

DELAWARE'S

Climate Action Plan

Public Workshop Summary

Round 2: Fall 2020

Workshop No. 1



This report was prepared by Planning Communities, LLC on behalf of the Delaware Department of Natural Resources and Environmental Control

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OVERVIEW

As part of the Climate Action Plan development process in 2020, the state engaged Delaware residents to share their ideas related to climate change and the opportunities and barriers to climate action. The Department of Natural Resources and Environmental Control's (DNREC) Division of Climate, Coastal and Energy has led ongoing public engagement in the development of a Climate Action Plan for Delaware. [An initial series of public workshops was held in March 2020](#) to educate the community about climate change, inform them of the state's planning process and introduce them to example strategies for minimizing greenhouse gas emissions and maximizing resilience to climate change impacts. The overall goal was to understand barriers, resource needs and interest in the public's support for various climate action strategies.

A second round of public workshops was held in fall 2020 to build on the initial engagement effort. This second round consisted of four workshops focused on soliciting feedback on potential actions the state could take to minimize greenhouse gas emissions (Workshop No. 1) and maximize resilience to climate change impacts (Workshop Nos. 2, 3 and 4). These workshops were held fully online using the videoconference software Zoom. This summary captures the results of Workshop No. 1, which was offered twice (September 15 and September 17, 2020). One session was offered in the morning and another in the evening to accommodate the needs of a wider audience. Workshop times and dates are noted below:

TUESDAY, SEPTEMBER 15 11:30 a.m. – 1 p.m. Online (Zoom)	THURSDAY, SEPTEMBER 17 5:30 – 7:00 p.m. Online (Zoom)
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The goals of Workshop No. 1 were to describe potential actions for minimizing greenhouse gas emissions that Delaware is considering for its Climate Action Plan, examine which actions have the greatest potential to reduce emissions and explore the challenges of prioritizing climate action and competing priorities.

BY THE NUMBERS

	September 15, 2020	September 17, 2020
Number of Workshop Participants	108	79

THE APPROACH

Workshop No. 1 was designed to share the results of the *Delaware Climate Action Plan Supporting Technical Greenhouse Gas Mitigation Analysis*. This analysis modeled what Delaware's greenhouse gas emissions could look like over the next three decades under two scenarios: (1) Delaware takes no new actions to minimize emissions (i.e., business-as-usual), and (2) Delaware implements new and expanded strategies to minimize emissions. The analysis was commissioned by DNREC and carried out by ICF Incorporated, a consulting firm with extensive experience in technical modeling to support climate planning. Workshop No. 1 aimed to present the results of the analysis in a readily understandable manner, including describing the actions that were modeled and their greenhouse gas reduction potential. The workshop also looked to

gauge public perception on other benefits of climate action and understand the public’s relative level of support for different climate action strategies.

Workshop No. 1 was held virtually due to the COVID-19 pandemic and was designed to be accessible to as many stakeholders as possible. Closed captioning was provided during the live workshops to increase accessibility.

Both the September 15 and September 17 sessions presented the same material and followed a similar format. The agenda was the same for both workshops. An example agenda from the September 17 workshop is shown below.

Agenda	
5:30 p.m. – 5:40 p.m.	Welcome and Overview
5:40 p.m. – 6:05 p.m.	Presentation and Polling
6:05 p.m. – 6:40 p.m.	Small Group Breakout Session
6:40 p.m. – 7:00 p.m.	Wrap-Up and Polling
7:00 p.m.	Workshop Ends

The core components of the workshops consisted of a presentation on Delaware’s Climate Action Plan and the results of the technical analysis (see Appendix 1), a series of interactive group polls (see Appendix 3) and a facilitated breakout session to guide small group discussions and exercises (see Appendix 4). Participants were provided with a fact sheet and infographic that summarized high-level results from technical report (See Appendix 2). Both the fact sheet and infographic were emailed to all participants prior to each workshop session.

A few adjustments were made to the format of the September 17 session. First, presenters clarified a few points of discussion based on questions received at the first workshop. Secondly, while the September 15 session included a debriefing period following the breakout session, this debriefing was eliminated for the second workshop to allow time for a short question and answer session. Finally, in the September 15 session, there were a few workshop attendees who struggled with participating in the online breakout session. So, the second workshop designated a specific breakout group for these participants to offer the opportunity for a facilitated discussion without the use of online tools.

Presentation

The presentation provided an overview of the state’s climate action planning process and emphasized why it is important to act now. Results from the technical analysis were also presented, including the greenhouse gas



reduction potentials of different climate action strategies. The strategies were presented in six “categories of actions”. In alphabetical order, these categories were:

1. Building Electrification
2. Building Energy Efficiency
3. Fuel and Roadway Efficiency
4. Renewable Energy
5. Waste Diversion and Reduction
6. Zero-Emission Vehicles

The slides shown are examples from the presentation (full presentation slides are in Appendix 1). The presentation began with DNREC’s Climate and Sustainability Programs Administrator, Susan Love, providing the welcome and overview. DNREC Secretary Shawn M. Garvin followed up to present and emphasized the importance of the plan and Delaware residents’ participation in the development process. Ms. Love then presented results from the technical analysis.

Polling

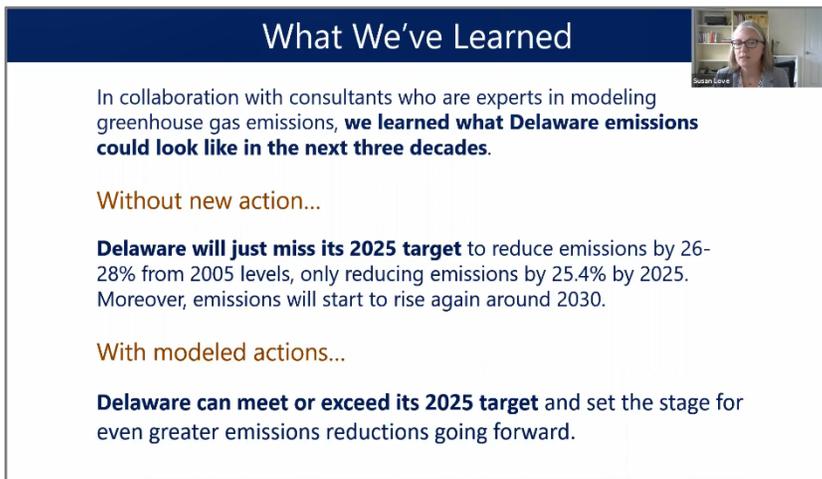
Interactive polls were used to gauge the audience’s existing knowledge and concerns around climate change. Polls occurred near the beginning of the presentation and following the breakout group sessions. Polls at the beginning of the session were focused on gathering information about participants, such as where they lived, their interest in the plan and whether they had participated in the Round 1 workshops.

Polls following the breakout session were designed for participants to reflect on the information received during the workshop. These questions asked participants which category of actions the state should implement first and requested feedback on whether Delaware should adopt a long-term GHG reduction target. Most participants indicated that Delaware should set a target of more than 80% emissions reduction by 2050. Full results of the polling can be found in Appendix 3.

Breakout Groups

Workshop participants were then assigned to one of a number of a breakout rooms facilitated by a workshop staff facilitator. A designated breakout room with closed captioning was made available to participants.

The purpose of the breakout group exercise was to gauge participant opinions on the six categories of climate actions, including



What We've Learned

In collaboration with consultants who are experts in modeling greenhouse gas emissions, **we learned what Delaware emissions could look like in the next three decades.**

Without new action...

Delaware will just miss its 2025 target to reduce emissions by 26-28% from 2005 levels, only reducing emissions by 25.4% by 2025. Moreover, emissions will start to rise again around 2030.

With modeled actions...

Delaware can meet or exceed its 2025 target and set the stage for even greater emissions reductions going forward.



Zoom Polling

Poll 1: 1

1. Who is joining us today? I live in:

- Kent County
- New Castle County
- Sussex County
- I don't live in Delaware, but I work in Delaware
- I neither live nor work in Delaware

Launch Poll



Breakout Group Exercise:
Where do we go from here?

greenhouse gas reduction potential, other benefits offered by those actions and how the state should prioritize the actions. The exercise was approximately 30 minutes long.

Each breakout group consisted of five to seven participants. There were eight rooms facilitated for the September 15 session and seven rooms for the September 17 session. Facilitators guided participants through an interactive activity hosted on the website Mentimeter, consisting of 12 questions that participants answered. Facilitators gave a brief explanation on how to answer each question and gave participants a few minutes to provide input. For each question, the group was able to see the consolidated results from their breakout room. Consolidated responses from the September 15 and 17 sessions are noted in the “What We Heard” section below. Results from each individual breakout group are provided in Appendix 4.

As mentioned previously, for the September 17 session, one of the breakout rooms was designated as a facilitated discussion group for those who were unable to participate in the online exercise. This group discussed the same questions as those hosted on Mentimeter.

Wrap-Up

Following the breakout sessions, all participants were gathered back together for a brief wrap-up period. For the September 15 workshop, part of this wrap-up period consisted of a breakout session debrief that reviewed results from all the breakout groups. For the September 17 session, this debrief was replaced by a short question and answer session in which Ms. Love answered questions that were submitted throughout the workshop. All questions asked during the September 15 and 17 sessions, along with DNREC answers to those questions, can be found in Appendix 6. Additional comments provided by participants during the presentation or breakout or wrap-up sessions are provided in Appendix 7.

The workshop ended with Ms. Love encouraging all participants to stay involved in the Climate Action Plan process, including submitting comments on the plan through the public input deadline of October 16, 2020. All participants were also encouraged to participate in an interactive survey on the project website (declimateplan.org) and to share information about the survey and the public input deadline with those who were not present at the workshop.

WHAT WE HEARD

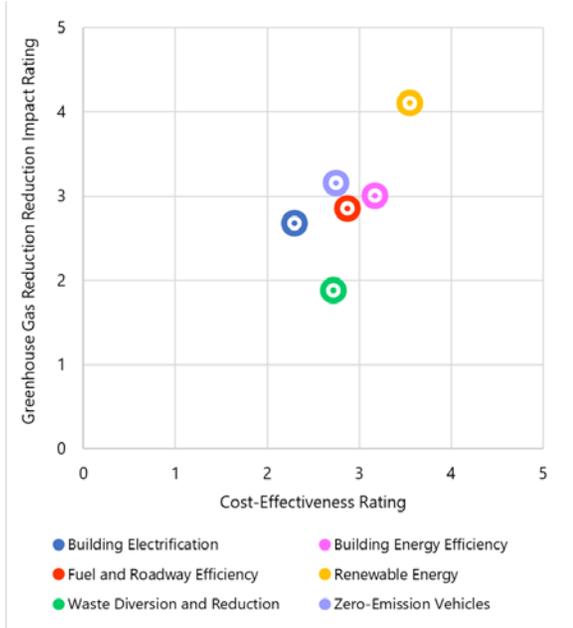
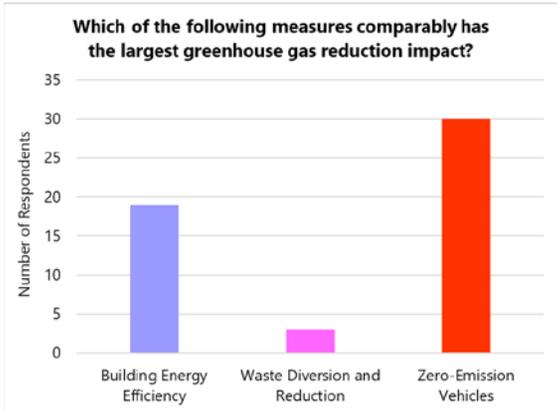
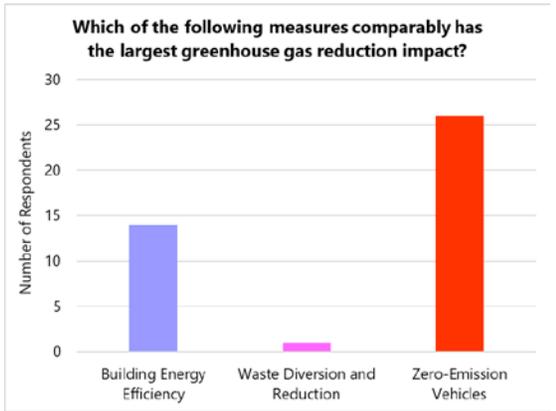
Workshop attendees stated that climate change is a real concern and is already starting to threaten the daily lives and economy of Delaware’s coastal towns, urban areas and vibrant farms. Participants noted that we need to act together.

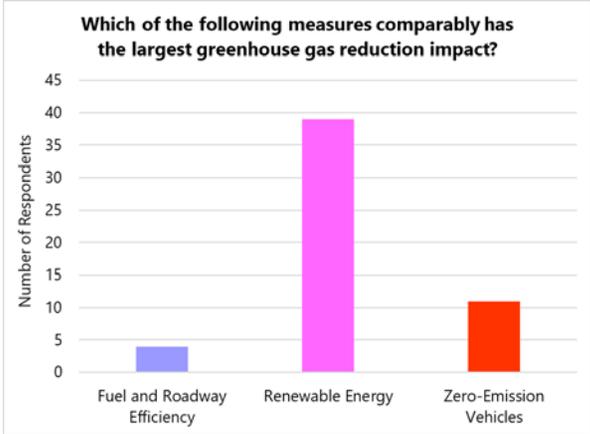
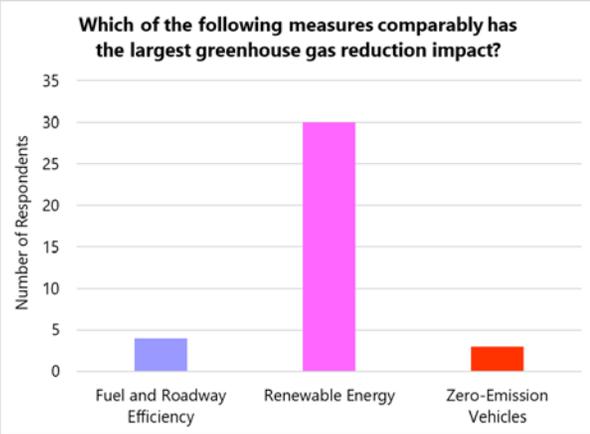
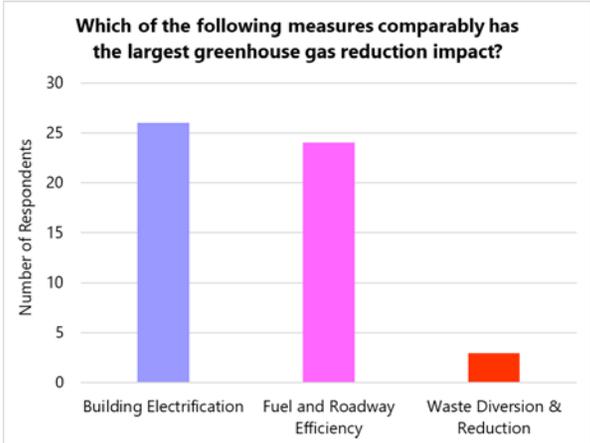
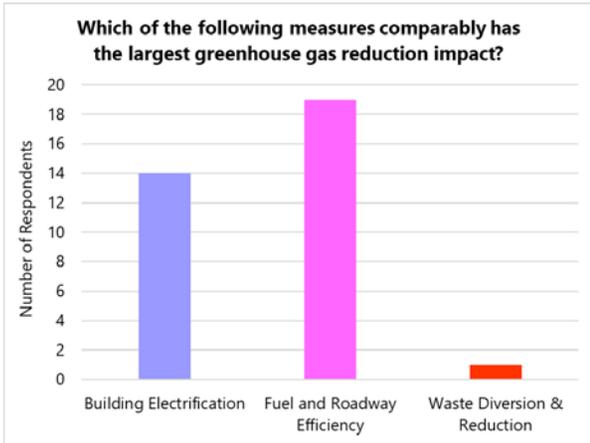
Participants encouraged the state government to require higher standards. They recognized the co-benefits of climate action, such as improving public health, clean air and water, job creation and supporting new energy and transportation technologies.

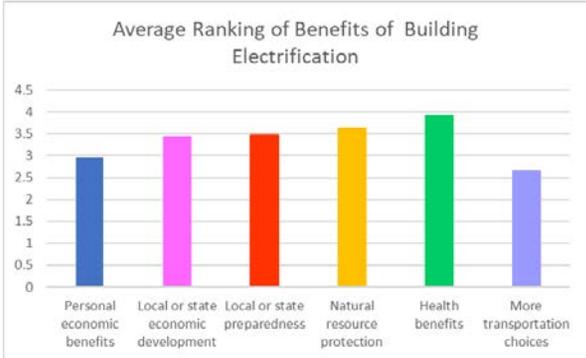
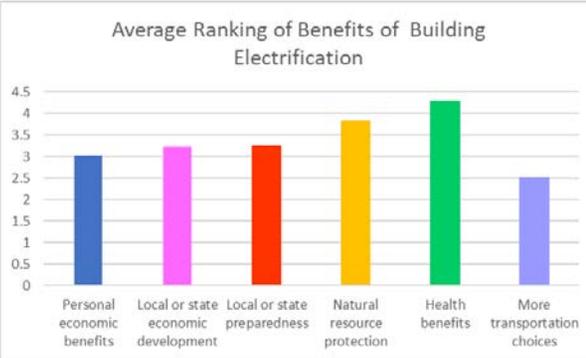
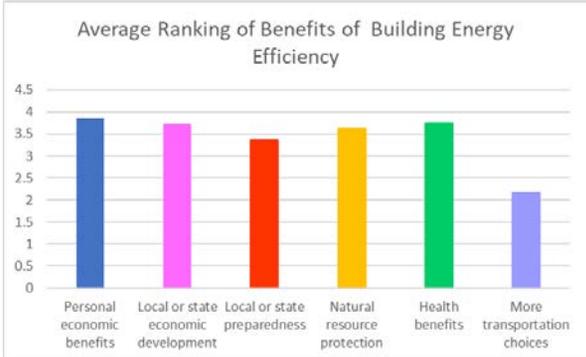
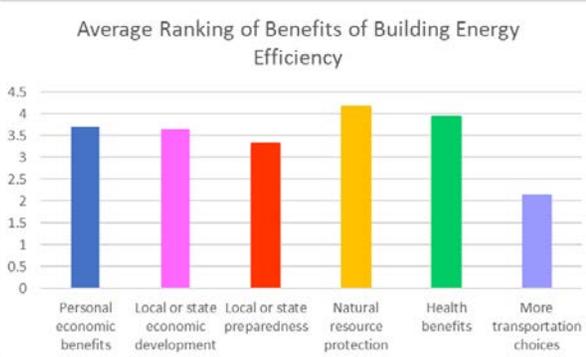
Participants gained an understanding of the range of potential actions the state of Delaware is considering including in its Climate Action Plan to reduce emissions and the relative greenhouse gas reduction potential of those actions. They considered how the state’s efforts can drive climate action and recognized the challenges and tradeoffs associated with prioritizing climate actions.

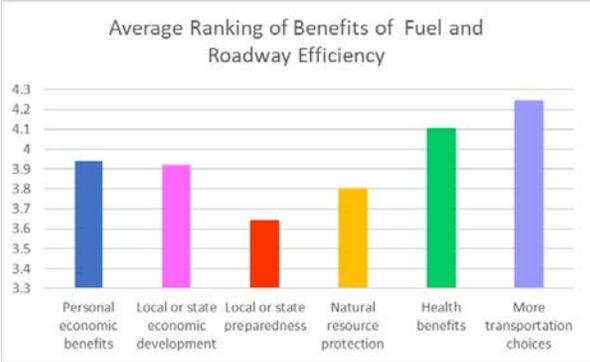
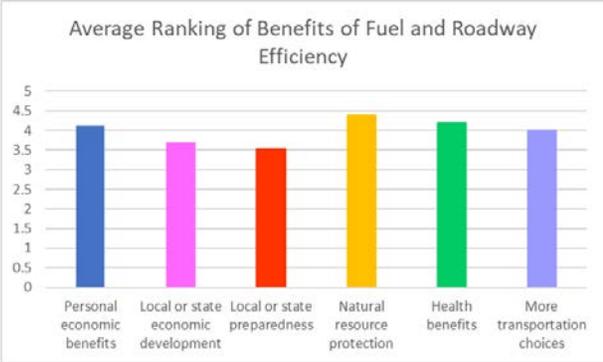
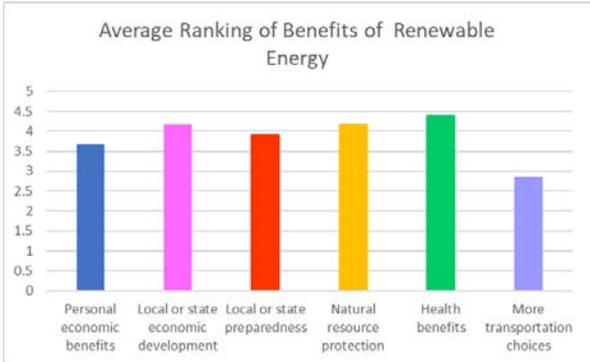
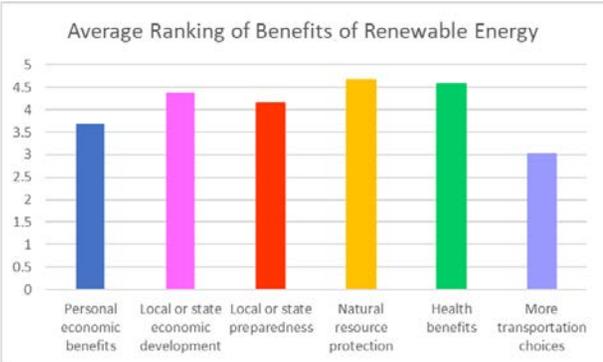
Participants strongly supported the adoption of a greenhouse gas reduction goal of at least 80% from 2005 levels by 2050. Participants showed support for implementing all of the actions being considered and strongly supported renewable energy as a top-priority action.

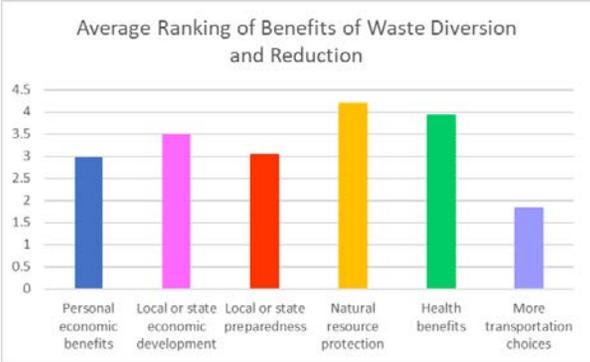
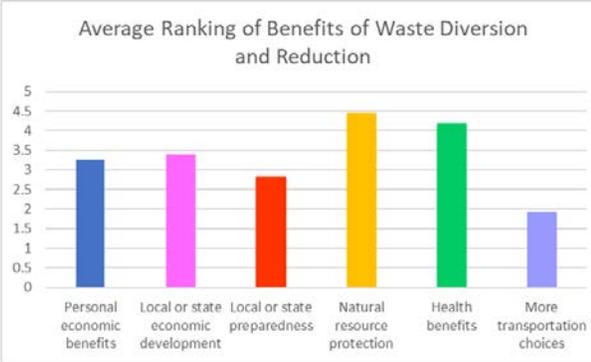
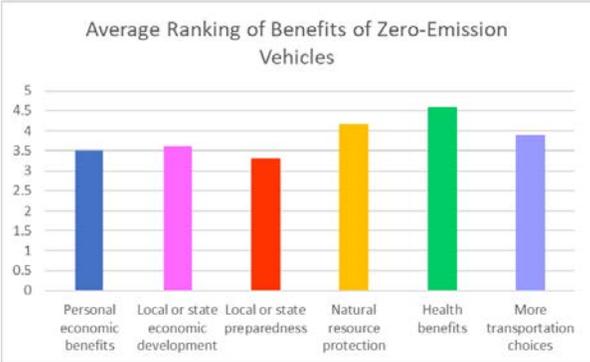
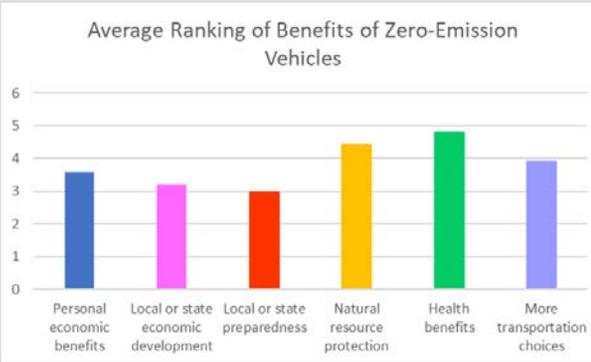
Consolidated breakout room responses from the September 15 and 17 sessions are included below.

