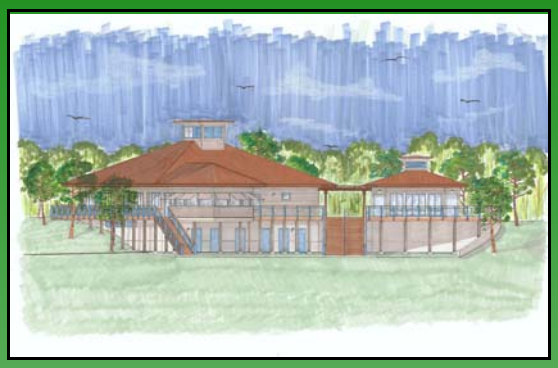
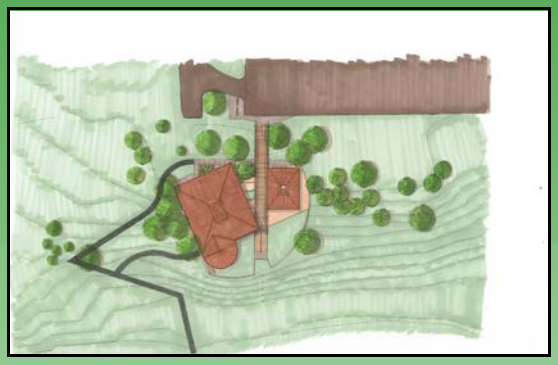
2002 Maryland Green Buildings Council Annual Report





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***Kathleen Kennedy Townsend**, Lt. Governor*

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On the Cover (Top to Bottom)

Illustrations of the first two pilot projects being developed under the Maryland Green Buildings Program: an elevation rendering of the Hammerman Beach Services Building at Gunpowder State Park; a site plan rendering of the Hammerman Beach Services Building; and the St. Mary's College Academic Building.

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Energy Efficiency Improvement Goal
Renewable Energy Project Goal
Greenhouse Gas Reduction Plan

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Executive Summary

In leading by example, State of Maryland policy decisions are influencing others in being more proactive about protecting the environment. The adaptive reuse of the long-abandoned Montgomery Ward building to green building standards is a notable example.

> "We have not historically viewed ourselves as "green" developers. At the same time, our typical product, the adaptive reuse of industrial buildings into commercial office space, preserves resources and is environmentally beneficial. The innovative RFP for MDE's lease, put together by DGS, caused us to embrace numerous green building technologies and view our business in a new light. Many of these systems make good business sense independent of whether your project is a "green" building."
>
> Samuel K. Himmelrich, Jr.
> Developer , Montgomery Park Business Center

Executive Order 01.01.2001.02 - *Sustaining Maryland's Future with Clean Power, Green Buildings and Energy Efficiency* contains three sections which (i) address the issue of cleaner power sources, (ii) creates the Maryland Green Buildings Council (the "Council") that is charged with developing a High Efficiency Green Buildings Program (the "Program"), and (iii) establishes several additional goals related to sustainability and greater resource efficiency.

During 2002, much progress was made in both building green state facilities and in fulfilling the Council's recommendations contained in the 2001 Annual Report. The cornerstone of the Council's efforts was the implementation of the High Efficiency Green Buildings Program (the "Program"). The Program requires all state-owned projects over 7,500 gross square feet to achieve the Silver rating of the US Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED™) Green Building Rating System. Maryland is the first state in the nation to adopt the LEED system as criteria for the design and construction of capital construction projects. In order to achieve this rating, a project must be designed to utilize a number of energy efficient and environmentally friendly strategies in its design, construction and operation.

The High Efficiency Green Buildings Program has been enacted largely through the Executive Branch's five year Capital Improvement Program. The Department of General Services (DGS), which prepares cost estimates for most state capital construction projects, began including additional costs for green design and construction in its FY 2003 cost estimates, using guidelines provided by a recent consultant's study. Additionally, the Department of General Services proceeded with two green building projects in anticipation of implementation of the program. DGS is also exploring the greening of its existing stock of buildings by participating in a pilot program of the USGBC's LEED for Existing Buildings Program.

For the procurement of electricity for use within State owned facilities, the Executive Order has a goal of 6% to be generated from Green Energy with no more than 50% of the total Green Energy procurement derived from the combustion of municipal solid waste. The State was successful in attaining the 6% green energy goal; a recent procurement request stipulates that 20% of the energy must come from green energy sources.

Development of the Maryland Greenhouse Gas Reduction Action Plan is underway. The Maryland Energy Administration (MEA) hired SAIC in July of 2002 to gather and analyze data and develop the plan. The Action Plan will be submitted to the Interagency Climate Change Working Group in the fall of 2003.

In accordance with Executive Order 01.01.2001.06, which requires all State facilities to audit their water use and develop plans to reduce their water consumption, the Maryland Department of the Environment (MDE) collected baseline data for water use from which to measure progress towards meeting the established goals. To date, 585, or approximately 89% of facilities have been audited. Nineteen agencies (41%) have completed their water conservation plans, and have begun implementing measures to reduce their water consumption. Fourteen agencies have submitted reports on their progress toward goal for fiscal year 2002. As of March 2001, DGS has included water conservation requirements in all State leases.

The Public School Construction Program (PSCP) has a history of promoting energy conservation and encourages effective and efficient planning, design, construction, operation and maintenance of public school buildings. Ongoing efforts have included the reduction of energy usage on major renovation projects by 30 percent from the previous three-year average. To help achieve this requirement, there are now over a dozen public schools in Maryland that have a geothermal ground source heat pump system in design, construction, or in operation. This is a significant increase from just one public school a few years ago.

The PSCP established a working committee to develop some material and information to assist school systems and their design professionals to implement green building principles in school construction projects. During 2002, the PSCP distributed to school system representatives Energy Design Guidelines for High Performance Schools developed by the National Renewable Energy Laboratory (NREL) operated for the U.S. Department of Energy. These Guidelines will be useful for the school system personnel and their design consultant as future projects are designed and constructed (new schools, additions and/or renovation projects).

The National Energy Policy Development (NEPD) Group outlined three challenges for the nation in respect to energy: "promoting energy conservation, repairing and modernizing our energy infrastructure, and increasing our energy supplies in ways that protect and improve the environment." High performance green buildings can help us achieve these goals, and help overcome current budget limitations by reducing operating costs. The *Sustaining Maryland's Future with Clean Power, Green Buildings and Energy Efficiency* Executive Order has institutionalized Maryland's commitment to building better, high performance buildings. Because of the Maryland Green Buildings Council, State buildings will have lower energy use, generate less waste, and reduce land impact while saving taxpayers millions of dollars and supporting our commitment to the environment. This document represents the Council's report to the Governor for 2002 outlining progress made toward meeting its responsibilities. Many thanks to the dedicated, hard-working Council members who have contributed to this effort.

Peta N. Richkus, Chair
Secretary, Department of General Services

Introduction

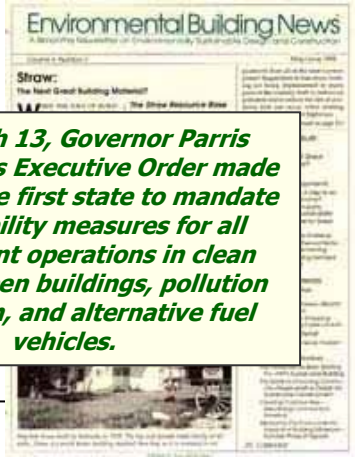
> "Ecological design means maximizing resource and energy efficiency, taking advantage of the free services of nature, recycling wastes, making ecologically smarter things, and educating ecologically smarter people. It means incorporating intelligence about how nature works into the way we think, design, build, and live. When human artifacts and systems are well designed, they are in harmony with the larger patterns in which they are embedded. When poorly designed, they undermine those larger patterns, creating pollution, higher costs, and social stress." *David Orr (Professor and Head of the Environmental Science Department at Oberlin College in Oberlin, Ohio)*

On May 13, 2001, Governor Parris N. Glendening signed **Executive Order 01.01.2001.02 - *Sustaining Maryland's Future with Clean Power, Green Buildings and Energy Efficiency***. The Order contains three sections. Section A addresses the issue of energy produced from cleaner power sources and establishes a goal requiring that part of the electricity purchased for use within state facilities comes from Green Power sources. Section B creates the Maryland Green Buildings Council (the "Council") and charges the Council to establish a High Efficiency Green Buildings Program (the "Program"). Lastly, Section C establishes several additional goals related to greater energy efficiency within State facilities. They include the purchase of products in the top 25% in energy efficiency and pollution prevention, and increased flexibility in the purchase of low emission and alternative fuel vehicles.

