

## Maryland Biofuels Task Force Organizing Committee

### Stakeholder Engagement Survey

(Final Draft 6.6.25)

#### Your Voice Can Shape Your Clean Energy Choice

You were selected as a stakeholder interested in economic, energy, and environmental security challenges in the United States and Maryland. We invite you to share your unique perspectives, insights, and feedback by participating in this Maryland Biofuels Task Force Stakeholder Engagement Survey. Your input will be a vital part of our research.

The initiative is part of the [Greater Washington Region Clean Cities Coalition](#)'s mission to foster economic, environmental, and energy security by working locally to advance affordable, domestic transportation fuels, energy-efficient mobility systems, and other fuel-saving technologies and practices.

#### About Initiative

Maryland has a long-standing tradition of successful public education and consumer awareness initiatives that reflect its commitment to environmental stewardship. This initiative seeks to build on that legacy, providing the information and resources necessary to empower consumers to make choices that align with their values and goals.

#### About the Task Force

- **Assess Biofuels Challenges and Possible Solutions:** Analyze the known challenges, costs, benefits, risks, and practicality of utilizing higher blends of biofuels to support the decarbonization of Maryland's transportation sector while enhancing its economic, energy, and environmental security.

#### About the Survey

- **Understand Perspectives:** Gather input from residents, government, industry, and nonprofit organizations to gain insights into public knowledge, concerns, and perspectives on Maryland's economic, energy, and environmental security challenges.
- **Explore Solutions:** Collect recommendations, identify opportunities, and effectively assess potential approaches to overcoming the identified challenges.

#### We appreciate your input and value your privacy.

- The survey is anonymous, with no right, wrong, or required answers.
- This [link](#) allows you to review the Stakeholder Engagement Survey and citations to the information provided on the GWRCCC website.
- After your survey, you can continue to receive information about this initiative or opt out of our community engagement campaign.

Thank you for taking the time to share your insights.

Engagement Survey Link: <https://www.surveymonkey.com/r/H5Z6BVY>

## Maryland's Economic, Energy, and Environmental Security Challenges

1. Maryland's Climate Solutions Now Act (CSNA) requires a 60% reduction in greenhouse gas (GHG or carbon) emissions by 2031.<sup>1</sup> The Maryland Department of the Environment estimates that reducing carbon by 646 million metric tons would achieve a "total societal benefit" of \$135 billion (reduced costs from climate change, health care, etc.).<sup>2</sup>

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2. The two largest sources of GHG emissions in Maryland are:

Transportation (35-36% of total emissions). Maryland's transportation sector is the largest source of GHG emissions, contributing 35-36% of the state's total emissions. Within this sector, 82% of transportation emissions come from on-road vehicles, which include light-duty vehicles (passenger cars, SUVs, and small trucks).<sup>3</sup>

Electricity production and consumption (18-24% of total emissions, depending on the year and accounting method). The electric power sector's emissions have declined significantly (66% reduction from 2005 to 2022) due to coal plant retirements and renewable energy adoption, but it remains the second-largest contributor.<sup>4</sup>

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3. Maryland's Climate Solutions Now Act (CSNA) mandates that 100% of the state-owned passenger fleet be "zero-emission" by 2028. Similar targets are set for light-duty vehicles, but with later deadlines.<sup>5</sup>

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4. In May 2023, Maryland became the 8th state to adopt the Advanced Clean Cars II rule,<sup>6</sup> which will require all new light-duty vehicles sold in the state to be zero-emission by 2035. (summer/fall 2024).<sup>7</sup> After 2035, manufacturers can no longer sell new gas-powered vehicles in Maryland, but existing vehicles can still be owned, operated, and resold. Current owners are not required to switch to EVs.<sup>8</sup>

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5. Maryland's Climate Solutions Now Act requires the state to focus only on vehicle tailpipe emissions for greenhouse gas accounting.<sup>9</sup> This methodology<sup>10</sup> excludes "full lifecycle" factors like source of electricity generation, vehicle manufacturing, mining, and fuel production, and overlooks the contribution from biofuels and possibly other sources of reductions.