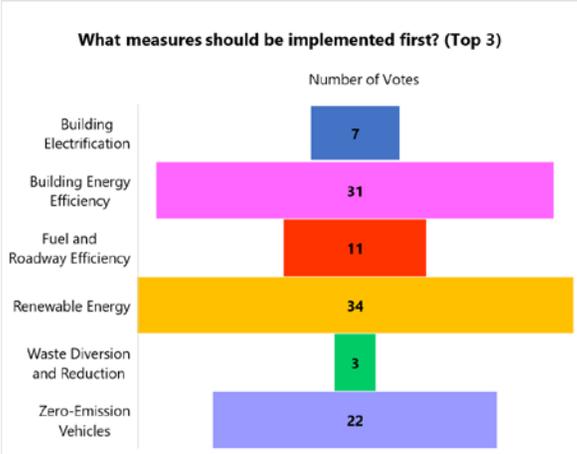
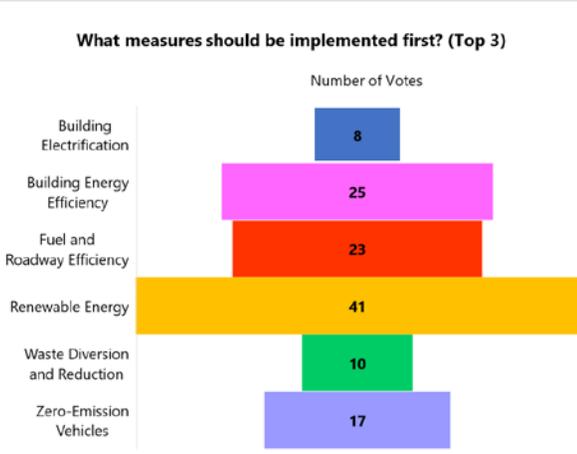
Question	September 15 Session	September 17 Session
<p>Which measures do you think have the most impact and are most cost effective?</p> <p>Participants indicated their ratings for greenhouse gas reduction impact and cost effectiveness of each of the six climate action categories using slider bars (on a scale of 0 to 5). The results show the average responses from each session. The purpose of this question was to gauge initial perceptions from participants.</p>	 <p>A scatter plot with 'Greenhouse Gas Reduction Reduction Impact Rating' on the y-axis (0-5) and 'Cost-Effectiveness Rating' on the x-axis (0-5). Data points are: Building Electrification (blue, ~2.8, ~3.2), Fuel and Roadway Efficiency (red, ~2.8, ~3.2), Waste Diversion and Reduction (green, ~2.3, ~3.0), Building Energy Efficiency (pink, ~3.1, ~3.7), Renewable Energy (yellow, ~4.4, ~3.1), and Zero-Emission Vehicles (purple, ~3.8, ~2.8).</p>	 <p>A scatter plot with 'Greenhouse Gas Reduction Reduction Impact Rating' on the y-axis (0-5) and 'Cost-Effectiveness Rating' on the x-axis (0-5). Data points are: Building Electrification (blue, ~2.7, ~2.5), Fuel and Roadway Efficiency (red, ~2.9, ~3.1), Waste Diversion and Reduction (green, ~1.9, ~2.8), Building Energy Efficiency (pink, ~3.0, ~3.3), Renewable Energy (yellow, ~4.1, ~3.5), and Zero-Emission Vehicles (purple, ~3.2, ~2.8).</p>
<p>Which of the following measures comparably has the largest GHG reduction impact?</p> <p><i>Correct answer: Zero-emission vehicles</i></p> <p>The purpose of this question was to help participants begin thinking about how different actions compared to one another and to gauge participants' perceptions after the presentation to help with future messaging.</p>	 <p>A bar chart titled 'Which of the following measures comparably has the largest greenhouse gas reduction impact?' with 'Number of Respondents' on the y-axis (0-35). The bars are: Building Energy Efficiency (blue, ~19), Waste Diversion and Reduction (pink, ~3), and Zero-Emission Vehicles (red, ~30).</p>	 <p>A bar chart titled 'Which of the following measures comparably has the largest greenhouse gas reduction impact?' with 'Number of Respondents' on the y-axis (0-30). The bars are: Building Energy Efficiency (blue, ~14), Waste Diversion and Reduction (pink, ~1), and Zero-Emission Vehicles (red, ~26).</p>

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<p>What other benefits could result from reducing greenhouse gas emissions?</p> <p>Participants were able to submit as many words or short phrases as they wished describing potential benefits of reducing greenhouse gases. Results were displayed as a word cloud, with the most common phrases shown in the largest font.</p>	<p>See word clouds below</p>																													
<p>What measures should be implemented first? (Choose your Top 3 Selections)</p> <p>The results indicate the overall number of votes for each action. Facilitators asked participants to think about both greenhouse gas reductions and other benefits to select actions they thought the state should implement first, with the understanding that not everything can be done at one time.</p>	<p style="text-align: center;">What measures should be implemented first? (Top 3)</p> <p style="text-align: center;">Number of Votes</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Measure</th> <th>Number of Votes</th> </tr> </thead> <tbody> <tr> <td>Building Electrification</td> <td>7</td> </tr> <tr> <td>Building Energy Efficiency</td> <td>31</td> </tr> <tr> <td>Fuel and Roadway Efficiency</td> <td>11</td> </tr> <tr> <td>Renewable Energy</td> <td>34</td> </tr> <tr> <td>Waste Diversion and Reduction</td> <td>3</td> </tr> <tr> <td>Zero-Emission Vehicles</td> <td>22</td> </tr> </tbody> </table>	Measure	Number of Votes	Building Electrification	7	Building Energy Efficiency	31	Fuel and Roadway Efficiency	11	Renewable Energy	34	Waste Diversion and Reduction	3	Zero-Emission Vehicles	22	<p style="text-align: center;">What measures should be implemented first? (Top 3)</p> <p style="text-align: center;">Number of Votes</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Measure</th> <th>Number of Votes</th> </tr> </thead> <tbody> <tr> <td>Building Electrification</td> <td>8</td> </tr> <tr> <td>Building Energy Efficiency</td> <td>25</td> </tr> <tr> <td>Fuel and Roadway Efficiency</td> <td>23</td> </tr> <tr> <td>Renewable Energy</td> <td>41</td> </tr> <tr> <td>Waste Diversion and Reduction</td> <td>10</td> </tr> <tr> <td>Zero-Emission Vehicles</td> <td>17</td> </tr> </tbody> </table>	Measure	Number of Votes	Building Electrification	8	Building Energy Efficiency	25	Fuel and Roadway Efficiency	23	Renewable Energy	41	Waste Diversion and Reduction	10	Zero-Emission Vehicles	17
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September 17 Session – Word Cloud Responses: What other benefits could result from reducing greenhouse gas emissions?



OTHER ENGAGEMENT

The state continued conversations on climate action following Workshop No. 1. Three more virtual public workshops, focused on maximizing resilience to climate change impacts, was held in late September and early October 2020. The summary for Workshop Nos. 2, 3 and 4 is available on declimateplan.org.

To complement the in-person workshops, the state launched an online survey on the project website (declimateplan.org) available from September 7 until October 16, garnering 96 total responses. The survey allowed people (particularly those unable to attend one of the virtual workshops) an opportunity to provide similar feedback to what was shared at the workshops.

The survey had similar goals to the virtual workshops. The survey questions asked respondents to rank potential actions for minimizing greenhouse gas emissions based on respondent beliefs about emissions reduction impact. Respondents were also asked to indicate which of these actions they believed the state should prioritize first. Additionally, respondents were presented with potential actions for maximizing resilience to climate change impacts and asked to also rank those they believed the state should prioritize first.

Survey results indicate that renewable energy and zero emission vehicles were perceived by the public as the most impactful (and highest priority) actions to minimize greenhouse gas emissions. Participants also indicated that changing state policy regulations and building stakeholder support were the highest priority actions for Delaware to pursue to maximize resilience to climate change impacts. Comments from the survey also revealed the public's interest in reducing food waste, encouraging plant-based diets, reducing vehicle miles traveled, increasing opportunities for carbon capture and storage and expanding public transportation.

A copy of the full survey instrument and results of the online survey can be found in Appendix 5.

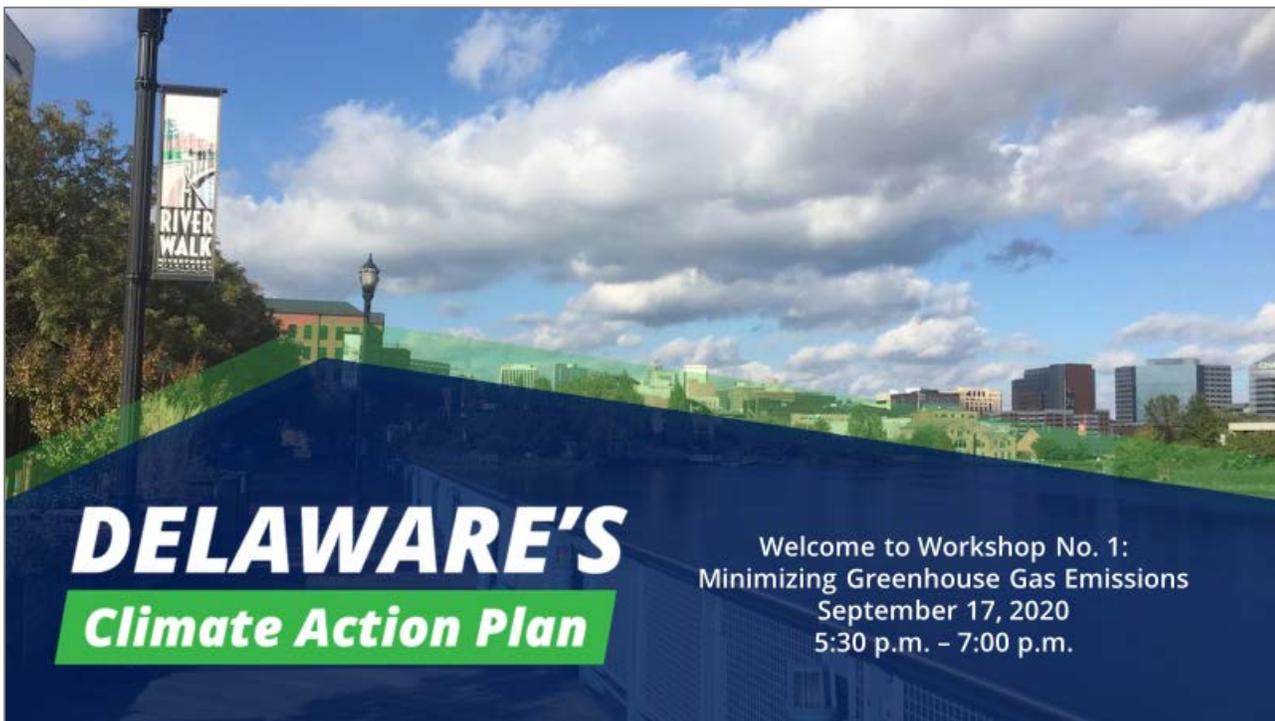
APPENDICES

APPENDIX 1: Presentation Slides

Note: Unless otherwise indicated, each of the slides below were presented at both the September 15 and 17 sessions.



The above slide was only presented at the September 15 session.



The above slide was only presented at the September 17 session.

Workshop Facilitators and Presenters



Shawn M. Garvin
Secretary
DNREC



Susan Love
Administrator
Climate and Sustainability
Programs, DNREC



Kari Hewitt
Consultant
KLA



Ann Steedly
Consultant
Planning Communities

Virtual Workshop Logistics

Make Sure Your Sound Works

- You will be muted upon entry to the workshop.
- To test incoming sound, click the “up” arrow next to the microphone icon at the bottom of your screen. Select “Test Speaker & Microphone”.
- If you can’t get computer/mobile device sound to work, either re-launch Zoom or click the “up” arrow and “Switch to Phone Audio”.
- **Note:** *You may not hear sound until the webinar begins.*

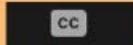


Get Tech Support or Ask a Question

- Click the “Chat” icon at the bottom of your screen. You can ask the meeting host for tech support or ask the Climate Action Plan team a question.
- We may not be able to answer all questions during the workshop. However, we will capture all questions from the chat box and include a Q&A section in our workshop summary report.



Closed Captioning



- To turn on captions, click the **Closed Caption** icon at the bottom of your screen and select "Show Subtitle". If you don't see this icon, click **More** at the bottom of your screen, select "Closed Caption", and then "Show Subtitle". To view captions that were typed previously, select "Show Full Transcript".
- To change caption size, click the "Closed Caption" icon again and select "Subtitle Settings". Use the slider to change caption size.

Workshop Materials and Additional Input

- Workshop materials are available at declimateplan.org. Workshop recordings will be posted there afterwards.
- You can provide additional comments via our online survey or our comment form. Details at declimateplan.org.
- We will email you a feedback form after the workshop. Let us know how we can improve these online workshops!

Virtual Workshop Logistics



GOALS FOR THIS WORKSHOP

Describe potential actions Delaware is considering for its Climate Action Plan

Examine which actions have the greatest potential to reduce emissions in Delaware

Explore the challenges associated with prioritizing climate action and competing priorities

Agenda

11:30 a.m. – 11:40 a.m.

Welcome and Overview

11:40 a.m. – 12:05 p.m.

Presentation and Polling

12:05 p.m. – 12:40 p.m.

Small Group Breakout Session

12:40 p.m. – 1:00 p.m.

Wrap-Up and Polling

1:00 p.m.

Workshop Ends

The above slide was only presented at the September 15 session.

Agenda

5:30 p.m. – 5:40 p.m.

Welcome and Overview

5:40 p.m. – 6:05 p.m.

Presentation and Polling

6:05 p.m. – 6:40 p.m.

Small Group Breakout Session

6:40 p.m. – 7:00 p.m.

Wrap-Up and Polling

7:00 p.m.

Workshop Ends

The above slide was only presented at the September 17 session.

DELAWARE'S

Climate Action Plan

A Plan to Protect and Strengthen Delaware

Implementing Delaware's Climate Action Plan will protect and strengthen:

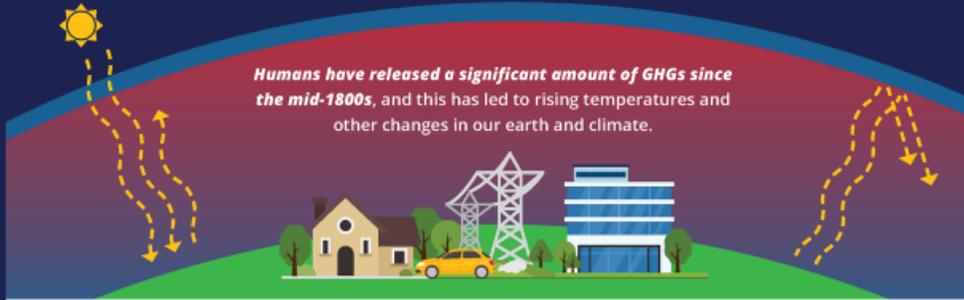
- Our agricultural and tourism economies
- The natural places we enjoy for recreation
- Our infrastructure
- The health of our residents and visitors
- Access to clean energy and transportation for all Delawareans



A Plan to Minimize Emissions

Climate Change: Causes

Greenhouse gases (GHGs) are vapors in the atmosphere, like carbon dioxide, that trap heat around the earth. When we use fossil fuels like coal, natural gas, and oil to power our homes, businesses, and vehicles, we release even more GHGs into the atmosphere.



Sources of Emissions



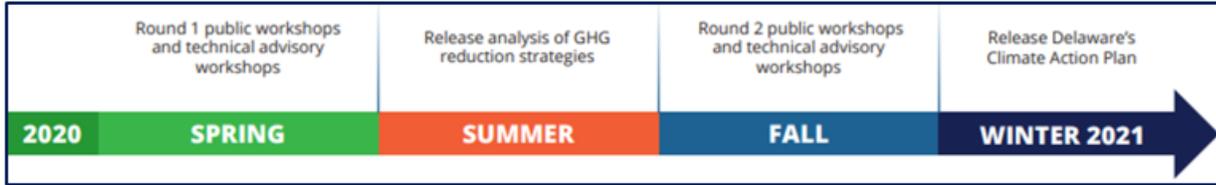
A Plan to Maximize Resilience

Climate Change: Consequences

Delawareans are already experiencing the impacts of climate change, with more on the way.

<p> Increased Temperatures Delaware temperatures have risen 2°F since 1900.</p> <p>PROJECTED: Delaware temperatures are expected to increase another 2.5-4.5°F by 2050, with an up to 8°F increase by 2100.</p>	<p> Hotter, Longer Summers Historically, days above 100°F in Delaware have occurred less than once per year.</p> <p>PROJECTED: By 2050, Delaware can expect 2-8 days per year to reach above 100°F.</p>
<p> Rising Sea Levels Sea levels at the Lewes tide gate have risen more than a foot over the last century.</p> <p>PROJECTED: Sea levels at the Lewes tide gate are expected to rise an additional 9-23" by 2050.</p>	<p> Increased Precipitation Delaware averages 45" of rain per year, typically evenly distributed among seasons. Rainfall in the autumn has been increasing 0.27" per decade.</p> <p>PROJECTED: Overall rainfall in Delaware is expected to increase by 10% by 2100. The number of very wet days (2" or more of rainfall) will also increase.</p>

Climate Action Plan Timeline

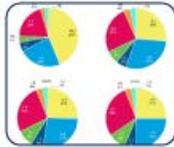


Developing the Climate Action Plan



WHAT WE HEARD

- Survey
- Spring workshops



WHAT WE'VE LEARNED

- Technical Advisory Workshop
- GHG modeling and analysis



WHERE DO WE GO FROM HERE?

- Fall workshops
- Survey

What We Heard

- **Energy**
 - Renewable energy
 - Energy efficiency
 - Green building design
- **Transportation**
 - High density development
 - Improved public transit options
 - Accessibility to electric vehicles and charging stations
 - More walkable, bikeable communities
- **Resilience**
 - Adapting to sea level rise
 - Alleviating flooding
 - Emergency preparedness planning
 - Habitat restoration
- **Accessibility and equity considerations throughout**
- **Education and skills training**

People signed in, by location	256 people (76 Sussex, 118 New Castle, 62 Kent)
Total number of climate action ideas provided by participants	870 comments
Total number of ideas about the causes and consequences of climate change	315 ideas
Total video stories shared	33 stories
Location-specific "Social Pinpoint" comments	65 comments



What We've Learned

In collaboration with consultants who are experts in modeling greenhouse gas emissions, **we learned what Delaware emissions could look like in the next three decades.**

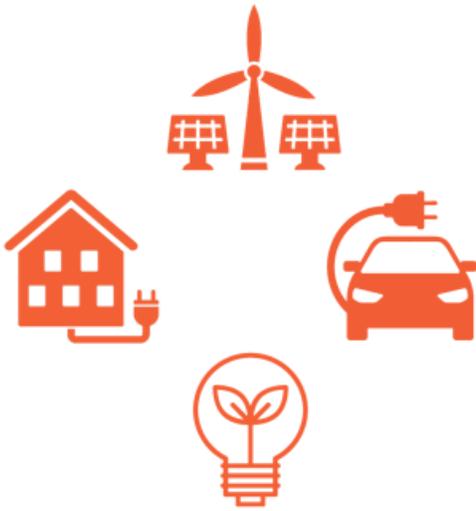
Without new action...

Delaware will just miss its 2025 target to reduce emissions by 26-28% from 2005 levels, only reducing emissions by 25.4% by 2025. Moreover, emissions will start to rise again around 2030.

With modeled actions...

Delaware can meet or exceed its 2025 target and set the stage for even greater emissions reductions going forward.

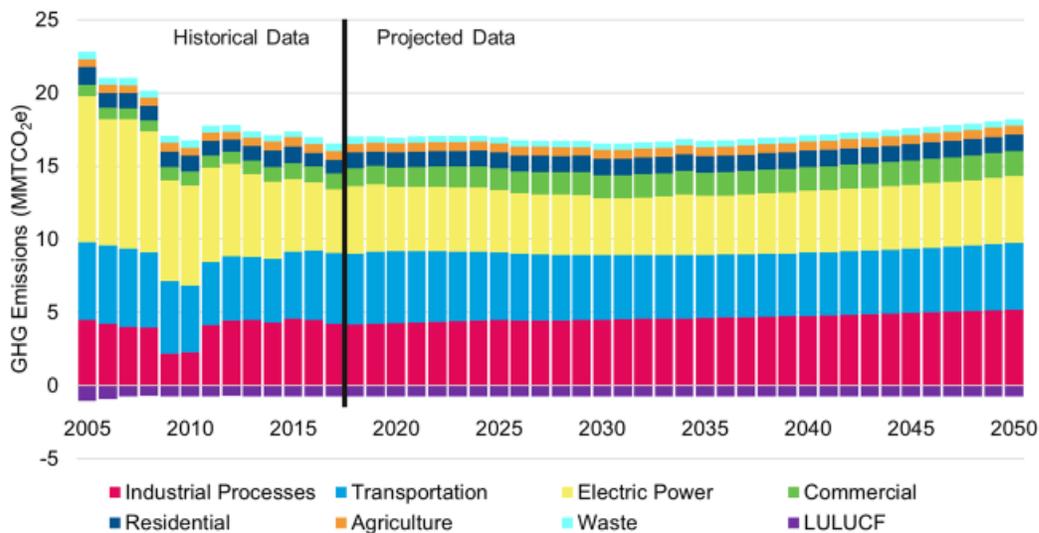
What We've Learned



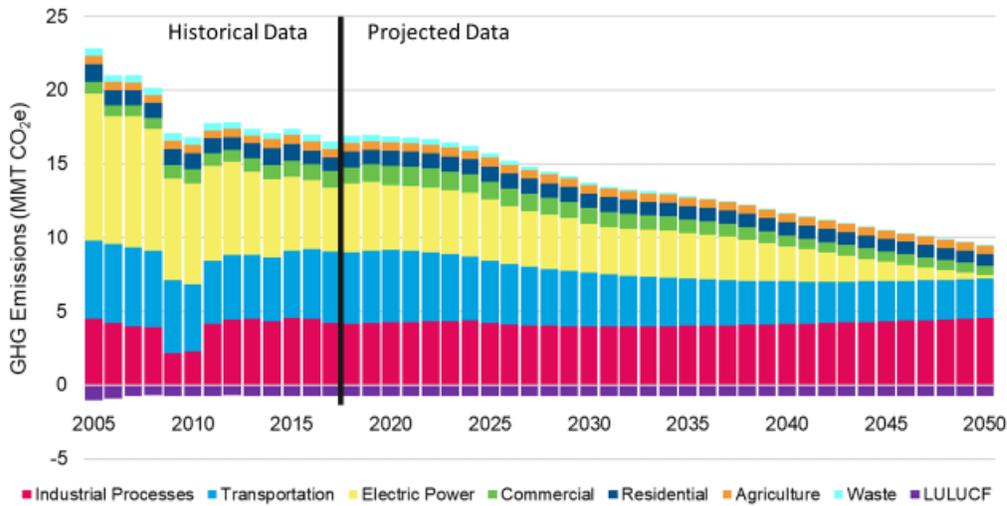
With modeled actions...