The focal point of the Executive Order is the Maryland Green Buildings Council and its responsibilities. The Order stipulates that the Council includes members representing environmental, business, and citizen interests, as well as those State agencies with large facility portfolios and related responsibilities, to ensure that a diversity of opinions and concerns are represented. The Council is to serve as an on-going forum for recommending and monitoring state actions related to energy efficiency, energy production and sustainability issues and policies. The Council's recommendations will not only save Maryland taxpayers millions of dollars by spending less to heat, cool and illuminate State facilities, but will also help Maryland grow smarter and contribute to meeting Maryland's commitment to protecting the environment, restoring the Chesapeake Bay, and improving air quality.

Over the past year, Maryland's green building efforts have been recognized across the country. Both *Governing* magazine and the *Environmental Building News* have cited Maryland's leadership in green building.

"One is for States to lead by example... this past spring, Maryland Governor Parris Glendening signed an executive order mandating all new state facilities meet certain green criteria."



"On March 13, Governor Parris Glendening's Executive Order made Maryland the first state to mandate sustainability measures for all government operations in clean energy, green buildings, pollution prevention, and alternative fuel vehicles.

Interest in green building continues to grow in Maryland and across the country. Maryland held its first Green Building Conference this past September, which was a tremendous success. Nearly 400 builders, developers, architects, green product manufacturers and interested citizens crowded into overcapacity rooms to hear about green projects being built in and around Maryland. This enthusiasm is only a reflection of the national interest in sustainable development. Using the US Green Building Council (USGBC) as a monitor of interest, membership has increased by almost 300% since 2000. Similarly, the cumulative amount of square footage being built to USGBC criteria has increased over 750% within the same time period. This past November, over 4,000 interested persons registered for the USGBC's 1st International Green Building Conference and Expo held in Austin, Texas.

The Maryland Department of the Environment has occupied their new leased offices in the renovated Montgomery Park facility and the Maryland Lottery Administration has recently joined them. The Montgomery Park Business Center is an adaptive reuse of the 1925 Montgomery Ward Catalog Building. The Center will become Maryland's premier example of ecologically sound, environmentally stable "green" building. The high-efficiency mechanical and electrical systems, when combined with state-of-the-art utility controls, will maximize energy savings and user comfort. Maintenance will be low and reliability will be high. These offices are setting the new standard for green renovation. In the early part of 2003 the new building housing the headquarters of the Maryland Department of Transportation (MDOT) will be completed. While the Maryland Green Buildings Program requires that facilities meet at least a LEED™ Silver certification, the Department of Transportation headquarters is being designed for Gold certification. Additionally, other facilities such as the University of Maryland, University College's expansion are also striving for LEED certification.

With the concurrence of the General Assembly, two pilot projects are under way to evaluate the costs and savings associated with building green. These projects are a 56,000 sq ft academic building at St. Mary's College, and a 6,700 sq ft beach multi-purpose building at Gunpowder Falls State Park. These projects are currently in the design phase and expected to be completed next year. The results of these projects will give us a better understanding of the long-term advantages of building green to Maryland taxpayers and confirm the findings from other studies.

The analyses of green building projects are showing that well integrated and comprehensive designs can result in neutral project development costs and overall cost savings. First, rehabilitating an existing building lowers infrastructure and materials costs. Second, integrated system design on new construction can use the savings from one strategy to pay for others. For example, energy-efficient building envelopes can reduce equipment needs by downsizing some machinery, such as chillers, or eliminating equipment altogether, such as perimeter

Case Study: Systems Approach

Pennsylvania Dept. of Environmental Protection Cambria Office Building

Elimination of Perimeter Heating System

- High Performance Windows – Add $15,000
- Perimeter Heating System – Deduct $25,000
- Down-sized HVAC System – Deduct $10,000
- **First Cost Impact – $20,000 Deduction**

For more information, please see www.gggc.state.pa.us/building/cambria/default.htm

heating. Savings from these features can then be used to pay for additional design costs or the cost of more efficient windows or raised floor systems (see Case Study: Systems Approach).

Third, energy- and water-efficient buildings have been shown to significantly reduce operating costs. Utility use can be cut to less than half that of a traditional building by employing aggressive and well-integrated green design concepts. The Baltimore Sun recently (November 18, 2002) reported that the Philip Merrill Environmental Center, the Chesapeake Bay Foundation's new green headquarters building, has exceeded design expectations during its first year of operation, consuming 52.5% less energy than a conventional building of comparable size. Similar results were achieved by the Cambria Office Building, the Pennsylvania Department of Environmental Protection Agency's green office building (see Case Study: Energy Savings). Considering that monthly utility costs comprise a large portion of building operating expenses, tremendous savings can accrue over the life of the building.

Case Study: Energy Savings

Pennsylvania Dept. of Environmental Protection
Cambria Office Building

	Average	Cambria	Savings
Total Energy (BTU/sf/yr)	87,400	39,291	55%
Total Cost ($/sf)	$ 1.71	$ 0.79	54%

For more information, please see
www.gggc.state.pa.us/building/cambria/default.htm

Fourth, a major benefit of green buildings is healthy indoor environments that result in greater employee productivity according to an increasing number of case studies. Employees in buildings with healthy interiors have less absenteeism and tend to stay in their jobs longer. The new International Netherlands Group (ING) Bank headquarters in Amsterdam uses only 10% of the energy of its predecessor building and has cut worker absenteeism by 15%. The combined savings equal $3.4 million per year.[a] Similarly, The West Bend Mutual Insurance Company documented a 16% productivity gain in the early 1990s due to a new 150,000 sq ft green building. The increase is worth more than $2 million each year. Green design strategies included: day lighting, individually controlled workstations, connectivity to nature, and improved lighting. Compared to the previously used facility, energy costs were reduced by an estimated 40%.[b] Thus, green buildings make good business sense.

For several years, the State has increased our energy efficiency with the use of energy performance contracts. The Department of General Services has had nine (9) energy performance contracts to date, which have resulted in total savings of $64 million in operating expenses.

[a] Lenssen and Roodman, 1995, "Worldwatch Paper 124: A Building Revolution"
[b] Kroner, W., Stark-Martin, J., Willemain, T., 1992, *Using Advanced Office Technology to Increase Productivity*- The Impact of Environmentally Responsive Workstations (ERWs) on Productivity and Worker Attitude. The West Bend Mutual Study, Center for Architectural Research, Rensellaer Polytechnic Institute, Troy, NY.

These contracts have also resulted in the following reductions:

- CO^2 by 945,000 tons
- NOx by 2,700 tons
- SO^2 emissions by 5,600 tons

These emissions reductions are the equivalent of eliminating pollution from 186,000 mid-size automobiles or planting 2.8 million trees, an enormous benefit to the environment and a major contribution to our efforts to restore and protect the Chesapeake Bay.

The *Sustaining Maryland's Future with Clean Power, Green Buildings and Energy Efficiency* Executive Order has institutionalized Maryland's commitment to government leading by example and through the Maryland Green Building's Council, coordinates a number of efforts related to environmental sustainability. This Executive Order along with Smart Growth policies continues to combat the adverse impacts of sprawl, and several other initiatives, both executive and legislative, form a comprehensive strategy to protect the State's natural resources and to set the example for citizens and businesses to be good stewards.

