

# Environmental Sustainability in Winston-Salem

AN OPPORTUNITY FOR COMMUNITY COLLABORATION

Community Sustainability Program Committee

SHORT-TERM  
ACCOMPLISHMENTS  
AND LONG-TERM  
STRATEGIES  
January 2010



APPROVED

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## INTRODUCTION

The Community Sustainability Program Committee (CSPC), established by City Council in August 2008, has been charged with developing a comprehensive plan for the City of Winston-Salem's environmental sustainability efforts. Specific responsibilities of the committee are described in the resolution authorizing the committee's formation:

- Establish a community-wide stakeholder process to further develop the Local Action Plan.
- Develop a Community Sustainability Awards Program.
- Develop public/private/community partnerships to promote the Local Action Plan and encourage participation in the process.
- Develop a public education program.
- Promote and expand energy conservation and sustainability measures in the residential, commercial, and industrial sectors.
- Consider land use planning strategies.
- Promote the use of alternative vehicles and fuels in the transportation sector.
- Promote the use of alternative transportation measures within the community.
- Monitor progress in achieving established greenhouse gas emissions target goals.

Through four subcommittees, the CSPC has identified a series of short-term activities that can be developed to provide an immediate impact on community education and awareness while allowing the committee and staff time to consider and evaluate more comprehensive and complex solutions that require cost analysis, potential adjustments to user fees and charges, and in some instances, changes to ordinances, policies and programs. This report provides a summary of the short-term accomplishments and work-in-progress endorsed by the CSPC and outlines long-term strategies being considered in relation to cost, greenhouse gas emissions, and job creation that lead to improvements in air quality and climate in Winston-Salem. A community approach is essential to making substantive progress in achieving the stated goals.

The CSPC is also responsible for monitoring the city's efforts to control its own greenhouse gas emissions from city operations. While comprising only a small portion of the overall community greenhouse gas emissions, the city has positioned itself as a leader in support of "green" policies and practices. A discussion of the city's activities is included in this report.

Finally, the CPSC requested city staff provide an update on the city's greenhouse gas emissions and planned use of Energy Efficiency Community Block Grant (EECBG) formula grant award of \$2,262,000 for which City Council adopted a list of approved projects at its April 2009 meeting. The updates are incorporated into this report and have been reviewed by the CPSC.

### **SHORT-TERM PROJECTS (January 2010 – June 2010)**

The CSPC has evaluated ways to sponsor low or no-cost activities during FY 2009-2010 through leveraging some of the \$300,000 in EECBG funds that have been allocated for community education and programs. The initial set of proposed actions is designed to achieve two objectives: begin the process to increase awareness and interest in the community, and establish a basic framework for providing information and education now and in the future. A key component of both objectives is establishing a program manager to manage the multiple facets of a global and far-reaching program within the community. Representing the city on state and national levels is also expected to become more important as national and international influences increase. The need for a sustainability program manager is clearly justified.

The committee has also determined branding of the community education and awareness campaign is essential to citizens and consumers identifying with and retaining interest in the need and ability to support environmentally friendly behaviors and attitudes. A branding strategy has been incorporated into the individual initiatives by linking them with the word “GO” designed to illustrate the “green light” in supporting green initiatives. The brand will be developed graphically and further reinforced with a slogan of “Just One Thing”, conveying the message that each citizen can do something to support environmental sustainability.

Strategy areas and action items for each area have been branded as follows:

## Go Bloom / Go Local

Go Bloom / Go Local supports environmentally friendly initiatives such as community gardens, the practice of composting, and the practice of sustainable farming.

- Utilize unused lots around the city/county for community gardens
- Early access to leaf composting for community garden sponsors
- Recognition of local/organic farmers with special designation
- Educate the public on buying local

## Go Fuel Efficient

Go Fuel Efficient promotes fuel efficiency.

- Encouraging the purchase of hybrid/ high miles-per-gallon vehicles
- Tips for gas reduction and increasing fuel efficiency
- Explore partnerships with car dealers, car washes, retail outlets for delivering message

## Go Recycle

Go Recycle reduces the amount of materials going into landfills through the increase of residential recycling, and implementation of programs for multi-family and business recycling.

- Expanded recycling advertising campaign
- Targeted marketing of recycling message in low participant areas of the city
- Business/Commercial Recycling
- Identifying the availability of markets for recycled materials

## Go Squiggle

Go Squiggle encourages residential, commercial, and industrial energy conservation and the promotion of weatherization programs.

- Promote commercial and residential weatherization programs
- Provide residents/businesses information on how to obtain/conduct an energy audit
- Promote use of compact fluorescent light bulbs (CFLs) through giveaways and promotions

Supporting initiatives include two education events and development of a comprehensive resource center for ongoing education and support for citizens in the community desiring assistance with sustainability issues.

