



Howard County Energy Task Force Final Report

January 2017



Message from the Co-Chairs

County Executive Allan Kittleman,

We are pleased to submit the Final Report for the Howard County Energy Task Force. The Task Force, comprised of 15 energy knowledgeable citizen volunteers, met monthly for the past year and compiled a list of recommendations and strategies for your review and action.

Energy is a broad topic. We focused on four general areas:

- 1) Energy Management and Efficiency
- 2) Renewable Energy
- 3) Workforce Development and Job Creation
- 4) Energy Reliability and Resiliency

Even within these areas, given the very technical nature of the topic and the many specific issues that fall under each, the Task Force focused its scope on providing broader recommendations and strategies. We trust that county government and leadership can undertake the detailed analysis and judgment to execute detailed policies and actions in the direction that Task Force has recommended.

Perhaps the greatest recommendation of the Task Force is to elevate Energy as an important and ever present consideration. This theme is present in many of the specific recommendations, including the recommendations to create a Director of Energy and to make each department accountable for its respective energy use.

We would welcome the opportunity to present our report in person and answer any questions that you may have. On behalf of the entire Energy Task Force, we thank you for the opportunity to provide input to the county on this very important topic.

Best regards,



Rizwan A. Siddiqi



Edward P. Wilson

Cc: Jon Weinstein, Chair, Howard County Council
Ned Tillman, Chair, Environmental Sustainability Board

HOWARD COUNTY ENERGY TASK FORCE

FINAL REPORT

INTRODUCTION

In December 2015, County Executive Kittleman announced energy initiatives that would benefit residents and businesses in Howard County. Not only would the initiatives be cost-saving but they would also help the environment. Howard County has been recognized as a community rich in natural resources and a leader in environmental sustainability.

As a key early step in this process, the Howard County Energy Task Force was convened at the request of County Executive Kittleman. Co-chaired by Rizwan Siddiqi of EBA Engineering (former member of the Environmental Sustainability Board) and Ed Wilson of Constellation (energy member of the Environmental Sustainability Board), the Task Force is comprised of volunteers with energy expertise from Howard County non-profit organizations, community associations, private businesses, and employees from the Howard County Government. A list of Task Force members is provided in Appendix A. The Task Force met monthly throughout 2016 and invited various speakers (see list provided in Appendix B) to address the group on pertinent topics.

The Task Force was asked to evaluate four areas:

1. Energy Management and Efficiency Strategies and Associated Cost Savings
2. Renewable Energy
3. Workforce Development and Job Creation Strategies
4. Energy Reliability and Resiliency

The Task Force organized into four subcommittees to consider each area for recommendations to improve County operations as well as positively impact County residents and businesses. In developing recommendations, the group created short-, medium-, and long-term actions for each area of recommendation. As a general rule, short term is defined as within the next fiscal year, medium term is within the next one to two years, and long term means longer than two years.

As a predominantly volunteer group, the Task Force did not have access to significant analytical resources or County data which was a limitation given the technical nature of the subject. As such, the Task Force relied upon its existing collective experience and expertise. As a result, several recommendations entail the undertaking of additional analysis. A detailed discussion on the many recommendations is included in this report as well as a spreadsheet matrix listing the recommendations along with the short-, medium-, and long-term actions.

It is worth noting that the County made important progress on energy issues during 2016. First, PACE (Property Assessed Clean Energy) enabling legislation was passed and a PACE Administrator selected. County officials briefed the Task Force during this process and all members were pleased with the outcome. PACE will help businesses implement energy efficiency and renewable energy projects under a favorable financial vehicle. Second, legislation was also passed to make it easier for solar projects to be developed on agricultural preservation land. Task Force co-chair Ed Wilson testified in favor of this legislation.

KEY RECOMMENDATIONS

Several key recommendations of the Task Force are worth highlighting in summary:

- **The County should hire a full-time Director of Energy, reporting directly to the Office of the County Executive, to ensure a county-wide energy focus on policy and accountability for results.**
- **In addition, each department should have a designated Energy Liaison responsible for its respective department's energy analytics and project identification and implementation.**
- **The County capital budget, including the budgets for County public schools and Howard Community College, should include line items totaling at least 5% of the annual energy spend to be designated for energy efficiency improvement projects.**
- **To raise energy awareness and accountability, each department should include in its budget, and pay for, its respective share of energy spend.**
- **The County should consider cost-effective renewable energy projects, taking into account a 10% additional benefit in its analysis to address non-financial societal benefits.**
- **The County should identify and take steps to promote and facilitate Community Solar projects within Howard County.**
- **The County should consider incentives for commercial and residential efficiency projects and improvements. Similarly, the County should promote PACE financing directly and through partners. Such effort, while not necessarily directly creating "green jobs," should create an overall need for greater employment and jobs by increasing "green work."**
- **The County should consider working with the local utility on a pilot micro-grid project for the County Office Complex.**
- **The County should assess positioning backup power for facilities critical to vulnerable populations.**
- **Across all areas, partnerships with key community groups as well as promoting education and awareness will be critical to improving the energy posture of County government, residents, and businesses of Howard County. This would be a key responsibility of the proposed Director of Energy.**

Many other recommendations were made by the four subcommittees and are detailed in the following respective sections as well as in the corresponding matrices.

ENERGY MANAGEMENT & EFFICIENCY STRATEGIES AND ASSOCIATED COST SAVINGS

Objective

The Subcommittee on Energy Management and Efficiency Strategies and Associated Cost Savings was directed to establish a matrix by which the County could systematically improve energy efficiency while reducing energy costs through a comprehensive approach with a singular focus. A key to the success of

this plan centers on a Director of Energy who reports directly to the County Executive and has a focus on managing energy across the County and over all departments.

The Subcommittee members came up with five recommendations:

1. **Conduct a gap analysis.** The purpose of this exercise is to first determine and assess the current energy, fuel, and water resource policies and procedures within the various County departments as well as to establish a resource consumption baseline against which future goals can be measured.
2. **Establish a capital budget line item dedicated to the installation and/or upgrade of equipment to optimize energy efficiency.** The amount should be at least 5% of the County's total annual expenses related to electricity, natural gas, fuel oil, gasoline, water, etc. This capital funding will be applied to assist the County in achieving a County-wide reduction in Energy Intensity or similar index to be determined subsequent to the Gap analysis. However, a 15% reduction by the year 2026 would be a reasonable goal.
3. **Empower and challenge each County department to reduce resource consumption.** It is essential that a method is established to allocate utility usage to specific departments that occupy a single metered facility, and that a complete data analysis of current billing structure by department is performed. Tying in consumption to individual cost centers will engage department representatives to buy into the resource focused budget. Additionally, a regular analysis report will be produced to reflect and evaluate each department's efforts and successes.
4. **Cultivate strategic partnerships** with government, non-profit, education, and small businesses to leverage funds, knowledge, and efficiency to improve knowledge base, and establish a best practices library and foster the general and consistent messaging regarding conservation.
5. **Aggressively pursue innovative sources of funding** to include utility rebates, energy performance contracting, public-private partnerships, grants, and green bonds.

