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State Spending on Greenhouse Gas Reduction in Maryland



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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 instructed the Maryland Department of the Environment to prepare an analysis that identified 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 analysis was to present the percentage of that funding that benefited disproportionately affected communities. This report includes a proposed methodology to assess the types of spending that reduce GHG emissions by the State of Maryland and applies that methodology for the previous fiscal year (FY2023). This report is the first such analysis produced in fulfillment of the legislative requirement. Future analyses will be included as an attachment to the Maryland Commission on Climate Change's annual report to the Governor and General Assembly, in accordance with § 2-1257 of the State Government Article, on the status of the State's efforts to mitigate the causes of, prepare for, and adapt to the consequences of climate change, including future plans and recommendations for legislation, if any, to be considered by the General Assembly

While there are potentially many state agencies that spend funds that would meet the definition of spending that reduces GHG emissions, for this first report, data were collected only from those agencies that are required by the law to report annually on their GHG reduction efforts. The spending by these agencies likely represents the vast majority of GHG reduction funds spent by the state. The report also develops a methodology for reporting spending on emissions reduction, in accordance

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with the state's GHG inventory. 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 of 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.

Since the law did not explicitly define disproportionately affected communities, such a definition needed to be developed for this report. Accordingly, we define disproportionately affected communities as those that are both overburdened and underserved, according to the definitions provided in the CSNA.

The state agencies responded to a questionnaire requesting information about spending at the program level. 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:

- Combined, these agencies are estimated to have spent \$463 million on measures to reduce GHG emissions in fiscal year 2023. This represents 7.3% of these agencies' budgets and 1.2% of the total budget of the state of Maryland.
- On average, agencies estimated that 39.1% of their GHG reduction spending benefited disproportionately affected communities.
- As this is to be an annual inventory of such spending, the report concludes with a number of recommendations that might increase the scope of reporting and enhance the accuracy of the information going forward.

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 [1]. 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 disadvantaged communities.

The specific language included in the CSNA (Section § 2-1304) reads as follows:

On or before December 15 of each year, the Commission shall report to the Governor and General Assembly, in accordance with § 2-1257 of the State Government Article, on the status of the State's efforts to mitigate the causes of, prepare for, and adapt to the consequences of climate change, including future plans and recommendations for legislation, if any, to be considered by the General Assembly.

(B) The report due on or before December 15th, 2023, and each subsequent report shall include an analysis, prepared by the Department, of:

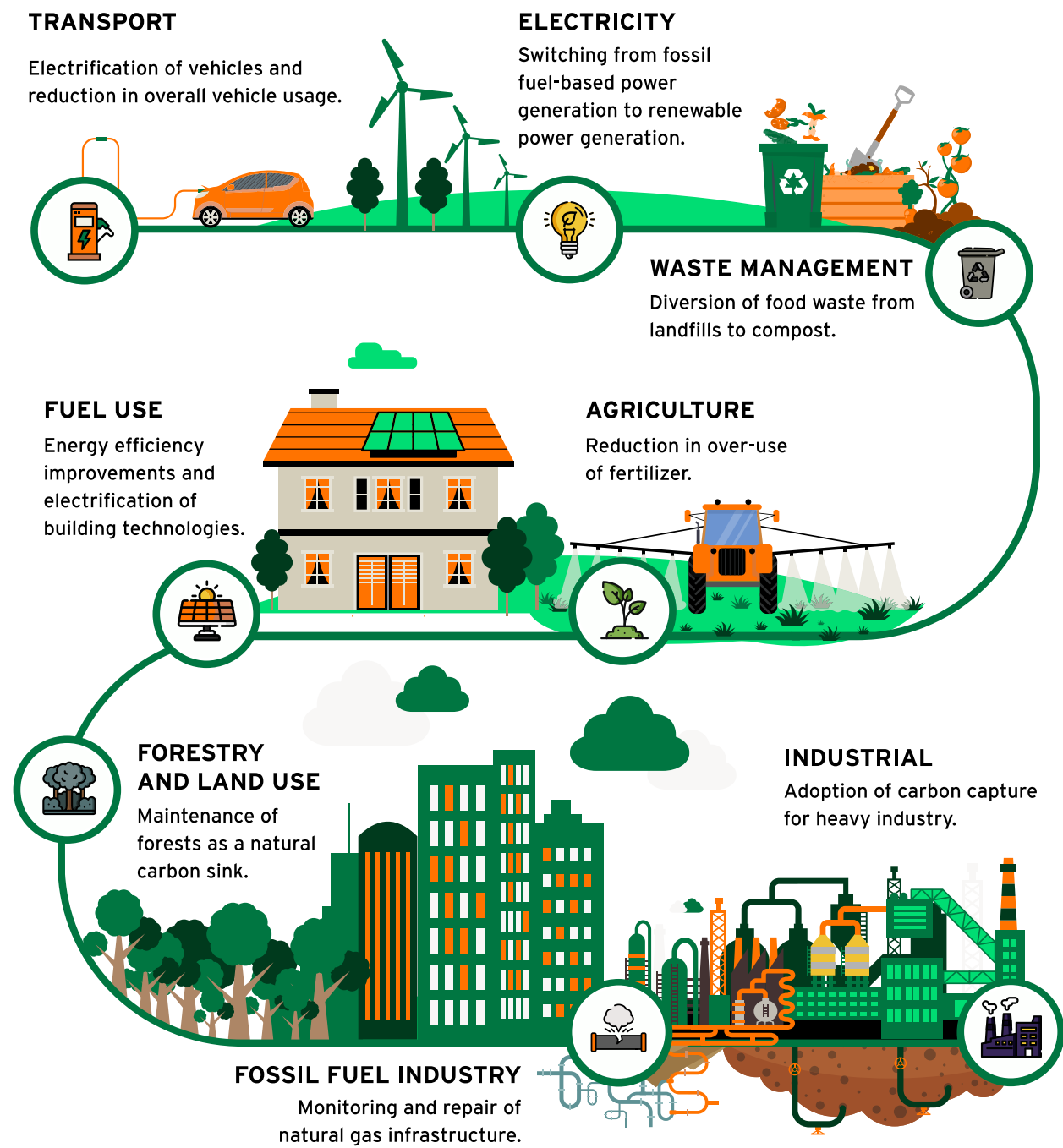
- (1) the total amount of state money spent on measures to reduce greenhouse gasses and, to the extent practicable, co-pollutants, during the immediately preceding fiscal year; and
- (2) the percentage of that funding that benefited disproportionately affected communities identified according to the methodology adopted by the Department under § 1-702 of this article.

