

**Answer two of these three questions:**

1. What one question do you have about the Climate Mitigation Study?
2. What are you excited to learn more about at the next Climate Mitigation Study briefing?
3. How might the Climate Mitigation Study inform future CAC discussions?

Group	Answers
Group 1 – Ashley	<ul style="list-style-type: none"> <li>• How to account for electricity that will be used by electric vehicles? <i>What are the climate impacts of energy sources used to power future vehicle fleet?</i></li> <li>• How to set goals and measure success mode shift travel behaviors.</li> <li>• Note – looking forward to seeing how government will promote move to electric vehicles</li> </ul>
Group 2 – Dan	<ul style="list-style-type: none"> <li>• How is this going to be communicated once the results are in? <i>What is the outreach plan?</i></li> <li>• Excited to see the findings.</li> </ul>
Group 3 – Jeff P	<ul style="list-style-type: none"> <li>• There is going to be an energy crunch in the future. More electricity is needed, and the infrastructure isn't vibrant enough to support increased demand. How can we redo the community to adapt to more energy demands?</li> <li>• What incentives can governments in the US use to encourage folks to move from gas powered cars to electric cars?</li> </ul>
Group 4 – Katherine	<ul style="list-style-type: none"> <li>• How will study findings relate to a federal infrastructure bill and reconciliations, etc?</li> <li>• What are the recommendations? Are they unique or similar to other recommendations?</li> </ul>

**1. How to account for electricity that will be used by electric vehicles? *What are the climate impacts of energy sources used to power future vehicle fleet?***

According to the Task 4 Technical Memorandum that is available on the September 2021 TPB meeting page, the consultant, ICF, plans to conduct a sensitivity analysis to show the effects of grid decarbonization on GHG emissions from EVs using three different assumptions for electricity carbon intensities. As noted in the report, the three cases are

**1. Reference Case for Electricity Carbon Intensity** - The Reference Emissions Factor represents the emissions factor based on current on-the-books policies. The value has been calculated by ICF by weighting the total VMT from each state's EV population in 2018 to influence regional grid factor projections from present to 2050. The grid factor projections are from ICF's proprietary power sector model, the Integrated Planning Model (IPM). IPM is a multi-regional, dynamic, deterministic linear programming model of the U.S. electric power sector. It provides forecasts of least cost capacity expansion, electricity dispatch, and emission control strategies while meeting energy demand, environmental, transmission, dispatch, and reliability constraints. Each state's emissions factor accounts for electricity decarbonization policies such as Virginia's Clean Economic Act (100% clean power by 2045, assuming Dominion as the dominant utility), Maryland's Renewable Portfolio Standard (50% renewable energy by 2030) and DC's Renewable Portfolio Standard (100% renewable energy by 2032). IPM's grid factor projections include not only the impact of state renewable portfolio standard (RPS) policies, but also the changes in fossil fuel emission intensity over time as coal retires and is replaced by natural gas or clean renewables. The grid factor projections also factor in the emission intensity of imports to the states based on each state's imports in 2019 (from U.S. Energy Information Administration [EIA] data). As a starting point for this analysis, ICF used 2019 eGRID values for Virginia and Maryland, and 2019 RFCEast values for Washington, DC.

**2. Modified Reference Case for Electricity Carbon Intensity** - The Modified Reference Case emissions factor has been calculated to represent a slightly more aggressive Reference Case. In this scenario, ICF assumes a more aggressive policy for Maryland: a zero-carbon grid by 2040. This assumption aligns with Governor Hogan's legislative proposal. In this scenario, ICF assumes that the 100% by 2040 requirement would have to be met in-state, as opposed to the current policy where eligible sources can be located anywhere in the PJM Interconnection, a regional transmission organization in the U.S. and part of the Eastern Interconnection grid operating an electric transmission system.

**3. Clean Grid Case** - The Clean Grid Case emissions factor represents the Biden Administration's plan for a 100% clean grid by 2035. This policy would be applied nationally, so the emission intensity of imports by 2035 is assumed to be zero. At present time, there have been multiple reports of a grid that is 80% decarbonized by 2030 and zero carbon by 2035. (pp. 14-15)

## **2. How to set goals and measure success [for] mode shift travel behaviors.**

Setting specific goals for any of the three pathways to reduce on-road mobile greenhouse gas emissions OR establishing performance metrics is not part of this technical study. This study is designed to show the magnitude of greenhouse gas emissions reductions that can be achieved at assumed levels of outcomes with a set of independent and combined strategies. Additionally, the study is exploring ten different scenarios representing various combination of strategies. The TPB, upon reviewing the results of the analysis and

discussion, may choose to identify one or more of the scenarios as a goal for its members to pursue.

