Economic Impact of Baltimore Gas and Electric Company's (BGE) Strategic Infrastructure Development and Enhancement (STRIDE) Program

Evaluation of the Current 2042 Plan and Accelerated Investment Options

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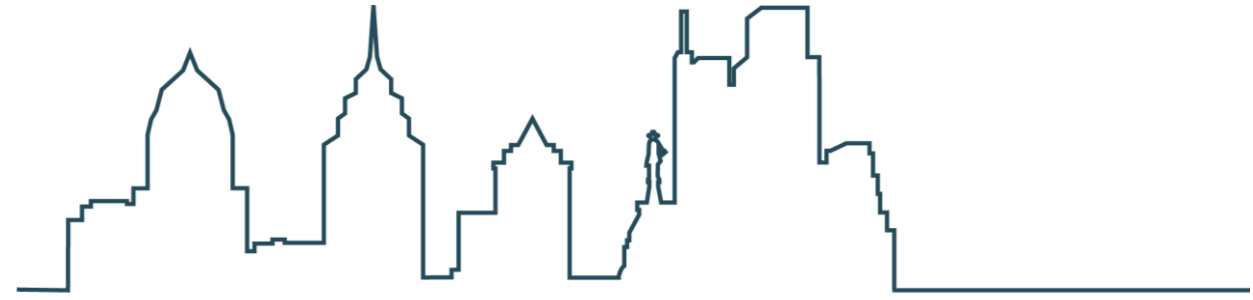

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Executive Summary

Since the passage of Maryland's Strategic Infrastructure Development and Enhancement (STRIDE) Law in 2013, Baltimore Gas and Electric Company (BGE) has accelerated the modernization of its natural gas system, benefitting customers with safer, more reliable gas service, reducing greenhouse gas emissions, and supporting job growth. Strategic investments in public infrastructure such as BGE's STRIDE program are an essential component of the region's economic vitality as well as the health and well-being of local communities.

BGE commissioned Econsult Solutions, Inc (ESI) to perform a study to measure the economic and environmental impacts of BGE's current approved STRIDE program – projected to be complete in 2042 – as well as three scenarios where the STRIDE program investments are further accelerated to be complete in 2032, 2035, or 2037.

The STRIDE program investments represent a significant boost to the local and state economies in Maryland, measured in terms of output, jobs, and labor income, as well as tax revenues. Direct construction activity puts construction workers and their professional service providers to work, who in turn spend a portion of their salaries and wages within the local and state economies. It also catalyzes the procurement of a wide range of goods and services, which translates into new economic opportunities for local and state vendors. Further, investments through the STRIDE program reduce emissions and pollutants into the region's environment.

Under the current (2042) STRIDE plan, the cumulative impact generated from the 22-year construction period going forward will produce a $2.5 billion impact to the state of Maryland, supporting 14,780 full-time equivalent jobs and $929 million in labor income. The STRIDE investments will also generate approximately $94 million in income, sales, and business taxes to the State of Maryland over the same period.[1]

If BGE were to accelerate the STRIDE program investments, the cumulative economic impacts are larger if the time period for completion is shortened to 2032, 2035, or 2037. For each of the acceleration scenarios, the cumulative economic and fiscal impacts are shown in the following figures.

[1] Analysis and metrics are shown in 2020 present value dollars throughout the report.

Figure ES.1: Cumulative Economic Impact from the STRIDE Program by Scenario within the State of Maryland

	Accelerated Scenarios			Current Plan
Impact Type	**2032**	**2035**	**2037**	**2042**
Total Impact ($M)	$3,019	$2,897	$2,785	$2,498
Employment Supported (FTE)[2]	**15,340**	**14,590**	**13,420**	**14,780**
Labor Income ($M)	$1,123	$1,078	$1,036	$929
Total Tax Revenue Impact ($M)	$114	$109	$105	$94

By modernizing natural gas infrastructure, the STRIDE program is improving environmental and health outcomes for communities both locally and globally. Replacing aged gas infrastructure reduces natural gas system leakages, which in turn prevents methane from entering the atmosphere. Methane directly contributes to global warming and serves as the main precursor to the harmful air pollutant, tropospheric ozone. Air pollution can disproportionally impact low-income communities, making health improvements in the BGE service area all the more crucial. BGE's investments in the STRIDE program will positively impact the health and well-being of Central Maryland residents for generations to come.

Under the current approved STRIDE plan, investments through 2042 will generate $21 million in societal benefit within the United States and $156 million globally from reduced greenhouse gas emissions.[3] Due to the cumulative benefit from replacing gas mains, the accelerated STRIDE 2032 program will produce the greatest emissions reductions and overall value.

Figure ES.2: Social Value of CO_2 Emissions Reduction from STRIDE Programs by Scenario, Through 2050

	CO2 Emissions Reduction (Metric Tons)	**Domestic Value of CO_2 Emissions Reduction ($M)**	**Global Value of CO_2 Emissions Reduction ($M)**
New Plan 2032	2,591,710	$24.9	$185.3
New Plan 2035	2,451,350	$23.7	$176.6
New Plan 2037	2,392,940	$23.2	$172.7
Current Plan 2042	2,146,650	$21.0	$156.4

[2] IMPLAN generates job estimates based on the term "job-years", or how many jobs will be supported each year. For instance, if a construction project takes two years, and IMPLAN estimates there are 100 employees, or more correctly "job-years" supported, over two years, that represents 50 annual jobs. Additionally, there may be a mix of full and part-time employment. Consequently, job creation could feature more part-time jobs than full-time jobs. To account for this, IMPLAN has a multiplier to convert annual jobs to full-time equivalent jobs. Therefore, the Current plan scenario has five additional years than the last Accelerated Scenario. The additional years impacts the calculations that accounts for the additional jobs needed to complete the plan.

[3] The social value of CO_2 equivalent reductions is valued using a social cost of carbon (SCC) estimate for each metric ton with a 3 percent discount rate; the measure has been estimated by the Environmental Protection Agency through 2050. The total value of CO_2 emissions reductions was calculated starting from 2021, with each year's pipeline improvements/reductions to emissions evaluated through year 2050.

In aggregate, the current approved STRIDE (2042) plan is expected to reduce 2.1 million CO_2 equivalent metric tons of greenhouse gases. To understand this number in more material terms, 2.1 million metric tons of CO_2 is equivalent to the following production measures:

- 464,000 million passenger vehicles driven in one year;
- 248,000 homes' energy use for one year;
- 363,000 homes' electricity use for one year.

Figure ES.3: CO_2 Emissions Equivalencies from STRIDE Programs

	CO2 Emissions Reduction (Metric Tons)	Passenger Vehicles Driven in One Year	Homes' Energy Use for One Year	Homes' Electricity Use for One Year
New Plan 2032	2,591,710	559,922	299,066	438,792
New Plan 2035	2,451,350	529,598	282,870	415,028
New Plan 2037	2,392,940	516,979	276,130	405,139
Current Plan 2042	2,146,650	463,770	247,709	363,441

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1. Introduction

1.1. Purpose of the Report

The purpose of this report is to articulate the impacts of Baltimore Gas and Electric Company's (BGE) Strategic Infrastructure Development and Enhancement (STRIDE) program at a local, regional, and statewide level. Through the comprehensive modernization plan, BGE will produce impacts through its upfront construction, which will create economic opportunities, support jobs, and generate tax revenues in addition to broader societal impacts on the environment and public health. Currently, the infrastructure improvement plan includes investments through 2042. The analysis will include a comparison of the impacts of scenarios in which the STRIDE plan is completed on quicker timetables.

1.2. About Baltimore Gas and Electric Company

BGE serves more than 1.3 million electric customers and more than 680,000 gas customers in a diverse, 2,300-square-mile area encompassing Baltimore City and all or part of 10 central Maryland counties.[4] With a history of more than 200 years of service as the first gas utility in the U.S., BGE has a long-standing commitment to its customers and the community. BGE was established in 1816 when Rembrandt Peale lit the first gas lamp in Baltimore, and it continues two centuries later with BGE and its customers still leading the way in energy innovation. Today the company is one of the 25 largest private employers in Maryland.[5]

1.3. Scope and Methodology

Within this report, Econsult Solutions, Inc. (ESI) employs industry-standard modeling techniques to estimate the direct economic activity generated by BGE's STRIDE program within its service area and the state of Maryland. Those direct impacts are then translated into total economic output, employment, associated earnings, and tax revenue impact using industry-standard input-output modeling. The appendix of this report describes the approach and methodology in detail.