Background

In order to achieve these five recommendations, the Subcommittee proposed short-, medium-, and long-term strategies to support each recommendation. In some instances, the strategies are dependent upon the completion of each other.

Conduct a gap analysis. The recommendation of a gap analysis should start with determining and assessing the current resource policies and procedures, and detecting the gap of goals to actual rollout, objectives, and performance. A baseline for resource consumption (in facilities, the fleet, and water/wastewater) and preventive maintenance services must first be established and then the goals for consumption reductions and preventive maintenance services can be put in place. After the baseline and goals are formulated, the standards for new and existing buildings and routine preventive maintenance can be put in place. Over the long term, the gap analysis will drive a list of goals set by the County, the performance against those goals, and recommendations for improvements to the goals and methods to achieve them.

Establish capital budget line item dedicated to the installation and/or upgrade of equipment to optimize energy efficiency. The amount should be 5% of the County's total annual expenses related to

electricity, natural gas, fuel oil, gasoline, water, etc. This capital funding will be applied to assist the County in achieving a County-wide reduction in energy intensity or similar index to be determined subsequent to the gap analysis. However, a 15% reduction by the year 2026 would be a reasonable goal. This can be accomplished by evaluating current staff and assignments as they relate to energy consumption/data management across the County and the creation of a single position entitled Director of Energy who reports directly to the Office of the County Executive. The Director of Energy will be focused on energy efficiency and best practices, development of goals and strategies, assigning accountability by department, executing the gap analysis, and reporting results. The percentage of budget to be dedicated will be determined based on the overall capital needs, total energy used by each department, and the total potential to become more energy efficient. The Director of Energy should be a single point of contact focused solely on energy and should initially defer involvement in storm water management and other areas linked under the title of sustainability. Additional resources should be acquired as needed to manage data and create a centralized resource for best practices and standards adopted by the County and continue the research to stay current on new and emerging technologies. Additionally, marketing and communications resources should be allocated to create strategic and impactful messaging. Lastly, there should be one dedicated staff member for each County department to develop a list of projects to accomplish this goal. This same person will be responsible for monitoring available and applicable rebates/grants/optional funding sources. The Task Force believes this is an effective way to achieve the funding of the required energy measures identified in the gap analysis.

Empower and challenge each County department to reduce energy usage. It is essential that a method is established to allocate energy usage to specific departments that occupy a single metered facility, and that a complete data analysis of current billing structure by department is performed. Tying accountability to individual cost centers will engage department representatives to buy into the energy-focused budget. Additionally, a regular analytic report will be produced to reflect and evaluate each department's efforts and successes. It is essential that a method is established to allocate resource usage to multiple agencies that occupy a single metered facility and that a complete data analysis of current billing structure by agency is performed. Each facility (and housed agency) should be metered to the extent economically feasible. Individual cost centers will become accountable for their consumption. Then, an energy budget can be created by each office so each agency has the incentive to reduce its resource consumption. A policy should be reviewed and adapted to encourage and support telecommuting for staff and County employees by 2019. Necessary supporting technologies must be in place to facilitate this initiative. Additionally, a regular annual report should be produced to reflect and evaluate each department's efforts and successes to incentivize energy savings.

Cultivate strategic partnerships with government, non-profit, education, and small businesses to leverage funds, knowledge, and efficiency to improve knowledge base, and establish a best practices library to foster the general and consistent messaging regarding conservation. In order to do this, it is important to identify strategic partners by reviewing existing programs and services such as grants, rebates, and federal incentives as available. Also, opportunities and education on a continuing basis for new technologies and sharing of concepts will be key to making this a success. In the future, the goal will be to build public and private partnerships to leverage resources, to increase efficiencies as well as to stay current on best practices and technologies. In addition, it will be important to develop education and outreach materials to engage internal and external stakeholders.

Aggressively pursue innovative sources of funding. Traditional funding sources should be supplemented by available vehicles including utility rebates, energy performance contracting, public-private partnerships, grants, and green bonds. Green bonds are tax-exempt bonds issued by federally qualified organizations for qualified green building and sustainable design projects.

RENEWABLE ENERGY

Objective

The Subcommittee on Renewable Energy was directed to formulate a set of recommendations to increase the development of renewable energy projects in the County. Like the other sections of this report, the recommendations are segmented into short-, medium-, and long-term strategies. For purposes of clarity, a discussion of relevant renewable energy background is provided to frame the recommendations contained in this section.

1. **Where cost-effective, install large (greater than 100 kW) renewable generation projects on County land.** Evaluation criteria should include 10% added to the project's benefit to account for non-financial societal benefits without unduly burdening the cost-effectiveness. Large projects should also take advantage of the County's ability to utilize aggregate net metering.
2. **The County should maximize the installation of rooftop solar projects on County schools and government buildings** to the full extent of physical and economic viability (inclusive of the 10% benefit addressed above).
3. **Review and reassess County zoning regulations and restrictions related to renewable generation development** to ensure consistency with the County's goals and priorities regarding agricultural land preservation, open space preservation, and quality of life considerations.
4. **Actively facilitate and promote development of community solar projects** to take advantage of a program that may be available for only a limited time. In addition to general promotion activities, the County should consider low-cost land leases for community solar development.
5. **Work with Baltimore Regional Cooperative Purchasing Committee (BRCPC) to increase purchase of Renewable Energy Credits (RECs) that will promote development of Howard County renewable projects.**

Background

Existing/Planned Renewable Generation in Howard County – The determination of the amount of renewable generating capacity in Howard County, or any particular county in Maryland, can only be estimated due to the dispersed nature of renewable power generation and the lack of record-keeping by industry participants on a county-level basis. The bulk of renewable energy projects in place in Howard County as of the end of Calendar Year (CY) 2014, the last year for which comprehensive data are available, was made up of small solar projects.¹ In total, the County had 14.8 megawatts (MW) of renewable energy projects, of which 13.7 MW were solar projects spread over approximately 1,250 separate installations. This equates to an average solar project size of approximately 11 kilowatts (kW). The bulk of the renewable generation in the County is rooftop solar and, as of the end of CY 2014, there are no utility-scale renewable energy projects in the County.²

On the basis of MW of installed renewable generating capacity as of the end of CY 2014, Howard County represented 4.7% of the total solar generating capacity in Maryland and 1.9% of the total Maryland

¹ Public Service Commission of Maryland, *Renewable Energy Portfolio Standard Report (With Data for Calendar Year 2014)*, January 2016, <http://www.psc.state.md.us/wp-content/uploads/2016-Renewable-Energy-Portfolio-Report.pdf>, 27-28.

