



# Public Knowledge, Behaviors & Preferences about Energy & Transportation

*A Maryland Statewide Survey | Fall 2016*



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*Acknowledgements:*

This survey was funded by the Town Creek Foundation of Easton, MD. We thank the Foundation and Executive Director Stuart Clarke for their support. We also thank members of the Climate Communication Consortium of Maryland ([climatemaryland.org](http://climatemaryland.org)), many of whom assisted in the development of the survey, and Jennifer Su at PSRAI.

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# Executive Summary

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State energy and transportation policies affect all Marylanders, and not just when they pay their monthly utility bill or fill up their car's gas tank. These issues affect residents every day in terms of their health and that of the environment around them. When Marylanders flip the switch on their lights, or plug in their coffee machines, their electricity can come from a variety of fuel sources, such as natural gas, nuclear, coal, and renewables. As consumers, they have the power choose their electricity provider and even to decide where their electricity comes from, including from solely renewable options like wind.

In the realm of transportation, there are also choices for Marylanders, from taking public transportation and carpooling to purchasing more energy efficient cars and trucks, even electric vehicles. Across the U.S., people are reimagining how to make these energy systems smarter, more resilient, and healthier for people and the places where they live.

Continuing a research partnership that began during the 2015 study, George Mason University (GMU) once again teamed up with the Johns Hopkins Bloomberg School of Public Health to get Marylanders' opinions on climate change, public health and energy sources, and their attitudes towards current or proposed policies that relate to these topics.

Below are some of the findings from the 2016 survey of Maryland residents, the fourth installment of an annual study dating back to 2013.

## Key Findings

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1. Most residents support the state's energy policies, even if they were previously unfamiliar with the directives prior to the survey.
  - Four out of five Marylanders support expanding rebates to help people purchase energy-efficient lighting and energy-efficient appliances (28% somewhat support, 55% strongly support). Nearly as many say continuing financial incentives for the generation of renewable energy is a good idea (27% somewhat support, 51% strongly support).
  - Chesapeake State adults also say that modernizing Maryland's electricity grid to better integrate renewable energy sources is a valuable endeavor. Seventy-seven percent support this policy, with almost half saying they strongly support it.
2. Many Marylanders say the Greenhouse Gas Reduction Plan will likely benefit the economy, but there is also great uncertainty about current economic projections for these policies.
  - Twenty-six percent say it is likely that the greenhouse gas reduction policies will generate between \$2.5 and \$3.5 billion in economic benefits, as projected by the state. Thirty percent say this is unlikely. Forty-four percent say they do not know.
  - Thirty-one percent say the Plan is likely to yield or maintain 26,000 to 33,000 jobs by the year 2020. Twenty-seven percent say this is unlikely and four in ten are unsure.

- One-quarter (25%) say it is likely that these policies will have no projected impacts on the state's manufacturing industries. Forty-three percent do not know enough to say one way or the other.
  - Uncertainties may loom regarding what benefits will result from the Greenhouse Gas Reduction Plan, but broadly, majorities think that stricter environmental laws are worth the effort and cost. Marylanders say stricter laws would benefit both public health (68%) and the environment (69%), as well as boost economic and jobs growth (54%).
3. Residents want to see increased use of renewable energy sources.
- Large majorities of Marylanders say the state should use more solar energy (77%) and wind energy (72%) over the next several years. Solar and wind energy are rated as the least harmful energy sources.
  - More traditional sources of electricity like coal, that are also more polluting, are less desirable than cleaner options. These sources of electrical energy are considered most harmful to people's health.
  - Residents are more cautious about newer or lesser-understood energy options like hydraulic fracturing, nuclear energy, incineration of waste and use of gas from landfills, with significant percentages expressing they do not know enough about these energy sources to offer an opinion.
4. Half of Marylanders are willing to pay more out of their own pockets for wind or solar energy.
- One-half of residents are willing to pay more each month on their electricity bill in order to purchase 100% of their electricity from wind. More than 60 percent of Millennials are willing to pay more per month for wind-generated electricity, including 23 percent who are willing to pay more than \$10 a month.
  - Roughly the same findings appear when Marylanders are asked about paying more for solar energy. Two-thirds of Millennials are willing to pay more per month for solar-generated electricity, including 26 percent who are willing to pay more than \$10 a month.
5. "Smart Grid" is an unfamiliar term to many.
- About half, 48 percent, of state residents have ever heard of the term "Smart Grid." About four in ten do not recognize this term, and about one in ten are unsure if they have ever heard of Smart Grids.
6. Marylanders are embracing the idea of Smart Grids and other smart technology, even if they have not yet starting using them themselves.
- Four in ten say they have not yet installed a Smart Meter but they would be likely to do so.