## Go Lead

Go Lead is a leadership summit event that is scheduled for February 10, 2010 designed to bring community leaders together to discuss environmental sustainability, the efforts of the City of Winston-Salem and the Community Sustainability Program Committee. It is intended to address the issues, and serve as a “call to action” to prompt community involvement in becoming a sustainable community. Leaders from all sectors will be provided guidance on ways they can implement sustainable practices in their own organizations and work together toward the community’s goals.

The event will be held Wednesday, February 10 from 4 – 8pm in the Windsor Club of the Lawrence Joel Veterans Memorial Coliseum; dinner will be provided. The event is intended to be held in connection with Wake Forest University’s “Energizing the Future” Sustainability Conference on February 10-11. Pulitzer prize winner Thomas Friedman, the author of “Hot, Flat and Crowded”, will speak in Wait Chapel the evening of February 10 and Go Lead Summit participants will be provided transportation and reserved seating.

## Go Expo

Go Expo is a community event expanded from the original “Go Green” week sponsored by the city and its partners in September 2008. The lecture series has been developed into a one-day trade show/entertainment/educational event. The expo would feature a series of lectures, “how-to” seminars, displays and demonstrations in education, transportation, residential, and commercial sectors. The committee continues to discuss the event.

## Resource Center

The Resource Center is a key initiative endorsed by the CSPC is the development of a resource center, a collaborative partnership between the City of Winston-Salem and local academic institutions, including Wake Forest University, Winston-Salem State University School of Business and Economics, UNC School of the Arts, Forsyth Technical College, and Salem College. The mission of the proposed resource center is to assist the community with the adoption of sustainability measures through targeted research, access to vetted and reviewed information, appropriate referrals to additional resources, and low- or no-cost advisory services. Services would be organized around the primary sectors of the local action plan, including residential, commercial (large and small businesses), non-profit, industrial and transportation.

Preliminary review of the concept by the City Attorney’s office indicate the program could be operated as a 501(c)(3) organization, with a director for the center working under the guidance of a board of directors and advisory council comprised of academic representatives and/or sustainability manager of the partnering educational institutions. Support staff would be obtained from paid internships (grant funded) and through curriculum-based internships with participating institutions. The CSPC has confirmed interest and availability of student resources to staff the center from the various educational institutions. Wake Forest University Community Law and Business Clinic has agreed to prepare and file the necessary paperwork for 501(c)(3) status. Winston-Salem State University School of Business and Economics has agreed to assist with the development of a comprehensive business plan. After the initial start-up costs are paid (primarily the resource center director’s salary, whose initial responsibility will be solicitation of grant and sponsorship funds), the resource center is proposed to be fully supported through grants and private/corporate support. Annual operating expenses are estimated to be

approximately \$100,000 for salaries, benefits and supplies. Support and a location are anticipated to be provided in-kind by the City of Winston-Salem or a partner organization.

The city has an opportunity to apply for a community sustainability matching grant, with an award of \$10,000 through the Duke Energy Foundation, and is aware of other grant opportunities that may come available to support Resource Center operations. Should the City receive the grant from Duke Energy, the committee will ask for approval to accept the grant and appropriate the necessary matching funds from existing EECEBG fund allocations.

Other Educational Activities/Partnerships

- The CSPC has worked with various community groups to collaborate and support each other’s activities. The committee has most actively worked with the Piedmont Environmental Alliance (PEA) on Earth Day activities, held in April of each year. The City of Winston-Salem will be recognized as a platinum sponsor at the 2010 event, scheduled for April 17 on the campus of Wake Forest University. An expanded city presence, advertising support and transportation services are included in the sponsorship. PEA and the CSPC are exploring jointly hosting the event in April 2011 with a planned move of the event to the Fairgrounds that will enhance accessibility of the event to the community.
- The committee endorses and supports the city’s membership in the International Council of Local Environmental Initiatives or ICLEI Local Governments for Sustainability and Climate Communities to assist the Sustainability Program Manager and city departments in managing greenhouse gas reductions monitoring and reporting.
- A Sustainable Education Series, consisting of a series of twelve programs highlighting various energy and environmental issues. The programs would be broadcast on WSTV 13 and available for use by community groups, neighborhood associations and other interested parties.
- The CSPC plans to participate and host periodic community events to maintain a consistent, structured focus on sustainability initiatives. Educational and promotional materials will be used to reinforce the sustainability message.

Project Allocations

The CSPC has established preliminary program allocations to community education. Projected expenditures are as follows:

Sustainability Program Manager (1/2 Year Salary and Benefits)	\$ 45,000
Sustainability Program Manager Support (Travel/Memberships)	5,000
Resource Center Start-Up Costs (1/4 Year)	12,500
Go Lead Summit	10,000
Promotions/Materials/Giveaways	10,000
Sustainability Education Series	5,400
Community Sponsored Events	5,000
Miscellaneous Expenses	7,100
Reserved for Future Years	200,000

The city should continue to maximize existing resources in city operating budgets to support non-energy related activities (recycling, for example) not available from grant funds.