² For purposes of this report, utility-scale renewable energy projects is defined as those in excess of 2 MW of generating capacity.

renewable energy generating capacity, including solar. For purposes of comparison, Howard County represents 5.2% of the State's total population.³

As a practical matter, future development of renewable projects in the County is likely to be predominantly, if not exclusively, solar. The development of wind power projects is too land-intensive, and the property values in Howard County are too high to attract wind power development.⁴ Additionally, obtaining approval for construction of a wind power project in the County is assessed to be unlikely given the County's relatively high population density, proximity to Thurgood Marshall BWI Airport, and potential adverse socioeconomic impacts (e.g., noise issues, property value impacts, visual aesthetics).

Examination of the PJM queue indicates that as of October 2016,⁵ there are 12 MW of capacity that may be going into the County over the next one to two years, assuming no change in the current queue status. The projects contained in the PJM queue, however, would be in addition to rooftop solar that would be installed in the County, since projects as small as rooftop solar do not require interconnection with the electric transmission system and hence do not appear in the PJM queue. Of the 12 MW that are listed in the queue, 2 MW are listed as "Under Construction" and 10 MW are listed as "Active."⁶

Maryland Renewable Energy Portfolio Standard – Maryland, along with 28 other states and the District of Columbia, has a Renewable Energy Portfolio Standard (RPS), which requires retail energy suppliers to include specified minimum percentages of renewable energy in the overall mix of energy that is being provided to end-use customers in Maryland. There are four separate components of the Maryland RPS: (1) Tier 1 renewable resources; (2) solar renewable resources (which are a "carve-out" of the Tier 1 resources); (3) off-shore wind resources, which like solar resources are a carve-out of the Tier 1 resources but are dependent on Maryland Public Service Commission (PSC or Commission) approval of development of off-shore wind; and (4) Tier 2 resources. The Tier 1 requirement reaches a maximum level of 20% in 2023 and continues at that level for the indefinite future. The solar requirement reaches a 2% maximum in 2020 and remains at the 2% level indefinitely. The Tier 2 requirement is currently at its maximum level of 2.5%, and that requirement is only in place until 2019, at which time the Tier 2 requirement terminates. Off-shore wind, both in terms of the cost and the amount of off-shore wind that would be required as part of the Maryland RPS, is dependent on proposals made by developers and approved by the PSC based on constraints contained in the RPS legislation. As of October 2016, no off-shore wind projects have been approved by the Commission.

³ Maryland Demographics by Cubit, <http://www.maryland-demographics.com/>.

⁴ Including separation of wind turbines, setbacks from nearby residential and/or commercial buildings, access roads, and electrical facilities, wind power projects require approximately 60 acres per MW of installed capacity. This estimate is based on research conducted by the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) combined with recent experience in Maryland. The Dan's Mountain wind energy project in Western Maryland is planned for 60 MW encompassing 3,000 acres (50 acres per MW of wind power capacity). NREL estimates between 30 and 84 acres per MW of installed wind power capacity. See Paul Denholm, *et al.*, *Land-Use Requirements of Modern Wind Power Plants in the United States*, National Renewable Energy Laboratory, August 2009, <http://www.nrel.gov/docs/fy09osti/45834.pdf>, 22.

⁵ The PJM queue is a listing of all generation and transmission projects that are being considered for development within the PJM footprint and are of a size sufficient to require an interconnection study; that is, it can be envisioned to potentially affect the operation of the electric power grid. Typically, projects in excess of 2 MW are required to have PJM interconnection studies performed, but under certain circumstances, small projects might be required to conduct such studies. Note that many of the projects in the PJM queue will never be constructed, and sometimes the same project can appear in the queue several times under slightly different names and with different locations.

⁶ The 10-MW project listed as "Active" appears to be a double entry for the same 5-MW project, hence the total may be 5 MW rather than 10 MW.

Role of Renewable Energy Credits (RECs) – RECs represent the environmental attributes of the power produced from renewable energy projects and are sold separate from commodity electricity.⁷ RECs can be purchased whether or not there is access to renewable energy through the local utility. The market for RECs enables renewable energy projects to financially compete with lower-priced fossil fuel-generated electricity and allows more clean-power producers to enter the electric power supply market.⁸

Some of the benefits of purchasing RECs to meet renewable energy goals as opposed to developing a renewable energy project include a higher degree of flexibility in terms of the size of the renewable energy commitment, any number of RECs can be purchased to maintain costs within a budget or to meet environmental goals, and there is also less risk and planning involved in purchasing RECs compared to developing renewable energy projects.

Some of the downsides of purchasing RECs compared to developing renewable energy projects include not actually switching electricity to a clean power source. In addition, RECs can be purchased for projects across the nation, thus a REC from a project in another state will not actually improve local energy or environmental conditions, such as reducing emissions of nitrogen oxides (NOx), which affect ozone levels on a more local basis.

A Maryland-eligible REC is equal to the environmental attributes associated with 1 megawatt-hour, or MWh (equal to 1,000 kilowatt-hours, or kWh) of energy generated by a qualified renewable energy system. The Maryland PSC receives and reviews all applications for qualified renewable energy technologies. Maryland-eligible RECs can be sold or traded to meet an electricity supplier's annual compliance obligations as part of Maryland's RPS.⁹

REC purchases are commonly used to meet not only the Maryland RPS requirements, but also other renewable energy goals that are established by other levels of government or by the Boards of Directors of certain companies. For example, the federal government has renewable energy requirements for its installations that are over and above the Maryland RPS requirements. One of the methods by which federal government customers satisfy their renewable energy mandates is through the purchase of RECs. Generally, the federal government relies on low-cost wind RECs from Texas, Oklahoma, and the Midwest. This option is available to Howard County as well, though the local benefits of renewable energy purchases would be lost under this approach.

Methods of Procuring Renewable Energy – There are several options available to the County to procure renewable energy, but the options are not as extensive as they could be due to regulatory issues and practical considerations. The most common method to procure renewable energy, other than through the purchase of RECs, is to enter into a Power Purchase Agreement (PPA) with a third-party developer. The third-party developer, unlike the County, can take advantage of the federal Investment Tax Credit (ITC), which effectively reduces the capital cost of a solar energy project by approximately 30%. Since the bulk of the costs of solar power are related to construction costs, the availability of the ITC significantly affects the economic desirability of the project.

