

# GHG Emissions Reductions in Maryland, Volume I: Current State Government Activities



Prepared by the

**Maryland Energy Administration**

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# I. Introduction

While the causes and impacts of climate change are not yet completely understood, its possible impacts in Maryland may be vast and potentially damaging to human health, the economy, and valuable natural resources. Climate change and its associated severe weather occurrences can negatively impact aquatic populations, recreation activities, coastal properties, overall water quality and coastal habitat.



The most common greenhouse gases are Volatile Organic Compounds (VOC), Nitrous Oxide (NO<sub>x</sub>), Carbon Dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>). While some greenhouse gases such as water vapor occur naturally, the increase in others such as carbon dioxide, methane, nitrous oxide, and halocarbons are increasing, in part, as a result of human activities. The most common of these, CO<sub>2</sub>, increases as the result of fossil fuel combustion. In Maryland, the largest contributors of CO<sub>2</sub> emissions are mobile sources (cars, trucks, motorcycles).

From waste management to land use, from transportation to energy efficiency, Maryland has a broad range of programs already in existence that, in addition to their primary goals, work to reduce or mitigate greenhouse gas emissions, or help Maryland respond and adapt to climate change.

Although originally developed to address ozone precursor emissions, careful land use planning, promoting infill or brownfields development, increasing mass transit use, researching alternative fuels, and educating the public all serve to have the collateral benefit of reducing greenhouse gases, as well as toxic air pollutants.

*Greenhouse Gas Emissions Reductions: A Compendium of State Government Activities* was created to provide a snapshot of those activities for private and public information, as well as for use as an evaluation tool in developing a statewide policy.

Most of these programs focus on identifying and implementing measures that can reduce emissions and conserve energy. Some have a direct impact on the amount of emissions released. Some have an indirect impact in changing the human behaviors that cause emissions, such as supporting public education, providing environmentally friendly alternatives, or offering financial incentives. Still others impact our future with respect to climate change by preserving the natural landscapes that filter our air and water and help to keep the planet cool.

## II. Planning & Development

The effects of sprawl development -- more roads, more buildings, more energy consumption, longer commutes, less use of public transportation -- all contribute to climate change. In contrast, locating new development in existing communities allows for preservation of healthy, abundant natural areas that help filter air and water, and prevent premature release of the carbon sequestered in soils, forest and other biomass.

Redevelopment also results in changes in driving behavior with shorter trips and alternative travel modes to automobiles. This, in turn, can help lower mobile emissions through reducing traffic congestion and growth in Vehicle Miles Traveled (VMT).

### **Brownfield's Voluntary Cleanup Program**

Many unused or abandoned commercial and industrial properties are not attractive to developers because of uncertainty about future liability. Often, however, these so-called *brownfields* sites, which are already served by needed infrastructure such as water and sewer, may be cleaned up to a level suitable for commercial or industrial use.



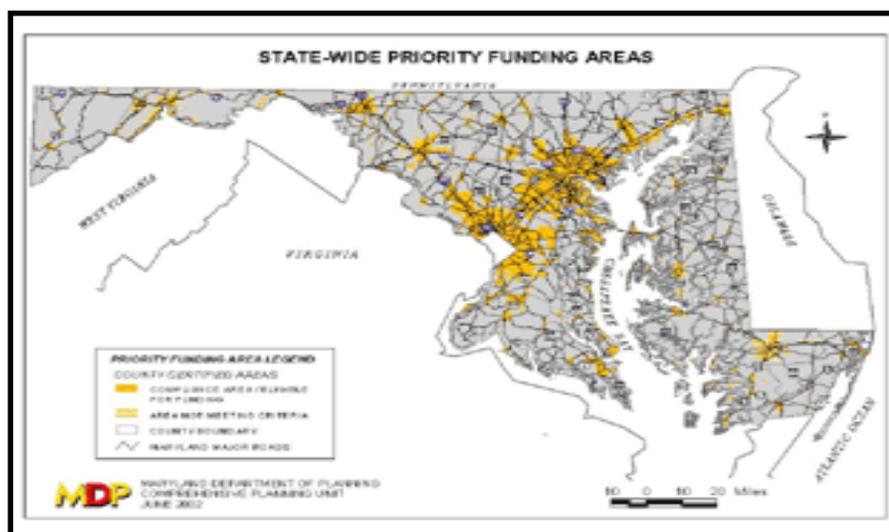
These abandoned or underutilized industrial or commercial sites are either contaminated or suffer from that perception. Several programs have been created to encourage the redevelopment of these sites, including the Brownfields Site Assessment Initiative, the Voluntary Cleanup Program, the

Brownfields Revitalization Incentive Program, the Maryland Water Quality Revolving Loan Fund, and the Federal Brownfields Tax Incentive Program.

MDE's Brownfield's Voluntary Cleanup Program streamlines the environmental cleanup process for these sites, providing developers and lenders with certain limitations on liability (as long as they do not exacerbate contamination or create new pollution) and letting them know up-front exactly what is required. MDE also conducts free site assessments for publicly owned brownfield's sites.

