

CAN FAIRFAX COUNTY KEEP ITS COOL?

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"Treat the Earth well; it was not given to you by your parents, it was loaned to you by your children. We do not inherit the Earth from our ancestors; we borrow it from our children." Ancient Indian Proverb.

A BRIEF LOOK AT THE GLOBAL SCENE

Global warming is threatening the livability of the Earth. Business-as-usual will result in irreversible destruction of vital ecosystems and possibly more than half of Earth's plant and animal species. If we do nothing, the Arctic is predicted to become free of ice in summer and the Amazon rainforest could revert to grassland this century. Accelerated collapse of the Greenland Ice Cap is expected to increase ocean levels this century, flooding many coastal cities and communities around the world. The power of hurricanes and typhoons is increasing, threatening hundreds of millions of coastal dwellers. Oceans are acidifying due to the uptake of increasing carbon dioxide emissions and are projected to lose virtually all fisheries by mid-century. Tropical coral reefs with their richness of aquatic life will all but disappear. Severe drought has been projected to cover almost a third of the land this century. Climate changes and extreme weather events will reduce agricultural production for a human population expected to increase from six to nine billion by mid-century. If we do nothing, water shortages are expected to impact three billion people and more than 600 million will not have sufficient food.

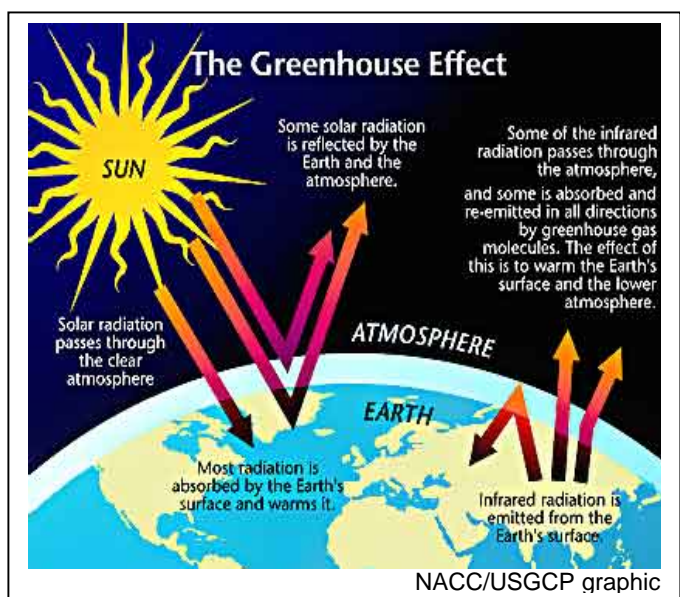
Greenhouse gases (GHGs) are those that cause heat to be trapped in the atmosphere. The diagram below visually illustrates the GHG effect. GHGs include carbon dioxide, methane, nitrous oxides, and fluorinated gases. Immediate action is required to reduce emissions of these gases to avert reaching tipping points leading to uncontrollable warming. The Fourth Assessment Report by the International Panel on Climate Change (IPCC) states that adaptation and mitigation measures can diminish the risks associated with climate change. Dr. James Hansen, noted NASA climatologist, says that "business-as-usual, if it continues for even another decade, will be disastrous for the planet."

Complicating efforts to curb greenhouse emissions is a

coming oil crunch, projected by the International Energy Agency (IEA) and the National Petroleum Council (NPC) to occur between 2010 and 2015. Diminishing oil supplies and growing international demand will drive up prices and perhaps lead to gasoline rationing. This event could greatly affect our local economy and suburban residents, changing transportation and commuting modes and altering lifestyles.

Preparations for the oil crunch will generally aid in curbing global warming provided that liquid fuels are not produced using highly polluting source material or inefficient fossil fuel processes, such as oil from coal, tar sands, or oil shale. Canada, for example, produces one million barrels of synthetic crude a day from tar sands. The extraction process using natural gas requires more BTUs than it produces and leaves a barren landscape.