The County, however, is only permitted to have a single retail electric power supplier per account, like all other retail customers. The County's electric power supply is competitively selected through BRPC, and for the County to receive the renewable power generated through a PPA, ownership of the power

⁷ U.S. Department of Energy, Green Power Markets, <http://apps3.eere.energy.gov/greenpower/markets/certificates.shtml>.

⁸ 3Degrees, Renewable Energy Certificates, <https://3degreesinc.com/services/renewable-energy-certificates/>.

⁹ Maryland Energy Administration, Solar Energy Progress, <http://energy.maryland.gov/Pages/Info/renewable/solar.aspx>.

must be transferred to the competitive electric power supplier (currently WGL Energy) since the electric power supplier is required by PJM to have ownership of the power being delivered to the retail customer. While the arrangements are a bit cumbersome, they are not unmanageable and simply need to be recognized when developing the relevant contracting mechanisms.

As an alternative, the County could own the project directly, but it would lose the benefit of the ITC. Additionally, the County may still need to transfer ownership of the power to its competitive supplier to facilitate delivery depending on the location of the renewable generation facility relative to the location of the County's electrical load.

One option for the County would be to simply purchase RECs, which would effectively convert what would otherwise be brown power into green power. Purchasing RECs, however, does not provide the County with any benefits associated with project development (e.g., tax revenues, employment benefits). Because each REC has a "tag" that indicates various characteristics of the REC, Howard County can specify which types of RECs it wishes to purchase, or have purchased on its behalf, as a means of meeting the RPS compliance requirements or for other purposes. ***The Task Force has recommended that the County, to the extent feasible, specify that its electric power supply provider purchase RECs from new renewable energy projects located in Howard County.*** This preference would help promote project development within the County and help the County garner the employment and other benefits associated with development of new renewable energy projects.

Factors Affecting Renewable Energy Development in Howard County

Several important interrelated factors affect the development of renewable energy in Howard County. Some of these factors are national in scope, some affect only Maryland entities, and others are unique to Central Maryland and the County.

One of the principal factors affecting renewable energy development is the price of conventional electric power, with which renewable energy competes. When conventional electric power prices are low, it is more difficult for renewable energy to be economic. During the second half of 2016, electric prices in PJM, as in much of the rest of the U.S., were low by historical standards. The fundamental reason underlying the low market prices for electricity is the low price of natural gas, which tends to play an important role in determining the price of electricity in Maryland for about half of the hours in the year, and in particular, the hours of highest demand (e.g., hot summer weekday afternoons). The market for natural gas has national and regional elements, and while natural gas prices differ from one region of the country to another, there is a general tendency for prices to rise and fall together in almost all areas of the country.

Federal renewable energy incentives significantly affect the cost of renewable energy, which enables renewable energy to compete more effectively with conventional energy. Solar projects (as well as certain other types of renewable energy projects) can benefit from the federal ITC, which is currently set at 30% of the capital cost of solar projects. The availability of the ITC effectively reduces the cost of solar projects by 30%. The ITC is scheduled to phase out over the next five years for residential installations and be lowered to 10% for commercial projects.

Wind power (and certain other types of renewable energy) has the benefit of the federal Production Tax Credit (PTC). The PTC is a per-MWh credit paid to wind power generators and increases at the rate of inflation each year. In 2016, the PTC was above \$20 per MWh (about \$0.02 per kWh) and is available to a generator for the first ten years that the project operates after construction. Like the ITC, the PTC is phasing out over the next five years.

As noted above, Maryland, like many states, has an RPS, which requires that retail suppliers include specified percentages of renewable energy into the supply mix. The applicability of an RPS in Maryland means that there is a market for RECs. The sale of RECs by a renewable project developer provides the developer with an additional revenue stream to close the gap between conventional power costs and the costs of renewable energy. The value of RECs in Maryland depends on numerous factors, including:

- The price of RECs in nearby states with similar RPSs in place (e.g., Pennsylvania, New Jersey, Delaware, and the District of Columbia);
- The RPS percentage requirements, which can affect to some degree the relative scarcity of the RECs;
- The quality of the renewable resource, that is, the quality of wind, or the quality of the solar resource;
- The cost of construction of the project, which in turn depends on certain local conditions (e.g., labor costs, land value) as well as national or international factors (e.g., the cost of equipment);
- The cost to interconnect to the electric power grid; and
- The cost of compliance with state and local environmental requirements and zoning regulations (e.g., set-back requirements, noise mitigation).

Cost-effectiveness

The recommendations related to renewable energy include the condition that investment in renewable energy purchases for the County should include an assessment of cost-effectiveness. The Energy Task Force recognizes that there are benefits that result from increased reliance on renewable energy that are difficult to quantify and monetize. These include:

- Reduced environmental harm through reductions in harmful emissions including NO_x, sulfur dioxide (SO₂), carbon dioxide (CO₂), and other greenhouse gas (GHG) emissions;
- Improvement in the quality of life resulting from reduced harmful air and water pollutants;
- Improvements in health related to reduction of air emissions from the combustion of fossil fuels;
- Enhanced localized electric grid reliability related to distributed resources and reduced dependence on central station energy generation; and
- Potential positive impacts on local employment and business opportunities.

The benefits listed above are not easily quantified and, consequently, the monetary value of these benefits cannot easily be incorporated into an assessment of the cost-effectiveness of a particular renewable energy project. ***Based on the availability of these difficult-to-quantify benefits, the cost-effectiveness evaluation should include a 10% adder to the benefit calculation to reduce the potential of rejecting a desirable project.*** The adder, however, is not so large as to induce the County's participation in projects that could be excessively costly and of uncertain overall net benefit.

Community Solar

The Community Solar program is a new State-wide program that will allow residential and commercial customers the opportunity to benefit from a solar project as if it were behind the meter when, instead, it is located elsewhere. This provides a significant economic benefit to customers who could not otherwise avail themselves of the use of solar power, such as those living in apartments or renting homes. The benefit to consumers is that behind-the-meter solar is essentially treated as a reduction in energy use and as such, the customer avoids not only the energy charges for the energy that the customer would otherwise receive from a supplier, but also avoids the delivery charges associated with the energy. The ability to avoid the delivery charges for the energy taken under a community energy arrangement significantly increases the level of savings, and thereby makes the arrangement much more financially attractive to customers that would otherwise find it uneconomic to rely on solar energy for a substantial portion of their power supply. In addition to the benefits accruing to customers, increased reliance on solar energy indirectly reduces emissions through reduced reliance on power generated from fossil fuels.