MD Code, Environment, § 2-1305 lists the state agencies that are to report annually on the status of programs that support GHG reduction. This list was used to identify the appropriate agencies that were included in this initial effort to comply with the updated reporting requirements.

This report outlines a methodology for reporting GHG reduction spending at state agencies in accordance with the state's [GHG inventory](#) [2]. 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.

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



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-CO2 emissions from air conditioning and refrigeration. The fossil fuel industry in Maryland primarily consists of natural gas transmission and distribution. Maryland's agriculture sector primarily emits non-CO2 GHGs from sources such as manure management and agricultural soils. The waste management sector also primarily emits non-CO2 gasses 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. Examples of emissions reduction strategies for each sector are shown in Figure 1.

All spending is considered to be GHG reduction spending if it reduces emissions of 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 but can be incorporated into future reporting as a more robust process is developed.

We included the agencies in our analysis that were identified in the CSNA as those annually required to report to the Governor and the Commission on their GHG reduction activities, including:

**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 Maryland Insurance Administration; and
The Public Service Commission;**

While we are confident that these agencies contain the majority of state spending on GHG reductions, in future years the Department of the Environment (MDE) could determine whether there are other agencies that were omitted from this initial analysis that have programs that spend state funds on these activities. For practical issues, the Maryland Insurance Administration was not included in the first round of this report.

Each of these agencies was requested to provide us with an estimate of how much state money they spent on measures to reduce GHG emissions. This excluded federal funds and included not only program spending but also 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 these activities. It is important to note that, as state agencies are not currently required to track GHG reduction spending, and have never before been asked to report it after the end of the fiscal year, the numbers provided in this report should be read as rough estimates. They are, however, the most precise numbers that can be provided at present, given data limitations and time constraints.

In addition to the state expenditures, these agencies were also asked how much of those funds were spent on disproportionately affected communities. This required a definition of those communities in Maryland and the collection of data from these same agencies.

DEFINITION OF DISPROPORTIONATELY AFFECTED COMMUNITIES

This section presents the methodology used to meet the mandate in Md. Code, Envir. § 2-1304 [3] to identify the percentage of GHG reduction funding that benefited disproportionately affected communities. In accordance with § 1-702 “Policies and programs for funding communities disproportionately affected by climate impacts” [4], we define disproportionately affected communities as those that are both overburdened and underserved. Our definitions of overburdened and underserved are based on the definitions provided in the Maryland Climate Solutions Now Act of 2022 [5] and that are codified in State law.

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

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:

- | | | |
|------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------|
| a | b | c |
| 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. |

List of overburdened and underserved census tracts

Based on these definitions and on the best available data, a list of census tracts was generated on August 16, 2023, using the [Environmental Justice Screening Tool \[6\]](#) created by the Maryland Department of the Environment. This resulting query classifies 366 out of 1463 census tracts as both overburdened and underserved. These census tracts represent between 9% and 11% of the area of the State of Maryland (the measurement changes depending on how water masses are counted).