## **LONG-TERM STRATEGIC INITIATIVES**

The CSPC continues to explore opportunities to broaden the reach of the sustainability program and consider strategies that provide the necessary community support and participation and reduction in greenhouse gas emissions. The following list of strategies are being evaluated and reviewed by the committee, with recommendations to be submitted to City Council in conjunction with the FY 2010-2011 budget process.

1. Go Bloom / Go Local
  - Consider discounts for local/organic vendors at Farmer's Market/Downtown Market
  - Implement a food-composting program for restaurants and cafeterias
  - Increase the number of trees planted annually (carbon sequestration measure)
2. Go Fuel Efficient
  - Investigate incentives for purchase of hybrid/ high miles-per-gallon vehicle purchases
  - Evaluate prime space parking availability for hybrid/ high miles-per-gallon vehicles at city parking decks
3. Go Recycle – Reducing the Waste Stream
  - Partnership with Waste Management to enhance recycling rate
  - Establish recycling facilities at grocery stores
  - Garbage collection fees for non-recyclers
  - Increase residential recycling
  - Implement a comprehensive recycling program for business and industry
4. Go Squiggle
  - Green building incentives (building permit rebates/priority scheduling)
  - Incentives for energy efficiency improvements/renovations (grants/low interest loans)
  - Promote existing incentives from utility companies, NC State Energy Office, others
  - Create financing mechanisms/incentives for residential weatherization
  - Create financing mechanisms/incentives for commercial and industrial energy-efficiency
  - Create public financing mechanisms to encourage installation of solar thermal and solar generation on private property
  - Implement an “Energy Star for Clunkers” appliance rebate program

5. Land Use Planning. The CSPC has recognized the need to more fully understand the city's planning and land-use principles, Legacy, and how the committee may play a role in the Unified Development Ordinance (UDO) review and recommendation process. The committee plans to hear a presentation by City/County Planning Director Paul Norby, early in the new year. Ideas that could be considered are:
  - Promote the use of conservation easements/set aside green space
  - Adopt zoning or land use policy changes to promote infill development
  - Adopt zoning or land use policy changes to promote high-density development
  - Adopt zoning changes to reduce parking requirements and allowances
  - Allow density bonuses and incentives for high-density, infill, transit-oriented development
  - Adopt impact, mitigation, and permit fees that discourage urban sprawl
6. Transportation Planning. The CSPC is interested in the city's management and support of the public transit system (WSTA) and considerations for a streetcar in the city and light rail in the region. Recognizing each operation has its own priorities and considerations, the committee supports policies that maximize the use of public transportation and requests the ability to participate in the review process as appropriate. Examples could include:
  - Consider free/discounted WSTA days to enhance ridership
  - Increase ridership on mass transit systems
  - Promote the purchase/use of high fuel efficiency vehicles
  - Utilize roundabouts instead of signalized intersections where feasible
  - Change four-way stops to two-way stops where feasible
  - Increase use of bike lanes
7. Federal and State Advocacy. An evaluation of the City of Winston-Salem's appropriate role in advocacy of legislation in support of environmental (air, water, land) and energy sustainability.
8. Procurement. Consideration of green/local procurement policies.
9. Future funding. Consideration of funding mechanisms which may be devoted to future sustainability efforts. An example might be an additional \$5 from the motor vehicle tax or similar options.
10. Solar Energy. Evaluate feasibility for City of Winston-Salem.

Long-term initiatives are anticipated to be much more comprehensive and will necessitate consideration of policies and operational procedures that address expanding the city's goal of establishing a climate action plan for the community.

## UPDATE ON GREENHOUSE GAS INVENTORY AND LOCAL ACTION PLAN

In August 2008, City Council adopted the Greenhouse Gas Inventory and Local Action Plan to Reduce Emissions. That report provided a baseline emissions inventory, with the year 2000 as a baseline year. Calendar year 2006 was chosen as the interim year for comparison and future forecast projections of greenhouse gas emissions in the community. City Council also established a goal of stabilizing greenhouse gas emissions in city operations and determining the costs and best methods for reducing GHG emissions from city operations to 2006 levels. These two actions correlate to the first two milestones outlined in the International Council for Local Environmental Initiatives, now ICLEI – Local Governments for Sustainability (“ICLEI”). The short-term projects and long-term initiatives outlined in this report support Milestone 3 – Developing a Local Action Plan. Milestone 4 will be achieved when policies and measures designed to reduce GHG are adopted and implemented by the city.