- One in five residents say they have “smart appliances” at home. Sixty percent say the prospects of buying these appliances are fairly or very good, including 36 percent who say they are very likely to make the purchase.
7. Elements of Smart Grid systems are appealing; but many raise concerns about the affordability of roof-top solar panels, and a small percent about the health and privacy implications of Smart Meters.
- Two-thirds are interested in generating their own energy. The same share say variable electricity rates at different times during the day will help them lower their electricity bills.
  - More than one-third are worried that Smart Meters threaten people’s privacy. Far fewer, 18 percent, worry that Smart Meters may be harmful to health.
  - Forty-four percent say they are unlikely to install solar panels for their home or community. For a majority, money is the obstacle. Fifty-seven percent cannot afford to install solar panels on their homes.
8. Despite widespread belief in climate change and the human effect on environmental changes, residents largely report being single occupant commuters and find transportation alternatives to be difficult to come by and often unappealing.
- Two-thirds of Maryland adults say they almost always drive a car or truck as a single occupant to get to work, school or other primary daily activity. Another 10 percent choose this mode of transportation most of the time.
  - More environmentally responsible modes of commuting, such as carpooling, public transportation, walking or biking, are not as widely used.
  - Seventy-one percent consider public transportation to be an implausible means of commuting. However, even if it were easy for them, a majority of Marylanders say they do not like this option. Six in ten (63%) would not like taking public transportation if even they could.
9. Marylanders seem to have a clear understanding that certain types of vehicles are more polluting than others.
- About three-quarters agree that the tailpipes of gasoline- or diesel-fueled motor vehicles release pollution that contributes to climate change.
  - Three-quarters also agree that plug-in electric vehicles pollute the air less than gas or diesel vehicles.
10. A majority of Marylanders have heard about state policies to combat road congestion and improve air quality, and there is large support for the policies as described in the survey.

- About six in ten residents have heard about the state promoting public transportation (59%) or making improvements to bike and pedestrian road access (58%). Half have heard about the policy for variable express lane fees based on road congestion or the state requirement that all new cars and other vehicles in Maryland be less polluting. Forty-four percent are aware of that tax credits and other incentives are extended to those who purchase or lease plug-in electric vehicles.
- Most Marylanders (77%) throw their support behind the improvement of bike and pedestrian access, including fully one-half who strongly support this policy. Residents are also largely in favor of requiring vehicles to pollute the environment less (74% somewhat/strongly support).
- The policy that faces the most criticism among state residents is charging variable rates in express lanes based on the volume of cars on the road. Three in ten (31%) are against this policy, with 18 percent in strong opposition.

These are just some of the findings from the 2016 survey, executed by Princeton Survey Research Associates International (PSRAI). Results are based on mail interviews in English with 907 adults ages 18 or older who live in the state of Maryland. Data collection, administered by the Scantron Corporation, ran from May 21 to August 1, 2016.

The margin of sampling error for the complete set of weighted data is  $\pm 4.3$  percentage points. For more details on the design, execution and analysis of the survey, please see the full methodological report, which can be found in Appendix 2 of this report.