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6. Maryland does not produce crude oil, gasoline, liquid alternative transportation fuels, or maintain a strategic fuel reserve.<sup>11 12</sup>

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7. The U.S. Renewable Fuel Standard (RFS) requires a minimum amount of renewable content in transportation fuel to reduce greenhouse gas emissions and dependence on fossil fuels. The RFS is a program under the Clean Air Act (CAA) established by the Energy Policy Act of 2005 and expanded by the Energy Independence and Security Act of 2007. The RFS requirements are codified in Section 211(o) of the CAA. This is why you see "This Gasoline Contains 10% Ethanol" labels on every gasoline dispenser in Maryland.

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8. Renewable fuel ethanol (100%) has an octane rating of 100-109, which boosts the overall octane level of the gasoline blend. EPA and all automakers approve gasoline use with 10% ethanol (E10) in all vehicles and 15% ethanol blends (E15, or 88-Octane, Regular 88) in cars manufactured after 2001. All flex-fuel vehicles are designed and approved to run on up to 85% ethanol (E85).<sup>13 14 15</sup>

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9. A gallon of ethanol has about 50% less carbon than a gallon of gasoline.<sup>16 17</sup>

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10. The term "Biomass-Based Diesel" includes biodiesel, renewable diesel, and sustainable aviation fuels. Biomass-based diesel can be made from renewable materials like animal fats and vegetable oils. Biodiesel is produced via transesterification, creating fatty acid methyl esters (FAME). It's often blended with conventional petroleum diesel (e.g., B5, B20, B100).<sup>18</sup> Renewable diesel and sustainable aviation fuels (SAF) are produced from feedstocks similar to conventional petroleum-based fuels through a hydrotreating process. They are chemically identical to conventional petroleum fuel and can fully replace it without the need to blend.<sup>19</sup>

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11. Compared to conventional petroleum diesel, biomass-based biodiesel and renewable diesel average about 60% lower greenhouse gas (GHG) emissions, with high ranges of 69% to 86% less carbon, when produced from some feedstocks.<sup>20 21 22</sup>

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12. 2019–2022 research data shows adding ethanol to gasoline saved U.S. drivers an average of \$0.77 per gallon. Savings ranged from \$0.32 to \$1.74 per gallon across various scenarios.<sup>23</sup> The consumption of 123.48 billion gallons of gasoline saves drivers \$95.1 billion annually nationwide, and about \$2.16 billion annually for drivers in Maryland.

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13. Approximately 40% of Maryland’s electricity is imported from other states.<sup>24</sup> About 36% of imported electricity is currently coal-generated and can be even higher at peak times, with real-time market data indicating that up to 70% of imported electricity may be coal-generated during specific intervals. The remainder of imported electricity is primarily sourced from natural gas and, to a lesser extent, nuclear and renewables.<sup>25</sup>

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14. The Massachusetts Institute of Technology study estimates over 50,000 people die prematurely each year from diseases caused by transportation-related air pollution.<sup>26</sup>

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15. What Maryland statistics were you aware of before taking this survey?

- Environmental justice communities bear the highest burden of asthma and cardiovascular costs.<sup>27</sup> About one in four people (24.1% ) in Maryland live in the Baltimore area or Prince George's County.
- Baltimore City: Particulate Matter (PM2.5) exposure is 37% above the state average.<sup>28</sup>
- Prince George’s County: Diesel pollution is 23% above average.
- Studies show 130 deaths per 100,000 residents annually in Baltimore due to long-term air pollution exposure, the highest rate in the U.S.<sup>29 30 31</sup>
- Baltimore’s asthma hospitalization rates remain at 2.3x Maryland’s average, with PM2.5-exposed areas seeing higher ER visits.<sup>32 33</sup>
- Older adults face elevated risks from PM2.5, which accounts for ~50% of pollution-related Medicare spending in comparable studies, driven by cardiovascular/respiratory admissions.<sup>34 35</sup>
- Cost-saving potential: Meeting federal air standards could reduce hospital spending by ~\$193 million over 3 years (California model), with Medicare likely seeing proportional savings in Maryland.<sup>36</sup>
- PM2.5 air pollution is responsible for ~1.8 million global deaths annually (2019 data), with Baltimore’s exposure rates 37% above Maryland’s average. Black children in Baltimore account for 88% of pediatric asthma hospitalizations, exacerbated by traffic pollution.<sup>37</sup>
- None of the Above

