State Spending on Greenhouse Gas Reduction in Maryland in Fiscal Year 2024

SCHOOL OF PUBLIC POLICY
CENTER FOR GLOBAL SUSTAINABILITY

Maryland Department of the Environment

MORGAN STATE UNIVERSITY

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Executive Summary

The Climate Solutions Now Act (CSNA) of 2022 adopted an ambitious set of greenhouse gas (GHG) emission goals for the state of Maryland. As a part of that law, the Maryland General Assembly directed the Maryland Department of the Environment (MDE) to produce an annual report that identifies the total amount of state money spent on measures to reduce greenhouse gasses (and, to the extent practicable, co-pollutants) during the immediately prior fiscal year. In addition, the report is required to present the percentage of that funding that benefited disproportionately affected communities, as defined by the Climate Vulnerability Score Tool developed by MDE. This report is the second annual report and covers spending during fiscal year 2024.

This report represents a more comprehensive reporting on state spending than the first report, prepared for fiscal year 2023. In that initial report, data were collected only from the nine agencies that are required by the law to report annually on their GHG reduction efforts. For the FY24 report, we collected data from the 26 agencies (including the nine from the FY23 report) that were required, according to Governor Moore's Executive Order 01.01.2024.19,[1] to develop Climate Implementation Plans (CIPs). The report also presents a methodology for reporting spending on emissions reduction that occurred in sectors covered by the state GHG emissions inventory reporting requirements. This inventory divides emissions into eight categories: electricity, transportation, fuel use in buildings (inclusive of residential, commercial, and industrial), industrial processes and product use (IPPU), fossil fuel industry, agriculture, waste management, and forestry and land use. For the purposes of this report, all spending is considered GHG reduction spending if it reduces emissions or increases sequestration of GHGs across any of these categories. Because of data limitations, spending on co-pollutants is not analyzed separately in this report.

The state agencies responded to a questionnaire requesting information about spending at the program level. A questionnaire was selected as the mode for data collection as there is currently no centralized source of data that tracks GHG reduction spending in the manner required for the report. The key findings are outlined below. Because state agencies are not currently required to track spending specific to GHG measures, these are, in most cases, rough estimates. They are, however, the most precise numbers that can be provided at present, given data limitations and time constraints.

Key Findings:

- Of the 26 agencies surveyed, 17 reported spending to reduce GHG emissions in fiscal year 2024. Combined, these 17 agencies spent an estimated $3.1 billion on measures that reduce GHG emissions, as defined below. This represents 10% of the budgets for the 26 agencies surveyed and 7.8% of the total budget of the state of Maryland.

- The spending on GHG emission reductions falls into many different categories, with the most prevalent being spending to promote the efficiency of energy use in buildings and reduce emissions from transportation.

- On average, agencies estimated that 30.64% of their GHG reduction spending benefited disproportionately affected communities.

- To improve the accuracy of future annual spending reports, we recommend that state agencies coordinate with MDE to develop a methodology to enhance the data collection procedure.

Introduction

In the Climate Solutions Now Act (CSNA) of 2022, Maryland set the most ambitious state-level greenhouse gas (GHG) reduction goal in the United States with a target of a 60% reduction in GHG emissions by 2031 and net-zero GHG emissions by 2045. As Maryland develops policies and programs to reach these goals, it will be essential to incorporate equity considerations into spending decisions so that no one is left behind in Maryland's transition to a clean economy. Prioritizing equity can also ensure that the benefits of emission reductions, such as the creation of green jobs and health improvements due to cleaner air and water, are enjoyed by everyone throughout the state.[2] However, a key requirement to enable equitable outcomes is to accurately track and report spending on emissions reduction activities in the state budget. In recognition of this need, the CSNA required that the Maryland Department of Environment (MDE) report annually on the amount of state spending directed towards GHG emission reductions, on co-pollutant reductions to the extent possible, and on the amount of this spending that is directed towards disproportionately affected communities. Here, we provide the second annual report on this information. The specific language included in the CNSA that requires this report is included as part of the questionnaire completed by agencies in Appendix 3.

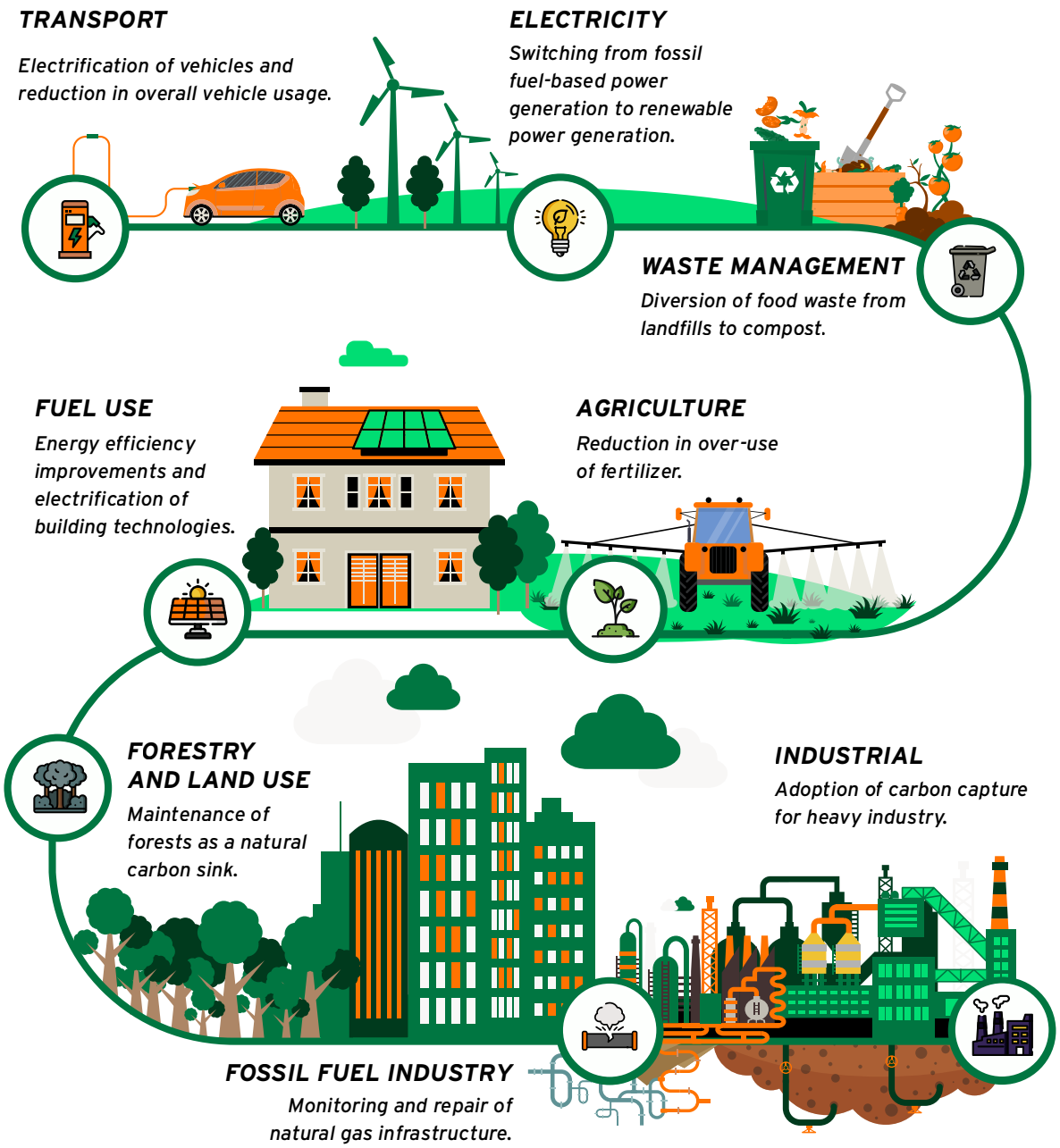
The report outlines a methodology for reporting GHG reduction spending at state agencies in congruity with the state's GHG inventory.[3] Maryland's GHG inventory divides emissions into eight categories: electricity, transportation, fuel use in buildings (inclusive of residential, commercial, and industrial), industrial processes and product use (IPPU), fossil fuel industry, agriculture, waste management, and forestry and land use. For the purposes of this analysis, we disaggregate fuel use into fuel use in buildings and fuel use in industry. We also provide agencies the option to select an "other" category and provide an explanation of activities that may not fit clearly into one of these categories. As a result, in this report, we provide information on a total of ten categories, instead of the eight categories used in Maryland's GHG inventory. Appendix 3, which includes the text of the questionnaire that the agencies completed, has a more detailed description of these categories.