**3. Note – looking forward to seeing how government will promote [the] move to electric vehicles**

Staff are, too! It must be noted that converting the existing fossil fuel-based fleet to a clean energy fleet will require collaboration and cooperation among multiple disciplines and sectors (public, private, academia, non-profits, etc.) together with significant investment of resources.

**4. How is this going to be communicated once the results are in? *What is the outreach plan?***

The results of the study will be shared with the TPB Technical Committee and the TPB in December. The findings of the analysis and any action the board may take on advancing the strategies will be added to the region's long range transportation plan, Visualize 2045. The final report will be made available on the TPB webpage<sup>1</sup> for use by the TPB member agencies and all others. There will be a presentation to the CAC, the Access for All Advisory Committee (AFA), the COG Board, and COG's Climate, Energy, and Environment Policy Committee (CEEP). We expect that the results of the study will be shared through the TPB's social media and the TPB newsletter. Any other opportunities to share the findings and promote decision making to advance the strategies will be examined and pursued, as feasible and appropriate, after the study is complete.

**5. Excited to see the findings.**

Yay! Staff are, too!

**6. There is going to be an energy crunch in the future. More electricity is needed, and the infrastructure isn't vibrant enough to support increased demand. How can we redo the community to adapt to more energy demands?**

This is a great question, but it is outside the scope of this study. Climate change mitigation is a multi-sectorial problem and will need a multi-sectorial solution. It is widely believed that there will be many challenges to making upgrades to infrastructure that will likely be needed to support GHG reduction goals.<sup>2</sup> COG's Climate, Energy, and Air Program, which is engaged in climate change planning work, does provide regional planning assistance within the energy sector.

**7. What incentives can governments in the US use to encourage folks to move from gas powered cars to electric cars?**

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<sup>1</sup> "TPB Climate Change Mitigation Study of 2021," Metropolitan Washington Council of Governments, July 15, 2021, <https://www.mwcog.org/documents/2021/07/15/tpb-climate-change-mitigation-study-of-2021-climate-change-greenhouse-gas-scenario-planning/>.

<sup>2</sup> See, for example, Brad Plumer, "A Glimpse of America's Future: Climate Change Means Trouble for Power Grids," *The New York Times*, February 16, 2021, sec. Climate, <https://www.nytimes.com/2021/02/16/climate/texas-power-grid-failures.html>.

The consultant may note some potential incentives to encourage people to shift to electric vehicles (EVs), but developing an implementation plan is outside the scope of this work. The recently completed Metropolitan Washington 2030 Climate and Energy Action Plan discusses different actions and strategies to expand light-duty electric vehicle deployment, accelerate electrification of medium- and heavy-duty vehicles, and build out the electric regional electric vehicle charging network. Government policy could include incentives to buy EVs, such as rebates, and disincentives to discourage the use of gas-powered cars, such as gas taxes or putting a price on carbon. These types of policies have typically not been a part of the TPB's long range transportation plan. Also, although EVs are often viewed as more expensive than gas-powered cars, a recent report from the National Academies of Sciences, Engineering, and Medicine shows that the total cost of ownership for EVs is likely to go down over time (see Figure 1).<sup>3</sup>

