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Adaptation Option Template Future Built Environment Infrastructure DRAFT

Common Option (FBEI-1): Integrated Planning for Sea Level Rise, Coastal Storms and Coastal Erosion

Option Description

Sea level rise and associated hazards such as storm surge, coastal flooding and erosion pose both short term and long term threats. Drawing on the MD CCC science report, we recommend integrated planning at the Federal, State, and local level for all bay and coastal communities within the State of Maryland. This option refers only to State and local comprehensive and associated policy plans. It does not refer to operational plans or building codes.

Planning for SLR and associated hazards must be flexible, in that it must account for a diversity of places, time horizons and a variety of hazards. Key to planning will be the establishment of a state-wide standard estimate of expected sea level rise and the time frame for such future projected rise. This standard will vary and is subject to change, so planning must reflect that uncertainty. Plans should include policies and appropriate adaptation responses in these defined geographic areas.

The goal of this policy option is to increase coordination and consistency in planning approaches and to create a framework for the integration of other climate adaptation proposals, such as new building and zoning codes, adaptation of infrastructure, and protection of natural resources. Land use related plans need to be integrated with transportation/infrastructure plans, emergency plans and natural resource plans.

This option includes two major components;

- 1) Local coordination of comprehensive and other plans to reduce risks from SLR and associated coastal hazards.
- 2) State of Maryland coordination of State plans to reduce risks from SLR and associated coastal hazards.

There are three continuums that must be addressed in these plans: land use, risk and response. Maryland's coastal lands run the gamut and include Assateague Island beaches, Ocean City condominiums, Middle River residential neighborhoods and the 350 year old historic downtown of Annapolis. This diversity of land uses represents a tremendous challenge so flexibility will be important in responding to sea level rise related concerns.

Maryland's coastal communities have had their coastal floodplains mapped through FEMA and the NFIP. Additional hazard mapping is being completed by MDE, DNR and Federal partners that show hurricane inundation and potential sea level rise flooding and inundation. These maps, taken together, will show a continuum of risk with some regions exposed to high velocity waves while other areas may have only periodic shallow flooding. Government and private responses to these increased risks include protection in place, mitigation design, avoidance and retreat.

These plans should appropriately apply strategies along the continuum from protection to retreat. They should also address mitigation activities such as avoidance. At a minimum the plans would address potential threats in affected areas and strategies for a phased implementation response under the following categories:

- Land use, zoning, and development density regulations to reduce population and investment at risk;
- Public and market-based incentives/disincentives to reduce property damage and threats to human health;
- Provision of community infrastructure such as roads, schools; public safety and medical facilities; water and wastewater systems; gas, electrical and communications utilities;
- Maintenance of existing and future natural resource lands and wildlife habitat, and working lands (i.e. agricultural and forest lands);
- Adaptive shoreline erosion control (non-structural and "living shorelines" approaches) and buffer management strategies, including the accommodation of future wetland migration corridors where limited or no development is allowed; and,
- Public communication and outreach.

The overarching mechanism recommended here is the integration and coordination of plans that support public and private actions. Specifically, the Departments of Planning, Natural Resources and the Environment in consultation with local governments should investigate the appropriate planning mechanism to implement this option. Considerations should include current timing of plan updates, capacity of local governments, and availability of suitable data. The primary mechanism may be local comprehensive plan elements as required in Article 66b of the Annotated Code of Maryland.

This recommendation includes of the consideration of plans that underpin the comprehensive plan, including but not limited to appropriate infrastructure and community facilities plans including (e.g., water and wastewater plans) land use plans, municipal growth elements, sensitive areas and areas of special concern (e.g., floodplain management, Chesapeake Bay Critical Area, forest preservation), and special plans (e.g., marina and boating plans, Land Preservation Parks and Recreation Plans (LPPRP), shoreline plans and emergency management plans, all hazard plans). Particular attention should be given to the integration of All Hazards Planning and the Comprehensive Planning processes, as currently there is no such mechanism to coordinate these activities.

In addition, insight from Health Impact Assessments, recommended in policy option HHSW-1, should be incorporated into planning efforts. This recommendation is expected to form the policy basis at the local and State level for the implementation of EBEI-3: Adaptation of Vulnerable Public and Private Sector Infrastructure. RRI-1. New Criteria for Identifying Natural Resource Priority Protection and Restoration Areas will also be an important cross linked adaption option.

Option Design

Targets:

- Identify all public and private land at risk from sea level rise and storm surge. Regular, updated floodplain mapping combined with predictive mapping of storm surge associated with specific weather events should be undertaken by MEMA. Local land use regulations should be adapted to better anticipate these risks. Potential health impacts should be assessed in by State and local health departments.
- State, Federal, and local transportation planners will include sea level rise and storm surge vulnerability into short and long range transportation planning to avoid infrastructure expansion into vulnerable areas. Where existing infrastructure is already vulnerable, options should be evaluated to minimize risks, move infrastructure from vulnerable areas, or otherwise reduce vulnerabilities.
- Stormwater management calculations must also take into account anticipated changes in precipitation associated with climate change in the Mid-Atlantic region and seek to accommodate potentially greater volumes of stormwater within the watershed without creating or exacerbating downstream and coastal water quality and habitat problems. All new development and transportation projects must include advanced “environmental site design” techniques for stormwater such as infiltration, use of natural features, and bioretention over traditional stormwater management techniques.
- Infrastructure and development should be adaptable and resilient in areas where development cannot be avoided. Provide disincentives for development within high vulnerability areas by ensuring that public funds are not spent on infrastructure that supports new development within vulnerable areas. Where feasible, the plan should identify where gradual realignment of existing structures, population density, land uses and management approaches will be required to protect the long term health, safety and welfare of Maryland residents.

Parties Involved: Maryland Department of Natural Resources, Maryland Department of Planning, Maryland Department of Environment, Maryland Department of Health and Mental Hygiene, Maryland Department of Transportation, Maryland Emergency Management Agency, Local and County Governments.

Timing: 2008 assess capacity of local governments; 2009 select appropriate planning implementation mechanisms at both State and local level; 2009 prepare proposed administration legislation; 2009 seek passage of legislation; 2010 prepare administrative guidelines, technical assistance materials; 2011 – State and local plans begin to incorporate SLR response elements.

Other: Maryland Association of County Organizations, Maryland Municipal League, affected local governments in Maryland's coastal zone; NOAA, USGS, Corps of Engineers

Implementation Mechanisms

Assessment of Local Government Capacity

Current available capacity of local governments to undertake necessary actions to implement these recommended actions is unknown. However, it is expected that the current capacity is insufficient to successfully complete the needed actions in a timely manner. Therefore, the following actions should take place immediately to estimate the capacity. What is recommended is that the DNR, MDE, MDP, MDOT, and MEMA work with MML and MACO to perform and provide:

- A survey of local governments throughout the state to assess the planning measures already in place for sea level rise, what are some perceived barriers, and how best to share information between state, county and local governments;
- A technical review and assessment of planning guidelines used by local communities and municipalities within the coastal zone;
- Guidance to assist local governments with identifying specific measures (e.g., local land use regulations and ordinances) to adapt to sea level rise and increasing coastal hazards.

Based on findings of the capacity assessment, State offerings of technical assistance, academic assistance, grants to local governments, and support for local GIS mapping may be appropriate.

Selection of Plan Mechanisms and Development of Guidelines

Planning guidelines would be developed jointly by the Departments of Planning, Natural Resources and the Environment in consultation with local governments to ensure consistency and clarity and to facilitate the integration of the new plan element with existing comprehensive planning and zoning requirements. Of particular importance is the need for the SLR element to clearly identify, under various scenarios, how the provision of public infrastructure may change, *i.e.* whether or not local governments plan to fortify and/or rebuild damaged infrastructure; reduce the footprint of vulnerable or damaged infrastructure; or abandon or relocate critical public infrastructure components. Local governments should also evaluate the estimated costs and benefits of proposed solutions and associated funding mechanisms. These analyses and decisions are of monumental importance to existing and future property owners, insurers, emergency personnel, local, state and federal government agencies, elected officials, the business community and others.

Maryland Planning Article 66B

Implementation of these recommendations could include amendments to §3.06(b) of Article 66B of the Annotated Code of Maryland to expand sensitive areas, and/or add a section on sea level rise under county comprehensive plans and/or local hazard mitigation plans. These efforts should draw on statewide mapping and monitoring efforts. Additional modifications to the Chesapeake Bay Critical Area Act (Natural Resources Article, §8-1807) and implementing Criteria (COMAR, Title 27) to enhance sea level rise adaptation and response might be required.