- **Decarbonizing the electricity grid** has the greatest potential in the medium and long terms
- **Electrification of buildings and the transportation sector** can achieve significant emissions reductions over time
- **Energy efficiency** is an important short-term (and a relatively lower cost) strategy

Without new action: 25.4% reduction by 2025



With modeled actions: 31.1% by 2025, 59.7% by 2050



DELAWARE'S Climate Action Plan

GREENHOUSE GAS EMISSIONS REDUCTION POTENTIAL

What is MTCO₂e?

METRIC TONS OF CARBON DIOXIDE EQUIVALENT
Each greenhouse gas (GHG) has a different ability to trap heat in the atmosphere. We can compare each GHG's heat-trapping ability to that of the GHG carbon dioxide (CO₂). This is called the CO₂ equivalent (CO₂e) and allows us to use a single measure to calculate all GHG emissions: metric tons of CO₂e (MTCO₂e).

CO-BENEFITS

- IMPROVED AIR QUALITY
- JOB CREATION
- COST SAVINGS
- ENERGY RESILIENCE
- ENHANCED MOBILITY

The values on top of each bar indicate the **2050 GHG emissions reduction potential** for implementing that strategy. Reduction potential values come from GHG modeling carried out in the summer of 2020, taking into account market feasibility for the earliest time each strategy could be put into place.

4,333,200 MTCO₂e
GHG reduction potential



Renewable Energy

Installation of on-site renewable energy at homes and businesses
—
More renewables in the grid

1,184,500 MTCO₂e
GHG reduction potential



Zero-Emission Vehicles

More electric, plug-in hybrid and fuel cell vehicles available
—
More charging infrastructure
—
Vehicle purchase incentives

732,200 MTCO₂e
GHG reduction potential



Building Energy Efficiency

Higher standards for energy performance
—
Buildings cost less to operate
—
More financial incentives available to implement upgrades

649,800 MTCO₂e
GHG reduction potential



Fuel and Roadway Efficiency

More efficient, cleaner running vehicles
—
More options to get around without a car
—
More walking and biking opportunities

545,700 MTCO₂e
GHG reduction potential



Building Electrification

Buildings increasingly rely on electricity for all energy uses to maximize renewable benefits
—
Options for homes and businesses to upgrade building systems

211,400 MTCO₂e
GHG reduction potential



Waste Diversion and Reduction

Increased options to divert waste through recycling and composting
—
Encourage the principles of "reduce, reuse, recycle (or compost)"

What does it mean?



Renewable Energy

2050 GHG Reduction Potential = 4,333,200 MTCO₂e

Efforts to increase the amount of clean, renewable energy (such as wind and solar) on the electricity grid has the largest long-term potential to reduce emissions. Strategies include:

- Increasing the number of homes and businesses with solar panels
- Increasing solar and geothermal systems on industrial properties
- Phasing out fossil fuels in utility scale electric generation

4,333,200 MTCO₂e
GHG reduction potential



Renewable Energy

Installation of on-site renewable energy at homes and businesses

More renewables in the grid



Zero-Emission Vehicles

2050 GHG Reduction Potential = 1,184,500 MTCO₂e

Zero-emission vehicles (ZEVs) rely on electricity or hydrogen fuel cells to power them, creating no direct emissions. As our electric supply comes increasingly from renewable sources, electric vehicles (EVs) will increasingly be free of emissions. Strategies include:

- Providing more EV charging infrastructure
- Consumer incentives for purchasing ZEVs
- Increasing the number ZEVs in the state fleet

1,184,500 MTCO₂e
GHG reduction potential



Zero-Emission Vehicles

More electric, plug-in hybrid and fuel cell vehicles available

More charging infrastructure

Vehicle purchase incentives



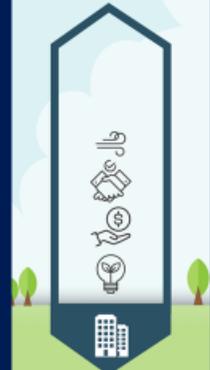
Building Energy Efficiency

2050 GHG Reduction Potential = 732,200 MTCO₂e

Reducing the amount of energy we need to power our homes, offices and industries is an easy way to reduce energy demand. Strategies include:

- Increasing the energy performance standards that new buildings must meet
- Providing incentives to upgrade existing building systems and envelope
- Identifying operational efficiencies to save money

732,200 MTCO₂e
GHG reduction potential



Building Energy Efficiency

Higher standards for energy performance

Buildings cost less to operate

More financial incentives available to implement upgrades



Fuel and Roadway Efficiency

2050 GHG Reduction Potential = 649,800 MTCO₂e

The transportation sector currently accounts for about a third of GHG emissions in Delaware. Along with more zero-emissions vehicles, reducing the amount of fuel used by vehicles already on the road is critical. Strategies include:

- Improving the efficiency with which we transport goods and materials
- Enhancing public transit options and creating more bikeable and walkable neighborhoods

649,800 MTCO₂e
GHG reduction potential



Fuel and Roadway Efficiency

More efficient, cleaner running vehicles

More options to get around without a car

More walking and biking opportunities



Building Electrification

2050 GHG Reduction Potential = 545,700 MTCO₂e

Building electrification is the shift from fossil fuel-powered appliances (gas and propane furnaces and hot water heaters) to clean electric appliances (electric heat pumps and hot water heaters), ideally powered by renewable energy. Strategies include:

- Transitioning existing buildings to utilize an all-electric energy source for heating and cooling spaces and water
- Moving the electricity grid toward 100% clean, renewable energy to multiply the impact of electrification

545,700 MTCO₂e
GHG reduction potential



Building Electrification

Buildings increasingly rely on electricity for all energy uses to maximize renewable benefits

Options for homes and businesses to upgrade building systems



Waste Diversion and Reduction

2050 GHG Reduction Potential = 211,400 MTCO₂e

Diverting and reducing waste applies to the entire life cycle of the goods we buy and use – from the energy, water and raw materials required to make them to the emissions associated with tossing them in landfills. Waste diversion strategies include:

- Reducing the amount of new materials we need to create by promoting the reuse of existing products
- Enhancing opportunities to compost and recycle those materials we cannot reuse

211,400 MTCO₂e
GHG reduction potential



Waste Diversion and Reduction

Increased options to divert waste through recycling and composting

Encourage the principles of "reduce, reuse, recycle (or compost)"

What is MTCO_{2e}?

METRIC TONS OF CARBON DIOXIDE EQUIVALENT
Each greenhouse gas (GHG) has a different ability to trap heat in the atmosphere. We can compare each GHG's heat-trapping ability to that of the GHG carbon dioxide (CO₂). This is called the CO₂ equivalent (CO_{2e}) and allows us to use a single measure to calculate all GHG emissions: metric tons of CO_{2e} (MTCO_{2e}).

CO-BENEFITS

- IMPROVED AIR QUALITY
- JOB CREATION
- COST SAVINGS
- ENERGY RESILIENCE
- ENHANCED MOBILITY

4,333,200 MTCO_{2e}
GHG reduction potential



Renewable Energy

Installation of on-site renewable energy at homes and businesses

More renewables in the grid

What does it mean?

1,184,500 MTCO_{2e}
GHG reduction potential



Zero-Emission Vehicles

More electric, plug-in hybrid and fuel cell vehicles available

More charging infrastructure

Vehicle purchase incentives

732,200 MTCO_{2e}
GHG reduction potential



Building Energy Efficiency

Higher standards for energy performance

Buildings cost less to operate

More financial incentives available to implement upgrades

649,800 MTCO_{2e}
GHG reduction potential



Fuel and Roadway Efficiency

More efficient, cleaner running vehicles

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Building Electrification

Buildings increasingly rely on electricity for all energy uses to maximize renewable benefits

Options for homes and businesses to upgrade building systems

211,400 MTCO_{2e}
GHG reduction potential



Waste Diversion and Reduction

Increased options to divert waste through recycling and composting

Encourage the principles of "reduce, reuse, recycle (or compost)"



Breakout Group Exercise:
Where do we go from here?



Breakout Debrief

Which measures do you think have the most impact and are most cost-effective?



The above slide was only presented at the September 15 session.



We'll Be Right Back



The above slide was only presented at the September 17 session.

Questions and Answers

(Time Permitting)



The above slide was only presented at the September 17 session.



MAKE YOUR **VOICE HEARD**

- › Public input is an important part of the Plan development process.
- › Please provide your feedback by **October 16, 2020**.

"In Person"



Attend public workshops.

Online



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Take a survey.
Engage on social media.

Word of Mouth



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Other Workshops in our Virtual Series

Workshop #2 – Maximizing Resilience to Sea Level Rise
Sept. 24 , 5:30 p.m. to 7 p.m.

Workshop #3 – Maximizing Resilience to Increased Temperatures
Sept. 29, 5:30 p.m. to 7 p.m.

Workshop #4 – Maximizing Resilience to Heavy Precipitation and Flooding
Oct. 1 , 5:30 p.m. to 7 p.m.

Details and Registration: declimateplan.org

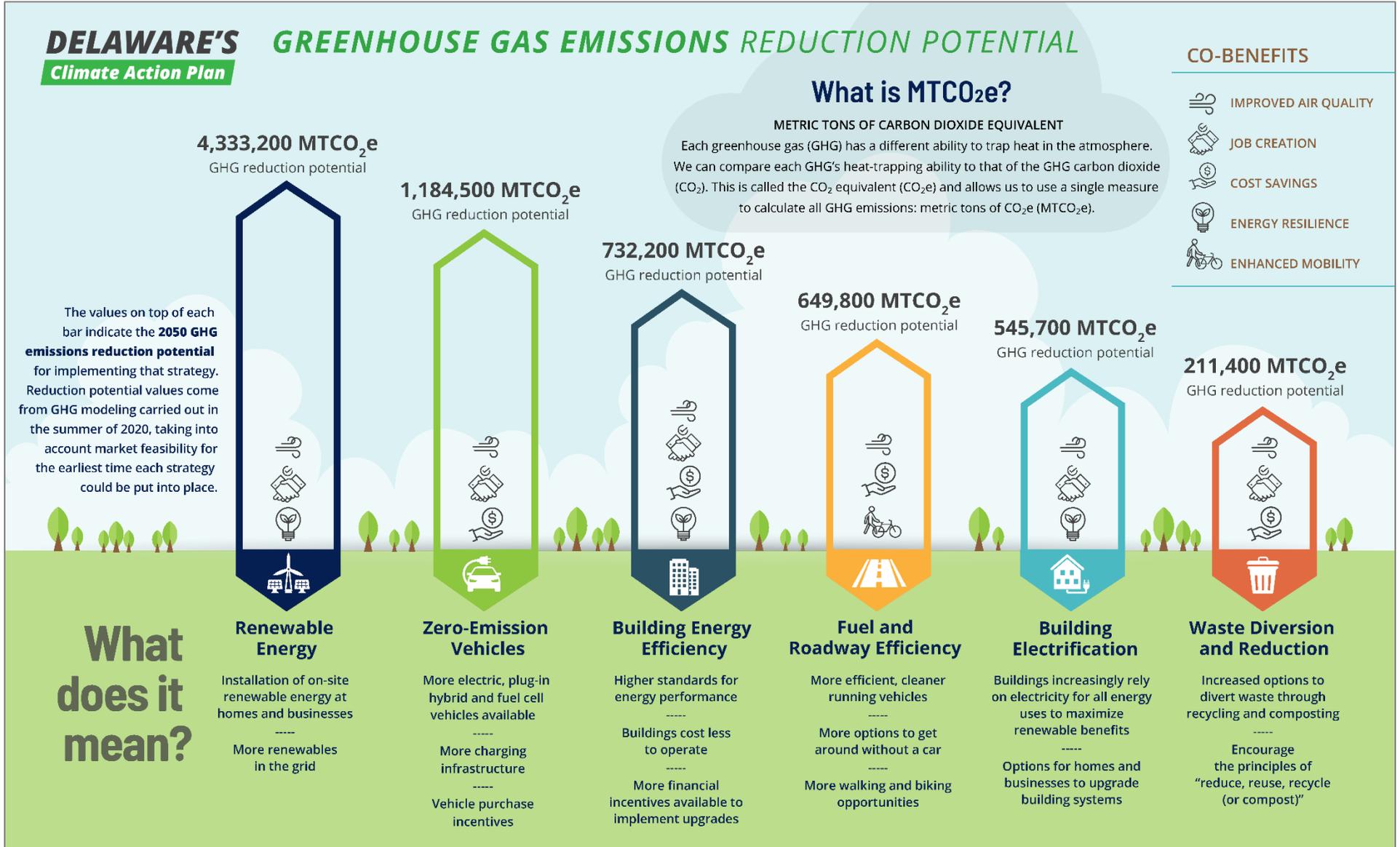


THANK YOU

DELAWARE'S
Climate Action Plan

www.declimateplan.org | declimateplan@delaware.gov | [@EnergyClimateDE](https://twitter.com/EnergyClimateDE)

APPENDIX 2: Informational Handouts



GREENHOUSE GAS EMISSIONS REDUCTION – FACT SHEET

There are several ways Delaware can take action to minimize greenhouse gas (GHG) emissions, which drive the climate change we see today. Through the Climate Action Plan process, the Department of Natural Resources and Environmental Control (DNREC) engaged a consultant team to model the GHG reduction potential of specific actions. These actions have been grouped into broader categories for ease of communication. The category name, a description of what is included in each category, and each category's GHG reduction potential in the year 2050 are provided in the tiles below.



Renewable Energy

2050 GHG Reduction Potential = 4,333,200 MTCO₂e

Efforts to increase the amount of clean, renewable energy (such as wind and solar) on the electricity grid has the largest long-term potential to reduce emissions. Strategies include:

- Increasing the number of homes and businesses with solar panels
- Increasing solar and geothermal systems on industrial properties
- Phasing out fossil fuels in utility scale electric generation



Zero-Emission Vehicles

2050 GHG Reduction Potential = 1,184,500 MTCO₂e

Zero-emission vehicles (ZEVs) rely on electricity or hydrogen fuel cells to power them, creating no direct emissions. As our electric supply comes increasingly from renewable sources, electric vehicles (EVs) will increasingly be free of emissions. Strategies include:

- Providing more EV charging infrastructure
- Consumer incentives for purchasing ZEVs
- Increasing the number ZEVs in the state fleet



Building Energy Efficiency

2050 GHG Reduction Potential = 732,200 MTCO₂e

Reducing the amount of energy we need to power our homes, offices and industries is an easy way to reduce energy demand. Strategies include:

- Increasing the energy performance standards that new buildings must meet
- Providing incentives to upgrade existing building systems and envelope
- Identifying operational efficiencies to save money



Fuel and Roadway Efficiency

2050 GHG Reduction Potential = 649,800 MTCO₂e

The transportation sector currently accounts for about a third of GHG emissions in Delaware. Along with more zero-emissions vehicles, reducing the amount of fuel used by vehicles already on the road is critical. Strategies include:

- Improving the efficiency with which we transport goods and materials
- Enhancing public transit options and creating more bikeable and walkable neighborhoods



Building Electrification

2050 GHG Reduction Potential = 545,700 MTCO₂e

Building electrification is the shift from fossil fuel-powered appliances (gas and propane furnaces and hot water heaters) to clean electric appliances (electric heat pumps and hot water heaters), ideally powered by renewable energy. Strategies include:

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Waste Diversion and Reduction

2050 GHG Reduction Potential = 211,400 MTCO₂e

Diverting and reducing waste applies to the entire life cycle of the goods we buy and use – from the energy, water and raw materials required to make them to the emissions associated with tossing them in landfills. Waste diversion strategies include:

- Reducing the amount of new materials we need to create by promoting the reuse of existing products
- Enhancing opportunities to compost and recycle those materials we cannot reuse

Key Terms

Greenhouse Gases: Greenhouse gases (GHGs) are vapors in the atmosphere that trap heat around the earth (such as carbon dioxide). When we use fossil fuels like coal, natural gas and oil to power our homes, businesses and vehicles, we release even more GHGs into the atmosphere. Humans have released a significant amount of GHGs since the mid-1800s, and this has led to rising temperatures and other changes in our earth and climate.

Metric Tons of Carbon Dioxide Equivalent (MTCO₂e): Each greenhouse gas (GHG) has a different ability to trap heat in the atmosphere. We can compare each GHG's heat-trapping ability to that of the GHG carbon dioxide (CO₂). This is called the CO₂ equivalent (CO₂e) and allows us to use a single measure to calculate all GHG emissions: metric tons of CO₂e (MTCO₂e).

APPENDIX 3: Polling

Polling Questions

Note: Poll questions 1 to 3 were asked at the beginning of the presentation. Poll questions 4 and 5 were asked after the breakout session.

The screenshot shows a mobile application interface for a poll. At the top, the word "Polls" is centered. Below it, the poll is titled "Poll 1: 1" with a dropdown arrow and an "Edit" button. The question is "1. Who is joining us today? I live in:". There are five radio button options: "Kent County", "New Castle County", "Sussex County", "I don't live in Delaware, but I work in Delaware", and "I neither live nor work in Delaware". At the bottom, there is a blue "Launch Poll" button.

The screenshot shows a mobile application interface for a poll. At the top, the word "Polls" is centered. Below it, the poll is titled "Poll 2: 2" with a dropdown arrow and an "Edit" button. The question is "1. Did you participate in the Round 1 workshops or take the online survey (in March)?". There are six radio button options: "I attended a workshop and completed the online survey", "I only attended a workshop", "I only completed the online survey", "I was not able to attend a workshop or complete the online survey", and "I did not know about the Climate Action Plan until recently". At the bottom, there is a blue "Launch Poll" button.

Poll 3: 3

▼  Edit

1. What is your PRIMARY interest in Delaware's Climate Action Plan?

- I am concerned about climate change and want to support state plans to address it
- I am curious to learn more about climate change and state plans to address it
- I am "on the fence" about climate change but am looking for more information
- I don't think climate change is an issue, but I want to know what the state is proposing
- I like to engage on many civic issues, climate change just happens to be one of them

Launch Poll

Polls

Poll 4: 4 ▼ ✎ Edit

1. Based on everything you've heard/discussed tonight, which category of actions do you think Delaware should take first to minimize emissions?

- Building Electrification
- Building Energy Efficiency
- Fuel and Roadway Efficiency
- Renewable Energy
- Waste Diversion and Reduction
- Zero-Emission Vehicles

Launch Poll

Polls

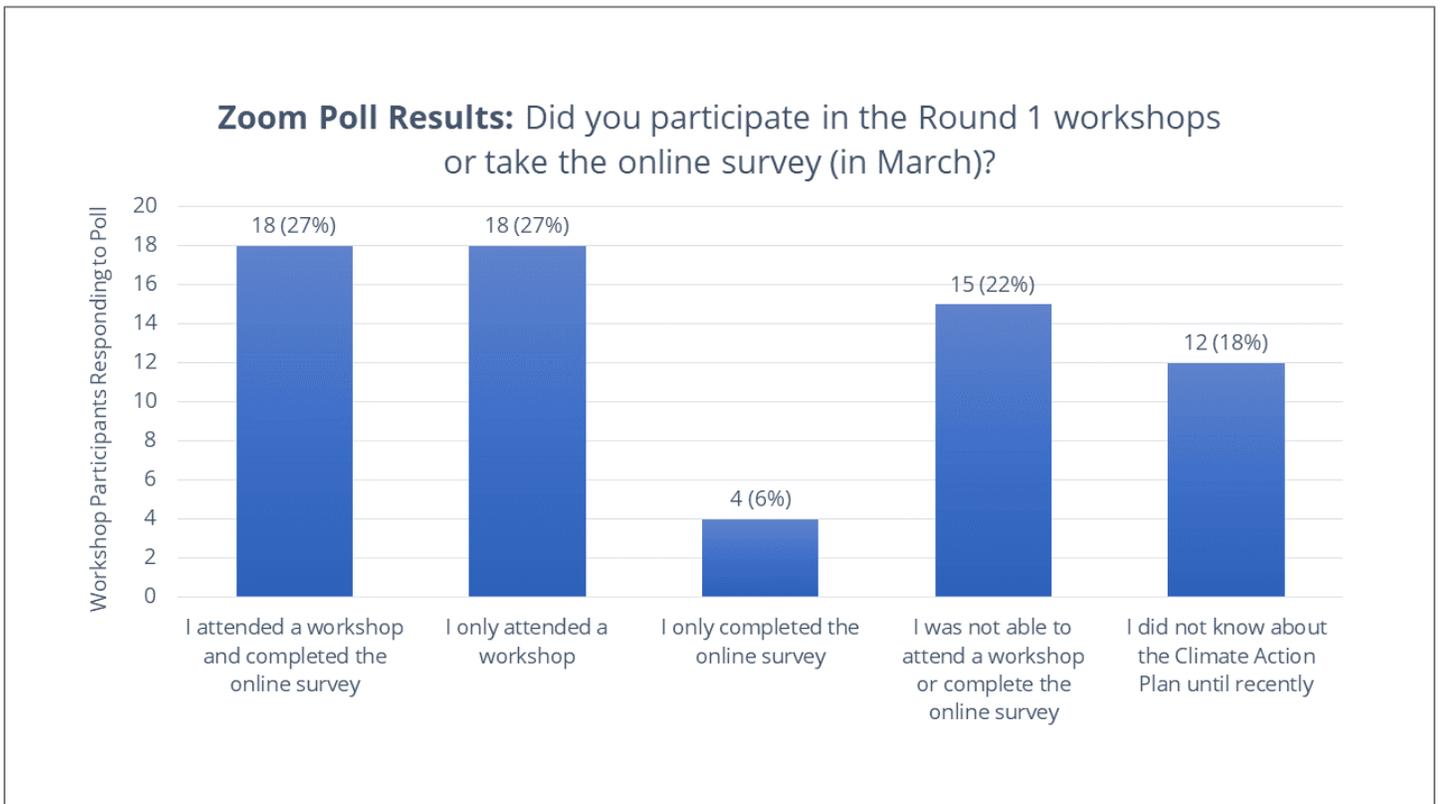
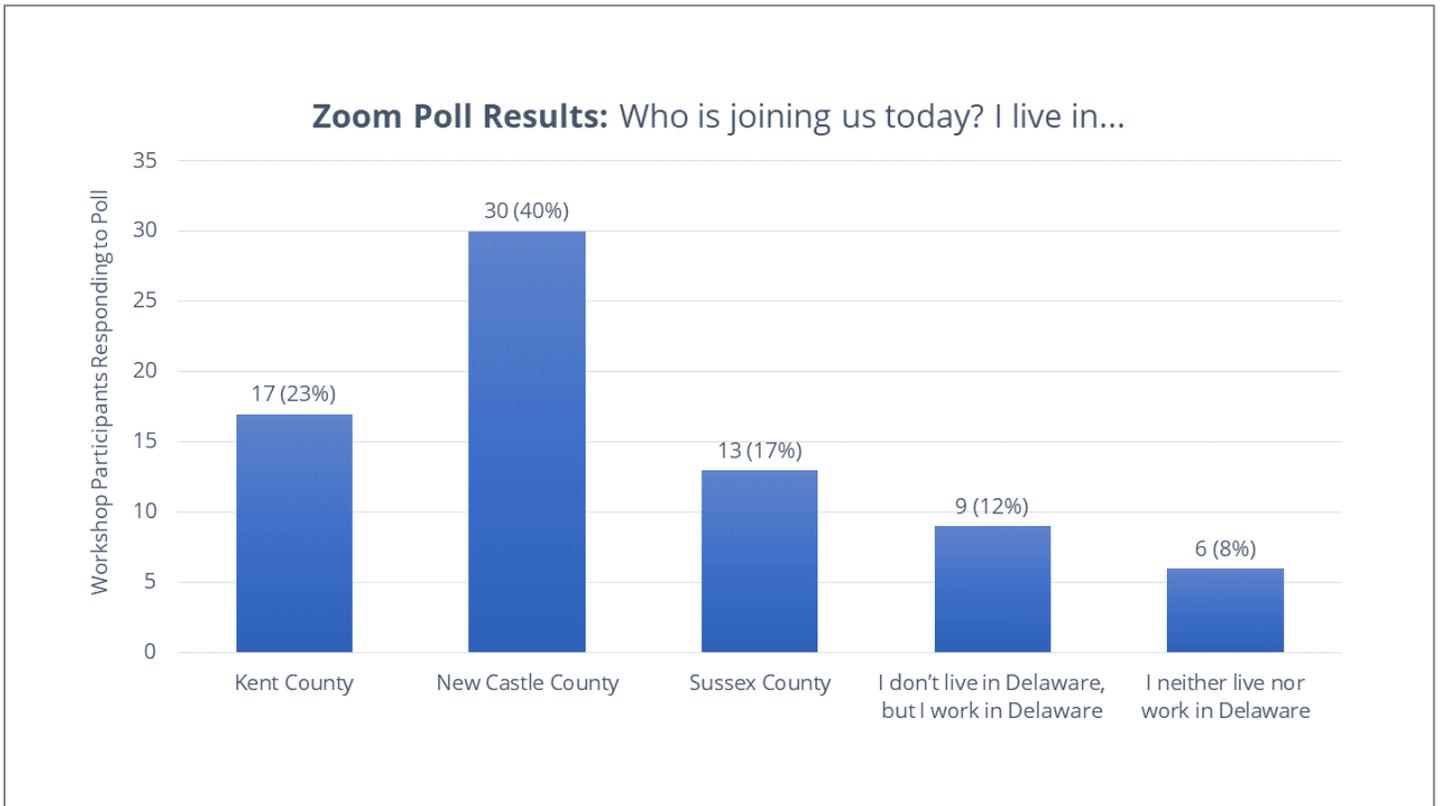
Poll 5: 5 ▼ ✎ Edit

