

I. Introduction and Executive Summary

King County is committed to being a leader in renewable energy and environmental mitigation. Now, as the impacts of climate change and dependence on foreign oil heighten the need for action, the county is increasing its efforts to combat these problems and to become a catalyst for renewable energy markets. This Energy Plan builds on King County's existing efforts and sets the stage for even greater strides towards energy efficiency and renewable energy use in county internal operations.

King County Executive Ron Sims issued an Executive Order in March of 2006 which establishes future renewable energy use requirements for King County government operations and directs the development of an energy plan to meet those requirements and address other energy goals. A copy of the Renewable Energy Order is attached as Appendix A. The Renewable Energy Order requires that:

- 50 percent of King County's non-transit energy use come from renewable sources by 2012
- 35 percent of King County's transit energy use come from efficiencies and renewable sources by 2015
- 50 percent of King County's transit energy use come from efficiencies and renewable sources by 2020

Further support for these efforts was demonstrated by the Metropolitan King County Council in adopting Motion 2006-0328, which requires an Energy Plan to be developed and delivered to the council by February 1, 2007.

The need for the Renewable Energy Order and King County's increased efforts to use and promote renewable energy is apparent. The use of fossil fuels results in air pollution and contributes to global warming. Global warming will have significant adverse impacts on our environment, health and economy. In complying with the Renewable Energy Order, King County will reduce green house gas emissions by at least 125,000 metric tons annually.

In addition, the supply of traditional fossil fuels is rapidly diminishing and continued dependence on these fuels may be economically devastating and perpetuates our reliance on foreign oil. Use of clean, renewable energy reduces the level of fossil fuel emissions, reduces dependence on foreign oil and promotes new and environmentally-friendly economic development.

This Energy Plan sets an initial roadmap for achieving the mandates of the Renewable Energy Order and planning for King County's future use, generation and conservation of energy. This Energy Plan is built around three main goals:

1. *King County will be a primary leader in the use of climate friendly, renewable energy sources and will achieve the goals of the Renewable Energy Order.*
2. *King County will maximize the conversion of waste-to-energy.*
3. *King County will be a primary leader in energy efficiency by achieving a 10 percent per square foot reduction in county energy use by 2012.*

Actions outlined in this plan will move the county forward towards achieving each of these goals.

To date, county-wide internal "waste-to-energy" projects have focused on wastewater treatment facilities. These projects currently provide 22 percent of the county's energy use from a renewable resource. Incremental plant improvements and operational changes may increase this number to roughly 26 percent by 2008, however the "lynch pin" in achieving the 50 percent renewable energy goal for non-transit energy use set by the Renewable Energy Order lies with the Cedar Hills Regional Landfill.

The Cedar Hills Landfill provides the greatest opportunity to turn waste into energy. Current projections are that the landfill will remain open until 2016 providing for methane extraction well into the late 2020's. An award-winning methane capture system is in place and provides for maximum capture of all methane gas emitted by decaying garbage. Engineering estimates place the output of generation that could be derived from methane at approximately 25 average megawatts (AMWs) of electricity. Other technologies that might be considered are pipeline quality gas, or high British Thermal Unit (BTU) gas, liquid natural gas (LNG) or perhaps even a biodiesel plant. When the Cedar Hills waste-to-energy project is developed, the BTU production from the project would raise King County's renewable benchmark to well over 50 percent.

Historically, wastewater treatment facilities have been the focus of renewable and efficiency efforts in the county because these facilities are far more energy intensive than other county facilities; roughly half of the total stationary energy used by county government is for wastewater treatment. In the 1960's, the West Point Wastewater Treatment Plant was constructed with influent pumps that were powered by methane gas derived from treating wastewater. Since this initial effort, King County has been actively engaged in pursuing similar waste-to-energy projects, as well as the application of other renewable energy technologies.

In 1985, three cogeneration units were installed at West Point to further maximize waste-to-energy and reduce the need to flare methane gas. The combined heat and power cogeneration, along with the gas-driven influent pumps, provided for nearly 50 percent of the plant's total electricity needs from a renewable resource. Additionally, nearly 100

percent of the digester gas was being converted to energy. However, due to the age of the cogeneration units, and the down time associated with maintenance, this number has decreased over the years and their current output is approximately 58%. Plans are now under way to replace the existing cogeneration units with new, more efficient units, or alternatives which will return the waste-to-energy output to nearly 100 percent.

King County's leadership in new energy technology continued in 2004 when the county brought the nation's largest single-unit methane gas fuel cell online at the South Wastewater Treatment Plant. The fuel cell, rated at one megawatt (MW) production, is a demonstration project whose costs are shared by King County, FuelCell Energy, and the Environmental Protection Agency (EPA).

Two combined-cycle turbines and one steam turbine were installed at the South Plant in 2005. These units can operate on scrubbed digester gas produced by sewage, or on natural gas supplied by the utility. Combined with the fuel cell, energy generation at South Plant will provide close to 90 percent of the plant's energy needs under normal conditions.

The Brightwater Treatment Plant, currently under construction and projected to begin operation in 2010, provides new opportunities for renewable energy development. An energy plan for the plant itself has already been initiated and alternative sources for power are being explored, including an energy "test bed" that will be a laboratory for proof-of-concept testing of new renewable energy technologies.

In addition to waste-to-energy projects, the county has been implementing projects to conserve energy and resources for many years. Since 2000, 58 major projects have been completed in partnership with Seattle City Light and Puget Sound Energy (PSE) conservation programs. Together, these projects are saving an estimated 24,857,405 kilowatt hours (kWh) and 8,925 therms, or \$1.75 million annually. Most of the projects qualified for utility funding, and King County has received grant payments totaling over \$1.9 million.

King County has led by example in building construction. Under King County Ordinance 2004-0443, Leadership in Energy and Environmental Design (LEED) certification is required for new construction and major remodels, where economically feasible, to maximize efficiency and minimize environmental impact. LEED certification provides guidelines for ensuring efficiencies are installed during construction. By reducing energy use, construction of expensive new generation can be avoided.

A progressive conservation program addressing all resources has recently been initiated in partnership with Puget Sound Energy. In March 2005, King County and PSE signed an agreement that would look at all King County facilities to reduce energy and resource usage. In August 2005, a resource conservation manager was hired to implement this program. The goal of this program is to achieve an overall resource reduction of 10 percent within the next five years. Achieving this goal will save the county hundreds of thousands of dollars.

In short, King County will achieve compliance with the Renewable Energy Order's requirement that 50 percent of King County's non-transit energy come from or be offset by renewable energy sources by 2012 by maximizing the conversion of waste-to-energy (particularly at Cedar Hills Landfill), purchasing renewable energy where appropriate and increasing energy efficiency.