Accomplishments and Recommendations

This report presents the accomplishments of Maryland's Green Buildings Council for 2002. The information is grouped into the following sections following the content of the Executive Order:

- Clean Energy Procurement Goal
- High Efficiency Green Buildings Program
- Additional Council Responsibilities
  - Sustainability
  - Maryland Greenhouse Gas Reduction Action Plan
- Additional Energy Efficiency Goals
  - Energy Efficiency Improvement Goal
  - Renewable Energy Project Goal
  - Efficient Product Purchase Goal
  - Pollution Prevention Goal

Clean Energy Procurement Goal

As required by the Executive Order, a goal of 6% of the procurement of electricity for use within State owned facilities has to be generated from Green Energy and no more than 50% of the total Green Energy procurement shall be derived from the combustion of municipal solid waste. The Energy Committee of the Maryland Green Buildings Council (MDGBC) re-evaluated the six-percent green energy goal and has determined that it was successful. At the last meeting of the MDGBC, the Energy Committee recommended that the next procurement of electricity be focused on wind-generated power in order to promote the development of clean, renewable wind resources in Maryland and throughout the region. This is a critical time for the wind industry as the federal wind production tax credit expires next year. With its extension in doubt, projects that do not get developed and financed this year will not be built in Maryland or, at the very least, will be built at a substantially reduced size.

The latest procurement issued by the Department of General Services for the Schedule P customers in the PEPCO/Conectiv service territory stipulated that 20% of the procurement must come from wind or solar. It is anticipated that the entire 20% would come from mid-Atlantic wind given the availability and price of solar electricity in the region. The ability of the successful offeror to utilize renewable energy credits is a novel approach for state procurement and will reduce the cost of the renewable energy.

The procurement of green power continues to be an important goal for Maryland. The Energy Committee believes that continued efforts to increase goal levels are necessary to fully develop Maryland's green power markets. A statement to green power providers and generation developers that Maryland is committed to green power development is necessary to have continued investment in these types of clean renewable energy. However, if a Renewables Portfolio Standard (RPS) is passed for Maryland during the next legislative session, the Energy Committee believes that a green power goal for the state would be duplicative. An RPS would be the strongest signal yet to developers that clean energy is a priority for Maryland.

In June of 2002, Maryland was recognized by the Environmental Protection Agency for its purchase of green power and participation in the Green Power Partnership, a voluntary public/private program that seeks to reduce the environmental impact of electricity generation by fostering the development of green power. Maryland's procurement of green power was the third highest level throughout the Partnership and the highest of any state, including Pennsylvania.

High Efficiency Green Buildings Program

> *"State government has a responsibility to maximize our resources and minimize the impact on the environment. While Smart Growth focuses on where we build, the green building initiative focuses on how we build. It is the next step in our efforts to grow smarter, live more in balance with our environment and help protect and restore the Chesapeake Bay."*
>
> Parris N. Glendening, Governor of Maryland

The High Efficiency Green Buildings Program (the Program) was introduced in the 2001 Maryland Green Buildings Council Report and is available on the Council's website at www.dgs.state.md.us/GreenBuildings. The Program requires all state owned projects over 7,500 gross square feet to achieve the Silver rating of the US Green Building Council's Leadership in Energy and Environmental Design (LEED) Green Building Rating System. Maryland is the first state in the nation to use the LEED system as criteria for its capital construction projects and leases. In order to achieve this rating, a project must be designed to utilize a number of energy efficient and environmentally friendly strategies in its design, construction and operation.

The Program has been enacted largely through the Executive Branch's five year Capital Improvement Program. The Department of General Services (DGS), which submits cost estimates for most state capital construction projects to the Department of Budget and Management (DBM), began including additional costs for green design and construction in its FY 2003 cost estimates. Due to budget limitations not related to green building, none of these projects have been funded thus far. For the FY 2004 budget, at least ten different projects include green costs in their budget request estimates.

At the present time, two buildings are being developed as pilot projects under the Program. The St. Mary's College Academic Building is a 56,000 square foot laboratory and classroom building. The Academic Building is being designed by the Smith Group Architects with Janet Harrison, Architect, the same team that designed the highly successful LEED Platinum rated Merrill Environmental Center for the Chesapeake Bay Foundation. The St. Mary's project is currently in the design development phase with the final design anticipated to be complete in September of 2003.

The design of the academic building poses interesting green building challenges for the architectural and engineering team. The laboratory functions with their inherent continuous air changes make it difficult to achieve large energy savings. Designing the building to fit into the

traditional southern Maryland architectural style required by the college limits opportunities for interior daylighting, dictates exterior materials and limits the expression of green technologies such as photovoltaic panels and sunscreens. In spite of these challenges, the designers are anticipating an energy savings of approximately 30% over a typically designed building. Water use will be reduced through the use of high efficiency plumbing fixtures, waterless urinals, rainwater collection for flushing toilets, and drought resistant native landscaping. Indoor air quality will be improved versus a standard building through the use of low emitting finish materials, adhesives and sealants as well as increased air changes monitored by carbon dioxide sensors. Resources will also be optimized through the use of certified wood products, rapidly renewable materials such as wheatboard and linoleum, the use of recycled materials, locally manufactured materials and a construction waste recycling plan. Other green features being considered in the design are hot water solar panels, daylighting, and a small living roof. Interestingly, the manufacturer of the college's traditionally styled site lighting fixtures has agreed to change the design of the fixture to reduce stray light pollution. The project is expected to achieve the mandatory LEED Silver rating. Unfortunately, due to budget shortfalls, the construction funding for this building has been delayed one year until FY 2005.

The second project, the Hammerman Area Beach Services Building is being developed for the Department of Natural Resources to replace an existing aging facility in Gunpowder State Park. The 6800 square foot building features showers and dressing rooms for beach goers, a concession pavilion, and offices for park staff. The architect for this building is Grieves Worrall Wright and O'Hatnick, Incorporated with TerraLogos Eco Architecture, both of Baltimore. This project is currently in the construction document phase and the design is expected to be complete in early 2003. The green features include a reduction in the use of wood by utilizing recycled wood from the existing building, engineered wood products and certified woods and the use of rapidly renewable products such as wheatboard in place of traditional wood trim. Energy savings of up to 40% over a conventionally designed building are expected due to the use of geothermal heat pumps, motion sensors for lighting, and daylighting. An innovative storm water management system will address both quantity and quality of runoff and will recharge the local aquifer. Water use will be reduced by 25% through the use of low flush and high efficiency plumbing fixtures and low moisture native landscaping. Other features contributing to the expected LEED Silver rating include light pollution reduction, recycling of concrete and masonry materials from the existing building, improved indoor air quality from low emitting finishes and purchase of 5% of the building's energy from green sources. This project also has been delayed due to budget constraints and is expected to be funded for construction in FY 2005.

The "green" premium for the design for both of these buildings fell within the range of costs budgeted (1% to 2½% of total construction cost). These additional design costs are attributed to the providing of required LEED documentation, energy modeling costs, development of additional green specifications and green material research; all design activities not currently included in the design of "standard" buildings.

During the 2002 Legislative Session, MDGBC Chair Peta Richkus made a presentation to the Legislative Budget Committees detailing the benefits of green building. The Committees, as part of the 2002 Joint Chairman's Report, tasked the MDGBC to create a system to measure and

verify energy savings. A report detailing a measurement and verification (M&V) system based on a similar protocol currently in use for DGS energy performance contracts was submitted to the Committees in July of 2002. This protocol has since been added to the scope of work of both of the pilot projects described above and will be applied to all future funded green buildings. Once the protocol is in place, a database can be developed to track the cost of green building versus the lifetime savings for buildings developed under the program. The M&V protocol will add minimal costs to the design and construction of green buildings and at the same time will qualify for additional credits under the LEED Rating System.