Only 275 MW State-wide will be eligible to participate in the program. A portion of the 275 MW will be earmarked for BGE. Once the maximum level of capacity is subscribed, the program will no longer be open to new participants. Each community solar project is limited to a size of not more than 2 MW (requiring about ten acres), and customers would subscribe to a portion of the project output at a specified price. The cost of any particular community solar project will depend most importantly on the ability of the developer to take advantage of the tax benefits (the ITC), the cost of installation, and the cost of the land. To the extent that land costs could be reduced, the cost of the energy to the project participants would also be reduced.

Aggregate Net Metering

Net metering is an arrangement whereby energy generated at the customer site is credited against the power taken by from the supplier. During times when more energy is generated than is consumed, the net metering arrangement allows the customer to essentially “bank” the excess generation to be credited against future use. In Maryland, eligibility to participate in net metering is restricted to certain types of renewable energy, including solar, wind, and biomass, and is also restricted to projects not larger than 2 MW. The aggregate capacity limit on net metering in the State is currently set at 1,500 MW, which represents approximately 10% of the State’s peak load.¹⁰

The principal advantage of net metering relative to certain other types of renewable energy supply arrangements is that with net metering, the customer is credited the full retail rate for each kWh of generation; that is, the credit includes the transmission, distribution, and energy charges (in addition to certain other charges billed on a per-kWh basis). Because the net metering credit for renewable generation includes more cost components than simply the energy cost component, cost-effectiveness is more easily realized.

One of the problems that is often associated with net metering is that the most favorable locations for renewable generation facilities (for example, County landfill locations) may have insufficient loads to make use of the full output of the renewable generation resource. Certain categories of customers, however, including County governments, are eligible to apply for aggregate net metering, which allows the customer to aggregate several meters for purposes of establishing the load for the net metering

¹⁰ Public Service Commission of Maryland, *Report on the Status of Net Energy Metering in the State of Maryland*, January 2016, <http://www.psc.state.md.us/wp-content/uploads/2015-MD-PSC-Report-on-the-Status-of-Net-Metering-Report.pdf>, 3.

arrangement. This permits the customer to install the renewable generation facility at the site most suitable for generation even if the load at the site is small relative to the size of the renewable generation facility. The aggregate net metering option, therefore, provides the customer with significant flexibility in the location and use of renewable generation that would otherwise not be available and can substantially improve the financial viability of a renewable energy project.

WORKFORCE DEVELOPMENT AND JOB CREATION STRATEGIES

Objective

The Workforce Development and Job Creation Strategies subcommittee was tasked with providing recommendations to enhance energy-related employment opportunities in Howard County. The concept of “green jobs” has been in existence for nearly a decade, and significant resources have been deployed at all levels of government to stimulate the creation of employment opportunities that are specific to environmental sustainability such as energy efficiency and renewable energy. Measurable impacts of unique green jobs creation has been limited, with several bright spots associated with specific job classifications such as energy auditors and solar photovoltaic (PV) installers. It is surmised that recent trends in green and energy-related jobs have been manifested as an additional responsibility to an existing full-time position or temporary contract positions for targeted service needs. Ultimately, efforts to create new green jobs in recent years have had limited effectiveness. In light of these challenges, the Task Force is recommending two approaches to foster energy-related workforce development and job creation in Howard County: (1) implement policies and programs to stimulate economic activity in the energy efficiency and renewable energy sector; and (2) implement targeted efforts to support energy-related training programs at Howard Community College and Lincoln Tech School and local business growth in these sectors.

An indirect approach to creating energy-related jobs and workforce development is to increase economic activity in those sectors in the County. For example, by stimulating an increase in home performance energy audits in the County, there will be an increased need for home energy auditors and home performance contractors in the region. The strategies contained in this report are intended to serve as examples of viable steps the County can take to increase activity in the energy efficiency and renewable energy sectors. These strategies consist of:

1. **Refine existing tax incentives and provide additional incentives as necessary to promote energy efficiency and renewable energy (EE/RE) investment by the residential and commercial sectors** (e.g., incentivizing the Home Performance with ENERGY STAR program and updating existing green building tax incentive programs)—please see Background information below for additional information relative to green building programs. Given the robust current state of the residential solar market, the relatively low participation in the Residential High Performance Building Credit for new construction, and the need to improve the energy efficiency of the existing housing stock, incentives might be best invested to leverage the BGE Smart Savers program.
2. **Develop commercial building energy efficiency programming to encourage the use of the recently established PACE program.** Participation in this useful program by commercial property owners should be enhanced through broad promotional programming and leveraging complementary programs such as encouraging ENERGY STAR building certification.

3. **Evaluating policies and regulations for opportunities to stimulate or address obstacles to energy conservation or renewable energy-related improvements.** There are numerous ways that the County can help support clean energy activities through optimizing policies and code requirements such as enforcement of Maryland Building Standards, requiring an energy audit to be performed as part of a residential property sale, or exploring the permitting process for solar PV systems.
4. **Evaluate and refine existing energy-related programming offered by the Office of Community Sustainability.** The existing Live Green Howard website could be more substantially updated to reflect the latest in programming and technologies (e.g., promoting LEDs rather than CFLs) and more robust outreach to residents/commercial property owners to inform them of available complementary energy programs such as BGE’s Smart Energy Savers program.

While direct efforts creating new energy-related jobs in Howard County are difficult to quantify, there are also steps that can be taken to support workforce development and job creation. Numerous entities can be leveraged to support this objective including Howard Community College, Civic Works-Retrofit Baltimore, local trade associations, related businesses, and Howard County offices. The strategies contained in this report are intended to serve as examples of viable steps Howard County can take to energy jobs. These strategies consist of:

5. **Cultivating strategic partnerships with non-profit, education, and small businesses to leverage funds, and expertise to foster clean technology workforce/skillset development and growth.** Key aspects of this effort would include:
 - a. Leveraging the Howard County Tech Council as an umbrella entity; and
 - b. Establishing partnerships between the Maryland Center for Entrepreneurship, Howard Community College’s Center for Entrepreneurial and Business Excellence, and Johns Hopkins’ ARL to create local technology transfer initiatives that will create an entrepreneurial energy innovation hub in the County.
6. **Establishing a regional green energy certification training and testing center in Howard Community College’s Division of Continuing Education and Workforce Development** to equip training laboratories and develop and offer approved training curricula in face-to-face, online, and hybrid formats that will prepare contractors and technicians for nationally recognized certification tests also offered in the same location to create “one-stop-shop” convenience for interested constituencies.
7. **Leveraging the Economic Development Authority and the Office of Workforce Development** to continue strategic efforts to actively promote the energy efficiency and renewable energy industry within the County.