To meet the Executive Order goal of 35 percent of transit energy use to come from efficiencies and renewable sources by 2015, and 50 percent by 2020, included in the plan are expanded hybrid electric bus use, hybrid electric support vehicles, synthetic oils, synthetic lubricants, biodiesel, ethanol and extended oil drain intervals with conventional oils. Additional use of biodiesel outside transit extends to the Wastewater Treatment Division trucking biosolids to eastern Washington and the Solid Waste Division hauling garbage within King County.

Fleet Administration has established a strategic environmental business plan to implement purchase of hybrid vehicles and renewable fuel vehicles. Fleet Administration will expand the purchase of hybrid vehicles in all segments of its fleet and is purchasing flex fuel vehicles so as to make a smooth transition to ethanol when it becomes more accessible and affordable.

King County has one of the largest publicly owned fleets of hybrid electric vehicles (HEVs) in the region. Since 2001, these vehicles have been in use across King County departments and in the daily rental motor pool dispatch. Fleet Administration has already documented significant reduction in fuel consumption from the 136 HEVs that it now operates. These HEVs represent 32 percent of the cars in the fleet. The potential savings to be realized on fuel costs, from the 105 Toyota Priuses and 31 Ford Escapes, range from 30 percent to 50 percent depending on the model. The county will save an average of 20 tons of carbon dioxide (CO₂) per Prius, and 27 tons of CO₂ per Escape. This amounts to approximately 2,937 tons of CO₂ emissions saved over the lifespan of these vehicles when compared to conventional vehicle counterparts.

Fleet Administration has also placed its first order for hybrid trucks. The data show that under certain applications, hybrid trucks can save up to 60 percent in fuel over conventional diesel-powered utility trucks.

Fleet Administration has formed a regional consortium to encourage other local governments to participate in the acceleration of the medium and heavy duty hybrid truck market. Fleet has also applied for, and received, grant funding to help offset the incremental higher purchase price for hybrid trucks. The plan is to continue to seek other third-party funding for hybrid trucks.

This plan builds on important strides in the use of renewable energy sources that King County has already made. King County has been a leader in the use of biodiesel fuel and is currently the biggest user of biodiesel in the state. All Fleet Administration diesel vehicles began operating on 20 percent blend biodiesel fuel in June 2006. By July, approximately 50 percent of the diesel transit bus fleet was using a blend of biodiesel

fuel, which is composed of 80 percent diesel and 20 percent vegetable oil. This represents almost one million gallons of vegetable oil use per year. This is expected to increase to over 2 million gallons per year as fuel availability increases.

Another strategic initiative is to reduce the amount of energy lost through unnecessary idling. The data indicate that a typical truck burns one gallon of diesel fuel for each hour it idles and as little as 10 seconds of idle time reduces fuel efficiency and produces unnecessary pollutants. King County will be implementing an Anti-Idling Policy which has the potential to save up to 12 percent in fuel per year.

All of these projects and the action items set out in the Energy plan bring tremendous benefits to King County and its citizens, including significant reductions in greenhouse gas emissions. As a result of these efforts, King County will also reduce its dependence on purchased energy and resources, and insulate itself from market pricing when possible. These efforts, coupled with the actions set forth in this plan, lay the groundwork for King County to meet its renewable energy goals.

To measure progress towards these goals, all county energy purchases, production, and usage will be converted to the standard unit of energy measurement the British Thermal Unit, or BTU. This will allow for universal tracking and accounting of the various energy forms utilized throughout county operations. A detailed description and method for energy accounting along with the various strategies to achieve the county's energy goals is provided in Appendix B.

II. Energy Task Force

A countywide task force will be convened to carry out this plan and ensure a consistent and continued focus on renewable energy use and efficiency. This task force will be composed of the director or designee from the departments of Natural Resources and Parks (DNRP), Transportation (DOT), and Executive Services (DES). The Energy Task Force will:

- a. Monitor compliance with this plan and the Renewable Energy Order;
- b. Recommend additional strategies as necessary to achieve compliance with the Renewable Energy Order;
- c. Adopt work plans to study and increase renewable energy use;
- d. Coordinate intra-county efforts regarding energy issues;
- e. Advise the Executive on energy matters and recommend new energy initiatives;
- f. Develop and monitor the implementation of energy conservation benchmarks and efforts within county facilities and operations;

- g. Monitor energy policy, development and supply markets for their effect on present and future energy costs;
- h. Explore partnership arrangements with other local jurisdictions and/or private businesses to gain access to improved power rates; and
- i. The Renewable Energy Order also requires that the departments of Natural Resources and Parks and Transportation provide the Executive with annual reports regarding energy use. The Energy Task Force will be responsible for the review of those reports prior to submittal to the Executive.

The Energy Task Force is to meet and develop a charter for their operations no later than June 1, 2007.

III. Goals and Actions

Goal No. 1

King County will be a leader in the use of climate friendly, renewable energy sources.

Actions:

1. *The county will seek to foster broader use and development of clean, renewable fuel technologies through energy demonstration projects that include biodiesel, hydrogen, or other developing technologies.*

The Energy Task Force is charged with adopting a work plan to guide the aggressive study and implementation of renewable energy demonstration projects. King County is already home to one of the world's largest fuel cell demonstration projects. New and innovative technology will continue to evolve, and King County will play a significant role in acting as a living laboratory for such technology.

King County will seek partnerships with other public and private organizations to test and utilize new and evolving energy technologies. King County can partner with organizations such as Pacific Northwest Laboratories or the Washington Technology Center to develop new energy technologies. Through the living laboratory concept, King County can continue to provide leadership in implementing new energy technologies. King County will strive to meet the challenge of future demand through economical, state-of-the-art technology.