Participating in an epic adventure to reorder our lives and to develop pollution-free sustainable communities that are necessary to save the planet and humanity is indeed a challenge. With humanity at risk and climate catastrophe looming, most scientists and citizens feel we must take immediate action to counter these threats.



FEDERAL ACTIONS—and INACTION

In 1992, as international awareness of climate change grew, the United Nations convened an Intergovernmental Negotiating Committee to address the subject. That group drafted a treaty known as the Intergovernmental Negotiating Committee for a UN Framework Convention on Climate Change (UNFCCC) that was ratified by the United States in October of 1992. The UNFCCC provided a mechanism for governments to share information on GHG emissions and policies, develop strategies to reduce emissions and adapt to the impacts of climate change, but did not require binding reductions in GHG emissions. In 1997, the United States declined to adopt the Kyoto Protocol that obligated signatory parties with the highest GHG emissions to specific reductions, stating among other reasons that developing countries like China and India should be equally bound to reduce their emissions and that a mandated reduction would be detrimental to the US economy.

Although it declined to adopt the Kyoto Protocol, the United States government established a climate policy with three components that mirror those of the UNFCCC: slow the growth of GHG emissions; strengthen science, technology and relevant institutions; and enhance international cooperation. To implement this climate policy, the Federal government is using voluntary and incentive-based programs instead of regulations to reduce emissions and to promote climate science and technology. For example, the Environmental Protection Agency's (EPA's) Office of Transportation and Air Quality forms partnerships with private companies to encourage voluntary use of cleaner diesel fuel, more fuel-efficient transportation systems for their employees, clean school buses, etc.

Federal control of air pollution to date has largely been under the provisions of the Clean Air Act, which authorizes EPA to set national standards for acceptable concentrations of pollutants considered harmful to public health and the environment and established a national system for monitoring air quality. The EPA monitors GHGs as part of the United States' reporting obligations under the UNFCCC. EPA requires submission of regular reports to Congress on global warming. However, until losing a recent court ruling, the EPA had held that GHGs were not pollutants. Therefore, the government agency which would be expected to be the major player in addressing GHGs has promulgated no regulations. Now that it has been established that the

EPA is legally required to apply air pollution regulations to these gases, it must begin to act. As public awareness of and concern about climate change have increased, Congress has begun to consider bills that would provide for mandatory reductions of GHGs. During the current 110th Congress, about 70 bills addressing climate change have been proposed. The bills generally provide for an emissions "cap and trade" market-based system to reduce GHGs, with varying timetables and levels of GHGs, long-term carbon storage, and research and development of climate-friendly technology. The "cap and trade" system is used to control pollution by providing economic incentives for achieving reductions in pollutant emissions. It is too early to tell which of these bills might pass, but at least Congress is now willing to address the issue for the first time in years.

VIRGINIA TAKES THE INITIATIVE

A few months after Governor Kaine took office in January of 2006, he announced a program to preserve 400,000 acres of open space during his four-year term. Trees and other vegetation consume CO₂ as they make chlorophyll. As of May 31, 2007, approximately 155,000 acres had been conserved. On June 18, 2007, Governor Kaine announced 15 grants totaling \$6.2 million awarded by the Virginia Land Conservation Foundation (VLCF) that would help add 11,540 acres to be conserved.

The Virginia Energy Plan of 2007 charts a path that will provide for "reliable energy supplies at reasonable rates and increase the use of conservation and efficiency measures." The 2006 General Assembly enacted legislation (§67-101 and §67-102 of the *Code of Virginia*) setting energy policy statements and objectives and directing development of a ten-year state energy plan, which is to be updated every five years. During development, the Plan was the subject of five public hearings and was reviewed by state agencies, the State Corporation Commission staff, the Virginia Center for Coal and Energy Research, and the Center for Innovative Technology.