### **Priority Funding Areas (PFA)**

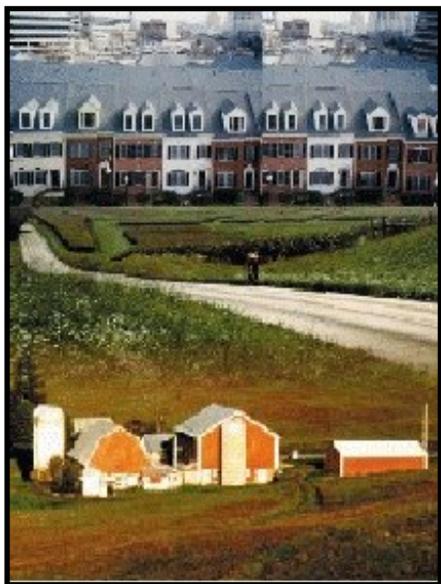
Counties have worked with the State to designate geographic areas where the State targets its growth-related spending and other support, including capital investments, grants and loans, and tax credits. The use of PFAs also applies to economic development programs such as Job Creation Tax Credits, Maryland Economic Development Assistance Authority and Fund, Sunny Day Fund, Maryland Industrial Development Financing Authority, and Maryland Competitive Advantage Financing Fund.



Qualifying PFAs include municipalities, areas located inside the Washington and Baltimore Beltways, designated enterprise zones, neighborhood revitalization areas, heritage areas, and industrial land.

History has shown that when offered different transportation modes, citizens will change their driving habits. By supporting infill and mixed-use development, alternative choices such as walking and mass transit become more available, leading to reductions in vehicle miles traveled and, ultimately, to reductions in greenhouse gases.

### **Rural Legacy Program**



Rural Legacy is the preservation counterpart to Priority Funding Areas. The State of Maryland targets funding for land preservation to Rural Legacy Areas and other preservation areas. Rural Legacy provides focus and funding to protect large, contiguous tracts of land and other strategic areas vulnerable to sprawl development, and to enhance natural resource, agricultural, forestry, and environmental protection. Through cooperative efforts among state and local governments and land trusts,

protection is provided through acquisition of easements and fee estates from willing landowners. Since its inception, the program has appropriated more than \$134 million for protection of 57,054 acres of land.

### **GreenPrint Program**

GreenPrint, is designed to protect Maryland's "green infrastructure" -- lands critical to long-term ecological health. The Department of Natural

Resources (DNR) has identified more than two million acres of green infrastructure lands that provide the natural foundation needed to support a diverse plant and animal population.

Maryland's GreenPrint program is managed under the umbrella of Maryland's Greenways and Water Trails Program and the related land acquisition activities. To date, Maryland has over 1,500 miles of protected greenway corridors, including over 600 miles of land trails and over 350 miles of water trails.

The GreenPrint program is expected to boost Maryland's land conservation capacity by about 10,000 acres per year over five years, and officials hope to leverage other resources to protect these important lands by working with citizens, land trusts, and conservation groups.

Forest conservation protects existing ecosystems that are important for carbon sequestration and store large amounts of carbon in living biomass, forest floor woody debris and soils. Without such protection, many of these forests could be cleared for development and Maryland's capacity to store and sequester carbon in natural landforms would be diminished.

Reforestation of open space occurring within GreenPrint acquisitions increases Maryland's carbon sequestration and storage potential. Each reforestation project contributes to the overall reduction of greenhouse gases.

## III. Agricultural Lands

### Agricultural Land Preservation Program

One of the most successful programs of its kind, the Maryland Agricultural Land Preservation Foundation (MALPF) was created in 1977 to preserve productive farmland and woodland. In addition to producing food and fiber products, agricultural land preservation helps curb the expansion of random urban development, protects wildlife habitat, and enhances the environmental quality of the Chesapeake Bay and its tributaries.



For each property submitted for easement sale, a Soil Conservation and Water Quality Plan is required to identify existing erosion and water quality problems; to recommend best management practices or other conservation measures necessary to address them; and to set up a schedule for implementation. The landowner becomes responsible for plan implementation and the land is thereby protected from erosion; potential yield is increased; and sediment flow into neighboring streams is reduced or eliminated. A Forest Management Plan is also encouraged on properties having 50 percent or more of the land in woodland.

Since its inception, more than 3,100 farms totaling 400,000 acres have been preserved by recorded documents that protect the land from commercial, industrial and residential development. Of those, 1,700 farms comprising 233,000 acres have been permanently protected through the purchase of

perpetual preservation easements. Maryland's state and local programs combined have preserved in perpetuity more agricultural land than has any other state in the Union.

### **Conservation Reserve Enhancement Program**

The Conservation Reserve Enhancement Program (CREP) is a federal-state initiative that pays farmers and landowners a sign-up bonus and annual rental payments to remove environmentally sensitive cropland from production for 10 to 15 years, and to create and retain streamside buffers or wetlands. CREP also covers most of the costs of building animal crossings, fences, and watering troughs to limit livestock access to streams. This program also has a perpetual easement purchase option.

### **Cover Crop Program**

Available to farmers on the Eastern Shore, Maryland's Cover Crop program is an important tool in efforts to control soil erosion and protect water quality from nutrients. Planted as ground cover in the fall and winter, crops such as rye, wheat, barley, triticale and oats, hold the soil in place and soak up residual fertilizer.