State Finance & Procurement Article §5-611

The State Finance & Procurement Article, Title 5, Sub-title 6 establishes the authority for the Maryland Department of Planning to define “areas of critical state concern.” MDP, DNR, MDE and local governments should work together to define the geographic limits of areas potentially impacted by SLR, coastal erosion and storm inundation. Once defined, MDP and local governments should act to more formally designate these areas as “areas of critical state concern.” This will allow the State to apply "federal consistency" which refers to the review process mandated by Section 307 of the Federal Coastal Zone Management Act of 1972, as amended (CZMA), and National Oceanic and Atmospheric Administration (NOAA) regulations (15 CFR part 930). The CZMA requires that federal actions which are reasonably likely to affect any land or water use, or natural resource of a state’s coastal zone be conducted in a manner that is consistent with a state’s federally approved Coastal Zone Management Program. The CZMA Federal Consistency requirement applies to direct federal activities, including federal development projects, federal licenses or permits, and federal assistance to state and local governments.

Capital Planning Component

Capital project planning efforts are to include in the planning process estimations of vulnerability for new or modified infrastructure to sea level rise and storm surge. This process will consider broad floodplain management criteria such that development occurs in areas that best reduce and minimize storm and flood hazards, facilitate natural infiltration, protect/restore riparian buffers, wetlands and forests and allow wetland migration corridors.

Emergency Management and Mitigation Plans

The adverse health consequences of flooding, storms, and storm surges are complex and far-reaching, and include the physical health effects experienced during the event or clean-up process, or from effects brought about by damage to infrastructure, including population displacement. The physical effects largely manifest themselves within weeks or months following the event, and may be direct (such as injuries) and indirect (such as increased rates of vector-borne and other diseases). Extreme weather events are also associated with mental health effects, such as post-traumatic stress disorder, resulting from the experience of the event or from the recovery process. These psychological effects tend to be much longer lasting and may be worse than the direct physical effects.

To address these risks, in collaboration with appropriate public health agencies and stakeholders, effective approaches will be developed to communicate appropriate responses that protect human health during large-scale floods, storms, and storm surges. Of particular concern are communication systems and plans that address health issues associated with low-income and under-served populations and other vulnerable groups. Plans will be developed for moving critical acute and longer term care facilities if they will need to be closed because sea level rise, storm surges, or flooding will put them at risk. The plans will ensure that climate change concerns are integrated into activities of the Maryland Institute for Emergency Medical Services Systems and other organizations engaged in disaster response. Stakeholders will include managers of hospitals, public buildings, and infrastructure that provide emergency security, communications, and health services, to reduce the vulnerability of critical activities and equipment during an extreme event or other climate-related event.

Efforts to link locally developed and adopted comprehensive plans and emergency management plans as well as the planning processes used to develop these plans must be accomplished as described above.

Integration Across State and Local Plans

Planning policy adopted at the state level will be integrated with local efforts at three levels of planning. At the broadest level of planning, state and federal-mandated efforts such as the Comprehensive Master Plan (MD), the Critical Area Master Plan (MD), All Hazard Plan (MD, US), Master Water and Sewerage Plan (MD, US) would guide adoption of broad classifications of impacts and policy response.

Local planning requirements would address in detail the design requirements for public and private development in areas at risk from sea level rise and associated hazards. Examples of these plans include Marina, Boating and Water Facility plans, Emergency Response Plan, Erosion Control Plans, Floodplain Management Plans, and Shoreline Master Plans. Planning for all publicly-funded projects through Capital Plans would require “screening” for possible SLR impacts and establish design standards for mitigating impacts.

Related Policies/Programs in Place

Recommend strengthening of enforcement of the Federal Consistency Review in the coastal management program.

The Maryland Coastal Program Coastal Communities Initiative provides technical and financial assistance to local governments to promote the incorporation of natural resource and/or coastal management (e.g., coastal hazards, public access, water-use activities) issues into local planning and permitting activities. Additionally, a number of state sponsored activities are currently underway that relate to this option including hazard mitigation planning; incentives and technical assistance for soft shoreline erosion control; sea level rise and storm surge mapping; green and blue infrastructure assessments; and an evaluation of growth management tools in coastal areas.

Mapping efforts already underway, such as Maryland Shorelines Online and Maryland’s iMap, as well as the policy option proposal for Integrated Geographic Information Systems: Mapping Modeling and Monitoring will provide local and regional governments access to required spatial information for these planning efforts.

Estimation of Adaptation Benefits and Costs

This policy option aims to increase the capacity of Maryland government to respond effectively to threats associated with sea level rise and associated hazards by increasing integration of planning efforts, including state, regional, and local land use planning, hazard management, and health care planning. The benefits of the effort come in the multiple contributions to risk reduction. These benefits are difficult to quantify as this effort contributes to effective identification and implementation of risk management strategies.

The improved coordination across planning will increase flexibility in the design and selection of future response options by reducing implementation obstacles, such as response time and inconsistent implementation and increasing the pool of strategies likely to be more effective and timely. Training efforts suggested in this policy option and others will disseminate information on the risks of sea level rise and associated hazards to people most closely in implementation, establishing a broad foundation of knowledgeable parties better able to identify future adaptation options. This policy option addresses an existing need to improve coordination of diverse planning efforts in Maryland and will provide benefits for other planning goals.

This option involves two main sets of costs. Legislative development, research, and training elements require investments of staff time and communications resources. The second set of costs is associated with increasing capacity to conduct planning according to new criteria and implementation of planning processes. These costs are similar to are much more broadly distributed among state, regional, and local planning staff. The training costs will be similar to those associated with other changes to state planning and the implementation costs are most likely to be incremental additions to the cost of ongoing planning processes.

In 2008, staff time will be required to research and prepare proposed administration legislation. Two specific projects have been identified

- A survey of local governments throughout the state to assess the planning measures already in place for sea level rise, what are some perceived barriers, and how best to share information between state, county and local governments; and,
- A technical review and assessment of planning guidelines used by local communities and municipalities within the coastal zone.

During 2009, staff will support passage of the legislation. Assuming successful passage, preparation of technical assistance materials identifying specific measures (e.g., local land use regulations and ordinances) will take place in 2010. Beginning in 2011, localities revising their comprehensive plans will be required to incorporate the new integrative elements.

Feasibility Issues

Full benefit of this effort will depend on access to local information on SLR and associated hazards for planning purposes. A policy option designed to address monitoring, data management and quality, geographic information systems, and integration of required modeling efforts is recommended elsewhere in this report.

Status of Group Approval

TBD

Barriers to Consensus

TBD

FBEI-2. State Agency Reporting on Response to CCC Findings

Option Description

In order to advance action on key recommendations and promote integration of existing programs with recommendations, we propose a two part strategy. Under this option, each agency with a mission affected by sea level rise, associated hazards, and recommended policy options will review the recommendations of the MD CCC and the adaptation policy options developed by the ARWG, report on how these issues and recommendations relate to their missions, and outline an agency action plan for integrating sea level rise and associated hazards into their planning and evaluation procedures. These revised procedures will be the basis for establishing performance measures. Revised procedures and performance measures would remain in place unless new information on risks or changes in policy emerge.

The report should address opportunities for integration with existing programs, actions initiated, new programmatic efforts, and barriers to response. Particular attention should be given to State and Local program implementation to assure that future decisions and actions adequately consider and respond to anticipated impacts due to SLR and increases in storm frequency and intensity. Greater detail on report content is discussed under implementation mechanisms below. These reports are to be submitted to the Governor, the Executive Committee, Cabinet members, and Committee Chairs with copies to the Commission on Climate Change. Information from these reports would support ongoing evaluation of MD's efforts, capacities, needs, and progress in addressing climate change mitigation and adaptation.

Performance measures will be reported annually. These measures should document process and progress in adaptation to sea level rise and associated hazards.

Option Design

Targets: The relevant subset of potential impacts and policy options will vary among agencies; however, they should all evaluate and identify needed changes to their programs, policies, standards, and activities in the areas of:

Engineering, design, and construction; siting and planning; funding; coastal zone management activities, including permitting of shoreline activities and monitoring; staff training programs; and education/ outreach programs.