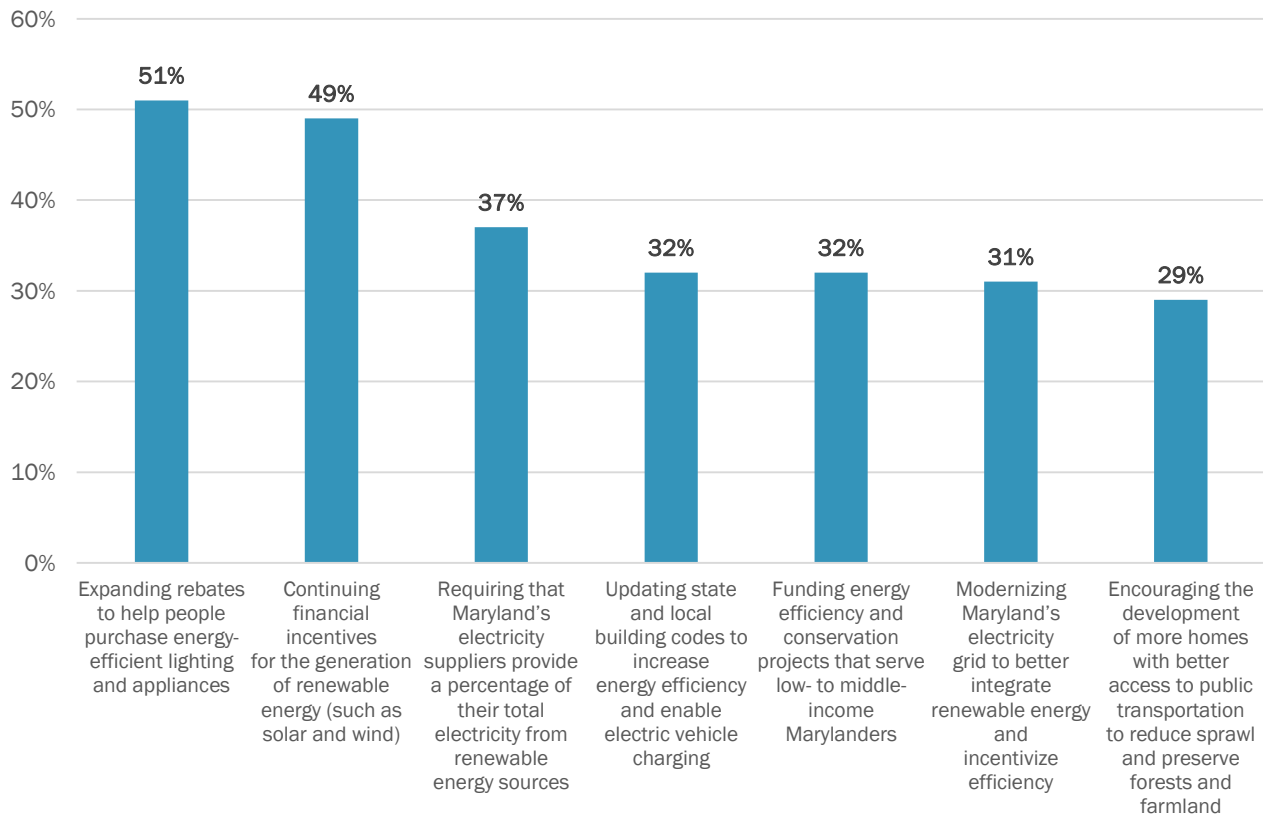


# Chapter 1: Most residents support the state's energy policies

Maryland has begun implementing policies to promote more affordable, clean and dependable energy for individuals, families and businesses throughout the state. Despite the state rolling out these initiatives, fairly small percentages of state residents are actually aware of the energy policies. Yet Marylanders support the state's plans as described in the survey.

The 2016 survey includes seven current energy policies. Of these seven, a majority of Marylanders are only familiar with one of them: expanding rebates to help people purchase energy-efficient lighting and appliances. Close behind are 49 percent who have heard of the state continuing financial incentives for the generation of renewable energy sources such as solar or wind power. However, for the remaining initiatives, recognition among residents is considerably lower, on average just three in ten.

Figure 1: Have heard of these Maryland energy policies



Thirty-seven percent are aware of Maryland's requirement that state electricity suppliers provide a portion of the electricity from renewable sources but six in ten have never heard of this policy until they took the survey.

Less than one-third have heard about the state's efforts to increase energy efficiency by updating building codes (32%) or modernizing the electricity grid (31%). And when it comes to policies that intersect with families and their homes, just three in ten are familiar with Maryland funding energy

efficiency and conservation projects to ease burden on the wallets of its lower-income residents (32%) or the development of more homes with better access to public transportation options (29%). The vast majority, about seven in ten, have never heard of these policies.

## Awareness of energy policies has fluctuated over the years

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Public awareness of the state’s expansion of rebates to help with purchasing energy-efficient options for the home has fluctuated over time, dipping to its lowest levels in the current poll. In 2013, 70 percent of Marylanders knew about this energy policy. This dropped to 56 percent in 2014, grew slightly in 2015 to 61 percent, and fell again in 2016, this time to just 51 percent.

Table 1: Public awareness of energy policies				
Have heard of this policy...	2016	2015	2014	2013
Expanding rebates to help people purchase energy-efficient lighting and appliances	51%	61%	56%	70%
Encouraging the development of more homes with better access to public transportation to reduce sprawl and preserve forests and farmland	29%	35%	28%	39%

Fewer Marylanders today are familiar with the state’s plan to encourage better city planning to reduce sprawl and preserve land. Just 29 percent today know about this initiative, down six points in the last twelve months and ten points since its highest recognition in 2013.