The 2008 report utilized years 2000 and 2006 to calculate GHG emissions for the Winston-Salem Community and for Winston-Salem’s internal city operations. Since the most reliable community data was available by county, the Winston-Salem Community is defined using Forsyth County data. Using the 2000 and 2006 data, the GHG emissions were backcast to 1990 and forecast to 2012 to determine community GHG reductions that would have to be achieved to meet the Kyoto target. The Kyoto target says future GHG emissions should be reduced to 93% of 1990 emissions levels by 2012.

City staff has updated the interim year 2006 GHG emissions to 2008, the most current year for which data is available, for both city operations and for the community. A summary of increases is provided below. Detailed information is provided in Attachment 1. Projections for 2012 (the Kyoto Protocol target year) and 2020 were also recalculated based on current usage rates and population growth for Forsyth County.

### Winston-Salem Internal City Operations

<b>City Operations Data Summary</b>			
	2006 GHG (tons)	2008 GHG (tons)	% Increase
Electricity and Natural Gas	121,126	129,111	6.6%
Vehicle Fuel	19,156	21,318	11.2%
<b>TOTAL</b>	<b>140,282</b>	<b>150,429</b>	<b>7.2%</b>

Comparisons of GHG emissions from 2006 to 2008 are affected by several changes occurring in the city during this period. The City of Winston-Salem’s annexation of approximately 24 square miles effective 9/30/2006 increased the city’s land area by 22% from 109 to 133 square miles. The expanded area resulted in increased vehicle fuel usage principally in the Public Works and Public Safety area, and added approximately 6,000 new street lights in the annexed areas that increased GHG emissions over 3,000 tons/year. The operations data reflects only three months of operations from this annexation in 2006, but full annual operations in 2007 and 2008. Additionally, in May 2008, Utilities began operating the BioSolids Dryer Facility at the Elledge Treatment Plant, which uses over 600,000 therms of natural gas per year and has increased CO<sub>2</sub> emissions for city operations over 3,800 tons/year.

GHG emissions for internal city operations increased from 140,282 tons to 150,428 tons or 7.2% from 2006 to 2008, even with ongoing implementation of reduction and stabilizing strategies. In order to stabilize city GHG emissions to 2006 levels, the city must achieve reductions of approximately 10,000 tons annually and control future emissions growth.

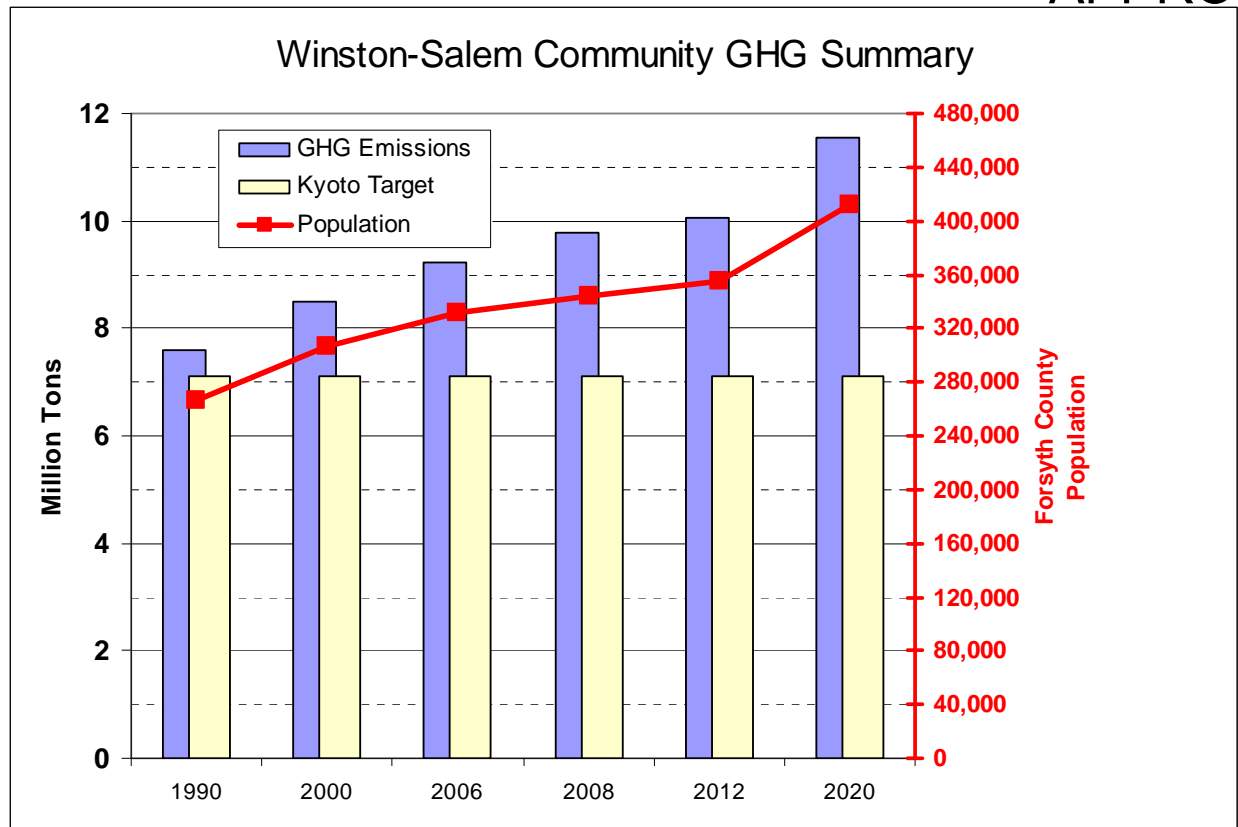
In addition to the EECBG projects described more fully below, the city may need to consider more stringent energy reduction and fuel management guidelines. Staff is currently evaluating the feasibility and quantifiable recommendations for reduction options and strategies to achieve the above goals and reduction target. Reductions within a range of 5-10% in both electricity and fuel would be necessary to achieve the reduction goal.