Data inputs on operating activity and capital investments were provided by BGE. ESI verified and supplemented these data with other public data sources and assumptions as needed. For each input, the most recent and appropriate dataset is used to show the annual and aggregate economic impact from the operating activity expected to be generated from the current approved STRIDE 2042 plan and further accelerated scenarios. A seven percent discount rate was applied to expenditures to ensure that

[4] The ten central Maryland counties are Baltimore County, Anne Arundel County, Howard County, Harford County, Carroll County, Cecil County, Frederick County, Montgomery County, Prince George's County, and Calvert County.
[5] Maryland Department of Labor, "Maryland Major Employer Lists," https://www.dllr.state.md.us/lmi/emplists/maryland.shtml.

the data remained consistent over time intervals. The discount rate is consistent with the Federal Rate set by The Office of Management & Budget.[6]

Figure 1.1: Economic Impact Methodology

Source: Econsult Solutions, Inc. (2020)

Economic impact results are calculated for the BGE service area and the state of Maryland. Key outputs include total economic output, employment supported, and earnings supported. In this report, the economic impacts are generated solely from STRIDE project investments and exclude broader impacts on the economy via surcharges and rate changes associated with the capital program.

Tax revenue impacts are expressed for the State of Maryland and the jurisdictions in the BGE service area. Fiscal modeling accounts for which types of economic activity are and are not subject to taxation specific to the taxing jurisdiction. STRIDE's economic activity generates taxable activity (for example, jobs and retail development) for the State of Maryland, as well as suburban municipalities, surrounding county governments, and other nearby state governments. These amounts are smaller and more diffuse than those calculated for the State, service area counties, and the City of Baltimore and are excluded from this analysis to be conservative.

1.4. Organization of the Report

BGE commissioned Econsult Solutions, Inc. (ESI) to complete an analysis of the potential economic and fiscal impacts of the BGE's current approved STRIDE program as well as comparing the impacts of scenarios in which the STRIDE plan is completed on quicker timetables.[7] The purpose of this analysis is to estimate the direct economic footprint and the spillover activity related to capital investments from STRIDE plans and ongoing operations. In addition, this report describes the many ways in which

[6]Circular A-94, Guidelines and Discount Rates for Cost Benefits Analysis of Federal Programs. https://www.wbdg.org/FFC/FED/OMB/OMB-Circular-A94.pdf

[7] Townson University completed an economic impact study for the Washington Gas Light Company's STRIDE program in 2018 to quantify the impacts of gas infrastructure replacements over two time periods, which has no bearing on the results of this study: Irani, Daraius, et al. "Economic Impacts of Natural Gas Infrastructure Spending. "Regional Economic Studies Institute Townson University, July 2018.

investments in public infrastructure support and enrich the local economy. The report is organized as follows:

- **Section 2: Overview of the STRIDE Program** contains information on the background of BGE's STRIDE program and its geographic footprint in the state of Maryland.
- **Section 3: Economic Impact of the STRIDE Program** quantifies the impact of capital investment and from the current STRIDE 2042 program, including an analysis of other industries that benefit economically from the activity as well as a fiscal analysis.
- **Section 4: Alternative Scenario Analysis** quantifies the impact of capital investment from the alternate STRIDE program timelines (2037, 2035, and 2032) including a fiscal analysis.
- **Section 5: Modeling Broader Impacts Associated with STRIDE** quantifies the potential environmental and health benefits associated with the overall reduction of greenhouse gas emission from STRIDE program infrastructure improvements.
- **Section 6: An Appendix** that provides additional methodology and analytical results at more granular geographies.

2. Overview of the STRIDE Program

Strategic investments in public infrastructure are an essential component of a region's economic vitality as well as the health and well-being of local communities. These investments can generate a significant upfront economic return in terms of output, jobs, and labor income, as well as tax revenues to local jurisdictions and the state. Further, investments through the STRIDE program will reduce emissions and pollutants into the region's environment; the value of these metrics can be quantified in economic and societal terms that are useful for stakeholders to understand their broader value. This report articulates the magnitude of the impact generated from this distinctive program and, where possible, quantifies those impacts locally, regionally, and statewide. These quantifications represent the impact of the STRIDE program's current and future investments as a force for good at the local and regional. As such, they demonstrate the upfront economic impacts generated by public infrastructure to local jurisdictions, to the Central Maryland region, and society as a whole.

2.1. About the STRIDE Program

The Strategic Infrastructure Development and Enhancement, or STRIDE plan is a multi-decade long agenda for natural gas system modernization and infrastructure improvement. The STRIDE program was made possible by legislation now codified in the Public Utilities Article, Annotated Code of Maryland (MD Pub Util Article § 4-210 (2013)) encouraging natural gas companies to accelerate infrastructure improvement by providing a mechanism for recovering the financial costs of systematic investments through a fixed annual surcharge.[8] STRIDE aims to improve the safety and reliability of natural gas delivery for decades to come above and beyond the current standard of maintenance. The replacement of cast iron, bare steel, pre-1970 ¾" HP steel services, and other outmoded materials drastically decrease the leakage of natural gas and the need for repairs. A central component of STRIDE is the targeted approach to infrastructure improvements by upgrading all the natural gas main and pipes in an entire neighborhood, work that is done through BGE's Operation Pipeline, which is part of BGE's STRIDE program. Antiquated pipes and mains are replaced with durable equipment, designed to better serve thousands of customers throughout the Central Maryland region.

BGE completed its first STRIDE plan in 2018 and received permission from the Maryland Public Service Commission to begin a STRIDE 2 plan in 2019 to further accelerate infrastructure improvements.[9] Currently, the comprehensive modernization plan includes investments through 2042. BGE has also considered internally three alternate plans with expedited investments concluding in 2037, 2035, and 2032. This report will seek to quantify the economic impact associated with the direct infrastructure investments for the current approved 2042 plan (Section 3) as well as alternative plans (Section 4).

[8] 2013 Maryland Code PUBLIC UTILITIES § 4-210 - Infrastructure replacement surcharge. https://law.justia.com/codes/maryland/2013/article-gpu/section-4-210/
[9] STRIDE Fact Sheet, Baltimore Gas & Electric Company. https://www.bge.com/SafetyCommunity/Safety/Documents/STRIDE%20Fact%20Sheet%202-10-15.pdf

2.2 Footprint of STRIDE Program's Spending in Maryland

The proposed STRIDE Program's investment timeframe would shift the value of these investments in 2020 dollars. Figures 2.1 and 2.2 outline each scenario's anticipated expenditures by labor and non-labor expenditures and then discounted based on the spending schedule during each scenario. Because of the time-value of money, upfront expenditures will be worth more than those that happen in the future; hence, the total expenditures for the current STRIDE Plan (2042) appears higher than the acceleration scenarios until discounted. The analysis completed in this report is only evaluating the economic impacts of this spending activity and does not further analyze or weigh in on the tradeoffs of spending sooner on these investments or their potential costs on the regional economy in the form of customer surcharges or rate increases.

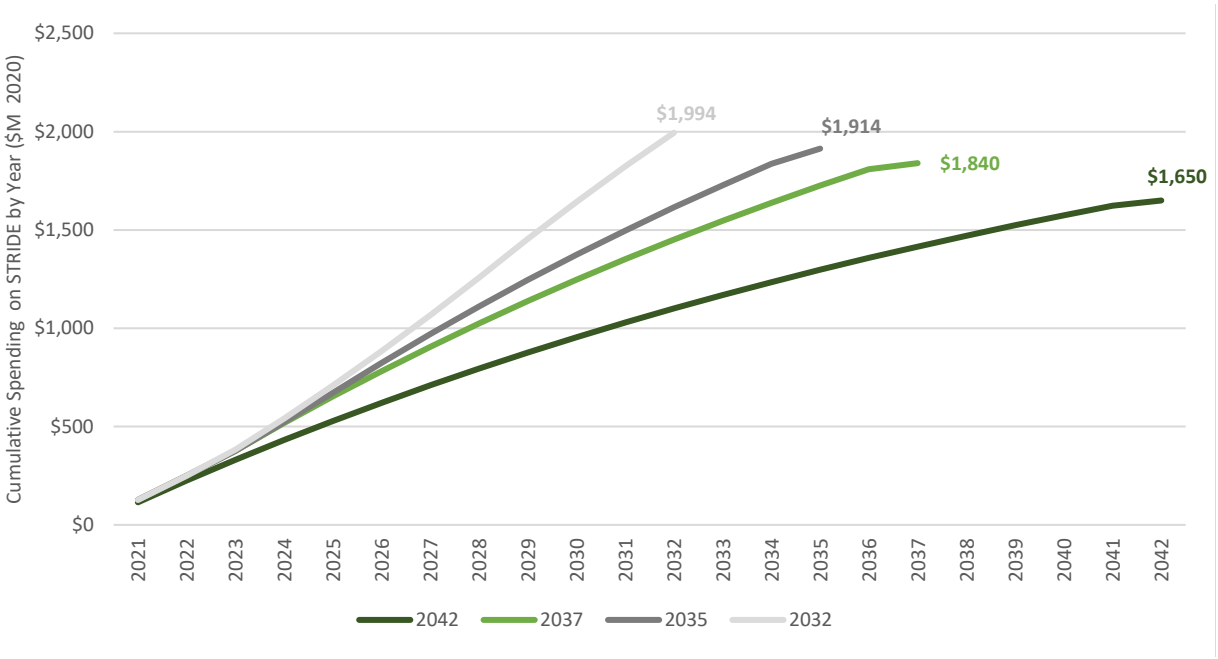
Figure 2.1: STRIDE Program Expenditures Depending on Planned Timeframe, in 2020 Present Value Dollars