In addition to the new state-owned from-the-ground-up projects described above, DGS, which is responsible for all State leases, created and implemented the state's first "green building" lease solicitation several years ago. This lease, for the Maryland Department of the Environment (MDE), provided financial viability for the redevelopment by Himmelrich Associates, Inc. of the 1.3 million square foot former Montgomery Ward warehouse adjacent to Carroll Park in West Baltimore. MDE occupies approximately 260,000 square feet of space at Montgomery Park. MDE and the Maryland Lottery recently moved into the building. Reusing the existing building structure saved immense amounts of energy and material and provided numerous opportunities for recycling of other existing building materials. Many of these as well as other green building features are described in a handout prepared by MDE and included in this report as Appendix 2. Most notable is the installation of the first green "living" roof on a state related project. This project was not developed under the LEED rating system but it appears that it would qualify for at least a Silver rating. The architect for the project was Hellmuth, Obata + Kassabaum of Washington D.C.

The Maryland Department of Transportation (MDOT) will also be moving into a green building in early 2003. The design portion of the development of their new headquarters building near BWI Airport was already underway several years ago when the decision was made to make the building green. The building includes many of the same green features described in the projects above plus an energy star roof , waterless urinals, light reflective pavers and bamboo and cork flooring. Additionally, the contractor was able to achieve a recycling rate of 75% of all construction waste and packaging materials. An estimated energy usage approximately 48% less than a conventional office building is expected to help the project achieve a Gold rating from the LEED Rating System. MDOT expects to begin moving into the building in January of 2003. Heffner and Weber Construction, the design build contractor, has gained valuable experience from the project and appears interested in pursuing future projects as green buildings.

DGS is also exploring the issues involved in the greening of its existing stock of buildings by participating in a pilot program of the LEED EB (for existing buildings) Program. Several buildings have been selected for this exercise though these selections have not been finalized at this time. DGS hopes to be able to use the LEED EB system in conjunction with its energy performance contract upgrades utilizing energy savings to fund building improvements.

The Maryland Green Building Council's High Performance Green Building Program has taken a leadership role among government agencies across the country by virtue of being the first to use the LEED system as criteria for its new building projects, renovations, and leases. The Program

has become known around the country as inquiries from jurisdictions as far away as San Francisco and Vancouver British Columbia are received regularly by the MDGBC.

Additional Council Responsibilities

(1) Sustainability Issues

While the initial focus of the Green Building Council was to develop and implement the Program, the Executive Order also directs the Council to consider additional sustainability issues and policies. The Department of Natural Resources worked with Harford Community College to assist in their broad-range sustainability efforts.

Several years ago, Harford Community College established a campus-wide sustainability initiative. The goal of this initiative is to fully incorporate four core elements into comprehensive Sustainable Master Plan for the college. These core elements are:

- Student Learning – Provide education that introduces new processes, paradigms, and technologies such as renewable energy technologies, planet restoration projects, and green building techniques.

- Program Development – Develop programs of training and implementation to apply sustainability for an improved world.

- Honor the Environment – Create a model for a better, healthier world through cooperation, recognition of humanity's interdependence, and the sharing of one environment, one world.

- Serve as a model for emerging sustainable practices – Demonstrate, showcase, and model practical uses and benefits of sustainability and alternative energy practices, processes, and technologies to higher education and K-12 school systems, local businesses, government, communities, and the various decision-makers involved. Provide needed evidence of financial, environmental, and social benefits delivered by sustainability programs.

> "We set out to become a leader in an adventure that would ensure our status as a sustainability pioneer and we have already achieved significant progress in that endeavor. In conversations with experts outside the College, it has become clear that no community college, if even any public agency, has taken the significant steps that HCC has taken into the realm of actively implementing examples of sustainability and green design."
>
> Donald L. Porter, Vice President
> For Institutional Advancement
> Harford Community College

The Council will watch with interest the progress of Harford Community College's effort as a model for future state sustainability initiatives.

(2) Maryland Greenhouse Gas Reduction Action Plan

Development of the Maryland Greenhouse Gas Reduction Action Plan is underway. The Maryland Energy Administration hired SAIC in July of 2002 to gather and analyze data and develop the plan. The Maryland Interagency Climate Change Working Group has been meeting monthly for the past year, and advises SAIC on policy issues surrounding the development of the

Action Plan. Once data gathering is complete and a policy matrix is developed, a separate stakeholder working group will be convened to further refine the Action Plan. The stakeholder group will work to develop policy and program options as input for the Plan. However, consensus will not be required of the stakeholder group. The Action Plan will be submitted to the Interagency Climate Change Working Group in the fall of 2003. The results of State action to date were presented at the Environmental Protection Agency's "State and Local Partners Conference" held in Annapolis on November 21, 2002.

Additional Energy Efficiency Goals

(1) Energy Efficiency Improvement Goal

While the Maryland Energy Administration and the Department of General Services continually strive to improve the energy efficiency of state owned and operated buildings, there is little data on the efficiency of existing buildings. A presentation was made to the Maryland Green Buildings Council on the Energy Star Benchmarking Tool for commercial buildings. Members of the Energy Committee who sat in on a follow-up meeting to explore the tool in more detail recommend utilizing this tool to assess the overall efficiency of the state's building portfolio. Only buildings that are individually metered can be evaluated for their overall energy intensity relative to other similar buildings in the region. For this reason, individual metering should be required where feasible.

Although a significant effort would be required to develop a protocol to transfer utility data on existing buildings, it can easily be replicated once in place. As accounts come off price-freeze service and electronic data transfer is required, this will make the task much easier. Once the data is downloaded into the Benchmarking database, an EPA contractor will run the numbers and the state can get an idea of the relative efficiency of its buildings portfolio. This tool will be especially important once the state's portfolio of green buildings expands, as it can be used to monitor the energy intensity of the buildings and alert the portfolio manager to any discrepancies. For instance, the building that meets LEED "Gold," but where the occupants leave the lights on all night, would not be particularly energy efficient. This tool will prove to be an important resources to assess which buildings in the portfolio are in the most dire need of energy efficiency upgrades, and which buildings are not performing up to specs.

(2) Renewal Project Energy Goal

Although there is a process in place to assure that all capital project expenditures undergo a review for their applicability for Energy Performance Contracting, there is no process, mandatory or otherwise, that requires projects to undergo a review for the feasibility of incorporating renewable, distributed generation into the buildings. Such a process could amount to substantial energy (and therefore monetary) savings for the state. The Energy Committee suggests that the Governor, given the lack of headway the Energy Committee has been able to make in this effort, require such a process of the Department of Budget and Management before any capital expenditure be approved.

(3) Energy Efficient Purchase Goal

In response to the Efficient Product Purchase Goal of the Governor's Executive Order, the Department of General Services' future solicitations will require energy-using products to be Energy Star labeled or to be in the top 25% in energy efficiency for products where labels are not available. This policy will also be added to the DGS procurement guidelines provided to other state agencies.

(4) Pollution Prevention Goal

Maryland State government agencies exceeded the 20% recycling goal set forth in the *Sustaining Maryland's Future with Clean Power, Green Buildings and Energy Efficiency* Executive Order by recycling 20.6% of the waste generated in 2001. Maryland State Agencies' 2001 Recycling Rates table (attached) gives a breakdown on the State recycling activities in 2001.

The following recommendations/responsibilities have been acted on in the past year:

Ensure opportunities for the recycling of computers and other electronics from State agencies. Obsolete State agency computers are sent to State surplus (Jessup Salvage Site) then onto the Ohio Prison System in partnership with Unicor Federal Prison Industries, Inc., for demanufacturing and recycling. Operational equipment is typically donated to schools or non-profit organizations.

Increase opportunities for State agencies to procure environmentally preferable products including carpet, paint, toner cartridges, and ceiling tiles manufactured with recycled content and energy savings equipment. MDE's *ALL StAR News* is a quarterly newsletter that is made available to all State agencies and regularly features information on environmentally-preferable products. DGS maintains a Recyclable Products List on its website; coordinated efforts to update and expand the list are underway.

Ensure that the Governor's Executive Order regarding double-sided copying is enforced. MDE continues to mention double-sided copying in the *ALL StAR News* and posts information to ensure double-sided copying at its Headquarters and field offices.