Implemented strategies have reduced the greenhouse gas emissions in city operations by 3,814 tons annually. Implementation of other strategies are expected to significantly contribute to reducing emissions and achieving stabilization goals. Strategies that have either been implemented or are being evaluated by the CSPS and city staff are detailed in Attachment 2

### Winston-Salem Community (Forsyth County) Update

From 2006 to 2008, total GHG emissions in the Winston-Salem community increased over 558,000 tons (from 9,214,500 to 9,772,867 tons). These increases are primarily due to a 2% increase in electricity used within the community, a 6% increase in natural gas used and a 4% increase in vehicle fuel. The chart below shows the GHG emissions for the Winston-Salem community for 1990, 2000, 2006 and 2008 and projects GHG emissions in 2012 and 2020 based on population growth, since GHG emissions are generally proportional to the population within the community. The Kyoto target bar is the level of GHG emissions required to meet the Kyoto target.

<b>Community Data Summary</b>				
<b>Year</b>	<b>GHG Emissions (tons)</b>	<b>Forsyth Co. Population</b>	<b>GHG per Resident (tons)</b>	<b>1990 Kyoto Target (93% of 1990 GHG)</b>
1990	7,581,200	265,855	28.5	7,100,000
2000	8,495,600	306,932	27.7	7,100,000
2006	9,214,500	331,064	27.8	7,100,000
2008	9,772,867	343,704	28.4	7,100,000
2012 (Projected)	10,054,000	355,000	28.4	7,100,000
2020 (Projected)	11,536,000	412,000	28.0	7,100,000



GHG emissions in 2008 in the Winston-Salem community were 43% above the Kyoto Protocol target. The population in the Winston-Salem community is forecasted to be over 412,000 in 2020. With a “business as usual” approach (i.e., no changes in behavior or action), community GHG emissions are projected to exceed 11 million tons in 2020).

Additional information regarding the increase in greenhouse gas emissions in Forsyth County from 2006 to 2008 is provided in Attachment 3.

Strategies to address greenhouse gas emissions growth in the Winston-Salem community are the primary focus of the CSPC’s long-term strategic initiatives and have previously been outlined in this report. Formal recommendations will be brought to City Council for review and approval through the city’s established budget consideration process.

### **UPDATE ON USE OF EECBG FUNDS**

The Winston-Salem City Council adopted a resolution in May 2007 establishing its commitment to reducing greenhouse gas emissions both from city operations and the community. Actions to develop a Greenhouse Gas Inventory and Local Action Plan were performed in the spring of 2008 quantifying and indentifying the sources of those emissions, which were shown to be directly related to the use of energy in the public and private sectors. The need to become more energy efficient and reduce the use of carbon-based fuels was recognized and is essential to reaching the emissions reduction goals adopted by Council. The use of the EECBG funds is strategically focused on the reduction of energy in city buildings as determined by the Greenhouse Gas Inventory and Local Action Plan.

Under the City of Winston-Salem’s Asset Management Program, an energy audit had been performed in major city facilities, which determined that the recommended improvements would significantly reduce the energy used by the listed facility or group of facilities. The Asset Management Program, established in 2006, is an on-going program to identify facility deficiencies through building condition assessments, prioritize the corrective measures needed to correct the deficiencies found, and seek funding to implement the corrective measures. The performance of an energy audit is a standard part of the building condition assessment of each facility.

