

Economic Impact of the Draft GGRA Plan

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How Do We Define Meeting the Economic Targets?

- Positive impacts on:
 - Average annual employment through 2030
 - Cumulative personal income through 2030 with a 3% discount rate
 - Cumulative GSP through 2030 with a 3% discount rate
- Important to consider post-2030 trends in employment, personal income, and GSP, but these timeframes are not used to define the economic targets.

How Do We Measure the Economic Impact of Policy Scenarios?

- Economic modeling conducted using REMI PI+
 - Dynamic economic impact analysis software
- Inputs sourced from several sources:
 - Expenditure changes from Pathways/LEAP modeling
 - Detailed health impacts modeled using EPA's COBRA tool
 - Spending priorities from state agencies
 - Review of literature as necessary
- Not Captured in REMI PI+:
 - Social cost of carbon
 - Total value of avoided mortality
 - Avoided costs of flooding/more severe weather

How Do We Measure the Economic Impact of Policy Scenarios?

- REMI PI+ output aligns with the metrics for the economic target:
 - Impacts on employment by industry and occupation
 - Impacts on personal income
 - Impacts on GSP
 - Impacts in five Maryland regions
- Results are further refined using models developed by RESI to comment on distributional impacts by:
 - Income
 - Education
 - Race/Ethnicity

Policy Scenarios 1, 2, and 3

What Goes Into The Policy Scenarios?

Reference Case

- All policies as they exist “on the books”

Policy Scenario One

- Current policies are extended

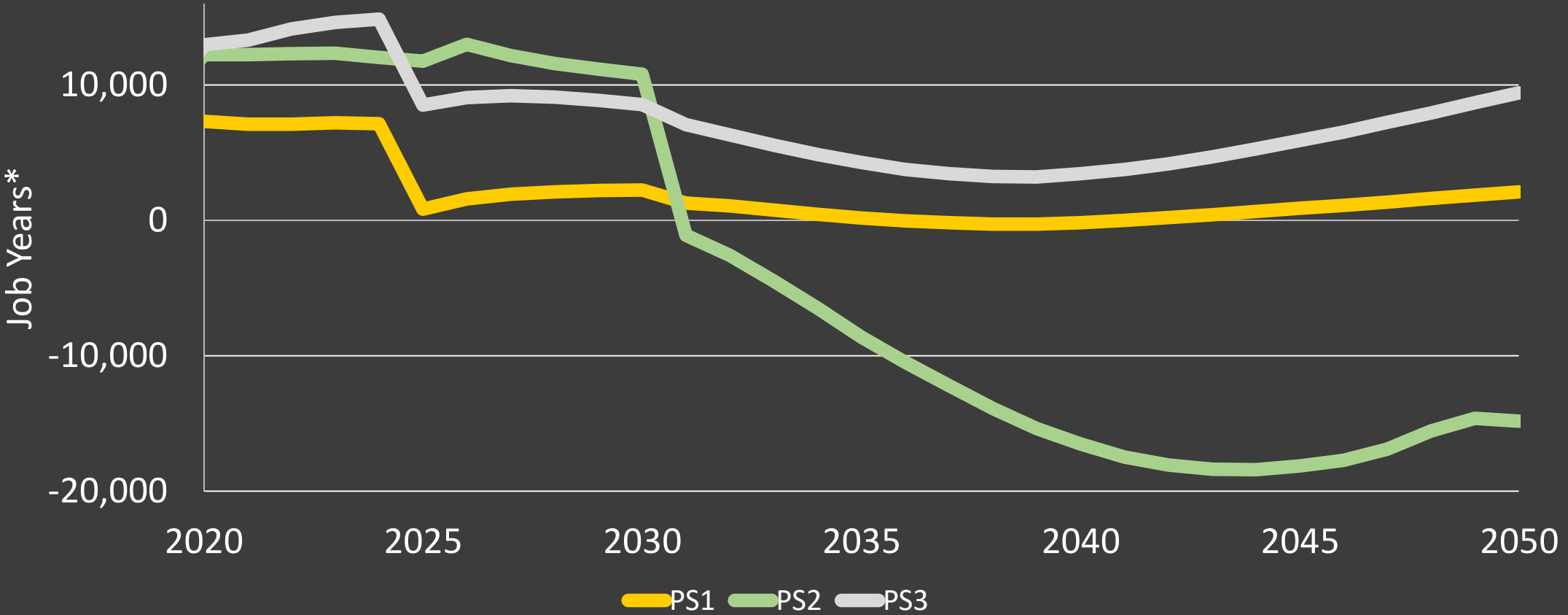
Policy Scenario Two

- Policies designed to lead towards deep decarbonization

Policy Scenario Three

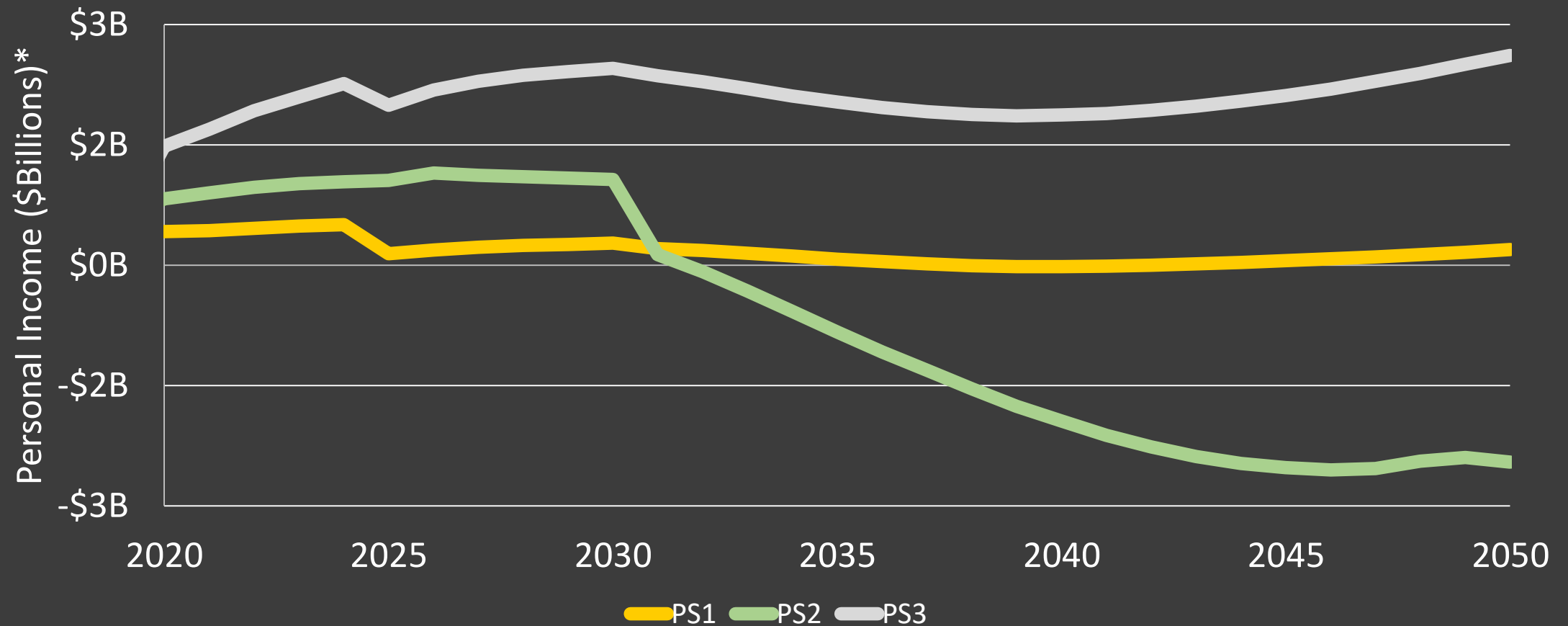
- Extension of current policies with addition of carbon pricing

Relative to the Reference Case, Employment is Higher in the Three Initial Policy Scenarios Through 2030