Establish an agency Managing for Results (MFR) objective and performance measurement to ensure that each State agency is accountable for annually diverting or recycling at least 20% of the waste they generate. MDE has established a MFR performance measure related to recycling at least 20% of the waste the Department generates. Refer to Appendix 1 for agency recycling rates for 2001.

Increase technical assistance to State agencies by conducting regular site visits to enhance recycling programs. MDE has an on-going process for conducting site visits to State agencies to enhance their recycling programs. In the last year MDE met with representatives from BWI Airport and Baltimore City Community College, and all site managers for DGS's 54 locations. MDE promotes its technical assistance and site visit program in correspondence sent to State agencies.

Benchmark the All StAR program against successful State and County Programs across the region and adopt proven program enhancements. MDE contacted Washington D.C., Delaware, Virginia, West Virginia, Pennsylvania, Anne Arundel County, and Howard County about their recycling programs. In all cases, Maryland's program was more inclusive than the other programs.

(5) Alternative Fuel Vehicles (AFV)

The Alternative Fuel Vehicle Subcommittee works as a joint effort between the public and private sectors within the State of Maryland to support alternative fuel vehicles, infrastructure development, and implementation. The primary focus of this effort is to help improve air quality, fuel efficiency, and economic development in the region.

The Advanced Technology Vehicle (ATV) Program has awarded almost $1.7 million dollars in grants to support the purchase of high mileage, high fuel-use, and alternative fuel vehicles. ATV is one component of the MDOT-funded Transportation Emission Reduction Measures (TERM) Program, which began in 1999 and seeks to improve air quality in the State of Maryland. The program has subsidized the cost of purchasing or re-powering 27 transit buses, 52 full-size taxicabs, and 23 shuttle vans in the Baltimore Washington region. The ATV partnership project development team consists of MDOT, MEA, MDE, Gas Research Institute (GRI), Metropolitan Washington Council of Governments, and private sector fleets**.** The ATV program works as the implementing agent to support the goals and objectives of the Alternative Fuel Vehicles Subcommittee.

Governor Glendening announced that the State of Maryland would provide over $22 million in state funds to purchase Compressed Natural Gas (CNG) bus replacements and refueling stations in Montgomery County. This is an effort to support County Ride-On vehicles and the local school bus systems. In addition, ten refueling stations will be strategically installed throughout the Metropolitan Washington Region. MDOT has committed to purchase 200 hybrid electric vehicles for the State fleet, and is exploring the potential for improved highway signage to direct AFV drivers to AFV fueling stations. Funding for these initiatives is being awarded as a TERM grant. MDOT is exploring the potential for similar types of support in the Baltimore region.

Over the last year, the ATV Program and the State have assisted in the development and installation of three new compressed natural gas refueling stations in the state. These have been added to the existing twelve stations in the Baltimore Washington region. A new public access CNG station has been opened at the Maryland Port Administrations' Dundalk Marine Terminal in Baltimore. Over $200,000 in funding for the station was provided by the State of Maryland and the Baltimore Gas and Electric (BG&E) Company. A Department of Energy (DOE) grant of $81,000 in addition to $130,000 from BG&E supported the purchase of equipment and infrastructure needed to open the CNG station located in Howard County, Maryland. In addition, the State has committed $187,000 for a new CNG Station in Annapolis, which is currently being installed.

Other Contributions by State Agencies to Sustaining Maryland's Future

The Green Buildings Council applauds the following initiatives of other state agencies and entities to advance the goals of the Governor's Executive Order.

- Water Conservation Executive Order
- Energy Conservation Task Force
- Maryland Commercial Green Buildings Tax Credit Program
- Department of Natural Resources' Environmental Design Program
- Department of Housing and Community Development
- Public School Construction Program

Water Conservation Executive Order

On May 17, 2001, Governor Glendening issued Executive Order 01.01.2001.06, which requires all State facilities to audit their water use and to develop plans to reduce their water consumption. The Executive Order established goals for facilities to reduce their water use by 7% by 2003, 8% by 2005, 9% by 2007 and 10% by 2010. MDE and the MDGBC are responsible for reporting to the Governor regarding progress towards meeting these goals.

In June 2001, MDE issued written guidance and offered a training session to assist agencies in completing these requirements. MDE has also offered technical assistance to a number of agencies in auditing their water use and developing water conservation plans. During 2002, MDE has been developing a baseline for water use from which to measure progress towards meeting the established goals. To date, 585, or approximately 89% of facilities have been audited. Nineteen agencies have completed their water conservation plans, and have begun implementing measures to reduce their water consumption.

Agencies are required to report on their progress towards meeting the established goals annually by December 1 of each year. MDE is issuing guidance to agencies for reporting the results of their audits for 2002 and will provide assistance to agencies where needed. MDE and the MDGBC will report to the Governor on progress toward meeting the goals in the Spring of 2003.

Energy Conservation Task Force

The Task Force reported to the Governor in December of 2001. It is hoped that these recommendations will be implemented through legislation to create energy efficiency programs that will support business development throughout the state and save Maryland residences, businesses and industry the cost of program implementation many times over.

Maryland Commercial Green Buildings Tax Credit Program

President George W. Bush stated, "America must have an energy policy that plans for the future, but meets the needs of today. I believe we can develop our natural resources and protect our environment." The President's National Energy Policy Development (NEPD) Group outlined three challenges for the nation in respect to energy: "promoting energy conservation, repairing and modernizing our energy infrastructure, and increasing our energy supplies in ways that protect and improve the environment." High performance green buildings can help us achieve these goals, and overcome some of the current challenges.

A green building tax incentive acts a catalyst to transform Maryland's commercial and multi-unit residential building market without the use of burdensome regulatory tools. There is no doubt that the technology exists to make our buildings more energy efficient and less burdensome on the environment. However, due to the learning curve and cost premiums, it is necessary to provide incentives for architects, engineers, and developers to utilize emerging technology. Refrigerators require just one-third the electricity they did 30 years ago, and with a little effort Maryland will be able to say that about our buildings.

The green building tax incentive act provides a personal or corporate income tax credit of 6-8 percent of the total allowable cost for the construction of a green building. The credit is 8 percent for a green whole building and 6 percent for a green base building and/or green tenant space. Additional credits of 20-30 percent are available for buildings utilizing fuel cells, photovoltaic modules, or wind turbines for the on-site production of energy.

There is strong public support for this program and the Maryland Energy Administration receives inquiries about the program from parties across the state on a daily basis. This ten year program will issue the first initial credit certificates this year. This program is a critical component in the portfolio of Maryland's energy strategy. Especially in tight fiscal times, the kilowatt of energy that is the cheapest to produce is the kilowatt we never use. High performance, energy efficient buildings will help foster growth in Maryland's economy.

Department of Natural Resources' Environment Design Program

The Environmental Design Program emphasizes innovative building and design techniques as options to build better buildings and reduce urban and suburban nutrient pollution. When combined with effective local planning, these measures help to protect and restore local watersheds, and reduce overall development costs. Over the past year, the Program used several methods to work directly with building industry professionals, local governments, and citizens to provide the information and on-site technical assistance they need to identify and implement environmentally sensitive and cost-effective building and site design techniques with the goal of preventing pollution and damage to Maryland's living resources.

In 2002, the Program completed three major outreach endeavors. First, the Program continued its coordination of the Green Building Network. The Network is an informal, national group of more than 1,000 design, construction, engineering, and other building professionals that promote

and encourage efficient use of natural resources, environmental protection, and sustainable communities. Second, staff designed, developed, and completed *Check-Up: A Teacher's Resource Guide for Assessing Natural Resources in Maryland Schools. Check-Up* is intended to educate students on green building principles and how they can conserve natural resources in their school. The guide provides detailed assessments for students and staff to measure trash, water, and energy, and provides recommendations on how to reduce unnecessary waste. And, third, the Program coordinated the Maryland Green Building Conference, as described previously in this report.