	2032 Scenario	2035 Scenario	2037 Scenario	2042 Plan
Non-Labor Expenditures ($M)	$2,771	$2,824	$2,819	$2,936
Labor Expenditures ($M)	$493	$503	$502	$523
Total Expenditures ($M)	$3,265	$3,327	$3,321	$3,458
Discount Rate[10]	7%	7%	7%	7%
Total Expenditures in $2020 ($M)	**$1,994**	**$1,914**	**$1,840**	**$1,650**
Total Direct Jobs and Contractors	**9,520**	**9,420**	**8,570**	**10,780**

Source: Baltimore Gas & Electric (2020), Econsult Solutions, Inc. (2020)

[10] A discount rate was used in order to keep the investment spending over time comparable by expressing it the value in present dollars. For a further methodology, see Circular A-94, Guidelines and Discount Rates for Cost Benefits Analysis of Federal Programs. https://www.wbdg.org/FFC/FED/OMB/OMB-Circular-A94.pdf and https://www.epa.gov/sites/production/files/2017-09/documents/ee-0568-06.pdf

Figure 2.2: Cumulative STRIDE Program Expenditures Current and Accelerated Plans, in Nominal Dollars

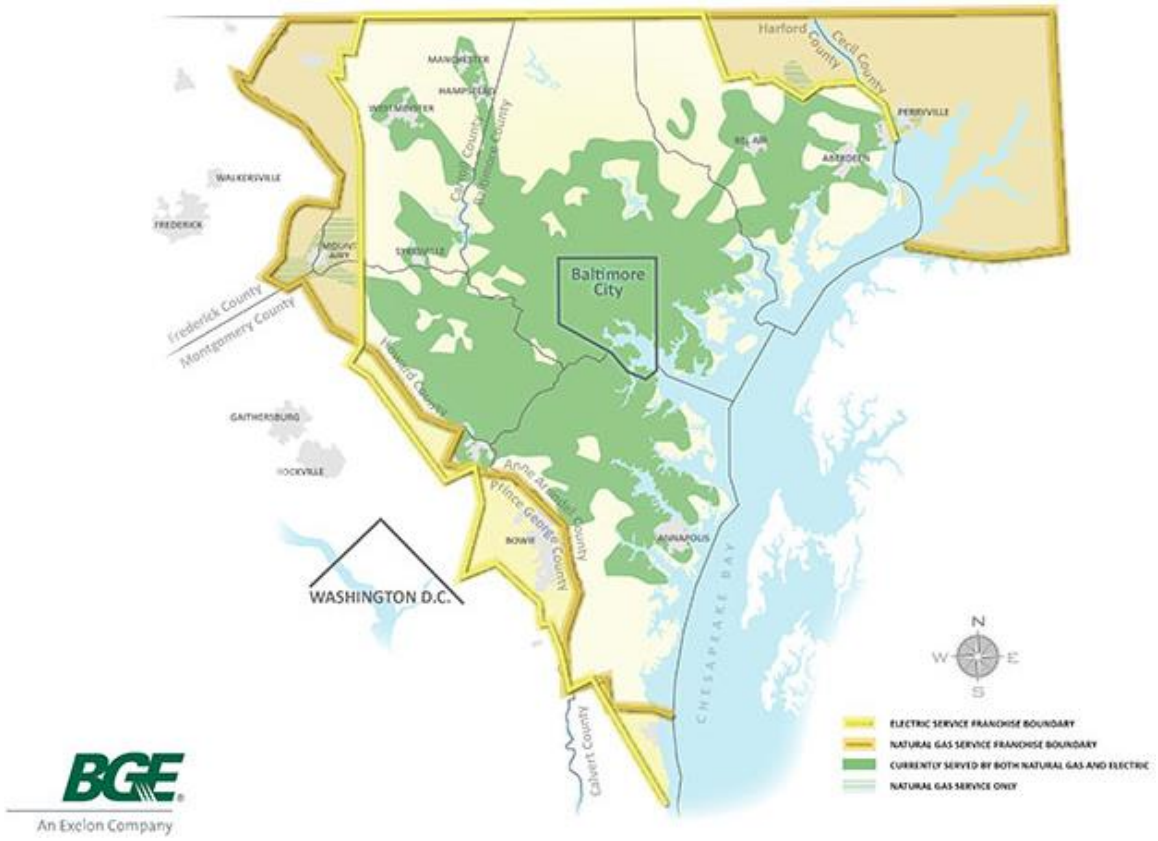


Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020)

2.3 Geographic Distribution of STRIDE Program

The economic impacts in this report are discussed at two different levels: the BGE service area and the state of Maryland. The BGE service area includes parts of Baltimore City and ten central Maryland counties including Baltimore County, Anne Arundel County, Howard County, Harford County, Carroll County, Cecil County, Frederick County, Montgomery County, Prince George's County, and Calvert County (see Figure 2.5). For the purpose of this analysis, the analysis of economic impacts on the BGE service area includes the spillover activity occurring in each county, even if the BGE only provides service to a portion of the county.

Figure 2.3: Baltimore Gas and Electric Company Service Area



Source: Baltimore Gas and Electric Company (2020)

While most Operation Pipeline projects occur within Baltimore City, STRIDE has a significant economic presence throughout the BGE service area (see Figure 2.4). The majority of main mile replacement for STRIDE's current approved 2042 plan happens in Baltimore City, Baltimore County, and Anne Arundel County.

Figure 2.4: STRIDE 2042 Miles of Mains to be Replaced by Geography

County	Percentage of Total Main Miles
Baltimore City	72.2%
Baltimore County	23.9%
Anne Arundel County	3.4%
Balance of Service Territory	0.5%
Total	100%

Source: Baltimore Gas and Electric Company (2020)

However, labor and procurement spending is further distributed throughout the service area and the state of Maryland. This direct spending also further circulates throughout these economies through spillover waves of spending on goods and services. This report will seek to quantify the economic impacts of STRIDE at these geographic levels.

3. Economic Impact of the STRIDE 2042 Program

The direct capital investments made through the STRIDE Program represent a significant boost to the local and state economies. Direct construction activity puts construction workers and their professional service providers to work, who in turn spend a portion of their salaries and wages within the local and state economies. It also catalyzes the procurement of a wide range of goods and services, which translates into new economic opportunities for local and state vendors.

The aggregate impact generated during the 22-year construction period will produce a $2.5 billion impact to the state of Maryland, supporting 14,780 full-time equivalent jobs and $929 million in labor income.

3.1 Direct Capital Investment for the Current STRIDE 2042 Plan

The upfront construction of the natural gas system modernization and infrastructure improvements is anticipated to be $3.5 billion.

However, an adjustment needs to be made to represent the current economic impact from the capital investments in 2020 present value. The $3.5 billion was adjusted using a seven percent discount rate across the 22-year time period of construction, which results in $1.6 billion in 2020 present value dollars. Since not all spending is directly occurring in the state, the modeled capital expenditures are $1.4 billion in 2020 present value dollar (see Figure 3.1).