These efforts should model best practices, assure funding consistent with the broad goal of reducing exposure to coastal risks; and utilize the most recent scientific information, spatial mapping resources, and monitoring systems on climate change impacts in Maryland.

Timing: Reports and first indicator data will be submitted within a year of publication of CCC Mitigation, Adaptation, and Science Working Group reports. For changes that can be implemented without legislation or adoption of regulation, draft language for necessary changes to rules, forms, evaluation criteria, and policies and procedures should be prepared concurrently with the report to facilitate implementing the recommended changes to programs, policies,

standards and activities. For changes that require legislation or adoption of new regulations, proposals for the recommended changes should be brought forward in the second year. Agencies will be asked to participate in the development of a reporting framework that will accommodate agency-designed measures and assure clarity, consistency, and measurability of indicators among agencies. Performance indicators will be submitted annually.

Parties Involved: The majority of state agencies will be affected by the changing risks and adaptation policy options. These agencies include Maryland Departments of Aging; Budget and Management; Business and Economic Development; Community Initiatives; Education; Emergency Management; Environment; Environmental Services; General Services; Grants Office; Health Care Commission; Health and Mental Hygiene; Higher Education Commission; Homeland Security; Housing & Community Development; Natural Resources; Insurance Administration; Labor, Licensing & Regulation; Institute for Emergency Medical Services Systems; Planning; Public Broadcasting; Public Service; Public Works; Retirement and Pension System; Rural Maryland Council; Secretary of State; Service and Volunteerism; Tourism; Transportation; Treasurer; University System of Maryland; and Volunteer Maryland.

Implementation Mechanisms

Orientation and training for principle agency staff involved in the review process will familiarize them with Maryland specific information on sea level rise, associated hazards, and adaptation policies. The initial agency reports on adaptation should include the following components:

- 1) Identification of programs affected by SLR, storm frequency and intensity;
- 2) Evaluation of programmatic and procedural modifications needed to address these issues, including those that may involve legislative or regulatory changes;
- 3) A timeline for modifications;
 - a. for changes that can be implemented without legislation or adoption of regulation provide draft language for early implementation and
 - b. identify changes that require legislation or adoption of regulation for introduction in the following year.
 - c. identify changes that require additional study/information over a longer period prior to development of necessary changes to programs, policies, standards and activities.
- 4) Specification of mechanisms to ensure that polices are updated regularly in accordance with science and observed changes; and,
- 5) Development of a reporting framework that will accommodate measures identified by agencies and assure clarity, consistency, and measurability of indicators among them.
- 6) Annual reporting of performance indicators.

Related Policies/Programs in Place

All agencies identified have on going review processes and reporting requirements for programs that might be influenced by SLR and associated hazards directly or by proposed policy options. In addition, the BaySTAT program collects indicators some of which may be appropriate to tracking adaptation efforts.

Estimation of Adaptation Benefits and Costs

Mainstreaming consideration of sea level rise and associated impacts into policy and procedures promotes a comprehensive approach to adaptation that reaches across the diverse programs potentially affected by efforts to adapt to SLR and associated hazards. Absent a full review of programs that may be affected, the benefits cannot be quantified but they will include reduction of economic, social, health, and ecological risks to sea level rise and associated hazards. The process of refining policy and procedures will result in increased staff awareness and understanding of the climate change, sea level rise, and associated potential impacts for Maryland. The deeper engagement offers greater capacity for sophisticated, innovative responses to new information.

This policy option has relatively low capital needs as it is designed to mainstream adaptation issues into current programs and review processes. In the first year, it will require each affected agency to conduct an analysis of existing programs and procedures and report on proposed refinements to those processes. This initial effort will require dedicated staff time for coordination and some time from staff in each program area. In addition, agency staff most closely involved with this review and refinement process are likely to require additional training on climate change, sea level rise, and associated impacts to assure that they bring to the process a firm knowledge base, informed by the most recent science conducted for Maryland.

Feasibility Issues

Internal constraints to agencies' abilities to address these changes are likely to be affected by budget limitations and availability of staff time. In some cases, external factors, such as legislative issues and potential agency need for enabling legislation, might limit potential to make some changes. Some agency staff will require additional training on sea level rise and associated hazards in order to conduct thorough evaluations of their programs.

Status of Group Approval

TBD

Barriers to Consensus

TBD

FBEI-5. Climate Change and Insurance Blue Ribbon Advisory Committee

Option Description

Insurance is a central, cross-cutting element to an overall adaptation strategy. It is clear that climate change is likely to affect virtually every segment of the insurance industry, and is also likely to have significant impacts on the financial condition of insurers and reinsurers, the ability to pay future claims, and hence on the availability and affordability of insurance to Maryland's citizens and businesses. The structure of insurance will shape social investments and the distribution of risks through society.

There are a number of approaches being discussed and tested in other states and many changes taking place in the industry, and in some cases the vulnerability of state insurance systems to climate change is becoming clearer. In Florida, for example, where 79% of insured property sits along the coast, homeowner insurance premiums have risen more than in any other state, with the average policy increasing by 88% between 2001 and 2006. Florida has a liability of over \$27 Billion dollars for a hurricane with an estimated return time of 100 years¹. Some insurance companies are no longer writing new coverage in the state.² In states that are insurers of last resort, the possibility of increasingly expensive or unavailable insurance coverage could pose significant problems for the state's financial and fiscal health as a whole.

Two measures in particular can help Maryland to assess its options for state regulation of insurance in the face of climate change. First, there is a need for information on the risks posed by climate change and how insurers and reinsurers are managing those risks. Second, it is important to have a focused assessment of this issue and a strategy for managing the ramifications of climate change risks and uncertainties.

Blue Ribbon Advisory Committee. We recommend that the Governor establish a blue ribbon advisory committee to study and report on potential impacts of climate change on insurance in the state, the potential role for insurance in promoting environmental management goals, and address the relationship between changing building and design standards and insurance. Further, we believe that the advisory committee should be independently chaired, and that the Maryland Insurance Commission take an active role in the advisory committee without chairing it, in order to assure that the breadth of stakeholder concerns is heard. As part of this effort, the committee should consider whether it is possible to develop a program, similar to the Community Rating System within the National Flood Insurance Program, which would encourage local governments to implement protective or adaptive measures by offering reduced insurance rates for risk-reducing actions.

Enhanced Disclosure of Climate Risks. We also recommend that the Maryland Insurance Commission consider requiring insurers operating in the State of Maryland to disclose to their

¹ Financial Services Commission, Florida Office of Insurance Regulation, "Annual Report Of Aggregate Net Probable Maximum Losses, Financing Options, And Potential Assessments." February 2008.

² Environmental Defense, "Blown Away: How Global Warming is Eroding the Availability of Insurance Coverage in America's Coastal States," 2007.

investors the risks posed by climate change, and what steps the companies are taking to manage those risks. At a minimum, the Commission could consider requiring disclosure of the steps taken to assess the impact of climate change in the state, the results of the assessment over various time periods (short term to long term), and the degree to which climate risks could affect the company's access to reinsurance, solvency, risks in its own investment portfolio, and possible effects on availability and affordability of coverage.

Option Design

There are two actions in this option:

1. Creation of a Blue Ribbon Advisory Committee to advise the state insurance commission and the Governor of the risks that climate change poses to the availability and affordability of insurance for Maryland citizens and businesses; and
2. Require that the State Insurance Commission study and report on the costs and benefits of requiring greater disclosure of the risks posed by climate change to investors on the part of all insurance companies operating in the state of Maryland.

Targets: Advisory Committee

Key issues that should be considered by the Blue Ribbon Advisory Committee include the following:

- Assess whether data available to insurers is adequate to assess risks posed by climate change (including sea-level rise) and recommend steps to improve data where it is deficient;
- Assess the degree to which adaptive options (such as zoning that recognizes risks of building in high-risk areas, improved building codes to protect against more severe weather and flooding) may mitigate insured losses due to climate change, and whether insurance rate structures could be constructed that provide incentives for early adaptive actions;
- Assess the accuracy and quality of climate initiatives on the part of insurers; and
- Assess options to promote partnerships with policyholders for loss mitigation.

Timing: The advisory committee should be established and provide an initial report back within one year.

Parties Involved: Maryland Insurance Administration, Department of Natural Resources, Department of Health and Mental Hygiene, Department of Planning, representatives of insurance and reinsurance companies (representing the spectrum of insurance: property and casualty, life and health, directors and officers insurance, etc.), homeowners and property developers, and representatives of public or private institutions providing essential infrastructure services (e.g., electricity, water and sewerage, and telecommunications); and businesses whose access to insurance is essential for continued operation.