The 2006 provisions added to the *Code of Virginia* call for Virginia to take a broad range of energy actions, some of which may support climate change initiatives while others may prove to be obstacles. They include:

- Ensure the availability of reliable energy at reasonable costs;

- Establish sufficient energy supply and delivery infrastructure;
- *Use energy resources efficiently and facilitate conservation;*
- Facilitate development of low-cost energy resources, inside and outside Virginia, including development of clean coal resources;
- Facilitate development of less-polluting energy sources and electric generation technologies that do not contribute to GHGs and global warming;
- Foster R&D of alternative energy sources that are competitive at market prices; and
- Increase reliance on Virginia agriculture-based ethanol and biodiesel.

Chapter 3 of the Energy Plan on “Energy Efficiency and Conservation” (see italicized item above) lists “a few of the most important strategies” for accomplishing this program, as follows: Consumer education; Training for service and design professionals; Financial incentives that influence consumers’ decisions; Increasing energy-efficiency building and equipment standards; Utility rates and programs (time-of-use rates, demand response, etc.); Research and development programs; and Transportation improvements and mass transit incentives.

Chapter 5 of the Energy Plan on “Energy and the Environment” contains significant and meaningful sidebar comments. Here are some of them:

- “Decisions on meeting future energy needs should no longer be based only on traditional economic models; they can also incorporate protection of ecosystems, natural resources, and the health and well-being of citizens.
- “Methane is a major source of greenhouse gases. According to the U. S. EPA, methane is more than twenty times more effective at trapping heat in the atmosphere than carbon dioxide over a hundred-year period.
- “On May 22, 2007, Governor Kaine announced that Virginia had joined The Climate Registry. With a membership of more than thirty states and several tribes, The Climate Registry is the nation’s only state-sponsored initiative to standardize methodologies to record and measure greenhouse gas emissions such as carbon dioxide, methane, and nitrous oxides.
- “Virginia adopted the Clean Air Interstate Rule and mercury rules capping emissions of sulfur dioxide, nitrous oxides, and mercury. Any new sources of these pollutants must be offset so there will be no

net increase in the emissions.

- “Transportation is Virginia’s largest energy-consuming sector. Land use and transportation are integrally linked. The typical suburban sprawl . . . increases the demand for new roads and highways. This style of development intensifies automobile use and discourages the use of less polluting alternatives such as public transit, bicycling, or walking.
- “From 1980 to 2000, Virginia’s population grew 33 percent, while vehicle miles traveled grew 90 percent.
- “A January 2007 report prepared by the State Advisory Board on Air Pollution . . . notes that the United States now saves ‘more energy each year from energy efficiency than we get from any single energy source.’ ”

ACTIONS In The US And ABROAD

In Europe, carbon dioxide emissions per capita are about half the 20 tons per year for Americans. The European Union (EU) has proposed to cut GHG emissions at least 20 percent by 2020. A carbon cap-and-trade system introduced in 2005 and under expansion will gradually ratchet up the cost of emitting carbon throughout the EU to promote the transition from fossil fuels to non-carbon energy sources such as wind, solar, biomass, tidal, and wave. They plan to decouple energy distribution from energy production to allow for stronger independent regulatory control. Energy efficiency will be improved by using more fuel-efficient vehicles, higher standards for appliances, strengthened building codes, and more efficient heat and electricity generation, transmission, and distribution.

In August 2006, President Clinton launched the Clinton Foundation’s Climate Initiative (CCI) with the mission of fighting climate change in practical, measurable and significant ways. CCI is working with an association of large cities dedicated to developing and implementing a range of actions that will accelerate GHG emissions reductions. CCI is bringing together Bangkok, Berlin, Chicago, Houston, Johannesburg, Karachi, London, Melbourne, Mexico City, Mumbai, New York, Rome, Sao Paulo, Seoul, Tokyo, and Toronto, four multinational energy service companies and five global banks to reduce energy use in major buildings 20 to 50 percent.

California is the leader in the fight against global warming in the United States. The California Global Warm-

ing Solutions Act of 2006 caps the 2020 GHG target at 1990 levels. A carbon cap-and-trade system, as well as penalties for industries in non-compliance, has been authorized. California already produces more than 10 percent of its electricity from renewable sources and another 15 percent from hydroelectric plants. The current goal is 33 percent renewable energy by 2020. Its New Solar Homes Partnership focuses on residential home construction aided by \$350 million managed by the California Energy Commission.