All calculations have been done with the best available data, considering potential database limitations and other issues. We acknowledge that calculations are also subject to involuntary human error and that additional indicators (such as those measuring flooding, storm surges, and urban heat island effects) could be included in subsequent years.

The list of census tracts and a map that highlights them can be found in Appendix 1.

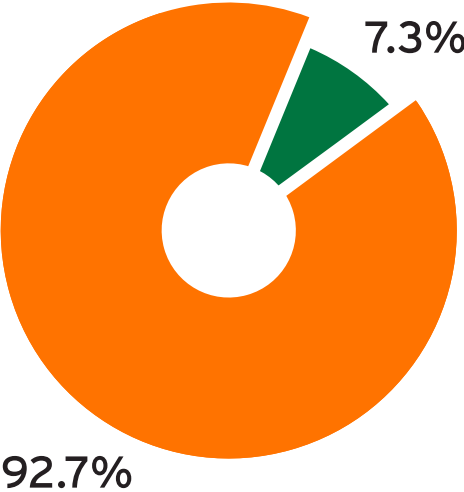
GREENHOUSE GAS REDUCTION SPENDING

A total of nine agencies provided the requested information through an online questionnaire developed for this analysis (the full questionnaire is available in Appendix 3). In total, those nine agencies reported an estimated spending of \$463,135,785 in GHG reduction activities throughout fiscal year 2023. As Figure 2 shows, this total represents an estimate of 7.3% of the total budget for those nine agencies and 1.2% of the total budget for the State of Maryland.¹ It is worth mentioning that 70.4% of the reported GHG reduction spending was incurred by the Department of Transportation, largely because of that agency's Transportation Emissions subprogram.

Figure 2. Estimated Greenhouse Gas Reduction Spending, Totals, FY 2023

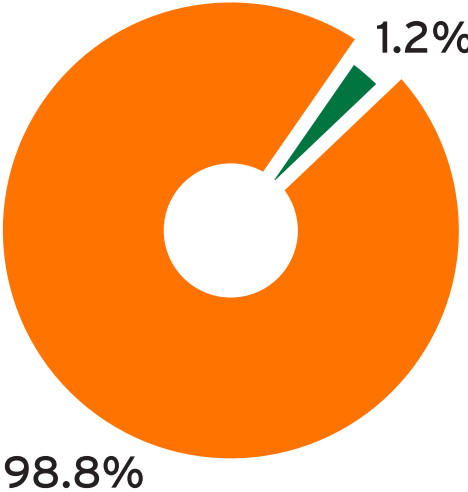
Agency Budgets

- Spending on Activities that Reduce GHG Emissions
- Other Spending



Total Maryland Budget

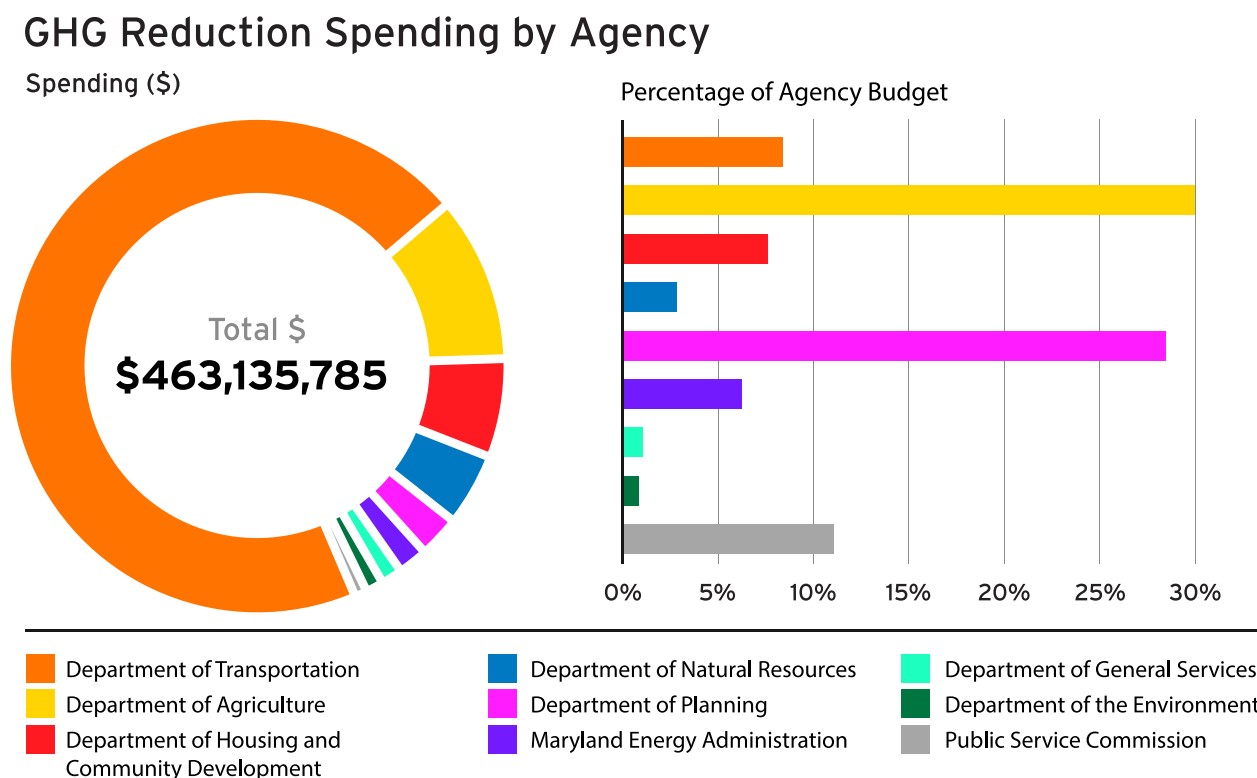
- Spending on Activities that Reduce GHG Emissions
- Other Spending