Figure 3.1: Cumulative Direct Capital Investments Made by the STRIDE Program, 2042 Program

	2042 Capital Investments
Non-Labor Expenditures ($M)	$2,936
Labor Expenditures ($M)	$523
Total Expenditures ($M)	$3,458
Discount Rate[11]	7%
Total Expenditures in $2020 ($M)	$1,650
Total Expenditures made out of State in $2020 ($M)	$235
Modeled Expenditures ($M)	**$1,415**
Total Direct Jobs and Contractors	10,780
Out of State Jobs and Contractors	1,190
Modeled Direct Jobs and Contractors (in state)	**9,590**

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020)

[11] A discount rate was used in order to keep the investment spending over time comparable by expressing it the value in present dollars. For a further methodology, see: https://www.epa.gov/sites/production/files/2017-09/documents/ee-0568-06.pdf.

3.2 Potential Economic Impact from Capital Investments in STRIDE's Current 2042 Plan

The capital investments made by the STRIDE program will have a significant impact on the local and state economies. Within the BGE service area, the cumulative economic impact will be $2.47 billion, supporting 14,670 jobs, and $926 million in labor income. Within the state, the cumulative economic impact will be $2.5 billion i, supporting 14,780 jobs, and $929 million in labor income.[12] See the Appendix for detailed economic impacts by county in the BGE service area.

Figure 3.2: Potential Economic Impact of the STRIDE Program, Current 2042 Plan in BGE Service Area and the Maryland

Impact Type	BGE Service Area	Maryland
Direct Output ($M)	$1,415	$1,415
Indirect and Indirect Impact ($M)	$1,054	$1,083
Total Impact ($M)	**$2,470**	**$2,498**
Employment Supported (FTE)	**14,670**	**14,780**
Labor Income ($M)	**$926**	**$929**

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020), IMPLAN

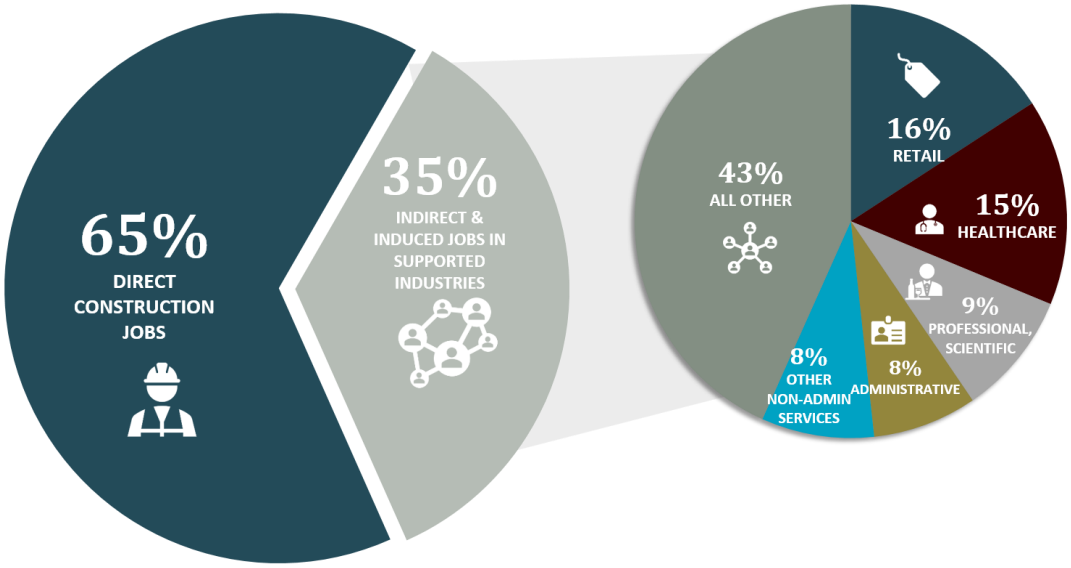
3.3 Industry Distribution of Economic Impact from Capital Investments

The economic impacts associated with the upfront capital investment affect a wide range of industries, far beyond the construction sector. While the construction industry is the largest individual beneficiary from these investments, other industries including retail, healthcare, and other professional services also see significant benefits from the indirect (supply chain) and induced (labor income) impacts of the capital activity. In other words, the economic activity supports various industries such as health care through the purchase of employee benefits, or the accommodation and food industry when a construction worker goes out and spend their earnings on lunch at nearby restaurants (see Figure 3.3).

Note that because the spending patterns for each of the STRIDE program scenarios are similar (aside from time frame) the industry impacts articulated in the figure below are consistent across the four scenarios.

[12] See Appendix 6.3 for county level economic impacts of the STRIDE program.

Figure 3.3: Industry Distribution of Employment Generated from the STRIDE 2042 Program within Maryland



Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020), IMPLAN

3.4 Potential Local and State Tax Revenue Impact from Capital Investments in STRIDE's Current 2042 Plan

The cumulative capital investments also generate State tax revenues during the period of construction. The direct activity from the STRIDE program's current plan and its indirect and induced economic impacts would generate approximately $94.3 million in income, sales, and business taxes to the State of Maryland over the 22-year construction period. At the county level, this activity would generate approximately $11.3 million in income tax across all counties in the BGE service area. See the Appendix for detailed tax impacts by county in the BGE service area.

Figure 3.4: Potential Tax Revenue Impact from the STRIDE Program, Current 2042 Plan to Counties in the BGE Service Area and to the State of Maryland

Tax Type	All Counties	Maryland
Income	$11.3	$35.9
Sales	-	$17.5
Business	-	$40.9
Total ($M)	**$11.3**	**$94.3**

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020), State of Maryland CAFR (2019)

3.5 Potential Spending Impact on Diverse Businesses

BGE has displayed a commitment to diversity, equity, and inclusion goals and objectives, most notably through the launch of *Focus Forward*, a strategic, small business development program in 2013. This program helps educate smaller, diversity certified businesses about how to navigate large business processes and better compete for contract opportunities. Focus Forward provides a unique educational opportunity to diversity-certified suppliers to learn from key BGE decision-makers about how to better to compete for sourcing opportunities and ultimately grow their business. As of FY 2019, BGE has reported that 42 percent of spending on procurement has been to Diverse Certified Businesses.

As a major capital investment program, STRIDE represents a key opportunity to further direct spending with local, diverse businesses. In the past few years, BGE has reached approximately 25 percent of program spending with local, diverse businesses, and endeavors to work towards 35 percent.

Figure 3.5 demonstrates potential spending scenarios by examining the purchasing component of the STRIDE program's budget, adjusting to 2020 dollars. If BGE meets those procurement targets (which BGE has in fact exceeded in recent years) STRIDE's spending could result in $350 million or more in spending specifically with Diverse Certified Businesses (in the current 2042 spending scenario).

Figure 3.5: Potential Spending ($2020) to Diverse Certified Businesses from the STRIDE Program, Current 2042 Plan

		Potential Spending with Diverse Businesses	
	Total Non-Labor Spending	**25% Participation Target**	**35% Participation Target**
Non-Labor Spending ($M)	$1,400	$350	$490

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020)

4 Alternative STRIDE Program Scenario Analysis

The prior section showed the economic impact from the STRIDE program at its current plan, with construction activities anticipated to occur from 2021 to 2042. In this section, three, alternate scenarios and their economic impacts are shown if the STRIDE program timeline was accelerated and completion of the infrastructure improvements occurred faster.

In the aggregate, the cumulative economic impacts from construction are larger if the time period for completion is shortened. The cumulative economic impacts to the state of Maryland are shown by scenario below:

- If completed by 2032, the cumulative economic impacts will be $3.02 billion impact to the state of Maryland, supporting 15,340 full-time equivalent jobs.
- If completed by 2035, the cumulative economic impacts will be $2.90 billion impact, supporting 14,590 full-time equivalent jobs.
- If completed by 2037, the cumulative economic impacts will be $2.78 billion, supporting 13,420 full-time equivalent jobs.

4.1 Direct Capital Investment from Accelerated Investment Scenarios

As mentioned in the prior section, data provided by BGE illustrated three alternate scenarios if the capital investments were accelerated to these respective years: 2032, 2035, or 2037. Because the capital investments are not in 2020 dollars, a discount rate of seven percent was applied for these alternate scenarios to show the economic impact in 2020 dollars. Not all spending is occurring within the state; therefore, the modeled capital expenditures were adjusted for each scenario, $1.71 billion in cumulative modeled spending by 2032, $1.64 billion in cumulative modeled spending by 2035, and $1.58 billion in cumulative modeled spending by 2037.