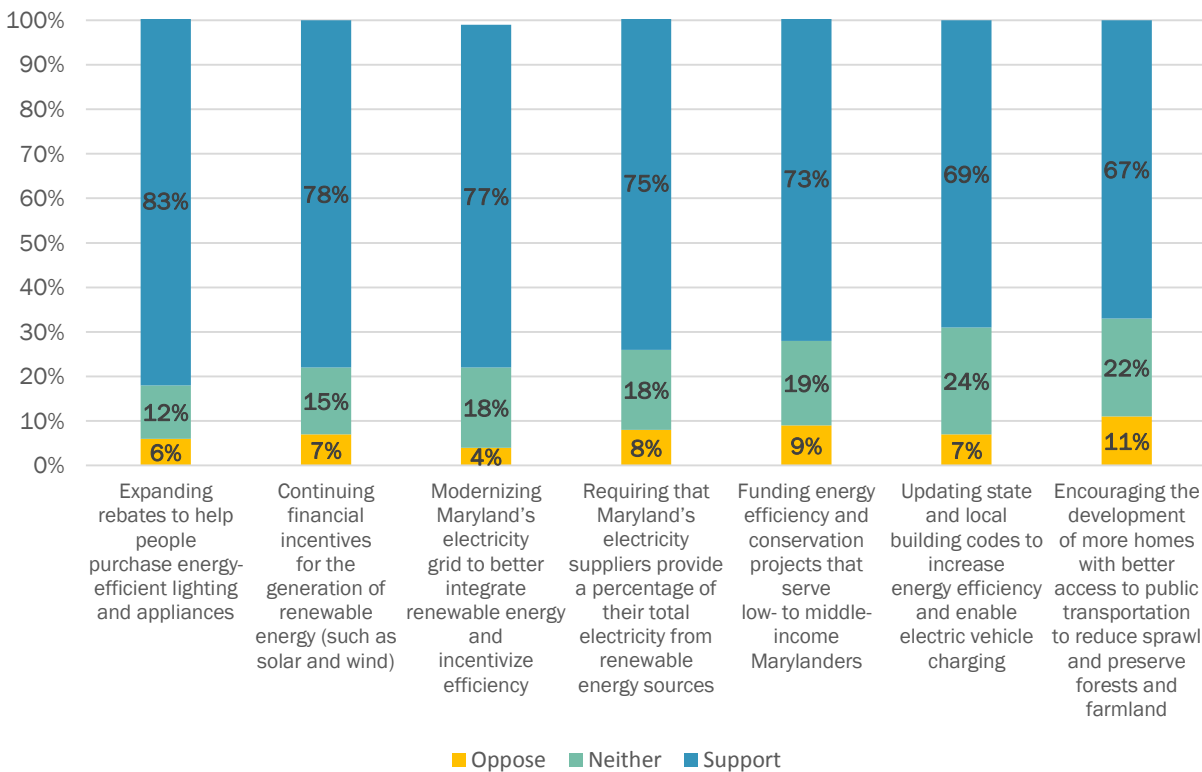
## There is large-scale support for state energy initiatives

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Substantial majorities of state residents are in favor of the energy policies that Maryland has started instituting. All policies asked about in the 2016 poll have the support of at least two-thirds of the population. Very few Marylanders are ambivalent or opposed to the state’s energy plans.

Four out of five Marylanders support expanding rebates to help people purchase energy-efficient lighting and energy-efficient appliances (28% somewhat support, 55% strongly support). Nearly as many think continuing financial incentives for the generation of renewable energy is a good idea (27% somewhat support, 51% strongly support).

Figure 2: Support for Maryland energy policies



Chesapeake State adults also say that modernizing Maryland’s electricity grid to better integrate renewable energy sources is a valuable endeavor. Seventy-seven percent support this policy, with almost half saying they strongly support it.

Three-quarters of Marylanders agree with the state requiring electricity suppliers to use renewable energy sources when providing a percentage of power to consumers. Just 18 percent neither support nor oppose the measure and fewer still, eight percent, are against the policy.

About seven in ten residents think that funding energy efficiency and conservation projects that serve low- to middle-income Marylanders is a good idea. A similar share, 69 percent, agree with state efforts to update building codes to increase energy efficiency and allow people to charge their electric vehicles.

The energy initiative that receives the lowest support still receives favorable marks from two-thirds of residents. Sixty-seven percent of Marylanders think developing homes to have better access to public transit options is a sound environmental policy that helps preserve forests and farmland by reducing sprawl. One in ten say they are opposed to this policy.