¹ 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 October 19, 2023. All figures represent actual spending for FY2023 operating budgets and exclude federal funds. Spending data provided by agencies also excludes federal funds, but might include capital spending.

Figure 3 presents estimated GHG reduction spending disaggregated for each of the nine agencies. This data shows significant variation across agencies.² The Department of Agriculture and the Department of Planning estimated GHG reduction spending for an amount equivalent to 30.0% and 27.3% of their budgets, respectively. On the other hand, the Department of the Environment and the Department of General Services reported estimated GHG reduction spending for an amount equivalent to 1.1% and 1.2% of their budgets, respectively.

Figure 3. Estimated Greenhouse Gas Reduction Spending, By Department, FY 2023



The categories of GHG reduction spending reported by agencies showcase a wide array of activities,³ with all of the categories described earlier 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 3.4 categories per agency. The two most selected categories are spending that reduces GHG emissions from energy used in buildings and spending that reduces transportation-related GHG emissions. Each of these two categories was reported by six agencies. Some specific examples of spending that reduces GHG emissions from energy used in buildings include spending by the Public Service Commission to replace HVAC and lighting equipment with more efficient technologies, thereby increasing efficiency and reducing energy demand for the building. Similarly, the Department of Housing and Community

² Comparisons between agencies should be handled carefully as this is the first time that 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.

³ The full list of categories selected by each department is available in Appendix 2.

Development brings the same effect by performing energy efficiency work in residential single-family and multifamily 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. Another example is the Department of Planning's efforts to rehabilitate and make use of existing historic properties, which in turn prevents sprawl and reduces transportation emissions by limiting vehicle miles traveled. In turn, the Department of General Services installed EV charging stations for 4,000 state fleet vehicles.

The third and fourth most selected categories are spending that reduces GHG emissions or increases carbon sequestration in forestry and land use, and spending that reduces GHG emissions from electricity generation, each of these selected by four agencies. An example of spending that relates to forestry and land use comes from multiple areas of the Department of Natural Resources that fund and support tree planting and climate-smart forest management. The Maryland Energy Administration provided multiple examples of spending that reduces GHG emissions from electricity generation, including the Commercial Clean Energy Rebate Program which provides incentives to encourage the installation of renewable energy on commercial buildings, mostly funding solar photovoltaic projects which generate electricity.