## IV. Natural Resources Management

### Urban and Community Forestry

The Maryland Department of Natural Resources Forest Service is the state agency responsible for management and protection of the state's urban forestry resources. Urban forests are generally, though not exclusively, thought of as providing services: recreation, aesthetics, wildlife habitat, stormwater management, carbon storage and interception of airborne pollutants are some. Planting, maintaining and conserving existing trees and forests in urbanized areas will become increasingly important in order to offset the higher temperatures and poorer air quality expected from global warming. In urban areas, where buildings and road surfaces hold the heat, temperatures average seven to nine degrees higher than surrounding areas -- differences that will be amplified as global temperatures increase. The Forest Service is conducting studies in Baltimore City and Frederick to identify opportunities to enhance urban forest cover.

### Forest Legacy Program



The Forest Legacy Program identifies and protects environmentally important forestlands threatened by present or future conversion to non-forest use through perpetual conservation. Participating landowners are required to manage their property according to the terms of an easement they have sold voluntarily. Forest management activities -- including timber harvesting, and recreational activities such as hunting, fishing, and hiking -- may be permitted as long as they are consistent with program goals.

## Stream Re-Leaf



As a Chesapeake Bay Program partner, Maryland's Riparian Forest Buffer Initiative and Stream Re-Leaf Program work to enhance riparian stewardship and conserve and restore riparian forest buffers. The capacity for stream bank stabilization and temperature moderation

are key buffer functions that address the impacts of climate change. In the face of more severe weather and higher air temperatures, buffer functions will become increasingly important in helping mitigate the erosive effects of storm waters and maintain cooler stream temperatures. Since 1999, Maryland has reforested over 900 miles of stream banks.

# V. Transportation Choices

Although new standards and better fuel efficiency have helped decrease emissions per vehicle, these reductions have been outweighed by increases in the number of vehicle miles traveled (VMT) and the continuing use of single occupant vehicles (SOV). To combat this increase in mobile source emissions, Maryland has initiated numerous programs that, by influencing travel behavior, help slow or reduce the growth in VMT and reduce the use of SOV.

Maryland has significantly strengthened the integration of transportation and land use by targeting state funding to existing municipalities and communities, priority funding areas, and planned growth areas.

## **Commuter Choice Maryland**

Commuter Choice Maryland describes a variety of programs that encourage employers and employees to use public transit, vanpools and other transportation alternatives to SOV. Benefit programs are set up by employers to assist employees with



commutes by offering financial incentives to those not driving alone. Programs can be customized to meet a variety of employer needs with parking cash-out options, employer-paid benefit options, employee-paid pre-tax benefit options, or a combination. Employees can receive benefits to ride transit and vanpools, save on taxes, and even get cash for their parking spaces. Employers benefit through tax savings, increased recruitment and retention, and more productive employees.

Because education and outreach to the general public is vital to the program's success, the Maryland Transit Administration (MTA), in partnership with MDE and MDOT, markets Commuter Choice through TV, radio, billboards, bus wraps, print media and on-air and community promotions.

Commuter Assistance Rideshare Coordinators -- employed by metropolitan, county and regional planning offices -- work directly with employers and employees to set up Commuter Choice programs. Employers can claim a 50 percent state tax credit for providing employees with transit and eligible vanpool subsidies up to \$100 per month per employee. The program helps reduce parking demand and costs, and recruits and retains valuable employees. Depending on the employer program, employees may also benefit from an employer-paid commute subsidy, lower taxes, and a less stressful commute.

### **Telework Partnership with Employers**

The Telework Partnership is an initiative to assist employers with developing and implementing telecommuting programs. MDOT partners with the Baltimore and Washington, D.C. Metropolitan Planning Organizations (MPOs) to assist large and small employers establish home-based telecommuting programs for employees.

While Telework does not offer tax advantages, it can help employers by reducing parking demand; by increasing recruitment and retention; and by boosting productivity among employees. At no cost to employers, Telework consultants assist employers in establishing policies, procedures and implementation, training senior and managerial staff, addressing critical

concerns and issues, and providing practical solutions and strategies to ensure program success.

### **Ride Share and Commuter Assistance Programs**

The Commuter Assistance Program is a voluntary commuter transportation program developed to help reduce Single Occupant Vehicle (SOV) travel miles during peak travel hours. Under this program, rideshare and commuter assistance coordinators:

- provide ridesharing information;
- assist employers and employees in identifying opportunities such as flexible work hours, compressed work weeks, Teleworking and Commuter Choice Maryland;
- offer valuable information on Ozone Action Day strategies;
- conduct surveys, seminars and workshops to determine employer and employee attitudes toward alternative commute strategies;
- provide ride-matching service; and
- distribute rideshare information in printed and electronic formats to public and private employers.

Coordinators are funded by the Maryland Transit Administration and administered in conjunction with local rideshare agencies, regional metropolitan planning organizations, county departments of public works and transportation, Transportation Management Associations and private consultants.

