
**Implementation Costs:** Medium to high costs for implementation, but high incidence of savings for participating businesses (90%)

## Key Actions & Roles

- Responsible Department: Procurement Services, Department of Public Works
- The franchise agreement would include commercial and multi-family residential waste and recycling
- This will require significant marketing and an aggressive education and public outreach campaign with area businesses on current waste management issues to seek endorsement for proposed program

## Additional Benefits

- Increased recycling rates in the commercial sector
- Lower and standardized pricing for commercial waste collection
- Potential cost savings to participating businesses
- Uniform waste collection and management
- Decreased truck traffic and mileage means reduced wear and tear on city roads
- Reduced noise and improved air quality

## Current Achievements

Currently, the City of Naperville has a commercial scavenger licensing program which controls commercial waste collection operations within the city. The current program is non-exclusive to vendors who meet the licensing requirements. The existing program does allow the city to ensure standards are met by multiple vendors.

## Success Story

Many municipalities in Illinois, including Barrington, Evanston, Highland Park, Prospect Heights, Skokie, Wheeling and Wilmette, currently franchise collection of commercial waste. Wilmette (population 30,000) implemented an exclusive commercial waste franchise program which reduced the volume of waste collection trucks in the town and reduced waste collection costs for approximately 90% of the town's businesses. This successful program provides uniform services and pricing for local businesses, reduces air pollution, reduces truck traffic, and encourages commercial recycling.

# *Best Practice 9B: Pedestrian & Bicycle Program*

**Sector:** Community-wide

**Emission Sources Targeted:** Mobile (vehicular) emissions

## Description and Intent

Expanding the scope and funding of the Pedestrian and Bicycle System Enhancement Program could help to decrease the use of automobiles for short-distance trips by at least 5% per year. This program will continue to improve infrastructure for walking and cycling, encouraging zero-emission modes of transportation. Calculations for GHG emissions savings assume 5% of the 2005 population will choose a zero-emission commute for a 10 mile trip at 5 days per week, 32 weeks out of a year.

> **Status:** Existing
> **Implementation Costs:** Low Cost
> **Annual GHG Savings**: 5,763 metric tons $CO_2$

## Key Actions & Roles

- Responsible Department: Transportation, Engineering and Development
- Develop a city-wide bicycle network by identifying bicycle-friendly commuting routes, bicycle storage areas and identifying the amenities along those routes
- Launch a bicycle commute program to provide information on how to encourage more bicycle riding and to create incentives for taking a bicycle to work
- Negotiate a bicycle "bring along" service with PACE, Metra rail and CTA during peak hours
- Increase the visibility of pedestrian-friendly signage along pedestrian routes

## Current Achievements

- Pedestrian traffic signal installed at South Route 59
- Construction of sidewalks and bicycle paths throughout the city
- Installing of pedestrian crossing signs
- Transit Oriented Development Planning Study

## Additional Benefits

- Reduces "cold start" vehicle emissions from short vehicular trips
- Reduces roadway congestion
- Lessens the need for roadway maintenance
- Improves access and quality of life for city residents
- Improves general public health

## Success Stories

The City of Cambridge, Massachusetts (population 100,000), has an extensive bicycling program for everyday commuting, shopping, and general transportation. To help make bicycle use even more convenient, the Cambridge Bicycle Program implemented a number of programs in coordination with Cambridge businesses and other city departments. Bicycle programs include the installation of bicycle lanes, street repavements, bicycle safety campaigns, and the installation of bicycle parking throughout the city.

# Best Practice 10B: Renewable Energy Program

**Sector:** Community-wide

**Emission Sources Targeted:** Residential, commercial and industrial electricity emissions

## Description and Intent

The Department of Public Utilities, in contractual partnership with Community Energy, Inc. provides the option for utility served electric consumers to pay an additional fee for renewable energy (i.e. local windfarms). Expanding participation in the Renewable Energy Program to 15% participation rate by 2015 would almost double the current participation rate.

City residents and businesses can choose the participation level that best fits their energy usage and their budget.  Metric tons of $CO_2$e per kWh are based on 2005 community electricity usage. A block of 200 kWh costs an additional $5 to a consumer's electricity bill.

> **Status:** Existing
> **Participation Rate in 2008:**  8.6% or 4,348 consumers
> **Target Participation Rate by 2015:**  15% or 8,328 consumers
> **Annual GHG Emissions Savings in 2015:**  20,175 metric tons of $CO_2$e

## Key Actions & Roles

- Responsible Department: Department of Public Utilities in partnership with Community Energy, Inc.
- This will require significant marketing and an aggressive education and public outreach campaign
- The establishment of an Energy & Environment Coordinator and/or Program (see Best Practices 4A and 5A) would assist in public engagement and the essential creation of public-private partnerships

## Additional Benefits

- Diversification of services provided by utility provider
- Encourages market for renewable energy in Illinois
- Reduces criteria air pollutant emissions
- Promotes local and independent sources of electricity
- Provides opportunity for community to enhance environmental sustainability

## Current Achievements

Naperville's Renewable Energy Program provides funding to support renewable energy development and is currently comprised of 70% wind energy, 29% small-hydro and 1% solar energy generated entirely within the State of Illinois.  The wind energy is generated by Illinois wind farms, solar power is from Chicago-based solar power projects, and the hydropower is generated by a small, low-impact hydro-facility. The GHG reduction benefits are dispersed regionally since the renewable energy is delivered to the Illinois electric grid and not directly to Naperville customers.

## Success Story

The City of Bellingham, Washington (population 75,000), is one of the most successful communities in the U.S. EPA's Green Power Partnership with an 11 % overall green power program participation rate.  The city proves that coordinated efforts between business, residents and local government are effective in supporting cleaner technologies and developing the green power market.  In 2007, Bellingham was chosen as the EPA's Green Power Partner of the Year.

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