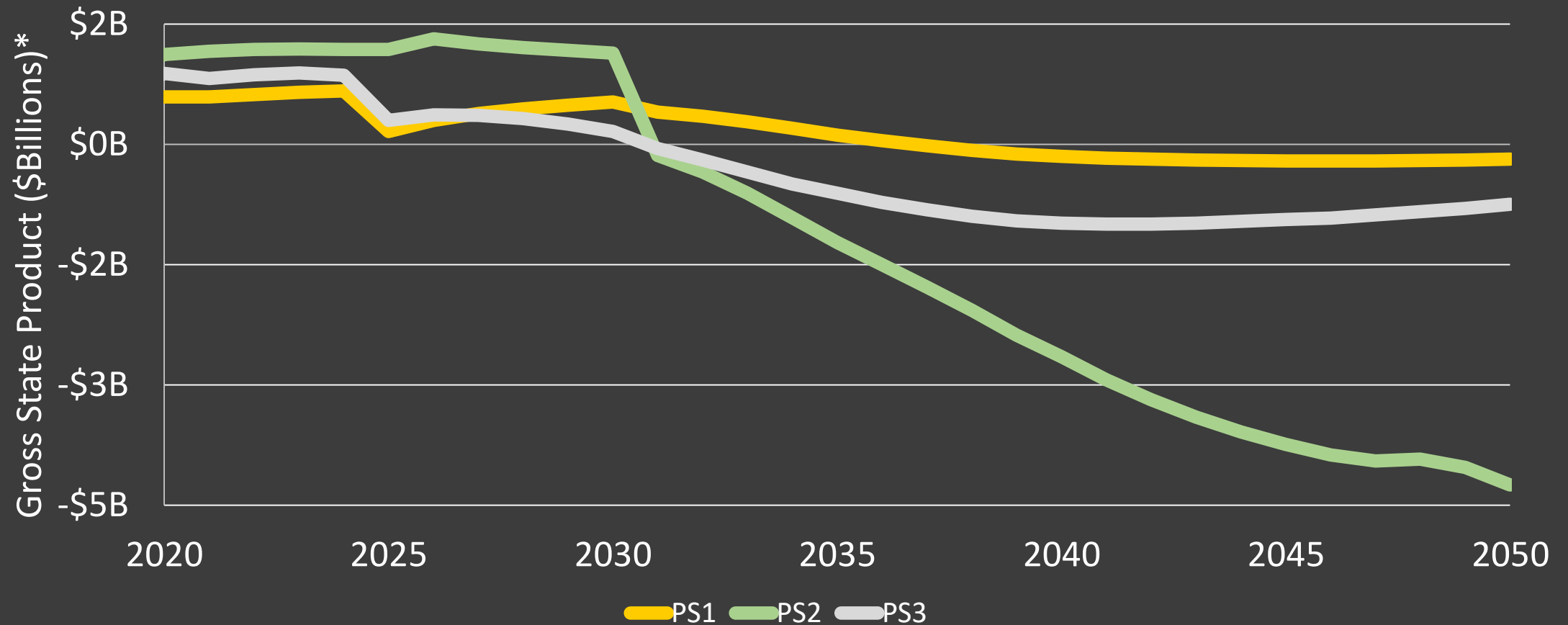
*Difference between policy scenario and reference case

In Addition to Jobs, Personal Income is Higher Each Year Relative to the Reference Case in Each of the Three Initial Policy Scenarios Through 2030



*Difference between policy scenario and reference case

...And GSP is Also Positive Relative to the Reference Case Through 2030



*Difference between policy scenario and reference case

What is Driving the Impacts in the First Three Policy Scenarios?

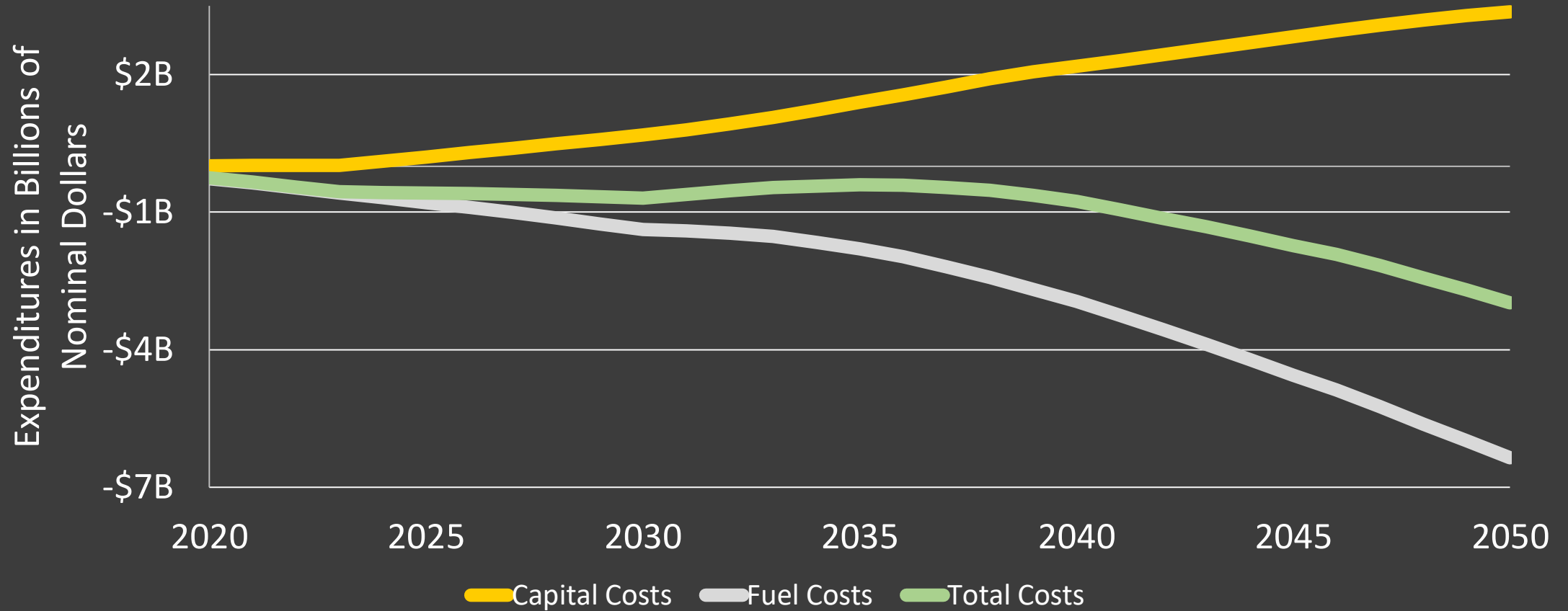
- In Policy Scenario One, capital costs are lower than fuel savings.
- In Policy Scenario Three, capital costs are higher than fuel savings, but carbon fee revenues act to offset this effect by keeping investment within Maryland.
- In Policy Scenario Two, further emissions reductions come at steeper up-front cost and outweigh fuel savings.
 - Impacts are driven by high uncertainty in modeling prices and macroeconomic structure 30 years into the future.

Policy Scenario Summaries

Policy Scenario	Achieve 2020 Emissions Goal?	Achieve 2030 Emissions Goal?	Achieve 2050 Emissions Goal?	Achieve Economic Goal?
Scenario One	✓	✗	✗	✓
Scenario Two	✓	✓	✓	✓
Scenario Three	✓	✓	✗	✓

Draft GGRA Plan Results

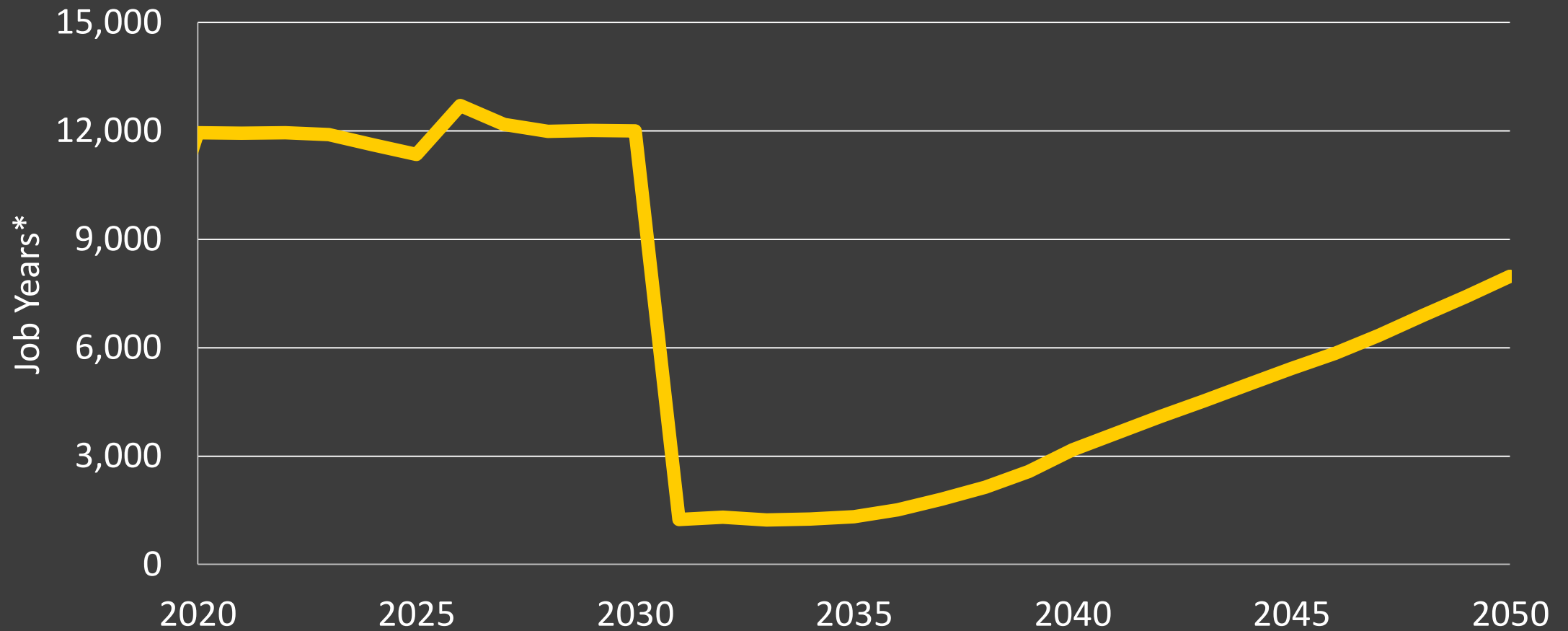
Through 2050, Fuel Savings Outweigh Capital Costs in Every Year, Resulting in Reduced Spending by Maryland Consumers and Businesses



What is Included in the Draft GGRA Plan?