Background

Supplemental Information on Updating Green Building Tax Incentives

The following items provide additional recommendations associated with Howard County’s existing green building incentive programs:

1. Extend the expiration date for existing green building incentives which are currently set to expire in June 2017.

2. Conduct a review of the County's current commercial and residential green building tax incentives. Compare them to those offered by other Maryland jurisdictions with the intent to provide incentives which are, at minimum, on par with neighboring jurisdictions.
3. Evaluate the continued relevance of the Green Neighborhood certification path for purposes of tax credits. If this path is not being utilized, consider eliminating it from the list of eligible certifications.
4. Expand the list of eligible certifications to include all Leadership in Energy and Environmental Design (LEED) rating systems.
5. Evaluate the impact of the LEED v4 update. Determine whether or for how long the County will continue to incentivize the current versions which expired on October 31, 2016, and at what point certification under LEED v4 will be required to secure tax incentives.
6. Evaluate the impact of the 2015 National Green Building Standard (NGBS) update. Determine whether or for how long the County will continue to incentivize the current 2012 version. This version is scheduled to expire on June 30, 2017 but will be available to all projects registered prior to that date and completed by December 31, 2021. Determine at what point certification under the 2015 NGBS will be required to secure tax incentives.
7. Clarify intent of the Green Building Tax credit program, *"intended for those buildings that do not meet the criteria for the High Performance Building Credit. This credit is a percentage of the amount spent to install an energy conservation device in a LEED certified building for a period of three years. The credit may not exceed the amount of the County taxes owed on the building."* The applicability of this credit can be made less ambiguous by explicitly stating under what circumstances the credit might be available, and by providing an example of a project ineligible for the High Performance Building Credit but still eligible for the Green Building Tax Credit.

ENERGY RELIABILITY AND RESILIENCY

Objective

The Energy Reliability and Resiliency subcommittee explored the current state of energy reliability and resiliency in Howard County. For Task Force purposes, energy reliability was defined as the ability to provide the routine energy needs of County residents, businesses, agencies, and industries for the present and for the next few years. Resiliency, in this context, is defined as the ability to withstand or recover from interruptions to the County's energy infrastructure. As described in Howard County's Hazard Identification and Risk Assessment, the most likely examples of such interruptions would include severe weather, utility disruption, or communications infrastructure failure.¹¹ Many actions that can be taken now to improve reliability will also improve resiliency. For example, electrical service looping (supplying from both ends) and underground (instead of stringing on poles) wiring will help the community recover faster from routine and disastrous disruptions.

Howard County is fortunate to have a relatively new energy infrastructure that has been able to expand with its growing population. There is land available now to continue that expansion at least for the

¹¹ Howard County Office of Emergency Management, "Community Hazard Handbook," <https://www.howardcountymd.gov/Departments/Fire-and-Rescue/Office-Of-Emergency-Management/Hazard-Information>.

electric distribution network. Plans should be made now for future growth and increased reliability. Liquid and gaseous fuels which must travel over road, rail, or pipeline are more constrained by rights of way, required setbacks or easements, and reliance on other jurisdictions. Point-of-sale transactions can also slow the flow of energy and can hamper emergency response pending the legal declaration of a disaster. Legislation, procedures, policies, Memoranda of Understanding (MOU), and contractual obligations should be established to be prepared for disaster and future growth and events.

The subcommittee's recommendations can be grouped into four broad areas:

1. **Partnerships** – Cultivate strategic partnerships with all of the entities who impact energy in Howard County. With these partners, the County needs to develop better policies to make the County more energy resilient. (Proposed Director of Energy, BGE, County Executive's Office)
2. **Planning** – Energy reliability and resiliency need to be included in all aspects of County planning. Infrastructure growth, distribution networks, and control systems must be planned rather than filling needs on an *ad hoc* basis as they develop. An example would be the current BGE/Md. State critical facilities list. (Department of Planning and Zoning, Department of Inspections, Licenses and Permits)
3. **Community Outreach** – The education community can be called upon to support needed infrastructure and can be better prepared to help themselves and the community in emergencies. (Office of Emergency Management)
4. **Improvements** – Implement specific resiliency improvements across the County. These improvements will help the entire County by preventing or preparing for disasters in areas that will require extreme amounts of County resources to respond to. Although the micro-grid proposed for Kings Contrivance was not approved by the PSC, the County should consider partnering with BGE on a micro-grid for the County Office Complex. Such a project may be viewed more favorably by providing broader community benefit. In addition, the deployment of backup generation, either permanently installed or mobile with pre-connections, should be considered for key facilities that serve vulnerable populations in the County. (Department of Public Works)

Recommended short-, medium- and long-term goals have been noted on the subcommittee's matrix.

As Howard County continues to grow in population, density, industry, and development, its use of energy will continue to grow in both complexity and volume. Dependence on reliable energy will become increasingly more important to maintain the County's citizens' quality of life, and resilience to disaster will be necessary to preserve the lives of its citizens. County government should take the lead in bringing the divergent and competing interests into focus on energy and plan for the future as well as react to current needs.

Table of Recommendations and Strategies

Energy Management & Efficiency Subcommittee				
	Recommendations	Strategies		
		Short-term	Mid-term	Long-term
1.	Conduct a Gap Analysis	<ol style="list-style-type: none"> 1. Determine and assess the current resource policies procedures. 2. Establish a Resource Consumption baseline by 2019. <ol style="list-style-type: none"> a. Facilities b. Fleet c. Water/Wastewater 3. The baseline will be used to establish a realistic goal for future energy reductions. 4. Determine the best analytical tool such as Portfolio Manager. 5. Establish a baseline for PM Services 	<ol style="list-style-type: none"> 1. Establish goals for energy reductions and a plan to measure the energy savings. 2. Establish goals for Preventive Maintenance (PM) Services. 	<ol style="list-style-type: none"> 1. Create standards for new buildings and existing buildings for continued reductions. 2. Establish standards for regular and routine PM such as a facility condition assessment.
2.	<p>Establish a capital budget line item dedicated to the installation and/or upgrade of equipment to optimize energy efficiency. The amount should be 5% of the County’s total annual expenses related to electricity, natural gas, fuel oil, gasoline, water, etc. This capital funding will be applied to assist the County in achieving a County-wide reduction in Energy Intensity or similar index to be determined subsequent to the Gap analysis. However, a 15% reduction by the year 2026 would be a reasonable goal.</p>	<ol style="list-style-type: none"> 1. Evaluate current staff and assignments as it relates o energy consumption/data management across the County. Hire a “Director of Energy” reporting directly to the Office of the County Executive with his/her full support. This position would manage the Gap Analysis and work across all departments to create reduction goals. The focus for the Director of Energy is energy efficiency and maintenance issues, development of goals, strategies, standardization and best practices, and reporting results. 2. Assign one full-time staff member for each County department to develop a list of projects to accomplish this goal. 3. This same staff person will be responsible for monitoring available and applicable rebates/grants/optional funding sources. 	<ol style="list-style-type: none"> 1. Hire or reassign additional staff members based on needs analysis to manage data and create a centralized resource for best practices and standards adopted by the County, and continue the research to stay current on new and emerging technologies. 2. Investigate the potential benefits of Internet of Things (IoT) for advanced building analytic capabilities and determine if and when this could be adopted. 	<ol style="list-style-type: none"> 1. Hire or contract with a marketing & communications coordinator to help create strategic and impactful messaging to increase environmental literacy. 2. Develop an ongoing plan for continued focus on energy efficiency and maximizing available outside resource for information of state-of-the-art and new technologies beyond the first five years.