Other: There is inevitably tension between the insurance companies and those insured, particularly when disasters occur. In some cases, most recently in Florida, many insurance curtailed their property and casualty businesses along the coastline, in anticipation of more damaging storms, increased incidence of severe weather, and sea-level rise. The loss of insurability, or increasingly expensive coverage, may well be an effective mechanism to discourage further development in areas that are most at risk from the effects of climate change, and may well be something Maryland policymakers should consider. However, changed coverage and loss of affordability can also be extraordinarily damaging to the reputations of insurers, even if the actions they take are in the long-term public interest. It would be useful for the commission to consider not only the needs of Maryland's homeowners and businesses in the work of the commission, but also to take into account the needs of the insurance companies.

Implementation Mechanisms

An advisory committee composed of staff from the MD Insurance Administration, MEMA, MDP, homeowners and municipalities vulnerable to damage from sea-level rise, and representatives from associated industries, such as insurance and reinsurance companies would meet to consider major issues. They would be expected bring in additional outside experts to inform their discussions on topics. We recommend that the chair of the advisory committee be an independent outside expert.

Related Policies/Programs in Place

The Maryland Insurance Administration has joined a multi-state effort among insurance administrations to study the implications of climate change on insurance.

Estimation of Adaptation Benefits and Costs

This option calls for investigation of insurance issues specific to Maryland and identification of policies and practices that best meet the state's needs. The option does not commit the state to a course of action, but seeks to inform a long term policy process that may establish legal and financial obligations that could be difficult to adjust in the future. By drawing a diverse set of stakeholders into a dialogue on insurance issues, this process will create a knowledge resource specifically attuned to Maryland's concerns. The potential benefits depend on emerging knowledge of vulnerability and risks as well as investment responses to climate change risks, thus they are difficult to fully anticipate. However, the effort will benefit the state through informing decisions about the government liability associated with various insurance strategies, identifying insurance options to meet the residents and businesses in the state, creating a forum for insurers, government, and consumer to discuss the role of insurance in managing climate risks, and providing access to information on the risks faced by insurance agencies and possible impacts on the accessibility and affordability of coverage.

Option costs are associated with the staffing and convening of an advisory committee and overseeing the disclosure process. These costs include staff time for organizing the committee, research to support committee efforts, staffing reporting, as well as communication and outreach on findings. The committee is expected to meet over the course of 1 year. The disclosure process would pose an incremental cost to the Insurance Administration. The full benefit of this effort will depend on a strong understanding of risks for Maryland. The proposed inventory of

public and private investment along the coast, integrated geographic information systems, sea level rise monitoring, and science studies are associated costs.

Feasibility Issues

TBD

Status of Group Approval

TBD

Barriers to Consensus

TBD

FBEI-6. Integrated Geographic Information Systems: Mapping, Modeling, and Monitoring

Option Description

Maryland's coast is particularly vulnerable to both episodic (i.e., hurricanes and Nor'easters) and chronic hazards associated with shore erosion, coastal flooding, storm surge, and inundation. These hazards are both driven by and exacerbated by climate change and sea level rise, which is occurring in the mid-Atlantic region at a rate nearly double the global average. Sea level rise poses a significant threat to resources and infrastructure in Maryland's coastal zone. As growth and development continues, especially within low-lying Eastern Shore communities, these impacts are likely to escalate.

In recognition of the State's vulnerability to sea level rise and its ensuing coastal hazards, Maryland's State Agencies have been aggressively acquiring and analyzing various data and technological resources (see Related Policies and Programs) to both gain a better understanding of sea level rise vulnerability and to increase the State and local government capacity to adapt and respond. To date, the State of Maryland has amassed a significant amount of data and undertaken state-of-the-art research, making Maryland a national leader in sea level rise modeling, research and response planning. However, more work is still needed.

Adaptation strategies for minimizing current and future risks to sea level rise and associated coastal hazards will depend on a full understanding of the extent of risks and vulnerabilities. To support this, the following additional data collection and modeling efforts are needed:

- Assess the status and capabilities of inundation and storm surge mapping and modeling efforts;
- Develop a strategy, along with financing options, for completing modeling and mapping on a state-wide basis at a scale appropriate for both state and local government needs;
- Adopt a maintenance schedule for updating mapping and modeling including the data necessary for both activities. This schedule should include, if practicable, anticipated costs, data sources, and increasing the accuracy of predicted results;
- Assure easy access to the comprehensive body of information necessary for planning and response activities by state and local governments;
- Develop pertinent data sets and mapping products at a scale relevant to state and local governments;
- Review institutional and organizational data management practices and make recommendations to enhance efficiency and cost effectiveness of data gathering, sharing, maintenance and processing efforts and to minimize duplication of effort and data redundancies;
- Create a digital, spatial inventory of potentially impacted infrastructure from sea level rise, including the identification of public and private systems and facilities and

threatened historical structures. This database should be maintained relative to emerging projected sea level rise findings;

- Undertake modeling and creation of geospatial coverages to reflect changing risks of SLR and associated coastal hazards; and
- Enhance the integration of data, research and technological capacity into State and local sea level rise adaptation and response planning efforts.

Option Design

Targets: The effort will provide comprehensive coverage for the state and assure regular updates of data, models, and maps. These maps will be made broadly accessible to professionals and public to support adaptation planning and understanding of risks and processes of change.

Timing: This effort will support the ongoing efforts of MDP, MDNR, MDE, and DHMH to integrate GIS data and improve data quality standards.

Parties Involved: MDNR, MDE, MDOT, MEMA, MDP and DHMH, MD iMap, MD State Geographic Information Committee (MSGIC), University System of Maryland.

Other: As needed, identify other factors/parties that would need to be engaged for successful implementation of the option in the state.

Implementation Mechanisms

This effort will build on ongoing efforts of the MDNR, MDE, MDP, and MEMA, and DHMH to improve the integration and data quality standards of their ongoing data acquisition, mapping and modeling efforts.

Implementation of this policy option should be intrinsically linked with the Maryland Statewide Basemap (Maryland's iMap or MD iMap). MD iMap is an Internet-based interactive map suitable for use by state agencies, local governments and the public. It is to provide access to standardized information (imagery, roads, streams, place names, property information, etc) that will serve as a base that other data can be overlaid, such as the locations of features or resources at risk from SLR or predicted water levels from storm surge modeling. Anticipated deployment of Phase I of iMap is Spring 2008. The coordination of maps and model output will be supported by broadly accessible information on the nature of the risks and guidance on appropriate use of the models.

Implementation of this option should also be closely coordinated with the Maryland State Geographic Information Committee (MSGIC). The Maryland State Geographic Information Committee (MSGIC) acts to promote coordinated development and efficient use of resources amongst all entities involved in the collection and/or use of spatial data and GIS technologies in Maryland.

Related Policies/Programs in Place

Over the past several years, the State of Maryland has directed substantial efforts toward advancing the State's understanding of sea level rise and coastal hazard vulnerability. The

foundation of this understanding has been implementation of an aggressive strategy dedicated toward advanced technology, data and research acquisition and support.

Sea Level Rise Vulnerability: Recent data and research efforts of the Department of Natural Resources include: the completion of historic shoreline position maps; the statewide calculation of historic erosion rates; a comprehensive inventory of shoreline features and conditions for Maryland's coast; and a sea level rise economic cost study. Another major achievement for the State is the acquisition of LIDAR (LIght Detection And Ranging) high-resolution topography. Over a five-year time span, DNR worked with State and local partners to acquire high resolution topographic data for the majority of the State's coastal counties including all of the Eastern Shore. This data is now being used to develop sea level rise inundation models that demonstrate both the impact of gradual sea level rise inundation over time, as well as impacts associated with increased storm surge from episodic flood events. Sea level rise modeling has been completed for Worcester County (<http://www.dnr.state.md.us/Bay/czm/wcslrreport.html>), Dorchester County, and pilot areas within Anne Arundel and St. Mary's Counties. Recently, Sea Level Rise Vulnerability Maps have been created for all coastal counties, depicting lands (i.e., 0-2'; 2 – 5' and 5 – 10') about mean sea level.