Renewable energy standards have been legislated by 25 states to set goals for renewable energy production in each state. More than 30 states have set up a GHG Registry to measure, track, verify, and publicly report GHG emissions. The Western Regional Climate Action Initiative, composed of Utah, Arizona, California, New Mexico, Oregon, Washington and the Canadian province of British Columbia, will set up a market-based system to reduce GHG emissions. Maryland, Connecticut, Delaware, Maine, Massachusetts, New Jersey, New Hampshire, New York, Rhode Island, and Vermont comprise the Northeast Regional Greenhouse Gas Initiative covering power plant emissions that will be capped at current levels and then reduced 10 percent by 2019.

Oregon intends to halt the growth of GHGs by 2010, reduce emissions to 10 percent below 1990 levels by 2020 and ultimately to 75 percent below 1990 levels by 2050. New Jersey will limit GHG statewide emissions and GHG emissions from electricity generated outside the state for its use to 1990 levels by 2020 and by 80 percent below 2006 levels by 2050.

In 1993, Portland, Oregon, was the first U.S. city to initiate a strategy to curb carbon emissions and has made significant strides toward their goal of 10 percent below the 1990 level. Their success has been due to a 75 percent growth in public transit use since 1990 encouraged by the construction of two major rail lines and the Portland Streetcar. The city also buys renewable energy for more than 10 percent of its electricity, recycles at a rate of 54 percent, has constructed nearly 40 high-performance green buildings, planted over 750,000 trees and shrubs, and insulated over 10,000 multifamily units and 800 houses. Portland's Peak Oil Plan of 2007 will further reduce carbon emissions by reducing oil and natural gas usage by 50 percent over the next 25 years, support land use patterns that reduce transportation needs, promote walkability, provide easy access to services and transportation, and design efficient transportation infrastructure for the movement of freight.

The Climate Protection Plan in Austin, Texas, is one of the most ambitious in the country. Austin will power all city facilities with renewable energy by 2012 and make its vehicles carbon-neutral by 2020 (powered by electricity and biofuels). City utilities will provide 30 percent renewable energy by 2020 including 100 megawatts of solar power and achieve carbon neutrality on any new generation units. All single-family homes will be capable of zero-net energy (creating as much energy as the home consumes) and other new construction will be 75 percent more energy efficient by 2015. Key to the Austin and Portland plans are the engagement and collaboration of the public and business in emission reduction efforts through readily accessible information, on-line "footprint" calculators, recognition, and incentives. Population growth in cities has made it difficult for them to reach original GHG emission reduction goals.

FAIRFAX COUNTY INITIATIVES

In early 2004, soon after they took office, the current Board of Supervisors adopted a new Environmental Improvement Program (EIP). Based on the Environmental Agenda ("Environmental Excellence for Fairfax County: A 20-year Vision"), the Program is divided into the following issue areas: growth and land use; air quality and transportation; water quality; solid waste; parks, trails and open space; and environmental stewardship. A 15-member interagency EIP Action Group updates the EIP for each coming fiscal year with recommended budgetary actions to continue implementation of the Program. Some of the recommended actions in each category are:

Growth and Land Use – The County is using more "smart growth" techniques, such as compact, higher density, mixed-use development and Transit-oriented Development (TOD), with a mix of uses so people can live, work and play in walkable communities to lessen vehicle usage and cut GHG emissions. Recent examples of such developments approved by the Board of Supervisors but not yet constructed are MetroWest adjacent to the Vienna Metro station, a Merrifield Town Center and an expansion of Tysons I with TOD on Route 123 close to the planned Metro station.