## Supporters are more likely female or college graduates

Women, more than men, say they support the state's energy policies. Of the seven policies asked about in the current survey, there is stronger support among women for five of the state mandates.

	<b>Women</b>	<b>Men</b>
Expanding rebates to help people purchase energy-efficient lighting and appliances	86%	79%
Continuing financial incentives for the generation of renewable energy (such as solar and wind)	82%	73%
Funding energy efficiency and conservation projects that serve low- to middle-income Marylanders	81%	63%
Updating state and local building codes to increase energy efficiency and enable electric vehicle charging	74%	64%
Encouraging the development of more homes with better access to public transportation, as a means to reduce sprawl, and preserve forests and farmland	74%	60%

Compared with those who have a high school diploma or less, college graduates are more likely to say they support six of the seven energy policies being implemented in Maryland.

	<b>College graduates</b>	<b>HS graduates or less</b>
Expanding rebates to help people purchase energy-efficient lighting and appliances	88%	74%
Modernizing Maryland's electricity grid to better integrate renewable energy and incentivize efficiency	84%	66%
Continuing financial incentives for the generation of renewable energy (such as solar and wind)	83%	72%
Requiring that Maryland's electricity suppliers provide a percentage of their total electricity from renewable energy sources	81%	66%
Updating state and local building codes to increase energy efficiency and enable electric vehicle charging	81%	52%
Encouraging the development of more homes with better access to public transportation, as a means to reduce sprawl, and preserve forests and farmland	76%	56%

## Marylanders show steady support for energy programs over the years

Despite lower levels of public awareness for certain state energy policies, support for those policies has remained remarkably consistent over the last three years. For Maryland’s expansion of rebates to purchase energy-efficient lighting and appliances, four in five residents are currently in favor of this policy, as they have been in the past three waves of this study.

<b>Table 4: Level of support for state energy programs</b>				
	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>
Expanding rebates to help people purchase energy-efficient lighting and appliances				
Support	82%	84%	82%	80%
Neither	12%	10%	13%	12%
Oppose	6%	6%	6%	8%
Encouraging the development of more homes with better access to public transportation to reduce sprawl and preserve forests and farmland				
Support	67%	67%	63%	66%
Neither	22%	20%	27%	23%
Oppose	11%	13%	11%	11%

Support for improved planning for home development has also remained fairly steady since 2013. Two-thirds support this energy initiative now, as they did in both 2015 and 2013. The current finding is up slightly from 63 percent support in 2014, as fewer residents are undecided about their opinion and come out in favor of the policy.

## Chapter 2: Many Marylanders say the Greenhouse Gas Reduction Plan will likely benefit the economy, but there's uncertainty about current economic projections

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Policymakers believe there will be significant financial and workforce gains from the Greenhouse Gas Reduction Plan, the state's plan to reduce greenhouse gas emissions by 40 percent from 2006 levels by the year 2030. Maryland adults are split in their opinion of the state's evaluations with the largest percentages of the public reporting they do not know enough to say.

Twenty-six percent say it is likely that the greenhouse gas reduction policies will generate between \$2.5 and \$3.5 billion in economic benefits, as projected by the state. Thirty percent say this is unlikely. The largest share, 44 percent, do not have an opinion.

Roughly the same number are skeptical about the projected job growth to result from these policies. Thirty-one percent say the Greenhouse Gas Reduction Plan is likely to yield or maintain 26,000 to 33,000 jobs by the year 2020. Twenty-seven percent say this is unlikely, while a larger percentage do not know enough to say (42%).

One-quarter say it is likely that these policies will have no projected impacts on the state's manufacturing industries. Three in ten (32%) are more optimistic that there will be some positive impact on the state's manufacturing. Four in ten are unsure.