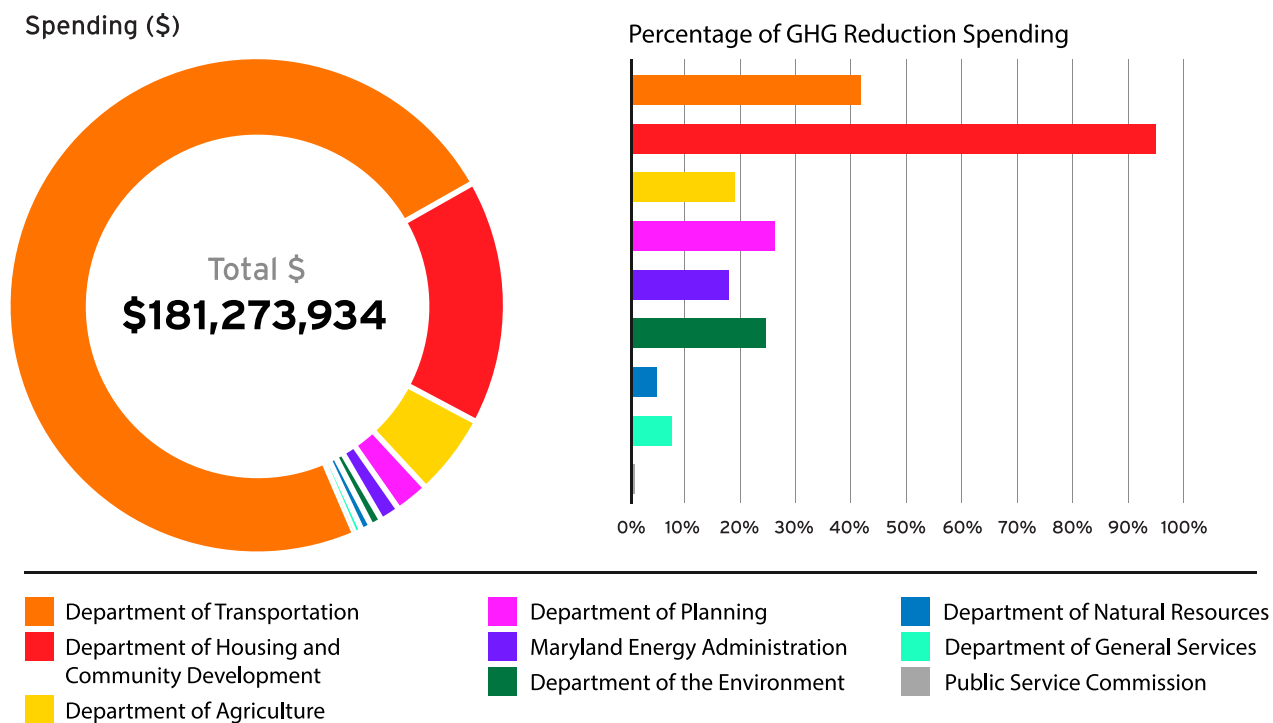
Each of the remaining categories was selected by less than four agencies. The Department of the Environment reported several activities that go beyond the scope of a single category, such as working on diverting resources from landfills and creating recycling solutions to lower transportation emissions, finding innovative ways to decrease waste, increasing recycling (plastics, metals, organics), and bring businesses into the state that can recycle/reuse these materials to spur economic growth, improve recyclable markets, and decrease transportation emissions by processing materials close to the source. Finally, the Department of Agriculture is the only one that reported activities that reduce emissions in agriculture, such as working with Maryland farmers to plan and implement conservation practices and programs that balance crop and livestock production with the need to protect natural resources and regulate the appropriate nutrient application (fertilizer, manure, and other organic sources) for agricultural production.

On average, agencies reported that an estimated 39.1% of their GHG reduction spending benefited disproportionately affected communities. The Department of Transportation, being the most significant spender on GHG reduction, largely influences this average. Excluding the Department of Transportation results in a decrease in the average spending on GHG reduction benefiting disproportionately affected communities to 33.7%. In most cases, this figure is calculated using the default methodology presented in Section 2 of this report, or an alternative that is directly derived from the default methodology. For example, in cases where spending is not localized but distributed across the state, the reported percentage of GHG reduction spending that benefited disproportionately affected communities was set at 24.5%, which equals the percentage of Maryland's population that falls within the overburdened and underserved census tracts. Details on the methodologies used for every calculation are available in Appendix 2.

Figure 4 presents the estimated percentage of GHG reduction spending that benefited disproportionately affected communities disaggregated by each agency. Six of the nine agencies reported estimated amounts equivalent to more than 10% of their GHG reduction spending. Two of those agencies are outliers, the Department of Housing and Community Development and the Department of Transportation, which reported that 94.0% and 41.4% of their GHG reduction spending benefited disproportionately affected communities, respectively.

Figure 4. Estimated Greenhouse Gas Reduction Spending in Overburdened and Underserved Census Tracts, By Department, FY 2023

Spending in Disadvantaged Communities by Agency



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 including a 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.
- 2. Expand expertise in georeferencing tools.** It has not been a standard practice for agencies to georeference their spending data. This resulted in excessive burdens for many agencies to generate the data required for this report. Additional training and technical capacities are needed if it is deemed that georeferenced information will be required on an annual basis.
- 3. Promote clarity for a homogeneous definition of disproportionately affected communities.** The current methodological guidance suggests that besides considering overburdened and underserved communities, this report should have also considered “Areas that are vulnerable to climate impacts, such as flooding, storm surges, and urban heat island effects, due to low levels of tree coverage, high levels of impervious surfaces, or other factors.” In this first version of the report, we could not operationalize and present information on areas vulnerable to climate impacts for two reasons. First, intersecting areas vulnerable to climate impacts with overburdened and underserved communities would have resulted in the exclusion of the many disproportionately affected communities that are not in coastal areas. Second, an approach that did not intersect areas vulnerable to climate impacts with overburdened and underserved communities, would have resulted in an excessively burdensome request to agencies, as they would have needed to provide duplicate georeferenced data. Provided with enough time and clarity, the measurement of spending that benefits disproportionately affected communities can be improved in subsequent years.
- 4. Define an approach for programs whose benefits can not be georeferenced.** The use of a geographic-based definition of disproportionately affected communities is not appropriate for programs that do not have localized benefits. In this year’s report, the approach has been to grant these programs the flexibility to define approximate figures on their impact on disproportionately affected communities. The way that programs have dealt with this situation is by assuming that their programs have a uniform impact throughout the state, therefore, the percentage that benefits disproportionately affected communities equals to the percentage of the state that is composed of those communities. It should be defined if this approach is appropriate for subsequent years, and provide guidance if it is not.