Figure 4.1: Cumulative Direct Capital Investments made by the STRIDE Programs by Alternate Scenario

	Accelerated Scenarios			Current Plan
	2032	**2035**	**2037**	**2042**
Non-Labor Expenditures ($M)	$2,771	$2,824	$2,819	$2,936
Labor Expenditures ($M)	$493	$503	$502	$523
Total Expenditures ($M)	$3,265	$3,327	$3,321	$3,458
Discount Rate	7%	7%	7%	7%
Total Expenditures in $2020 ($M)	$1,994	$1,914	$1,840	$1,650
Total Expenditures made of out of State in $2020 ($M)	$284	$272	$262	$235
Modeled Expenditures ($M)	**$1,711**	**$1,641**	**$1,578**	**$1,415**
Total Direct Jobs and Contractors	9,520	9,420	8,570	10,780
Out of State Jobs and Contractors	1.050	1,040	940	1,190
Modeled Direct Jobs and Contractors (in state)	**8,470**	**8,380**	**7,630**	**9,590**

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020)

4.2 Potential Economic Impact from Accelerated Investment Scenarios

The capital investments made in each alternate STRIDE program will have significant cumulative impacts on the local and state economies. Within the BGE service area, the cumulative economic impacts by scenario are as follows:

- If completed by 2032, the cumulative economic impact will be $2.98 billion in the BGE service area, supporting 15,200 full-time equivalent jobs, and $1.12 billion in labor income. The capital investments will produce a $3.02 billion impact to the state of Maryland, supporting 15,340 full-time equivalent jobs and $1.12 billion in labor income.
- If completed by 2035, the cumulative economic impact will be $2.9 billion in the BGE service area, supporting 14,460 full-time equivalent jobs, and $1.08 billion in labor income. The capital investments will produce a $2.90 billion impact to the state of Maryland, supporting 14,590 full-time equivalent jobs and $1.08 billion in labor income.
- If completed by 2037, the cumulative economic impact will be $2.75 billion in the BGE service area, supporting 13,300 full-time equivalent jobs, and $1.03 billion in labor income. The capital investments will produce a $2.78 billion impact to the state of Maryland, supporting 13,420 full-time equivalent jobs and $1.04 billion in labor income.

See the Appendix for detailed economic impacts by county in the BGE service area.

Figure 4.2: Potential Economic Impact of the STRIDE Programs, by Scenario in the BGE Service Area

	Accelerated Scenarios			Current Plan
Impact Type	**2032**	**2035**	**2037**	**2042**
Direct Output ($M)	$1,711	$1,641	$1,578	$1,415
Indirect and Induced Impact ($M)	$1,275	$1,223	$1,176	$1,054
Total Impact ($M)	**$2,985**	**$2,864**	**$2,754**	**$2,470**
Employment Supported (FTE)[13]	**15,200**	**14,460**	**13,300**	**14,670**
Labor Income ($M)	**$1,032**	**$1,074**	**$1,032**	**$926**

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020), IMPLAN

Figure 4.3: Potential Economic Impact of the STRIDE Programs by Scenario in Maryland

	Accelerated Scenarios			Current Plan
Impact Type	**2032**	**2035**	**2037**	**2042**
Direct Output ($M)	$1,711	$1,641	$1,578	$1,415
Indirect and Induced Impact ($M)	$1,309	$1,256	$1,207	$1,083
Total Impact ($M)	**$3,019**	**$2,897**	**$2,785**	**$2,498**
Employment Supported (FTE)[14]	**15,340**	**14,590**	**13,420**	**14,780**
Labor Income ($M)	**$1,123**	**$1,078**	**$1,036**	**$929**

Source: Baltimore Gas & Electric (2020), Econsult Solutions, Inc. (2020), IMPLAN

4.3 Potential Local and State Tax Revenue Impact from Accelerated Investment Plans

The cumulative capital investments also generate state tax revenues during the period of construction. The following tables show the fiscal impact by scenario/investment plan. See the Appendix for detailed tax impacts by county in the BGE service area.

- If completed by 2032, economic activity from the STRIDE program would generate approximately $113.9 million in income, sales, and business taxes to the State of Maryland and $12.7 million in taxes to all the counties in the BGE service area.

[13] IMPLAN generates job estimates based on the term "job-years", or how many jobs will be supported each year. For instance, if a construction project takes two years, and IMPLAN estimates there are 100 employees, or more correctly "job-years" supported, over two years, that represents 50 annual jobs. Additionally, there may be a mix of full and part-time employment. Consequently, job creation could feature more part-time jobs than full-time jobs. To account for this, IMPLAN has a multiplier to convert annual jobs to full-time equivalent jobs.
[14] IMPLAN generates job estimates based on the term "job-years", or how many jobs will be supported each year. For instance, if a construction project takes two years, and IMPLAN estimates there are 100 employees, or more correctly "job-years" supported, over two years, that represents 50 annual jobs. Additionally, there may be a mix of full and part-time employment. Consequently, job creation could feature more part-time jobs than full-time jobs. To account for this, IMPLAN has a multiplier to convert annual jobs to full-time equivalent jobs.

- If completed by 2035, economic activity from the STRIDE program would generate approximately $109.3 million in income, sales, and business taxes to the State of Maryland and $12.7 million in taxes to all the counties in the BGE service area.
- If completed by 2037, economic activity from the STRIDE program would generate approximately $105.1 million in income, sales, and business taxes to the State of Maryland and $11.7 million to all the counties in the BGE service area.

Figure 4.4: Potential Tax Revenue Impact from the STRIDE Program by Alternate Scenario to All Counties in BGE Service Area and the State of Maryland

	Accelerated Scenarios			Current Plan
Total Tax Revenue Impact ($M)	**2032**	**2035**	**2037**	**2042**
State of Maryland Total	**$113.9**	**$109.3**	**$105.1**	**$94.3**
Income	$43.4	$41.6	$40.0	$35.9
Sales	$21.1	$20.3	$19.5	$17.5
Business	$49.4	$47.4	$45.6	$40.9
All Counties in BGE Service Area[15]	**$12.7**	**$12.7**	**$11.7**	**$11.3**

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020), State of Maryland CAFR (2019), Various Counties CAFRs (2019)

4.4 Potential Spending Impact on Diverse Businesses

Similar to Section 3.5, the following figure highlights the potential spending to Diverse Certified Businesses based on various STRIDE acceleration scenarios, using 2020 dollars and assuming various participation goals demonstrates potential spending scenarios by examining the purchasing component of the STRIDE program's budget, adjusting to 2020 dollars and assuming different participation goals.

Figure 4.5: Potential Spending (2020 dollars) to Diverse Certified Businesses from the STRIDE Program, Alternative Scenarios

	Accelerated Scenarios			Current Plan
	2032	**2035**	**2037**	**2042**
Non-Labor Expenditures ($M)	1692	$1,624	$1,562	$1,400
Potential Spending, 25% Target ($M)	$423	$406	$390	$350
Potential Spending, 35% Target ($M)	$592	$589	$547	$490

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020)

[15] Potential County taxes calculated for wage taxes within each county where STRIDE improvements were analyzed. See Appendix for more detailed breakdown by County.

5 Broader Impacts Associated with STRIDE Program Investments

BGE's current approved STRIDE 2042 plan produces direct economic impacts through its operations, capital investments, and employment. Further accelerated STRIDE scenarios increase the scope and economic impact of infrastructure investments. This section explores yet another gain to the regional and state economies – the value of reductions in greenhouse gas emissions. The continued reduction of methane and carbon dioxide emission from BGE's gas distribution system has significant impacts on, not only the environment but the health and well-being of the local and global population.

5.1 Environmental Impacts

The prevention of natural gas leakages reduces the overall presence of greenhouse gases in the atmosphere and generates significant societal benefits. This subsection analyzes conversion of greenhouse gas emissions to CO_2 equivalencies, common units for the monetizing of greenhouse gases, to determine the appropriate estimate of the social cost of carbon to calculate the economic impacts of reducing leakages.