Maryland Shorelines Online: To provide ready access to the data and information discussed above, the Maryland Coastal Program, in cooperation with Towson University, developed an Internet portal, titled *Maryland Shorelines Online* (<http://shorelines.dnr.state.md.us/>). The portal provides information and tools to coastal managers and decision makers, educators, and the public on sea level rise, coastal hazards and shoreline management. This site houses information on Maryland's legal framework, permitting and regulatory guidance, educational materials, assessments, and spatial decision support tools for shore erosion and sea level rise. The tools provided on the website allow for the identification of potential shoreline protection and restoration options throughout the State to mitigate hazards and enhance natural shoreline habitat.

Coastal Bays Hazards Initiative: In February 2004, the Coastal Bays Policy Committee charged the Department of Natural Resources, Coastal Program, with the task of assembling a Work Group to investigate the need and opportunities for better coordination of coastal hazards issues. In particular, recommendations were to be developed on how to promote the use of new tools and developing technologies at the local level to assist in visualizing hazards and local vulnerability.

Recent developments in data gathering, information management, and planning tools have crossed technological thresholds that have greatly enhanced the ability to do desktop planning for hazard response and mitigation. To effectively achieve the efficiencies that the employment of these new technologies and tools offers, a better understanding is needed of local government technology requirements, mechanisms to increase coordination and leverage available resources. This Final Report identifies some of the hurdles to implementation and lays the groundwork for expanding application of the products and tools statewide. Specific recommendations provided in the report focus on: 1) means for incorporating, developing, processing, and formatting data for decision makers, 2) identifying capacity building opportunities and needs, 3) recognizing responsibilities and coordination, 4) technical support, and 5) financial assistance.

Floodplain Map Modernization: The Maryland Department of the Environment (MDE) Business Plan for Map Modernization (2004-2008) outlines the State's vision for modernization of the State's flood studies and maps. Maryland's vision for floodplain management is closely coupled with its vision for map modernization. MDE seeks to reduce costs associated with traditional detailed studies by developing a new set of "live" studies (digital verses paper product), which can be modified as watershed conditions change. Any proposed changes can be modeled to keep the maps current as permits are issued. LIDAR data is being used to develop the more accurate map products. [NEED TO UPDATE – send to MDE]

Surge Inundation Mapping: LIDAR data has also been used by the U.S. Army Corps of Engineers to develop surge inundation models for Maryland's Eastern Shore Counties. These counties are the lowest areas in the State and some areas are experiencing significant growth pressures. The maps are essential in expanding our knowledge of potential impacts and identifying vulnerable communities and infrastructure. These maps have been provided to local comprehensive planning and emergency management offices. Extension of these mapping efforts into all coastal counties is needed and under consideration. [NEED TO UPDATE – send to MEMA]

Local Hazard Mitigation Plans. In November 2004, the Maryland Emergency Management Agency (MEMA) completed the Maryland State Hazard Mitigation Plan (SHMP) and associated mapping pursuant to regulations established by the Disaster Mitigation Act (DMA) of 2000. The goal of the SHMP is to reduce the loss of life and property damage associated with hazard events in Maryland. MEMA complied with this priority as considerable effort has been put forth to map state-owned and critical facilities, as well as the hazard areas for eleven other hazards. The most important aspect of this mapping effort was the identification of facilities, total populations at risk, and vulnerable populations at risk within hazard areas. The data sets and mapping effort will continue to evolve and improve as new data and technologies become available. MEMA considered historic shoreline changes data during the development of the SHMP, which was then used by local governments as the baseline/starting point of information for local hazard mitigation planning activities.

HAZUS-Multi Hazard (MH): HAZUS is a risk assessment software program for analyzing potential losses from floods, hurricane winds and earthquakes. HAZUS-MH estimates damage before, or after, a disaster occurs and takes into account various social and economic impacts of a hazard event. MDE partnered in {insert year} with Salisbury University to complete a statewide analysis of flood vulnerability estimated through the HAZUS-MH flood module. The Level One analysis completed in June 2005, estimates flood damage from a 100-year coastal or riverine flood event to commercial and residential properties. This study takes the next step from identifying flood vulnerability to understanding the risk to the built environment. The final report, "An Assessment of Maryland's Vulnerability to Flood Damage" is now available. [NEED TO UPDATE SEND TO MDE AND MEMA].

Emergency Management Mapping Application (EMMA). EMMA was developed by Towson University Center for Geographic Information Science (CGIS) in cooperation with Maryland Emergency Management Agency. EMMA is an incident response tool for the emergency management community to display relevant information before, during, and after an incident

occurs. As a web-based mapping application, EMMA enables the emergency responders to identify incident locations from the field, generate location-specific reports, visualize incident locations via a map, perform site-specific analysis, and coordinate response efforts. Using a simple Web browser, such as Internet Explorer, EMMA provides basic and advanced tools for map visualization, location analysis, and report generation.

Sea, Lake and Overland Surges from Hurricanes (SLOSH): SLOSH is a computer program available to the emergency management and planning communities. SLOSH is housed and utilized in the State and local emergency operations centers to identify storm surge impacted areas and determine evacuation routes. SLOSH, a computerized model developed by the National Hurricane Center (NHC), assists Maryland's emergency management and response communities in estimating storm surge heights and winds resulting from historical, hypothetical, or predicted hurricanes by taking into account a storm's pressure, size, forward speed, track and wind. During tropical Storm Isabel, communication of the surge predictions from SLOSH for the Chesapeake Bay were not accurately translated and transferred to the public.

Hurricane Evacuation Tool (HURREVAC): HURREVAC is a computer program that is available to the emergency management and planning communities through the National Hurricane Center. HURREVAC automatically tracks hurricane related information and displays the results graphically. The program is utilized in the State's Emergency Operation Center (EOC) housed at MEMA to assist in determination of evacuation options and routes. HURREVAC utilizes current and forecast storm data and displays the track of the storm in various formats. The program derives the potential for storm surge and calculates evacuation times based on storm speed and intensity. It can also be used as a "what-if" tool to help decision makers determine courses of action for different storm characteristics.

Maryland State Geographic Information Committee (MSGIC): MSGIC acts to promote coordinated development and efficient use of resources amongst all entities involved in the collection and/or use of spatial data and GIS technologies in Maryland. The Committee is crucial in promoting coordinated development and efficient use of resources amongst all entities involved in the collection and/or use of spatial data and GIS technologies in Maryland. Most recently MSGIC has focused on interoperable practices and standards, which relate to the "capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units" (MSGIC website). The Maryland Mapping Resource Guide lists projects addressing parcel mapping, tax maps, emergency management support, floodplain mapping, and other projects, including several at the county level.

MD iMap: The Maryland Statewide Basemap (Maryland's iMap or MD iMap) is an Internet-based interactive map suitable for use by state agencies, local governments and the public. It will provide access to standardized information (imagery, roads, streams, place names, property information, etc) that will serve as a base that other data can be overlaid, such as the locations of features or resources at risk from SLR or predicted water levels from storm surge modeling. Anticipated deployment of Phase I is Spring 2008.

Estimation of Adaptation Benefits and Costs

This option builds on ongoing efforts to integrate and disseminate GIS information collected by state, regional, and local entities and proposes expansion of the modeling and mapping information available relevant to sea level rise and associated coastal hazards. Integration of the diverse, relevant spatial data, increased monitoring information, refined risk modeling capabilities, and improved accessibility of information is required to assure the full benefits of many adaptation options and other planning goals. Greater accessibility of spatial information combined with regularly updated modeling and risk mapping will facilitate the integration of climate change-related information into existing decision-making and planning processes. These tools offer benefits through informing a wide array planning initiatives for individuals, public, and private entities as well as assessment of risks and policy options. While information is crucial to some analyses and these benefits are likely to be substantial, the benefits of the inputs to a decision are difficult to empirically assess separate from future decisions and uncertainties.

The option requires more detailed assessments in several areas to inform a cost estimate. These research needs include: determination of an appropriate maintenance schedule for updating mapping and modeling, assessment of the status and capabilities of mapping and modeling efforts, review of institutional data management practices to enhance efficiency and coordination, development of pertinent data sets and modeling tools. Development of a financial strategy will depend on findings of these studies and a determination of the adequacy of cyber-infrastructure to assure easy access to information.

Feasibility Issues

TBD

Status of Group Approval

TBD

Barriers to Consensus

TBD

FBEI-8. Economic Development Initiative

Option Description

“We must transition from a carbon-based economy to a green, sustainable economy...”