1. Do you think Delaware should adopt a long-term GHG reduction target?

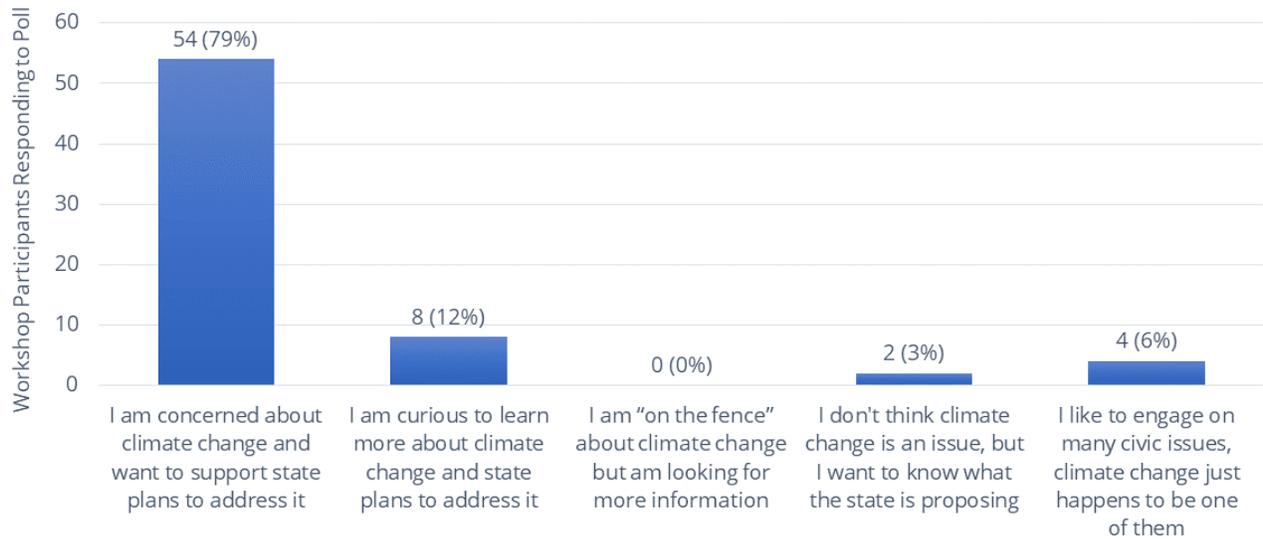
- No, we don't need to worry about GHG emissions
- No, Delaware is doing enough without setting specific targets
- Yes, Delaware should set a target of 80% emissions reduction by 2050 (from 2005 levels), similar to other U.S. states
- Yes, Delaware should set a target of MORE than 80% emissions reduction by 2050 (from 2005 levels)
- Yes, Delaware should set a target of LESS than 80% emissions by 2050 (from 2005 levels)

Launch Poll

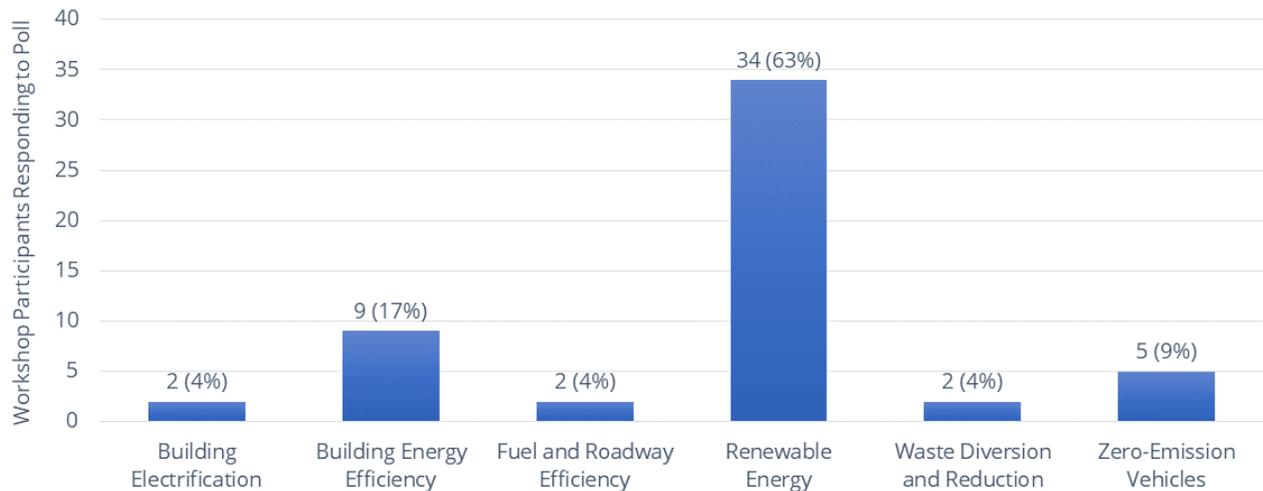
Polling Responses – September 15, 2020



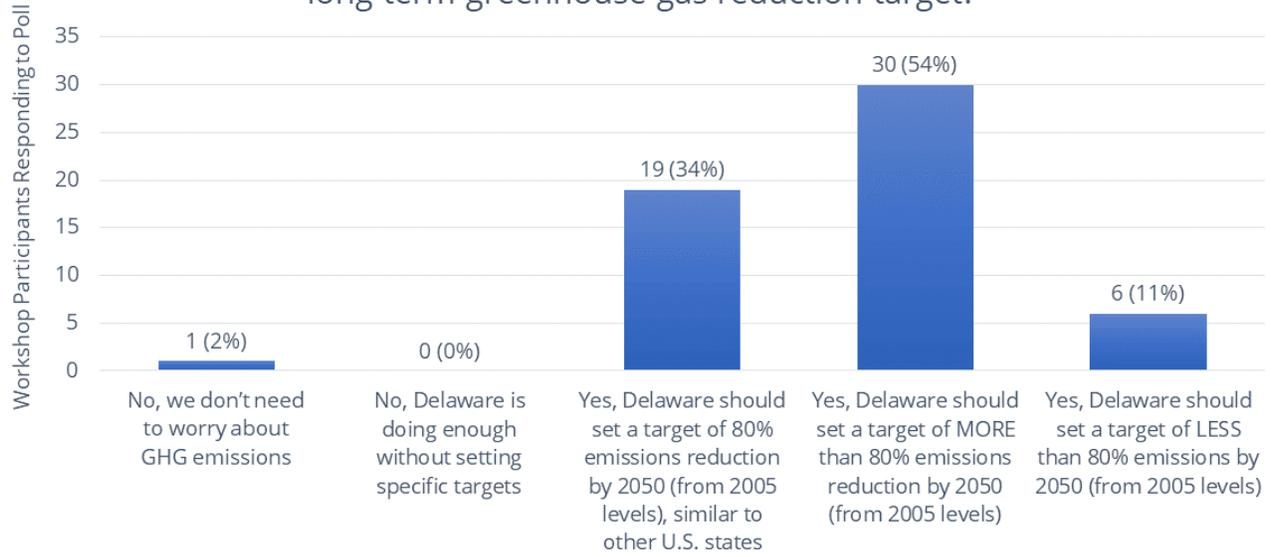
Zoom Poll Results: What is your PRIMARY interest in Delaware's Climate Action Plan?



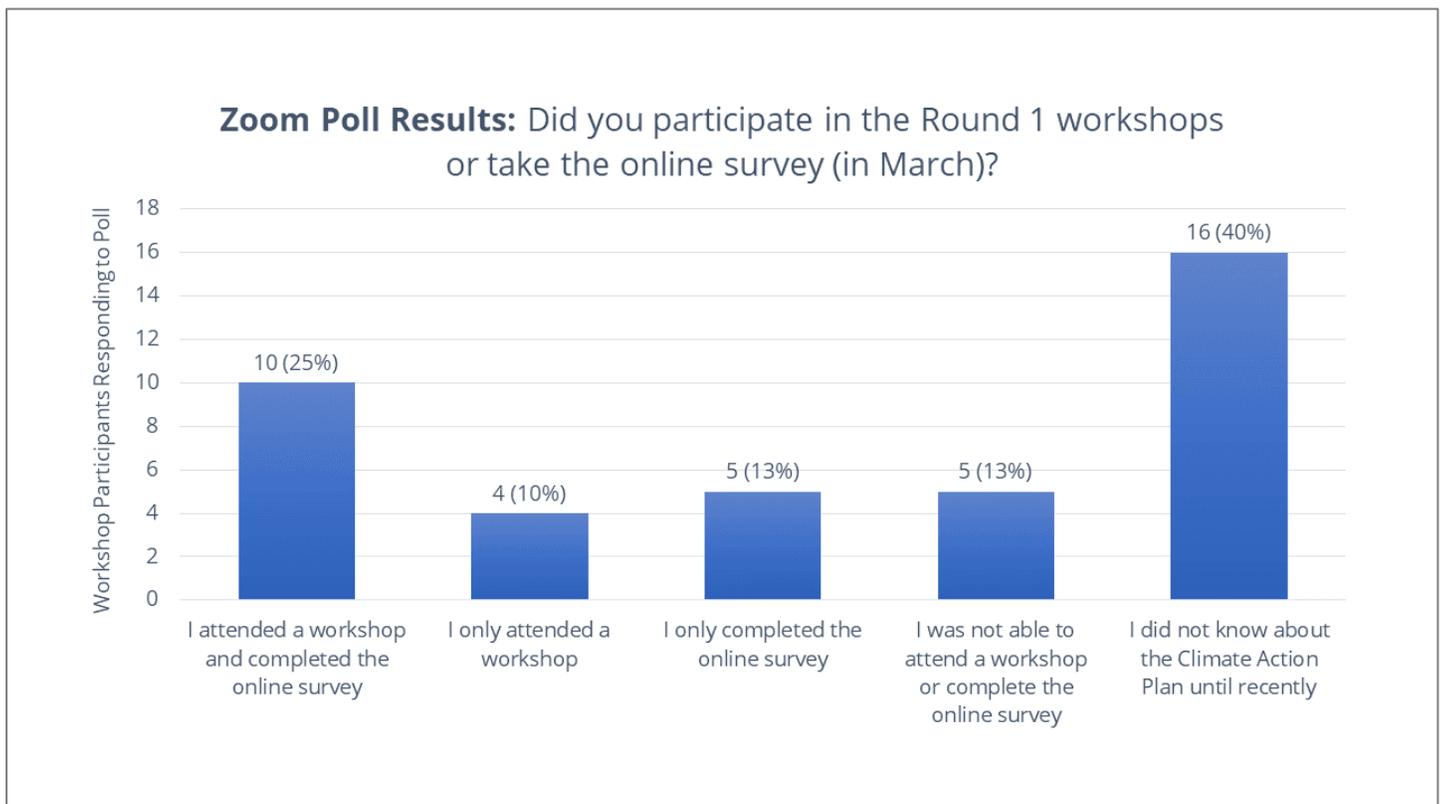
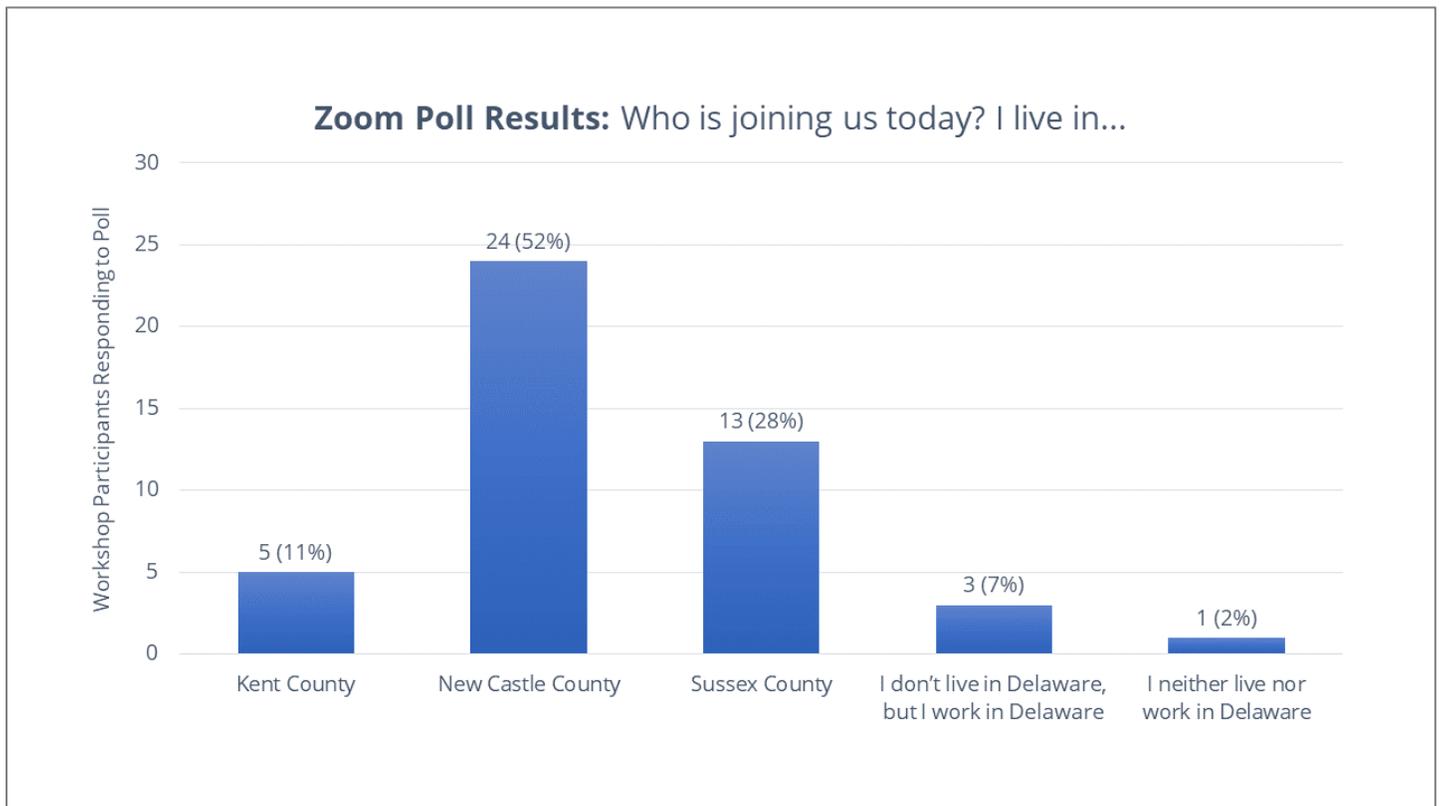
Zoom Poll Results: Based on everything you've heard and discussed today, which category of actions do you think Delaware should take first to minimize emissions?



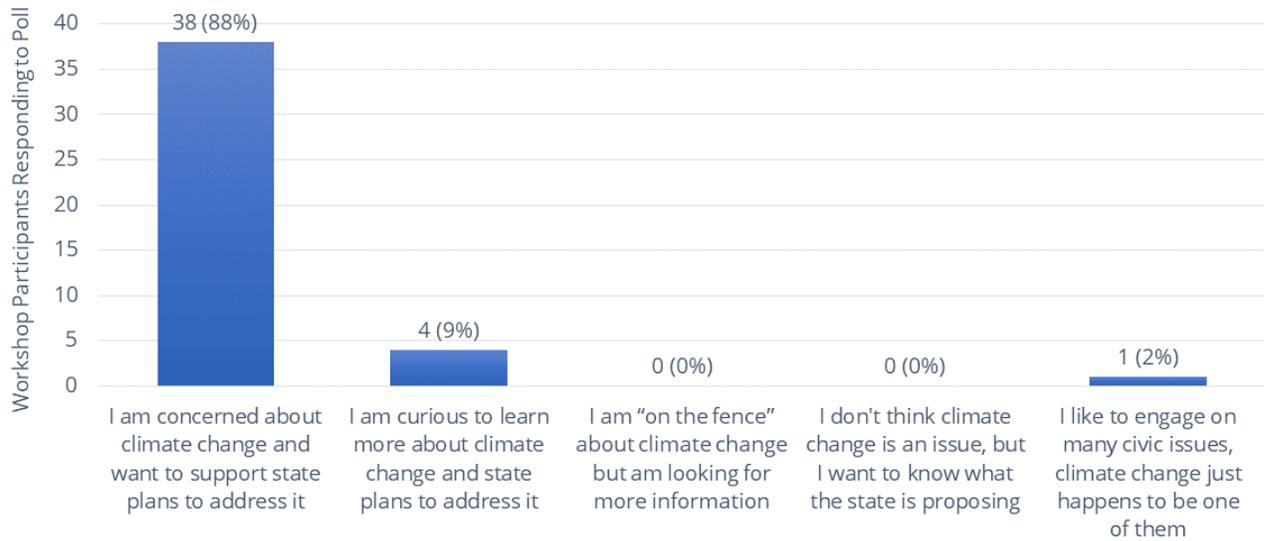
Zoom Poll Results: Do you think Delaware should adopt a long-term greenhouse gas reduction target?



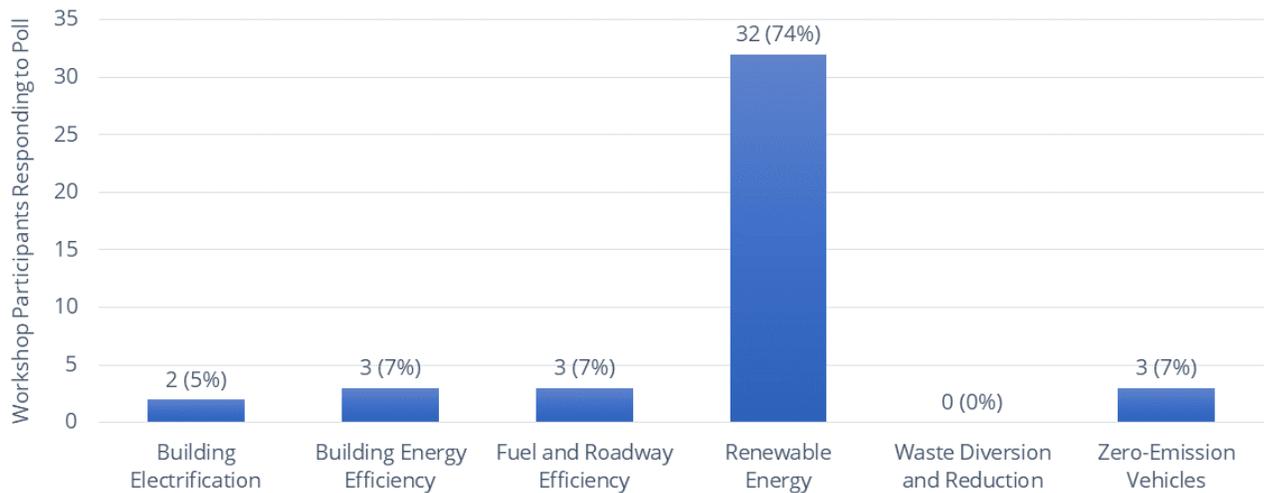
Polling Responses – September 17, 2020



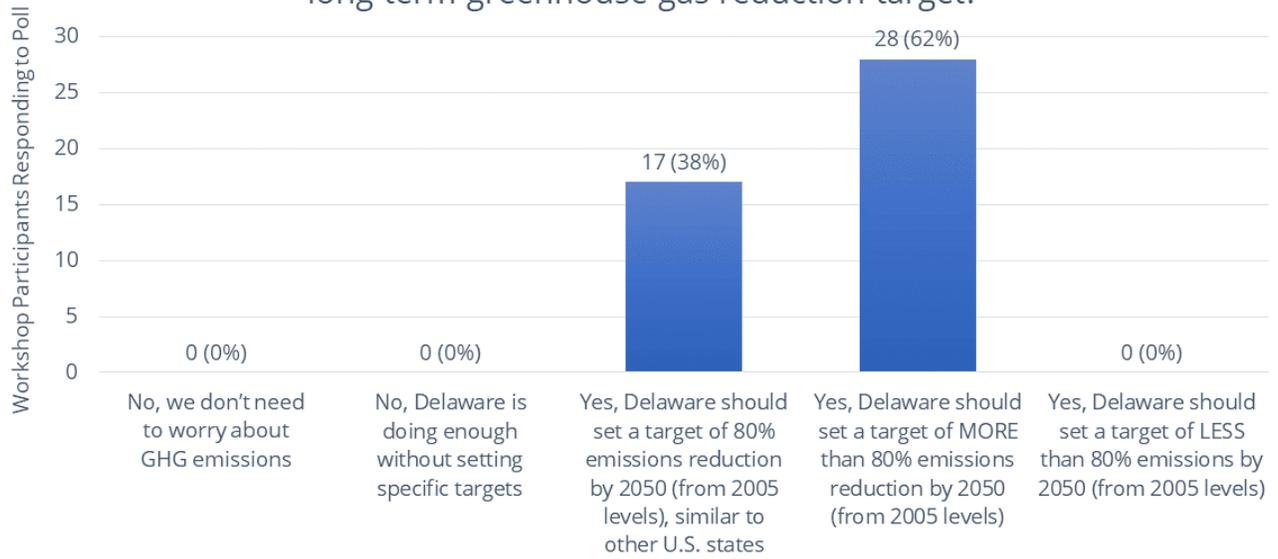
Zoom Poll Results: What is your PRIMARY interest in Delaware's Climate Action Plan?



Zoom Poll Results: Based on everything you've heard and discussed today, which category of actions do you think Delaware should take first to minimize emissions?



Zoom Poll Results: Do you think Delaware should adopt a long-term greenhouse gas reduction target?