The County has included in the Policy Plan of the Comprehensive Plan and in the Public Facilities Manual provisions encouraging the use of Low Impact Development to reduce energy usage and protect the envi-

ronment. Finally, whenever possible, the County is building new facilities to meet the silver standards of the national Leadership in Energy and Environmental Design (LEED) program. The Board approved another Policy Plan amendment in December 2007 to encourage meeting Green Building standards in new construction. The County is using the green building approach on nearly 20 active building development projects, and the Park Authority will use this technology on expansion of one of its recreation centers. Two new fire stations are green buildings.

Fairfax County has a 41 percent tree canopy with a goal of reaching 45 percent by 2020. Fairfax ReLeaf sponsored a program called "2000 Trees in 2000" that was very successful. It has since continued the program with the aim of planting the same number of trees as the year. They have, in fact, surpassed their goal. In January of 2007, the Board approved a Tree Action Plan designed to methodically provide more tree cover.

The anticipated revenue shortfall caused by the fall in real estate values will mean that initiatives requiring increased funding are unlikely to be adopted and implemented until the fiscal situation improves.

Air Quality and Transportation measures are essential to meaningful GHG reduction in Fairfax County and the Washington metro region. The biggest effort, by far, to reduce vehicle emissions is the proposed Dulles Corridor Metrorail to Dulles Airport and beyond.

Fairfax has addressed its own sizable fleet by reducing its size and converting 99 vehicles to hybrid gas and electric. Other measures include reduction of idling, use of diesel filters and more fuel-efficient and cleaner-burning busses. The county has retrofitted 436 school buses with diesel particulate filters that reduce nitrous oxides emissions and indirectly assist in GHG reduction. There is preferred parking for van pools and payments to employees who use public transit. Efforts to increase telework by County employees, now at 20 percent, have shown encouraging results and continue to be promoted.

In 2007, Fairfax County purchased 5 percent of its energy from wind and will expand that source to 10 percent by 2009. This energy source reduces the production of several million pounds of carbon dioxide.

The county encourages ride sharing and telework to reduce vehicle trips. Other measures addressing this goal are company Transportation Demand Management

(TDM) programs and provision of bicycle parking and shower facilities as well as shuttle bus service to and from Metro stations. Some companies provide a Metro check fare card voucher program for users of public transportation.

Planned but not fully funded is a major program to address bus-stop safety. Better access and shelters will encourage bus usage. Public outreach includes forums for fleet users and participation in air quality programs of the Metropolitan Washington Council of Governments (WASHCOG).

Solid Waste is treated by a waste-to-energy plant in Lorton, operated by Covanta, that incinerates trash. Residents are encouraged to recycle newspaper; office paper; and glass, metal and plastic containers. Businesses must recycle only office paper and cardboard. Recycling of office paper is especially effective in reducing the waste stream and has a high, more stable sale value. The waste-to-energy plant generates electricity, which it sells to Dominion Virginia Electric Power. Landfill gas (LFG) at the I-95 landfill is used at the Noman Cole Wastewater Treatment Plant as fuel for sludge processing, and LFG generated at the I-66 landfill heats county buildings on West Ox Road.

Parks, Trails and Open Space - Fairfax County has a cross-county trail serving walkers and bikers that runs uninterrupted for 40 miles from the southeast to the northwest parts of the county. This facility is well loved and heavily used. The remainder of the County's trail system has frequent gaps in the neighborhood trails and sidewalks intended to provide pedestrian access to shopping, schools, libraries, etc. The Parks and Sidewalks Committee's list of priorities for addressing these gaps is not new, but funding is not sufficient. The Park Authority is doing an analysis of its parkland to identify different types of developed and undeveloped uses. For several years the Park Authority has been short of the funds and staff to properly maintain its resources. The goal for parkland is 10 percent of County acreage; it currently stands at nearly 9.5 percent.

Environmental Stewardship

In an effort to reduce energy use and thereby reduce GHG emissions, the County has replaced its lights or retrofitted its lighting system in county buildings; has installed Energy Management Control Systems (EMCS) in two buildings; reduced energy consumption by 13.2 percent between FY 2001 and FY 2006; established a countywide tree planting program; participated in the ENERGY STAR® "Change a Light" challenge pro-

gram; is developing a Green Building policy for county capital projects; is promoting stewardship of urban forest resources with a 30-year canopy goal of 45 percent; is undertaking a feasibility study for renewable energy technologies; has a Government Center energy project; and will perform energy audits for county facilities. Finally, the Environmental Coordinator has proposed a new position—an Energy Coordinator, whose salary would be more than supported by the energy cost savings.