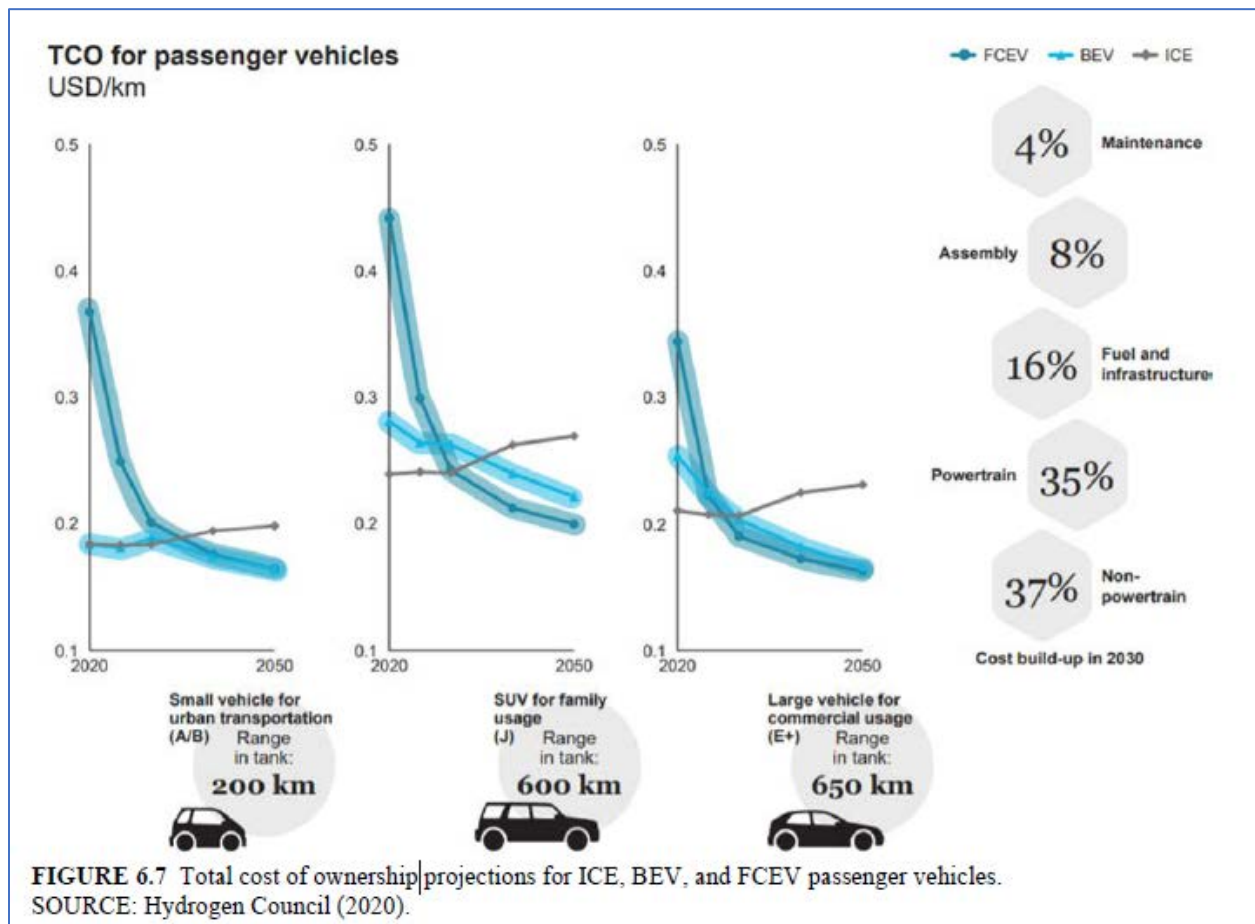


Figure 1 Total cost of ownership projections for internal combustion engine vehicles, battery electric vehicles, and fuel-cell electric vehicles.

<sup>3</sup> See, for example, *Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy 2025-2035 (Prepublication Copy – Subject to Further Editorial Correction)* (Washington, D.C.: National Academies of Sciences, Engineering, and Medicine, 2021), <https://doi.org/10.17226/26092>, especially p. 6-165.

November 9, 2021, TPB staff responses

Source: Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy 2025-2035 (Prepublication Copy – Subject to Further Editorial Correction) (Washington, D.C.: National Academies of Sciences, Engineering, and Medicine, 2021)

## **8 How will study findings relate to a federal infrastructure bill and reconciliations, etc.?**

That is unclear at this time. Obviously, the federal infrastructure bills could have a large impact on the United States' ability to achieve greenhouse gas reduction goals.

## **9. What are the recommendations? Are they unique or similar to other recommendations?**

Before proposing the scenarios for analysis, both the TPB staff and the consultant did an extensive literature review of promising strategies to reduce greenhouse gas emissions.<sup>4 5</sup> Many of those strategies were included in TPB and COG's previous studies (What Would it Take? Scenario Study, Multi-Sector Working Group study, and Long-Range Plan Task Force study). The benefit of this study is that unlike previous TPB and COG studies, the Climate Change Mitigation Study is analyzing multiple scenarios and examining the potential impacts of strategies on each other. The results of the study will be shared with the TPB Technical Committee and the TPB in December.

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<sup>4</sup> Erin Morrow, Dusan Vuksan, and Mark S. Moran, "TPB Climate Change Mitigation Study of 2021, Phase 1 Report: Greenhouse Gas Emissions Reductions Strategies: Findings from Past Studies" (Metropolitan Washington Council of Governments, National Capital Region Transportation Planning Board, March 2, 2021), <https://www.mwcog.org/file.aspx?&A=MiD6Ji82bKyfKHZxf4NWsf6lDtx%2b0IVznGk7eZoe1E%3d>.

<sup>5</sup> ICF, "TPB Climate Change Mitigation Study of 2021: Task 4 Technical Memo: Scenarios and Associated Greenhouse Gas Reduction Actions" (National Capital Region Transportation Planning Board, Metropolitan Washington Council of Governments, August 25, 2021), <https://www.mwcog.org/events/2021/09/10/tpb-technical-committee-tpb/>.