Natural gas is composed of several hydrocarbon gases such as ethane, propane, butane, carbon dioxide, oxygen, nitrogen, hydrogen sulfide, but is formed primarily of methane (CH_4). Methane is the second most abundant greenhouse gas originating from human activity, after carbon dioxide. Methane directly contributes to global warming, and while it is a short-lived pollutant, it is 25 times as potent as carbon dioxide in terms of trapping heat in the atmosphere.[16]

Various studies quantify the effects of greenhouse gas emissions in economic terms by estimating a numeric value for the social cost of carbon (SCC). SCC is an estimate of the economic damages incurred from the addition of one marginal ton of carbon dioxide in the atmosphere. **SCC is a comprehensive estimate of cost including agricultural productivity, fluctuations in energy, property damages from flood risks, and human health. Estimates of SCC vary based on the assumptions made when creating the model such as geographic scope and future cost discount rates.** The discount rate used to estimate SCC, similar to that used in a present value calculation, converts the cost of future pollution into present-day value. SCC is highly sensitive to discount rates, as the total damages from greenhouse gas emissions are calculated as far out as the year 2300.[17]

The Interagency Working Group on the Social Cost of Greenhouse Gases (IWG), formed to establish a federal government standard for SCC estimates in regulatory analysis, developed the methodology used to estimate the global and domestic SCC.[18] Although there is no universal consensus on the appropriate

[16] "Importance of Methane." United States Environmental Protection Agency, https://www.epa.gov/gmi/importance-methane
[17] EPA Fact Sheet: Social Cost of Carbon, U.S. Environmental Protection Agency, December 2016, https://www.epa.gov/sites/production/files/2016-12/documents/social_cost_of_carbon_fact_sheet.pdf
[18] The IWG was disbanded in 2017 by Executive Order 13783 (E.O. 13783 of Mar 28, 2017). https://www.federalregister.gov/documents/2017/03/31/2017-06576/promoting-energy-independence-and-economic-growth

rate, a 3 percent discount rate is used as the central value by the IWG to reflect the rate that society discounts future consumption.[19] SCC estimates grow over time as physical and economic systems become more stressed in response to environmental changes, producing larger incremental damage. The social value of reducing a metric ton of greenhouse gas emissions in 2020 is $53 globally and $8 domestically (see Figure 5.1).

Figure 5.1: Global and Domestic Social Cost of CO_2 per Metric Ton, 2015 – 2050 (2020 dollars)

Year	Global SCC	Domestic SCC
2015	$45	$6
2020	$53	$8
2025	$58	$8
2030	$63	$9
2035	$69	$10
2040	$76	$10
2045	$81	$11
2050	$87	$12

Source: Interagency Working Group on Social Cost of Greenhouse Gases (2016), U.S. Environmental Protection Agency (2019)

Comparison of STRIDE Plan Scenarios

Although the environmental impact of the STRIDE scenarios is felt at both a national and international level, the reduction of gas emissions originates from counties in the BGE service area based on infrastructure replacement activity. Each mile of gas main replaced avoids additional leakages in the subsequent year for the entire lifespan of the updated equipment, creating a cumulative benefit of reducing CO_2 equivalent tons of greenhouse gas emissions.[20] Given that the value of the global and domestic SCC is only projected through 2050, ESI only estimates the costs associated with emissions through that time. Under the current approved STRIDE plan, investments through 2042 will generate $21 million in societal benefit within the United States and $156 million globally from reduced greenhouse gas emissions.[21] Due to the cumulative benefit from replacing gas mains, the accelerated STRIDE 2032 program will produce the greatest emissions reductions and overall value.

The reduction of greenhouse gas emissions from the STRIDE scenarios is estimated to generate the following impacts through 2050 (see Figure 5.2):

- $25 million domestically and $185 million in international benefit under the STRIDE 2032 scenario;

[19] Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis, Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, 2016, https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc_tsd_final_clean_8_26_16.pdf

[20] The calculation of greenhouse gas emissions reductions assumes that every 10 miles of gas infrastructure replacement avoid 1,100 metric tons CO_2 in each subsequent year. The total value of CO_2 emissions reductions includes impacts from 2021 through 2050.

- $24 million domestically and $177 million in international benefit under the STRIDE 2035 scenario;
- $23 million domestically and $173 million in international benefit under the STRIDE 2037 scenario; and
- $21 million domestically and $156 million in international benefit under the STRIDE 2042 scenario.

Figure 5.2: Social Value of CO_2 Emissions Reduction from STRIDE Programs by Scenario, Through 2050

	CO2 Emissions Reduction (Metric Tons)	Domestic Value of CO_2 Emissions Reduction ($M)	Global Value of CO_2 Emissions Reduction ($M)
New Plan 2032	2,591,710	$24.9	$185.3
New Plan 2035	2,451,350	$23.7	$176.6
New Plan 2037	2,392,940	$23.2	$172.7
Current Plan 2042	2,146,650	$21.0	$156.4

Source: Baltimore Gas and Electric Company, Econsult Solutions, Inc (2020)

5.2 Health Impacts

A robust body of literature highlights the societal impacts of greenhouse gas emissions on a community, particularly on human health. Methane, the primary component of natural gas, does not directly harm human health but is a key contributor to the rise in tropospheric ozone which is harmful to humans.

Studies have shown that methane is responsible for half of the observed rise in tropospheric ozone globally.[22] Because of its atmospheric formation, tropospheric ozone travels with the wind and migrates across national and continental borders (hence why the costs of these emissions are calculated from a domestic or societal perspective). Tropospheric ozone exposure has been associated with a wide variety of health risks. Recent evidence supports the effects of both long and short-term exposure to ozone on respiratory health, including worsened asthma, exacerbated chronic obstructive pulmonary disease (COPD), and respiratory infections.[23] An article in the *Journal of Environmental Health Perspectives* estimated that long-term exposure to ozone was attributed to the premature respiratory death of over one million adults globally in 2010.[24] Other studies suggest that exposure to ozone is likely to produce metabolic effects. Additionally, there exists suggestive evidence that exposure to ozone can affect the

22 "Near-term Climate Protection and Clean Air Benefits: Actions for Controlling Short-Lived Climate Forcers." United Nations Environment Programme (UNEP), November 2011, page 4

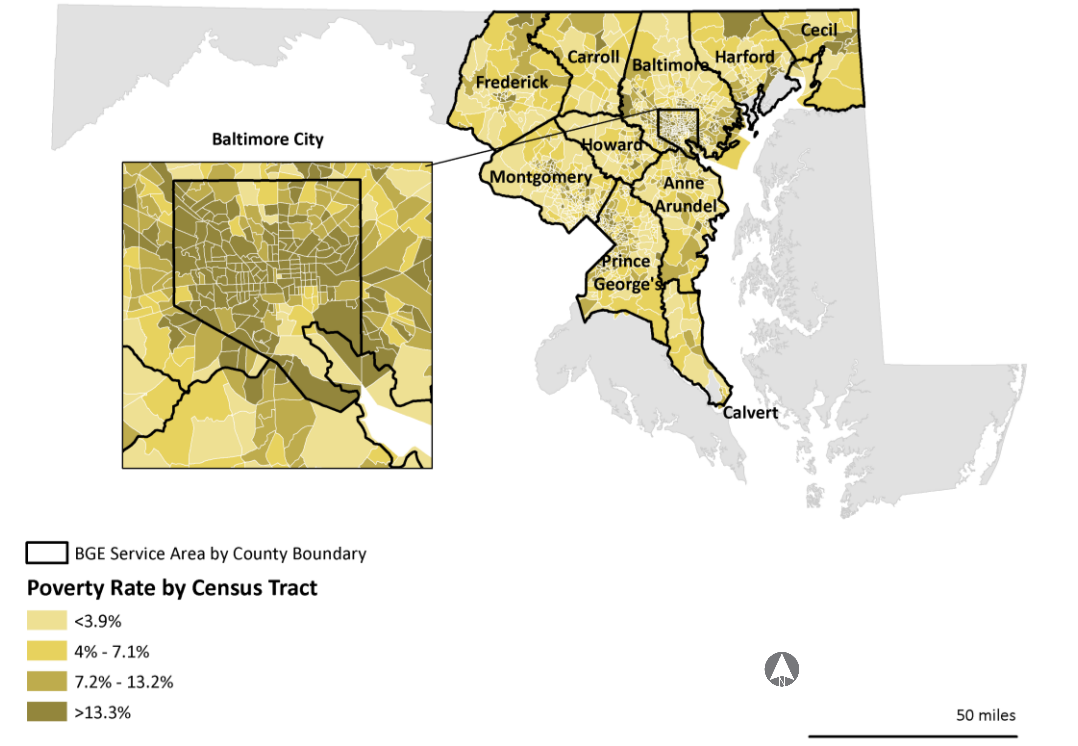
23 U.S. EPA. Integrated Science Assessment (ISA) for Ozone and Related Photochemical Oxidants (Final Report, Apr 2020). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-20/012, 2020. ES-8.