16. A Trinity Consultants study found that switching to 100% biodiesel in Washington, D.C. could reduce asthma symptoms by nearly 13,000 incidents annually. The study also found that nationwide, a 100% biodiesel switch could prevent over 910 premature deaths and result in more than 142,000 fewer sick days, while avoiding over \$7.5 billion in health costs annually.<sup>38</sup>

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17. Between 1959 and 2007, Maryland lost 41.7% of its farmland (1.4 million acres), with urbanization accounting for most conversions.<sup>39</sup> From 2017 to 2022, the state lost 12,086 acres of farmland.<sup>40</sup> Maryland could lose 24,000 acres by 2035, threatening the state's agricultural critical mass.<sup>41</sup>

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18. If U.S. biofuel production stopped, U.S. farmers would need to plant an additional 5 million acres of corn and 15 million acres of soybeans to compensate for the loss of high-protein co-products produced from ethanol plants that also produce distillers' dried grains and biodiesel plants that produce soymeal.<sup>42</sup>

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19. According to the U.S. Energy Information Administration (EIA), light-duty vehicles—including cars, sport utility vehicles, and small trucks—account for approximately 91% of all U.S. gasoline consumption.<sup>43</sup> As of 2024, the average age of U.S. light-duty vehicles (cars and light trucks) is approximately 12.6 years.<sup>44</sup>

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20. In 2011, the EPA approved using 15% ethanol blended with gasoline (E15) in cars manufactured after 2001. About 97% of the gasoline consumed in the U.S. is in vehicles built after 2001.

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21. Maryland has 4.3 million internal combustion engine (ICE) vehicles, including 309,300 flexible fuel vehicles (FFVs) capable of using up to 85% ethanol, 31,300 plug-in ICE hybrids, 168,700 hybrid electric vehicles (EVs) that are ICE and battery powered, and 86,367 dedicated battery-powered EVs.<sup>45</sup> There are 86,900 diesel-powered vehicles and 32,100 that use biodiesel. Most ICE/hybrid vehicles manufactured in the past five years, and new ICE/hybrid vehicles purchased over the next five years, will be consuming gasoline or diesel in 2024.<sup>46</sup>

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22. A 2023 analysis shows consumers saved at least 25 cents per gallon with E15.<sup>47</sup> April 2025 data from the Minnesota Department of Commerce shows E15 saved consumers an average of 17 cents per gallon in 2024.<sup>48</sup>

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23. A 2022 report estimated that from 2010 to 2021, the global introduction of biomass-based diesel reduced #2 diesel prices by 8% to nearly 19% annually, depending on the year and supply levels. U.S. production alone contributed to a 1–4% reduction in diesel prices. A 4% reduction in diesel fuel prices in Maryland is equivalent to \$104.7 million in annual savings. The savings can translate into lower costs for the trucking industry, farmers, and consumers.<sup>49 50</sup>

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24. Gasoline contains about 20% aromatics, chemicals that boost its octane level.<sup>51 52</sup> The main aromatics—are Benzene, Toluene methylbenzene, Ethylbenzene, and Xylene dimethylbenzene (BTEX). BTEX are the most carbon-intensive and carcinogenic<sup>53</sup> compounds in gasoline.<sup>54 55</sup>

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25. Diesel fuel contains benzene-ring-structured aromatics, typically called "C9 to C12+ aromatics," which can make up about 22% of the fuel's composition.<sup>56</sup>