The electricity sector includes emissions from all power generation within the state, as well as an estimate of emissions from electricity that is imported from outside of Maryland. The transportation sector is the largest source of emissions, primarily due to on-road gasoline and diesel vehicles. Fuel use in buildings includes emissions from all fossil fuel use in commercial, residential, and industrial buildings from activities such as heating and cooking. The IPPU sector includes a diverse range of GHG sources, ranging from process emissions in cement manufacturing to non-CO_2 emissions from air conditioning and refrigeration. Fossil fuel industry emissions in Maryland primarily consist of natural gas transmission and distribution. Maryland's agriculture sector primarily emits non-CO_2 GHGs from sources such as manure management and

agricultural soils. The waste management sector also primarily emits non-CO_2 gases from landfills, waste incineration, and wastewater. The forestry and land use sector includes negative emissions from the sequestration of greenhouse gasses in natural sinks such as forests.

All spending is considered to be GHG reduction spending if it reduces emissions or increases sequestration of GHGs across any of these categories, even if that is not the primary intent of the spending program. Due to constraints on data availability, spending on co-pollutant reductions is not analyzed explicitly in this report.

Figure 1. Examples of sectoral strategies to reduce greenhouse gas emissions.



In January 2024, Maryland Governor Wes Moore issued Executive Order 01.01.2024.19, *Leadership by State Government: Implementing Maryland's Climate Pollution Reduction Plan*.[1] This executive order noted that Maryland has seven years to achieve its goal of 60% reduction in emissions by 2031, and 21 years to reach its goal of net-zero emissions by 2045. As reaching these goals will involve all state agencies taking actions in both the short and long term, the order required each agency to develop a "Climate Implementation Plan" (CIP), defined as "a document outlining the steps a State agency will take to implement the Climate Solutions Now Act of 2022 and Maryland's Climate Pollution Reduction Plan, and the time, personnel, and funding it will take to implement both."

Twenty-six state agencies were required to develop CIPs as a result of this Executive Order. The agencies that were required to submit CIPs, and were also in last year's report (because they were identified in the CSNA as those annually required to report to the Governor and the Commission on their GHG reduction activities), include:

- The Department of the Environment
- The Department of Agriculture
- The Department of General Services
- The Department of Housing and Community Development
- The Department of Natural Resources
- The Department of Planning
- The Department of Transportation
- The Maryland Energy Administration
- The Public Service Commission

Reporting this year was expanded to include all agencies that were required to prepare CIPs. This means that, in addition to the agencies listed above, we have also included the following 17 additional agencies in this year's report:

- Department of Budget & Management
- Department of Human Services
- Department of Juvenile Services
- Department of Commerce
- Department of Information Technology
- Department of Public Safety & Correctional Services
- Department of Service & Civic Innovation
- Department of Veterans & Military Families
- Department of Emergency Management
- Department of Health
- Department of Labor
- Department of Aging
- Department of Disabilities
- Department of State Police
- Maryland Higher Education Commission
- Department of Education
- Office of the Secretary of State

Each of these agencies was asked to estimate how much state money it spent on measures that reduce GHG emissions. Estimates excluded federal funds and included program spending as well as salaries and benefits of staff working on these programs. In this latter case, agencies were asked to estimate the amount of time they spent on relevant program activities. It is important to note that state agencies are not currently required to track GHG reduction spending and have not (prior to the requirement for this report) ever been asked to report such spending after the end of the fiscal year. Therefore, the numbers provided in this report should be read as estimates. They are, however, the most precise numbers that can be provided at present, given data limitations and time constraints. It is also important to keep in mind that roughly two-thirds of the agencies being asked to report have been included in the study for the first time, meaning that they have never been asked to provide such data before.

In addition to total state expenditures on GHG reduction, these agencies were also asked to estimate the percentage of those funds that benefited disproportionately affected communities. The definition of disproportionately affected communities in Maryland is incorporated into the methodology adopted by the Department to identify communities disproportionately affected by climate impacts and used to develop the Climate Vulnerability Score Tool created by MDE.[4]

Definition of Greenhouse Gas Reduction Spending

In this questionnaire we categorize greenhouse gas reduction spending into nine categories consistent with MDE's GHG inventory, plus a tenth option open to greenhouse gas reduction spending that does not fit any other category. Spending is defined as any operating and capital spending which has the effect of reducing greenhouse gas emissions, whether or not that is the primary intention of the spending. This may include salaries, analysis, supplies and material, and any other spending that can be reasonably linked to any of the ten greenhouse gas reduction spending categories.

Definition of Disproportionately Affected Communities

Disproportionately affected communities are defined according to two sub-indices in MDE's Climate Vulnerability Score (CVS) Tool[4] — "community impact" and "climate exposure". The community impact index identifies communities that are overburdened, underserved, and lack tree canopy cover. Overburdened and underserved communities were defined in the CSNA by the legislature. The remaining criteria were identified through consultation with the Commission on Environmental Justice and Sustainable Communities (CEJSC) to evaluate the climate hazard exposure of a community, as described below.

Note that in the previous Climate Spending Report in FY23, the CVS Tool was not yet available, and the definition of disproportionately affected communities was taken solely as those that are over-burdened and underserved, as defined in the CSNA. This means that spending on disproportionately affected communities cannot be compared directly between last year and this year.

Definition of overburdened

Overburdened census tracts are defined as those that are exposed to significant pollution, that are in proximity to infrastructure that produces negative environmental effects, and that are composed of individuals who are more sensitive to environmental issues. Those three broad areas are measured through a list of 21 specific indicators. For a census tract to be considered overburdened, it must score above the 75th percentile statewide for at least three out of the following 21 indicators:

- (I) particulate matter (PM) 2.5;
- (II) ozone;
- (III) National Air Toxic Assessment (NATA) diesel PM;
- (IV) NATA cancer risk;
- (V) NATA respiratory hazard index;
- (VI) traffic proximity;
- (VII) lead paint indicator;
- (VIII) national priorities list superfund site proximity;
- (IX) risk management plan facility proximity;
- (X) hazardous waste proximity;
- (XI) wastewater discharge indicator;
- (XII) proximity to a concentrated animal feeding operation (CAFO);
- (XIII) percent of the population lacking broadband coverage;
- (XIV) asthma emergency room discharges;
- (XV) myocardial infarction discharges;
- (XVI) low-birth-weight infants;
- (XVII) proximity to emitting power plants;
- (XVIII) proximity to a toxic release inventory (TRI) facility;
- (XIX) proximity to a brownfields site;
- (XX) proximity to mining operations; and
- (XXI) proximity to a hazardous waste landfill.

Definition of underserved

Underserved census tracts are identified as those that, based on their socioeconomic and demographic indicators, have historically been shown to receive largely inadequate public services. For our purposes, census tracts that meet one or more of the following thresholds are considered underserved:

- at least 25% of the residents qualify as low-income;
- at least 50% of the residents identify as nonwhite; or
- at least 15% of the residents have limited English proficiency.

Revised and expanded definition of disproportionately affected for FY24

The "climate exposure" sub-index includes the following three elements:

1. Urban heat islands, defined as the areas of cities that are hotter than average temperature in that same city;
2. Percentage area and intensity of drought conditions; and
3. Watersheds with significant existing and future flooding impacts.