The Environmental Design Program also provides technical assistance to its many partners. One example is the *Environmental Design Advisor,* a web-based advisor created to help building industry professionals and interested citizens assess the viability of using environmentally responsible building and design alternatives, learn about new techniques and products, and connect the user to the companies that supply them. In addition to the private sector, the Program worked closely with several local governments to provide technical assistance on how their communities can adopt green building and environmental design techniques and policies. Lastly, Program staff worked with the City of Bowie, Anne Arundel County, and other jurisdictions to adopt resolutions and policies similar to Maryland's Executive Order.

Department of Housing and Community Development

The Department of Housing and Community Development (DHCD) contributes to the Maryland's green building efforts through code administration, community development and neighborhood revitalization.

Maryland Codes Administration conducted 10 regional training sessions for local government building officials and design professionals in October and November 2002. The sessions began with an overview of green building efforts in Maryland and provided a look at many of the new technologies that assist with providing energy efficient buildings of the highest quality. Codes Administration created a new web page for Maryland's Green Buildings. The page provides links to State agencies with green building programs and services. It also provides links to LEED and the U.S. Green Buildings Council.

The Community Development Administration revised its scoring criteria for multi-family housing projects to give extra points to projects that use green building technology in the total building project, including site design. Extra points are also awarded to rehabilitation projects in neighborhoods that have revitalization plans in place. Since the multi-family programs are highly competitive, funds are awarded only to the highest scoring project.

Single Family Housing efforts include the Weatherization Program. This program, in conjunction with the Maryland Energy Administration, is participating in a demonstration project in Baltimore City called the Cool Roof Program. The project is using silver roof coatings to reflect the sun's energy that will provide greater comfort to building occupants and reduce cooling costs.

The new Maryland Building Rehabilitation Code (MBRC) encourages the rehabilitation and reuse of all types of existing buildings. The MBRC applies throughout the State and will save the energy costs related to the construction of new roads, infrastructure as well as new buildings themselves.

The Neighborhood Business Development Program provides flexible gap financing to small businesses starting up or expanding in locally designated neighborhood revitalization areas throughout the State. It reduces sprawl by encouraging growth in existing neighborhoods.

Public School Construction Program

Public school buildings in the State of Maryland are owned by the local board of education in each jurisdiction. They are not State owned facilities and are therefore not covered by the Executive Order. Still, the Public School Construction Program (PSCP) has a history of promoting energy conservation and encourages of effective and efficient planning, design, construction, operation and maintenance of public school buildings. Project architects, engineers, and other design consultants are to design new school buildings to utilize less than 45,000 BTU/sq. ft./year. Major renovation projects are to reduce the energy usage by 30 percent from the previous three-year average.

In June 2001, the PSCP organized and sponsored a one day workshop entitled "High Performance School Buildings: Green Buildings in Maryland" which drew 240 participants. The PSCP established a working committee to develop some material and information to assist school systems and their design professionals to implements Green Building principles in school construction projects. Envisioned is a voluntary program to utilize the LEED™ Green Building Rating System and a means by which to share best practices and design solutions.

In February 2002 the PSCP and DGS cosponsored a Geothermal Energy Savings Conference, which was attended by about 75 architects, engineers, and representatives from several state agency and school systems. Many ideas about energy conservation were shared and discussed. There are now over a dozen public schools in Maryland that are either have a geothermal ground source heat pump system in design, construction, or in operation. This is a significant increase from just one public school a few years ago.

The PSCP distributed information to school system representatives in March 2002 pertaining to the recently released Energy design Guidelines for High Performance Schools that was developed by the National Renewable Energy Laboratory (NREL) operated for the U.S. Department of Energy. This was the first of a seven set series that will cover the entire nation. In October 2002, the PSCP distributed information regarding the remainder of the guidelines that have now been published. They will be useful documents for the school system personnel and their design consultant as future projects are designed and constructed (new schools, additions and/or renovation projects).

The PSCP is working to have legislation reintroduced during the 2003 session to modify the statute that established the Solar Energy Pilot Program for Public Schools. This will enable local school systems to apply for State funding for the installation of photovoltaic collectors (assuming that the State funds previously approved but reverted are reinstated).

Appendices

Appendix 1

Maryland State Agencies' 2001 Recycling Rates

Agency Name	No. of Sites	No. of People*	Total MRA 2000 (tons)	Total MRA 2001 (tons)	2001 MRA Recycling Rate (%)
Dept. of General Services	16	10,837	842.44	732.26	**31.6**
Injured Workers Insurance Fund	1	386	28.00	15.00	15.3
Dept. of Labor, Licensing & Regulation	16	1,240	69.50	79.48	12.9
Dept. of Agriculture	3	302	47.76	74.97	**46.6**
MD Public Broadcasting Commission	1	235	14.40	14.56	17.2
Comptroller of the Treasury	1	940	233.50	240.74	**53.6**
MD School for the Deaf	2	870	71.44	102.40	**41.3**
Dept. of Natural Resources	7	862	32.36	35.31	**25.6**
Dept. of Juvenile Services	14	2,283	57.14	60.28	9.2
MD State Archives	1	110	5.21	5.95	16.0
Dept. of the Environment	1	900	105.65	88.18	**39.1**
Dept. of Transportation^	57	17,084	3,321.96	3,815.13^	**20.0^**
Dept. of Health and Mental Hygiene	18	9,267	629.40	1,165.78	18.6
MD General Assembly	1	1,247	168.19	194.18	**43.3**
Dept. of Public Safety and Corr Services	30	36,015	1,556.34	2,288.50	15.6
Dept. of Human Resources	15	4,344	190.52	165.48	18.8
State Dept. of Assessments and Taxation	2	222	4.00	1.27	4.3
University of Maryland System	14	117,494	4,669.85	5,248.15	**23.3**
St. Mary's College of MD	1	1,850	217.00	184.00	**25.7**
Morgan State University	1	7,200	5.55	98.65	13.2
Dept. of Education	1	715	NR	28.26	**35.2**
MD Automobile Insurance Fund	1	451	15.70	25.75	19.8
MD Stadium Authority	1	2,100	609.00	471.90	19.4
Baltimore City Community College	1	2,300	15.03	30.06	3.6
MD Environmental Service	1	144	9.93	11.94	**43.4**
MD Food Center Authority	1	20	1.84	1.98	**24.0**
Judiciary of MD	1	142	14.20	13.39	**26.2**
Office of the Public Defender	1	150	0.00	0.00	0.0
Subsequent Injury Fund Board	1	18	1.50	3.00	**46.3**
Dept. of Veterans Affairs	5	698	96.70	21.58	**38.1**
Dept. of Budget and Management	1	300	NR	5.67	13.9
MD State Police	37	2,236	287.89	199.42	**21.3**
Dept. of Bus. and Economic Development	1	666	18.87	27.54	**25.5**
MD Higher Education Commission	1	80	2.60	3.21	**23.6**
Dept. of Housing and Comm. Development	1	455	37.39	48.20	**53.7**

Agency Name	No. of Sites	No. of People*	Total MRA 2000 (tons)	Total MRA 2001 (tons)	2001 MRA Recycling Rate (%)
MD Insurance Administration**	1	260		0.00	0.00
TOTALS	**258**	**224,423**	**13,380.86**	**15,502.21**	**20.6**

MRA Recycling Rates in **bold** indicate exceeding the goal.

***** State employees comprise approximately 77,924 of the total amount of people at State Agencies
NR – Did Not Report; ^ 17 of 57 sites did not report in 2001; ** new in 2001, program just being set up

Appendix 2

Maryland Department of the Environment

Green Building Features of Montgomery Park

Montgomery Park is an adaptive re-use of the 1.3 million square feet Montgomery Wards Building built between 1925 and 1927. This building is also on the National Register of Historic Places

The Maryland Department of the Environment (MDE) moved into Montgomery Park in September 2002, as the first tenant, and occupies nearly 270,000 square feet.

Montgomery Park is a design model for "green" buildings in Maryland. Its features include: recycling of existing materials as renovations occur; two green roofs encompassing over 30,000 square feet; operable windows with low-E glazing; automatic lighting sensors that adjust to natural light and room occupancy; low energy, glass-backed elevators; recyclable or sustainable materials used for workstations; recycled carpeting; waterless urinals; rainwater runoff used for toilets; and ice storage utilized with Trane " Chillers" which will allow energy to be consumed during off-peak electrical periods.