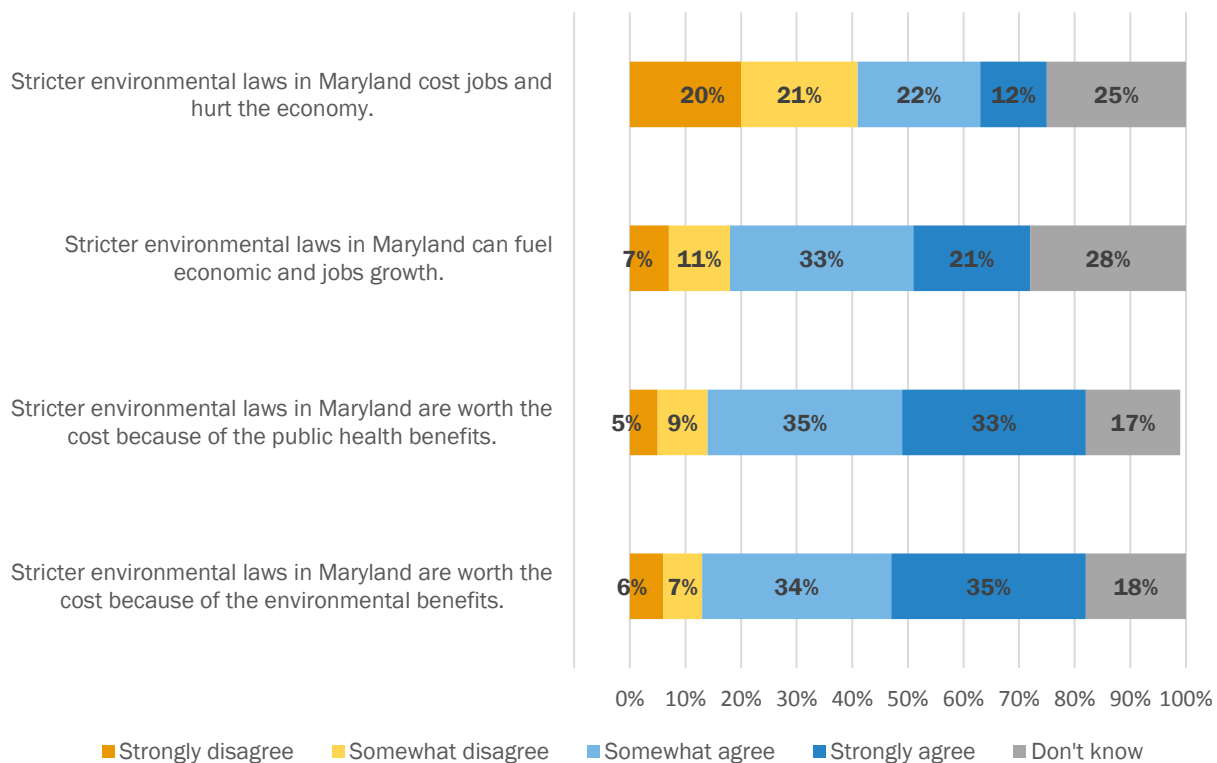
### Stricter environmental laws have more pluses than minuses

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Despite public uncertainty regarding the projected economic benefits from the Greenhouse Gas Reduction Plan, majorities of Marylanders say that stricter environmental laws are worth the effort and cost.

Nearly seven in ten Marylanders say stricter environmental laws are worth it because of the potential benefits to the environment. Just as many say stricter laws would result in improved public health (68%), including one-third who feel this way strongly.

Figure 3: How much do you disagree or agree with the following statements?



More than one-half agree that stricter environmental laws in Maryland can fuel economic and jobs growth (33% somewhat agree/21% strongly agree). About one in five (18%) do not think stricter laws would boost economic growth and just over a quarter say they do not know.