Table of Recommendations and Strategies

Energy Management & Efficiency Subcommittee				
	Recommendations	Strategies		
		Short-term	Mid-term	Long-term
3.	Empower and challenge each County department to reduce resource consumption. It is essential that a method is established to allocate utility usage to specific agencies that occupy a single metered facility and that a complete data analysis of current billing structure by department is performed. Tying in consumption to individual cost centers will engage department representatives to buy into the resource focused budget. Additionally, a regular annual report will be produced to reflect and evaluate each agency's efforts and successes.	<ol style="list-style-type: none"> 1. Complete a data analysis of current billing structure by department. 2. Establish a method to allocate usage to multiple agencies that occupy a single metered facility. 3. Develop a telecommuting policy to encourage County employees and establish a telecommuting platform by FY 2019. 	<ol style="list-style-type: none"> 1. Engage agency representatives to get buy-in on the resource focused budget. 	<ol style="list-style-type: none"> 1. Create regular annual reporting to reflect each department's efforts and successes.
4.	Cultivate strategic partnerships with government, non-profit, education and small businesses to leverage funds, knowledge, and efficiency to improve knowledge base, establish a best practices library, and foster the general and consistent messaging regarding conservation.	<ol style="list-style-type: none"> 1. Identify strategic partners by reviewing existing programs and services – grants, rebates, and federal incentives as available. 	<ol style="list-style-type: none"> 1. Create energy budgets by agency so each agency has the ability to directly affect its energy consumption. 2. Provide opportunities and education on a continuing basis for new technologies and sharing of concepts and include Howard Community College and Howard County Public Schools. 	<ol style="list-style-type: none"> 1. Build public/private partnerships to leverage resources to expand efficiencies as well as staying current on best practices and technologies. 2. Develop education and outreach materials for use in engaging various stakeholders.
5.	Aggressively pursue innovative sources of funding.	<ol style="list-style-type: none"> 1. This could include utility rebates, energy performance contracting, public-private partnerships, grants, and green bonds. 		

Table of Recommendations and Strategies

Renewable Energy Subcommittee				
	Recommendations	Strategies		
		Short-term	Mid-term	Long-term
1.	Where cost-effective, install large (greater than 100 kW) renewable generation projects on County land. Candidate projects include solar generation at the Alpha Ridge Landfill (ARL), Carr’s Mill, and the Little Patuxent Water Reclamation Plant (LPWRP). Assessment of economic feasibility should be conducted and updated prior to contract award.	1. Conduct preliminary engineering and economic analyses to assess the physical and economic potential for large renewable generation installations at County-owned sites, with initial assessment on the ARL, Carr’s Mill, and the LPWRP.	1. Implement those projects that are feasible and desirable from an engineering/economic perspective. 2. Continue the program of identification and evaluation as long as potential locations exist with adequate land availability and sufficient electric power loads to warrant consideration.	1. Monitor market conditions and relevant economic factors (e.g., costs of installation) to determine if projects previously evaluated and found not to be viable warrant updated evaluation and renewed consideration.
2.	The County should maximize the installation of rooftop solar projects on County schools and government buildings to the full extent of physical and economic viability.	1. Determine the physical and economic potential for rooftop renewable generation installations at County schools and other County government buildings; for example, the Meadowbrook Athletic Complex.	1. Implement those projects that are feasible and desirable from an engineering/economic perspective. 2. Continue the program of identification and evaluation as long as potential locations exist with compatible roofs.	1. Monitor market conditions and relevant economic factors (e.g., costs of installation) to identify projects previously evaluated and found not to be viable but which may warrant updated evaluation and renewed consideration.
3.	Review and reassess County zoning regulations and restrictions related to renewable generation development to ensure consistency with the County’s goals and priorities regarding agricultural land preservation, open space preservation, and quality of life considerations.	1. Review current zoning regulations and restrictions affecting new electric generation facility development to ensure consistency with other County objectives and modify the relevant regulations/restrictions as warranted.	1. Conduct periodic reviews of County siting restrictions to ensure continued consistency with other County objectives.	1. Continue periodic reviews of County siting restrictions to ensure continued consistency with other County objectives.

Table of Recommendations and Strategies

Renewable Energy Subcommittee				
	Recommendations	Strategies		
		Short-term	Mid-term	Long-term
4.	Actively facilitate and promote development of community solar projects to take advantage of a program that may be available only for a limited time. In addition to general promotion activities, the County should consider low-cost land leases for community solar development.	1. Working with BGE, the County should explore methods by which it can position itself to take full advantage of this program once the program is opened by BGE for enrollment. One method to be considered is to provide low-cost land leases for County land that could be used for community solar development.	1. Implement additional community solar project development activities where feasible, incorporating lessons learned from initial projects.	1. Once projects are implemented, the County's role would be limited. Ensure the adequate decommissioning of the project at the end of the useful life of the project (20-25 years).
5.	Work with the Baltimore Regional Cooperative Purchasing Committee (BRCPC) to increase purchase of Renewable Energy Credits (RECs) that promote Howard County renewable projects.	1. Work with BRCPC to monitor RECs markets and identify opportunities to purchase RECs to support Howard County projects.	1. Continue monitoring and coordinating activities with BRCPC.	1. Continue monitoring and coordinating activities with BRCPC.