Together these two sub-indexes (community impact and climate exposure) are used to develop an index of disproportionately affected communities. Each of the 1,463 census tracts in the state receives a "score" from 0 to 100% based on these factors. MDE then classified the census tracts into four categories, based on the extent to which they are disproportionately affected:

- "Baseline", as census tracts with a score between 0 and 25%;
- "Low", with a score of greater than 25% but less than 50%;
- "Medium", with a score of greater than 50% but less than 75%; and
- "High", with a score of greater than 75%.

For the purposes of this study, we have defined "disproportionately affected" census tracts as those falling in the medium and high categories, according to the MDE methodology. This results in 717 of the 1,463 census tracts being included in the definition. This represents a substantial increase over those included in last year's report, where only 366 census tracts met the narrower definition used for FY23.

A map of the location of the disproportionately affected census tracts is provided in Appendix 1, along with a link to a list of the census tracts considered to be disproportionately affected. The questionnaire given to the agencies is included in Appendix 3.

Greenhouse Gas Reduction Spending

The online questionnaire, as noted above, was administered to the 26 agencies that were required to submit Climate Implementation Plans, per the Governor's Executive Order. Of these agencies, 17 of them reported that they had at least some FY24 spending that reduced greenhouse gas emissions. Of the remaining nine agencies, seven reported that they had no GHG reduction spending, and two did not respond to the survey. Appendix 2 describes the responses, by agency, and also lists the agencies that reported no GHG reduction spending and those that did not respond. The full questionnaire is available in Appendix 3. Of the 17 agencies that did report GHG reduction spending, that spending added up to $3,142,720,929 in FY24. As Figure 2 shows, this total represents an estimate of 10.1% of the total budget for the 26 agencies included in the study, and 7.8% of the total budget for the State of Maryland. Notably, 93% of the reported GHG reduction spending was incurred by the Department of Transportation, largely because of that agency's Transportation Emissions subprogram.

We use the total operating budget for each department to contextualize data and facilitate comparisons. The total budgets for each department and for the State of Maryland were collected through the Maryland Open Data Portal on November 8, 2024.[5] All figures represent actual spending for FY2024 operating budgets and exclude federal funds. Spending data provided by agencies also excludes federal funds, but might include capital spending.

Figure 2. Estimated Greenhouse Gas Reduction Spending, Totals, FY 2024. Note that the percentage of agency budgets is calculated relative to the aggregated budgets of the 26 agencies included in this study.

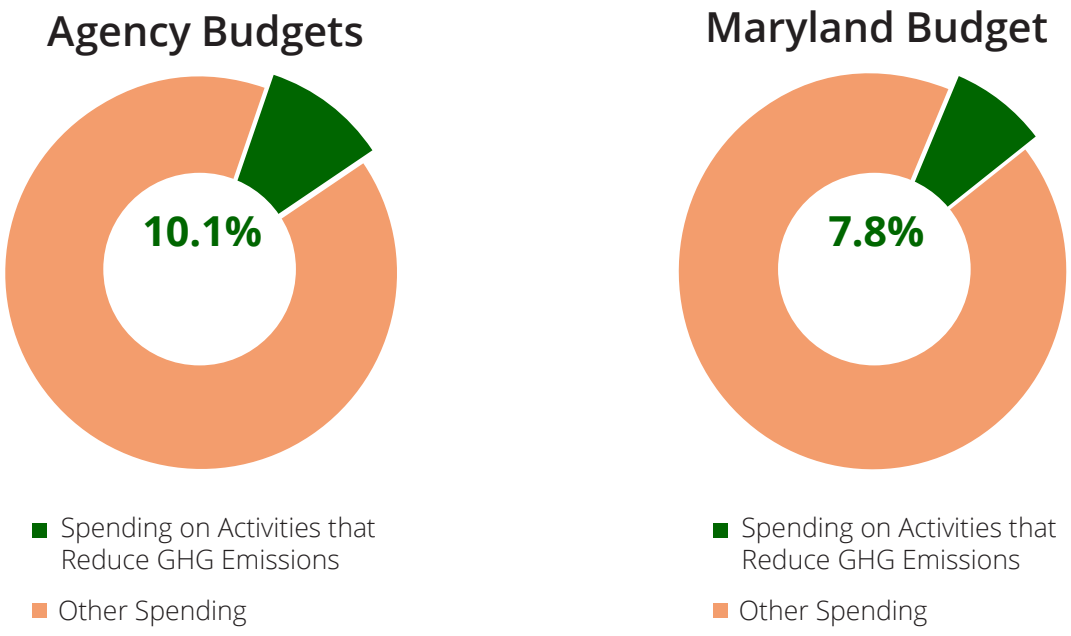
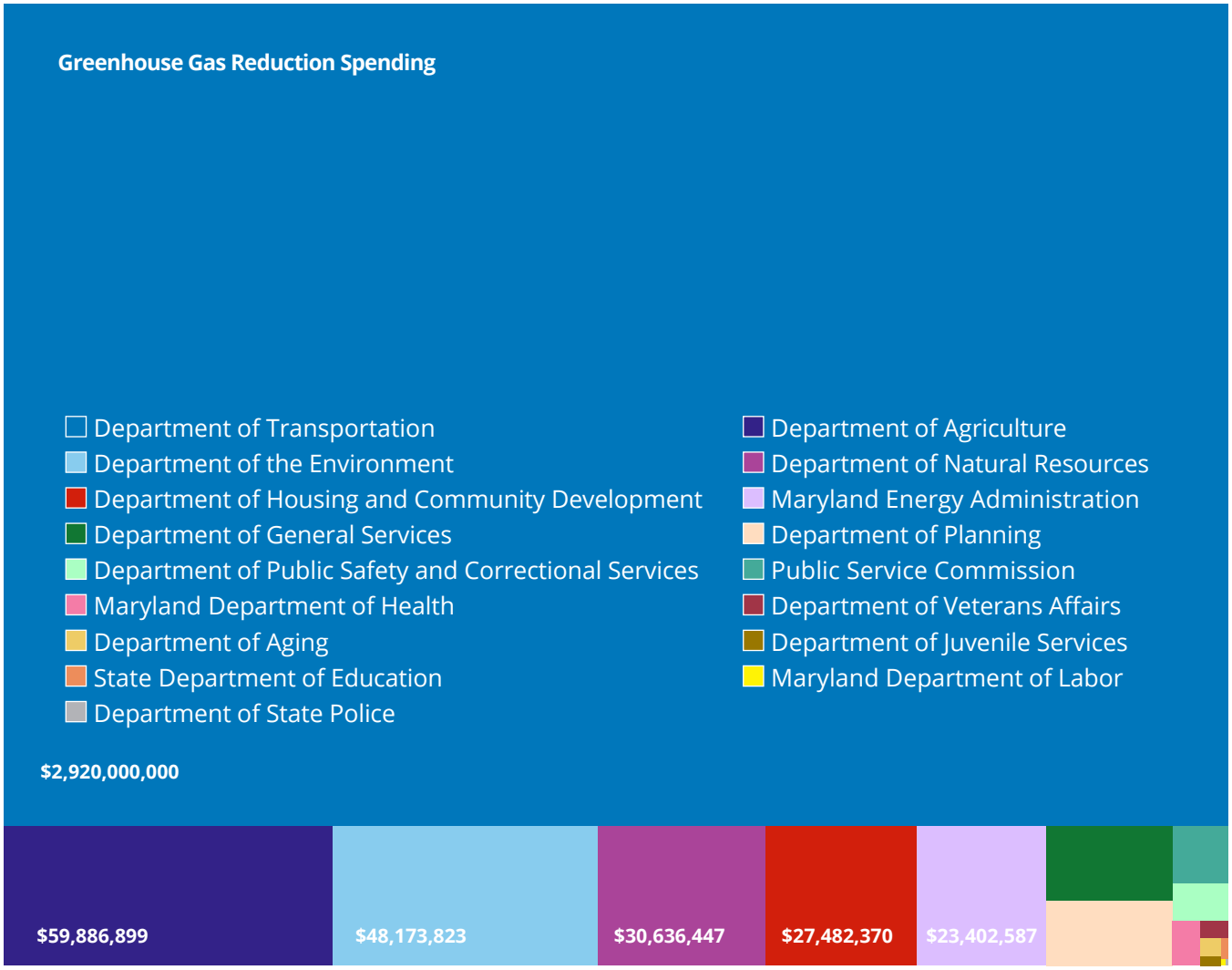


Figure 3. Estimated Greenhouse Gas Reduction Spending, by Agency, FY 2024. Agencies that spent less than 1% of their budgets on greenhouse gas reduction are not shown in the bar graph and include the Department of Public Safety and Correctional Services (0.17%), Department of Juvenile Services (0.08%), Maryland Department of Health (0.02%), Maryland Department of Labor (0.01%), State Department of Education (0%), and Department of State Police (0%).