- Governor Martin O’Malley testimony before the U.S. Senate Environment and Public Works Committee in September 2007

A bold, simple vision that unites diverse interests, when supported by a plan, resources, and tangible results, can inspire Marylanders to meet today’s and tomorrow’s challenges. The observed and projected impacts of climate change provide ample reason for Maryland and the U.S. to shift toward a green, sustainable economy. While some fear climate change as inhibiting economic prosperity and development, many solutions to climate change can actually create significant economic opportunities while solving other societal problems. The IPCC’s Fourth Assessment Report states that “Sustainable development can reduce vulnerability to climate change by enhancing adaptive capacity and increasing resilience. At present, however, few plans for promoting sustainability have explicitly included either adapting to climate change impacts, or promoting adaptive capacity.” Solutions to climate change can be smart, win-win strategies that address multiple issues for diverse stakeholders simultaneously. To realize the promise of such strategies, a green economic development plan for Maryland is needed.

Fortunately, the benefits of creating a green, sustainable economy are substantial and widespread. They include a better quality of life, independence from imported fossil energy, thousands of “green collar” jobs, lower operating and maintenance costs for homes and businesses, cleaner and more reliable and resilient power systems, a more dependable and healthy food system, better access and mobility, and significant environmental and health improvements such as cleaner air and water, open space, pedestrian-friendly communities and restored habitats.

The goal of this option is to develop and execute a green economic development plan. The intent is to catalyze a self-reinforcing green growth cycle across all sectors of Maryland’s economy. In such a growth cycle, a growing demand for green products and services sustains a growing community of green businesses and industries, who in turn create more jobs, healthy communities and a cleaner environment. Central to this growth cycle are natural principles such as turning waste into wealth, resource efficiency, optimizing stakeholder value, and life-cycle thinking. Thus, we meet the challenges of Climate Change while helping Maryland shift toward a greener, leaner, more sustainable economy.

Option Design

Targets: Establish MD as a leader in the new “green” economy by increasing by 2015 both: 1) the market value of businesses within the State that provide products or services related to a green, sustainable economy; and 2) the amount of investment within the State in products and services related to the green economy.

This option includes both new green businesses as well as the greening of more traditional businesses to improve their economic, social and ecological performance. Currently, there is no standard for defining what constitutes a green business or commonly accepted measures of what it means to be “green.” However, the growth potential for a green, sustainable economy is likely quite large given the existing opportunities for reducing resource waste, pollution and ecological impacts. Using State government as a “pump primer” will save taxpayers money by reducing waste while encouraging the growth of green service and product providers. Finally, while the exact percentage of the Maryland’s economy that is considered green is difficult to discern, it is generally understood that the green portion of Maryland’s economy is relatively small while the demand for green growth is substantial.

There are many barriers to any new technology, of course, and many of those barriers are created by those who profit from the status quo. Using public-sector procurement and publicly-supported resources like academic institutions to help overcome them is a strategy that has been successfully used by governments at every level. The dominance of American microelectronics throughout the latter half of the twentieth century is attributable in some significant measure to early support by the Department of Defense, just as Europe’s current dominance in renewable energy technology is attributable to government incentive programs.

Parties Involved:

MD Green Community (such as Green Drinks, Green Building Institute, Chesapeake Alliance for Sustainable Business, Maryland League of Conservation Voters and Businesses for the Bay)
MD Department of Business and Economic Development
MD Economic Development Corporation
MD Department of Environment
MD Coastal Program (a networked program administered at DNR that includes state, federal and local partners)
MD Department of Transportation
MD Department of Agriculture
MD Department of Housing and Community Development
MD Office for a Sustainable Future (within Department of Natural Resources)
MD Green Building Council (standing commission created by legislature)
MD Sustainability Sub-Cabinet
MD University System
Baltimore Development Corporation
MD Association of Counties
MD Chapter of National Federation of Independent Business (NFIB) – small business advocacy organization
Financial Community – banks, investment firms, pension funds
Clean Energy Partnership – MD-based non-profit that organizes businesses in support of practical solutions to global warming

Implementation Mechanisms

Building on Governor O'Malley's vision and the momentum of initiatives already in place, the State of Maryland should take the following steps:

1. **Build public and business awareness of why a green, sustainable economy is good for Maryland.** This will stimulate demand for green products and services and the “greening” of businesses across sectors. Use benefits listed under Option Description to track and communicate progress.
2. **Promote the “greening” of existing Maryland businesses.** This includes demonstrating and supporting practices and solutions that integrate economic, social and environmental performance. For instance, a company can reduce its risks, build market share and profits and cut costs through better environmental management (by reducing waste, pollution and ecological impact) and the introduction of green products and services. Key actions include recognizing leadership in green business practices, providing education, networking and outreach, and supporting technology and standards development.
3. **Use Maryland government as a “pump primer” for stimulating the growth of a sustainable, green economy.** This includes greening State procurement and work policies to save money, improve worker productivity and morale, reduce waste, improve resource efficiency and lower or eliminate pollution. Develop a scorecard that measures progress along these and other goal areas.
4. **Market Maryland as a leader in the green revolution.** Undertake communications campaign to market Maryland as a “green collar state” receptive to new green businesses. Take inventory of green initiatives and green enterprises already started within the State. Help these entities collaborate, succeed and market themselves more effectively. Build on the innovations of other states and governments and promote eco-innovation within the State.
5. **Build a green-collar, entrepreneurial workforce through education, training and outreach.**
 - a. Education from grade school to university/community college can help our society transition to a greener, more sustainable future. People become more aware of problems and opportunities.
 - b. Professional and trade personnel across diverse industries need to be trained on installation and maintenance of technologies and the opportunities and risks associated with climate change.
 - c. Networking and public outreach will help foster collaboration and help build public support.
6. **Consider allocating portions of public pension funds within the state to green or clean tech strategies, within the state's definition of fiduciary duty.** Like public procurement, State and local government pension funds can help to foster the development of clean technologies and enterprises. Several state pension funds have

made allocations of small portions of overall assets to publicly traded or private equity green technology portfolios. The size of the allocation must be consistent with the public, private and non-profit funding sources can play a pivotal role. This includes, for instance, retirement funds and mortgages. Consider targeting state pension plans to in-state investments. There is a need to coordinate the two sides of the insurance--risk management and the investment portfolio. State retirement funds should offer opportunities to invest in green industries, technologies and companies.

7. Create an environment to foster green business and markets.

Possible examples include:

- a. Develop new sustainability curricula and R&D (research and development) programs within the State University System.
- b. Create business incubator within the State University System to provide technological and business services support and outreach to green businesses.
- c. Provide tax credits or other tax incentives for green consumers, businesses and technologies.
- d. Promote and invest in distributed power systems such as combined heat and power, microturbines, wind and solar power.
- e. Subsidize the production of cellulosic biomass in the agricultural and forestry industries. Partner with Pennsylvania and other States promoting this development path.
- f. Increase Renewal Portfolio Standard (RPS) requirements for utilities; broaden requirement to include energy efficiency along with renewable energy.
- g. Fostering businesses specializing in emissions brokering, offset credits/allowances, and other economic opportunities generated by MD participation in Regional Greenhouse Gas Initiative (RGGI) cap-and-trade system; provide tradeable credits for green buildings, agricultural sequestration and other GGH mitigation mechanisms under cap-and-trade system.
- h. Incorporate monitoring and improvement of sustainability performance metrics for state agencies under new Department of Information Technology (see Governor's 2008 Legislative Agenda). Tie economic incentives to performance.
- i. Create sustainability "revitalization and incentive zones" similar to, or incorporated within, new BRAC R&I Zones (see Governor's 2008 Legislative Agenda) or green business park models.
- j. Foster green, eco-industrial parks where collocated businesses benefit from sharing and exchanging resources and byproducts.
http://en.wikipedia.org/wiki/Industrial_ecology

8. Create sustainable resource-based industries.

Resource-based industries such as forestry, agriculture, commercial and recreational fishing, and sportsmen’s activities represent the economic backbone of rural Maryland. These industries are heavily dependent on the health and vitality of the Chesapeake Bay and its tributary ecosystems, which is threatened by SLR and associated hazards such as storm surge, coastal flooding and erosion. Research should be conducted within each respective field to identify potential ecological and subsequent economic impacts. The end result should lead to formulating and implementing appropriate adaptation strategies to buffer such effects, as well as identifying potential opportunities for expansion and development within respective fields. (*cross reference with RRI8, “Resource-Based Industries – Economic Initiative”*)

Related Policies/Programs in Place

The following policies and programs were obtained directly from Governor O’Malley’s web site. *Italicized sentences and phrases were added to emphasize or help clarify the relevance of various policies and programs to this policy option.*

MAKING GOVERNMENT WORK (*State government is “primer” for green economy*)

StateStat is a performance-measurement and management tool implemented by Governor Martin O’Malley to make our state government more accountable and more efficient. Modeled after the award-winning CitiStat program that he developed as Mayor of Baltimore City, Governor O’Malley is using this data-based management approach to make Maryland’s government work again for the people of our State. *Better information leads to better management and service, higher efficiency and less waste and pollution.*

Department of Information Technology

Governor O’Malley will introduce legislation creating a new Department of Information Technology, which will have policy responsibility for information technology matters across State agencies. Advances in technology have enabled vast amounts of data and useful information to become immediately available to residents of our State. Because information technology impacts the ability of every State agency to serve the public, it is important that an agency exists to provide oversight authority over large information technology expenditures, and to centralize common information technology functions and assets. It is also important that these functions be consolidated into one department and elevated to a level that reports directly to the Governor.