24 Malley, Christopher S, et al. "Updated Global Estimates of Respiratory Mortality in Adults ≥ 30 Years of Age Attributable to Long-Term Ozone Exposure." National Institute of Environmental Health Sciences, U.S. Department of Health and Human Services, ehp.niehs.nih.gov/doi/10.1289/ehp1390.

cardiovascular and central nervous system and poses a potential threat to reproduction, development, and mortality.[25]

The localized impact of STRIDE infrastructure replacement work is positively impacting the communities in which it occurs, including low-income communities and communities of color (see Figures 5.3 and 5.4). Various studies document the impacts of income on health, hypothesizing that both the inaccessibility of healthcare for low-income families and the place-based health benefits experienced by more affluent families, such as decreased exposure to environmental pollution, drive the disparities in health outcomes.[26] Researchers found that non-Hispanic Black residents experience an increased likelihood of living in areas of worse ozone air quality.[27] Challenges related to environmental justice are particularly relevant to BGE since the majority of the Stride Program projects occur in Baltimore City, a predominantly-Black municipality with a poverty rate more than twice that of the nation.[28]

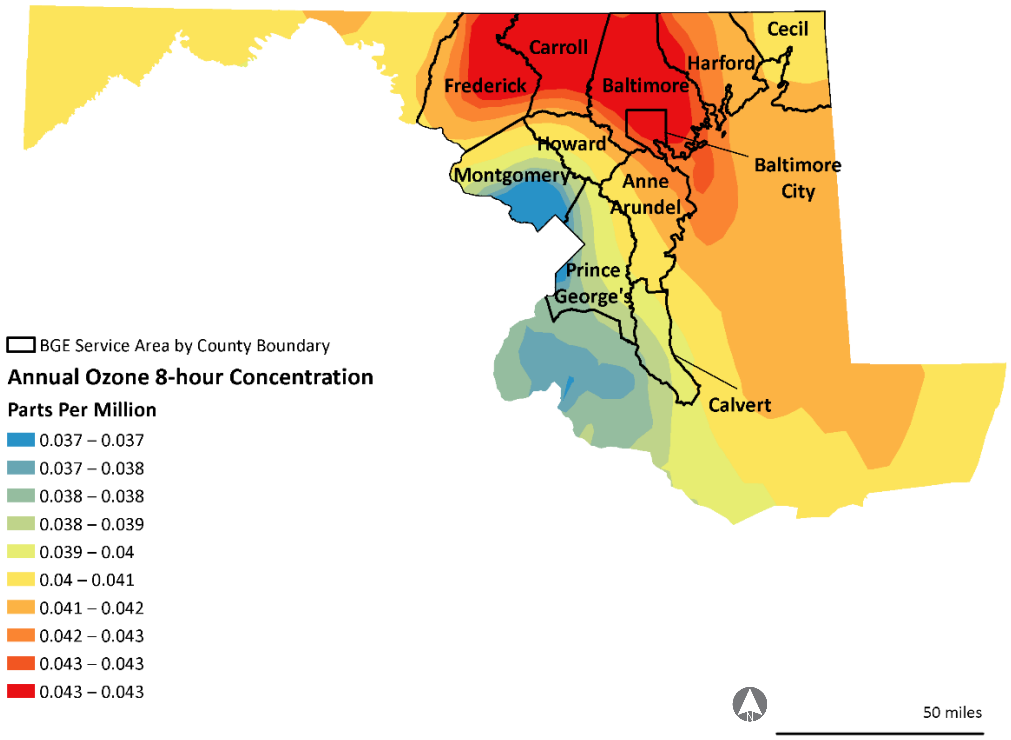
Figure 5.3: Poverty Rate by Census Tract in BGE Service Area



Source: US Census Bureau American Community Survey (2019), ESRI ArcMap (2020), Econsult Solutions, Inc. (2020)

[25] U.S. EPA. Integrated Science Assessment (ISA) for Ozone and Related Photochemical Oxidants (Final Report, Apr 2020). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-20/012, 2020. ES-7.
[26] "How are Income and Wealth Linked to Health and Longevity". The Urban Institute, April 2015. https://www.urban.org/sites/default/files/publication/49116/2000178-How-are-Income-and-Wealth-Linked-to-Health-and-Longevity.pdf
[27] Miranda, Marie Lynn, et al. "Making the Environmental Justice Grade: The Relative Burden of Air Pollution Exposure in the United States." International Journal of Environmental Research and Public Health, June 2011
[28] U.S. Census Bureau, American Community Survey, 2019

Figure 5.4: Existing Standard Ozone Concentrations Across Maryland



Source: EPA (2020), ESRI ArcMap (2020), Econsult Solutions, Inc. (2020)

By modernizing natural gas infrastructure, the STRIDE program is improving health outcomes for communities both locally and globally. Replacing aged gas infrastructure reduces natural gas system leakages, which in turn prevents methane from entering the atmosphere that causes the formation of the harmful air pollutant, tropospheric ozone. Exposure to ozone poses many serious health risks ranging from respiratory health to disparities to premature death. The existing disparities in the impact of air pollution make health improvements in the BGE service area all the more crucial. BGE's investments in the STRIDE program will directly impact the health and well-being of Central Maryland residents for generations to come.

5.3 Key Findings

In aggregate, the current approved STRIDE (2042) plan is expected to reduce 2.1 million CO_2 equivalent metric tons of greenhouse gases. To understand this number in more material terms, 2.1 million metric tons of CO_2 is equivalent to the following production measures:

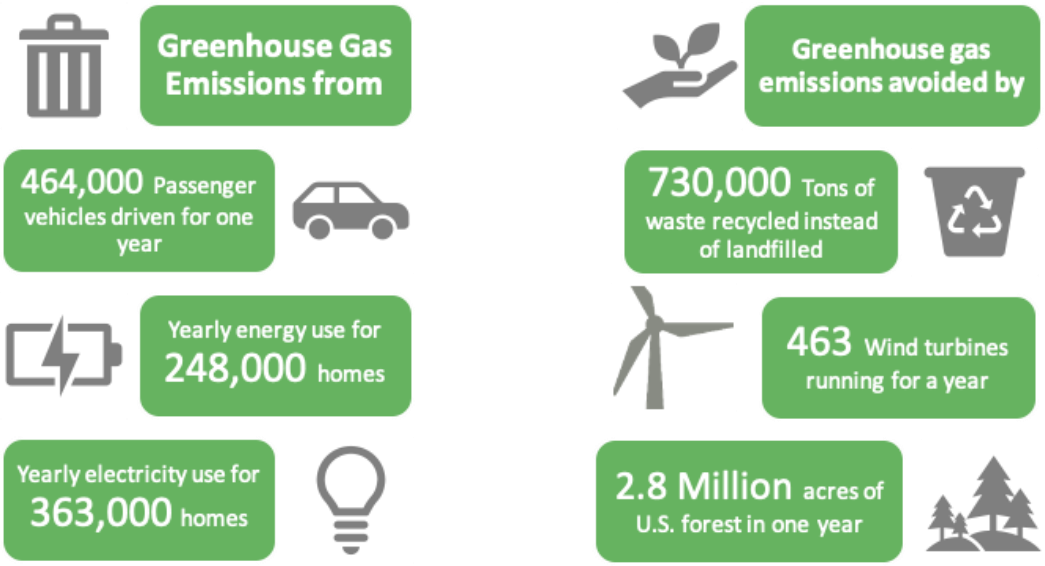


Figure 5.5: CO_2 Emission Equivalencies from STRIDE Programs by Scenario

	CO2 Emissions Reduction (Metric Tons)	Passenger Vehicles Driven in One Year	Homes' Energy Use for One Year	Homes' Electricity Use for One Year
New Plan 2032	2,591,710	559,922	299,066	438,792
New Plan 2035	2,451,350	529,598	282,870	415,028
New Plan 2037	2,392,940	516,979	276,130	405,139
Current Plan 2042	2,146,650	463,770	247,709	363,441

Source: Greenhouse Gas Equivalencies Calculator, U.S. Environmental Protection Agency (2020)

Figure 5.6: CO_2 Reduction Equivalencies from STRIDE Programs by Scenario

	CO2 Emissions Reduction (Metric Tons)	Tons of Waste Recycled Instead of Landfilled	Wind Turbines Running for a Year	Acres of U.S. Forests in One Year
New Plan 2032	2,591,710	881,534	560	3,384,653
New Plan 2035	2,451,350	833,793	529	3,201,349
New Plan 2037	2,392,940	813,925	517	3,125,069
Current Plan 2042	2,146,650	730,153	463	2,803,425

Source: Greenhouse Gas Equivalencies Calculator, U.S. Environmental Protection Agency (2020)

6 Appendix

6.1 About Econsult Solutions, Inc.

This report was produced by Econsult Solutions, Inc. ("ESI"). ESI is a Philadelphia-based economic consulting firm that provides businesses and public policy makers with economic consulting services in urban economics, real estate economics, transportation, public infrastructure, development, public policy and finance, community and neighborhood development, planning, as well as expert witness services for litigation support. Its principals are nationally recognized experts in urban development, real estate, government and public policy, planning, transportation, non-profit management, business strategy and administration, as well as litigation and commercial damages. Staff members have outstanding professional and academic credentials, including active positions at the university level, wide experience at the highest levels of the public policy process and extensive consulting experience.

