

Appendix C – 2024 Maryland BEPS Impact Analysis Update

## 2024 Maryland BEPS Impact Analysis Update

This document summarizes the updated emissions and economic modeling for the 2024 proposed Building Energy Performance Standards (BEPS) based on the 2023 Maryland BEPS Impact Analysis (8/21/2023) from the Lawrence Berkeley National Lab (LBNL).

Using the data from the 2023 Maryland BEPS Impact Analysis, LBNL analyzed modified scenarios that reflect the 2024 Maryland BEPS proposed regulation. LBNL modeled three scenarios in 2024 – baseline, full compliance, and finance-driven:

### 2024 Updated Baseline Scenario

In the baseline scenario, buildings are not subject to any BEPS targets. Buildings replace their space heating and water heating system once during the analysis period. Space and water heating systems are replaced like-for-like, so gas consumption decreases, but electricity consumption does not change. Since there are no targets, buildings do not pay alternative compliance fees.

### 2024 Updated Full Compliance Scenario

In the full compliance scenario, buildings are subject to direct emissions intensity standards. During each five-year compliance cycle, each building first tries to meet its direct emissions standard through gas efficiency (up to 20% reduction for space heating). If gas efficiency savings are not sufficient to meet the standard, it then electrifies space heating, water heating, and other end uses until the emissions standard is met. The logic applied to prioritize electrification of end-uses was developed to minimize project size for each compliance cycle. First – a building considers if either space heating, water heating, or a combination of both can satisfy the standard, electing to electrify the minimum amount needed for compliance. Second – if space heating and water heating are already electrified, ‘other’ end-uses are electrified at a lower assumed efficiency. All buildings comply with the standards, regardless of cost, so no buildings pay alternative compliance fees.

### 2024 Updated Finance-Driven Scenario

In the finance-driven compliance scenario, buildings are subject to the same standards as the full compliance schedule, and use the same reduction strategy to meet the standards, except that they only make reductions if they are cost effective. At each modeling step (i.e., gas efficiency, gas electrification, electric efficiency), a building compares the cost of implementing the reduction and the cost savings due to purchasing energy to possible alternative compliance fees. The building uses a

10-year outlook when considering implementing efficiency measures and a 30-year outlook when considering electrification. If possible alternative compliance fees are less expensive, the building chooses not to make any energy reductions and pays the alternative compliance fees instead.

LBNL modeled estimated energy impacts, emissions impacts, and costs from 2025-2050. The results are summarized in the table below.

Table. 2024 MD BEPS Statewide Impact Analysis Model Results Summary for 2025-2050.

	Energy Use (billion kBtu)	Emissions (billion kgCO <sub>2</sub> )	Total Cost (billion \$)
Baseline Scenario	1,833	58.9	69.84
Full Compliance	1,717	49.6	72.35
Financial-Driven Compliance	1,723	50.1	70.26
Savings - Full Compliance	116	9.3	-\$2.51
Savings - Financial Driven Compliance	110	8.8	-\$0.42

In the finance-driven compliance scenario, natural gas consumption decreases 94% by 2040, and electricity consumption increases 8%. Overall energy consumption decreases 9%.