2. *Increase use of renewable fuel and efficiency of county buses and vehicles.*

a. Hybrid-electric buses

King County is a nationally acclaimed leader in the use of hybrid-electric bus technology, and the county will continue to purchase and use hybrid-electric buses. Data developed by the National Renewable Energy Laboratory indicates that hybrid-electric buses are 30 percent more fuel efficient than conventional diesel buses on the same routes operating in similar service. Metro Transit operates 236 hybrid-electric buses, or 16 percent of the fleet. Operating costs are estimated to be 15 percent lower than a conventional diesel bus.

b. Biodiesel fuels

Biodiesel fuel represents a significant opportunity. By July 2006, approximately 50 percent of the diesel revenue fleet was using a blend of 80 percent diesel and 20 percent vegetable oil. All non-revenue and off-road equipment began using a 20 percent blend earlier in the year. King County will seek to increase biodiesel use to meet the goals of the Renewable Energy Order. In addition, other renewable fuel sources will be studied for use in the county's bus fleet.

c. Efficient vehicles

Vehicles other than those used to convey transit passengers will be reviewed in four areas to maximize fuel efficiencies. First, the physical size of support vehicles will be reduced with the intent of improving fuel economy and overall operating cost. Second, the county will review the retail market to seek vehicles that use 85 percent ethanol (E-85) and will strategically apply those vehicles in our fleet. Third, all diesel vehicles will use biodiesel (at least B-20, 20 percent biodiesel). Over the next several years, diesel engines will become more available in smaller vehicles and King County will seek opportunities to apply them in the fleet. They offer the opportunity of extremely low emissions and superior fuel economy. Fourth, the county will use only hybrid cars and trucks, as funding is available.

d. Reduce engine oil use

Engine oil drain intervals provide a new opportunity for reducing the impacts of engine oil used in buses. This is particularly evident with engines in hybrid vehicles which operate much cooler than conventional diesel buses. The testing and data collection is not complete in this area but early indications are very promising for reducing mineral based engine oil. The second part of this effort is to validate the technical application and cost effectiveness of synthetic engine oil. This work is also in progress. In order to minimize the use of fossil fuels, Fleet Administration has been using re-refined lubricating oil in all of its vehicles since 1995. In 2000, Fleet Administration began using used motor oil to heat its maintenance facility.

3. *Maximize cost effective use of solar energy to power lighting at bus shelters, park and ride lots, county roads and other county facilities.*

Solar energy is a proven approach to renewable energy generation. Even in the Pacific Northwest, where sunlight can be limited, solar projects can be effective. To date, the county's solar energy installations have included security lighting on bus shelters, supplemental lighting of roads and partial power at solid waste transfer stations. Solar energy will continue to be regularly evaluated county-wide for use in new construction, retrofit construction and in specific applications.

4. *King County will transition to purchasing electricity produced from renewable sources, either from the local utilities that currently serve county facilities or other providers.*

County departments responsible for electricity purchasing will seek to make this transition as resources become available in the market and on a schedule that takes into consideration the cost, available funding and public benefit associated with such purchases. King County's purchase will not only increase its use of renewable energy but will also further stimulate the market to increase the availability of renewable power. A detailed plan for this transition will be completed by the Energy Task Force.

Goal No. 2

King County will maximize the conversion of waste-to-energy.

Actions:

1. *Convert to energy 100 percent of all reasonably usable waste products at landfills and wastewater treatment plants by 2012.*

- a. Landfill gas project

King County will continue to seek development of a landfill gas project at the Cedar Hills Regional Landfill. The landfill provides the county's greatest opportunity to turn waste into energy. Decomposing waste at the landfill produces methane gas, which is a potent greenhouse gas. The county works diligently to capture this gas and avoid its release into the atmosphere. Once it's collected, methane gas can be used to generate electricity, or can be scrubbed and used in place of natural gas.

Current projections are that the landfill will continue to receive solid waste until 2016, which means that methane gas could be extracted well into the late 2020's. An award-winning methane capture system is in place at Cedar Hills, providing 95-99 percent capture of gas emitted by decaying garbage. It is predicted that output of a facility at Cedar Hills could be approximately 25 average megawatts of electricity.

Other technologies that might be used to take advantage of this evolving energy source include pipeline quality gas, or high BTU gas, liquid natural gas (LNG) production or perhaps even a biodiesel plant. DNRP's goal is to have an energy project started at Cedar Hills by 2008.

b. One of the world's largest fuel cell projects

In 2006, King County will complete its testing phase for a pilot project with the nation's largest fuel cell at the South Wastewater Treatment plant in Renton. The cell extracts hydrogen from natural gas, scrubbed digester gas, or unscrubbed digester gases. These three forms of fuel are being tested as a viable hydrogen conversion for the one megawatt fuel cell. A grant from the U.S. Environmental Protection Agency, and partnership arrangements with Fuel Cell Energy and King County made this project possible. Following completion, analysis will be conducted to determine the future use of the cell and acquisition of other fuel cell technologies.

c. Increase energy generated at wastewater facilities

The South Wastewater Treatment Plant is now positioned to respond to a number of market conditions. With rising natural gas prices, digester gas can be scrubbed and sold to the local utility at a competitive price, based on the weighted average cost of natural gas. Or the plant can choose to use the scrubbed digester gas for generating heat and power via the cogeneration units or the fuel cell. Purchased natural gas is only used as a backup for the fuel cell and cogeneration when sufficient scrubbed digester gas is not available. South Plant may well be the first "insulated" wastewater treatment facility in the nation – capable of responding to rising or falling natural gas and electricity prices while utilizing renewable energy from methane gas.

King County will explore ways to further increase the energy generated from waste at wastewater facilities. Potential exists for increasing energy production by increasing digester output through the direct acceptance of food waste and/or agricultural wastes at wastewater treatment facilities. The Wastewater Treatment Division is currently studying ways to determine the viability of such an application and the impact on increased digester gas output, plus the costs for additional waste treatment.

2. *Develop rural biomass energy projects*

King County is pursuing a unique biomass project on the Enumclaw Plateau, a rural area that features the county's largest concentration of dairy farms. The project will seek to process manure from dairy cattle through anaerobic digesters to remove nutrients and convert the byproducts into energy. The county will partner with researchers and farmers to design and implement a successful project.

3. *Conduct studies to identify other commercial and industrial wastes that could be converted to energy and plan for county facilitation of waste-to-energy projects.*

The Energy Task Force will create a work plan to analyze other waste-to-energy projects. The Task Force will evaluate innovative ways to utilize King County's

existing infrastructure or new facilities to convert waste-to-energy. The progress on this effort will be included in the annual renewable energy report that DNRP is to file with the Executive, in accordance with the Renewable Energy Order.

Goal No 3.

King County will become a national model for energy efficiency by achieving a 10 percent per square foot reduction in county energy use by 2012.

Currently, the county uses approximately 1.39 million, million-BTUs (MMBTUs) of energy a year at a cost of roughly \$18 million dollars. With approximately 5.5 million square feet of facility space, this relates to a county-wide average Energy Use Index (EUI) of 256 thousand BTUs (kBTUs) per square foot. A 10 percent reduction to this amount would relate to reducing our average energy use by 26 kBTU per square foot or the equivalent of 35,801 MMBTU per year, countywide. By achieving this goal, the county will save enough energy to power roughly 540 single-family homes. Additionally, by reducing energy use, we help to reduce greenhouse gas (GHG) emissions. To help achieve the GHG reduction goals outlined in the county's Climate Plan, priority will be placed on energy saving actions where GHG emissions can be reduced.