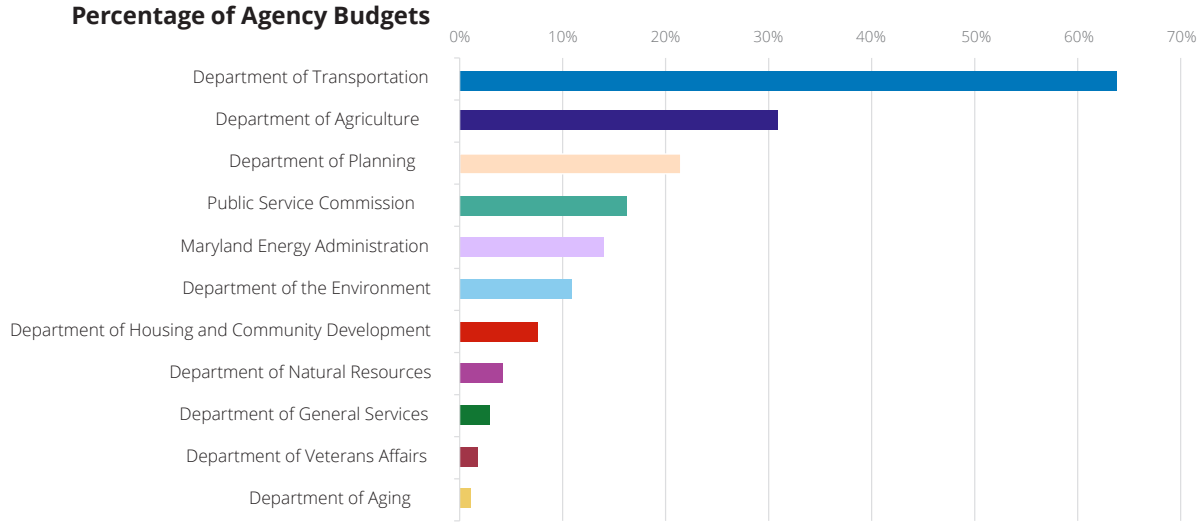


Figure 3 presents estimated GHG reduction spending disaggregated for each of the agencies that reported GHG reduction spending. The data show significant variation across agencies. The Department of Transportation (MDOT) estimated that their GHG spending was 63.8% of the total MDOT budget. Other agencies spending a significant percentage of their budgets on GHG reduction included the Department of Agriculture (30.9%), the Department of Planning (21.5%) and the Public Service Commission (16.3%). Note that comparisons between agencies should be handled carefully as this is the first time that many agencies have been asked to track this type of data, making it subject to potential database limitations, involuntary human errors, differences in measurement approaches, and other issues.

The 17 agencies who reported GHG reduction spending showcased a wide array of activities, (see Appendix 2 for full list of categories by agency), with all of the categories described in the introduction being selected by at least one agency. At the same time, most agencies do work that goes beyond the scope of a single category, averaging 2.4 categories per agency.

The two most selected categories are spending that reduces GHG emissions from energy used in buildings (selected by eight agencies) and spending that reduces transportation-related GHG emissions (selected by seven agencies). Some specific examples of spending that reduces GHG emissions from energy used in buildings include the EmPOWER program in the Public Service Commission that incentivizes energy efficiency throughout the state and offers programs to residential and commercial customers which reduce the need for fossil fuels. Similarly, the Department of Housing and Community Development has programs that retrofit residential single-family and multifamily buildings to make them more energy efficient. The Maryland Energy Administration promotes energy efficiency in moderate- and low-income households, and renewable energy in homes and commercial buildings. Examples that relate to transportation-related emissions include the Department of Transportation's projects on active transportation (bicycle and pedestrian), intelligent transportation systems, and advanced traffic management systems, among others. Other examples include the Department of General Services' promotion of electric vehicles for the state vehicle fleet, and the Department of the Environment's promotion of electric vehicle purchases by Marylanders.

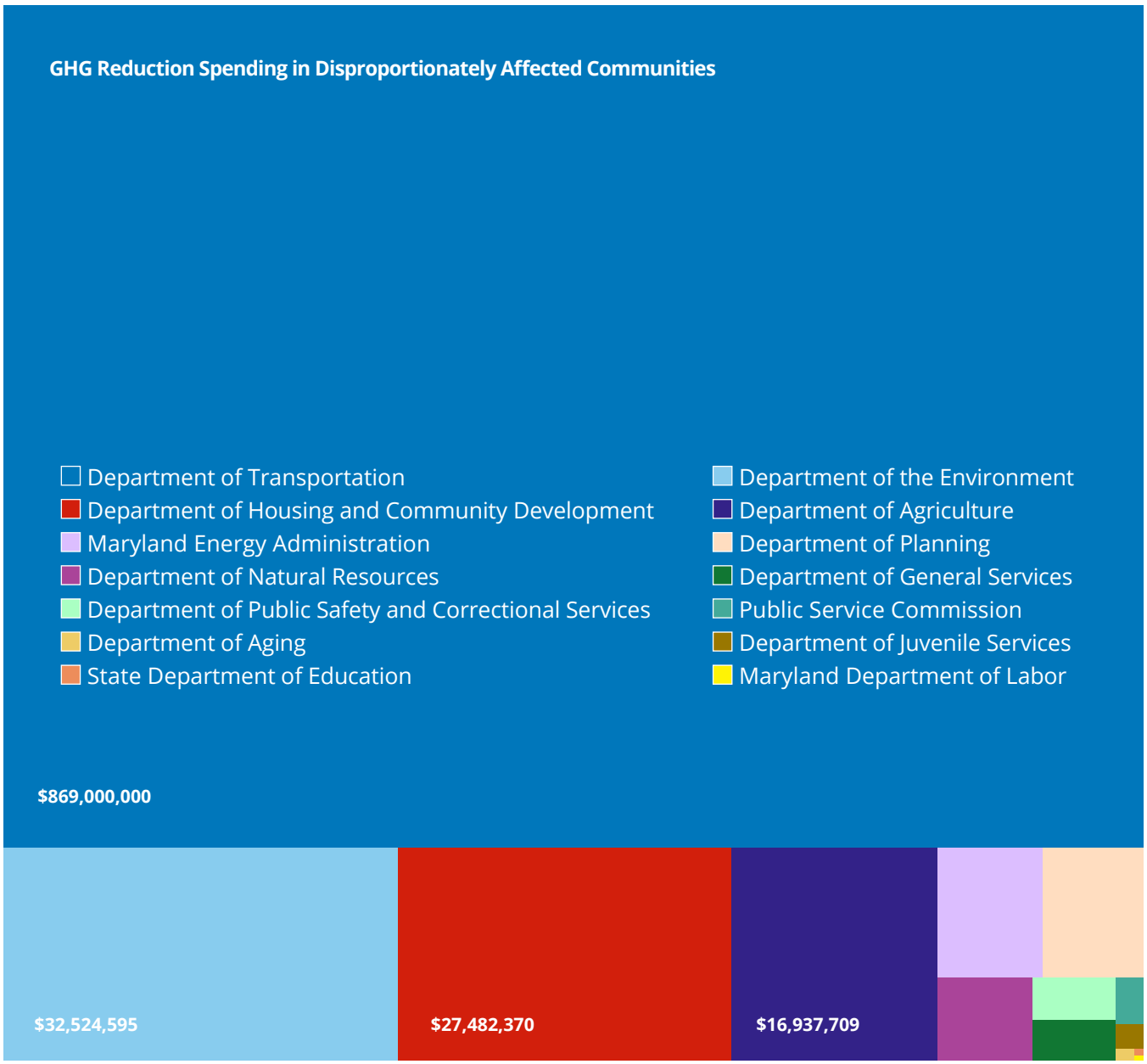
The third and fourth most selected categories are spending that reduces GHG emissions from waste management (selected by four agencies), and spending that reduces GHG emissions or increases carbon sequestration in forestry and land use (selected by five agencies). In the former case, the Maryland Department of the Environment funds waste diversion activities such as recycling, organic waste diversion, and composting, along with energy reduction, energy efficiency, and renewable energy generation at wastewater systems. In the case of forestry and land use initiatives, the Maryland Forest Service (part of the Department of Natural Resources) promotes carbon sequestration in forestry and land use through its management of state forests, and its promotion and implementation of the 5 Million Trees program. Another example in this category is the Department of Planning's promotion of the reuse of existing buildings, infill, and previously developed sites.