### **Chesapeake Highway Advisories Routing Traffic Program (CHART)**

CHART is a Freeway Incident Management System created through a joint effort of MDOT and the Maryland State Police to improve traffic flow on Maryland major highways, particularly the Interstate System. Freeway

Incident Management activities like CHART (included in Section 108 (f) of the Clean Air Act Amendments of 1990) are recognized as having air quality improvement benefits. Given the size and impact of back-ups typically caused by freeway incidents, it is easy to see how improving overall roadway clearance time and rerouting traffic around incidents will reduce vehicle idling and queuing with corresponding reductions in vehicle emissions.

***Surveillance (traffic monitoring):*** Real time detection of traffic flow on all major highways.

***Incident Response:*** Working with emergency response agencies to remove roadway accidents/blockages.

***Traveler Information:*** Alerting users to unusual problems that disrupt flow of traffic.

***Traffic Management:*** On major roads traffic counters embedded in travel lanes and entrance ramps provide traffic volume information to computers at state Traffic Operations Centers to regulate traffic flow. Contingency plans are developed to expedite rapid development of temporary signs to help guide traffic.

The transportation and air quality improvements associated with this program are estimated by assuming that during periods of delay the CHART system guides people to faster, less congested routes. The best measure of emission reductions comes from the State Highway Administration's reduced vehicle delay time that estimates more than 23 million-vehicle hours of idling delay have been saved by CHART since its inception.

### **Bicycle/Pedestrian Promotional Efforts and Facility Development**

Bicycle and pedestrian efforts are helping to reduce auto emissions, to revitalize older communities, and to create walkable vibrant neighborhoods.

MDOT is investing in these efforts through planning, promotion, and facility development.

### Bicycle/ Pedestrian Planning

MDOT has developed a statewide 20-year Bicycle/Pedestrian Access Master Plan to help guide future transportation projects and actions. The Plan focuses on safety, education, facility development, tourism, and health and welfare. MDOT also ensures that bicycle/pedestrian access and facility use are considered in all phases of transportation planning, and that best practices are employed. This is being accomplished in part by training all state highway engineers on bicycle and pedestrian issues, and by using context sensitive design or Thinking Beyond the Pavement principles when designing highways.

### Bicycle/Pedestrian Promotion

Pedestrian and bicycle use and safety are being encouraged through a variety of promotional and public awareness activities.

- SHA's Maryland Highway Safety Office issues grants to local jurisdictions for education and enforcement efforts crucial to making communities safer for pedestrians and bicyclists.
- MDOT publishes a number of informational materials including:
  - the *Transportation Choice Guide*, highlighting programs to improve pedestrian and bicycle



mobility;

- *Safe Bicycling in Maryland*, a comprehensive bicycling guide that includes rules of the road and safety tips;
  - *Bicycles on MTA*, the Maryland Transportation Administration's guide to bicycle access to transit in the Baltimore metropolitan area; and
  - a statewide bicycle map.
- MDOT encourages development of local policies, ordinances and use regulations that facilitate bicycle and pedestrian modes of travel.

#### Bicycle/Pedestrian Facility Development

MDOT's capital program includes a number of funding programs dedicated to improving the transportation system for pedestrians and bicyclists, including:

- bicycle and sidewalk retrofit funds that add facilities to existing highways; construction of wide curb lanes, shoulders, bikeways, sidewalks and trails as part of highway construction;
- Neighborhood Conservation and Transportation Enhancement projects that will accommodate and encourage non-motorized travel; and
- SHA's commitment to add 200 miles of marked bike lanes throughout the state by the end of 2006.

#### **Continued Efforts to Increase Transit Ridership**

To help combat highway traffic congestion, improve air quality, and increase citizen mobility choices, Maryland has set a goal to double transit ridership levels by the year 2020 (from year 2000 levels). To reach this goal, MDOT is engaged in a series of planning and capital initiatives.

## Planning

*Maryland Comprehensive Transit Plan* -- This first-ever, statewide transit plan identifies services, projects, programs and other improvements to increase public transit ridership. The plan is arranged around nine themes, each with a series of short-term actions to enhance transit quality and long-term investment in facilities and services.

***Baltimore Region Transit Plan*** – This study will analyze the Red Line (Social Security Complex to Fells Point) and Green Line (Johns Hopkins Hospital to Morgan State University) alternatives.

***Bi-County Transitway*** -- Study of a 14-mile corridor from Bethesda to New Carrollton to serve a highly congested corridor in Montgomery and Prince George's Counties. The impacts of connecting Metro Rail stations to significant employment and residential destinations via bus, rapid transit, and light rail are also being considered.

## Capital Initiatives

***The Light Rail Double Track Project*** – Converts 9.4 miles of single-track sections of the Light Rail line in the Baltimore region to double track that enhance operation flexibility; reduce headways between trains; and improve service by eliminating delays.

***The Metrorail Blue Line Extension*** – This project, being considered jointly with the Washington Metropolitan Area Transit Authority, extends the Washington Metro Blue Line from Addison Road adding

Morgan Boulevard and Largo Town Center to increase ridership to Prince George's County and surrounding areas.

***Corridor Cities Transitway*** - A new busway or light rail service from Shady Grove to COMSAT in Bethesda. The project proposes the connection of a 14 mile corridor with new express bus service on managed lanes.