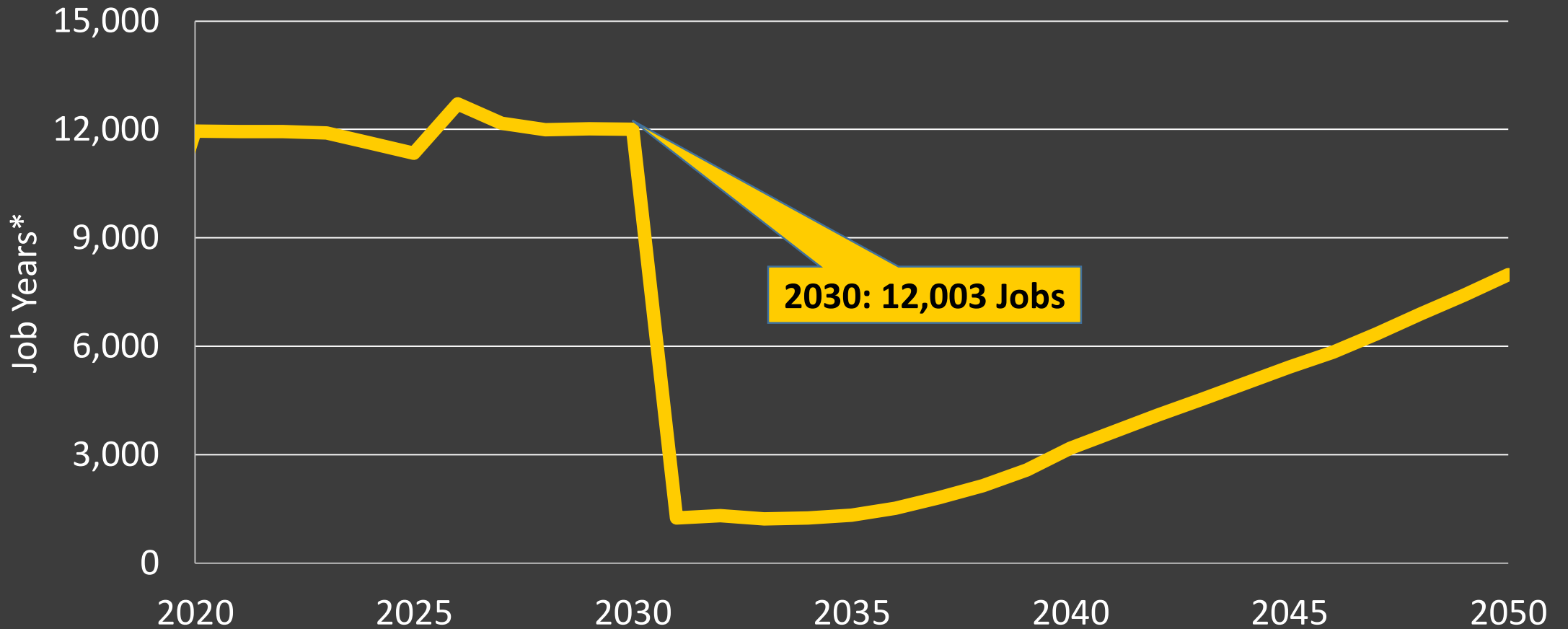
- The Draft GGRA Plan represents the final policy scenario modeled to balance emissions reductions and economic prosperity.
- Builds off Policy Scenario One and adds additional programs, including:
 - 100 percent CARES goal by 2040
 - Measures to reduce bus emissions
 - Transportation policies from both Policy Scenario Two and Three

In the Draft GGRA Plan, Job Growth Remains Positive Through Both 2030 and 2050



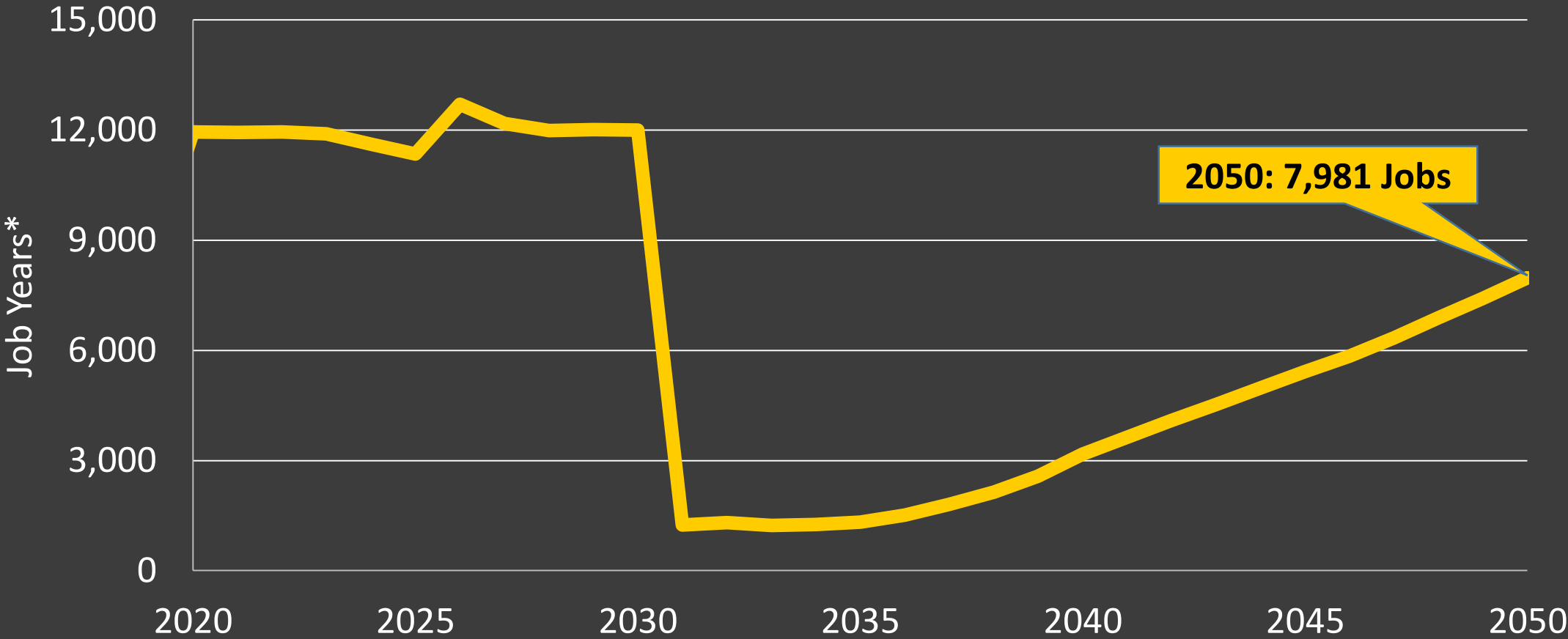
*Difference between the Draft GGRA Plan and reference case

On Average Through 2030, the Draft GGRA Plan Supports 11,648 Additional Jobs Relative to the Reference Case



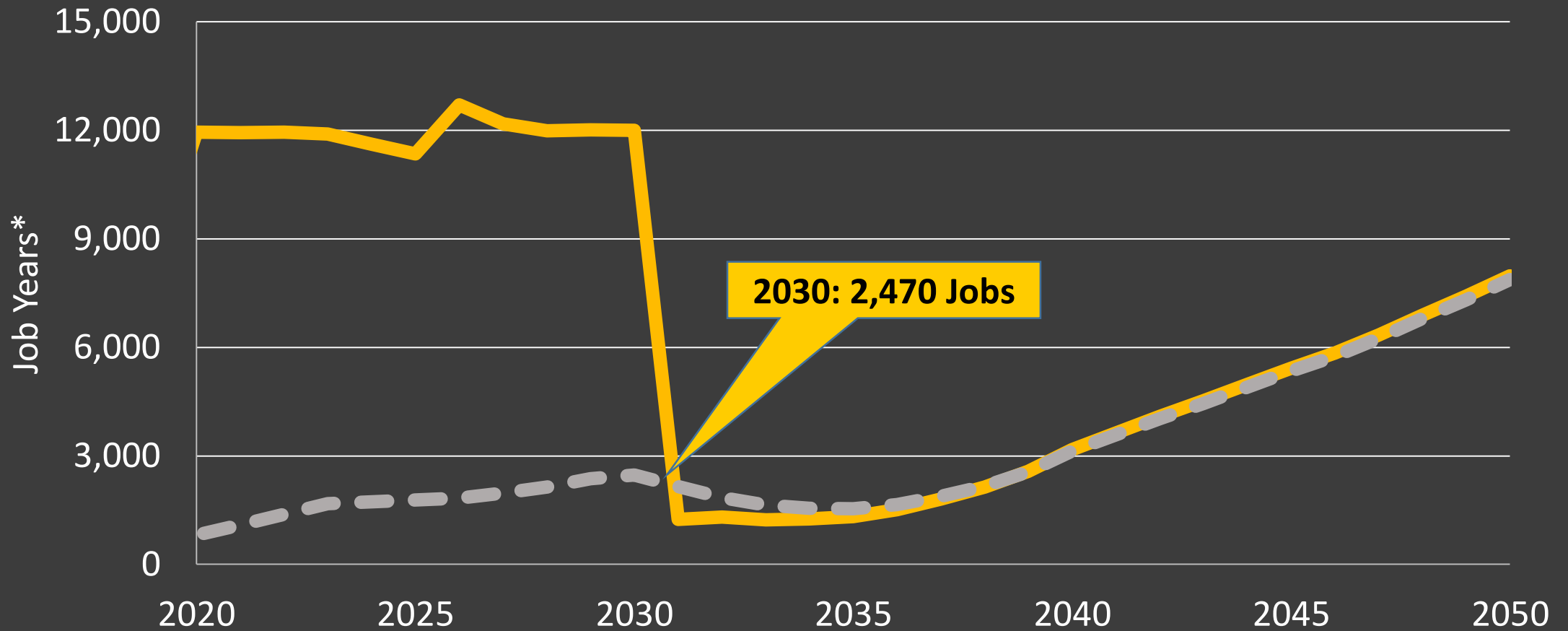
*Difference between the Draft GGRA Plan and reference case