APPENDIX 4: Breakout Group Exercise Results

Results from the September 15, 2020 Session

Group 1

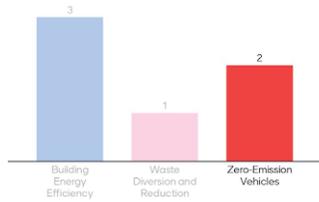
Which measures do you think have the most impact and are the most cost-effective?



Which of the following measures comparably has the largest GHG reduction impact?



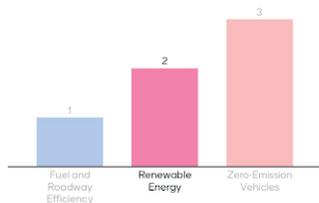
Which of the following measures comparably has the largest GHG reduction impact?



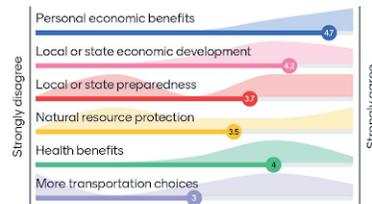
Building Electrification - Potential Benefits?



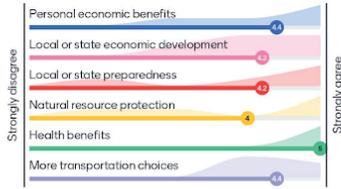
Which of the following measures comparably has the largest GHG reduction impact?



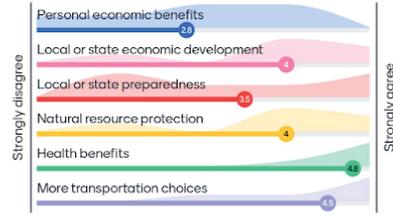
Building Energy Efficiency - Potential Benefits?



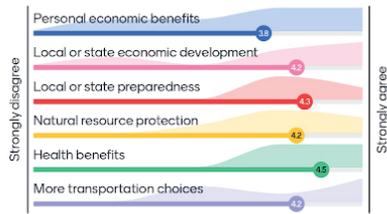
Fuel and Roadway Efficiency - Potential Benefits?



Zero-Emission Vehicles - Potential Benefits?



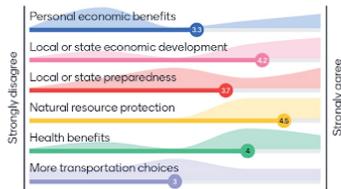
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)



Group 2

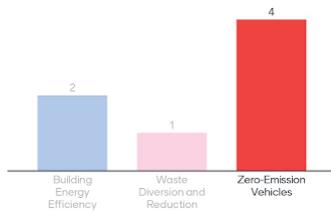
Which measures do you think have the most impact and are the most cost-effective?



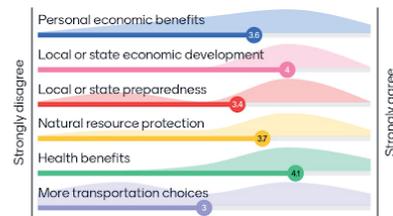
Which of the following measures comparably has the largest GHG reduction impact?



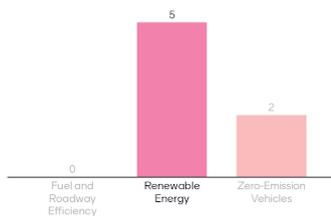
Which of the following measures comparably has the largest GHG reduction impact?



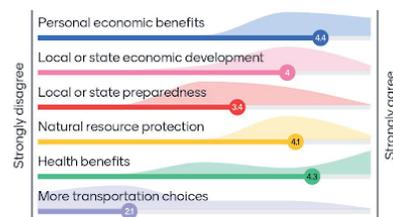
Building Electrification - Potential Benefits?



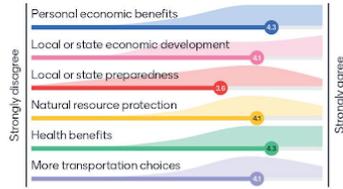
Which of the following measures comparably has the largest GHG reduction impact?



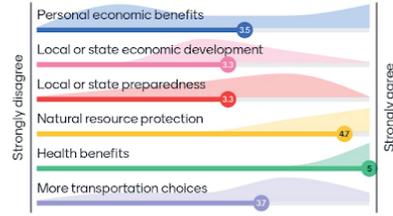
Building Energy Efficiency - Potential Benefits?



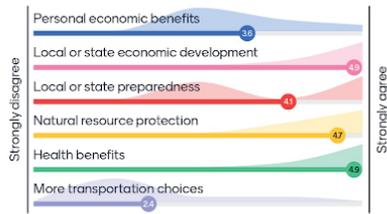
Fuel and Roadway Efficiency - Potential Benefits?



Zero-Emission Vehicles - Potential Benefits?



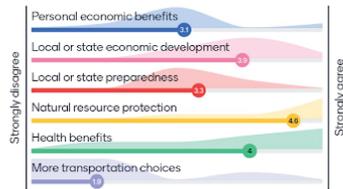
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)

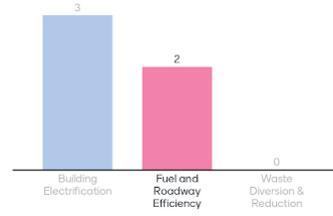


Group 3

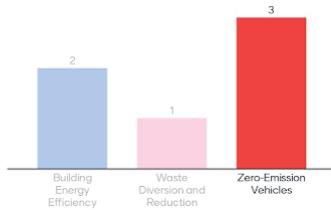
Which measures do you think have the most impact and are the most cost-effective?



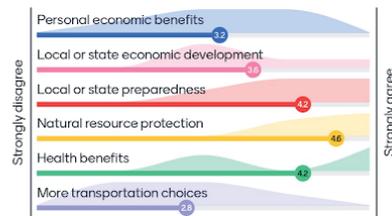
Which of the following measures comparably has the largest GHG reduction impact?



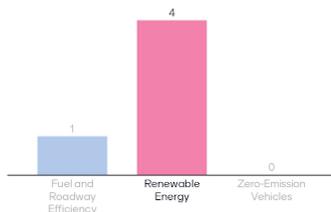
Which of the following measures comparably has the largest GHG reduction impact?



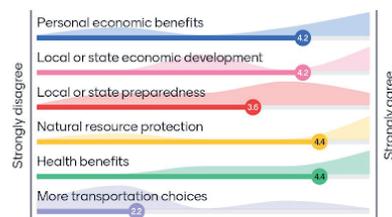
Building Electrification - Potential Benefits?



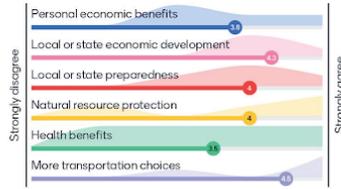
Which of the following measures comparably has the largest GHG reduction impact?



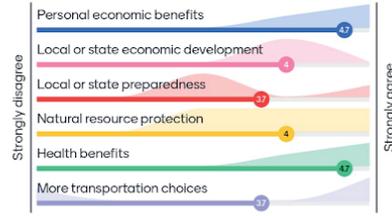
Building Energy Efficiency - Potential Benefits?



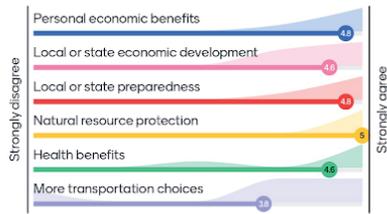
Fuel and Roadway Efficiency - Potential Benefits?



Zero-Emission Vehicles - Potential Benefits?



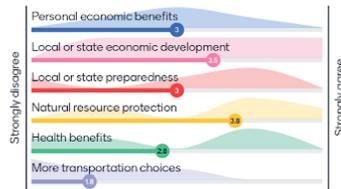
Renewable Energy - Potential Benefits?



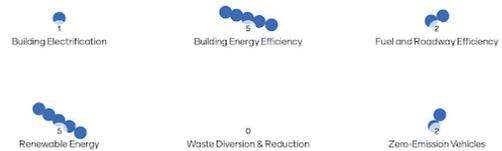
What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)

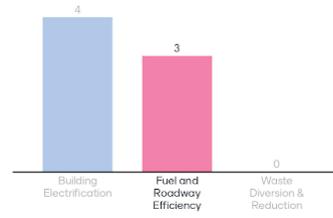


Group 4

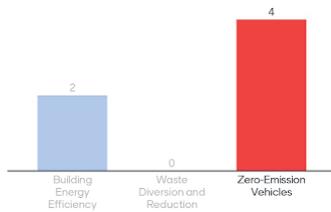
Which measures do you think have the most impact and are the most cost-effective?



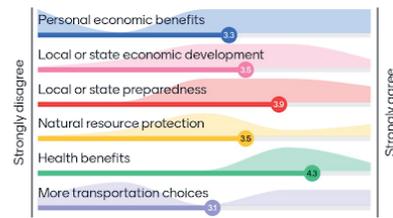
Which of the following measures comparably has the largest GHG reduction impact?



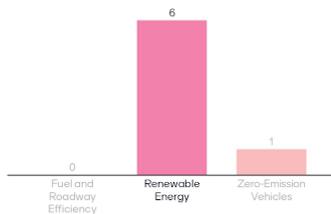
Which of the following measures comparably has the largest GHG reduction impact?



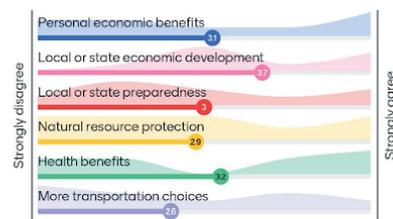
Building Electrification - Potential Benefits?



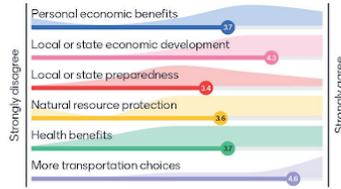
Which of the following measures comparably has the largest GHG reduction impact?



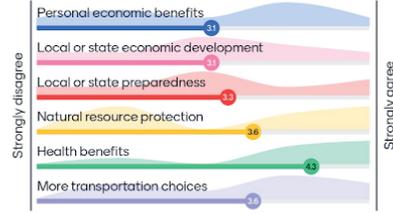
Building Energy Efficiency - Potential Benefits?



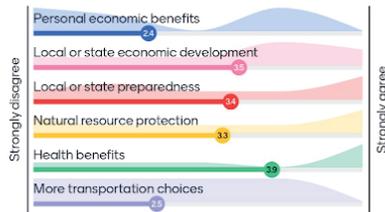
Fuel and Roadway Efficiency - Potential Benefits?



Zero-Emission Vehicles - Potential Benefits?



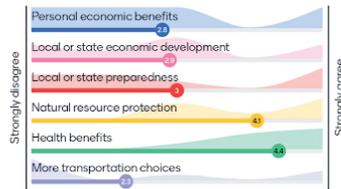
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)



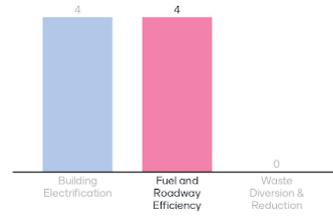
Breakout Group No. 4 was not able to answer this question in the time allotted for the breakout room activity.

Group 5

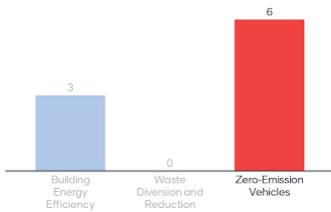
Which measures do you think have the most impact and are the most cost-effective?



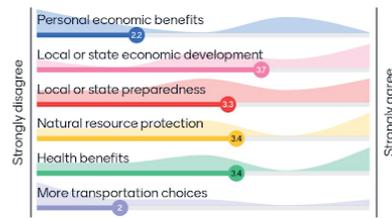
Which of the following measures comparably has the largest GHG reduction impact?



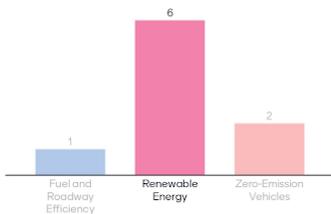
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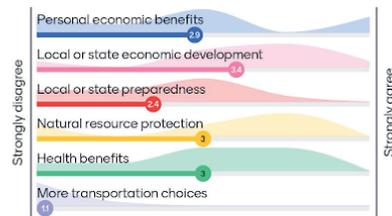
Building Electrification - Potential Benefits?



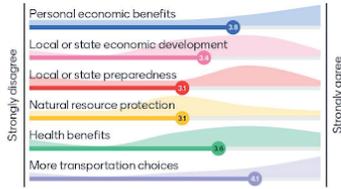
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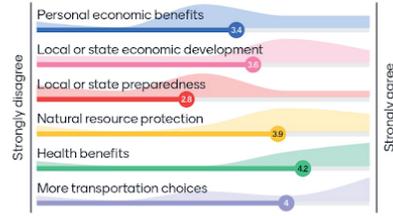
Building Energy Efficiency - Potential Benefits?



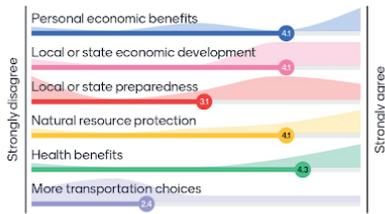
Fuel and Roadway Efficiency - Potential Benefits?



Zero-Emission Vehicles - Potential Benefits?



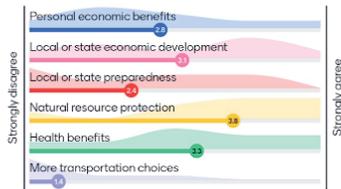
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)

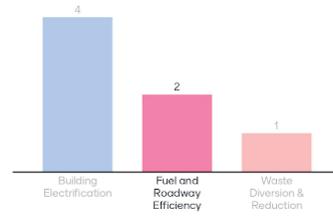


Group 6

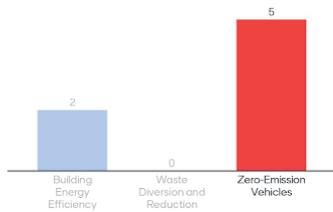
Which measures do you think have the most impact and are the most cost-effective?



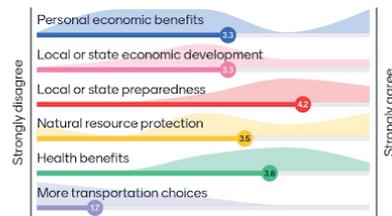
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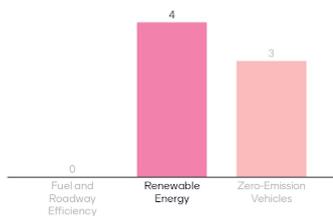
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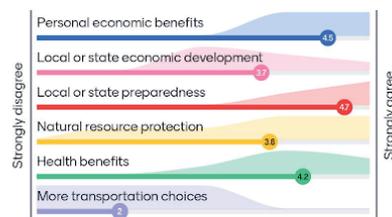
Building Electrification - Potential Benefits?



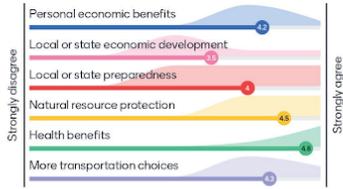
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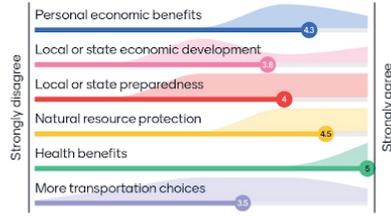
Building Energy Efficiency - Potential Benefits?



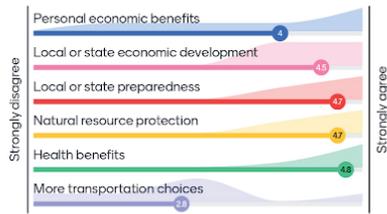
Fuel and Roadway Efficiency - Potential Benefits?



Zero-Emission Vehicles - Potential Benefits?



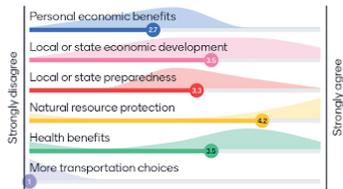
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)



Group 7

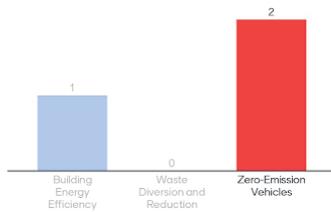
Which measures do you think have the most impact and are the most cost-effective?



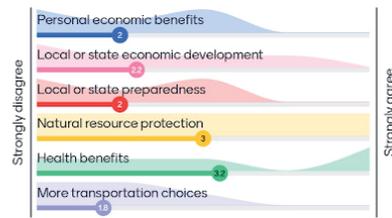
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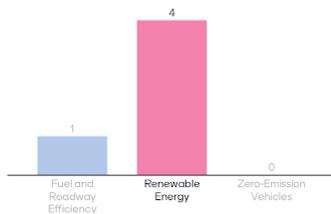
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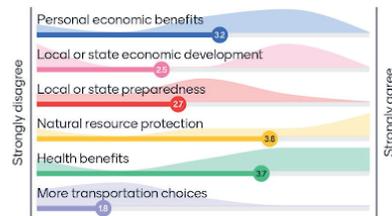
Building Electrification - Potential Benefits?



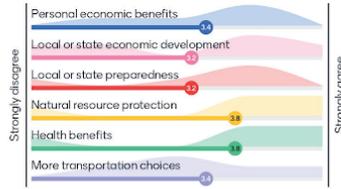
Which of the following measures comparably has the largest GHG reduction impact?



Building Energy Efficiency - Potential Benefits?



Fuel and Roadway Efficiency - Potential Benefits?

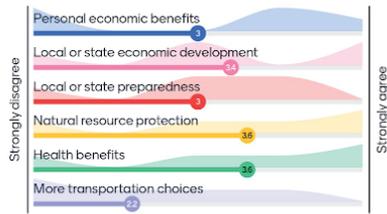


Zero-Emission Vehicles - Potential Benefits?



Breakout Group No. 7 was not able to answer this question in the time allotted for the breakout room activity.

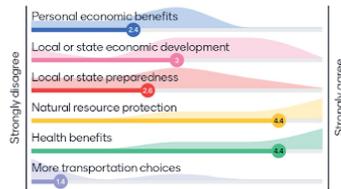
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?

Breakout Group No. 7 was not able to answer this question in the time allotted for the breakout room activity.

Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)



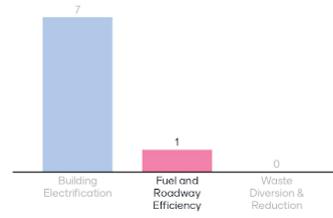
Breakout Group No. 7 was not able to answer this question in the time allotted for the breakout room activity.

Group 8

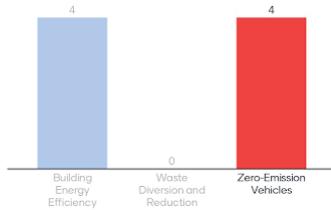
Which measures do you think have the most impact and are the most cost-effective?



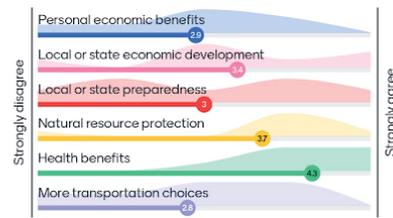
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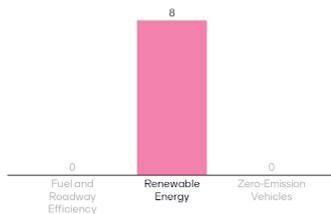
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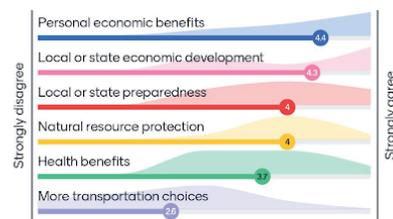
Building Electrification - Potential Benefits?



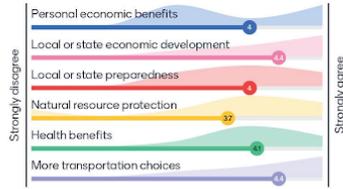
Which of the following measures comparably has the largest GHG reduction impact?



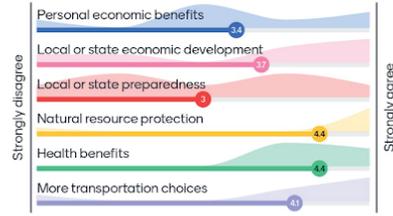
Building Energy Efficiency - Potential Benefits?



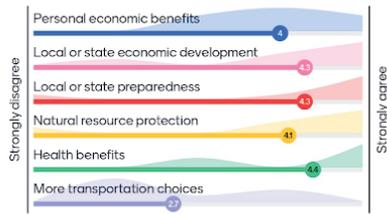
Fuel and Roadway Efficiency - Potential Benefits?



Zero-Emission Vehicles - Potential Benefits?



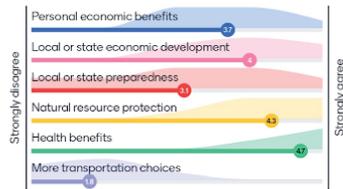
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)



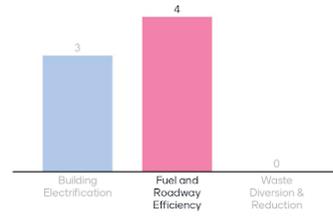
Results from the September 17, 2020 Session

Group 1

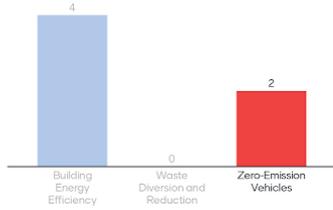
Which measures do you think have the most impact and are the most cost-effective?



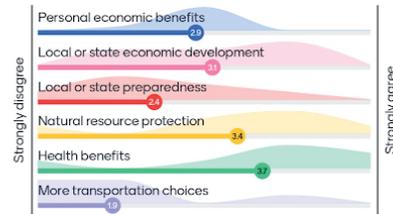
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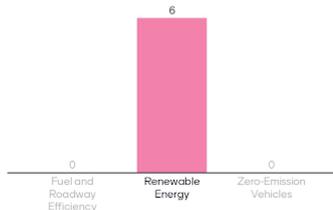
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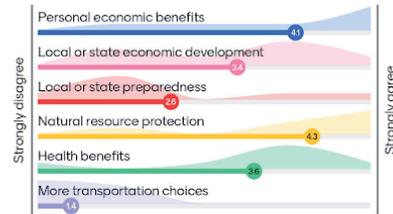
Building Electrification - Potential Benefits?



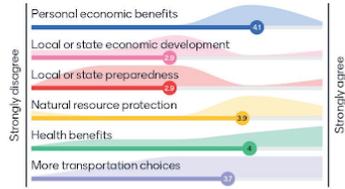
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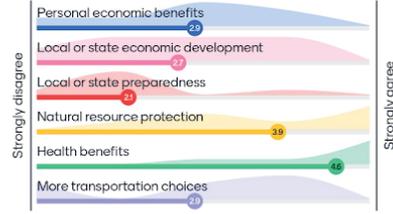
Building Energy Efficiency - Potential Benefits?



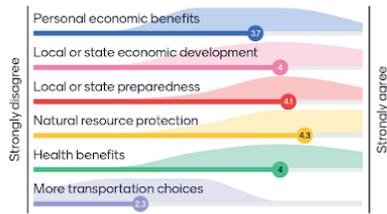
Fuel and Roadway Efficiency - Potential Benefits?



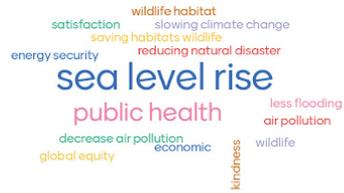
Zero-Emission Vehicles - Potential Benefits?