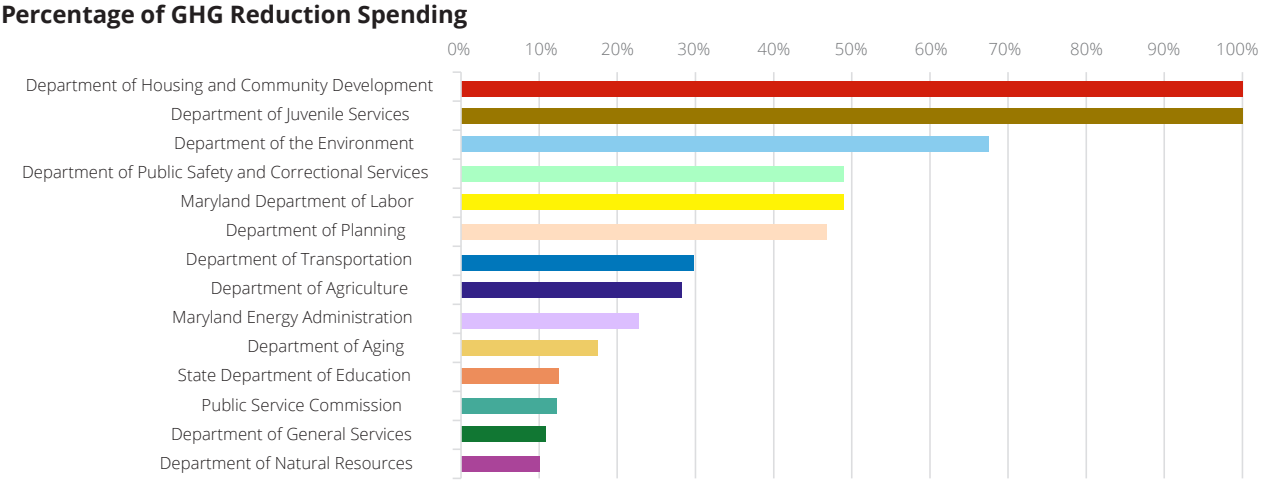
The Maryland Energy Administration provided multiple examples of spending that reduces GHG emissions from electricity generation, a category that was selected by three agencies. Funds support a wide range of activities, including solar energy development, offshore wind development, and renewable energy installations in homes and commercial buildings.

While each of the remaining categories was selected by only one or two of the 17 agencies, they included a number of notable activities. For example, the Public Service Commission promotes GHG reduction in the fossil fuel industry through its regulatory activities and oversight of compliance with energy and climate change programs, like the Renewable Portfolio Standard. The Department of Agriculture, in addition to promoting increased soil carbon sequestration, is focused on encouraging agricultural best management practices to decrease emissions in the sector more generally. In addition, some agencies reported practices that they felt did not fit into the nine categories identified in the survey. These included the Maryland Department of Aging's promotion of the reuse of durable medical equipment, the Maryland State Department of Education's initiatives to educate students on climate pollution reduction and environmental justice, and the Maryland Green Purchasing Committee chaired by the Office of Energy and Sustainability at the Department of General Services, which develops specifications for state agencies when procuring products and services to encourage sustainable and environmentally beneficial practices. Notably, these actions may also have the effect of reducing GHG emissions outside of Maryland when products or services are sourced from outside of the state.

The 17 agencies reported that a total of $962.9 million, or an estimated 31% of their combined GHG reduction spending, benefited disproportionately affected communities. Out of the total of $962.9 million, MDOT represents $869 million, or 90%, of the combined GHG reduction spending in disproportionately affected communities. This amount represents 29.8% of MDOT's total GHG reduction spending. The three agencies that reported the highest percentage of their GHG spending that benefited disproportionately affected communities are the Department of Housing and Community Development (100%), the Department of Juvenile Services (100%), and the Department of the Environment (67.4%), as seen in Figure 4. Figure 4 presents the estimated percentage of GHG reduction spending that benefited disproportionately affected communities disaggregated by each agency. In addition to the three agencies above, the three agencies that had total GHG spending exceeding $20 million and estimated that greater than 20% of their GHG reduction spending benefited disproportionately affected communities include MDOT (29.8%), the Department of Agriculture (28.3%), and the Maryland Energy Administration (22.7%).

Figure 4. Estimated Greenhouse Gas Reduction Spending in Disproportionately Affected Communities, by Agency, FY 2024





Recommendations for the Reporting Process

The following recommendations are based on the experience of the team that developed this report and the feedback from the agencies involved.

1) **Develop a budget code to track GHG reduction spending in real time.** Multiple agencies suggested that establishing a dedicated budgetary code would facilitate tracking of GHG reduction spending. Such a code would allow tracking as spending takes place and would potentially allow the inclusion of more programs within each agency. It may be necessary to develop a centralized requirement for such a code through the Department of Budget and Management in order to facilitate the tracking of this information. The sooner this occurs the more likely it is that the FY25 report will be easier to complete and include more accurate data.

2) **Expand expertise with or provide training for use of georeferencing tools.** Multiple agencies indicated that their project-level data are tracked by zip code, which was difficult for them to screen using a tool that identifies disproportionately affected communities based on census tracts. However, it can be challenging to provide these data on a zip code level, as one zip code can map to several census tracts. The research team was able to provide a solution for one agency. That agency provided the team with project-level data and those projects' associated addresses. The addresses were geocoded, or converted into geographic coordinates, and the census tracts from the CVS tool were overlaid in order to determine the disproportionately affected communities. This may not be a standard practice for agencies, so additional training or provision of technical assistance are needed if it is deemed that this process will be required on an annual basis and agencies do not have the in-house expertise to do so.

Conclusions

This report represents the second annual reporting of GHG reduction spending in Maryland, in response to the requirements included in the Climate Solutions Now Act. It has improved on the initial report by expanding the agencies included to all of those that were required to develop Climate Implementation Plans (CIPs), pursuant to Governor Moore's June 2024 executive order. As some agencies (particularly those surveyed last year, which are the ones with the most significant GHG reduction activities) have gained additional experience in reporting these data, we believe that we have made progress in improving the precision of the estimates included in this report. We remain convinced, however, that the development of more precise estimates would necessitate more systematic tracking of data throughout the year, rather than estimating spending after the fiscal year has ended. This is particularly true with respect to the data on spending affecting disproportionately affected communities. As MDE has now developed a methodology that is likely to be reused in future years, agencies should be able to use that information to better track their spending geographically. Since this is to be an annual report, we are confident that future reports will represent a more definitive accounting of this spending.

References

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(4) Maryland Department of the Environment. MDE Climate Vulnerability Score Tool 1.0. MDE Climate Vulnerability Score Tool 1.0. https://maryland.maps.arcgis.com/apps/instant/sidebar/index. html?appid=bfa2417b2c4f4c9a86c4b63cb8bd461f (accessed 2024-11-08).