The Energy Task Force will oversee development of a county-wide baseline and methodology for calculating annual reduction in energy use. To accommodate growth in occupancy, square footage and substantial changes in facility function, the Task Force will evaluate annual adjustments to the initial baseline.

Actions:

- 1. Implement a countywide comprehensive utility accounting management software program to achieve best management practices for energy use, billing services and cost savings.*

In August 2005, King County began developing a countywide database for utility costs and consumption. The database, Utility Manager, is the workhorse accounting system of the energy and resource conservation management program. The database will be used to establish baselines and quantify savings, allowing the county to easily consolidate and compare energy and resource consumption data for its buildings. Through this program King County will be able to actively manage energy consumption for the first time. With this action, the county will:

- Compile a master list of all county utility accounts, meters, services and rates;
- Identify billing discrepancies and facilitate and track credits;
- Establish facility baselines and goals and provide regular feedback to departments on program progress;

- Identify consumption anomalies that may relate to operational issues such as leaks or failed controllers;
- Track consumption patterns to verify the success of implemented savings programs; and
- Make accurate use projections to help create budgets and forecasts.

As part of this effort, division finance managers and accounts payable personnel will be trained on the system as well as the process of utility bill auditing to identify billing errors, dormant and non-county accounts, and opportunities to save money through rate changes. The Department of Natural Resources and Parks (DNRP) technology unit will house and maintain the Utility Manager software system. The DNRP energy group will be responsible for training county staff on the system and for establishing utility accounting and bill auditing procedures to ensure consistent and accurate data. Cost savings achieved through these activities will be tracked and reported annually to demonstrate the added value of utility accounting and bill auditing.

2. *Adopt mandatory energy efficiency and resource use guidelines for operation and maintenance of all county occupied facilities. Unique operating requirements of specialty facilities will be addressed in separate facility plans, as outlined in action item 4.*

To help achieve a standard level of efficiency in its buildings, the King County Energy Task Force will establish general operating guidelines for county occupied facilities by July 2007. Maintenance and operations sections will be expected to implement and monitor the guidelines applicable to building heating, ventilating and air-conditioning (HVAC) and other technical hardware. All county staff and visitors will be expected to follow the guidelines relating to daily operation of building resources.

The energy and resource use guidelines will address heating and cooling set points, building HVAC schedules, lighting expectations, plug load management including computer power management settings, operation of office equipment, and use of personal appliances. The guidelines will also address water conservation and waste reduction and recycling expectations. For buildings with unique operating requirements, such as detention facilities, the guidelines may be modified to accommodate their special conditions.

3. *Create an initiative to encourage employees to implement energy conserving measures at work.*

People who occupy, operate, and maintain our buildings play a significant role in how much energy and resources a facility consumes. Each day, we all make decisions that impact the bottom line. For example: all building users are capable of turning lights off in unoccupied rooms. Building operators make decisions about system set points. And maintenance insures that systems run efficiently. Companies can spend

thousands of dollars on efficient equipment, but if the whole building community is not aware of their role in maintaining efficiency and minimizing waste, building performance can soar well above projected levels. By educating and motivating people to use resources wisely, we can reduce waste and generate savings.

The King County energy awareness campaign will seek to fundamentally change the energy and resource consuming behavior of all 15,000 county employees. By actively engaging staff to make daily decisions to reduce resource consumption, the county can achieve significant cost savings and environmental mitigation. Behavior modification has been shown to generate up to 10 percent reduction in resource use from a typical building baseline. Eliminating waste through operational changes is a low-cost no-cost strategy that should be implemented with priority.

This campaign will aim to empower employees to help manage energy and resource consumption by:

- Providing information and technical assistance on efficient operation of building resources to help employees evaluate their daily practices for efficiency;
 - Creating a designated web site and e-mail address (conserve.energy@metrokc.gov) to allow for feedback and distribution of information;
 - Developing a program for monitoring efforts and regular distribution of reports;
 - Creating user incentives for aggressive resource and energy reduction; and
 - Promoting successful building and/or departmental efforts through awards, case studies and contests.
4. *Develop specific energy management plans for each energy-intensive and/or special-purpose county facility, such as the West Point and South wastewater treatment plants, the King County Correctional Facility, and transit bases. These plans will focus on least-cost management and include specific approaches for each facility's use, production and sale of energy.*

As the energy market has developed and fluctuated over the last several years, the county's wastewater treatment plants have developed the capability to not only capture and reuse digester gas for on-site energy needs, but also to sell that generated energy for off-site use.

We now have many viable choices for energy supply and export. The challenge is to ensure that our operational choices reflect the most economical decision for King County. We must take into account overall costs and benefits of each system when determining how we will operate our energy generation resources.

In addition to wastewater treatment, the county provides several other public purpose facilities such as jails, police precincts, and transit bases. These types of facilities, while not as extreme in energy consumption as a wastewater treatment plant, also require certain operating considerations in order to meet their mandates. The

specialized mission of these facilities warrants specific building operating guidelines that consider unique process or facility requirements.

The Energy Task Force will identify facilities requiring specialized energy management plans. The task force will work with key staff at these locations to identify operating parameters and best practices to be incorporated in the plan. Special purpose facility energy management plans will be completed no later than December 2008.

5. *Conduct and/or update efficiency audits of all county buildings by 2010 and create a prioritized action plan for reducing energy use at each building.*

By inventorying building equipment and systems, along with operational characteristics, we can identify cost-effective opportunities to improve efficiencies and reduce waste. These efforts will be completed in several phases and will consist of both an operational component (OCM) and an equipment upgrade component (ECM). Operational audits will be ongoing, whereas equipment upgrade audits will be phased based on complexity.

- a. *Operational Assessments*

Operational and maintenance (O&M) assessments focus on no-cost, low-cost opportunities to optimize the performance of existing systems. These audits include analyzing historical energy data for trends, performing daytime and nighttime walk-throughs, and analyzing set points, control strategies, and equipment performance in relationship to system design and occupancy needs in order to identify opportunities to reduce operating costs.

Building O&M audits will be prioritized based on building EUI (energy use per square foot adjusted for weather). Buildings with the highest EUIs will be audited first. Initial walk-through audits will be conducted to identify obvious operating issues and general system conditions. Inconsistencies relevant to the county operating guidelines (action item 2) will be noted, along with additional recommendations to increase system efficiencies through operational changes. Operational issues relating to county guidelines will be forwarded to the relevant party to be acted upon immediately. Items identified might include resetting HVAC start and stop times, the temperature range between heating and cooling set points, or on and off times for exterior lights. These control settings should align with the energy and resource use guidelines as described in action 2.