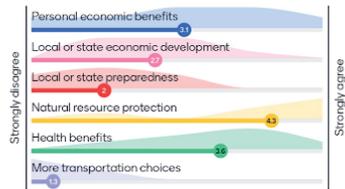
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)

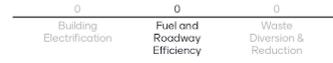


Group 2

Which measures do you think have the most impact and are the most cost-effective?

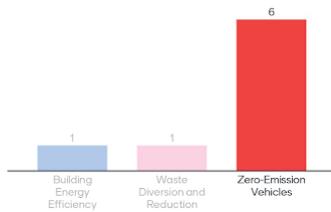


Which of the following measures comparably has the largest GHG reduction impact?

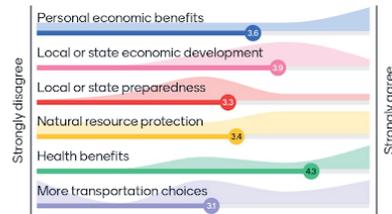


Breakout Group No. 2 was not able to answer this question in the time allotted for the breakout room activity.

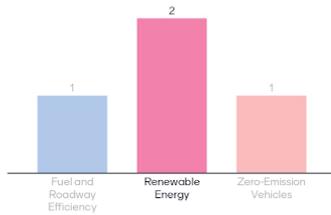
Which of the following measures comparably has the largest GHG reduction impact?



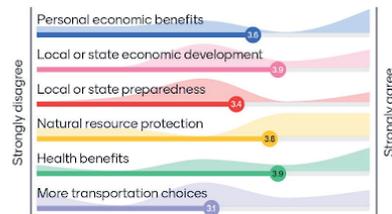
Building Electrification - Potential Benefits?



Which of the following measures comparably has the largest GHG reduction impact?



Building Energy Efficiency - Potential Benefits?

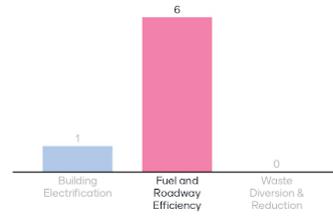


Group 3

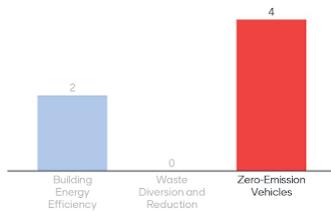
Which measures do you think have the most impact and are the most cost-effective?



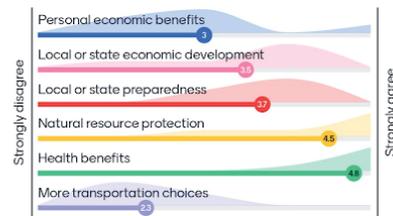
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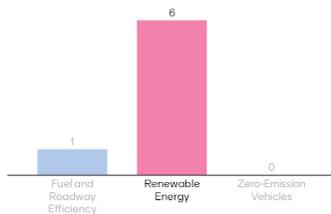
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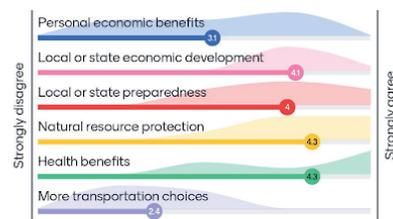
Building Electrification - Potential Benefits?



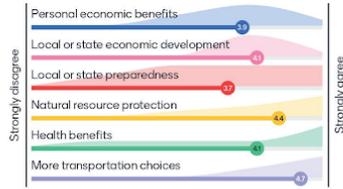
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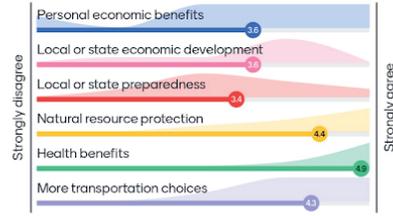
Building Energy Efficiency - Potential Benefits?



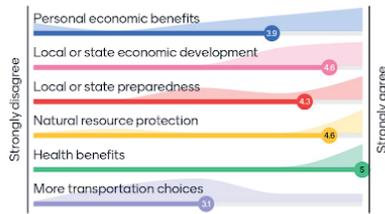
Fuel and Roadway Efficiency - Potential Benefits?



Zero-Emission Vehicles - Potential Benefits?



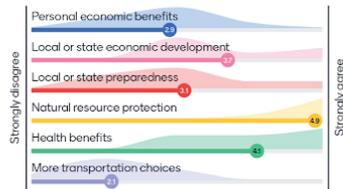
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)



Group 4

Group 4 was a facilitated dialogue instead of an online exercise. The following input was collected from this group:

“The best and highest value thing you can do is to increase the RPS and boost the amount of renewable energy by making the companies who sell electricity into Delaware required to provide it. They will need to work with developers to make more renewables and now, renewable energy is cheaper so we should be getting it. That is the most cost-effective and it will allow the highest level of emissions reductions – not just in the electric sector but it will boost uptake in the transportation area as well.”

“To do that, we need to designate places to place offshore wind and the RPS requirement helps as it will be purchased when it is ready.”

“Offshore wind is now selling 5.8 cents per kilowatt-hour where it costs at least 6.5 cents per hour for dirty energy. We need to put the “pedal to the metal” on all of these projects because we do control offshore opportunities. Or we can buy wind power from other states, but we need it.”

“And part of the need is to replace transportation fuels with clean electricity so we will need more wind and solar to power our EVs going forward. I have 3 including a Porche that I retrofit to run on solar energy.”

“Don’t just change lightbulbs, change laws.”

“Recycling and composting are also needed but they are a little harder – individual action is harder to change especially now when sorting is such an issue and a little of the wrong thing can lead to waste contamination of a whole load.”

“Purchase power agreements for the state and local governments with clean power, the Governor and the Secretary need to set a good example personally and in all state buildings.”

“I favor reductions by 80% by 2050.”

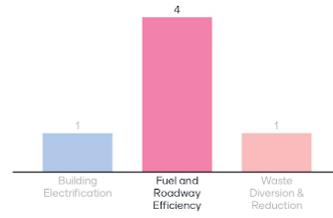
“Those other pillars – offshore wind paired with electric vehicles. Look at the book “Drawdown” to see the whole breadth of options but start right now with deep reduction targets and offshore wind contracts.”

Group 5

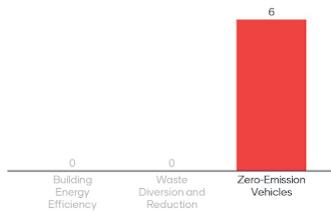
Which measures do you think have the most impact and are the most cost-effective?



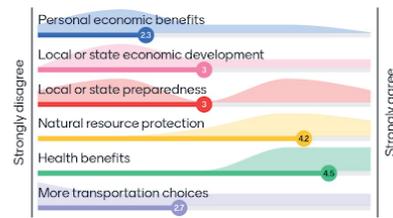
Which of the following measures comparably has the largest GHG reduction impact?



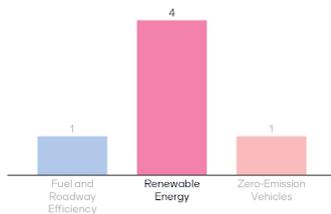
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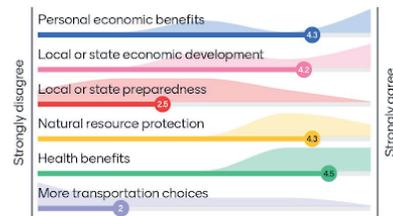
Building Electrification - Potential Benefits?



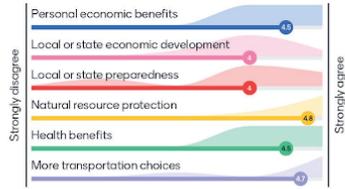
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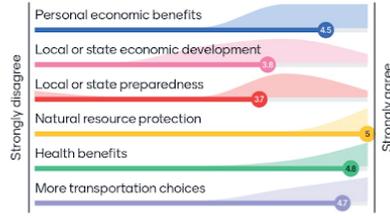
Building Energy Efficiency - Potential Benefits?



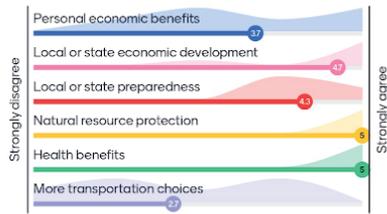
Fuel and Roadway Efficiency - Potential Benefits?



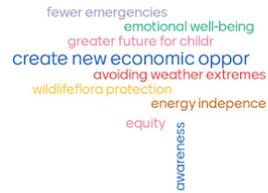
Zero-Emission Vehicles - Potential Benefits?



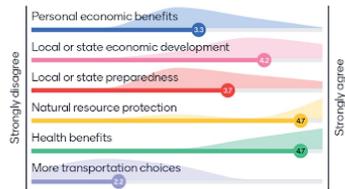
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)

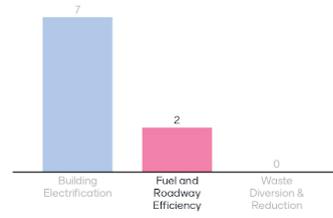


Group 6

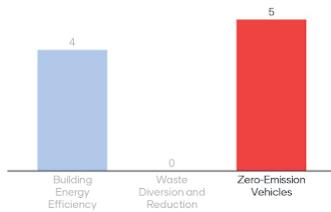
Which measures do you think have the most impact and are the most cost-effective?



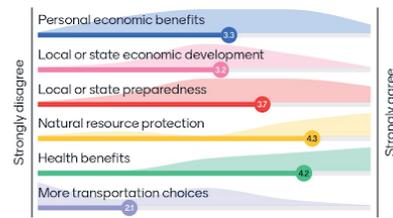
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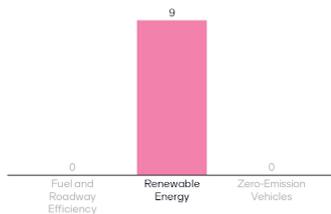
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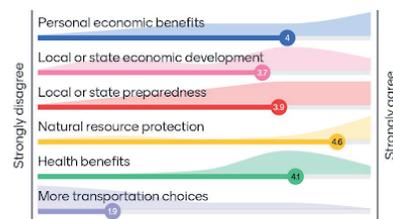
Building Electrification - Potential Benefits?



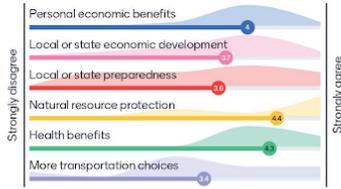
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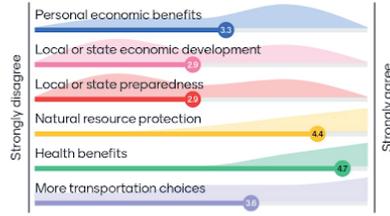
Building Energy Efficiency - Potential Benefits?



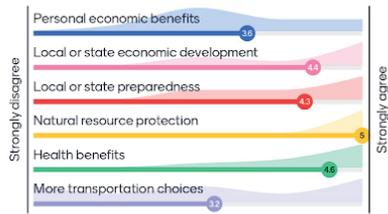
Fuel and Roadway Efficiency - Potential Benefits?



Zero-Emission Vehicles - Potential Benefits?



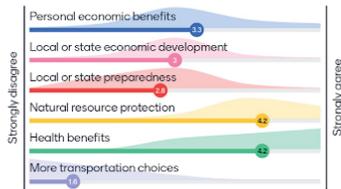
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)



Group 7

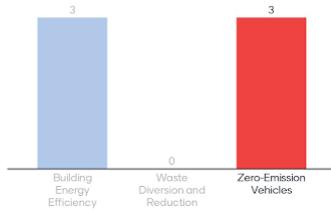
Which measures do you think have the most impact and are the most cost-effective?



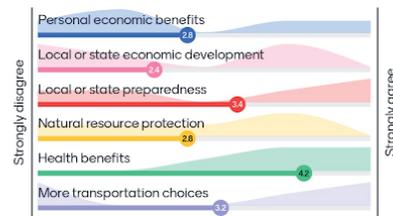
Which of the following measures comparably has the largest GHG reduction impact?



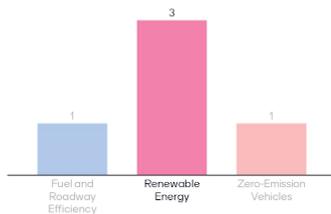
Which of the following measures comparably has the largest GHG reduction impact?



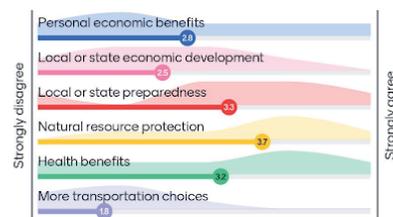
Building Electrification - Potential Benefits?



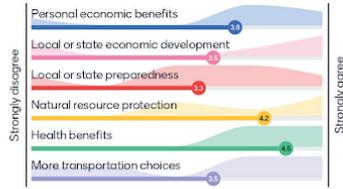
Which of the following measures comparably has the largest GHG reduction impact?



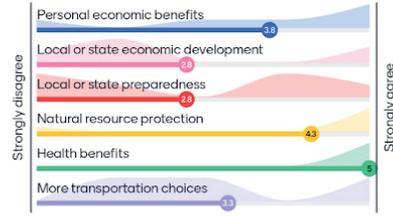
Building Energy Efficiency - Potential Benefits?



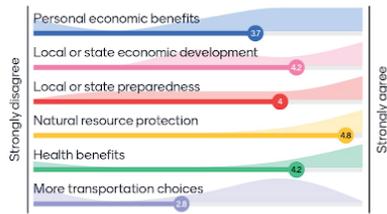
Fuel and Roadway Efficiency - Potential Benefits?



Zero-Emission Vehicles - Potential Benefits?



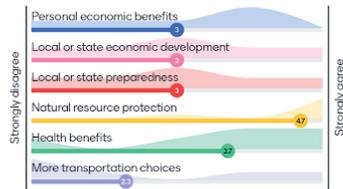
Renewable Energy - Potential Benefits?



What other benefits could result from reducing GHG emissions?



Waste Diversion & Reduction - Potential Benefits?



What measures should be implemented first? (Top 3)



DELAWARE'S

Climate Action Plan

Climate Action Strategies MetroQuest Survey Results

October 2020

CLIMATE ACTION STRATEGIES

In September and October 2020, Delaware’s Climate Action Plan team hosted a second series of public workshops, held fully online. The goal of these virtual workshops was to provide the public with an overview of various climate action strategies and to gather feedback about which strategies the public sees as most important to tackle first.

To maximize public feedback, the planning team released an online survey accompanying the workshops to capture the thoughts of interested residents who were not able to attend the workshops. The survey was open from September 7th to October 16th and garnered 96 responses. This document summarizes the results of that survey.

Key takeaways:

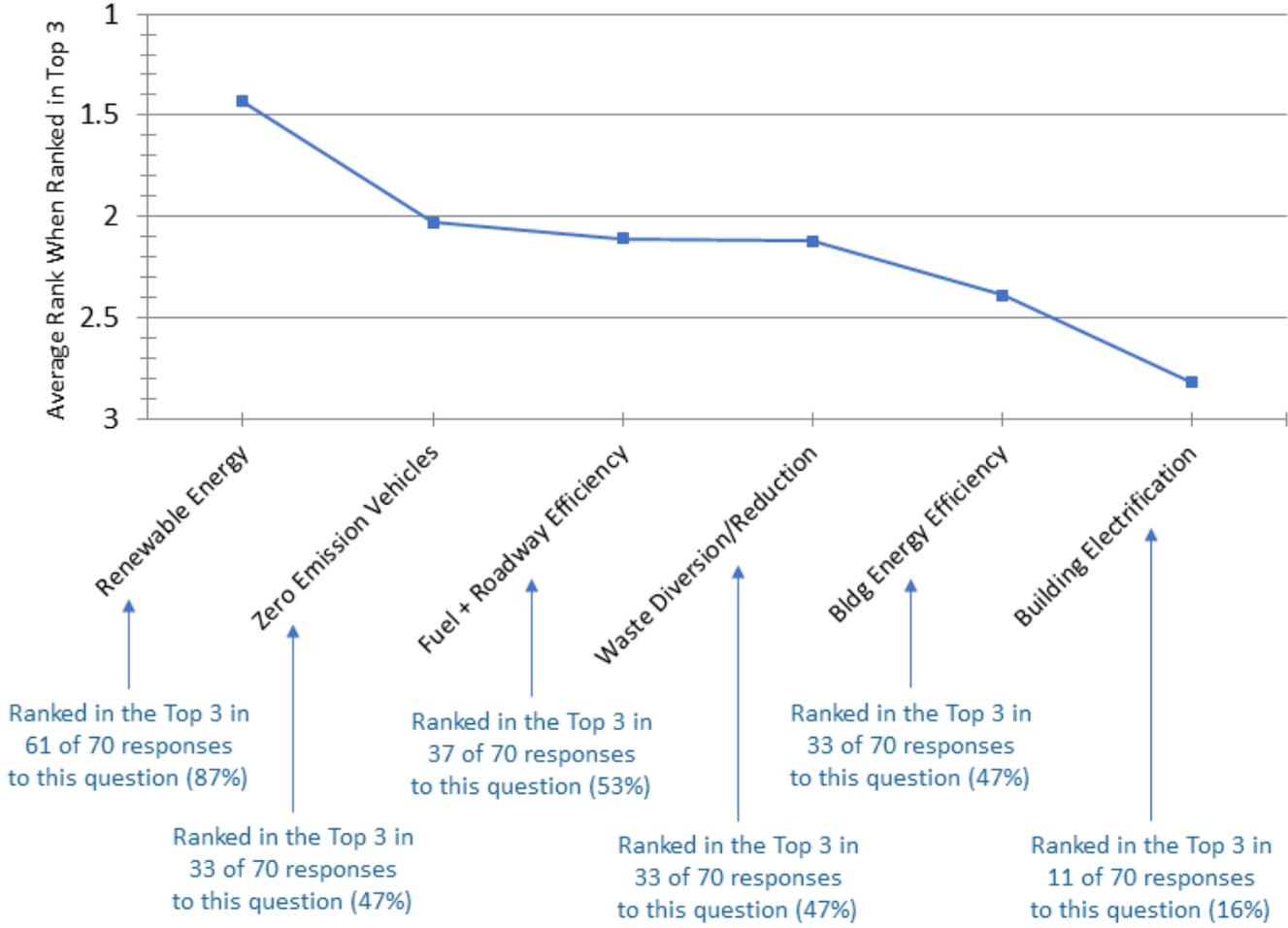
- Renewable energy and zero emission vehicles are perceived by the public as the most impactful (and highest priority) mitigation actions
- Changes to state policy regulations is seen as the highest priority action to maximize Delaware’s resilience to climate impacts



GREATEST IMPACT ACTIONS

Survey respondents were presented with a list of six potential actions Delaware could take to minimize its greenhouse gas emissions. They were asked to rank the top three actions they believed would have the greatest impact on reducing emissions in Delaware. The graph below indicates the number of times each action was ranked among the top three and the average rank value of the action when it was ranked. 1 correlates to the top rank, 3 to the third rank. Renewable energy was the action ranked most often among the top three and the action with the highest average rank.

Greatest Impact Rankings



GREATEST IMPACT ACTIONS

Survey respondents could also provide suggestions on additional actions as well as provide comments on specific actions. All the feedback submitted by survey respondents is noted below (continued on the following slide).

Additional Actions Suggested

- Replacing gasoline and diesel with electricity generated from nuclear and renewable power and with hydrogen (especially using hydrogen for trucks and buses) is critically important.
- Reduce food waste/increase plant-based eating
- Protecting natural habitats that store carbon
- Reduce vehicle miles traveled
- How about considering an impact of a 'climate friendly diet'.
<https://guarinicenter.org/wp-content/uploads/2018/07/Linn-Climate-Friendly-Diets-FINAL.pdf>. I felt your climate action plan failed to address food systems-related emissions (diet, food loss, food waste, regenerative ag). Reference:
<https://www.drawdown.org>
- Carbon sequestration in farming and LAWN CARE
- Don't do any of these
- Allowing HOAs to determine if homeowners want to permit clothes lines to reduce energy consumption.
- Infrastructure/public transportation
- Sustainable farming practices to absorb and trap carbon in the dirt
- 1. Sustainable farming practices to absorb and trap carbon in the dirt
2. Agricultural incentives to move to less carbon heavy livestock and farming practices
- Require Delmarva Power to deliver electricity created with 100% renewable energy by 2030

GREATEST IMPACT ACTIONS

Comments on Specific Actions

Building Energy Efficiency

- This is much too expensive and not worth the effort.
- Energy efficiency is the most cost effective and underutilized climate action tool. It's the low hanging fruit that we must focus on!
- This is a stacked deck! Of all these things on the list, the major things we can do to mitigate climate change do not include any of the last 3 items. What about transit? What about land use changes?
- I consider the reduction of energy consumption within buildings highly important.

Fuel and Roadway Efficiency

- Reducing use of single occupancy vehicles and increasing reliance upon public transportation (primarily buses) is critically important. Reducing fossil fuel use in both cases is similarly critically important.
- CO₂ follows temperature change caused by solar activities; it does not precede it. Your premise has been shown by scientists from DE to be wrong.
- Aren't we already doing this?
- I think there is more potential for quick reduction here, though I am a very strong proponent of zero emission vehicles.

Renewable Energy

- Nuclear energy and gas are not considered renewable but are consistent and cheap. Wind and solar still require standard backup.
- With note that a plan for heavy metal leaching from solar panels should be considered before large scale work is done.
- Replacing natural gas and coal with primarily solar and offshore wind for power generation is critically important.

Waste Diversion/Reduction

- I hope this includes food waste. According to Project Drawdown, reducing food waste is the third most effective way to cut carbon emissions.

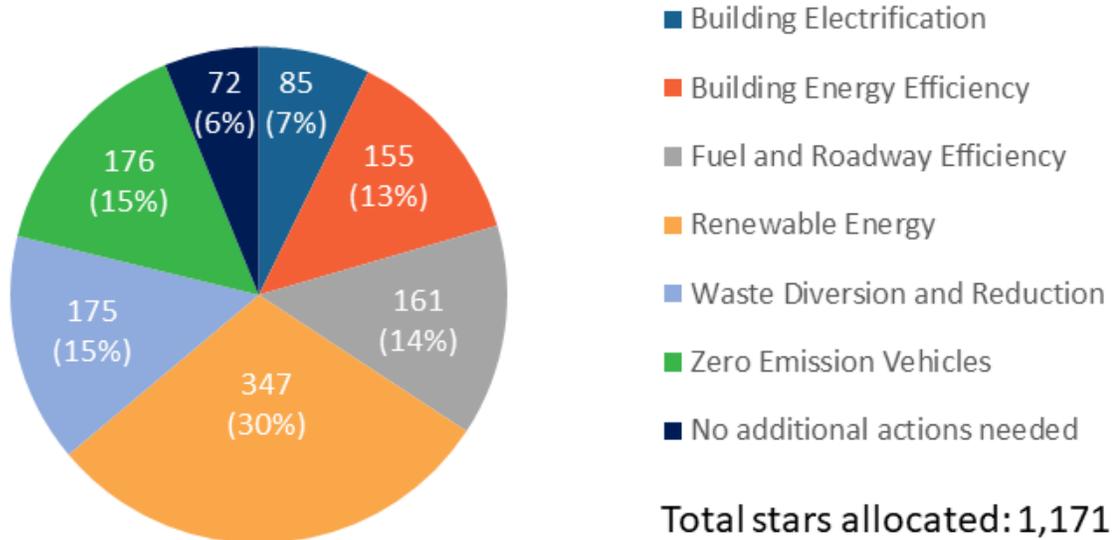
Zero Emission Vehicles

- This requires forcing the public to buy certain vehicles which they may not want. Force/mandates is not the way to go.
- Electric vehicles don't solve the issue if the electricity is still created from non-renewables.
- Good idea. Incentives should cover used electric and hybrid vehicles.