Through 2050, the Draft GGRA Plan Supports an Average of 6,702 Additional Jobs Relative to the Reference Case



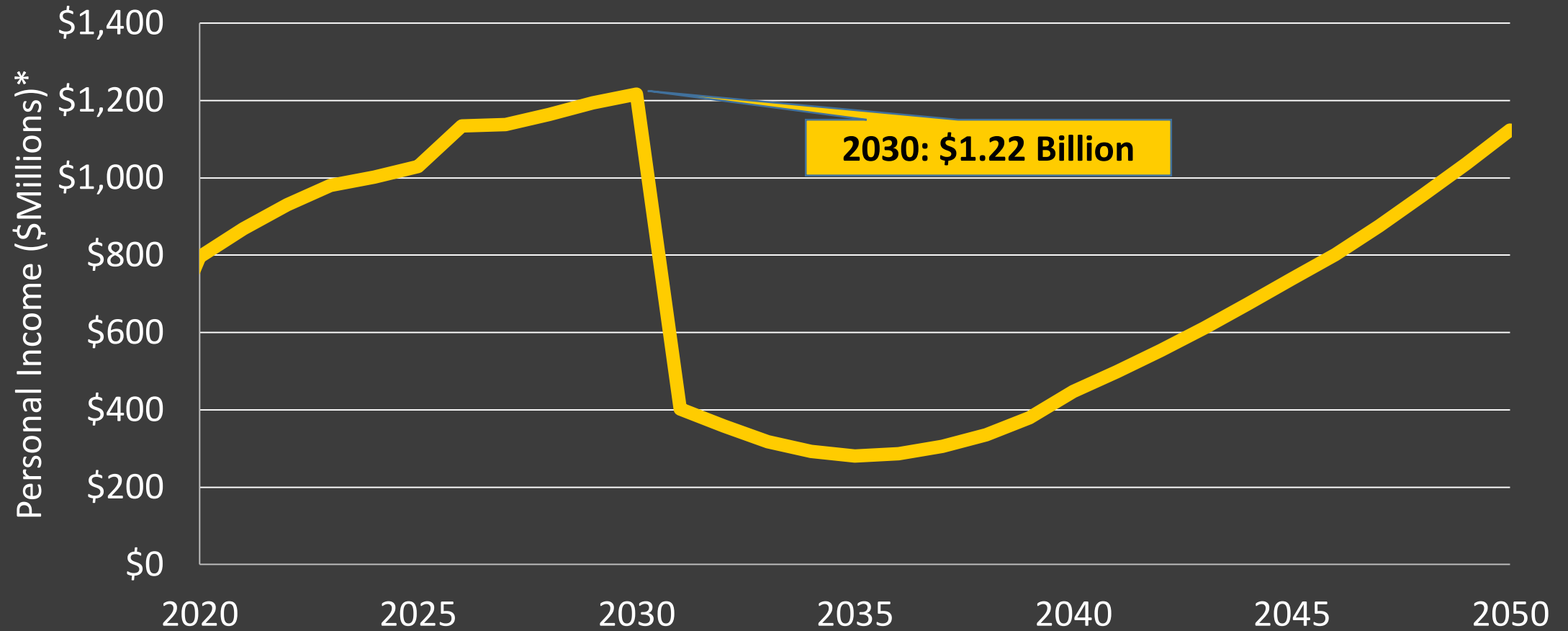
*Difference between the Draft GGRA Plan and reference case

Without the Transportation Measures, Impacts Are Still Positive—Supporting an Average of 1,636 Jobs Each Year Through 2030



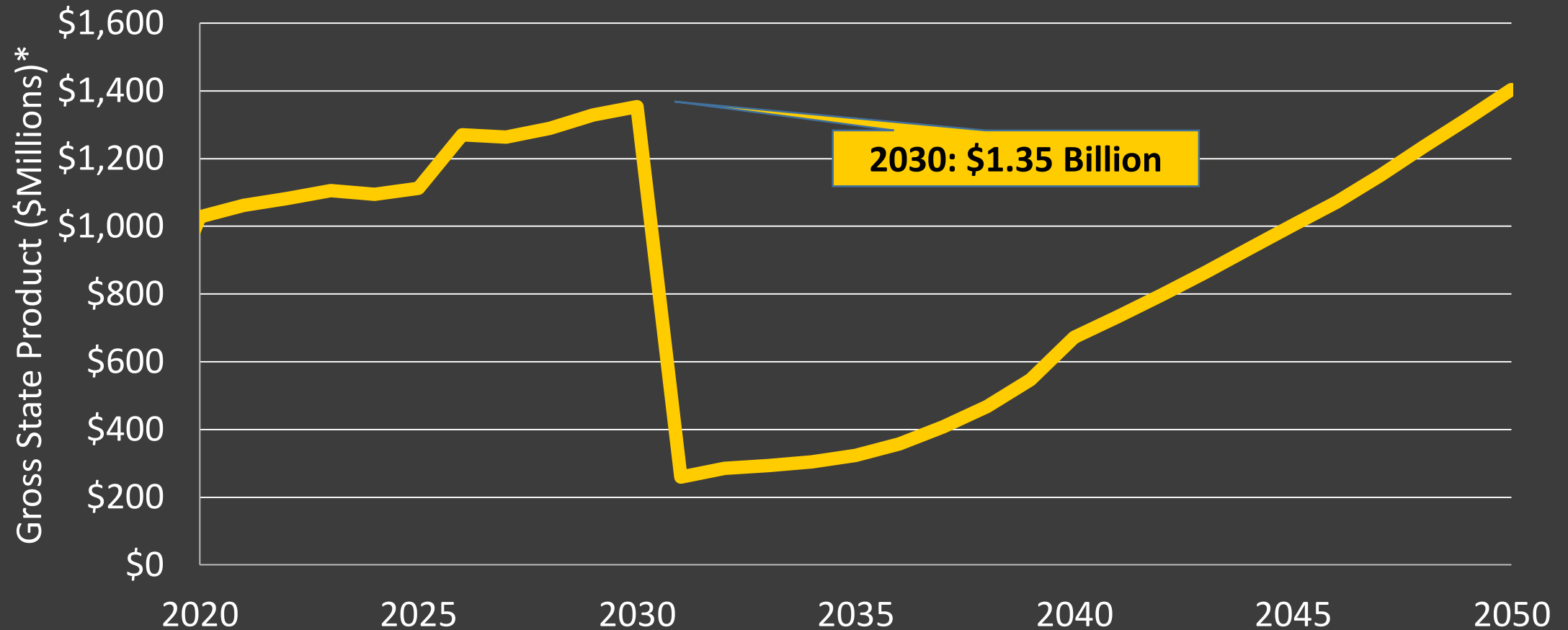
*Difference between the Draft GGRA Plan and reference case

On Average Through 2030, the Draft GGRA Plan Increases Personal Income by \$1.0 Billion



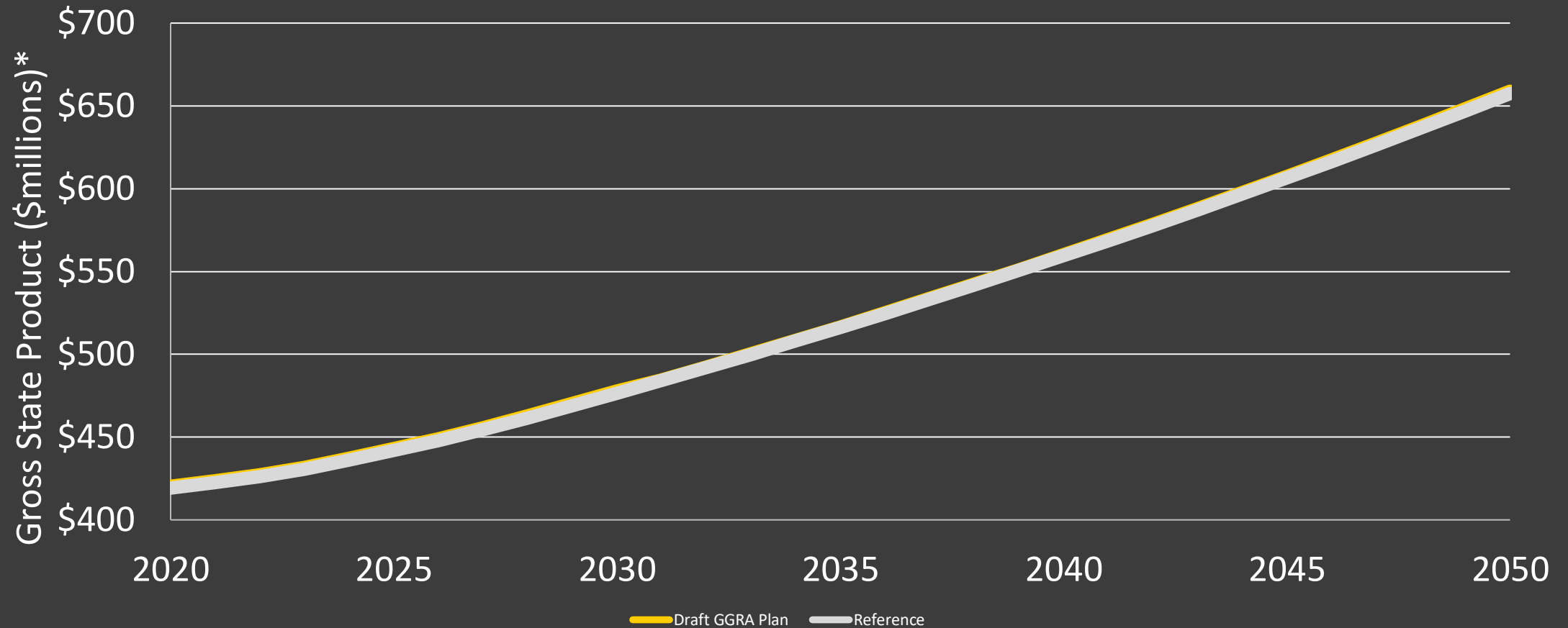
*Difference between the Draft GGRA Plan and reference case