After walk-through audits have been completed, findings and a list of specific recommendations will be compiled and presented to facility managers, technicians and operators. Together, this group will then prepare a facility action plan to identify clear and specific actions that need to be taken and a timeframe for how and when issues will be addressed.

If considerable operational issues exist, retro commissioning may be considered. Retro commissioning is a detailed, systematic process for investigating an existing building's operations and identifying ways to improve performance. If the walk-through audit notes major operational and comfort issues, retro commissioning could be considered as the first line of attack to increase the building's energy efficiency. A commissioning agent (either in-house or independent) will be employed and the local utility will be contacted for assistance.

The DNRP energy group will prepare a work plan and procedures for the O&M audit process including expected report outcomes. Efforts will be made to quantify and verify savings generated from the O&M audit process. Energy management system trend logging, independent metering, and utility interval data will be used for this task.

b. *Equipment Assessment*

Traditional energy audits focus on investigating existing building systems for opportunities to replace equipment in order to save energy. Over the years, many of our buildings may have been audited for equipment upgrades through local utility programs or other contracted services. Initially, building documentation will be reviewed for past energy audits. Buildings that have had an energy audit within the last three years, and buildings that have been constructed within the same period, will be considered current for equipment upgrades. It is anticipated that any equipment upgrade projects that have occurred as a result of these audits will be accounted for in the current ECM project inventory.

The first priority for new building audits will be the 10 largest users (total energy) and the 10 buildings with the highest energy use per square foot (EUI). Walk-through audits will be conducted in these facilities to identify existing equipment, obvious equipment upgrades and general system conditions. In terms of equipment upgrades, a walk-through may identify potential efficiency improvements to lighting, controls, or motors. At this phase, a simple list of each action item can be generated to serve as a placeholder until further analysis can be done.

Once a general list of equipment upgrades has been compiled for a building, each department has the option of further developing this list with consultants and/or utility assistance or an Energy Services Company should be enlisted via the General Administration (GA) Energy Savings Performance Contract (ESPC) to further analyze the cost and savings potential of the projects. Equipment Conservation Measures (ECMs) will be prioritized and may be implemented via the revolving fund described under strategy 6.

Upon completion of the first set of buildings, the auditing process will continue with the next top 10 facilities until all facilities have been audited.

6. *Allocate \$5 million seed money to implement efficiency projects as identified through audits.*

Technology is constantly changing. As new products enter the market place, it often makes economical sense to upgrade equipment to save energy and resources. These projects can take the form of no-cost or low-cost, in-house jobs, or, more likely, larger projects executed as part of the capital improvement program. In either case, utility rebates and grant partnerships should be pursued and total investment, cost savings, and environmental benefit will be tracked.

King County has been implementing projects to conserve energy and resources for many years. However, there has never been a unified effort to compile information on these projects and to report the overall benefit to the county. A strategy of the ECM program element will be to pull these efforts together and develop a consistent, coordinated approach to efficiency upgrades so that we can more easily account for resource savings from capital improvements and quantify income from utility grants and rebates.

An initial budget will be allocated to each department to implement efficiency projects as identified through the audit process described in action 5. The county Energy Task Force, in coordination with the Budget Office, will be responsible for assigning funds to divisions. Projects funded through this mechanism will be implemented in priority of cost effectiveness, in other words, the most cost effective projects should be implemented first. The Energy Task Force will determine the combination of life-cycle costing and analysis appropriate for each ECM.

All projects will be implemented in coordination with the energy task force. As such, projects will be assigned a tracking number and standard data will be collected for county reporting. Forms for recording necessary information will be developed by the energy office. Verified annual savings from completed projects will then be captured from departmental utility budgets and reallocated to a specified budget location to be used to implement future ECM projects.

7. *Aggressively pursue utility grant funding and energy services contracts to supplement county monies for energy efficiency efforts.*

Ever since the oil embargo and consequent energy crisis in the 1970's, utility companies have been involved in implementing conservation projects as a recognized means of avoiding building new generation. Oftentimes these programs include grant incentives for design, materials, and installation of equipment that will save energy or other resources. For obvious reasons, it is in the best interest of the county to take advantage of these programs and partner with local utilities whenever possible. Under our current capital improvement procedures, however, there is no mechanism in place to ensure this.

To begin the process of organizing information, the county will adopt a standard energy and resource balance sheet requirement for all capital improvement projects. This form will indicate the overall impact to energy or resources as a result of the project or modification. Not only will collecting this information allow us to begin the collective process of evaluating ECM funding, it will also help us to forecast expenditures, establish budgets and facilitate the county benchmarking required by the new executive orders.

The Energy Task Force will approve a project form for energy and utility impact with input from DNRP and other departments. Projects that are expected to result in utility savings will be forwarded to the relevant utility company for their review and analysis. Individual project managers will be expected to follow the utility grant program application process through to close out. Copies of approved grants and rebates and payments from utilities should be forwarded to the energy office for record keeping. The energy office will prepare a flowchart and hold trainings to assist project managers, as required, in this effort.

8. *Benchmark all applicable county buildings using the ENERGY STAR benchmarking tool. Apply for LEED Existing Building (LEED EB) and/or ENERGY STAR certification on all qualifying existing county buildings.*

The EPA has developed a nation-wide energy performance rating system called ENERGY STAR. This tool allows users to enter building specific information into a national database which then rates the building's performance on a scale of 1-100 relative to similar buildings nationwide. The rating system accounts for the impacts of year-to-year weather variations, as well as building size, location, and several operating characteristics. Buildings that rate 75 or greater may qualify for the ENERGY STAR label.

Building types that are eligible for this rating system are:

- Offices (general offices, financial centers, bank branches, and courthouses)
- K-12 schools
- Hospitals (acute care and children's)
- Hotels and motels
- Medical offices
- Supermarkets
- Residence halls and dormitories
- Warehouses (refrigerated and non-refrigerated)

Due to the unique nature of King County operations, only 35 out of 345 (10 percent) county-owned facilities potentially fall into these categories. For those buildings that do qualify, efforts will be made to utilize this national system of benchmarking. Furthermore, due to the nature of our facilities, only a small percentage of the 35 eligible buildings may additionally qualify for LEED-EB certification. The LEED Green Building Rating System® is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. LEED-EB provides a

recognized, performance-based benchmark for building owners and operators to measure operations, improvements and maintenance on a consistent scale.