“COOL COUNTIES” INITIATIVE

At the National Association of Counties (NACO) meeting in Richmond on July 14-16, 2007, Fairfax County; King County, WA; and Nassau County, NY joined the Sierra Club in announcing the creation of the Cool Counties Climate Stabilization Declaration, a new initiative to combat climate change. There are now at least 17 other counties, representing more than 25 million people, participating in the Cool Counties program. In the absence of Federal government action, U.S. counties will reduce GHG emissions through actions in seven key areas: energy efficiency, renewable energy, greening county vehicle fleets, land use, transportation, water conservation, and educational outreach.

The Cool Counties Declaration asks counties to:

- Create an inventory of their present local emissions of greenhouse gas (GHG) to serve as a baseline for planning and implementing policies to achieve measurable and sustainable reductions.
- Call on local governments to work with their regional and state governments to reduce GHG emissions to 80 percent below current levels by 2050.
- Urge Congress and the Administration to enact market-based limits and incentives to reduce GHG emissions by 80 percent by 2050.

The implementation tool for achieving the stated goals is the Template, prepared by Fairfax County, which is a detailed check list of suggested policies, programs and specific actions that fall under the headings of: Energy Efficiency, Renewable Energy, Fleets/Vehicles/Equipment, Land Use, Transportation, Education and Outreach, and Water Conservation. Counties are free to modify the template to fit their needs and goals.

TAs the nation's wealthiest county, measured by median family income, Fairfax County has the capability to set a model for the 3066 counties in the United States. As

part of this effort Fairfax County will first inventory the major sources of GHG emissions. If the Austin, Texas, estimate of transportation emissions can serve as a guide, then the Fairfax transportation sector would be the major source of GHGs at about 40 percent. The heating and cooling of buildings is another major GHG contributor. Growth will have to be managed, consumerism moderated, and lifestyle changes encouraged. Major programs in the Cool Counties template that may apply to the Fairfax County program follow:

TEnergy Efficiency - Promote energy-efficient and non-fossil fuel heating, cooling, and lighting in county buildings, businesses and homes; organize increased recycling; promote green building (LEED) standards and energy-efficient landscaping for county and commercial buildings and homes; promote energy-efficient public and private outdoor lighting; promote home and business energy audits through Fairfax County and area utility companies.

Renewable Energy - Promote distributed renewable power generation at businesses, individual homes, and communities. Solar, biomass, fuel cell, wind, and cogeneration are some of the candidate energy sources in Fairfax County. Promote state action to extend the Net Metering Law to allow for greater private contributions to the power net; promote a statewide Renewable Energy Standard; promote decoupling of commercial power output from profits in order to reward conservation and energy efficiency.

Fleets/Vehicles/Equipment - Promote incentives for the purchase and operation of fuel-efficient vehicles, particularly hybrids and electric cars; promote fewer auto trips and shorter trips; promote and organize computerized ride sharing and community parking and pickup areas.

Land Use - Promote transit-oriented and mixed-use development; support land use planning that reduces transportation demand; promote tree planting and preservation; promote smart growth to limit sprawl; encourage grocery stores to stock local produce to reduce long-distance trucking; protect and save natural areas.

Transportation - Build and promote mass transit systems to prepare for “peak oil” and to lower GHG emissions; design and promote transportation infrastructure for the efficient movement of freight by rail; adapt communities to become more walkable to shopping and services; promote telework and flex-time schedules.

Education and Outreach - Inform homeowners, businesses, and county employees about global warming, the steps necessary to bring GHG emissions under control, and sources of distributed renewable energy generation and non-fossil fuel methods for heating and cooling; inform citizens of products with high GHG impact such as meat and bottled water; establish partnerships with civic groups, churches, homeowner associations, and business and trade associations to participate in the long-term effort of GHG reduction.