The new Department of Information Technology will also assume the responsibility for coordinating, purchasing and managing all telecommunications devices and systems utilized by State agencies. The Secretary of Information Technology will lead chief information officers of all agencies to streamline business processes across State government, achieve cost-savings through economies of scale, and coordinate initiatives related to security, disaster recovery and continuity of operations.

SUSTAINABLE ENERGY POLICY (*Distributed power systems need to be more visible in the debate over Maryland's energy future. Benefits include more reliable and resilient power, much greater energy efficiency (80% compared to the 29% delivered from centralized power), less pollution, and more job and business growth.*)

Maryland is facing significant electricity challenges that have real world impacts on its economy, environmental quality, and overall standard of living. Over the past few years, Maryland has experienced dramatic hikes in electricity rates, coupled with a warning that electricity shortages could cause rolling blackouts as early as 2011. At the same time, global warming and other environmental challenges are driving a transition from fossil fuels to more sustainable, clean energy.

In July 2007, Governor O'Malley announced the *EmPOWER Maryland* goal of reducing the State's electricity consumption 15% by 2015, one of the nation's most ambitious energy efficiency targets. Also in July, the Administration held the Governor's Energy Summit, which brought together businesses, utilities, energy companies, environmental groups, energy experts, government agencies, and political leaders to discuss and develop solutions to lower energy bills while providing clean and reliable electricity to all Marylanders. At the request of the Governor, the Maryland Energy Administration (MEA) developed the Maryland Strategic Electricity Plan to assist the Governor and General Assembly in crafting a sustainable energy policy for Maryland's future.

To mitigate the long-term increase in electricity bills and keep the lights on in the face of Maryland's projected electricity shortage, the O'Malley-Brown Administration is introducing six energy initiatives.

Create a Maryland Strategic Energy Investment Fund

The O'Malley-Brown Administration will introduce legislation to create the Maryland Strategic Energy Investment Fund. This fund will allow Maryland to take control of its energy future by investing in energy efficiency technology, stimulating Maryland's emerging clean energy industry, promoting programs to reduce electricity consumption by low and moderate income customers, and sponsoring research on technologies to reduce Maryland's vulnerability to climate change.

The Maryland Strategic Energy Investment Fund will not rely on general funds or a surcharge on ratepayers. Rather, the fund will be financed through the upcoming sale of carbon allowances to power plants as part of the Regional Greenhouse Gas Initiative, which Maryland joined as part of the 2006 Healthy Air Act. The fund will allow MEA to provided services to traditionally

underserved markets, such as providing window air conditioner and refrigerator exchange programs to low-income residents and providing below-market financing to encourage energy efficiency investments by homeowners and small businesses.

Codify the EmPOWER Maryland Energy Efficiency Initiative

The Administration proposes to codify Governor O'Malley's *EmPOWER Maryland* initiative which challenges Maryland to reduce statewide per-capita consumption and peak demand by 15% by 2015. This ambitious goal can be achieved through greater use of proven technologies, such as programmable thermostats and compact fluorescent light bulbs. Utilities will have to do their part by establishing a range of programs to reduce household bills, such as rebates for the purchase of ENERGY STAR appliances, incentives for home energy improvements, and voluntary payments for the use of interruptible load devices on air conditioners.

When EmPOWER Maryland is successfully implemented, it will:

- Save Marylanders \$1.9 billion by 2015 and over \$4 billion by 2020;
- Avoid using 25 billion kWh of electricity, which is enough to power three-fourths of Maryland's homes in 2015; and
- Prevent the need to build at least two new large power plants.

Establish Green Building Standards for State Buildings and Public Schools

During the 2007 Session, the General Assembly passed legislation creating the Maryland Green Building Council for the purpose of developing recommendations for the renovation and construction of energy efficient and resource friendly public buildings.

Based on the Council's recommendations and working with legislators – including Senator Frosh and Delegates Morhaim and Bronrott – the Administration will introduce legislation to promote green building technologies in State buildings and public schools. Maryland will lead by example by requiring that all new and significantly renovated State buildings over 7,500 square feet meet the LEED Silver green building standard. To realize lower energy costs and encourage more productive students, the legislation will also require all new public schools to meet the LEED Silver green building standard.

Residential and commercial buildings make up 40 percent of total U.S. energy consumption, which makes improving the energy efficiency of buildings essential to achieving Maryland's long term goals. In addition to greater energy efficiency, green buildings promote more natural light, better air quality and contribute to improved occupant health, comfort and productivity.

Enhance the Renewable Portfolio Standard (RPS)

To meet our growing electricity needs, Maryland must invest in new generation. By investing in renewable energy, Maryland can increase its supply of clean electricity and help transition to a

more sustainable, secure economy. The O'Malley-Brown Administration will introduce legislation to increase renewable and clean energy generation by:

- Increasing the RPS requirement from 9.5% to 20% by 2022, while maintaining the current 2% level for solar;
- Limiting the geographic scope to generation resources located within the PJM to promote generation on Maryland's grid; and
- Increasing the Alternative Compliance Payment (penalty for failure to comply) to ensure that the RPS will be effective.

Solar and Geothermal Tax and Grant Incentives

Maryland's tax system imposes a significant barrier to residents who want to invest in clean energy systems for their homes. The sales tax on solar systems alone will cancel much of the State grant used to encourage Marylanders to invest in solar power. In addition, the current grants provided by MEA for solar energy and geothermal heating are too low to induce significant household participation. The O'Malley-Brown Administration will propose various tax and grant changes for both solar and geothermal systems to stimulate investment in clean energy, increase supply, and promote energy security through the following measures:

- Exempt all solar and geothermal systems from the sales tax and State and local property tax valuation;
- Increase the State grant to \$2,500 per kilowatt installed with a cap of \$10,000, for solar (photovoltaic) energy systems;
- Increase the grant to \$3,000 or 30% of system cost, for solar water heaters; and
- Increase the grant up to \$1,000 per ton with a cap of \$3,000 for residential customers and \$10,000 for non-residential systems, for geothermal heating systems.

Authorize the Maryland Environmental Service to Promote Energy Projects

To facilitate new electricity generation, legislation will be introduced on behalf of the Maryland Environmental Services to give MES greater authority to promote energy projects in Maryland. By authorizing MES to provide energy projects and services, Maryland will have a powerful, new tool to help get energy projects off the drawing board and onto the grid to promote affordable, reliable, and clean energy.

SUSTAINABLE ENVIRONMENTAL POLICY – A HEALTHIER CHESAPEAKE BAY

The Chesapeake Bay is Maryland's most precious resource. Yet despite past efforts, much remains to be done to protect our Bay. The FY 2009 budget provides \$381 million to fund statewide programs that are directly related to the restoration of the Bay and its tributaries, and the O'Malley-Brown Administration has launched BayStat, which tracks efforts of many State agencies to improve the health of the Bay. The Administration has also invested in important agricultural programs, such as cover crops, to sustain agriculture and preserve open space in a way that protects the Bay. Last Session, the Administration and the General Assembly took significant steps to protect the Bay and Maryland's environment by passing legislation related to clean cars, enhanced stormwater management, and oyster restoration. The O'Malley-Brown Administration is introducing three initiatives to continue their commitment to protect and clean up the Chesapeake Bay and protect Maryland's environment.