While a majority of our facilities will not be eligible for recognition under these national rating systems, King County's goal is to reduce county energy consumption by 10 percent per square foot, which will be an effort worth recognition once achieved. With this goal in mind, King County will investigate the requirements for recognition under the ENERGY STAR leadership program.

9. *Achieve LEED certification on all new county construction as defined in King County Ordinance 2004-0443.*

Washington State has had a progressive energy code for many years. King County has committed to building above those codes to achieve higher LEED standards. Innovative design can often be received with skepticism, so it is important to demonstrate performance through measurement and verification. By quantifying and verifying the amount of resource savings that result from King County's efforts to exceed model code efficiencies, we can help demonstrate the value added by this program.

In addition to the requirements set forth in Ordinance 2004-0443, King County will develop a system to track and report energy and resource savings that result from our green-building efforts. A balance sheet, similar to the one described for capital improvement projects, will be developed for LEED applicable projects. The baseline for resource savings will be the Washington State Non-Residential Energy Code or the Seattle Energy Code, whichever is applicable, and other local codes related to a building's resources consumption. As a goal, all new construction and major remodel projects should exceed code by a minimum of 20 percent. In addition to resource savings, efforts shall be made to determine incremental costs for each above-code element.

In addition to rebates for energy efficiency improvements in existing buildings, utility companies often offer grants for new construction where design substantially exceeds local codes. Utilities should be approached to partner with the county on efforts to increase efficiencies in new buildings and to secure grant funding where available. By requiring the quantification of energy and resource savings against local codes, the supporting documentation required for participation in these programs will be readily available.

10. *Purchase only ENERGY STAR-labeled appliances and equipment and require consideration of energy efficiency in all procurement decisions as element of determining lowest priced bids.*

ENERGY STAR products meet strict energy efficiency criteria as set by the EPA or the U.S. Department of Energy. These energy efficient products save money and help

protect the environment by causing fewer harmful emissions from power plants. Some examples of product specifications are:

- Qualified refrigerators are at least 15 percent more efficient than the minimum federal efficiency standard.
- Qualified TVs consume three watts or less when switched off, compared to a standard TV, which consumes almost six watts on average.
- Office equipment that qualifies automatically enters a low-power "sleep" mode after a period of inactivity.

The King County Department of Finance shall work with the Energy Task Force to create a county purchasing policy for ENERGY STAR equipment. Equipment covered by this policy shall include, but not be limited to, kitchen appliances, clothes washers and dryers, electronics such as televisions and VCRs, computers and their peripheral equipment, and office equipment including copy machines, fax machines, etc.

11. Allow a portion of energy cost savings to be retained by applicable county departments as incentive for achieving energy efficiency.

King County will seek to establish a formal process to recognize and reward county departments for successful conservation programs. Utility savings generated from efforts will be calculated and a portion of the savings will be returned to the departments that generated the savings.

Conserving energy and water and reducing waste can potentially generate revenue for the county through reduced operating costs. By quantifying and reinvesting this money into our departments, the county can encourage energy and resource management, reward departments for their efforts, present departments with additional opportunities to reinvest monies in their operations and facilities, provide building occupants with a goal to work towards, and demonstrate the county's support for resource conservation

The Energy Task Force will develop a proposal for a shared savings program.

**Appendix A
Renewable Energy Order**

Executive Order: Renewable Energy and Related Economic Development

Document Code No.: PUT 7-6 (AEO)

Department/Issuing Agency: Executive Office

Effective Date: April 1, 2006

Approved: /s/ Ron Sims

Type of Action: New

This Order requires that at least 50 percent of King County’s total non-transit energy use come from renewable energy sources by the year 2012, that at least 35 percent of transit energy use come from efficiencies and renewable energy sources by the year 2015, and that at least 50 percent of transit energy use come from efficiencies and renewable energy sources by the year 2020.

WHEREAS, this Order sets a renewable energy standard that will put King County at the forefront of renewable energy use and will be a market catalyst to help move the region and the nation towards a clean energy economy; and,

WHEREAS, supply of traditional fossil fuels is rapidly diminishing and continued dependence on traditional fossil fuels will be economically devastating and is a threat to our national security; and,

WHEREAS, use of traditional fossil fuels results in air pollution and is a primary cause of global warming and climate change; and,

WHEREAS, global warming will have significant adverse impacts on our environment, health and economy; and,

WHEREAS, use of clean, renewable energy reduces the level of fossil fuel emissions that are a main cause of global warming; and,

WHEREAS, use of clean, renewable energy provides a primary resource for self-sustaining counties; and,

WHEREAS, improved transit technology and best practices by Metro Transit Operators and Vehicle Maintenance Section employees contribute to efficiencies that reduce non-renewable energy consumption and reduce greenhouse gas emissions; and,

WHEREAS, use of clean, renewable energy reduces our dependence on sources of foreign oil – strengthening our economy and promoting national security; and,

WHEREAS, use of clean, renewable energy promotes new and environmentally-friendly economic development; and,

WHEREAS, use of renewable energy can be made in a cost-effective manner; and,

WHEREAS, King County has set a goal to use biodiesel across 20 percent of its buses and vehicles, making it the largest single user of biodiesel in Washington State and significantly helping to stimulate the region's biodiesel market; and,

WHEREAS, King County has demonstrated a first-of-its-kind stationary application of hydrogen fuel cell technology run on methane gas from its South Treatment Plant; and,

WHEREAS, King County has demonstrated the significant potential for waste-to-energy conversion at its Cedar Hills landfill; and,

WHEREAS, King County has joined with education, energy and business groups such as Friends of the Hidden River, the Northwest Energy Technology Collaborative, Snohomish County Public Utility District and Snohomish County Economic Development Council in designing an energy technology education center at its Brightwater Treatment Plant that aims to educate the public on innovative energy technologies that can be applied in wastewater treatment; and,

WHEREAS, King County is entrusted with protecting its citizens, the environment and economy and will be a leader in the use of renewable energy;

NOW, THEREFORE, I Ron Sims, King County Executive do hereby order and direct:

(1) This Order requires that at least 50 percent of King County's total non-transit energy use come from renewable energy sources by the year 2012, that at least 35 percent of transit energy use come from efficiencies and renewable energy sources by the year 2015, and that at least 50 percent of transit energy use come from efficiencies and renewable energy sources by the year 2020.