Water Conservation – Treatment of water to make it potable consumes energy.

HOW CAN I HELP?

First of all, stay informed. The assessments of global warming and “peak oil” worsened in 2007 and projections will be revealed more fully as the science matures. Go to the most authoritative sources on-line, such as the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA). Most importantly, identify, campaign for, and elect federal, state, and local officials who will take action. Strong federal leadership is needed to prepare for “peak oil” and bring down GHG emissions in time to avert climate catastrophe. Hold their feet to the fire after they are elected.

Since there are fewer than 10 years to begin substantially reducing GHGs, we must concentrate on high emissions items such as our transportation, the heating and cooling of our homes, and our purchases of consumer items. Prepare for the likelihood of gasoline rationing by planning your transportation needs now. Is public transportation available? Will you need a more fuel-efficient car? Reduce air travel by taking a train or bus when possible. Consider using heat pumps to reduce GHG emissions in heating and cooling your home. Consider installing solar panels on your roof to generate some of your electric power and for lowering your GHG emissions. Reduce purchases of non-essential consumer items. Reduce consumption of meat, which accounts for 18 percent of GHGs. Buy more locally grown food to reduce transportation emissions--and plant a vegetable garden.

Save energy! Turn out the lights when you leave a room; never leave the TV on when no one is watching it; turn off electronic equipment when not in use for several hours. In the winter, wear a sweater or sweatshirt and lower the thermostat setting to 68 degrees; in

the summer, turn up the thermostat and use fans; use programmable thermostats to cut energy use during the night. Run dishwashers and washing machines only when there is a full load.

Replace your incandescent light bulbs with compact florescent lamps (CFLs). They use 70-75 percent less electricity and last 15 times longer, but EPA recommends against their use where they are lit only briefly (closets, stairways) because of loss of efficiency and likelihood of premature burnout. Vehicle emissions are a major source of GHG emissions in Fairfax County, so we can have a significant effect on the problem by combining trips, ridesharing, using public transit, avoiding high speeds, learning to approach a stop light or sign by decelerating slowly, keeping tire pressure at the proper level, and following tune-up recommendations. When it is time to buy a car, consider a hybrid or a high-mileage vehicle. Telework when possible and substitute e-mail for meetings.

Our homes and office buildings are a big source of wasted fuel and of GHG emissions. Very few have adequate insulation in roofs and walls. Single-pane windows waste great amounts of heat and cool air. Caulking and weather stripping should be checked regularly. An attic fan and a roof vent make a noticeable difference during summer months. Investments in upgrades will pay for themselves in a few years.

The siting of a house on the land is important. If windows face south or west, a roof overhang will shade the windows in the summer, when the sun is high in the sky, and let in solar heat in winter when the sun is lower on the horizon. Deciduous trees have a similar effect, shading in summer and letting solar heat reach the house when leaves have fallen. The more plants and the less heat-absorbing surfaces that we have on our property the better, but large lawns are not helpful as lawnmowers are notorious GHG emitters. Consider replacing grass with native plants and ground cover.

New ENERGY STAR® appliances consume significantly less power than older versions. Consider whether your furnace, air conditioner, washing machine, dryer, refrigerator, dishwasher or water heater should be replaced. When you calculate the long-term savings on utility bills, the purchase can be a wise financial move as well as a way to help mitigate calamitous impacts on the earth's ecosystem.

Green buildings should be the goal for all new construction. As far as financially practicable, convert your

house to a green building using solar hot water heating and solar panels for part of your electricity; save water by mulching gardens to retain water better and use rain barrels to supply water for outside uses. It takes power to treat water to drinking quality.

"We, the human species, are confronting a planetary emergency. . . . But there is hopeful news as well: we have the ability to solve this crisis and avoid the worst – though not all – of its consequences, if we act boldly, decisively and quickly."
Former Vice President Al Gore, Nobel Peace Lecture, Dec. 10, 2007

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