Table of Recommendations and Strategies

Workforce Development and Job Creation Subcommittee				
	Recommendations	Strategies		
		Short-term	Mid-term	Long-term
1.	Refine existing tax incentives to promote energy efficiency investment by the residential and commercial sectors.	<ol style="list-style-type: none"> 1. Evaluate existing energy efficiency/green building tax credits and penetration rates. 2. Evaluate new tax credits (e.g., tax credit for Home Performance with ENERGY STAR participation) to increase activity levels. 	<ol style="list-style-type: none"> 1. Develop new tax credits or other incentives to promote energy efficiency activity in the residential and commercial sectors leveraging the ENERGY STAR brand and standards. 	<ol style="list-style-type: none"> 1. Monitor program participation rates and make adjustments as needed.
2.	Develop commercial building energy efficiency programming to encourage the use of the recently established Property Assessed Clean Energy (PACE) funding mechanism as a tool to enable energy efficiency improvements.	<ol style="list-style-type: none"> 1. Engage local clean technology firms to actively promote PACE to potential customers. 2. Evaluate complimentary programs for commercial properties (e.g., ENERGY STAR building promotion, energy consumption reporting) as motivation for PACE projects. 	<ol style="list-style-type: none"> 1. Develop and implement commercial EE/RE programming leveraging PACE. 	<ol style="list-style-type: none"> 1. Monitor PACE program participation rates and make adjustments as needed.
3.	Evaluate Howard County policies and regulations for opportunities to stimulate or address obstacles for EE/RE activity including enforcement of current Maryland Building Performance Standards.	<ol style="list-style-type: none"> 1. Identify strategic commercial entities associated with EE/RE in Howard County. 	<ol style="list-style-type: none"> 1. Hold a forum with commercial entities to explore policies to stimulate or address obstacles to the industry (e.g., require a home energy audit as part of every residential home sale). 	<ol style="list-style-type: none"> 1. Implement policy changes to help foster EE/RE economic activity.
4.	Evaluate and refine existing Office of Community Sustainability programming to promote EE/RE efforts.	<ol style="list-style-type: none"> 1. Host an EE/RE program and incentives forum to educate commercial and residential property owners on available tools and identify knowledge/incentive gaps. 2. Engage program allies such as BGE and MEA to help effectively tailor programming. 	<ol style="list-style-type: none"> 1. Develop and implement enhanced EE/RE programming leveraging ENERGY STAR and other resources. 	<ol style="list-style-type: none"> 1. Monitor program participation rates and make adjustments as needed.

Table of Recommendations and Strategies

Workforce Development and Job Creation Subcommittee				
	Recommendations	Strategies		
		Short-term	Mid-term	Long-term
5.	Cultivate strategic partnerships with non-profit, education, and small businesses to leverage funds and expertise to foster clean technology workforce/skillset development and growth.	<ol style="list-style-type: none"> 1. Identify strategic partners by reviewing existing programs and services associated with EE/RE in Howard County (e.g., Howard County Tech Council and MD Center for Entrepreneurship). 	<ol style="list-style-type: none"> 1. Form a committee from the construction/HVAC/remodeling industry to advise on the needs and opportunities for EE/RE technology soft skills and hard skills 2. Develop forum for aligning industry needs with local training/educational capacity 	<ol style="list-style-type: none"> 1. Develop formal programming to facilitate educational pathways and linkages to employers
6.	Establish a formal clean energy certification training and testing center at Howard Community College (HCC)	<ol style="list-style-type: none"> 1. Engage HCC education and workforce development division to determine existing status of related programs and determine opportunities for expansion 	<ol style="list-style-type: none"> 1. Provide support for HCC efforts to increase training and testing capacities associated with clean energy technologies and practices 	<ol style="list-style-type: none"> 1. Monitor program developments at HCC and support adjustments as needed based on industry trends and participation rates
7.	Leverage the Economic Development Authority and the Office of Workforce Development to continue strategic efforts to actively promote the EE/RE industry within Howard County.	<ol style="list-style-type: none"> 1. Explore specifically promoting HC as a preferred location for EE/RE related businesses. 2. Engage the Chamber of Commerce as a promotional partner. 	<ol style="list-style-type: none"> 1. Explore other pro-active steps such as economic development zones to encourage EE/RE industry growth. 	<ol style="list-style-type: none"> 1. Monitor how the EE/RE industry develops in HC and revisit programming as needed.

Table of Recommendations and Strategies

Energy Reliability & Resiliency Subcommittee				
	Recommendations	Strategies		
		Short-term	Mid-term	Long-term
1.	Partnerships – Office of Community Sustainability will collaborate with all entities concerned with energy in Howard County to develop better policies to improve resilience.	1. Identify partners and stakeholders to include representatives from Director of Energy, BGE, and the County Executive’s Office.	1. Hold an open forum to foster community input and to research and launch efforts.	1. Form a long-term advisory committee for continued collaboration and development of energy resilience.
2.	Planning – Department of Planning and Zoning and Department of Licensing & Permits will include concerns about reliability and resiliency in all areas of County planning decisions.	1. Evaluate existing planning and zoning regulation & examine inspection, licensing, and permitting procedures.	1. Propose or support the implementation of regulations, codes, etc. that foster energy-resilient plans and building.	1. Monitor results & adjust planning and codes.
3.	Community Outreach – Office of Emergency Management will educate community to prepare for and respond in emergencies and support needed funding.	1. Join existing events to promote resilience (examples: 50+ EXPO & GreenFest).	1. Stage resilience EXPO, and/or hold multi-department forums for community outreach and preparedness.	1. Large-scale community response exercise.
4.	Improve Infrastructure – Department of Public Works will identify and implement improvements.	1. Continue to research and identify potential pilot microgrids.	1. Coordinate with BGE and County departments for a microgrid in Ellicott City County Complex.	1. Plan for energy needs of vital and vulnerable population support centers with additional backup generation.

Appendix A - Howard County Energy Task Force Members

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Appendix B - Howard County Energy Task Force Presenters

In addition to the expertise brought by the task force members, some outside speakers were brought in to Energy Task Force meetings. The presenters and their topics were:

Laura A.T. Miller
Howard County Office of Community Sustainability
Topic: Overview of Howard County's energy projects

Daryl Paunil
Bureau of Facilities, Howard County Department of Public Works
Topic: Bureau of Facilities energy efficiency efforts

Jeff Jerome
BGE
Topic: BGE Smart Energy Savers Program

Karen Galindo-White
Energy Systems Group
Topic: Converting street lighting to more energy efficient options

Stuart Kaplow
Kaplow Attorneys at Law
Topic: Financing energy projects through PACE programs

Geoff Mirkin,
Solar Energy World
Topic: Solar energy

R. Daniel Wallace
Bith Energy
Topic: Solar energy

Edgar Swain
Howard Community College
Topic: Green energy sector, green jobs and career training

Tony Rosano
Howard County Office of Emergency Management
Topic: Energy resiliency and energy issues relevant to emergency planning

Rich Reis
Maryland Sierra Club
Topic: Environmental group perspective on energy issues