***Neighborhood Shuttle Service*** – Operates small distinctive buses within a community, connecting people to employment, health care, retail and entertainment centers, and main transit lines. Each neighborhood's route is tailored to meet the needs of area residents.

***Enhanced Service*** - New state services designed to meet the evolving transit needs of today and tomorrow including additional bus routes and rural service; expanded service on commuter bus routes; more frequent service to reduce headways and overcrowding on established bus routes; and Sunday service for Baltimore Metro.

***Carpool and Park and Ride Lots*** - Park and ride facilities provide a common place for a person in an SOV to park and transfer to a shared ride -- bus, rail, carpool, vanpool or a combination. The benefits of implementing these park and ride lots include:

- Reducing air and noise pollution by minimizing traffic volumes and improving traffic flow;
- Reducing fuel consumption and enhance operational economy;
- Reducing travel times through reduction of peak hour volumes;
- Improving safety by removing vehicles from the highway;

- Minimizing capital expenditures outlay for reconstruction or maintenance of existing highways; and
- Supporting transit operations.

SHA operates 93 lots statewide, consisting of 10,586 spaces. MTA operates over 100 parking facilities statewide, providing: 10,178 bus lot spaces; 7,375 Metro lot spaces; 3,303 Light Rail lot spaces; and 25,857 MARC lot spaces (Brunswick Line-5,374; Camden Line-9,217; Penn Line-11,266).

SHA has been constructing ridesharing lots since 1976, and has established a special program for development of ridesharing facilities (in addition to sites associated with major projects) that provides funding for all phases of the design, right-of-way and construction of ridesharing lots.

SHA decides to build a lot on cost-per-space criteria with higher costs being allocated for urban locations and those that will have bus service. The key aspect in implementing a project is identifying the appropriate location for a lot. Factors considered for a successful lot include: existence of impromptu carpooling; availability of reasonably priced land; pre-existing lot with high occupancy rate; location near high volume roadway; good visibility from major roadways; direct or nearby bus service; transit or high occupancy vehicle roadways; and a location with relatively level terrain.

### **Transit Oriented Development**

Transit Oriented Development (TOD) defines a place of relatively higher density that includes a mix of residential, employment, shopping and civic

uses, located within an easy walk of a bus or rail transit center. The development design gives preference to pedestrians and bicyclists, and may be accessed by automobiles. MDOT is promoting TOD around the state as a way of integrating land use with multi-modal transportation opportunities.

### **Coordinated Visioning & Planning**

MDOT has partnered with other state agencies and local land use decision-makers to develop alternative transportation and land use visions for both revitalization areas and emerging suburban communities. Using a series of innovative and interactive public planning workshops, MDOT has helped communities understand how land use and transportation investments reinforce one another, and determine the best mix of resources and development for the area. A recent result of a State and local partnership was a plan for a mixed-use community with a series of next steps for refining land uses, and changing zoning and design standards.

### **Thinking Beyond the Pavement - Context Sensitive Design**

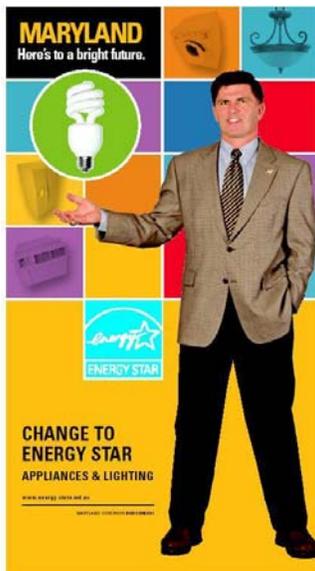
Thinking Beyond the Pavement or Context Sensitive Design (CSD) is a collaborative, interdisciplinary approach that involves all stakeholders in developing a transportation facility that fits its physical setting, preserves scenic, aesthetic, historic and environmental resources, and maintains safety and mobility. By considering the total context within which a transportation improvement project will exist, CSD places emphasis on the people, neighborhoods and businesses that are served by the transportation network. SHA uses this strategy as the standard operating procedure for state road projects.

# VI. Energy Efficiency and Alternatives

Energy consumption--specifically the use of fossil fuels to run cars and trucks, heat homes and businesses, run appliances, and power factories--is responsible for about 96 percent of U.S. carbon dioxide emissions, 24 percent of methane emissions, and 18 percent of nitrous oxide emissions. The activities and programs of the Maryland Energy Administration (MEA) strive to maximize energy efficiency and conservation, and to encourage the use of green energy sources where economically feasible, thereby reducing consumption of fossil fuels and reducing greenhouse gas emissions.

## **ENERGY STAR® Lighting and Appliances Program**

The Maryland ENERGY STAR® Program is a consumer education program designed to increase the market penetration of ENERGY STAR labeled products, appliances and new homes. The program informs consumers, appliance and lighting retailers, and homebuilders about the ENERGY STAR



program and the benefits to consumers who use appliances and lighting or build new homes that meet ENERGY STAR standards for energy-efficiency.