The list of projects noted below has been approved by City Council as being the priority projects for the EECBG funds meeting the federal program objectives. These projects are instrumental in achieving the goal of stabilizing the city’s greenhouse gas emissions:

<b>Project</b>	<b>Cost</b>	<b>GHG Reduction (annual, in tons)</b>	<b>Annual Savings</b>
Community Education/Support	\$300,000		
One Triad Parking Garage Lighting	250,000	377	\$20,000
City Hall Energy Management System	50,000	77	7,000
City Building Energy Efficiency Improvements	350,000	829	30,000
Fire Facility Energy Efficiency Improvements	270,000	300	13,500
Public Safety Facility Energy Efficiency Improv	405,000	500	35,000
Recreation Facility Energy Efficiency Improv	437,000	250	23,000
Street/Pedestrian Lighting (Pilot)	200,000	24	20,000
<b>TOTAL</b>	<b>\$2,262,000</b>	<b>2,357</b>	<b>\$ 148,500</b>

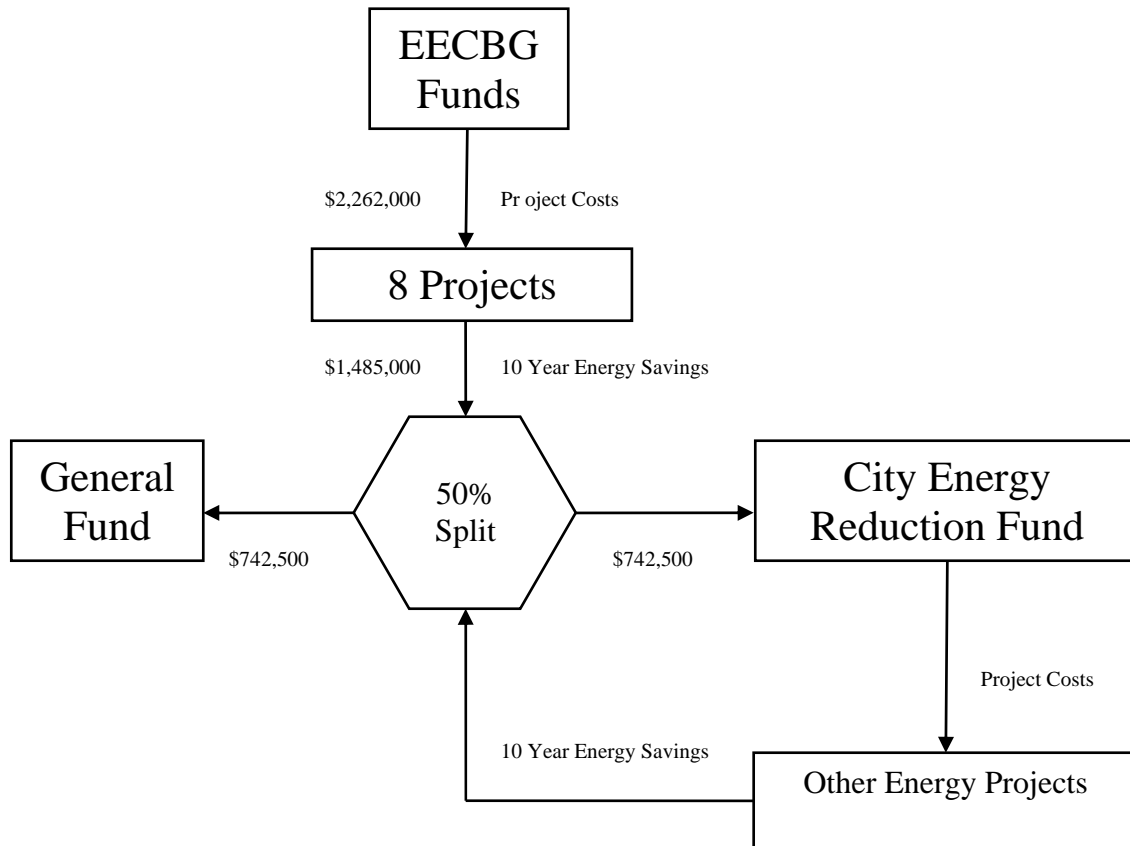
**Project Status**

- One-third of the community education/support allocation has been set aside to support the hiring of the city’s Sustainability Program Manager and to implement the short-term objectives outlined above. These short-term efforts are integral to fostering a consistent message and to maintaining focus and attention on sustainability issues.
- Staff issued a Request for Letters of Interest and Statement of Qualifications for three services: HVAC design, lighting design, and solar design solutions that will facilitate progress of most of the EECBG projects outlined above. Responses have been received and are currently being evaluated. Selection of a firm(s) is expected in January 2010 and will be based on information received and expedient scheduling of projects to maximize completion and greenhouse gas reduction goals. Specific facilities are currently being identified and timelines for scheduling projects considering operational needs and weather impacts are being developed. Projects not requiring design work (roofs, window replacement, water heaters) are being scheduled for the spring. A more detailed schedule of projects will be provided as design services get underway.
- City staff is currently evaluating several vendors offering solutions to assist the city in tracking its power usage. Purchase of software or a contract to provide these services are options being considered for implementation/installation in spring 2010.

Staff also plans to begin discussions with Duke Energy and various vendors to enhance existing energy management through the installation of smart metering.