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26. California started its Low-Carbon Fuel Standard (LFSC) in 2011. The LFSC requires fuel producers and importers to meet declining targets. For example, 2019 required a 6.25% reduction in carbon compared to 2010. Reduction targets increase linearly to achieve a 30% reduction by 2030.<sup>57</sup>

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27. California estimates that by 2025, the health benefits of reducing emissions from its Low Carbon Fuel Standard (LCFS) will save \$8.3 billion in pollution-related health care by preventing 38,000 asthma attacks, 600 heart attacks, and 880 premature deaths.<sup>58</sup>

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28. Biomass-based diesel (BBD) accounts for 75% of diesel sold in California to meet its Low Carbon Fuel Standard and generates 45% of the credits.<sup>59</sup>

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29. Similar to Maryland recognizing the total societal costs of carbon emissions, crude oil and gasoline also have total societal costs, which are often called external or hidden costs. Like tobacco, gasoline has negative economic, energy, environmental, and personal security costs that are not included in the sales price, but are paid in different ways by federal and state governments and consumers.<sup>60</sup>

**Economic Security Costs:** A 1% increase in PM (particulate matter) concentration is associated with an 11.02% rise in personal commercial health insurance expenditures.<sup>61</sup> Property insurance premiums have risen 21% since 2015, and nearly 67% of U.S. homes are underinsured.<sup>62</sup>

**Energy Security Costs (Military):** Protecting oil supply chains and strategic reserves: \$0.10–\$0.40 per gallon.

**Environmental Security Costs:** \$0.10–\$0.50 per gallon (Impact of climate change, e.g., CO<sub>2</sub> emissions).

**Personal Security:** \$0.30–\$1.00 per gallon (Air pollution health effects, e.g., PM, VOC, SOA, NO<sub>x</sub>, SO<sub>x</sub>, and BTEX)

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30. A McKinsey & Company report found that using E15 saves consumers 20-59 cents per gallon and E20 saves 18-63 cents per gallon (mileage-adjusted). As a result of ethanol's high octane, the amount of gasoline a refiner can produce from a barrel of oil increases by 3.2% for E10, 4.7% for E15, and 6.7% for E20, and avoids the economic hardship of investing in additional refining capacity.<sup>63</sup>

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31. A March 2025 California Air Resources Board (CARB) study found that E15 emits fewer pollutants than E10 and reduces the carbon intensity of the fuel supply. It also had statistically significant reductions in emissions from particulate matter (PM), carbon monoxide, total hydrocarbons, non-methane hydrocarbons, and carbon dioxide.<sup>64</sup>

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## Your Perspectives & Opinions

### Check all that apply.

32. Please indicate the category that best represents your stakeholder perspective and provide a descriptor where applicable.

*(Check all that apply and a descriptor in the last box if appropriate.)*

- Maryland resident
- DMV area (DC, MD, VA)
- Out of state
- Nonprofit organization (e.g., Economic, Energy, Environment, Public Health)
- Government representative (e.g., Federal, State, Local)
- Academia (e.g., University, Foundation, Research Think Tank)
- Industry (e.g., Oil & Gas, Utility, Alternative Fuel Provider, Automotive, Refueling, Agriculture)
- Optional Descriptor:

33. Converting farmland to commercial use irreversibly increases carbon intensity by ~4% annually, making farmland preservation vital for Maryland's 2035 climate goals.<sup>65</sup>

(Pick 1)

- I believe increasing biofuel use in Maryland could help prevent the direct loss of farmland, decrease carbon emissions, and help stabilize the price of food and fuel.
- I believe increasing biofuel use will not prevent the loss of farmland, and converting those acres to commercial use will not increase carbon emissions or food and fuel prices in Maryland.

34. Maryland and federal regulations require ingredients, side effects, hazardous materials, and other warning labels on music, movies, food, alcohol, tobacco, and pharmaceutical products. Do you think gasoline dispensers should also have country of origin, health side effects, ingredients, and warning labels?