CONCLUSIONS

This report represents the first attempt to catalog GHG reduction spending, in response to the requirements included in the Climate Solutions Now Act. As the agencies surveyed had not previously attempted to track their spending in this way, these initial estimates are necessarily imprecise. Since this is now to be an annual report, we are confident that future reports will represent a more definitive accounting of this spending.

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APPENDIX 2

DETAILED RESULTS BY AGENCY

Department of Agriculture

The data is based on spending by the Office of Resource Conservation.

The Department of Agriculture used an alternative methodology to estimate spending that benefited disproportionately affected communities. The Department of Agriculture tracks financial and technical assistance provided to farm operations at the parcel level. They overlaid the parcels with activity during FY23 with the defined census tracts provided by MDE to calculate a percentage. Their calculation excludes new conservation program activity occurring in urban farm settings. Those programs were new in FY23 and they are still developing data management methods.

This agency reported an estimated \$49,619,045 in GHG reduction spending and estimated that 19.0% of it benefited disproportionately affected communities. It listed the following categories of spending: 7. Emissions in agriculture, 9. Emissions or carbon sequestration in forestry and land use.

Department of General Services

The data is based on spending by the Office of Energy and Sustainability (excluding funding from the Strategic Energy Investment Fund), the Maintenance Engineering subprogram within the Office of Design, Construction & Energy, and the Assistant Secretary subprogram within the Office of Design, Construction & Energy.

The Department of General Services used an alternative methodology to estimate spending that benefited disproportionately affected communities. For the Office of Energy and Sustainability, there is no appropriate way to estimate the communities that were directly benefited since all of their relevant projects in 2023 addressed electricity reduction, which is not generated on-site. The estimate used of 3% represents the percentage of buildings with new LED light fixtures that are located within the census tracts listed under the default methodology.

The two subprograms within the Office of Design, Construction & Energy identified in this response are focused on supporting over 1,400 different types of facilities statewide. There are multiple facilities along the I-95 corridor as well as the eastern shore and western Maryland. The 10% estimate is based on considering the location of projects they managed for the various state agencies they support. These subprograms typically perform work based on a priority rating system and the needs of the facility so that they can improve conditions to ensure the facility is operational to support the agency's mission.

This agency reported an estimated \$6,610,835 in GHG reduction spending and estimated that 7.3% of it benefited disproportionately affected communities. It listed the following categories of spending: 1. Electricity generation, 2. Transportation emissions, 3. Energy use in buildings, 10. Greenhouse gas emissions reductions in some other way.

Department of Housing and Community Development

The data is based on spending by the EmPOWER Maryland Limited Income programs and the BeSMART program. These programs work exclusively in energy efficiency, meaning all work completed results in a GHG reduction.

The Department of Housing and Community Development used the default methodology and an alternative methodology to estimate spending that benefited disproportionately affected communities. For the BeSMART program, they used the default methodology to identify which customers fell within the listed census tracts. For the EmPOWER programs, they considered all spending to benefit disproportionately affected communities as these programs set income limits that limit spending to clients meeting a household income at or below 80% AMI or 250% federal poverty level. The low-income population will not be a perfect match for the census tracts from the default methodology, but it is considered a reasonable estimate for spending that benefited disproportionately affected communities.

This agency reported an estimated \$31,389,100 in GHG reduction spending and estimated that 94% of it benefited disproportionately affected communities. It listed the following categories of spending:
3. Energy use in buildings.

Department of Natural Resources

The data is based on spending by the Maryland Forest Service, the Chesapeake and Coastal Service, the Restoration Finance/Habitat Restoration Division, and the Chesapeake and Coastal Bays Trust Fund.

The Department of Natural Resources used the default methodology and an alternative methodology to estimate spending that benefited disproportionately affected communities. The default methodology was used for the Chesapeake and Coastal Bays Trust Fund, the Chesapeake and Coastal Service, and the Restoration Finance/Habitat Restoration Division (for the latter, it assumes the percentage of staff time matches the percentage of grants awarded in disproportionately affected communities). An alternative methodology was used for the Maryland Forest Service. As spending is not tracked geographically for the Maryland Forest Service, they estimated that the spending on the Urban and Community Forestry Program benefited disproportionately affected communities, while the rest of the spending did not.