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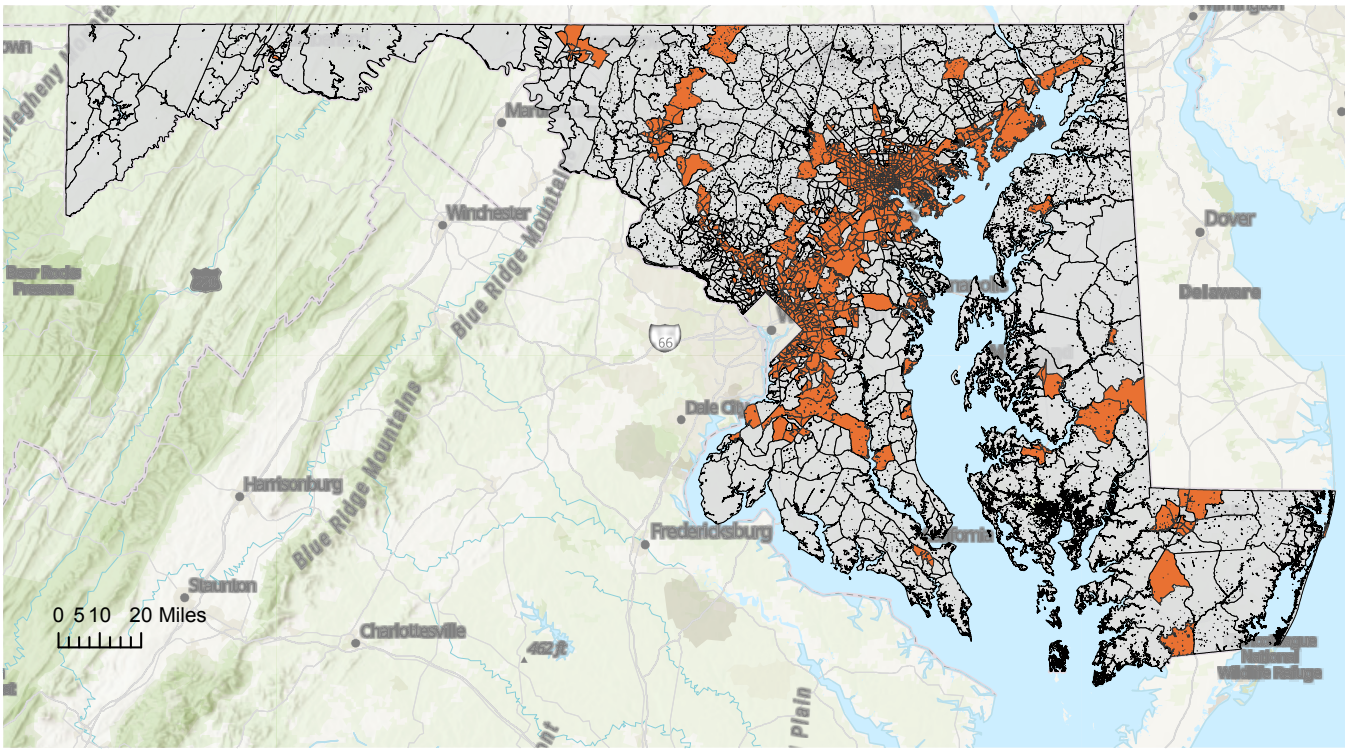
Appendix 1

Map of the 717 disproportionately affected census tracts



Disproportionately Affected Census Tracts

Disproportionately Affected

All others

A list of the 717 disproportionately affected census tracts (i.e., those with high and medium CVS percentiles) is available as a dataset appended to this report and at this link.

Appendix 2

Spending by Agencies Reporting GHG Reduction Spending

In all, 17 agencies (out of 26 contacted) provided estimates of both GHG reduction spending and the portion of that spending that benefited disproportionately affected communities. The remaining nine agencies, while responding to our inquiries, reported that they did not spend any state funds in fiscal year 2024 that fit into any of the categories of GHG reduction spending used for this study. The agencies below are presented in descending order, with those with the most GHG spending first.

Department of Transportation

The Department of Transportation reported $2.92 billion in spending on greenhouse gas reductions. MDOT reports that it implements numerous projects and programs across its Modal Administrations that benefit greenhouse gas emissions reduction. The projects cited in the estimate include transit, active transportation (bicycle and pedestrian), intelligent transportation systems, advanced traffic management systems, urban tree plantings, and operating budgets for programs that support these projects and services. This spending covered three GHG reduction categories—transportation emissions, emissions in forestry and land use, and mode transfer from single occupancy vehicles to transit. MDOT reported that 30% of the spending on greenhouse gas reductions, or $869 million, went to disproportionately affected communities.

Department of Agriculture

The Department of Agriculture reported $59.9 million spent on GHG reductions. The spending went for the following categories—emissions in agriculture and emissions in waste management, through the agency's Office of Resource Conservation (ORC). This office works with Maryland farmers to plan and implement conservation practices and programs that balance crop and livestock production with the need to protect natural resources. The ORC's Nutrient Management program works to regulate the appropriate nutrient application (fertilizer, manure, and other organic sources) for production that would contribute to decreased emissions from agriculture. Other ORC programs - District Operations, Conservation Grants, and Program Planning & Evaluation - administer technical and financial assistance directly to farmers to advance the adoption of conservation (cover crops, conservation plans, urban and small farms, Healthy Soils Program) that would contribute to decreased emissions from agriculture (category #7) or increase soil carbon sequestration (category #9). Of the total amount spent on GHG reduction activities 28%, or $16.9 million, went to disproportionately affected communities.

Department of Natural Resources

The Department of Natural Resources (DNR) reported $30.6 million spent on activities to reduce GHG. All of these were for reducing emissions or carbon sequestration in forestry and land use. The Maryland Forest Service (MFS) directly manages state forests through planning and management interventions on state lands. They also provide technical assistance and funding for forest management on private lands. These actions enhance and protect the state's carbon sink. The MFS also works to promote and implement the 5 Million Trees program, working to plant trees on state and private lands. The projects create or enhance natural systems that sequester carbon and contribute to the overall carbon sink for Maryland while supporting green jobs and a renewable resource-based economy. The Chesapeake and Atlantic Coastal Bays Trust Fund supports water quality projects, many of which also increase carbon sequestration, such as riparian buffer planting and wetland creation. Of the total amount spent on GHG reductions, $3.1 million, or 10%, was spent on actions benefiting disproportionately affected communities.

Maryland Department of the Environment

The Maryland Department of the Environment (MDE), through its Land and Materials Administration, Water Infrastructure Financing Administration, Air and Radiation Administration (ARA), and the management of the 5 Million Trees program, estimated that it spent $48.2 million on GHG reductions in FY24. These activities affected emissions from waste management and forestry and land use, in addition to spending for planning, regulation and policymaking activities. The funding is going to waste diversion activities such as recycling, organic waste diversion, and composting, along with energy reduction, energy efficiency, and renewable generation at wastewater and water systems, as well as deployment of green infrastructure. The ARA spent general funds and special funds on the development and implementation of the Climate Pollution Reduction Plan which will help Marylanders purchase EVs, heat pumps, and other zero-emission devices that eliminate fossil fuel use and shield people from fossil fuel price impacts. Of the total amount spent by MDE on GHG reductions $32.5 million, or 67.5%, was spent on actions benefiting disproportionately affected communities.

Department of Housing and Community Development

The Department of Housing and Community Development (DHCD), through its Housing and Building Energy Programs and its Special Loans Programs, reported spending $27.5 million on activities to reduce GHG. These activities reduced emissions from energy use in buildings. The majority of the funds are used for retrofitting buildings to make them more energy efficient. DHCD reports that 100 percent of these funds, or the entire $27.5 million, benefits disproportionately affected communities.