Governor Robert L. Ehrlich, Jr. is the spokesman for the Maryland ENERGY STAR® Program. The program will run radio and newspaper ads, and point-of-purchase promotions, throughout the State in 2004 to educate Marylanders about the

money saving and environmental benefits of purchasing ENERGY STAR labeled products. The Governor's involvement will help gain the attention of Marylanders, and help spread the ENERGY STAR message across the State.

Energy efficient choices can save families about a third on their energy bill with similar savings of greenhouse gas emissions, without sacrificing features, style or comfort. Results are already adding up. In 2002 alone, Americans, with the help of ENERGY STAR, saved enough energy to power 15 million homes and avoid greenhouse gas emissions equivalent to those from 14 million cars - all while saving \$7 billion.

### **Clean Energy Incentive Act Program**

The Maryland Clean Energy Incentive Act (July 1, 2000) provides Maryland



sales tax exemptions or income tax credits to citizens and businesses purchasing qualifying high efficiency ENERGY STAR® appliances, electric and hybrid-electric vehicles, and renewable resource energy systems. MEA is working to inform those affected by the legislation, including appliance retailers, heating and cooling professionals, auto manufacturers and sellers, environmental groups

and consumers. MEA is also working with the Comptroller's Office to facilitate application of sales tax incentives for energy efficient heating and cooling equipment.

MEA estimates that during the course of the tax credit, the sale of Energy Star refrigerators, room air conditioners, and clothes washers will provide an energy savings of nearly 28,000,000 kilowatt hours per year over the life of the appliances. This amounts to approximately 19,000 tons of CO<sub>2</sub> reduced.

### **Green Buildings Tax Credit Program**

MEA manages the Commercial Green Buildings Program for the state. The Income Tax Credit for Green Buildings (2001) provides up to \$25 million in

tax credits for construction or rehabilitation of green buildings. The U.S. Green Buildings Council's LEED rating system has been chosen as the evaluation criteria, following in the footsteps of the Executive Order, which established LEED Silver as the minimum standard for all new state construction and leased spaces.

### **Green Building Template Project Program**

With funding from MEA, DNR has worked with a team of builders, architects and energy specialists to develop the green building template for renovation of typical urban row houses. The template establishes a standard set of affordable options that can be incorporated to improve energy efficiency and indoor air quality, conserve resources and minimize waste. The template describes both materials and techniques for producing a basis level of energy efficiency, two levels of higher efficiency and better indoor air quality.

### **Industries of the Future Program**

Building on the success of the national program, MEA has developed a state-wide Industries of the Future (IOF) initiative to encourage energy efficiency and technological advances in Maryland's energy intensive industries -- aluminum, steel, paper, wood products and petrochemicals. Under this program, resources for energy efficiency will be developed and disseminated to Maryland industries identifying opportunities for significant energy and cost savings.



To increase competitiveness through energy efficiency the program focuses on two areas: delivering education and information for energy efficiency improvements in the near term, using existing, proven technologies and best practices; and leveraging corporate interests and resources, and university excellence to bring in federal funding for research and development projects in industrial energy efficiency. By working directly with some of the largest energy-users in the state, MEA can have a significant impact on energy consumption and the level of greenhouse gas emissions.

### **Energy Performance Contracting Program**

An Energy Performance Contract (EPC) is an agreement between a facility owner and energy contractor to provide energy services (including survey, design, installation, financing and maintenance or management of a facility's energy systems or equipment) to improve a facility's energy efficiency. The energy savings are guaranteed and are used to repay the cost of the project. EPC projects generate an annual savings of \$4 million for the state.

### **State Agency Loan Program**

Under this program, MEA provides approximately \$1 million in no-interest loans annually for energy efficiency improvements in state facilities. State agencies pay a one percent administration fee and make payments based on the avoided energy costs of the project. During FY2001 and FY2002, an estimated 11.6 billion BTUs were saved as a result of SALP loans, translating to a two-year operating budget energy savings of \$238,000.

### **Community Energy Loan Program**

Originally funded with \$3.2 million in 1989, the Community Energy Loan Program (CELP) provides local governments and nonprofit organizations in Maryland a unique opportunity to reduce operating expenses by identifying

and installing energy conservation improvements. The program awards \$1 million in new loans each year at an average below-market interest rate of 3.5 percent (negotiated for each project).

### **Home Energy Rating System Program**

Energy efficient mortgages take the energy efficiency of a house into account when assessing a potential buyer's ability to afford a home, allowing for larger loan qualification when purchasing certified energy efficient homes or planning energy-efficient improvements. Analysis is done by Certified Energy Raters (independent businesses that provide energy efficiency information and analysis of new and existing residential structures for a fee).

### **Renewable Energy**

MEA is dedicated to renewable energy technologies with long-standing programs in residential and school solar roofs, landfill gas and biomass.

### **Maryland's Solar Roofs Program**

The Maryland Energy Administration has established the Million Solar Roofs Program to install solar electric systems throughout the State. Maryland was the first state to sign on to the Federal Million Solar Roofs Initiative in 1997. MEA continues



to help homeowners install photovoltaic (PV) systems to convert sunlight to electricity in their homes and to enable use of reverse metering. In addition to the installation of PV, MEA provides schools with curriculum materials on PV systems. To date, Maryland's Solar Roofs Program has completed: Maryland Solar Schools (7 PV

systems); Residential Rooftops (70 PV systems); and Solar Farms (6 solar systems).