This agency reported an estimated \$21,732,025 in GHG reduction spending and estimated that 4.7% of it benefited disproportionately affected communities. It listed the following categories of spending:
9. Emissions or carbon sequestration in forestry and land use.

Department of Planning

The data is based on spending by the Planning Data Services subprogram, the Planning Services subprogram, and the Tax Credit Reserve Fund.

The Department of Planning used the default methodology and an alternative methodology to estimate spending that benefited disproportionately affected communities. The default methodology was used for the Tax Credit Reserve Fund. Two of the five funded projects in FY23 were in disproportionately affected communities. The funding for these projects equaled \$1.65 million, about 28% of the total spending for the subprogram. An alternative methodology was used for the Planning Data Services and the Planning Services subprograms. In both cases, their activities benefit all of Maryland, therefore, MDP assumed that the percentage of the state's population in overburdened and underserved tracts (calculated as 24.5%) would equal the percentage of the subprogram's F23 budget benefiting those communities.

This agency reported an estimated \$12,372,242 in GHG reduction spending and estimated that 26.3% of it benefited disproportionately affected communities. It listed the following categories of spending: 2. Transportation emissions, 3. Energy use in buildings, 9. Emissions or carbon sequestration in forestry and land use.

Department of the Environment

The data is based on spending by Pollution Prevention Grants, the Land and Materials Administration, the Air and Radiation Administration, and the Water and Science Administration.

The Department of the Environment used the default methodology and an alternative methodology to estimate spending that benefited disproportionately affected communities. The default methodology was used for the Pollution Prevention Grants, as three out of six manufacturers were located in the designated census tracts. An alternative methodology was used in all remaining cases. For the Air and Radiation Administration, the Land and Materials Administration, and the Water and Science Administration, their activities are estimated to benefit all of Maryland, therefore, it assumed that the percentage of the state's population in overburdened and underserved tracts (calculated as 24.5%) would equal the percentage of the subprogram's F23 budget benefiting those communities.

This agency reported an estimated \$4,636,357 in GHG reduction spending and estimated that 24.7% of it benefited disproportionately affected communities. It listed the following categories of spending: 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), 8. Emissions from waste management, 9. Emissions or carbon sequestration in forestry and land use, 10. Greenhouse gas emissions reductions in some other way.

Department of Transportation

The data is based on spending by the Transportation Emissions subprogram.

The Department of Transportation used the default methodology to estimate spending that benefited disproportionately affected communities. Approximately 41.4% of MDOT's FY2023 state-funded climate-related capital expenditures (approximately \$135,000,000) benefited disadvantaged communities. This includes an estimation that 65% of WMATA stops are either located within or immediately adjacent to disadvantaged communities.

This agency reported an estimated \$326,000,000 in GHG reduction spending and estimated that 41.4% of it benefited disproportionately affected communities. It listed the following categories of spending: 2. Transportation emissions.

Maryland Energy Administration

The data is based on spending by the Commercial Clean Energy Rebate Program, Clean Fuels Incentive Program, Energy Technical Studies, Low-to-Moderate Income Energy Efficiency Grant Program, Jane E. Lawton Conservation Loan Program, Maryland Smart Energy Communities, Offshore Wind Business Development, Solar Photovoltaics on Public Institutions, Electric Vehicle Supply Equipment (EVSE) Rebate Program, and Residential Clean Energy Rebate Program.

The Maryland Energy Administration used the default methodology and an alternative methodology to estimate spending that benefited disproportionately affected communities. The default methodology was used for all areas except the Electric Vehicle Supply Equipment (EVSE) Rebate Program and Residential Clean Energy Rebate Program.

The Residential Clean Energy Rebate Program issued over 4,400 awards for new solar photovoltaic, solar thermal, and geothermal systems using fiscal year 2023 funding. The address data for the residential recipients were sorted first by city, and then by zip code. The subsequent calculations were conducted based on a sample of awards (in this case, the cities beginning with letters A through C) which wound up representing ~1/4 of all awards. On a city-by-city basis, all addresses in cities that are not located near areas identified as underserved and overburdened using the MDE EJ tool were excluded. The addresses of projects located in cities that appeared to be wholly or partially in areas that meet the underserved and overburdened definition represented about 16.2% of the sample based on the number of addresses and 15.5% of the total awards in the sample based on spending.