(2) To achieve compliance with this Order, the following Actions, among others that will be developed over time, will be taken:

a) The county will seek to maximize the conversion and use of waste for energy. The Department of Natural Resources and Parks (DNRP) will seek to convert and use all reasonably usable waste at wastewater treatment facilities and the Cedar Hills Landfill to energy. DNRP will also analyze other opportunities to use county or third party wastes to generate energy.

b) The county will transition to purchasing electricity produced from renewable sources either from the local utilities serving county facilities or other providers. County departments responsible for electricity purchasing are directed to make this transition as such resources become available and on a schedule that takes into consideration the cost, available funding and public benefit associated with such purchases.

c) The county will continue the use of biodiesel in county buses and other county vehicles and will seek to increase the amount of biodiesel used. In addition, the county will seek to use other alternative fuels and hybrid vehicles as technology and funding allows.

d) The county will implement a program to minimize existing energy use through increased efficiency, optimized operation and maintenance, and conservation efforts.

(3) A detailed approach to carrying out these Actions and achieving compliance with this Order will be include in a King County Energy Plan, which is to be completed by the Department of Natural Resources and Parks (DNRP) by January 1, 2007. The Energy Plan will also include other energy objectives and the necessary actions for achieving those objectives.

(4) The Energy Plan is to be consistent with the county's global warming policy and is to be completed in coordination with the Executive, the Department of Transportation (DOT) and the Facility Management Division of the Department of Executive Services (FMD). The Energy Plan will be updated at least every five years to ensure that the county is taking appropriate steps to achieve compliance with this Order and meet the other objectives of the Energy Plan.

(5) DOT will be responsible for developing the portion of the Energy Plan relating to county vehicle and bus fuel use. In addition, DOT will continuously analyze new fuel and technology developments in order to prepare for the eventual transition to a fleet of county vehicles and buses powered solely by renewable energy sources.

(6) DNRP is directed to monitor the county's overall compliance with this Order. DNRP will issue an annual Renewable Energy Use Report to the Executive detailing total county energy usage measured in British Thermal Units (BTUs) and the total percentage of such energy that is from renewable energy sources. The Report will also advise the Executive of the planning and measures being undertaken to increase the county's use of renewable energy. DOT will provide the portion of this annual report that addresses trends and developments in renewable energy sources and the potential use of such sources to power county buses and vehicles.

(7) For purposes of this Order, "energy" includes electricity, vehicle fuel, oil, natural gas, steam and other fuel purchased for the function of heating, cooling, lighting, and mechanical motion. "Renewable energy sources" includes solar, wind, water, geothermal, refuse-derived fuels, and other sources that can be replenished naturally or biologically. "Renewable energy" means energy derived from renewable energy sources.

DATED this 22nd day of March 2006.

Ron Sims, King County Executive (Original Signed)

ATTEST: (original signed)

James J. Buck, Interim Director
Records, Elections and Licensing Services Division

Appendix B
King County Energy Use and
Compliance with Renewable Energy Order

I. King County current energy & resource use

King County facilities and operations purchased roughly \$20.3 million worth of electricity from Seattle City Light and Puget Sound Energy in 2004. The King County Department of Natural Resources and Parks (DNRP) purchased \$15.9 million, or 73 percent of King County’s total purchases. The Wastewater Treatment Divisions of DNRP (WTD) was responsible for 92 percent of DNRP’s total electricity purchases. The King County Department of Facilities Management (DFM), which is responsible for operation of 2 million square feet of county buildings, accounted for approximately \$5.3 million of the electricity and energy purchases. All total, King County uses energy that equates to approximately the annual energy consumed by 40,000 homes.

The following is a breakdown of King County’s energy and resource acquisitions for 2004.

Electricity	\$16,752,713
Natural Gas	\$834,976
Fuel Oil	\$26,060
Steam	\$862,384
Propane	\$18,890
Water	\$831,394
Sewer	\$823,779
Refuse	\$142,925
Recycling	\$3,359
Total Utilities	\$20,296,479

II. Energy accounting methodology and compliance with Renewable Energy Order

To allow for tracking and accounting of the various non-transit fuel types used throughout county facilities, all energy will be converted to British Thermal Units (BTUs) using standard conversion factors. A BTU is a universal standard unit of measurement for energy. One BTU is equal to the amount of energy required to raise one pound of water one degree Fahrenheit.

To assist the accounting process, the county will categorize energy consumption in terms of our method of acquisition and application. The most common and largest in volume are direct purchases from utility suppliers. This includes electricity, natural gas, propane, fuel, oil, steam, etc. The second category of usage is the direct application of waste-to-energy at our facilities. At these facilities, raw methane gas can be used to fuel boilers, reciprocating engines, and other plant equipment. Additionally, the gas can be treated

and then sold to local utility companies. Finally, we have our independent capacity to generate energy either using waste energy (digester and/or methane gas) or purchased natural gas. The energy generated can either be used on site or exported. To accurately account for internal usage and exported energy generation, these fuel volumes have been separated by category. And lastly, all of the three categories may include a renewable energy portion and that has been separated out as well.

The following is a table which lists current County energy purchases, use and production and its conversion to BTU's.

**King County
2004 Energy Statistics
Current Scenario**

Energy use without rolling stock. SCL as non-renewable. Actual generation from plant records.

						KC FACILITY USE	EXPORT	RENEWABLE	
Fuel Purchases									
Fuel Type	Annual Volume	Unit		BTU/ Unit	MMBTU/ Year	% of Total	MMBTU/ Year	MMBTU/ Year	MMBTU/ Year
Electricity	307,842,081	kWh	@	3,413 =	1,050,665	81.7%	1,050,665		
Natural Gas	1,411,313	Therms	@	100,000 =	141,131	11.0%	141,131		
Steam - Low Pressure	34,109	Mlbs	@	1,164,000 =	39,703	3.1%	39,703		
Steam - High Pressure	36,347	Mlbs	@	1,190,000 =	43,253	3.4%	43,253		
Propane (west point only)	125,795	Gallons	@	95,500 =	12,013	0.9%	12,013		
						1,286,766			
Waste to Energy - Direct Use									
Facility	Annual Volume	Unit		BTU/ Unit	MMBTU/ Year	% of Total	MMBTU/ Year	MMBTU/ Year	MMBTU/ Year
West Point Boilers	44,578,743	CF	@	600 =	26,747	9.7%	26,747		26,747
West Point Influent Pumps	19,716,439	CF	@	600 =	11,830	4.3%	11,830		11,830
South Plant Boilers	69,766,076	CF	@	630 =	43,953	15.9%	43,953		43,953
South Plant Gas Sales (actuals)	1,935,694	Therms	@	100,000 =	193,569	70.1%	-	193,569	193,569
						276,099			
Waste to Energy - Generation									
Facility	Actuals	Unit		BTU/ Unit	MMBTU/ Year	% of Total	MMBTU/ Year	MMBTU/ Year	MMBTU/ Year
West Point Cogen	7,637,182	kWh	@	3,413 =	26,066	88.7%	26,066		26,066
South Plant Fuel Cell	976,880	kWh	@	3,413 =	3,334	11.3%	3,334		3,334
South Plant Cogen	0.0	kWh	@	3,413 =	0	0.0%	0		0
Cedar Hills	0.0	Therms	@	100,000 =	0	0.0%	-	0	-
						29,400			
							1,398,695	193569.4	305,498

Total King County Energy Use (MMBTU)
% of total from Renewables

1,398,695
21.8%

Currently, 21.8 percent of the county's total stationary energy consumption comes from energy renewable energy sources. The three goals outlined in this plan will help the county reach the 50 percent renewable energy goal outlined in the Renewable Energy Order.