Frequently Asked Questions:

1. Describe the Green Roof.

The Green Roof encompasses 20,000 sq. feet on the main building and another 10,000 sq. feet on the North Building. The purpose of the Green roof is to minimize runoff, reduce energy costs through increased insulation properties, reduce urban noise and provide an aesthetically pleasing view.

The soil depth on the roof is approximately 4 inches. The weight load is approximately 18lbs per square inch. There is a PVC membrane on the roof, followed by insulation board, then two textile layers that prevent root penetration. Drainage is accomplished via gravity.

The soil is a mixture of 75-80% inert, expanded, slate mixed with 20-25% organic material. In this case, the organic material is composted mushroom substrate that comes from an organic mushroom farm. This mixture is water soluble and nutrient rich.

Expanded slate, which puffs up like popcorn, is from an abandoned quarry. An 80% use of a mineral such as slate is necessary to prevent soil erosion and compaction.

The majority of the plants that are on the roof are from the Sedum, Rosularia chrysanthea, and Sempervivum families with common names such as: Russian Stonecrop, Spider-web Hen and Chicks, Pink Stonecrop and Jellybean Sedum. They are hardy, require no irrigation, maintenance, or fertilization, and spread quickly.

There are approximately 2 plants per square foot, with 61,000 plants overall. These plants only need to be fertilized once per year for the first five years at a very low rate of application (1 oz of 14% strength fertilizer) per square meter. After 5 years, the plants stabilize and they do not need fertilizer again. Maintenance consists of removing any weeds that may grow.

The roof looks sparse now because it was just recently planted. Given a normal amount of rainfall, it will take one year to grow and provide complete roof coverage.

Finally, roof temperatures rarely exceed 80º when planted, compared to 140º on a standard roof. A 3-7% drop in roof temperature equals an approximate 10% reduction in cooling costs.

2. Can you explain the ice storage and cooling features?

The Ice Storage Tank is a model of energy efficiency. The tank, located on the roof, is filled with coiled tubing and water. It contains no moving parts, minimizing breakdowns. At night, when electrical rates are low, a water and glycol mixture that is chilled to 17°F is run through the tubing. This causes the water stored in the tank to freeze,

in effect creating a huge ice cube. During the day, warmer water is circulated through the tank and over the ice, which chills and delivers the water back through at 45°F.

Most systems deliver water at 55-60° F, so less energy is needed to maintain comfortable temperatures utilizing this system. Another key component is an economizer system that utilizes fresh air from the outside. Whenever economizer detects that air levels are enough to provide adequate cooling and venting, it pumps in fresh air rather than artificially cooling the air. In addition, this system is able to monitor CO_2 levels within the building. If necessary, the system will pump in fresh air to purge the building of unacceptable levels of CO_2. Use of the economizer also assists in the reduction of heating/cooling costs.

3. Flooring materials are often overlooked, what about yours?

Our carpeting began its first life in a federal building in Texas. All 230,000 square feet was removed from that building during a renovation and sent to the Milliken Company to begin a new life. " Earth Squares" is Milliken's carpet renewal program that uses 100% post consumer waste. The Milliken Company has patented a process the takes existing modular carpets, super-washes, retextures, and then recolors them. They are then either reinstalled in the existing location or sold to others. This is how carpeting in Texas found a second home in Maryland.

The carpet is comprised of 18" x 18" squares that are easily pulled up to access our raised flooring. If a carpet square is damaged, it is much easier to replace one tile than to try to replace an entire carpet section. Low VOC glue was used to secure the tiles.

Our break rooms have Marmoleum floors. This linoleum product is made from virtually inexhaustible, natural raw materials. Those materials: Linseed Oil is made from flax seed, Wood Flour is derived from trees felled in European controlled forestry zones, no tropical hardwoods are used; Cork Flour, made from cork grown on oak plantations in Mediterranean countries is used, but most of the cork is obtained from scrap generated from wine cork makers. Also, bark is peeled every 7-10 years with no impact on the health of the tree; Rosin is obtained from pine trees in a method that does not affect future growth; Pigments are created using ecologically responsible processes. The organic pigments used are from ingredients that contain no heavy metals; Jute is spun from fibers of Jute plants in India and Bangladesh. Jute is plentiful and has a renewable supply base.

Bamboo flooring is located in our reception area. The bamboo is 100% Mao Zhu Bamboo. Our bamboo, from Greenwood Products Company, has the lowest formaldehyde emissions in the industry (0.0127 ppm). It exceeds all Internal Air Quality standards and passes German Air Quality standards, some of the strictest in the world. Bamboo is a fast growing grass and has a sustainable supply base. During the manufacture of this flooring, almost 100% of the bamboo is used --materials too small for flooring are turned into paper, chopsticks, or toothpicks.

3. What are the unique features in your bathrooms?

The bathrooms have many environmentally sound features such as waterless urinals; recycled concrete sink tops; 70% post-consumer ceramic tiling; 100% post-consumer recyclable plastic in the stall doors; and gray water is used in the remainder of the toilets.

The waterless urinals work completely without water and save approximately 45,000 gallons of water and more, per year, per fixture. Urine flows into a special drain insert that has a patented liquid seal

that neutralizes the urine and prevents odor build up, it then flows down the regular drain line. This is the first building in Baltimore City to be approved for the waterless urinal system.

A drain field at the bottom of Monroe Street is used to collect stormwater from drains running along Monroe Street and from runoff of the Montgomery Park property. It is cleaned via a sand filtration system and the treated gray water is then pumped to a cistern on the roof, where it is held and then distributed for use in the remainder of the toilets.

4. With so many windows, how do you maintain energy efficiency?

There are approximately 70,000 windows at Montgomery Park and every third window cluster is operable. The steel windows were preserved and reglazed utilizing glass panes that are low-E, Argon-filled glass. These new windows exceed the State's conservative efficiency guidelines and retain sufficient daylight light transmission (75%) to meet Preservation guidelines.

The floor plans were designed to maximize the opportunity to use natural lighting. This was done by concentrating enclosed offices in the center of each floor and placing open workstations along the perimeter of the building.

In addition, high efficiency lighting combined with occupancy and ambient light sensors add to efficiency savings. The sensors detect how much light is coming in through the windows and adjusts wattage accordingly. If an occupant leaves or enters an enclosed office or conference room, the lights turn off or on accordingly.

The lights utilize low mercury fluorescent lights with electronic 4-tube ballasts. Each ballast will control tubes in multiple fixtures. If there is enough daylight and the required foot-candle level is accomplished without artificial light, the light will remain off. With slightly lower daylight levels, the sensor will cause the center tube (only) to operate. Because one ballast will control 4 lamps this will save 67% of the energy of an energized three-tube fixture. With moderate daylight levels, the sensor will cause the center tube to turn off and the two exterior tubes to light. Should minimum or no daylight occur, the sensor causes all tubes to be utilized.

5. You have so many workstations! Are they "Green" too?

Yes, the workstations are also "Green". Each of the workstations consists of Homasote walls, replenishable ash trim and recycled wheat board on the work surfaces and interior of the partitions. Homasote is durable and has good sound dampening properties. It is made from 100% recycled post consumer newsprint and contains no asbestos or formaldehyde. All of the water removed from Homasote Products during manufacturing - hundreds of thousands of gallons per day - is completely recycled in a "closed loop" system. Additionally, no glues were used in manufacturing the workstations. Instead, UV curing of the sealant on work surfaces was used to prevent off-gassing and sick-building syndrome.

6. What is interesting about the site and the location?

Redevelopment of this Brownfield site was made feasible by Maryland's brownfield redevelopment programs. MDE's voluntary Cleanup Program provides a streamlined process for determining soil and groundwater cleanup requirements and provision of a liability release to the buyer for post contamination the developer did not cause or contribute to.