- Yes
- No

35. Are conventional compression ignition diesel engines approved to use up to 20% biodiesel blends without any modifications?<sup>66</sup>

- Yes
- No

36. Prince George's County has launched a 100% Biodiesel (B100) Transit Pilot Program to reduce greenhouse gas emissions by over 90%. The program is part of the county's broader initiative to convert 375 current diesel vehicles to be capable of using 100% biodiesel (B100).<sup>67</sup>

How do you feel about this project?

- I like the project and would like to see projects like this expand.
- I do not like the project.

37. The D.C. Department of Public Works added 17 new refuse trucks to its heavy-duty vehicles that can run on renewable pure biodiesel (B100). This initiative aligns with the department's sustainable energy goals, aiming to reduce up to 86% of the vehicles' greenhouse gas emissions.<sup>68</sup>

How do you feel about this project?

- I like the project and would like to see projects like this expand.
- I do not like the project.

38. Due to the EPA's Diesel Emission Reduction Act grant, the DC Government's DC Water agency will replace 13 diesel vehicles with 12 B100 vehicles by the end of 2024. The transition will cut greenhouse gas emissions by 76% (98.3 metric tons)-equivalent to removing 21 cars or planting 1,625 trees. The project will also reduce cancer-causing particulate matter by 97% and nitrogen oxides by 94%, benefiting 31 Washington, D.C. zip codes.<sup>69</sup>

How do you feel about this project?

- I like the project and would like to see projects like this expand.
- I do not like the project.

39. As part of PepsiCo's sustainability initiative pep+, the company is using B100 in over 100 of its semi-trucks and plans to expand its use, aiming to lower its carbon footprint significantly.<sup>70</sup>

How do you feel about this project?

- I like the project and would like to see projects like this expand.
- I do not like the project.

40. Research consistently found that particulate matter (PM2.5) and other pollutants inside school buses are often several times higher than ambient outdoor levels, largely due to "self-pollution"-emissions from the bus's engine entering the cabin. For example, one review found that the average PM2.5 exposures inside school buses were 5–6 times greater than outside, and up to 5–10 times higher than background levels in some cases.<sup>71 72</sup>

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41. If the only affordable option to reduce emissions from school buses, delivery vehicles, and other diesel vehicles in your neighborhood was to add more biodiesel, would you encourage the government or private fleet to use it?

- Yes
- No

42. When considering the economic, energy, and environmental security challenges Maryland faces, there appears to be no valid scientific reasons to prevent increasing the levels of biofuels in every gallon of gasoline and diesel fuel sold to reduce carbon and mobile source toxic emissions during the time it takes to phase in more electric vehicles, buses, and trucks.

- I agree
- I strongly agree
- I am unsure
- I disagree
- I strongly disagree

43. What topics could you confidently explain to a friend? Please select all that apply.

- The National Renewable Fuel Standard and its purpose
- The differences between E10, E15, and E85 fuel blends
- The differences between 87, 88, 90, and 93 octane fuel
- What a Flexible Fuel Vehicle (FFV) is and how to identify if a vehicle is an FFV
- None of the Above

44. What topics could you confidently explain to a friend? Please select all that apply.

- The Reid Vapor Pressure (RVP) of gasoline.
- The impact of the volatility of gasoline (RVP) on vehicle emissions.
- The difference between aromatics and BTEX in gasoline.
- The impact that gasoline direct injection engines have on particulate matter emissions.
- Why do more than half of new cars require premium gasoline, and it's about \$1 more than regular unleaded gasoline?
- None of the Above

45. What air pollutants could you confidently explain to a friend? Please select all that apply.

- Particulate Matter (PM) and ultrafine particulate matter (PM2.5)
- The differences between carbon monoxide, total hydrocarbons, non-methane hydrocarbons, and carbon dioxide
- How secondary organic compounds (SOA) increase volatile organic compounds (VOCs)
- Nitrogen oxides (e.g., NOx, nitric oxide [NO], and nitrogen dioxide [NO<sub>2</sub>])
- Sulfur oxides (e.g., SOx, sulfur dioxide [SO<sub>2</sub>], and sulfur trioxide [SO<sub>3</sub>])
- None of the Above