Maryland Energy Administration

The Maryland Energy Administration (MEA), through nine separate subprograms, estimates that they spent $23.4 million on activities to reduce GHG in FY24. These subprograms included Resilient Maryland; OSW Development; Offshore Wind Business Development; MDOT-EV Excise Tax Credit; LMI Community Grants/Energy Efficiency Equity; C&I Deep Energy Retrofit Program; Commercial Renewable Grants (C-CERP); Residential Renewable Grants (R-CERP); and EVSE Rebate Program. The activities under these subprograms focused on electricity generation, transportation emissions, and energy use in buildings. Funds support a wide range of activities, including solar energy, offshore wind development, the purchase and charging of electric vehicles, energy efficiency in moderate and low income households, and renewable energy in homes and commercial buildings. MEA reports that $5.3 million, or 22.7% of these funds, benefit disproportionately affected communities.

Department of General Services

The Department of General Services (DGS), through its Office of Energy and Sustainability (OES), estimates that it spent $12.3 million on GHG reduction activities. These activities affected electricity generation, transportation emissions, and energy use in buildings. In addition, the Office of Energy and Sustainability chairs the Maryland Green Purchasing Committee that develops specifications for state government's purchases of sustainable products. OES performs the following functions: 1) purchases renewable energy, 2) manages the energy performance contracting program, 3) performs energy audits, 4) installs electric vehicle infrastructure for the state fleet, 5) chairs the Green Purchasing committee, 6) plans for decarbonizing state facilities and 7) develops policies and introduces legislation to reduce carbon emissions in state operations. DGS estimates that $1.3 million, or 10.8%, of its funds benefit disproportionately affected communities.

Maryland Department of Planning

The Maryland Department of Planning (MDP), through its Planning Data Services, Planning Services, and Tax Credit Reserve Fund subprograms, estimates spending for GHG reductions at $10.8 million. These funds support spending to reduce transportation emissions, energy use in buildings, and emissions in forestry and land use. The agency reports that this spending reduces vehicle miles traveled and energy use in buildings by contributing to compact development patterns, like multi-family housing and attached housing. The spending embodies energy in the reuse of existing buildings, infill, and previously developed sites, and it supports carbon sequestration by discouraging new development in forest or on farmland. The agency estimates that $5.0 million, or 46.8%, of this spending benefited disproportionately affected communities.

Public Service Commission

The Public Service Commission (PSC), through multiple subprograms, estimates that it spent $4.1 million on activities to reduce GHG emissions in FY24. These subprograms covered a wide range of GHG reduction categories, including electricity generation, transportation emissions, energy use in buildings, energy use in industry, emissions from the fossil fuel industry, emissions from industrial processes, and reduction of GHG emissions from the grid. For example, the EmPOWER program delivers energy efficiency throughout the state and offers programs to residential and commercial customers which reduces the need for generation, reduces the impact from buildings and industry, and reduces the impact from fossil fuels. The PSC estimates that $503 thousand, or 12.2%, of this spending benefited disproportionately affected communities.

Department of Public Safety and Correctional Services

The Department of Public Safety and Correctional Services (DPSCS) estimates that it spent $2.8 million on activities to reduce GHG emissions in FY24. This spending fell into two categories– transportation services and wastewater management. This includes waste management at various correctional facilities as well as fleet management activities, such as the installation of charging stations. The department is also focusing on improving energy efficiency in its buildings as a part of its construction planning process. It is estimated that $1.35 million, or 49%, of these funds benefited disproportionately affected communities. This estimate is based on the assumption that the activities that DPSCS identified have statewide impact, therefore this number represents the ratio of disproportionately affected census tracts to total census tracts in the state.

Maryland Department of Health

The Maryland Department of Health, through its Office of Facilities Management and Development, estimates that it spent $1.6 million on GHG reduction activities in FY24. All of this spending focused on energy use in buildings, specifically modernizing equipment to have less climate impact. There are no reliable estimates of the amount of these funds that benefited disproportionately affected communities.

Maryland Department of Aging

The Maryland Department of Aging (MDOA), through its Durable Medical Equipment Reuse Program, estimates that it spent $476 thousand on activities to reduce GHG emissions in FY 24. This spending focused on reduced emissions from waste management and the recycling and reuse of durable medical equipment such as walkers, wheelchairs, home hospital beds, power wheelchairs, etc. that are collected at various landfill and recycling center sites. The collected items are sanitized, repaired, and entered into a reuse cycle. This service directly diverts equipment from landfills which reduces GHG emissions. MDOA estimates that $83 thousand, or 17.5%, of this spending benefited disproportionately affected communities.

Department of Juvenile Services

The Department of Juvenile Services (DJS), through its Executive Direction program, estimates that it spent $255 thousand on spending to reduce GHG emissions in FY24. This spending was for the purchase of electric vehicles in order to reduce transportation-related emissions. These vehicles will be used to transport families of clients from disproportionately affected communities; therefore, 100% of these funds are estimated to be used to support these communities.

State Department of Education

The Maryland State Department of Education (MSDE) estimates that it spent $189 thousand on activities promoting GHG reductions in FY24, through educational policies, programs, and participation in boards that lead initiatives to educate the student population, as well as their families, about sustainability and environmental justice. Of this amount, it estimates that $24 thousand, or 12.6 percent, was spent on programs benefiting disproportionately affected communities.

Maryland Department of Labor

The Maryland Department of Labor, through its Building Codes Administration, estimates that it spent $38 thousand on activities focused on GHG reductions in FY24. These are primarily focused on energy efficiency in buildings and industry. Because these standards apply statewide, the agency estimates that the percentage of the spending benefiting disproportionately affected communities is the same as the percentage of the census tracts relative to total census tracts in the state that include those communities. Therefore, $18.7 thousand, or 49%, are estimated to have benefited disproportionately affected communities.

Maryland Department of State Police

The Maryland Department of State Police (MDSP), through a program designed to reduce electricity usage and costs through installing LED lighting at select MDSP facilities, estimates that it spent $17.5 thousand on this program, thus reducing GHG emissions from energy use in buildings. No reliable estimate was made for the amount of this spending benefitting disproportionately affected communities.

Department of Veterans and Military Families

The Department of Veterans and Military Families (DVMF), through their wastewater management program at Charlotte Hall Veterans Home, estimates that it spent $609 thousand on activities designed to reduce GHG emissions in FY24. None of these funds are estimated to have specifically benefited in disproportionately affected communities.

Appendix 3

Greenhouse Gas Reduction Spending Questionnaire: Identifying spending that helps reduce greenhouse gas emissions in the State of Maryland

The objective of this questionnaire is to collect data to report on greenhouse gas reduction spending in accordance with Md. Code, Envir. § 2-1304

GUIDANCE TO COMPLETE THE QUESTIONNAIRE

Structure: The state budget is divided into 'programs' and 'subprograms'. For the purpose of this questionnaire, we follow that language and our default approach is to collect information at the subprogram level. We will ask you to complete one questionnaire per subprogram. You can find a link to the budget, including subprograms by agency, here.

However, if the subprogram structure does not fit properly with your agency's internal structure, then you might approach this questionnaire differently. For example, by program, by departmental area, etcetera. In these cases, please explain properly.

The questionnaire consists of three sections. The first section asks for general information. The second section asks you to categorize and provide a brief description of greenhouse gas reduction spending incurred by this subprogram. The final section asks about greenhouse gas reduction spending and the percentage of that spending that benefited certain communities.

Fiscal year: All the questions must be answered in relation to actual spending (not just encumbered) for FY24. To properly complete this questionnaire, you must have access to actual spending data for FY24.

Instructions: Before completing the questionnaire, please read the explanation of the different greenhouse gas reduction spending categories used in this questionnaire. The explanation is available below.

Before completing the questionnaire, please read the frequently asked questions (FAQ) below.

Deadline: The completed questionnaire should be sent back to Philip Joyce [pgjoyce@umd.edu] from the University of Maryland by October 18, 2024.

Additional Questions? If you have any additional questions you may contact Philip Joyce [pgjoyce@umd.edu] from the University of Maryland and/or Chris Beck [christopher.beck@maryland.gov] from MDE.

GREENHOUSE GAS REDUCTION SPENDING CATEGORIES

In this questionnaire we categorize greenhouse gas reduction spending into the following 9 categories, plus a tenth option open to greenhouse gas reduction spending that does not fit any other category. Your subprogram might spend resources in more than one category. These categories are based on the state's greenhouse gas emissions inventory.