The location symbolizes Maryland's commitment to Smart Growth. Montgomery Park is the south anchor of the Carroll Camden Industrial Park, a Baltimore City urban renewal plan. Over 60 bus lines serve the location and it also connects to light rail by shuttle. Increasing use of public transportation is a vital component to Maryland's strategy to reduce vehicle miles traveled and in improving air quality. Likewise, projects like this that encourage redevelopment and neighborhood revitalization promote development densities that can better support use of public transit. While all state agencies are required to lease new space within priority funding areas, the reuse of the long vacant Montgomery Wards building is a big boost to local neighborhood revitalization.

7. Are there any other interesting "Green" features?

- *All of the glass panes that were removed were recycled into "glassphalt" and used to pave the entranceway to the "Red" parking lot;*
- *Bio-retention ponds are used in the "Red" parking lot to trap and filter stormwater runoff;*
- *The pavers near the building entrance were once the floor of a factory in Baltimore City;*
- *The site is landscaped with native species plants that require no irrigation;*
- *Acoustical ceiling tiles are formaldehyde free and contain 79% recycled content;*
- *Zero VOC paint was used on all of the drywall. All primer, flat, eggshell and semi gloss paints were from Enviro-Pure by MAB, which is a vinyl acetate/acrylic latex paint that emits zero VOC;*
- *The glass backed elevators are energy efficient and use 66% less energy than standard elevators;*
- *80% of all material removed during construction was recycled. To mention just a few:*
- *3 million pounds of metal, 5,800 cubic yards of wood, and 24,840 pounds of copper were recycled. In addition, 8,036 board feet of wood was reused;*
- *Window shades have pinholes that allow the natural light to come in, but still provide the necessary light deflection;*
- *Re-utilized 90% of existing sprinkler system and piping;*
- *LED "exit" lights provide an 87.5% savings over the standard 40 watt fixture;*

Product Websites:
www.greenroofplants.com
www.milliken.com
www.greenwoodflooring.com
www.homasote.com
www.forbolinoleumNA.com
www.waterless.com

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Appendix 3

MDE

All StAR News

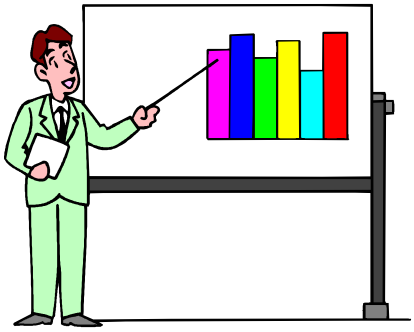
Spring, 2002

All StAR

All State Agencies Recycle

Preliminary All StAR Recycling Results Show Improvement

– DAVID M. MRGICH
MDE STAFF



With the majority of Maryland's All StAR sites reporting, preliminary results show that Maryland State Government recycled about 20% of the waste it generated in 2001. Congratulations on a job well done! We cannot rest on our laurels, though. In 1997, Maryland State Government recycled 20% of its waste only to see that rate fall to a low of 15.5% in 2000. We need to continue to build on the 2001 successes some of which include:

- Large increases in recycling at Dept. of Agriculture, Subsequent Injury Fund Board, General Assembly, MD School for the Deaf, Dept. of Veterans Affairs, MD Higher Education Commission, and Morgan State University.
- 19 State Agencies recycled at least 20% of their waste.

Individual agency results are as follows:

Hous. & Com. Dvpmnt.	53.7%
Comp. of Treasury	53.6%
Agriculture	46.6%
Sub. Injury Fund	46.3%
MD Envmnt. Service	43.4%
General Assembly	43.3%
MD School for Deaf	41.3%
Environment	39.1%
Veterans Affairs	38.1%
Education	35.2%

[*See LOOKING UP, page 2*]

RECYCLING CONTACTS

Maryland Department of the Environment
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www.mde.state.md.us/was/recycle

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Questions, Comments, Ideas
dmrgich@mde.state.md.us

Maryland Recycling Conference and Exposition

– D. M. MRGICH, V. LIPSCOMB
MDE STAFF

Looking for ways to energize your recycling program? Come to the 14th Annual Maryland Recyclers Coalition Conference and Training Exposition on May 30th and 31st at the Community College of Baltimore County, Catonsville Campus, to hear more about:

- ✓ Electronics Recycling
- ✓ Recycling at Colleges
- ✓ Waste Prevention
- ✓ Recycling Non-traditionals
- ✓ Glass Recycling
- ✓ Success Stories

Participate in a silent auction and win one of a hundred door prizes. For more information about the conference and exposition, visit www.marylandrecyclers.org.

[*LOOKING UP, from page 1*]

General Services	31.5%
Judiciary of MD	26.2%
St. Mary's College	25.7%
Dept of Natl. Resources	25.5%
Bus & Econ. Development	25.5%
MD Food Ctr. Authority	24.0%
Higher Ed. Comm.	23.6%
Univ. of MD. System	23.2%
Maryland State Police	21.3%
Automobile Ins. Fund	19.8%
Stadium Authority	19.4%
Human Resources	18.8%
Health & Mental Hygiene	18.6%
Public Brdcstng Comm.	17.2%
MD State Archives	16.0%
Public Safety & Corr.	15.6%
Inj Workers Ins. Fund	15.3%
Budget & Mgmt.	13.9%
Morgan State Univ.	13.2%
Labor, License & Reg.	12.8%
Assessments & Taxation	4.3%
Balt. City Comm. Coll.	3.6%
MD Insurance Admin	0%**
Ofc. of Public Defender	0%
Juvenile Justice	DNR*
Transportation	DNR*

* Did not report
** Recycling started in 2002

MDE worked with the MD Green Building Council's Pollution Prevention Subcommittee (created in response to the Governor's Executive Order "Sustaining Maryland's Future with Clean Power, Green Buildings and Energy Efficiency") to come up with proposals ensuring the success of recycling in State Government. Proposals included:

- Asking the Department of General Services (DGS) to ensure that all leased property for State functions includes recycling collection services as part of the lease terms.
- Encouraging DGS to document and increase its procurement of a wide variety of recycled products.
- Ensuring opportunities for the recycling of electronics.
- The recognition of successful recycling programs at State Government sites.

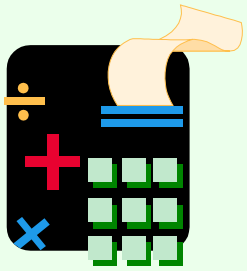
Remember, MDE is here to help. If you need assistance in setting up or improving your All StAR program, contact MDE at dmrgich@mde.state.md.us.

We hope you enjoy this issue of the All StAR News. The next All StAR News is scheduled for the Summer of 2002!

The Environmental Benefits of Recycling:
A Spreadsheet Model

– VIRGINIA LIPSCOMB
MDE STAFF

Positive feedback is important to the success of any recycling program. To help in this area, MDE has a Microsoft Excel spreadsheet model, developed by The Northeast Recycling Council with funding by U.S. EPA, Region II, which will allow employees to see the environmental benefits of their recycling efforts. The model generates charts from the tons of glass, newspaper, office paper, cardboard, plastic, and metals that are recycled along with the tons of total MRA material that is landfilled or incinerated.



Using average, per-ton figures from several recent life-cycle analysis studies, the model yields the following detailed tables (along with descriptive charts):

1. Waste Management Overview;
2. Reductions in Greenhouse Gas Emissions through Recycling;
3. Greenhouse Gas Savings Comparisons;
4. Energy Savings from Recycling;
5. Energy Savings Comparisons;
6. Life-Cycle Stage Comparisons; and
7. Air Emissions and Waterborne Wastes.

Details on obtaining the model are available by contacting MDE at dmrgich@mde.state.md.us.

Getting Ready to Move

– DAVID MRGICH
MDE STAFF

In preparation for MDE's move to Montgomery Park, MDE conducted its second Pitch-it or Pack-it event from April 8 thru May 17. Early estimates indicate that 18 tons of paper was collected during the event. This is an increase of nearly 160% over the tonnages routinely collected for the same time period.