On Average Through 2030, the Draft GGRA Plan Increases GSP by \$1.1 Billion



*Difference between the Draft GGRA Plan and reference case

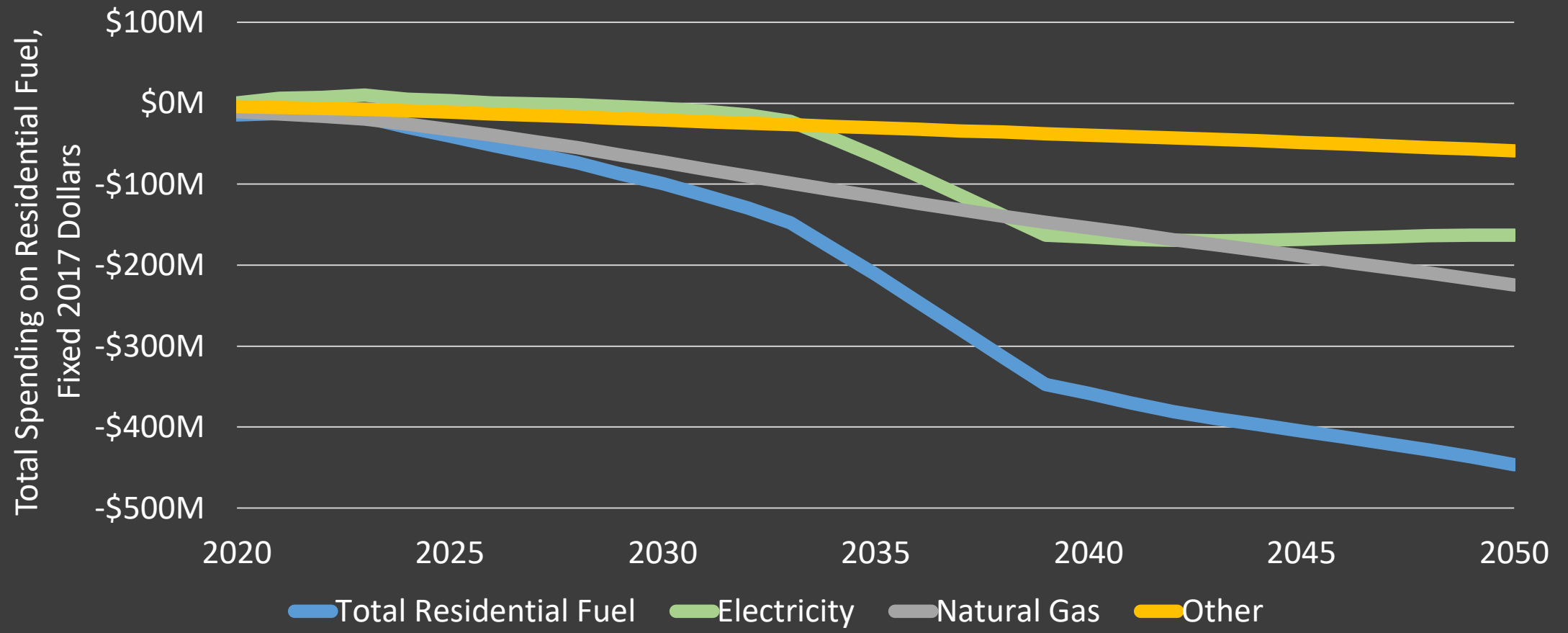
Compared to Existing GSP Levels, These Impacts are Relatively Minor



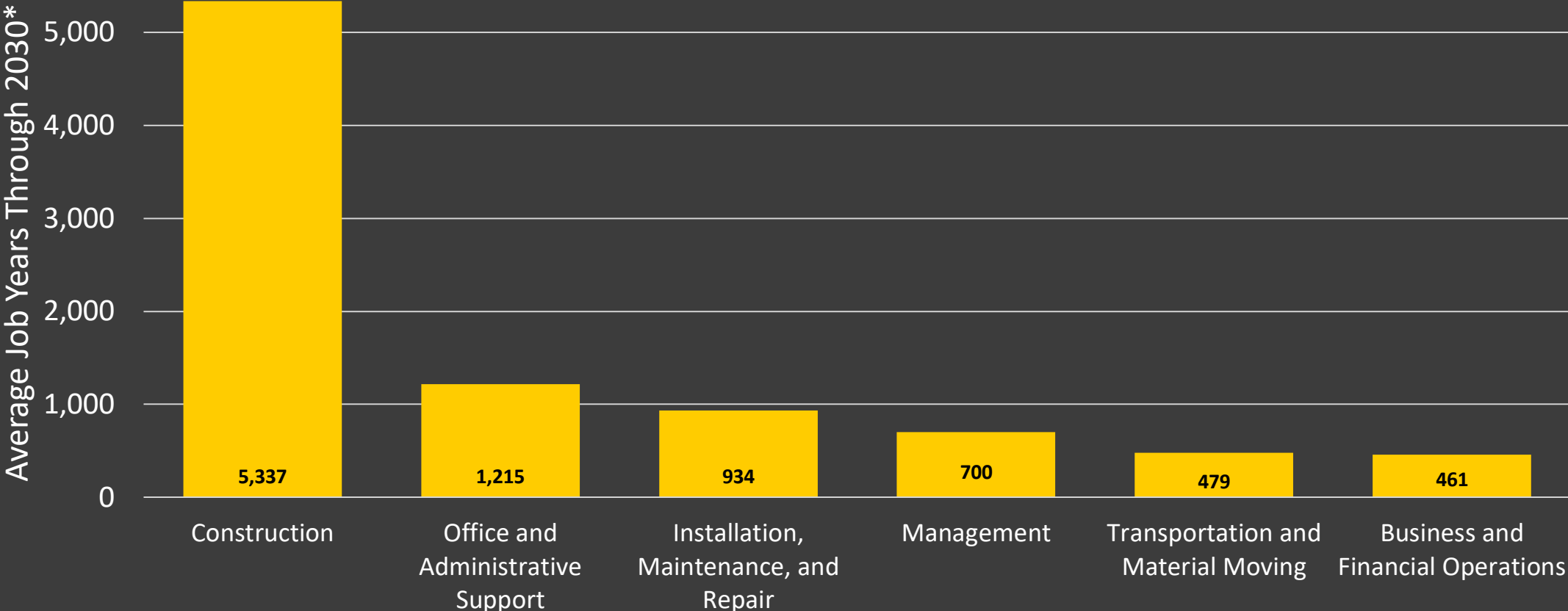
What Is Happening in the Draft GGRA Plan?

- Similar to Policy Scenario 2, the spike in employment in early years is due to near-term transportation and infrastructure spending
- Total Spending (capital costs plus fuel expenditures) is the lowest across all policy scenarios.
 - Capital expenditures are being significantly offset by fuel savings
- Public health benefits are small but meaningful
 - In 2050, 82 new jobs are created/sustained due to better air quality

Consumer Spending on Non-Transportation Fuels Declines Substantially Through 2050