### **Harvesting of the Sun-Solar for Farms**

This program is being conducted in conjunction with the Forum for Rural Maryland. MEA worked with the Western Maryland Resource Conservation and Development Program, Inc. in developing a system for watering livestock while keeping them out of surface water, providing both environmental and energy benefits.

### **Biomass Projects Program**

MEA is working with several partners to research and develop biomass projects. Highlights include:

- Construction and testing of a chicken litter-fueled, small scaled furnace at Morgan State University (co-funded with the Animal Waste Technology Group);
- Developing a project to burn switchgrass as fuel at the Wye Island Research and Education Center.
- Working with Worcester County to use landfill gas as a fuel.

### **Maryland Wind Program**



Wind energy is also quickly becoming a valuable source of clean renewable energy in the U.S. Bringing together state agencies, landowners and wind developers, this newly established program promotes development of wind as a renewable energy generation source in Maryland. As part of this process, MEA, in partnership with the U.S.

Department of Energy, TrueWind Solutions, LLC and other mid-Atlantic states, produced a high resolution wind map that will help evaluate the prospect for developing wind energy resources in Maryland and determine locations where wind turbines can be installed to produce electricity.

Currently, over 140 Megawatts of large-scale wind projects have been permitted in Western Maryland, as well as a number of smaller on-site, distributed generation projects. In March 2002, Eastern Neck National Wildlife Refuge worked with MEA to install a 10kw wind turbine to provide on-site electric power to the administration building and to publicly demonstrate renewable energy.

### **Alternative Fuel Vehicles Program**

MEA continues to guide state agencies and lead statewide activities in purchasing, operating, maintaining and refueling alternative fuel vehicles (AFV). MEA also coordinates the Baltimore Clean Cities Vehicle Rebate Program that provides rebates to private companies and local governments to cover the incremental cost of purchasing light and medium duty compressed natural gas (CNG) vehicles.

### **Refueling Infrastructure Development**

Recently completed projects include:

- Construction and opening of a CNG refueling station at the Maryland Port Administration's Dundalk Marine Terminal.
- Completion of site design and construction plans for new CNG refueling stations at I-95/MD Route 175 in Howard County, and at Taylor Avenue/Rowe Boulevard in Annapolis.

- Opening of the first of five E85 (85% ethanol/15% gasoline blend) refueling stations near Fort Meade in Anne Arundel County, funded by federal grant money.
- Acquisition of a fuel cell bus for the University of Maryland College Park campus.

## VII. Waste Management

Administered by the Maryland Department of the Environment (MDE), the state's waste management programs work in partnership with federal agencies and local governments to reduce emissions from a variety of sources.

### **Landfill Regulations**

Emissions from municipal solid waste landfills, which contain a mixture of volatile organic compounds (VOCs) and toxic substances, are rich in methane, a potent greenhouse gas. The U.S. Environmental Protection Agency has established standards to reduce emissions of volatile organic compounds, major contributors to ground-level ozone, for these facilities. The control devices that eliminate such emissions also have the collateral benefit of reducing methane--a greenhouse gas more than 20 times as potent in its heat trapping capacity as carbon dioxide. As a result of this regulation, three of the state's largest landfills have applied controls that have reduced methane emissions.

### **Recycling and Waste Minimization**

Recycling and waste minimization reduce the amount of waste sent to landfills and incinerators that produce methane and carbon dioxide. These minimization activities also benefit energy conservation by reducing the energy needed, and environmental impacts associated with acquiring the raw materials used in production processes.



**Recycling in Maryland  
It's Everybody's Business**

Before 1985, almost all of Maryland's solid waste was landfilled. The Maryland Recycling Act of 1988 requires the City of Baltimore and Maryland's larger counties to recycle 20 percent of all solid waste. Since 1994, counties with populations less than 150,000 have been required to recycle 15 percent of their waste.

In 1999, Maryland had a 36 percent statewide recycling rate. This translates to approximately 2.15 million tons per year of materials diverted from landfills, and roughly three million short tons of carbon dioxide equivalents prevented from entering the atmosphere.

### **Pollution Prevention**

MDE's Pollution Prevention Program (P2) promotes the reduction or elimination of pollution at its source, rather than through control or treatment technologies at the end of the pipe or stack. P2 techniques include equipment or technology modifications, process or procedure modifications, redesign of products, substitution of raw materials, improved housekeeping, maintenance, training and inventory control.



P2 measures often lead to greater efficiency and lower operating costs by reducing the cost of raw materials, waste disposal and regulation; and by decreasing liability and worker exposure. With respect to greenhouse gas reductions, energy-efficiency measures such as the installation

of fluorescent lighting not only reduce business expenses, but also reduce consumption of fossil fuels that produce carbon dioxide at the point of generation. Waste minimization activities can also reduce the energy consumption associated with the transport and combustion of such material.

Part of the P2 program, Businesses for the Bay, presents annual awards to companies within the Chesapeake Bay watershed that have achieved significant reductions and offers a business-to-business mentoring program for those seeking technical assistance.