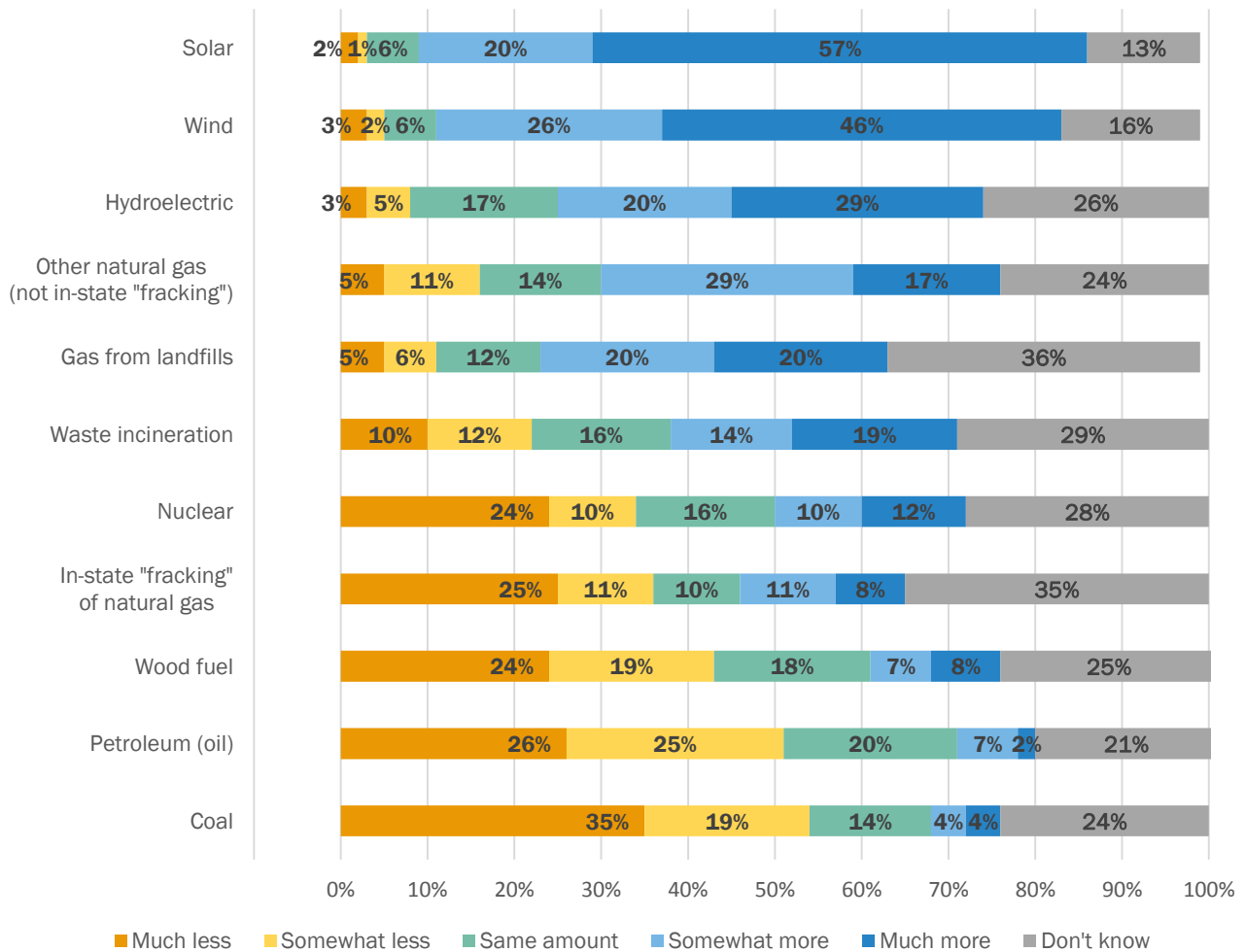
# Chapter 3: Residents want to see increased use of renewable energy sources

Residents want to see increased use of renewable energy sources in the state. More traditional sources of electrical energy like coal, that are also more polluting, are less desirable than cleaner options.

## Solar, wind and hydroelectric energy earn top marks

A large majority of Marylanders say the state should use more solar energy (77%) over the next several years, including nearly six in ten who would like to see much more solar power used as an electrical energy source. Less than ten percent say the same amount or less solar power should be used. Thirteen percent could not provide an opinion.

Figure 4: Over the next several years, do you think Maryland should use less, more or about the same amount of each of these sources of electrical energy?





Harnessing wind energy is a close second. Seventy-two percent of residents want Maryland to use more wind energy in the coming years (26% somewhat more, 46% much more). Sixteen percent do not know enough to say.

A distant third are hydroelectric sources, including dams. Just about half (49%) would like to see the state use more hydroelectric energy sources, 17 percent say the same amount and just eight percent say less. A quarter of Marylanders are unsure about hydroelectricity.

Forty-six percent say sources of natural gas other than that obtained by hydraulic fracturing in Maryland (“fracking”), should be used more in the Old Line State.

## **Residents say less coal and oil should be used**

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More than half of Marylanders say that the state should use less fossil fuels over the next several years as electrical energy sources. Very few say the state should use more of these energy sources, with almost a negligible amount saying much more should be used in Maryland.

Fifty-four percent want to see the state use less coal for electrical energy, including over one-third (35%) who say much less coal should be used. One in seven are fine with the same amount of coal being used and just eight percent say more coal should be used.

Petroleum, or oil, fares about the same as coal. Fifty-one percent say oil energy should be used less in Maryland, with equal shares saying somewhat less or much less. One in five say about the same amount of petroleum should be used as an electrical energy source in the years to come. Nine percent would like to see more oil used to fuel their homes and Maryland overall. Of note, Maryland – and indeed the U.S. – currently use very little oil to fuel electric power plants.

Wood fuel rounds out Marylanders’ three least preferable energy sources. Fifteen percent want wood fuel used more, 18 percent say the same amount and 43 percent say wood fuel should be used less over the next several years.

At least two in ten residents are unsure how the state should use these three energy sources in the future.