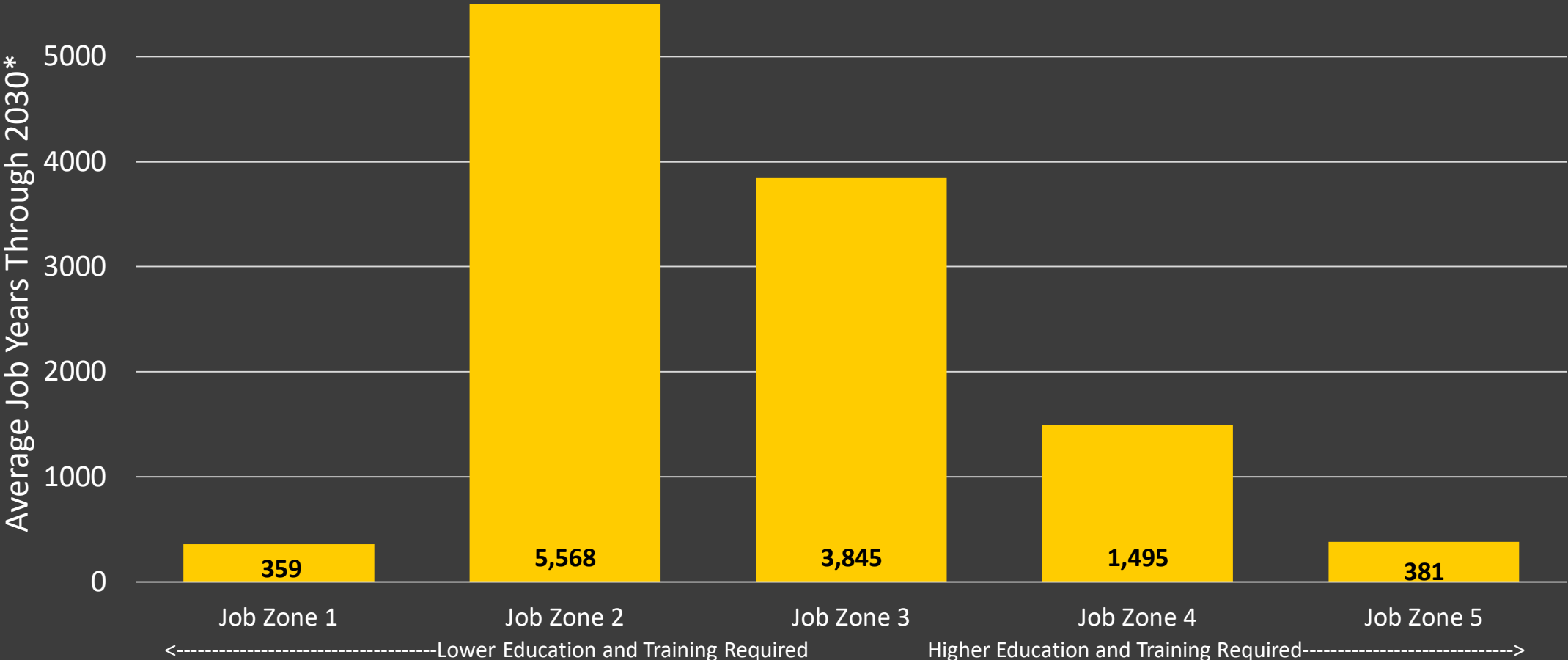


No Major Occupation Groups Experience Job Losses On Average Through 2030



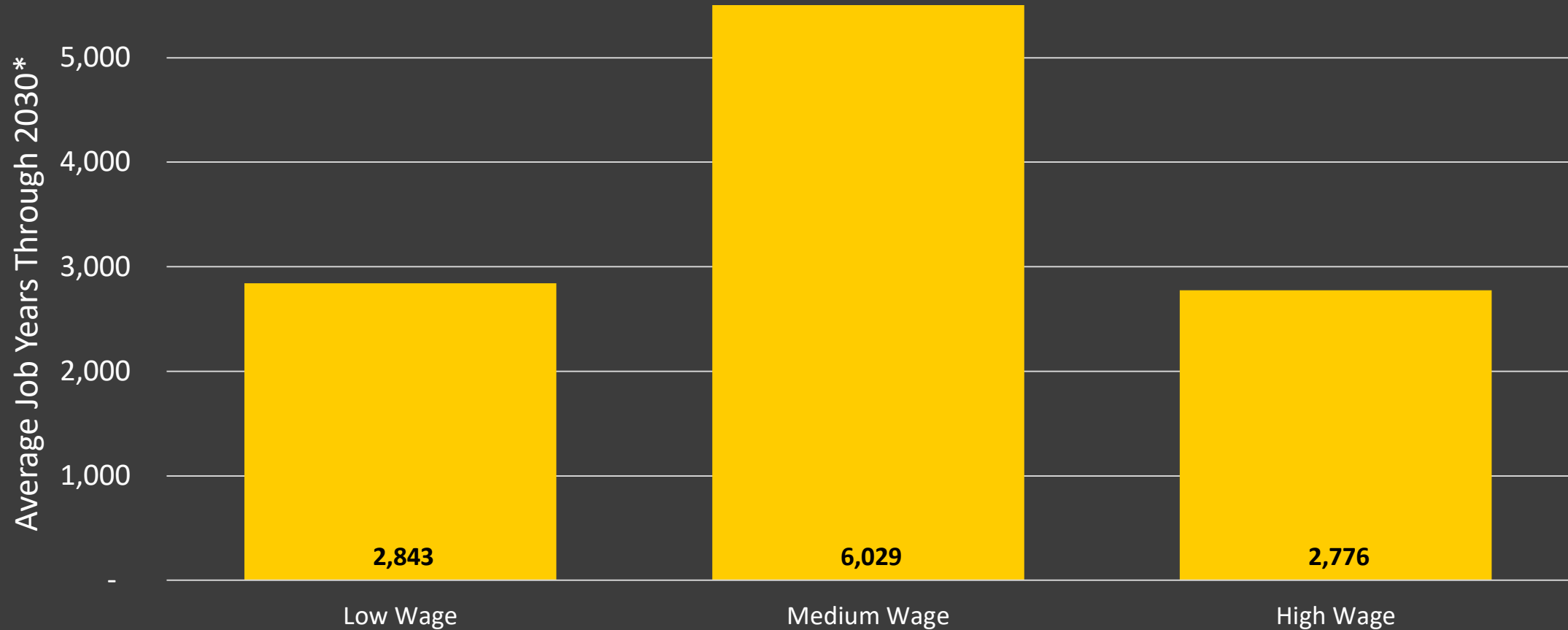
*Difference between the Draft GGRA Plan and reference case

Job Gains Through 2030 are in Occupations Which Generally Require Lower Levels of Training and Education



*Difference between the Draft GGRA Plan and reference case on average through 2030

...These Jobs are Mostly in Medium Wage Occupations, Earning Between \$35k and \$65k



*Difference between the Draft GGRA Plan and reference case

Sensitivity Analyses Were Performed Under Four Alternate Scenarios

1. Decrease in REC prices
 2. CAFÉ rollback
 3. Reduced consumer adoption
 4. Combined CAFÉ rollback and reduced consumer adoption
- Under all sensitivities, the economic goals are still met.

Draft GGRA Plan Summary

Policy Scenario	Achieves 2020 Emissions Goal?	Achieves 2030 Emissions Goal?	Achieves 2050 Emissions Goal?	Achieves Economic Goal?
Draft GGRA Plan				

Q&A

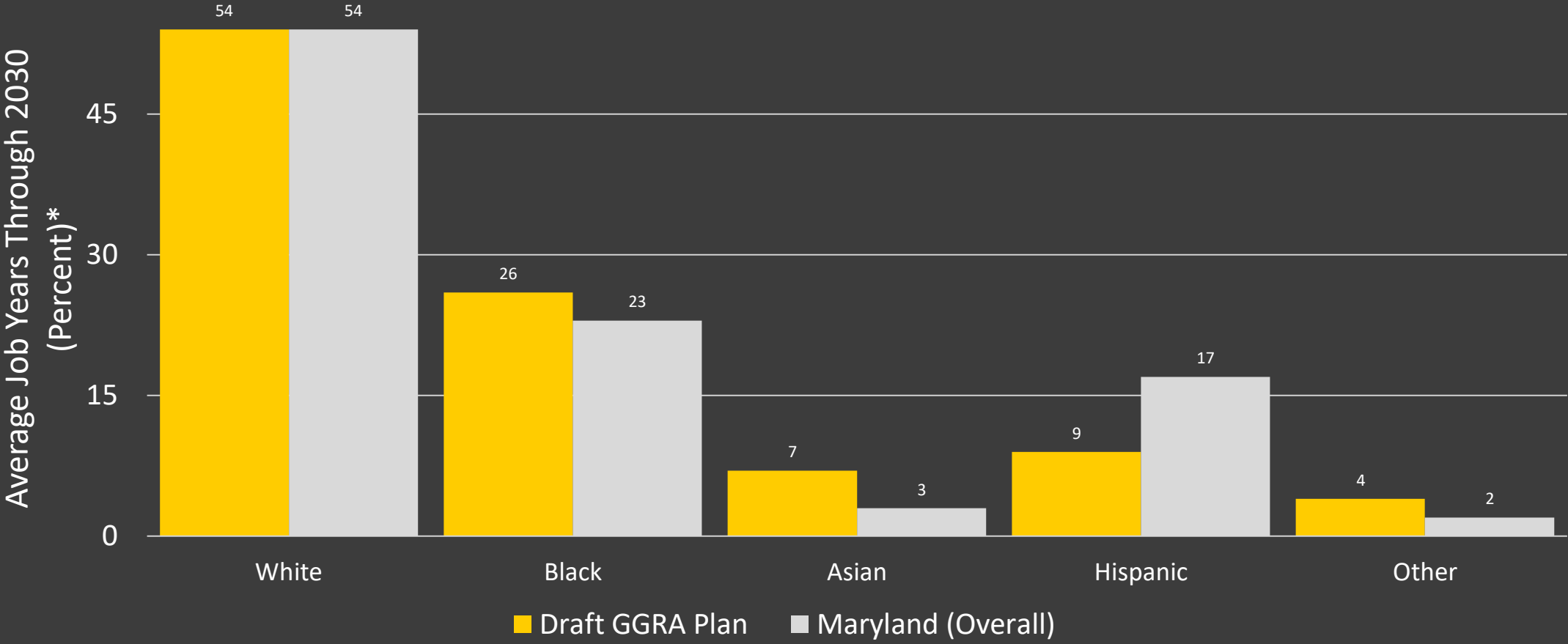
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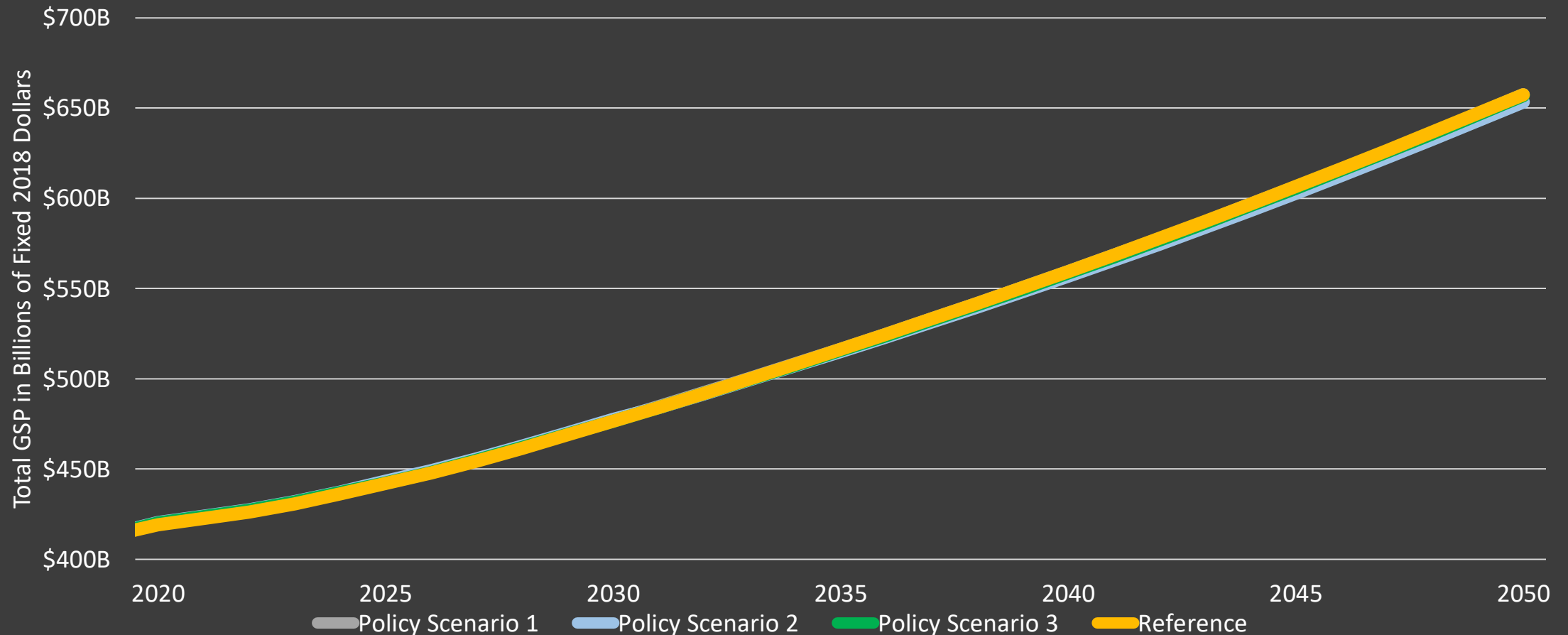