- **City Energy Reduction Fund/Program**

One of the primary and overarching objectives of the Department of Energy (DOE) in administering the Energy Efficiency and Conservation Block Grant (EECBG) is to allow the federal funds for energy reduction to extend beyond the funding period. An example of how the DOE indicates this can be done is a revolving loan program. Fifty per cent of the energy cost savings for the first 10 years of implemented projects would go into a fund to pay for other energy reduction programs. The figure below indicates how the funding would work.



The Energy Reduction Fund/Program should be considered as the fundamental program under which all the other city projects are placed. This will allow the city to satisfy the federal requirement for extending the benefits of the funds over the longest terms possible. It will also provide long term cost reduction opportunities in the city.

**SUMMARY**

The CSPS is excited about its progress, yet recognizes the substantial work necessary to accomplish stated reductions in greenhouse gas emissions in city operations and in the Winston-Salem community, as well as obtain the intangible but meaningful improvement in the environment and associated health benefits attributable to sustainable behaviors. We look forward to developing the comprehensive program necessary to both the short-term and long-term success of sustainable operations in the future.

**ENVIRONMENTAL SUSTAINABILITY IN WINSTON-SALEM  
ATTACHMENT 1**

**GHG EMISSIONS DATA FOR CITY OPERATIONS**

**Electricity Used Within Winston-Salem Community (from Duke Energy by Calendar Yr)**

<b>Year</b>	<b>Residential kWh (thousands)</b>	<b>Commercial kWh (thousands)</b>	<b>Industrial kWh (thousands)</b>	<b>Total kWh (thousands)</b>	<b>Carbon Dioxide (tons)</b>
2000	1,713,278	1,820,268	1,189,660	4,723,207	5,184,368
2006	1,871,552	2,103,491	1,120,168	5,095,211	5,592,693
2008	1,961,284	2,245,779	1,009,161	5,216,223	5,725,449

**Natural Gas Use Within Winston-Salem Community (from Piedmont Natural Gas)**

<b>Year</b>	<b>Residential million BTU</b>	<b>Commercial million BTU</b>	<b>Industrial million BTU</b>	<b>Total million BTU</b>	<b>Carbon Dioxide (tons)</b>
2000	2,991,975	2,457,000	4,880,863	10,329,838	638,177
2006	3,693,450	2,829,500	4,485,379	11,008,329	680,095
2008	3,170,983	2,764,185	5,702,585	11,637,753	718,981

**Vehicle Miles Traveled (VMT) Within Winston-Salem Community**

The PART Long Range Transportation Plan Update published on 5/15/08 lists the vehicle miles travelled (VMT). The gallons of fuel used, carbon dioxide and other pollutants were estimated/calculated from ICLEI's Clean Air and Climate Protection Software:

<b>Year</b>	<b>Daily VMT (millions)</b>	<b>Annual VMT (millions)</b>	<b>Gallons of Fuel (millions)</b>	<b>Carbon Dioxide (tons)</b>	<b>Other Pollutants (tons)</b>
2000	9.622	3,512	225	2,416,973	75,204
2006	11.042	4,030	258	2,773,669	86,441
2008	11,515	4,203	269	2,891,926	90,126

Both 2006 and 2008 data are based on the same 5/15/08 report and continue a linear regression between the report years of 2002 and the 2009 forecast.

Waste Information for W-S Utilities Landfills (FY)

Year	Hanes Mill Solid Waste LF (tons)	Old Salisbury Rd C&D (tons)	Equivalent CO <sub>2</sub> Emissions
2000	305,000	77,000	183,360
2006	266,504	102,058	176,910
2008	250,627	101,390	168,968

City Operations - Electricity and Natural Gas Energy (FY)

Responsibility	FY05-06		FY07-08	
	Annual Cost	Carbon Dioxide (tons)	Annual Cost	Carbon Dioxide (tons)
Street Lights	\$2,516,700	12,173	\$3,153,000	15,251
General Fund (except street lights)	\$1,058,500	8,475	\$1,150,000	8,700
City Parking Decks	\$ 146,300	1,794	\$ 170,000	1,900
Entertainment Facilities	\$ 924,700	8,210	\$ 890,000	7,902
City/County Utilities	\$4,218,600	87,314	\$4,600,000	92,208
WSTA	\$ 120,000	3,160	\$ 124,000	3,150
<b>TOTAL</b>	<b>\$8,984,800</b>	<b>121,126</b>	<b>\$10,087,000</b>	<b>129,111</b>

City Operations Gasoline and Diesel Fuel in City Vehicles (FY)

Responsibility	FY05-06		FY07-08	
	Gallons of Fuel	Carbon Dioxide (tons)	Gallons of Fuel	Carbon Dioxide (tons)
Police	383,952	4,111	502,451	5,380
Sanitation	219,299	2,323	273,717	2,899
Fire	72,935	774	86,035	913
Other General Fund	289,962	3,104	306,053	3,276
Entertainment Facilities	4,635	50	6,182	67
Utilities	339,866	3,635	333,541	3,567
WSTA	487,505	5,159	492,870	5,216
<b>TOTAL</b>	<b>1,798,154</b>	<b>19,156</b>	<b>1,997,979</b>	<b>21,318</b>