The commercial EVSE projects were screened using the default methodology because they tend to be much larger than the residential projects. For the residential EVSE projects, MEA first organized the awards by location and pulled a subset of awards (~29%, which corresponded to cities with names beginning from A to C). The subset of A-C cities was then screened at the city level. For cities or areas where it appeared that a project could be within a qualifying area, MEA then checked the individual address. MEA was then able to estimate a percentage of residential EVSE project funding going to disproportionately affected communities in the sample of communities whose names begin with A-C. Finally, to estimate an overall percentage that considers both residential and commercial EVSE awards, MEA calculated a weighted average using the commercial percentage (the actual number after reviewing all commercial awards) and the residential percentage (based on the sample average for A-C), with the weighting being based on the actual spending for the commercial awards and the residential awards. The final estimate is 25%.

This agency reported an estimated \$8,202,575 in GHG reduction spending and estimated that 17.5% of it benefited disproportionately affected communities. It listed the following categories of spending: 1. Electricity generation, 2. Transportation emissions, 3. Energy use in buildings, 10. Greenhouse gas emissions reductions in some other way.

Public Service Commission

The data is based on all spending by the Public Service Commission.

The Public Service Commission used an alternative methodology to estimate spending that benefited disproportionately affected communities. It is based on the GHG reduction spending overseen by the Commission that requires limited-income/low-income offerings (community solar, geothermal power as part of the state's renewable portfolio standard, and EmPOWER). The estimates are based on a conservative approximation as it can be difficult to estimate exactly how much time anyone spent on a given issue since the Commission's cases and hearing docket fluctuate annually. The low-income population will not be a perfect match for the census tracts from the default methodology, but it is considered a reasonable estimate for spending that benefited disproportionately affected communities.

This agency reported an estimated \$2,508,491 in GHG reduction spending and estimated that 0.2% of it benefited disproportionately affected communities. It listed the following categories of spending: 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), 10. Greenhouse gas emissions reductions in some other way.

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

* Indicates a required question

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.

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 environmental justice.

Fiscal year:

All the questions must be answered in relation to actual spending (not just encumbered) for FY23. To properly complete this questionnaire, you must have access to actual spending data for FY23.

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 Juan Pablo Martinez Guzman from the University of Maryland by September 29th, 2023.

Additional Questions? If you have any additional questions you may contact Juan Pablo Martinez Guzman from the University of Maryland and/or Chris Beck 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.

1. 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.
2. Spending that reduces *transportation-related* greenhouse gas emissions. Emissions categories in this sector include fuel consumption by on-road vehicles, rail, marine, aviation, and 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.
3. 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.
4. 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.
5. 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. It 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).

6. 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.

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

9. 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.

10. 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 that can be reasonably linked to any of the ten greenhouse gas reduction spending categories. This may include salaries, supplies and materials, and any other spending object 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 with 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 FY23 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?

You have two options.

First option:

We provide a default methodology based on the Environmental Justice Screening Tool created by the Maryland Department of the Environment. This methodology classifies 366 out of 1463 census tracts as both overburdened and underserved. The list of census tracts and a map that highlights them can be found [here](#). If you are interested, you may read summarized explanations on how overburdened and underserved are defined and measured by accessing the Environmental Justice Screening Tool directly.

Second option:

You may calculate the percentage of spending that benefited disproportionately affected communities through a different methodology that better fits the characteristics of your subprogram. You may use any methodology as long as you include an explanation about why the methodology you used is more appropriate for your subprogram than the default option we provided.

Can I access the list of disproportionately affected communities directly on a GIS platform?

Yes, by accessing the Environmental Justice Screening Tool and running a query for "All EJ Scores Combined." You can use the instructions available on pages 5-7 of this document to run this query.

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.

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

Agency name *

Subprogram *

Total spending for this subprogram for FY23 (in Dollars, excluding federal funds) *

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

Your answer

SECTION II. GREENHOUSE GAS REDUCTION SPENDING

What percentage of the subprogram's FY23 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

Your answer

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.

You have two options.

First option:

Use our default methodology based on the Environmental Justice Screening Tool created by the Maryland Department of the Environment. This methodology classifies 366 out of 1463 census tracts as both overburdened and underserved. The list of census tracts and a map that highlights them can be found [here](#).

Second option:

You may calculate the percentage of spending that benefited disproportionately affected communities through a different methodology that better fits the characteristics of your subprogram. You may use any methodology as long as you include an explanation about why the methodology you used is more appropriate for your subprogram than the default option we provided.

What percentage of the subprogram's FY23 budget (excluding federal funds) benefited disproportionately affected communities? Please provide your best estimate: *

Did you arrive at this estimate by using the default methodology or an alternative methodology? If you used an alternative methodology, please explain on the next page.*

Default methodology / Alternative methodology

Please provide a detailed explanation about the methodology and assumptions you made to estimate the percentage of funding that benefited disproportionately affected communities. If you used the default methodology you may skip this question. *

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



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