Appendix

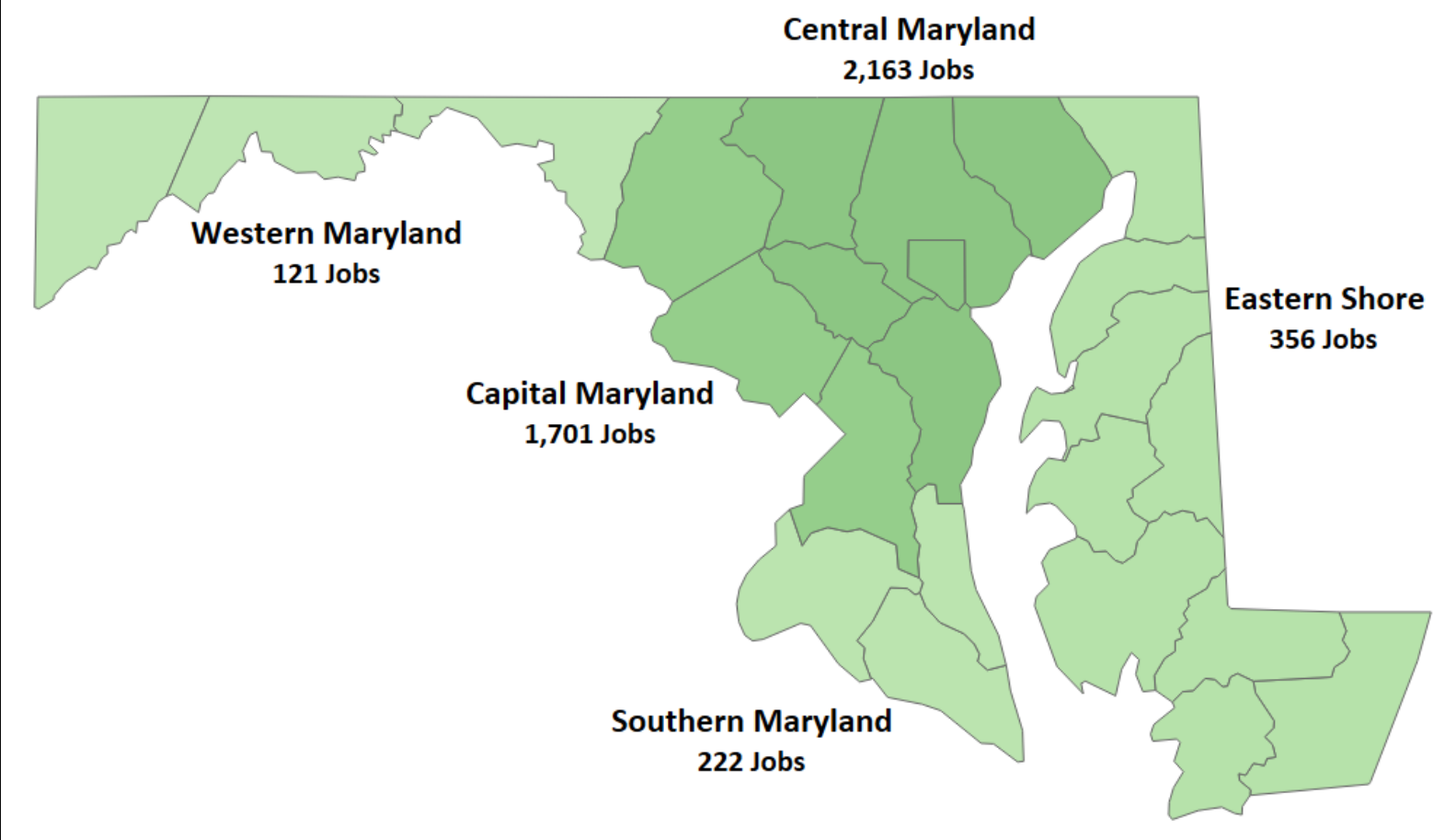
Job Gains are Largely Equitable in Regards to Race and Ethnicity



Through 2050, Maryland's Economy Experiences Growth in all Initial Policy Scenarios