**ENVIRONMENTAL SUSTAINABILITY IN WINSTON-SALEM  
ATTACHMENT 2**

**UPDATE ON GREENHOUSE GAS INVENTORY AND LOCAL ACTION PLAN**

**Strategy:     Reduce Vehicle Fuel Usage**

<b><u>Action Item</u></b>	<b><u>Status</u></b>	<b><u>Estimated Tons GHG Reduction</u></b>
Adopt a long-term strategic fuel reduction plan	Ongoing	1,000
Purchase high efficiency and alternative fueled vehicles (Hybrids, electric & CNG)	Implemented 2008 21 Vehicles Purchased	20
Utilize alternate fuels (bio-diesel, etc)	Implemented 2009 189,000 Gallons Biodiesel Purchased	416

**Strategy:     Reduce Electricity and Fuel Usage in City Facilities**

<b><u>Action Item</u></b>	<b><u>Status</u></b>	<b><u>Estimated Tons GHG Reduction</u></b>
Adopt a long-term strategic energy plan	Under consideration	TBD
Adopt Energy Conservation Policy	Under consideration	TBD
Adopt LEED or other energy-efficient standards for new and renovated city buildings	In development	TBD
Utilize renewable energy methods where feasible (solar, thermal, other)	Ongoing (EECBG Projects)	140
Utilize cool roof materials where possible	Five projects completed FY 2009 Ongoing (EECBG Projects)	250

**APPROVED**

Implement water efficiency measures in new or Or renovated city facilities	Implemented/Ongoing	4
Replace old lighting with high efficiency lighting; Install automatic controls	Ongoing (EECBG Projects)	921
Replace inefficient HVAC systems with high-efficiency HVAC systems	Ongoing (EECBG Projects)	994

**Strategy:     Reduce Waste Stream**

<b><u>Action Item</u></b>	<b><u>Status</u></b>	<b><u>Estimated Tons GHG Reduction</u></b>
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Increase recycling in all city facilities	Under consideration	TBD
Make recycling mandatory at all events on City Property	Under consideration	TBD

**Strategy:     Other**

Reduce miscellaneous electrical energy	Ongoing (EECBG Projects)	69
Utilize unused city property for distributed Generation facilities	Under consideration	Potential 1,000
Adopt an environmentally preferable purchasing program	Under consideration	TBD
Encourage environmentally friendly employee Commuter options	Under consideration	TBD
Alternative work schedules/Telecommuting	Under consideration	TBD

ENVIRONMENTAL SUSTAINABILITY IN WINSTON-SALEM  
ATTACHMENT 3

**GHG EMISSIONS DATA FOR FORSYTH COUNTY**

**Electricity Use**

Duke Energy provided kilowatt-hours (kWh) used countywide in 2006 and 2008.

Duke's total kWh sales increased 2.3% from 2006 to 2008.

Duke's total customers increased 7.6 % from 2006 to 2008.

CO<sub>2</sub> Emissions from Electricity = Total kWh's x 2.1 Pounds of CO<sub>2</sub> / kWh

(Note – the 2.1 is a regional multiplier used by ICLEI's Climate Protection software for community measures. Duke Energy's published multiplier is 1.05 lbs. of CO<sub>2</sub> / kWh for their North and South Carolina energy mix, which is approximately 49% nuclear.)

**Natural Gas Use**

Piedmont Natural Gas provided total Therms used in Forsyth County in 2006 and 2008.

PNG's total therm sales increased 5.7% from 2006 to 2008.

PNG's total customers increased 6.1% from 2006 to 2008.

CO<sub>2</sub> Emissions from Natural Gas = Total Therms x 12.4 Pounds of CO<sub>2</sub> / Therm

**Vehicle Fuel Use**

Piedmont Area Regional Transportation published a Long Range Transportation Plan in May 2008 that statistically estimated total "Vehicle Miles Traveled" in Forsyth County in 2006 and 2008 and provided a breakdown of vehicle types (passenger vehicle, large truck, etc.). A computer calculation assumed certain average miles per gallon per vehicle type and estimated the total number of gallons of gasoline and diesel fuel burned in Forsyth County in 2006 and 2008 and calculated the total CO<sub>2</sub> output. Total vehicle miles driven increased 2.3% from 2006 to 2008.

**Other GHG Emissions Contributors**

Several other sources contributed to total GHG emissions, including some "CO<sub>2</sub> Equivalents" from other GHG's emitted by electric generation, natural gas burning and fuel burning. These other contributions were not significant percentages, but are part of the total GHG emissions.