MINIMIZE EMISSIONS

After rating the actions they believed would have the highest impact, survey respondents used a priority allocation tool to indicate which actions to minimize emissions they wished to see Delaware pursue *first*. Each participant had a stack of 15 “stars” they could allocate however they wanted across six actions and to a “no additional actions needed” option. Below are the cumulative results from all survey respondents, both in terms of star count and percentage of total stars allocated.

Which Action First?



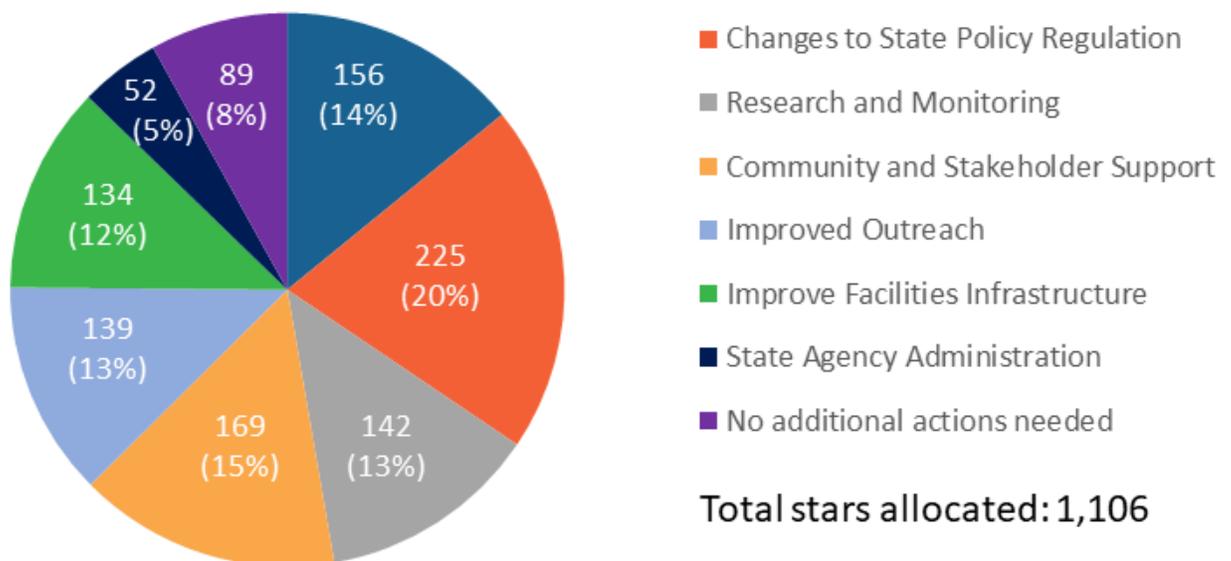
Detailed descriptions of the top 3 actions:

1. Renewable Energy: Expanded renewable energy on-site (residential, commercial, and industrial); expanded Renewable Portfolio Standard (RPS)
2. Zero Emission Vehicles: Incentives and regulations to support adoption of zero emission vehicles (e.g. electric, plug-in hybrid, hydrogen fuel cell); state fleet electrification
3. Waste Diversion and Reduction: Diversion of waste and landfills through increased recycling and organic waste diversion (composting, land application, animal feed, etc.).

MAXIMIZE RESILIENCE

Resilience to climate impacts is another key factor to consider in a climate action plan. Participants used a second priority allocation tool to indicate which resilience-enhancing action they wished to see Delaware pursue *first*. Each participant had a stack of 15 “stars” that they could allocate however they wanted across seven actions and to a “no additional actions needed” option. Below are the cumulative results from all survey respondents, both in terms of star count and percentage of total stars allocated.

Which Action First?

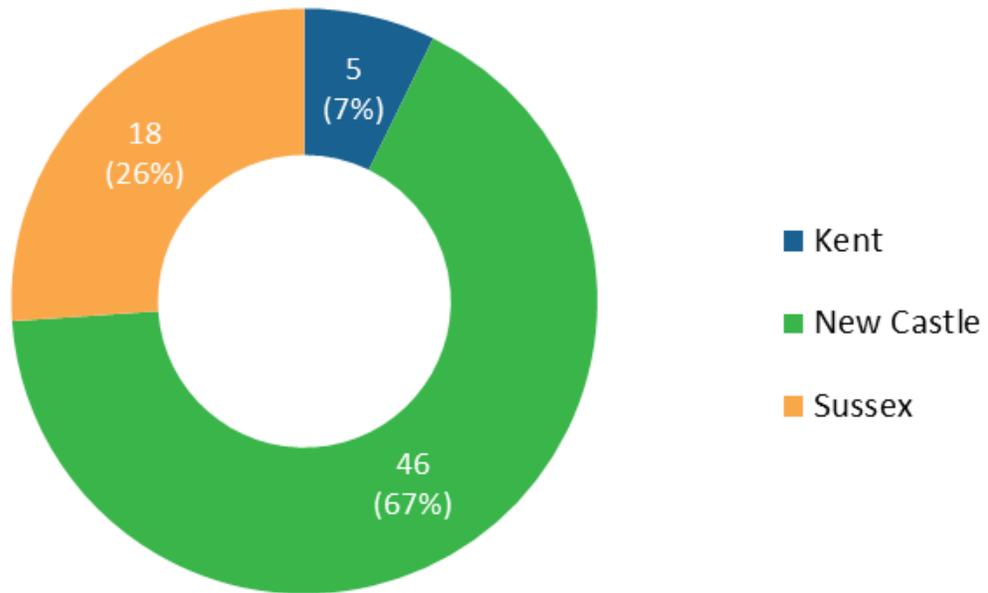


Detailed descriptions of the top 3 actions:

1. Changes to State Policy Regulation: Update current regulations and consider creating new regulations to address climate change impacts.
2. Community and Stakeholder Support: Provide up-to-date tools, training and other support to communities and other stakeholders.
3. Changes to State Program Plans: Update planning documents related to asset management, natural resources management, emergency response, and facility access.

DEMOGRAPHICS

What county do you live in?



Actual County Populations

Kent	18.1%
New Castle	60.0%
Sussex	21.9%

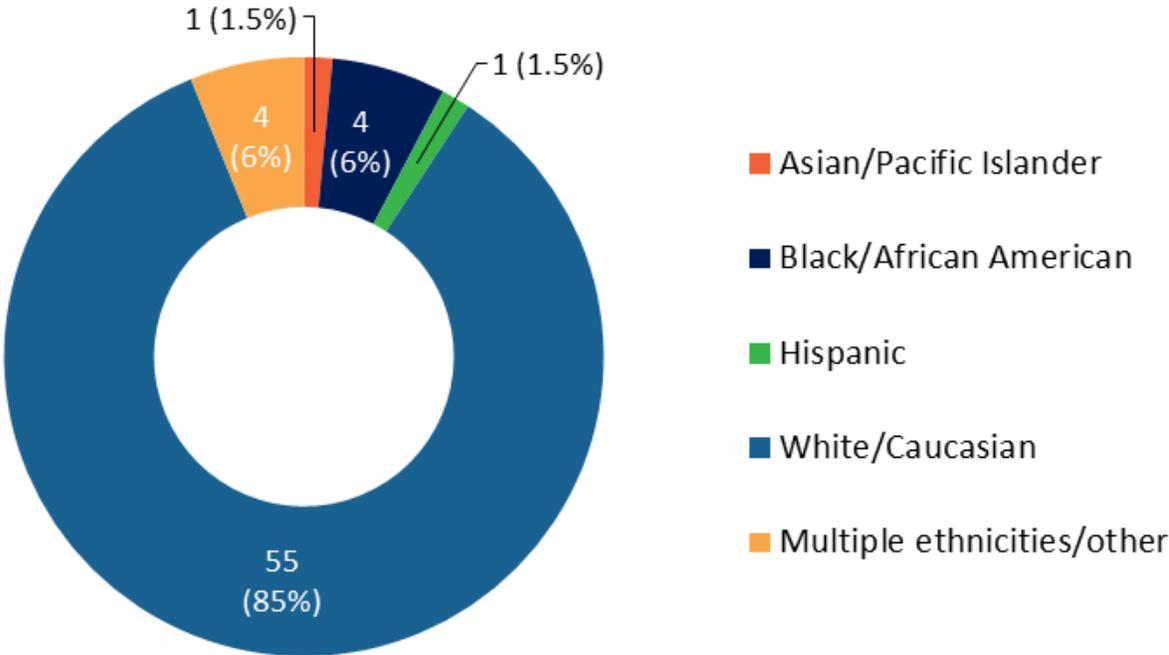
Based on the survey respondents who provided demographic information on county residence, New Castle was the most well represented county, which is representative of the true population breakdown of Delaware counties.

What zip code do you live in? (Top 10 displayed)

Zip code	Count	Zip code	Count
19711	9	19958	3
19805	5	19808	3
19968	4	19807	3
19702	4	19975	2
19971	3	19970	2

DEMOGRAPHICS

With which ethnicity do you most identify?

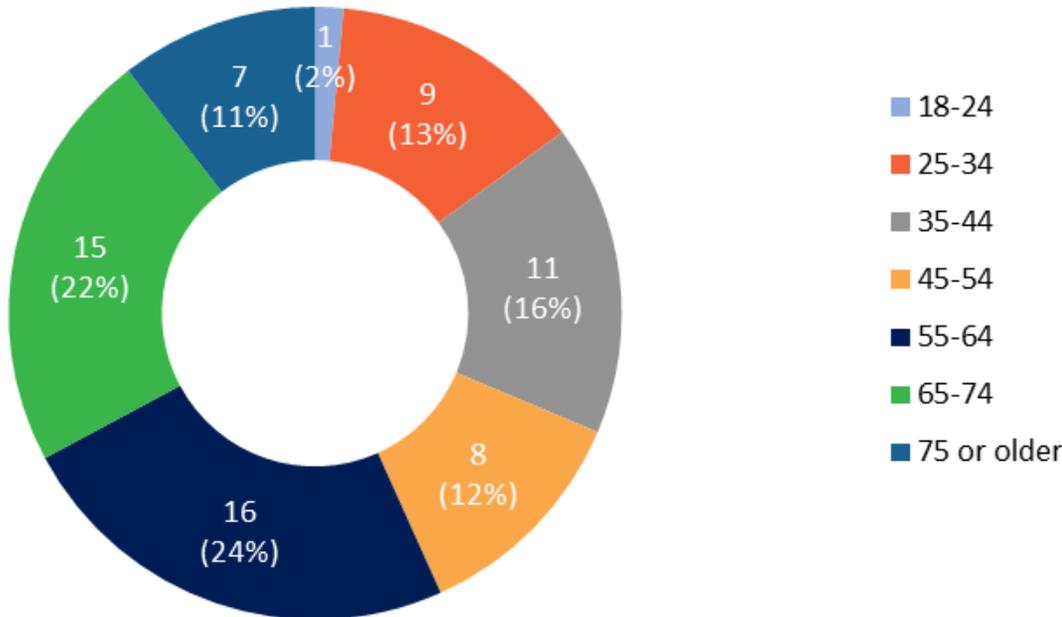


Actual State Demographics	
American Indian/Alaskan Native	0.7%
Asian/Pacific Islander	4.2%
Black/African American	23.2%
Hispanic	9.6%
White/Caucasian	61.7%
Multiple ethnicities/other	0.6%

The majority of survey respondents who provided demographic information on ethnicity identify as White/Caucasian — far more than the share of white Delaware residents. African American, Hispanic, and Asian residents were underrepresented in the survey responses, based on actual state demographics.

DEMOGRAPHICS

What is your age?



The survey respondents who provided demographic information on age spanned a wide age range. 15% were between 18 and 35. 52% were between 35 and 65. 33% were 65 or older.

Survey Instrument

Delaware Climate Action Plan

Progress 

Climate Action Plan Input

WELCOME

Help Prioritize Delaware's Climate Action Strategies

The state of Delaware is working to minimize its greenhouse gas emissions and maximize its resilience to climate change impacts. Achieving these goals require trade offs and prioritization. Share your input!

 Begin

This survey supports the second round of public workshops for Delaware's Climate Action Plan.

DELAWARE'S
Climate Action Plan

IMPACT RANKING

2 3 4 5

MINIMIZE EMISSIONS
MAXIMIZE RESILIENCE
THANK YOU



Delaware Climate Action Plan

Progress 

Greatest Impact Actions

WELCOME

IMPACT RANKING

Order your top 3 items above this line

- Zero Emission Vehicles
- Waste Diversion/Reduction
- Fuel + Roadway Efficiency
- Building Electrification
- Renewable Energy
- Bldg Energy Efficiency

Delaware could take a number of potential actions to *minimize greenhouse gas emissions in the state*. Rank the three actions you believe will have the greatest impact on reducing emissions in Delaware - placing the action with **most** impact on top.

Please drag 3 of the items above the line in your preferred order.

 Suggest another

What to do **Next Task**

3 4 5

MINIMIZE EMISSIONS
MAXIMIZE RESILIENCE
THANK YOU

The order in which the actions were presented in this question were randomized for each survey respondent.

3 Which Actions First?

Delaware could take a number of potential actions to *minimize greenhouse gas emissions* in the state. Which actions should Delaware take **first**? The more stars you put in a box, the more important you think it is to take that action **first**.

Drag stars to invest in the categories you prefer.

 15	Building Electrification Details 0	Building Energy Efficiency Details 0	Fuel and Roadway Efficiency Details 0	Renewable Energy Details 0
	Waste Diversion and Reduction Details 0	Zero Emission Vehicles Details 0	No additional actions needed Details 0	

WELCOME | 2 IMPACT RANKING | 3 MINIMIZE EMISSIONS | 4 MAXIMIZE RESILIENCE | 5 THANK YOU

Text Contained in the “Details” Button for Each Action

- **Building Electrification** – Retrofits of existing buildings and requiring building electrification for new construction.
- **Building Energy Efficiency** – Expanded building energy codes; residential and commercial energy efficiency programs; industrial energy efficiency improvements.
- **Fuel and Roadway Efficiency** – Incentives and regulations to increase low-carbon fuels and fuel-efficient vehicles and freight; lessen travel demand (e.g., reduce miles driven, optimize freight routes).
- **Renewable Energy** – Expanded renewable energy on-site (residential, commercial and industrial); expanded Renewable Portfolio Standard (RPS).
- **Waste Diversion and Reduction** – Diversion of waste and landfills through increased recycling and organic waste diversion (composting, land application, animal feed, etc.).
- **Zero Emission Vehicles** – Incentives and regulations to support adoption of zero emission vehicles (e.g., electric, plug-in hybrid, hydrogen fuel cell); state fleet electrification.
- **No additional actions needed** – No additional actions needed.

1
2
3
4

Which Actions First?

? What to do
Next Task

WELCOME

IMPACT RANKING

MINIMIZE EMISSIONS

MAXIMIZE RESILIENCE

THANK YOU

Delaware could take a number of potential actions to *maximize resilience to climate change impacts*. Which actions should Delaware take **first**? The more stars you put in a box, the more important you think it is to take that action **first**.

Drag stars to invest in the categories you prefer.



15

Changes to State Program Plans <small>Details</small>	Changes to State Policy/Regulation <small>Details</small>	Research and Monitoring <small>Details</small>	Community and Stakeholder Support <small>Details</small>
★ 0	★ 0	★ 0	★ 0
Improved Outreach <small>Details</small>	Improve Facilities & Infrastructure <small>Details</small>	State Agency Administration <small>Details</small>	No additional actions needed <small>Details</small>
★ 0	★ 0	★ 0	★ 0

?
THANK YOU

Text Contained in the “Details” Button for Each Action

- **Changes to State Program Plans** – Update planning documents related to asset management, natural resources management, emergency response and facility access.
- **Changes to State Policy/Regulation** – Update current regulations and consider creating new regulations to address climate change impacts.
- **Research and Monitoring** – Support monitoring of conditions and research in minimizing greenhouse gas emissions and maximizing resilience to climate change impacts.
- **Community and Stakeholder Support** – Provide up-to-date tools, training and other support to communities and other stakeholders.
- **Improved Outreach** – Incorporate messaging about actions to minimize greenhouse gas emissions and maximize resilience to climate change impacts to stakeholders and the public
- **Improve Facilities & Infrastructure** – Improve resilience and adapt infrastructure and agency assets to the impacts of climate change.
- **State Agency Administration** – Review and edit current operational guidelines and documents and creation of new procedures to address climate change impacts.
- **No additional actions needed** – No additional actions needed.

5 **Wrap Up** What to do

WELCOME 2 IMPACT RANKING 3 MINIMIZE EMISSIONS 4 MAXIMIZE RESILIENCE 5 THANK YOU

Demographics

Which county do you live in?

What zip code do you live in?

What is your age?

With which ethnicity do you most identify?

Email (if you would like to stay updated)

Equitable Engagement

We are committed to an equitable process. By filling out the information on this page, we can ensure we are reaching everyone in our state.

Visit declimateplan.org for more information.

5 **Wrap Up** What to do

WELCOME 2 IMPACT RANKING 3 MINIMIZE EMISSIONS 4 MAXIMIZE RESILIENCE 5 THANK YOU

Demographics

Which county do you live in?

 Kent
New Castle
Sussex

What is your age?

With which ethnicity do you most identify?

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5 Wrap Up What to do

WELCOME **2 IMPACT RANKING** **3 MINIMIZE EMISSIONS** **4 MAXIMIZE RESILIENCE** **5 THANK YOU**

Demographics

Which county do you live in?

What zip code do you live in?

What is your age?

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I would like to stay updated

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DELAWARE'S
Climate Action Plan

5 Wrap Up What to do

WELCOME **2 IMPACT RANKING** **3 MINIMIZE EMISSIONS** **4 MAXIMIZE RESILIENCE** **5 THANK YOU**

Demographics

Which county do you live in?

What zip code do you live in?

What is your age?

With which ethnicity do you most identify?

I would like to stay updated

Equitable Engagement

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DELAWARE'S
Climate Action Plan

Detailed Survey Results

Note: The results reported below simply represent the opinions of the **96 people** who responded to the survey; the results are not necessarily representative of the Delaware population as a whole.

All percentage values in the data tables below are rounded to the nearest percentage point.

Survey Page #1: IMPACT RANKING

Question: Delaware could take a number of potential actions to *minimize greenhouse gas emissions in the state*. Rank the three actions you believe will have the greatest impact on reducing emissions in Delaware – placing the action with the **most** impact on **top**.

Total responses to this question: 70

Action Options	Number of Responses		Percent of Top 3 Rank Responses	Percent of Total Responses	Average Rank When in Top 3
Building Electrification	Top 3	11		16%	2.82
	First Rank	0	0%	0%	
	Second Rank	2	18%	3%	
	Third Rank	9	82%	13%	
	No Rank	59		84%	
Building Energy Efficiency	Top 3	33		47%	2.39
	First Rank	3	9%	4%	
	Second Rank	14	42%	20%	
	Third Rank	16	48%	23%	
	No Rank	37		53%	
Fuel and Roadway Efficiency	Top 3	37		53%	2.11
	First Rank	11	30%	16%	
	Second Rank	11	30%	16%	
	Third Rank	15	41%	21%	
	No Rank	33		47%	
Renewable Energy	Top 3	61		87%	1.43
	First Rank	41	67%	59%	
	Second Rank	14	23%	20%	
	Third Rank	6	10%	9%	
	No Rank	9		13%	
Waste Diversion and Reduction	Top 3	33		47%	2.12
	First Rank	8	24%	11%	
	Second Rank	13	39%	19%	
	Third Rank	12	36%	17%	
	No Rank	37		53%	
Zero-Emission Vehicles	Top 3	33		47%	2.03
	First Rank	8	24%	11%	
	Second Rank	16	48%	23%	
	Third Rank	9	27%	13%	
	No Rank	37		53%	

Survey respondents could also provide suggestions on additional actions as well as provide comments on specific actions. All the feedback submitted by survey respondents is noted below.

Additional Actions Suggested:

Replacing gasoline and diesel with electricity generated from nuclear and renewable power and with hydrogen (especially using hydrogen for trucks and buses) is critically important.
Reduce food waste/increase plant-based eating
Protecting natural habitats that store carbon
Reduce vehicle miles traveled
How about considering an impact of a 'climate friendly diet'. https://guarinicenter.org/wp-content/uploads/2018/07/Linn-Climate-Friendly-Diets-FINAL.pdf . I felt your climate action plan failed to address food systems-related emissions (diet, food loss, food waste, regenerative ag). Reference: https://www.drawdown.org
Carbon sequestration in farming and LAWN CARE
Don't do any of these
Allowing HOAs to determine if homeowners want to permit clothes lines to reduce energy consumption.
Infrastructure/public transportation
Sustainable farming practices to absorb and trap carbon in the dirt
1. Sustainable farming practices to absorb and trap carbon in the dirt
2. Agricultural incentives to move to less carbon heavy livestock and farming practices
Require Delmarva Power to deliver electricity created with 100% renewable energy by 2030

Optional Comments:

Building Energy Efficiency	This is much too expensive and not worth the effort.
	Energy efficiency is the most cost effective and underutilized climate action tool. It's the low hanging fruit that we must focus on!
	This is a stacked deck! Of all these things on the list, the major things we can do to mitigate climate change do not include any of the last 3 items. What about transit? What about land use changes?
	I consider the reduction of energy consumption within buildings highly important.
Fuel and Roadway Efficiency	Reducing use of single occupancy vehicles and increasing reliance upon public transportation (primarily buses) is critically important. Reducing fossil fuel use in both cases is similarly critically important.
	CO ₂ follows temperature change caused by solar activities; it does not precede it. Your premise has been shown by scientists from DE to be wrong.
	Aren't we already doing this?
	I think there is more potential for quick reduction here, though I am a very strong proponent of zero emission vehicles.
Renewable Energy	Nuclear energy and gas are not considered renewable but are consistent and cheap. Wind and solar still require standard backup.
	With note that a plan for heavy metal leaching from solar panels should be considered before large scale work is done.
	Replacing natural gas and coal with primarily solar and offshore wind for power generation is critically important.
Waste Diversion and Reduction	I hope this includes food waste. According to Project Drawdown, reducing food waste is the third most effective way to cut carbon emissions.
Zero-Emission Vehicles	This requires forcing the public to buy certain vehicles which they may not want. Force/mandates is not the way to go.
	Electric vehicles don't solve the issue if the electricity is still created from non-renewables.
	Good idea. Incentives should cover used electric and hybrid vehicles.