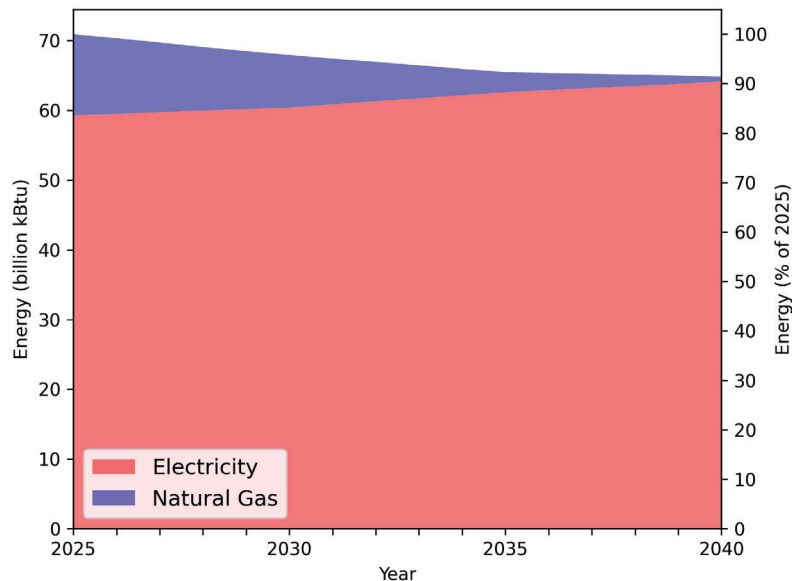


Figure 1: Finance-Driven Compliance Scenario – Projected State-wide Covered Building Energy Consumption

Similarly, emissions from natural gas decrease by 94% by 2040 and emissions from electricity decrease 81%, largely due to the electric grid getting cleaner. In the baseline scenario, electricity consumption does not decrease, but emissions from electricity decrease 82%.

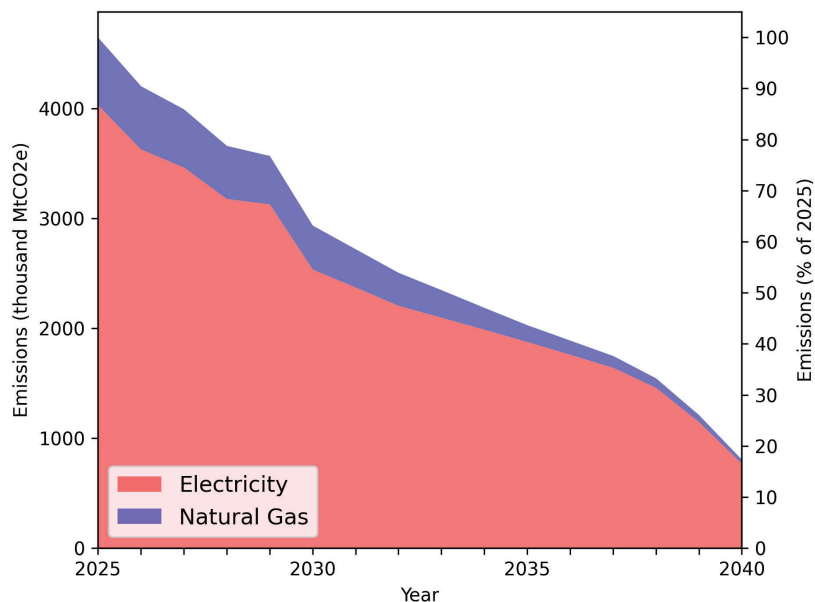


Figure 2: Finance-Driven Compliance Scenario – Projected State-wide Covered Building Emissions

The most likely outcome for buildings complying with Maryland’s BEPS policy would be a finance-driven compliance scenario. According to the model, during BEPS implementation (2025-2040), under a regulation that includes emissions standards but does not yet include EUI standards, all covered buildings combined will spend more on efficiency measures (\$205 million) and electrification measures (\$5.53B) than the energy cost savings accrued in this period (\$1.20B). On a longer time horizon (2025-2050), energy cost savings increase to \$4.56B.

While these previous numbers are all statewide costs and savings, the model can also be used to understand the impacts for the average covered building owner in Maryland. For the average building owner, over the 2025-2050 time horizon, they will spend \$0.65 per square foot for their building to comply with the regulation. However, there is significant variation with 25% of covered buildings modeled to save more than \$0.06 per square foot and 25% of covered buildings modeled to spend more than \$2.65 per square foot.

In this finance-driven compliance scenario, many building owners choose to make some amount of alternative compliance payments instead of fully meeting the standard. In 2030, 7% of all covered buildings choose to make an alternative compliance payment. Of those that choose to make a payment, the median cost for the year is \$1,010. In 2040, 39% of covered buildings choose to make some alternative compliance payments, with the median payment equaling \$600.