6.2 Appendix B: Methodology

Economic impact estimates are generated by utilizing input-output models to translate an initial amount of direct economic activity into the total amount of economic activity that it supports, which includes multiple waves of spillover impacts generated by spending on goods and services and by spending of labor income by employees. This section summarizes the methodologies and tools used to construct, use, and interpret the input-output models needed to estimate this project's economic impact.

Input-Output Model Theory

In an inter-connected economy, every dollar spent generates two spillover impacts:

- First, some amount of the proportion of that expenditure that goes to the purchase of goods and services gets circulated back into an economy when those goods and services are purchased from local vendors. This represents what is called the "indirect effect," and reflects the fact that local purchases of goods and services support local vendors, who in turn require additional purchasing with their own set of vendors.

- Second, some amount of the proportion of that expenditure that goes to labor income gets circulated back into an economy when those employees spend some of their earnings on various goods and services. This represents what is called the "induced effect," and reflects the fact that some of those goods and services will be purchased from local vendors, further stimulating a local economy.

The role of input-output models is to determine the linkages across industries in order to model out the magnitude and composition of spillover impact to all industries of a dollar spent in any one industry. Thus, the total economic impact is the sum of its own direct economic footprint plus the indirect and induced effects generated by that direct footprint.

Input-Output Model Mechanics

To model the impacts resulting from the direct expenditures, Econsult Solutions, Inc. developed a customized economic impact model using the IMPLAN input/output modeling system. IMPLAN represents an industry standard approach to assess the economic and job creation impacts of economic development projects, the creation of new businesses, and public policy changes within its surrounding area. IMPLAN has developed a social accounting matrix (SAM) that accounts for the flow of commodities through economics. From this matrix, IMPLAN also determines the regional purchase coefficient (RPC), the proportion of local supply that satisfies local demand. These values not only establish the types of goods and services supported by an industry or institution, but also the level in which they are acquired locally. This assessment determines the multiplier basis for the local and regional models created in the IMPLAN modeling system. IMPLAN takes the multipliers and divides them into 536 industry categories in accordance to the North American Industrial Classification System (NAICS) codes.

The IMPLAN modeling system also allows for customization of its inputs which alters multiplier outputs. Where necessary, certain institutions may have different levels of demand for commodities. When this occurs, an "analysis-by-parts" (ABP) approach is taken. This allows the user to model the impacts of

direct economic activity related to an institution or industry with greater accuracy. Where inputs are unknown, IMPLAN is able to estimate other inputs based on the level of employment, earnings, or output by an industry or institution.

Employment and Labor Income Supported

IMPLAN generates job estimates based on the term "job-years", or how many jobs will be supported each year. For instance, if a construction project takes two years, and IMPLAN estimates there are 100 employees, or more correctly "job-years" supported, over two years, that represents 50 annual jobs. Additionally, these can be a mix of a full and part-time employment. Consequently, job creation could feature more part-time jobs than full-time jobs. To account for this, IMPLAN has a multiplier to covert annual jobs to full-time equivalent jobs.

Income to direct, indirect, and induced jobs is calculated as labor income. This includes wage and salary, all benefits (e.g., health, retirement) and payroll taxes (both sides of social security, unemployment taxes, etc.). Therefore, IMPLAN's measure of income estimates gross pay opposed to just strictly wages.

Tax Revenue Impact

The economic impacts in turn produce one-time or ongoing increases in various tax bases, which yield temporary or permanent increases in various tax revenues. To estimate these increases, ESI created a tax revenue impact model to translate total economic impacts into their commensurate tax revenue gains. These tax revenue gains only account for a subset of the total tax revenue generation that an institution or industry may have on the economy. ESI estimated the income and business tax revenue generated using data from Maryland's FY2020 Comprehensive Annual Financial Report (CAFR). The effective income tax rate was used from the CAFR, along with historical business tax revenue generated in the State to arrive at estimated tax revenue impacts.

6.3 Appendix C: County-Level Economic and Fiscal Impacts

The following tables show the county level impact of the STRIDE program by scenario, for only counties where spending of non-labor expenditures is occurring: 1) Anne Arundel County, 2) Baltimore County, 3) Baltimore City, and 4) Howard County. A discount rate of seven percent to the expenditures by county were applied to show the economic impacts in $2020.

Figure C.1: Economic Impact from the STRIDE Program in Anne Arundel County

Impact Type	2032	2035	2037	2042
Direct Output ($M)	$457.0	$438.5	$421.5	$378.1
Indirect and Induced Impact ($M)	$272.6	$261.6	$251.5	$225.5
Total Impact ($M)	**$729.6**	**$700.0**	**$673.0**	**$603.6**
Employment Supported (FTE)	**2,730**	**2,550**	**2,350**	**2,500**
Labor Income ($M)	**$251.8**	**$241.6**	**$232.3**	**$208.3**

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020), IMPLAN

Figure C.2: Economic Impact from the STRIDE Program in Baltimore County

Impact Type	2032	2035	2037	2042
Direct Output ($M)	$537.2	$515.4	$495.5	$444.4
Indirect and Induced Impact ($M)	$321.1	$308.1	$296.2	$265.7
Total Impact ($M)	**$858.3**	**$823.6**	**$791.7**	**$710.1**
Employment Supported (FTE)	**5,130**	**4,910**	**4,515**	**5,105**
Labor Income ($M)	**$348.9**	**$334.8**	**$321.8**	**$288.6**

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020), IMPLAN

Figure C.3: Economic Impact from the STRIDE Program in Baltimore City

Impact Type	2032	2035	2037	2042
Direct Output ($M)	$468.0	$449.1	$431.7	$387.2
Indirect and Induced Impact ($M)	$173.4	$166.3	$159.9	$143.4
Total Impact ($M)	**$641.4**	**$615.4**	**$591.7**	**$530.6**
Employment Supported (FTE)	**2,075**	**1,975**	**1,810**	**2,040**
Labor Income ($M)	**$234.5**	**$225.0**	**$216.3**	**$194.0**

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020), IMPLAN

Figure C.4: Economic Impact from the STRIDE Program in Howard County

Impact Type	2032	2035	2037	2042
Direct Output ($M)	$170.7	$163.8	$157.4	$141.2
Indirect and Induced Impact ($M)	$101.7	$97.5	$93.8	$84.1
Total Impact ($M)	**$272.3**	**$261.3**	**$251.2**	**$225.3**
Employment Supported (FTE)	**930**	**870**	**800**	**860**
Labor Income ($M)	**$101.4**	**$97.3**	**$93.5**	**$83.9**

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020), IMPLAN

Figure C.5: Income Tax Impact by County from the STRIDE Program by Scenario

County	2032	2035	2037	2042
Anne Arundel County	$2.79	$2.68	$2.58	$2.68
Baltimore County	$4.31	$4.67	$3.98	$3.57
Baltimore City	$2.73	$2.62	$2.52	$2.26
Calvert County	$0.01	$0.01	$0.01	$0.01
Carroll County	$0.37	$0.35	$0.34	$0.30
Cecil County	$0.03	$0.03	$0.03	$0.03
Frederick County	$0.03	$0.03	$0.03	$0.03
Harford County	$0.78	$0.75	$0.72	$0.64
Howard County	$1.63	$1.56	$1.50	$1.80
Montgomery County	$0.04	$0.03	$0.03	$0.03
	$12.73	**$12.74**	**$11.74**	**$11.35**

Source: Baltimore Gas and Electric Company (2020), Econsult Solutions, Inc. (2020), IMPLAN, Various City and County CAFRs (2019)

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