### **Pilot Manure Transport Project**

This project provides animal operations with cost-share assistance of up to \$20 per ton to move excess manure off farms and transport it to recipients who can use it safely. Originally developed for poultry growers, the project was expanded in FY 2001 to allow manure brokers and other types of animal operations to participate.

Alternative uses for manure also expanded with the opening of the Perdue AgriRecycle Micronutrient Plant in 2001. The \$12 million, 65,000 square foot state-of-the-art facility uses an environmentally friendly process to convert chicken litter into fertilizer pellets, and ship it to nutrient deficient farms in the Midwest.

# VIII. Contacts

## Planning & Development

Maryland Department of Planning  
301 West Preston Street, Suite 1101  
Baltimore, Maryland 21201-2305  
Tel: 410-767-4500  
[www.mdp.state.md.us](http://www.mdp.state.md.us)



Brownfields Voluntary Cleanup Program  
Maryland Department of the Environment  
1800 Washington Boulevard, Suite 625  
Baltimore, MD 21230-1719  
Tel: 410-537-3000



[www.mde.state.md.us/Programs/LandPrograms/ERRP\\_Brownfields](http://www.mde.state.md.us/Programs/LandPrograms/ERRP_Brownfields)

Maryland Priority Funding Areas and Priority Places  
Maryland Office of Smart Growth  
301 West Preston Street, Suite 1101  
Baltimore, Maryland 21201-2305  
Tel: 410-767-4500  
[www.smartgrowth.state.md.us](http://www.smartgrowth.state.md.us)



Rural Legacy Program  
MD Department of Natural Resources  
580 Taylor Avenue  
Tawes State Office Building  
Annapolis, MD 21401  
Tel: 410-260-8428  
[www.dnr.state.md.us/rurallegacy/rlprogram/index.html](http://www.dnr.state.md.us/rurallegacy/rlprogram/index.html)



Greenprint  
MD Department of Natural Resources  
580 Taylor Avenue  
Tawes State Office Building  
Annapolis, MD 21401  
Tel: 410-260-8705  
[www.dnr.state.md.us/greenways/greenprint](http://www.dnr.state.md.us/greenways/greenprint)



## **Agricultural Lands**

Maryland Department of Agriculture  
50 Harry S. Truman Parkway  
Annapolis, Maryland 21401-8960  
Tel: 410-841-5860  
[www.mda.state.md.us](http://www.mda.state.md.us)

Agricultural Land Preservation  
Tel: 410 841-5860  
[www.mda.state.md.us/geninfo/genera3.htm](http://www.mda.state.md.us/geninfo/genera3.htm)

Conservation Reserve Enhancement Program  
Tel: 410-841-5863  
[www.mda.state.md.us/resource/crep.htm](http://www.mda.state.md.us/resource/crep.htm)

Cover Crop Program  
Tel: 410-841-5864  
[www.mda.state.md.us](http://www.mda.state.md.us)

## **Natural Resources Management**

Department of Natural Resources  
Maryland Department of Natural Resources  
580 Taylor Avenue  
Tawes State Office Building  
Annapolis, MD 21401  
Tel: 1-877-620-8DNR (8367)  
[www.dnr.state.md.us](http://www.dnr.state.md.us)

Urban and Community Forestry  
Tel: 410-260-8507  
[www.dnr.state.md.us/forests/programs/urban](http://www.dnr.state.md.us/forests/programs/urban)

Forest Legacy  
Tel: 410-260-8531  
[www.dnr.state.md.us/forests/programapps/legacy2.html](http://www.dnr.state.md.us/forests/programapps/legacy2.html)

Stream Re-Leaf  
Tel: 410-260-8590  
[www.dnr.state.md.us/forests/programapps/ripfbi.html](http://www.dnr.state.md.us/forests/programapps/ripfbi.html)



## **Transportation Choices**

Maryland Department of Transportation  
7201 Corporate Center Drive  
Hanover, MD 21076  
[www.mdot.state.md.us](http://www.mdot.state.md.us)



Commuter Choice  
Tel: 410-767-8755  
[www.mdot.state.md.us/CommuterChoice](http://www.mdot.state.md.us/CommuterChoice)

Telework  
Tel: 410-865-1308  
<http://www.mdot.state.md.us/telework>

Bicycle and Pedestrian Coordinator  
State Highway Administration  
707 N. Calvert Street,  
Baltimore, MD 21203  
Tel: 410-545-5656  
[www.sha.state.md.us/exploremd/bicyclists/OPPE/bicyclists.asp](http://www.sha.state.md.us/exploremd/bicyclists/OPPE/bicyclists.asp)

## **Energy Efficiency and Alternatives**

Maryland Energy Administration  
1623 Forest Drive, Suite 300  
Annapolis, MD 21403  
Tel: 410-260-7655  
Web: <http://www.energy.state.md.us>



## **Waste Management**

Maryland Department of the Environment  
1800 Washington Blvd.  
Baltimore MD 21230



Recycling  
Tel: (410) 537-3314  
<http://www.mde.state.md.us/Programs/LandPrograms/Recycling/>

Office of Pollution Prevention  
Tel: (410) 537-4119  
<http://www.mde.state.md.us/BusinessInfoCenter/PollutionPrevention>