Survey Page #2: MINIMIZE EMISSIONS

Question: Delaware could take a number of potential actions to *minimize greenhouse gas emissions in the state*. Which actions should Delaware take **first**? The more stars you put into a box, the more important you think it is to take that action **first**. *Drag stars to invest in the categories you prefer.* [Each survey respondent is given 15 stars for allocation]

Total responses to this question: 87 Total stars allocated: 1,171 Total stars available for allocation: 1,305

Action Options	Number of Responses		Percent of Responses That Allocated Stars	Percent of Total Responses	Total Number of Stars Allocated	Percent of Total Stars Allocated	Average Stars Allocated Per Respondent
Building Electrification	0 stars	40		46%	85	7%	0.98
	At least 1 star	47		54%			
	1 to 5 stars	47	100%	54%			
	6+ stars	0	0%	0%			
Building Energy Efficiency	0 stars	24		28%	155	13%	1.78
	At least 1 star	63		72%			
	1 to 5 stars	63	100%	72%			
	6+ stars	0	0%	0%			
Fuel and Roadway Efficiency	0 stars	21		24%	161	14%	1.85
	At least 1 star	66		76%			
	1 to 5 stars	62	94%	71%			
	6+ stars	4	6%	5%			
Renewable Energy	0 stars	13		15%	347	30%	3.99
	At least 1 star	74		85%			
	1 to 5 stars	55	74%	63%			
	6+ stars	19	26%	22%			
Waste Diversion and Reduction	0 stars	22		25%	175	15%	2.01
	At least 1 star	65		75%			
	1 to 5 stars	60	92%	69%			
	6+ stars	5	8%	6%			
Zero-Emission Vehicles	0 stars	26		30%	176	15%	2.02
	At least 1 star	61		70%			
	1 to 5 stars	59	97%	68%			
	6+ stars	2	3%	2%			
No Additional Actions Needed	0 stars	77		89%	72	6%	0.83
	At least 1 star	10		11%			
	1 to 5 stars	4	40%	7%			
	6+ stars	6	60%	5%			
Stars Unallocated	0 stars	71		82%	134 [^]		
	At least 1 star	16		18%			
	1 to 5 stars	6	38%*	5%			
	6+ stars	10	63%*	11%			

* Percent of responses that left at least one star unallocated

[^] Total number of stars unallocated

Survey Page #3: MAXIMIZE RESILIENCE EMISSIONS

Question: Delaware could take a number of potential actions to *maximize resilience to climate change impacts*. Which actions should Delaware take **first**? The more stars you put into a box, the more important you think it is to take that action **first**. *Drag stars to invest in the categories you prefer.* [Each survey respondent is given 15 stars for allocation]

Total responses to this question: 84 Total stars allocated: 1,106 Total stars available for allocation: 1,260

Action Options	Number of Responses		Percent of Responses That Allocated Stars	Percent of Total Responses	Total Number of Stars Allocated	Percent of Total Stars Allocated	Average Stars Allocated Per Respondent
Changes to State Program Plans	0 stars	25		30%	156	14%	1.86
	At least 1 star	59		70%			
	1 to 5 stars	55	93%	65%			
	6+ stars	4	7%	5%			
Changes to State Policy/ Regulation	0 stars	18		21%	225	20%	2.68
	At least 1 star	66		79%			
	1 to 5 stars	58	88%	69%			
	6+ stars	8	12%	10%			
Research and Monitoring	0 stars	35		42%	142	13%	1.69
	At least 1 star	49		58%			
	1 to 5 stars	46	94%	55%			
	6+ stars	3	6%	4%			
Community and Stakeholder Support	0 stars	26		31%	169	15%	2.01
	At least 1 star	58		69%			
	1 to 5 stars	53	91%	63%			
	6+ stars	5	9%	6%			
Improved Outreach	0 stars	28		33%	139	13%	1.65
	At least 1 star	56		67%			
	1 to 5 stars	54	96%	64%			
	6+ stars	2	4%	2%			
Improve Facilities and Infrastructure	0 stars	34		40%	134	12%	1.60
	At least 1 star	50		60%			
	1 to 5 stars	49	98%	58%			
	6+ stars	1	2%	1%			
State Agency Administration	0 stars	52		62%	52	5%	0.62
	At least 1 star	32		38%			
	1 to 5 stars	31	97%	37%			
	6+ stars	1	3%	1%			
No Additional Actions Needed	0 stars	75		89%	89	8%	1.06
	At least 1 star	9		11%			
	1 to 5 stars	2	22%	2%			
	6+ stars	7	78%	8%			
Stars Unallocated	0 stars	68		81%	154 [^]		
	At least 1 star	16		19%			
	1 to 5 stars	4	25%*	5%			
	6+ stars	12	75%*	14%			

* Percent of responses that left at least one star unallocated

[^] Total number of stars unallocated

Survey Page #4: THANK YOU

1. What county do you live in?

Response Options	Number of Responses	Percent of Total Responses
Kent	5	7%
New Castle	46	67%
Sussex	18	26%
TOTAL	69	

2. What zip code do you live in?

Response Options	Number of Responses	Percent of Total Responses
19701	2	3%
19702	4	6%
19703	2	3%
19707	1	1%
19709	2	3%
19711	9	13%
19713	1	1%
19720	2	3%
19733	1	1%
19734	2	3%
19801	1	1%
19803	2	3%
19804	1	1%
19805	5	7%
19806	1	1%
19807	3	4%
19808	3	4%
19809	1	1%
19810	2	3%
19901	2	3%
19904	1	1%
19933	1	1%
19934	1	1%
19940	1	1%
19958	3	4%
19968	4	6%
19970	2	3%
19971	3	4%
19973	1	1%
19975	2	3%
19977	1	1%
Out of state/other	1	1%
TOTAL	68	

3. What is your age?

Response Options	Number of Responses	Percent of Total Responses
Under 18	0	0%
18-24	1	2%
25-34	9	13%
35-44	11	16%
45-54	8	12%
55-64	16	24%
65-74	15	22%
75 and older	7	11%
TOTAL	67	

4. With which ethnicity do you most identify?

Response Options	Number of Responses	Percent of Total Responses
American Indian or Alaskan Native	0	0%
Asian/Pacific Islander	1	2%
Black or African American	4	6%
Hispanic	1	2%
White/Caucasian	55	85%
Multiple ethnicities/other	4	6%
TOTAL	65	

APPENDIX 6: Questions and Answers

This appendix provides a list of questions that were submitted during the September 15 and 17 sessions. Unless otherwise noted, the questions below are worded “as submitted” by workshop participants. In some cases, DNREC staff either modified the wording of the questions for clarity or consolidated questions that were asked more than once into a single entry; any questions that fall into either of these categories are preceded by an asterisk (*) and changes are indicated in brackets, as applicable. DNREC aimed to maintain the integrity and spirit of all questions that were modified or consolidated.

This appendix also provides answers to participant questions. These answers come from DNREC’s Division of Climate, Coastal and Energy in consultation with technical experts from within DNREC and other state agencies.

A complete list of web links embedded in this document is provided at the end of the appendix.

Additional comments provided by participants during the presentation or breakout or wrap-up sessions are provided in Appendix 7.

Questions Related to Delaware’s Greenhouse Gas Emissions and Emissions Reduction Goal

Q: *Why did Delaware select 2005 as [the] base year [to measure greenhouse gas emissions reductions for its emissions reduction goal]? Most places are using 1990.

A: It is true that other U.S. states, counties and municipalities use 1990 as the baseline year for measuring greenhouse gas emissions reductions. The 2005 base year that Delaware uses comes from the greenhouse gas emissions reduction goal that Governor John Carney adopted when [Delaware joined the U.S. Climate Alliance in 2017](#): 26-28% emissions reductions by 2025 from 2005 levels. This goal is the same commitment the U.S. made to the Paris Agreement.

As a reference, the U.S. Climate Alliance is a bipartisan coalition of governors committed to reducing greenhouse gas emissions consistent with the goals of the Paris Agreement. The Alliance was formed following President Donald Trump’s announcement to withdraw the U.S. from the Paris Agreement.

Q: Is our current goal of 26-28% reduction in greenhouse gases the same or similar to our Renewable Portfolio Standard, which has a similar goal to convert to renewable electricity?

A: The similarity in percentage numbers and target years between the state’s greenhouse gas reduction goal and the state’s Renewable Portfolio Standard requirement may confuse people into thinking that they are the same thing; they are not

The state’s 2025 goal of reducing greenhouse gas emissions by 26-28% from 2005 levels is an economy-wide goal. In other words, Delaware’s goal is to reduce the state’s total emissions by 26-28% by 2025. Emissions in Delaware come from many sources including transportation, electricity generation, industrial activities and landfills.

Separately, Delaware has a [Renewable Portfolio Standard](#), a state law that requires Delaware’s utilities acquire an increasing percentage of their electricity from renewable resources. This law mandates that utilities derive 25% of their energy portfolios from renewable sources by 2025.

Renewable energy remains an important component for the state to meet its economy-wide, greenhouse gas emissions reduction goal by 2025. However, meeting the state’s Renewable Energy Goal does not provide enough emission reductions to meet the economy-wide greenhouse gas emissions goal.

Q: *Why [were greenhouse gas emissions in] 2005 so high?

A: The greenhouse gas emissions in 2005 are fairly consistent with emissions levels between 1990 and 2005 (see [Delaware's Greenhouse Gas Emissions Inventory](#)). The trend of decreasing emissions in Delaware since 2005 can be

generally attributed to current state policies and past energy trends, primarily due to a shift from coal- to natural gas-powered electricity.

Q: Why do emissions drop in 2008?

A: The drop in Delaware’s greenhouse gas emissions around 2008 is correlated with two events: (1) the economic recession in 2008, and (2) the temporary shutdown of the Delaware City refinery in 2009 (which re-opened in 2011). It should be noted that the state does not believe or contend that economic downturn is necessary to reduce emissions. In fact, the [U.S. Climate Alliance’s 2020 Annual Report](#) indicates that Alliance states (which includes Delaware) have collectively reduced emissions while increasing total and per capital economic output.

Questions Related to the Greenhouse Gas Emissions Modeling Analysis

Q: *Are the comparisons for greenhouse gas reduction potential [between the different strategies, as presented at the public workshop,] Delaware-specific?

A: Yes, all of the greenhouse gas emissions reduction potential values presented at the public workshop are Delaware-specific and are based on the results of the emissions modeling analysis that the state’s consultants, ICF Incorporated, carried out. The report of results from this emissions modeling analysis is available at declimateplan.org.

Q: Many states and countries are using 1990 as a baseline for reductions while we are using 2005. How does that difference affect the projected reductions?

A: Delaware’s 2025 goal of 26-28% greenhouse gas emissions reductions from 2005 levels was adopted by Governor John Carney when Delaware joined the U.S. Climate Alliance in 2017; this goal is the same commitment the U.S. made to the Paris Agreement. Based on information from [Delaware’s Greenhouse Gas Emissions Inventory](#), the state’s emissions were slightly higher in 1990 compared to 2005. Thus, for any state emissions reduction target — whether for our current emissions reduction goal or for any target set beyond 2025 — a 2005 baseline would result in a more ambitious goal for Delaware than using a 1990 baseline for that same target value.

Q: In the graph illustrating the projected results of modeled actions by 2025/2050, emissions from industrial processes continue to increase. Why are there no targeted plans to reduce emissions from industrial sources (which typically are the most toxic to humans and can have greater environmental impact)?

A: It’s helpful to clarify that the greenhouse gas emissions modeling analysis the state commissioned ICF Incorporated to carry out was simply intended to model the emissions reduction potential of 20 possible actions. We were limited to 20 actions based on available time and resources. As such, these 20 actions do not represent the only actions the state could take to reduce emissions.

We consulted DNREC’s in-house industrial processes emissions expert on this question. He noted that the industrial processes sector is difficult to decarbonize with "general" emissions reduction actions (as opposed to "site-specific" actions at particular industrial sites). In our modeling exercise, three of the 20 "general" emissions reduction actions related to the industrial processes sector:

- High-GWP-2: Reduce Industrial High-Global Warming Potential Emissions
- NG-1: Methane Emission Reductions from Utility Gas Lines
- EE-5: Industrial Energy Efficiency Improvements (*Note: Some of the emissions reductions from this action were allocated to the electric power sector*)

While emissions reductions *are* achieved by these three "general" actions, our modeling assumptions (derived from the [U.S. Energy Information Administration’s State Energy Data System](#)) project an increase in overall energy use and emissions in the industrial sector through 2050, likely due to population and economic growth. Based on our modeling, if Delaware were to implement the above three actions, total emissions in the industrial processes sector would start to decrease around 2025, level out around 2030 and start increasing again around 2035 — even *after* taking into account emissions reductions from the three modeled strategies.

Again, these three modeled actions are not the only actions that can be taken to reduce emissions in the industrial sector. However, another factor that must be considered is the fact that a large majority of industrial processes emissions in Delaware come from a very small number of locations, including sites where fossil fuel production or refining is a core part of their business. As such, "site-specific" actions could result in additional emissions reductions; however, we did not model any such actions.

Q: Steam and process heat generation (boiler or co-gen) appear to be missing in the modeling? This is a major consumer of natural gas in refining and chemical processes.

A: ICF did not model petroleum use reductions due to a lack of data on energy efficiency potential for petroleum in the industrial processes sector. This reality reflects the overall difficulty in modeling "general" emissions reduction measures without having more specific details on in-state industrial facilities (baseline data, reduction potentials, etc.).

DNREC had early discussions with ICF to potentially include combined heat and power (CHP) as a modeled emissions reduction strategy, but we ultimately moved away from selecting that strategy for modeling. Based on conversations with industry representatives, and low utilization of DNREC's CHP grant programs, we determined that CHP likely has limited growth in Delaware. As such, we prioritized other actions for modeling that we felt had higher potential for emissions reductions in Delaware.

Q: Is the modeling for industrial sources of greenhouse gas and chemical sources in the full report online?

A: Our greenhouse gas emissions modeling analysis looked at "general" actions to reduce emissions in the industrial processes sector. Such actions include reducing emissions from the use of industrial high-global warming potential chemicals (primarily hydrofluorocarbons, which are used as refrigerants and extinguishing agents), from methane leaks in utility gas lines and through energy efficiency improvements. Information on these strategies are described in the emissions modeling analysis report, available at declimateplan.org.

Q: *One of your [greenhouse gas reduction] categories was the electricity sector. What is left in that after you take out all the reductions for the transportation [sector] (electrify vehicles) and [electrifying] buildings?

A: Decarbonizing the electric grid (i.e., having Delaware's utilities acquire more of their electricity supply from renewable resources) is a key strategy for reducing greenhouse gas emissions in the electric power sector. In fact, the results from our emissions modeling analysis show that renewable energy has the greatest emissions reduction potential for Delaware in the long term. Additionally, our emissions modeling analysis shows that for the electrification of transportation and buildings to be fully effective in reducing emissions, we must also decarbonize the electric grid. This is because decarbonizing the electric grid means we use low- or no-carbon electricity in our transportation and buildings.

Q: *The modeling results reference an economic sector called LULUCF? What is that?

A: LULUCF stands for "Land Use, Land Use Change and Forestry." Activities in this sector include land use and forestry activities (e.g., land development, deforestation, reforestation), where carbon is either captured (i.e., natural areas "soak up" carbon from the atmosphere and store it in plants, trees and soil) or released, depending on the land use.

Q: Is a 60% reduction target for 2050 adequate when a net-zero (or 80% minimum reduction) target for 2050 is thought to be essential to maintain temperature rise below 2 degrees Celsius?

A: The 60% value (or, more accurately, 59.7%) comes from our greenhouse gas emissions modeling analysis, which shows the emissions reduction potential of 20 modeled strategies in 2050 compared to 2005. This 59.7% value is not a target that the state has set at this time; it is simply the result of our emissions modeling analysis. In fact, the state does not currently have an emissions reduction target beyond 2025. However, the state aims to use the emissions modeling analysis results (including the 59.7% value) to inform emissions reduction actions going forward.

Questions Related to Climate Change Policy and Action in Delaware

Q: How will Delaware's Climate Action Plan be used? What legislative or executive order impact will it have?

A: Delaware's Climate Action Plan does not, in and of itself, create new mandates or requirements, but it will provide data, information and strategies that state leaders, including the governor and General Assembly, can use for decision-making.

Q: All strategies are interconnected. How does the plan account for these interconnections?

A: Greenhouse gas emissions reduction strategies are indeed interconnected; they all contribute towards lowering the state's emissions, oftentimes in tandem. For instance, as noted in an answer to an earlier question, our emissions modeling analysis indicates that there will be greater emissions reductions when the electrification of buildings and the transportation sector are linked with adding more renewable energy to the electricity grid. Our emissions modeling analysis gave us a deeper understanding of these interconnections; as such, Delaware's Climate Action Plan will put forth numerous actions, knowing they work together to reduce emissions.

Q: *How will the state consider costs, capacity and other potential negative impacts of climate action?

A: Delaware's Climate Action Plan will not include a comprehensive cost-benefit analysis of climate action. However, the greenhouse gas emissions modeling analysis that ICF Incorporated carried out for the state includes estimates for both the net present value (i.e., current economic value of all future costs and benefits) and the cumulative cost (or benefit) per metric ton of carbon dioxide equivalent reduced for certain modeled actions (see the emissions modeling analysis report at declimateplan.org). Additionally, DNREC is currently working with consultants to estimate the cost of climate change impacts to various sectors in the state should no further climate action be taken (the report is set to be released in 2021). All this information can be utilized by state leaders for decision-making on climate action. Moreover, implementation of Delaware's Climate Action plan will require further coordination and engagement with stakeholders, including discussions and considerations surrounding costs, capacity and other economic impacts of proposed actions.

Q: Where does grid-scale renewable energy fit? How do we incentivize the various electric companies in the state to switch to installing grid scale?

A: Grid-scale renewable energy in Delaware has historically been developed through the state's [Renewable Portfolio Standard](#), a state law that requires Delaware's utilities to acquire an increasing percentage of their electricity from renewable resources. Based on the results of the greenhouse gas emissions modeling analysis, a Renewable Portfolio Standard remains an important strategy for reducing emissions in the state using grid-scale renewable energy.

Q: When will Delaware get on the bandwagon with wind? We are the only state between Massachusetts and North Carolina with no wind.

A: Delaware's utilities continue to acquire a portion of its electricity from renewable resources, including wind energy sources. With regards to in-state wind generation, DNREC manages the state's [Green Energy Program](#), which provides incentives for renewable energy projects including wind. Additionally, DNREC is actively looking into issues related to wind energy in Delaware, including, most recently, transmission impacts of offshore wind to the state. Establishing larger scale in-state wind generation for the state will require the input and collaboration of numerous stakeholders including state government leaders (both executive and legislative), Delaware's public service commission, the state's utilities, labor organizations, environmental organizations and other affected communities and groups.

Q: What can a small state like Delaware do to capture technology innovation opportunities?

A: Smart climate action should consider ways to reduce greenhouse gas emissions while also taking advantage of new economic opportunities — including investments in low-carbon energy technologies. There are numerous case studies of how other jurisdictions, [including those in the U.S. Climate Alliance](#), have done this (and continue to do so). As such, Delaware's Climate Action Plan looks to highlight actionable, low-carbon economic opportunities for the state.

Q: How do we convince the building trades to understand that jobs will be created?

A: As indicated in our greenhouse gas emissions modeling analysis, there are a number of possible emissions reduction actions within the residential and commercial buildings sector. Implementing any of these actions will require close coordination with representatives from the buildings sector to address potential impacts, barriers and opportunities, including the effect on jobs in the industry.

Q: Curious if Delaware considered plant-based diets as an area to focus on for greenhouse gas reduction?

A: Due to limitations in time and resources, DNREC was only able to model 20 greenhouse gas emissions reduction actions in its emissions modeling analysis. Plant-based diets was not one of the actions modeled. However, Delaware's Climate Action Plan may consider other emissions reduction actions in addition to those that were modeled.

Q: Economists talk about a fee on carbon. Is that an option for Delaware?

A: The emission reduction or economic effects of an economy-wide fee on carbon was not analyzed as part of the greenhouse gas emissions modeling analysis. Robust information about the emission reduction potential and economic effects of a carbon fee would be necessary for Delaware to consider implementing this at a state scale.

Q: Will Delaware sign on to the Transportation and Climate Initiative?

A: Delaware is a founding member of the [Transportation and Climate Initiative](#), a multi-state collaborative of Northeast and Mid-Atlantic states working together to reduce emissions in the transportation sector. The Transportation and Climate Initiative is now engaged in a multi-year effort to develop a market-based program that would cap emissions from the combustion of transportation fuel in the region. Delaware staff are engaged at the table in the development of this program. No decision has yet been made whether to implement the program in Delaware.

Embedded Web Links

- Delaware joined the U.S. Climate Alliance in 2017: <https://news.delaware.gov/2017/06/05/delaware-joins-u-s-climate-alliance-to-uphold-goals-of-paris-agreement/>
- Renewable Portfolio Standard: <https://dnrec.alpha.delaware.gov/climate-coastal-energy/renewable/portfolio-standards/>
- Delaware’s Greenhouse Gas Emissions Inventory: <https://data.delaware.gov/Energy-and-Environment/Delaware-Greenhouse-Gas-GHG-Emissions-Inventory-19/w7vd-h5a8>
- U.S. Climate Alliance’s 2020 Annual Report: <http://www.usclimatealliance.org/annual-report>
- U.S. Energy Information Administration’s State Energy Data System: <https://www.eia.gov/state/seds/>
- Delaware’s Green Energy Program: <https://dnrec.alpha.delaware.gov/climate-coastal-energy/renewable/assistance/>
- Jurisdictions in the U.S. Climate Alliance: <http://www.usclimatealliance.org/state-climate-energy-policies>
- Transportation and Climate Initiative: <https://www.transportationandclimate.org/>

APPENDIX 7: Comments from Workshop Participants

This appendix provides a list of comments provided by workshop participants during the September 15 and 17 sessions. Questions that were submitted by workshop participants can be found in Appendix 6.

DNREC provided clarification on some of the comments below, including redacting personally-identifiable information. These clarifications are indicated with italicized text in brackets.

Comments from the September 15, 2020 Session

It will be important for the state to consider costs and capacity, or potential negative impacts of climate action.
It is a combination of electrification and increasing low carbon liquid fuels that will work to lowering GHG. More emphasis should be placed on low carbon liquid fuels.
Thrilled to see roadway and fuel efficiency included. It takes 30 years to retire 95% of the on-road vehicles in the U.S., which means methods to reduce miles travelled, reduce congestion and increase operational efficiency and fuel blends is important to address the vehicles on the road now and how they're used. So, the only transportation solution is NOT EVs – need to do a lot more, particularly in the nearer term. Need to work hard on EVs, yes, but need to think broader to solve our transportation impacts.
Land use planning AND telecommuting!

Comments from the September 17, 2020 Session

Vehicle emission standards got repealed by Trump
That trend seems to indicate that by 2100 we would be back at 2005 levels [<i>Referring to presentation slide titled "Without new action: 25.4% reduction by 2025"</i>]
My Cat's name is Princess Lulu [<i>Referring to LULUCF</i>]
Renewable energy should also include cost savings, as recent data from NY and MA, offshore wind will produce power at 5.8 cents/kwh and 6.5 cents/kwh, cheaper than dirtier power.
We need to get serious about wind farms. Dr. Willett has suggested that Delaware could cover more than half of all electric power needs with wind turbines.
Very informative...Mark Jacobson (Stanford) would be a helpful resource for renewable energy; he has a plan for every state, every country...thank you. [<i>Name redacted</i>]
Thanks very much. This is important work.
I attended a webinar earlier this week held by TCI, and they said that efficient cars and low carbon fuels were not very helpful because people are driving more. Furthermore, hybrids and EVs are really only for rich folks.
Even \$5,000 off a \$40,000 vehicle isn't going to help a lot. [<i>Referring to electric vehicle rebates</i>]
Hope bicycles are considered in plan
Economists talk about a fee on carbon. Is that an option for Delaware? The news today is that the Business Round Table supports a carbon fee.
Education around the radiation around electric wires [<i>Verbal comment requested to be recorded by participant</i>]
We don't have any cost information [<i>Referring to breakout session exercise asking participants to provide ratings on cost-effectiveness</i>]
Building energy efficiency – hasn't received enough attention; could share data [<i>Name redacted</i>]; has contributed the greatest savings in Kw equivalent since 1970; higher than renewables, nuclear, etc. has a lot of potential; it's low hanging fruit. In general, it has been underutilized. Changing light bulbs from incandescent to LED you start making savings already. It should be number 1 or 2 next to renewables.

These projections are based on EPA and GHG inventory; you can see biggest sliver is electricity generation in DE. These projections are developed based on where these emissions are which is why renewable energy is biggest sliver.

Renewable energy; we were introducing renewables in the 70s and 80s; the oil industry owns everything; we are 50 years too late. Everyone is too dependent. We have to do this now. Want to see DE set goals for counties and municipalities; we can select renewable energy in the electric bill; want to see regulations to switch renewables.