Chesapeake Bay 2010 Trust Fund

Building on the historic work of the Governor and the General Assembly last year in creating an annual \$50 million Chesapeake Bay 2010 Trust Fund, the O'Malley-Brown Administration will introduce legislation that provides a mechanism for spending these Bay cleanup dollars in the most effective scientifically-informed manner, with maximum accountability.

The Administration will propose that Trust Fund dollars be spent on projects designed to prevent runoff that indirectly finds its way into the Bay through such activities as stormwater runoff and agricultural practices, which accounts for a significant portion of the pollutants that enter the Bay and its tributaries. Led by the participants in the Administration's BayStat accountability program, allocations for cleanup projects will be made on a primarily competitive basis following careful review of which projects provide the most cost-effective water quality benefits to the Chesapeake Bay. To aid their decision-making, the group will be guided by a scientific panel that will advise the BayStat group on cost efficiency and effectiveness estimates.

Protecting the Bay from the Effects of Ill-Advised Growth and Reducing the Effects of Climate Change

The O'Malley-Brown Administration will take steps to strengthen the Critical Areas law, a groundbreaking piece of legislation when it was enacted in 1984, in an effort to preserve and restore the water quality of the Bay, maintain valued wildlife habitat and accommodate growth. In the intervening years, we have all seen the detrimental effects that unrestrained and ill-advised growth in environmentally sensitive areas near the Bay can have on the health of our State's most treasured resource. Among other necessary measures, the Administration believes actions should be taken to stop unrestrained growth near the water, to stop illegal building in the Critical Area, and to require offenders to restore the harm they inflict on the Bay. Giving the Critical Areas Commission the tools they need to more effectively deal with these issues is a high priority of the Administration.

The O'Malley-Brown Administration is committed to taking strong action to reduce the effects that global climate change is having on our State's shorelines and environment. Throughout the

2008 legislative session, the Administration will work with the General Assembly to address the interim recommendations of the Maryland Commission on Climate Change.

Transit Oriented Development

Governor O'Malley will introduce legislation to permit the State to aggressively promote transit-oriented development (TOD) as a smart growth tool to revitalize communities and curb sprawl. The bill codifies TOD as a statewide transportation purpose and provides the legal framework and authority to advance TOD projects around the State. It will allow the Department of Transportation to designate TOD projects and use its property and resources to support mixed use and pedestrian friendly development around existing and future transit stations.

Transit-oriented development is a development style that leverages transit stations as the foundation for vibrant communities with a dense mix of commercial, residential, and retail development. By clustering development around transit sites, TOD maximizes the State's investment in transit by promoting increased ridership and enhanced opportunities for pedestrian and bicycle mobility. The benefits of TOD include easing congestion on our roadways, curbing of green house gas emissions, reducing pollution, and providing a viable alternative to sprawl.

Maryland has all the building blocks for a nationally-recognized TOD program, with 75 rail transit stations across the State, including Metro stations in the Washington, D.C. area. Additional stations are being planned for the MARC system, as well as for three transit lines being designed: the Red Line, the Purple Line and the Corridor Cities Transitway.

PROMOTING JOBS AND ECONOMIC GROWTH (*Integrate green knowledge, technology & entrepreneurial opportunities into all facets of workforce and economic development*)

The O'Malley-Brown Administration understands that an educated workforce is the key to economic growth. The FY 2009 budget provides historic levels of K-12 education funding, over \$330 million in school construction funds, and record levels of funding for our institutions of higher education. For the first time, Maryland has a dedicated source of funding for higher education, the Higher Education Investment Fund. The FY 2009 uses that Fund to freeze in-State undergraduate tuition for the third year in a row; provide access to higher education for an additional 1,600 students; fund critical workforce development initiatives; and help promote academic success for low-income students, first generation college students, and minority students.

In addition, the budget contains record levels of operating and capital funds for Maryland's community colleges, in support of their role in helping the State meet its workforce needs. In order to build on these opportunities, the Administration will be introducing two bills.

Base Realignment and Closure (BRAC) Redevelopment Act (Applying smart growth and green principles offers enormous leverage here. However, there are barriers to be overcome to ensure success. Whether real or perceived, issues such as quality of schools, safety, convenient transportation, and tax burden often stymie redevelopment of urban areas. This illustrates the need for holistic and practical solutions)

In the 2007 Session, the O'Malley-Brown Administration introduced legislation to create the Base Realignment and Closure (BRAC) Subcabinet to coordinate the planning and financial resources of State government to support the missions of military installations expanding under BRAC. Between now and 2011, Maryland anticipates the arrival of as many as 60,000 new jobs and 28,000 new households as a result of the BRAC Commission recommendations. Under the leadership of Lieutenant Governor Brown, the BRAC Subcabinet has worked throughout the past year to prepare Maryland's action plan to support of our Nation's defense and security efforts. The BRAC Subcabinet worked extensively with local, State and federal agencies, the private sector and the public to develop strategies to accommodate the new employers, workers and families that will relocate to Maryland in the coming years.

BRAC Community Enhancement Act

Based on the recommendations of the BRAC Subcabinet, the O'Malley-Brown Administration will introduce the *BRAC Community Enhancement Act*. This legislation will include two initiatives to leverage State and private sector investments critical to support the community and transportation infrastructure necessary to accommodate BRAC-related growth.

BRAC Revitalization and Incentive Zones

The legislation will establish BRAC Revitalization and Incentive Zones ("BRAC Zones") to provide local jurisdictions with incentives to enhance public infrastructure such as streets, utilities and recreation venues in designated revitalization and redevelopment areas. BRAC Zones will also provide BRAC businesses with incentives to locate in targeted areas of the State that are in need of revitalization and redevelopment.

BRAC Zones will accommodate and encourage BRAC-related growth in the State, without contributing to sprawl, by directing the population growth to Priority Funding Areas that are served by public transit and have underutilized capacity in housing, public facilities, and infrastructure. In keeping with these principles of Smart Growth, the BRAC Zones program will provide certain tax incentives to businesses and local governments in the designated BRAC Zones. The business incentives are similar to those offered in Enterprise Zones and will help attract high quality businesses into these areas.

Accommodating Commercial Development on Military Installations

Legislation will also give State and county government greater flexibility to negotiate a payment-in-lieu-of-taxes agreement with private sector entities building commercial developments on military installations. This measure will ensure that the private sector will fairly contribute to the

public infrastructure necessary to accommodate the commercial developments planned at Aberdeen Proving Ground and Ft. Meade.

In addition to the *BRAC Community Enhancement Act*, the Administration will propose to expand the uses of the new Higher Education Investment Fund to allow for BRAC-related higher education initiatives administered by the Maryland Higher Education Commission. Governor O'Malley has included \$3 million in the Fiscal Year 2009 budget for workforce training initiatives related to BRAC.

Consolidation of Workforce Development Functions (Re-training trade and professional workers will be a critical component of building a green economy.)

To better coordinate education efforts, particularly programs for adult learners, and to better coordinate workforce development efforts, legislation is being introduced to transfer the State's adult education and correctional education programs to the Department of Labor, Licensing, and Regulation, the State's lead agency on workforce development and job training policies. If Maryland is going to continue to be an economic leader in the country and the world, we need to do a much better job of serving our citizens who currently lack the skills to enter the workforce. The FY 2009 budget includes almost \$50 million for the Department of Labor, Licensing and Regulation's Division of Workforce Development to support workforce development programs for young people and adults, dislocated workers, and job services for veterans.

In addition to the programs and policies listed above, there are other initiatives related to renewable energy development (especially ethanol and biodiesel) and business incubators that support this policy option.

Estimation of Adaptation Benefits and Costs

This policy option focuses on taking advantage of new market opportunities arising from climate adaptation and mitigation needs. The level of benefits will depend on the implementation strategies pursued and their success in the broader competitive market. At a minimum, this option encourages private sector involvement in innovation and development of green economic sectors and jobs. It also broadens the range of entities involved in collecting, evaluating, and responding to climate change and increases the potential for innovation and better adaptation solutions. The mix of these programs can be adjusted relatively quickly and easily to accommodate new information and opportunities, particularly if there is a diverse set of sectors and strategies in the portfolio. Costs associated with this policy option will vary based on the portfolio of strategies pursued.

Feasibility Issues

Status of Group Approval

Barriers to Consensus