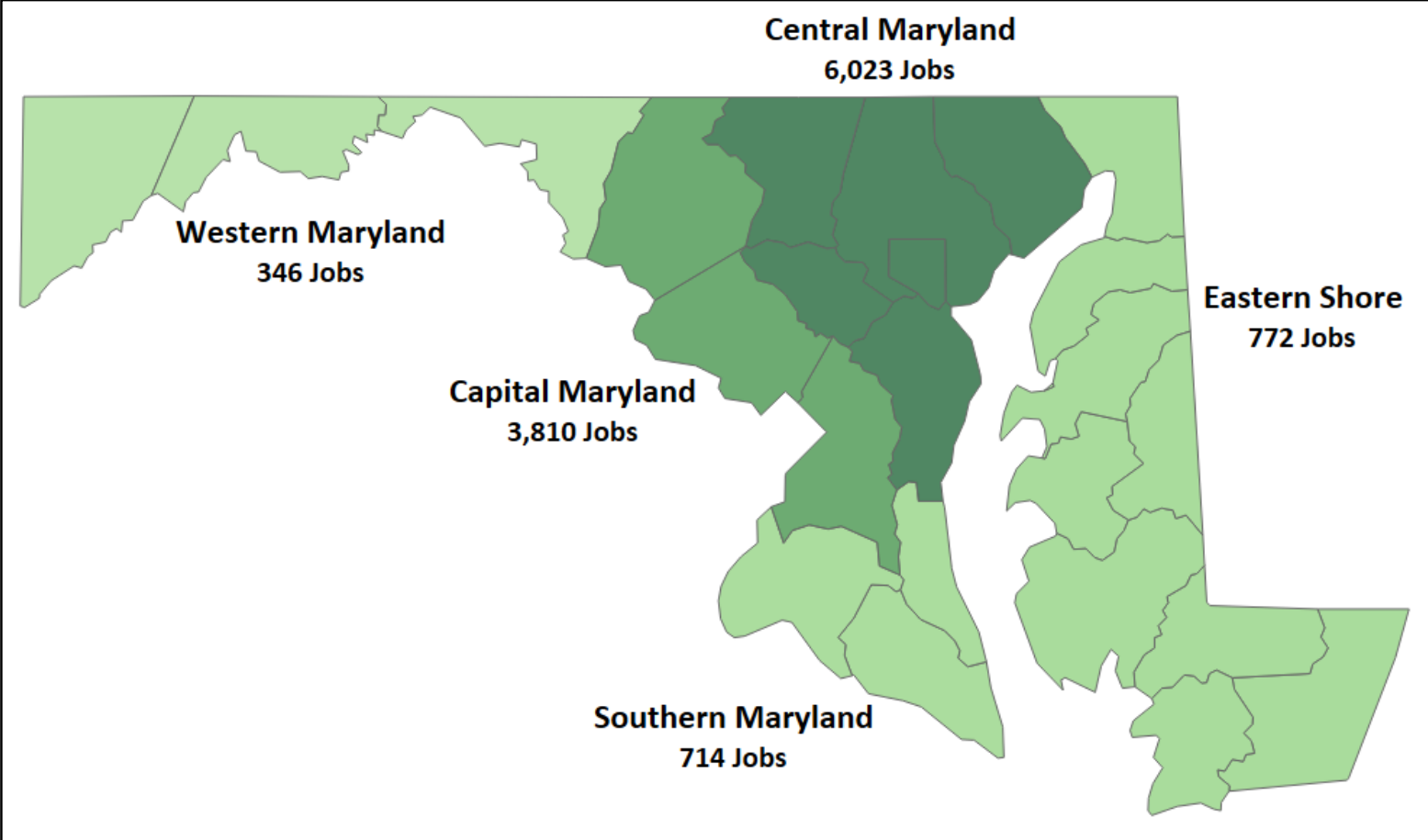


Regional Employment Impacts for Policy Scenario 1*



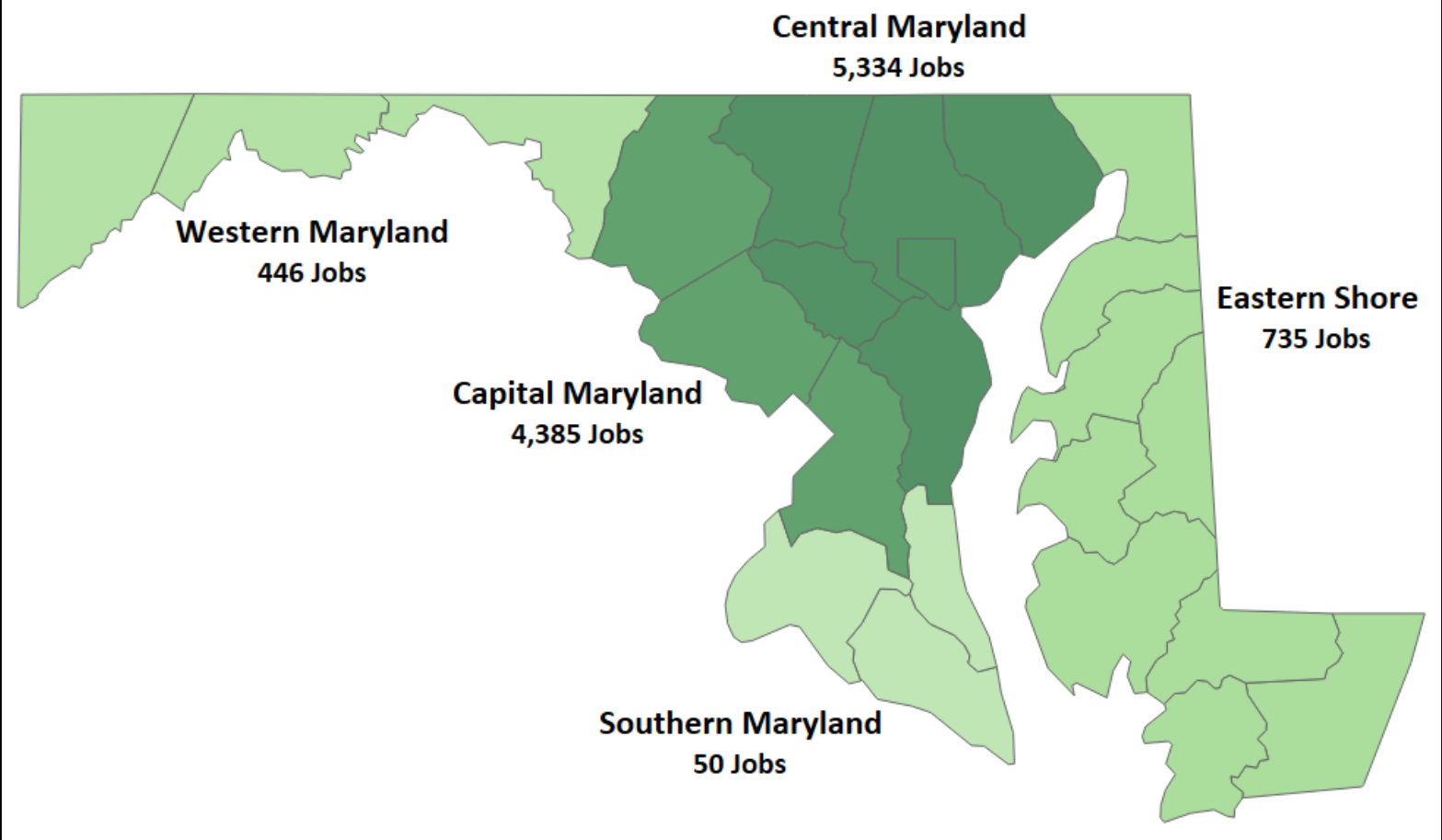
*Average number of jobs through 2030

Regional Employment Impacts for Policy Scenario 2*



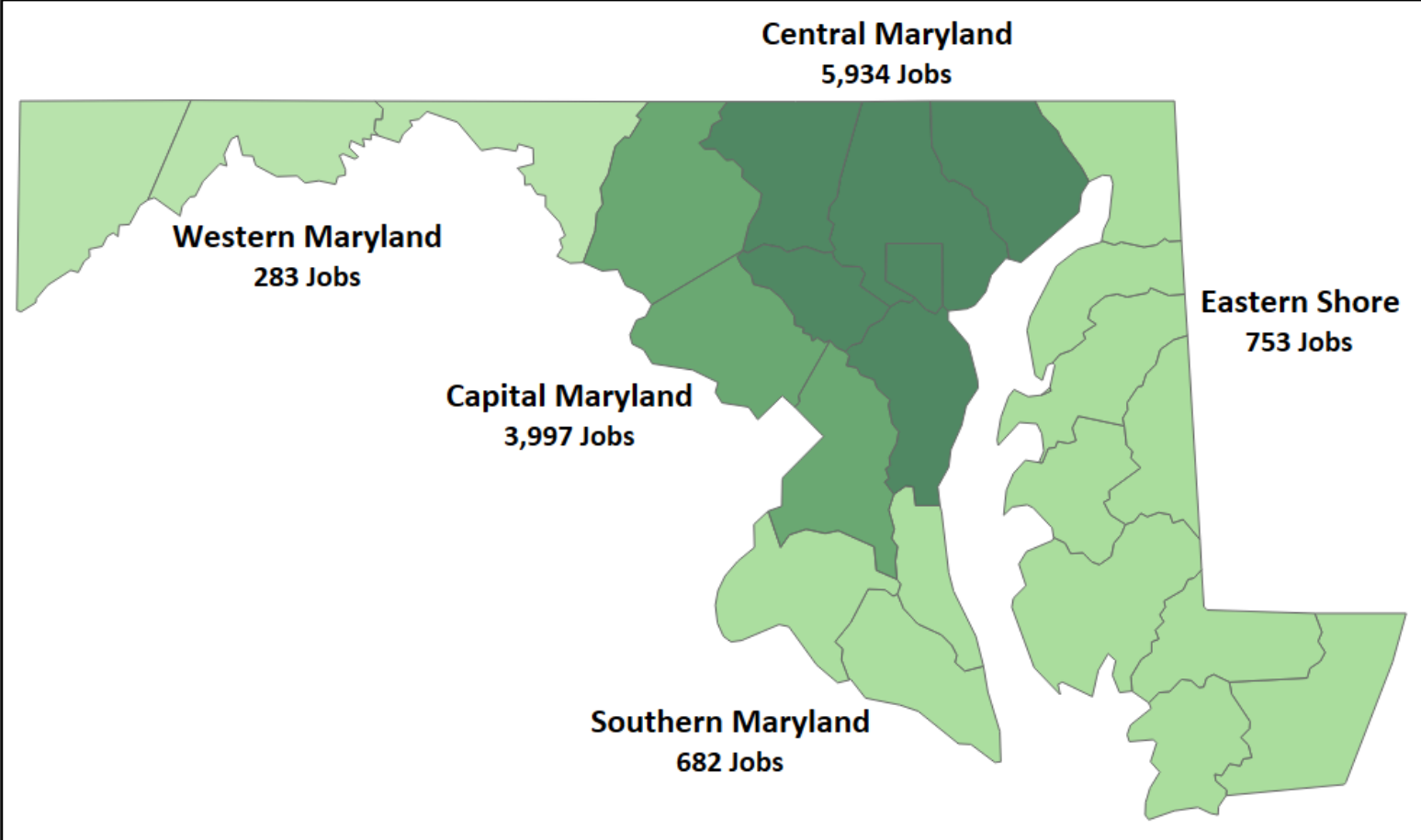
*Average number of jobs through 2030

Regional Employment Impacts for Policy Scenario 3*



*Average number of jobs through 2030

Regional Employment Impacts for Draft GGRA Plan*



*Average number of jobs through 2030