46. How concerned are you about the environmental impact of the fuel you use in your vehicle?

- Very concerned – I actively consider environmental impact when choosing fuel
- Somewhat concerned – I think about it, but it's not my top priority
- Neutral – I don't give it much thought
- Not very concerned – Other factors matter more to me
- Not concerned at all – Environmental impact does not influence my decision

47. Rank the following Maryland energy challenges in order of importance to you?

(1 = most important)

- Economic Security: \$3 billion budget deficit, job creation, food production.
- Energy Security: Reducing gasoline price volatility caused by reliance on importing foreign oil, and reliance on out-of-state electricity from fossil fuel sources.
- Environmental Security: Reducing carbon emissions, property damage, and insurance premiums.
- Personal Security: Reducing air pollution, health effects, and rising cost of health care premiums.

48. Should Maryland state agencies provide information about biofuels like those offered to EVs and other health and safety campaigns, e.g., texting, speeding, and driving under the influence?

- Yes
- No

49. Should the economic, energy, and environmental impacts of crude oil and gasoline use be included in Maryland's driver education program?

- Yes
- No

50. Have you ever purchased higher blends of biofuels?

- Yes
- No

51. Do you plan to buy higher blends of biofuels in the future?

- Yes
- No

52. If a fuel retailer offered you the choice to purchase a fuel that the EPA and your vehicle manufacturer approve, lowers carbon and mobile source air toxics emissions, is produced in the United States, helps farmers maintain farmland, and helps reduce food and fuel prices, would you expect to pay?

- Less
- 25 cents less
- More
- 10 cents more
- 25 cents more

53. Would you rather pay for the total societal costs of gasoline and diesel or the societal benefits of biofuels?

- I want to continue to pay for the total societal costs of gasoline and diesel fuel
- I would rather pay for the societal benefits of biofuels.

54. Which of the following external costs do you believe should be factored into the price of gasoline? (Check all that apply.)

- Health care costs from air pollution
- Environmental cleanup and climate change impacts
- Military expenditures to secure oil supplies
- Federal and state subsidies for oil and gasoline
- All of the above
- None of the above

55. If the total societal costs (including health care, property insurance, environmental impacts, and military spending) were included in the price of gasoline, how would that influence your fuel choices?

- I would be more likely to choose alternative fuels or electric vehicles.
- I would continue to use gasoline regardless of the total societal cost.

56. Do you believe biofuels are worse than fossil fuels?

- Yes
- No
- Not sure

57. Maryland has not included strategies to increase the use of biofuels in its climate change or decarbonization goal plans.

- |  |   |
|--|---|
| <input type="checkbox"/> I was unaware and not concerned.            | <input type="checkbox"/> I was unaware and now concerned. |
| <input type="checkbox"/> I was unaware and would like to learn more. | <input type="checkbox"/> I was aware and concerned.       |
| <input type="checkbox"/> I was aware and not concerned.              | <input type="checkbox"/> Comments                         |

58. Do you believe strategies to expand the use of biofuels should be included in Maryland's plans to reduce the impact of climate change and count towards the state's decarbonization goals?

- Yes
- No



## 59. Please Choose Your Level of Future Engagement

- I would like to review the survey and references to information provided in the engagement survey located on the GWRCCC website at [www.gwrccc.org/Maryland-Biofuels-Task-Force](http://www.gwrccc.org/Maryland-Biofuels-Task-Force)
- I would like to be invited to attend two virtual Task Force meetings.
- I would like to receive quarterly updates about Task Force findings and special events related to this initiative.
- Please remove me from the Task Force's Community Stakeholder Engagement List.

## 60. Option to include your name and email address

Privacy Policy: Your email will never be shared. It is for the sole purpose of receiving the information described above. You can unsubscribe anytime by using the opt-out link.

- Name
- Organization
- Title
- Email
- Phone

Thank you for taking the time to share your insights and provide us with feedback.

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