The impact of this plan's actions is projected as follows:

Action 1: Maximize waste-to-energy projects at all Wastewater Treatment Facilities resulting in increasing the present level of renewables from 22 percent to 26 percent.

As market conditions make renewable energy more available, the county will seek to purchase renewable energy from utilities for county use. Such purchases will supplement the other actions in this plan and can also be utilized to compensate for any shortfalls in compliance with the Renewable Energy Order.

Action 2: Fully implement the waste-to-energy capabilities at Cedar Hills contributing to the goal by an additional 30 percent resulting in achieving the 50 percent goal by 2012.

Action 3: A 10 percent reduction to overall county energy consumption will have a significant impact to our ability to achieve the 50 percent goal; namely it will contribute 5 percent of the total energy required to meet the goal.

III. Transit Energy Use and Compliance with Renewable Energy Order

For tracking and accounting of Transit revenue and non-revenue vehicle fuel types, all energy will be converted to British Thermal Units (BTU) using standard conversion factors.

For reporting purposes, Transit will have 2 categories of energy consumption; 1) revenue fleet and 2) non-revenue fleet.

Following is a table listing energy purchases, units of measure and the converted BTU values that Transit will use to establish a baseline for reductions.

Transit Division

2004 Energy Used for Public Transportation Benefit

Revenue Fleet						
Energy Type	Annual Volume	Units		BTU's/ Unit	Percent of total	MMBTU/Year
Diesel Fuel	10,000,981	gallons	@	135,000	89.9 percent	1,350,132,435
Biodiesel B100	24,948	gallons	@	130,950	0.00 percent	0
Engine Oil	25,093	gallons	@	138,000	0.23 percent	3,462,834
Electricity	16,749,028	Kwh	@	3,413	3.79 percent	56,946,695
sub-total					93.89 percent	1,410,541,964

Non-Revenue Fleet						
Energy Type	Annual Volume	Units		BTU's/ Unit	Percent of total	MMBTU/Year
Diesel Fuel	549,617	gallons	@	135,000	4.94 percent	74,198,295
Gasoline	140,457	gallons	@	125,000	1.17 percent	17,557,125
sub-total	690,074				6.11 percent	91,755,420

Total MMBTU						
						1,502,297,384

In 2004, 4 percent of Transits fleet energy consumption came from renewable energy sources. The short-term actions outlined herein offer a net reduction potential of 20 percent, and move Transit toward meeting the goals of the Renewable Energy Order.

- Action 1: Increase utilization of hybrid-electric transit buses through future capital purchases, providing funding is available.
- Action 2: As regional supplies become available, expand the use of B-20 bio-diesel in the revenue fleet.
- Action 3: Where applicable, extend oil drain intervals in the revenue fleet.
- Action 4: Where applicable, utilize synthetic lubricants in the revenue fleet.
- Action 5: Where applicable, purchase electrical energy for the Transit Trolley system from green portfolios.
- Action 6: Where applicable, purchase non-revenue vehicles that use E-85 ethanol fuel.
- Action 7: Where applicable, purchase non-revenue vehicles that use B-20 bio-diesel.

Action 8: Where applicable and funding is available, purchase hybrid-electric non-revenue vehicles.

Action 9: Where applicable, reduce the physical size of non-revenue support vehicles to allow improvement of fuel economy.

2004 Energy Used for Fleet Vehicles

	Annual Volume	Units	BTUs/Unit (source DOE)	% of Total BTUs	MMBTU/Year (millions BTUs)
Gasoline	1,227,289	gallons	125,000	78.54%	153,411
Petroleum Diesel	322,361	gallons	130,000	21.46%	41,907
Biodiesel (B20)	0	gallons	120,000	0.00%	0
Ethanol	0	gallons	80,000	0.00%	0
CNG	84	gallons	44,000	0.00%	4
			TOTAL	100.00%	195,322

IV. Fleet Administration Non-Revenue Vehicle energy Use and Compliance With Renewable Energy Order

The following table lists Fleet’s energy use starting with the year 2000, with projections to the year 2012. Fleet will achieve the goal acquiring at least 50 percent of its energy used from efficiencies and renewable energy sources by 2012. This will be achieved by using a number of approaches simultaneously. (a.) Gasoline vehicles will be replaced with fuel efficient hybrid-electric or diesel vehicles whenever possible. (b.) Renewable biodiesel fuel will be used in diesel vehicles. The use of a B-20 blend was begun in 2006 and Fleet’s diesel vehicles will begin using B-50 by 2010. (c.) An idle reduction policy will be implemented. This will increase efficiency by reducing the amount of fuel which is used for non-productive purposes. (d.) Fleet vehicles will use renewable ethanol E85 when it becomes available on the retail market. E85 is not included in the calculations because its retail availability date is currently unknown.

Fleet Renewable Energy Use

Year	Gasoline Used	Petro Diesel Used	B100 Biodiesel Used	Propane Used	CNG Used	Ethanol Used	Efficiency / hybrid Gallons of Gasoline Saved	Idle Reduction Gallons Saved (3 percent net fuel gallons)
2000	1,253,750	274,801	0	8,041	6,406	E85 is not currently available	0	0
2001	1,273,125	307,773	0	3,857	1,803		913	0
2002	1,246,367	335,500	0	4,127	1,945		3,036	0
2003	1,244,377	326,085	0	2,681	1,428		4,323	0
2004	1,227,289	322,361	0	2,453	84		5,711	0
2005	1,239,030	327,705	0	2,153	85		8,970	0
2006	1,225,332	300,332	38,070	1,921			12,297	0
2007	1,208,591	279,894	69,974	1,921			21,247	46,174
2008	1,183,673	289,803	72,451	1,921			39,062	45,264
2009	1,131,689	304,802	76,200	766			79,129	43,030
2010	1,067,339	208,169	208,169	535		143,689	40,216	
2011	988,379	234,558	234,558	22		223,802	37,011	
2012	997,329	245,975	245,975	22		336,245	34,592	