Spending that reduces greenhouse gas emissions from *electricity generation*. Emissions categories in this sector include the burning of coal, natural gas, oil, or biomass for grid-level power generation.

Spending that reduces *transportation-related* greenhouse gas emissions. Emissions categories in this sector include fuel consumption by on-road vehicles, rail, marine, and aviation, as well as non-road consumption of fuel through uses such as lawn care equipment, construction equipment, mining equipment, etc. It also includes transportation-related emissions from lubricants, natural gas, and LPG.

Spending that reduces greenhouse gas emissions from *energy use in buildings*. Emissions categories in this sector include the use of coal, natural gas, LPG, petroleum, and wood for building services such as heat, etc.

Spending that reduces greenhouse gas emissions from *energy use in industry*. Emissions categories in this sector include the use of coal, natural gas, LPG, petroleum, wood, and other fuels in industrial facilities. Only energy-based emissions are included here - for process emissions, see IPPU.

Spending that reduces greenhouse gas emissions from *industrial processes and product use (IPPU)*. Emissions categories include process emissions (i.e., not from fuel combustion) from cement manufacture, limestone and dolomite, soda ash, iron and steel, semiconductor manufacturing, non-fertilizer production of ammonia and urea, and aluminum production. This category also includes SF6 emissions from electricity, transmission, and distribution systems. Finally, it includes HFC and PFC emissions from product use and disposal (e.g., refrigerants, air conditioning, aerosols, and others).

Spending that reduces greenhouse gas emissions in the *fossil fuel industry*. Emissions categories include natural gas production, transmission, and distribution. Coal mining emissions are also included.

Spending that impacts greenhouse gas emissions in *agriculture*. Emissions categories include enteric fermentation, manure management, agricultural soils, agricultural burning, and urea fertilizer usage and liming.

Spending that reduces greenhouse gas emissions from *waste management*. Emissions categories include waste combustion, landfills, wastewater management, and residential open burning.

Spending that reduces greenhouse gas emissions or increases carbon sequestration in *forestry and land use*. Emissions categories include settlement soils, forest fires, and wetlands. Sequestration categories include tree and forest carbon, wood products and landfilled carbon, agricultural soil carbon, and wetlands.

Spending that reduces greenhouse gas emissions in some other way.

FREQUENTLY ASKED QUESTIONS (FAQ)

What should I do if the subprogram incurs greenhouse gas reduction spending that does not fit any of the greenhouse gas reduction spending categories?
The last category is designed to serve as an "Other" category. Please select only the final category if your subprogram does not fit within any of the other nine categories.

You might also select the final category in combination with one or more categories, if only part of its greenhouse gas reduction spending should be categorized as "Other."

What type of spending can be considered as greenhouse gas reduction spending?
Any type of operating and capital spending intended to reduce greenhouse gas emissions in any of the ten greenhouse gas reduction spending categories. This may include salaries, analysis, supplies and material, and any other spending that can be reasonably linked to any of the ten greenhouse gas reduction spending categories.

Should I include spending through federal funds?
No, federal funds must be excluded.

Should I answer based on appropriated, encumbered, or spent?
The questionnaire must be answered in terms of actual spending.

Do I need to detail the spending object code?
We would prefer it if you could provide us as much detail as possible, but it is not strictly required. In an ideal scenario, you would provide us with the estimated percentage of the subprogram's FY24 budget that was spent on activities related to greenhouse gas reduction, and you would also provide a detailed explanation about how you estimated that percentage. The explanation could reference different object codes.

What should I do if I don't have the exact spending amount?
We understand that it is not always possible to reach an exact spending amount. This might be the case for greenhouse gas reduction spending and/or for spending that benefited disproportionately affected communities. In these situations, feel free to simply include your best estimate and provide a brief explanation of the limitations of that estimate.

How should I calculate the percentage of spending that benefited disproportionately affected communities?
We provide a methodology based on the Climate Vulnerability Score Tool created by the Maryland Department of the Environment (MDE). This tool classifies 717 out of 1463 census tracts that are disproportionately affected. This tool is a composite index of percentile scores from MDE's EJ Screening Tool and datasets evaluating community impact and climate exposure. For the purpose of this study, we are defining disproportionately affected communities as those in the "High" and "Medium" categories as classified by this tool. If you are interested, you may read the Climate Vulnerability Score methodology here. The list of census tracts and a map that highlights them can be found here.

Can I access the list of disproportionately affected communities directly on a GIS platform?
Yes, the Climate Vulnerability Score Tool is built using ArcGIS Online. The link to download the list of census tracts within each category and the map itself (shapefile) is available in the 'Details' section of the tool.

If the subprogram does not have location-specific information, should I still provide an estimated percentage of spending that benefited disproportionately affected communities?
We encourage you to provide your best estimate, even if you don't have location-specific data. Please specify in your answer how you arrived at your estimate. You may answer "Not available" or "N/A" only in the exceptional circumstance that no educated estimate can be provided. If your subprogram fits this circumstance, then please explain why, and provide potential solutions for upcoming fiscal years.

RECENTLY ADDED

Do I need to provide spending amounts for each greenhouse gas reduction spending category?
No, you only need to provide the total spending amount for all categories.

What location (census tract) should I consider if the funds are disbursed in one location but spent to benefit members of a different location?
The intent is to focus on the census tract of the ultimate recipient/beneficiary, even if the actual disbursement happened elsewhere due, for example, to the physical location of a consultant or grantee. If your only information is the location of the initial grantee or consultant, then you can go ahead and use that information for lack of a better alternative.

Should I count a program's spending as greenhouse gas reduction even if its primary objective was not greenhouse gas reduction?
Yes, it is ok to count greenhouse gas reduction spending that is a by-product or side effect of another type of policy intervention.

SECTION I. BASIC INFORMATION

Description (optional)

Agency name*

_____

Subprogram*

_____

Total spending for this subprogram for FY24 (in Dollars, excluding federal funds)*

_____

Please provide the name(s) and email(s) of the people completing this questionnaire*

_____

_____

_____

SECTION II. GREENHOUSE GAS REDUCTION SPENDING

Description (optional)

What percentage of the subprogram's FY24 budget (excluding federal funds) was spent on greenhouse gas reduction-related activities? Please provide your best estimate:

_____

_____

_____

Please provide a detailed explanation about how you estimated that percentage. If you relied on budgetary object codes in your calculation, please explain.*

_____

_____

_____

Which greenhouse gas reduction spending category matches the type of greenhouse gas reduction spending for this subprogram? Select all that apply. If needed, please refer to the greenhouse gas reduction spending categories available above.*

- ☐ 1. Electricity generation
- ☐ 2. Transportation emissions
- ☐ 3. Energy use in buildings
- ☐ 4. Energy use in industry
- ☐ 5. Emissions in the fossil fuel industry
- ☐ 6. Emissions from industrial processes and product use (IPPU)
- ☐ 7. Emissions in agriculture
- ☐ 8. Emissions from waste management
- ☐ 9. Emissions or carbon sequestration in forestry and land use
- ☐ 10. Greenhouse gas emissions reductions in some other way

If you selected category #10, please briefly explain. If not, you may skip this question

_____

Provide a brief description of the subprogram's greenhouse gas reduction spending. Please explain your rationale for the categories you selected.

_____

_____

_____

SECTION III. ENVIRONMENTAL JUSTICE

In this section we ask you to estimate the percentage of funding that benefited disproportionately affected communities. In order to do this we have providing you with a list of census tracts that are considered overburdened and underserved based on the Climate Vulnerability Score Tool created by the Maryland Department of the Environment. This methodology classifies 717 out of 1463 census tracts as disproportionately affected. These include those that MDE has listed as in the "High" and "Medium" categories according to that methodology. The list of census tracts and the map can be downloaded from here.

What percentage of the subprogram's FY24 budget (excluding federal funds) benefited disproportionately affected communities? Please provide your best estimate:*

_____

Do you have any suggestions on how we can improve this data collection process in upcoming years?

_____

_____

_____

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