## **There are signs of caution about less familiar energy sources**

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Residents are more cautious about newer or lesser-understood energy options like hydraulic fracturing, nuclear energy, incineration of waste and use of gas from landfills, with significant percentages expressing they do not know enough about these energy sources to offer an opinion.

Though no hydraulic fracturing, or fracking, of natural gas is currently occurring in Maryland, more than one-third of residents are unsure about how they feel about introducing the option as fuel for electrical energy in the state. Nineteen percent would like to increase fracking, while 36 percent want to see less of it, illustrating their distaste for this potential energy source.

According to the U.S. Energy Information Administration, 40 percent of the state's net electricity in 2015 was produced by the Calvert Cliffs nuclear facility, Maryland's only nuclear power plant.<sup>1</sup> Despite the large amount of electricity generated by nuclear power, significant percentages of the state's adult population either would like to see nuclear energy used less or express doubts. Thirty-four percent say Maryland should use less nuclear energy, including almost one-quarter who say much less. Twenty-eight percent say they do not know how much nuclear energy should be used to generate electricity in the future.

Residents were also asked about two energy sources that originate from the refuse produced by individuals, families and businesses throughout the state: gas from landfills and incineration of waste.

Forty percent say gas from landfills should be used more as an electrical energy source. Almost as many, 36 percent, cannot offer an opinion.

A similar finding emerges for incineration of waste as an energy source. Thirty-three percent support more waste incineration to generate electricity and almost as many, 29 percent, say they do not know enough to say.

## Likely voters echo the general public

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The state's goals to increase use of renewable energy sources and develop alternatives to conventional fuels have important consequences to Marylanders. Elected officials pay close attention to views expressed by the constituents with the biggest impact on their runs for office: likely voters.<sup>2</sup> In this pivotal election year, likely voters mirror the general public in their views on energy sources for electricity generation.

Nearly eight in ten likely voters would like to see more energy generated from solar power. Seven in ten would welcome more use of wind energy. In contrast, majorities of likely voters support Maryland reducing its use of coal and oil (58% use less coal, 51% use less petroleum). While oil is not a primary source of electrical energy for the state, coal remains so.

For six of the eleven energy sources asked about in the current survey, a quarter or more of likely voters say they do not know if more, less or the same amount should be used to fuel the state.

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<sup>1</sup> U.S. Energy Information Administration: <https://www.eia.gov/state/print.cfm?sid=MD>

<sup>2</sup> Likely voters are defined as those who know where people in their neighborhood go to vote and say they always or nearly always vote.

Table 5: Likely voters' opinion on energy sources				
	Use more	Use less	Use same amount	Don't know
Solar	78%	3%	5%	14%
Wind	73%	6%	6%	15%
Hydroelectric	49%	7%	18%	26%
Other natural gas (not in-state "fracking")	44%	17%	16%	24%
Gas from landfills	39%	11%	14%	36%
Waste incineration	32%	22%	19%	28%
Nuclear	24%	31%	20%	26%
In-state "fracking" of natural gas	17%	38%	12%	34%
Wood fuel	12%	45%	19%	25%
Coal	7%	58%	14%	21%
Petroleum	6%	51%	22%	21%

## The strength in support for solar, wind, and hydroelectricity dips in 2016

Since 2013, both solar and wind energy have seen increased support among Marylanders. However, over the last twelve months, the share of residents who want to see these two renewable energy sources used more has declined by a few percentage points.

Support for enhanced use of hydroelectric energy sources like dams had the biggest decline since 2015, dropping seven points to 49 percent in the current survey.

Table 6: Opinion on energy sources over time				
Maryland should use MORE...	2016	2015	2014	2013
Solar	77%	82%	78%	69%
Wind	72%	78%	69%	59%
Hydroelectric	49%	56%	53%	49%
Other natural gas (not in-state "fracking")	46%	46%	49%	41%
Nuclear	22%	21%	24%	21%
In-state "fracking" of natural gas	19%	23%	28%	33%
Wood fuel	15%	13%	20%	13%
Petroleum	9%	10%	9%	6%
Coal	8%	7%	12%	12%

Over the last twelve months, the percentages of residents who say each of these electrical energy sources should be used less over the next several years has remained relatively steady. Wood fuel has lost some support among the public, now with 43 percent expressing a wish for the state to use less of it.

Compared with 2013, notably more Marylanders today say they want the state to use less wood fuel (16-point difference), less hydraulic fracturing or "fracking" (12-point difference), and less coal (10-point difference).

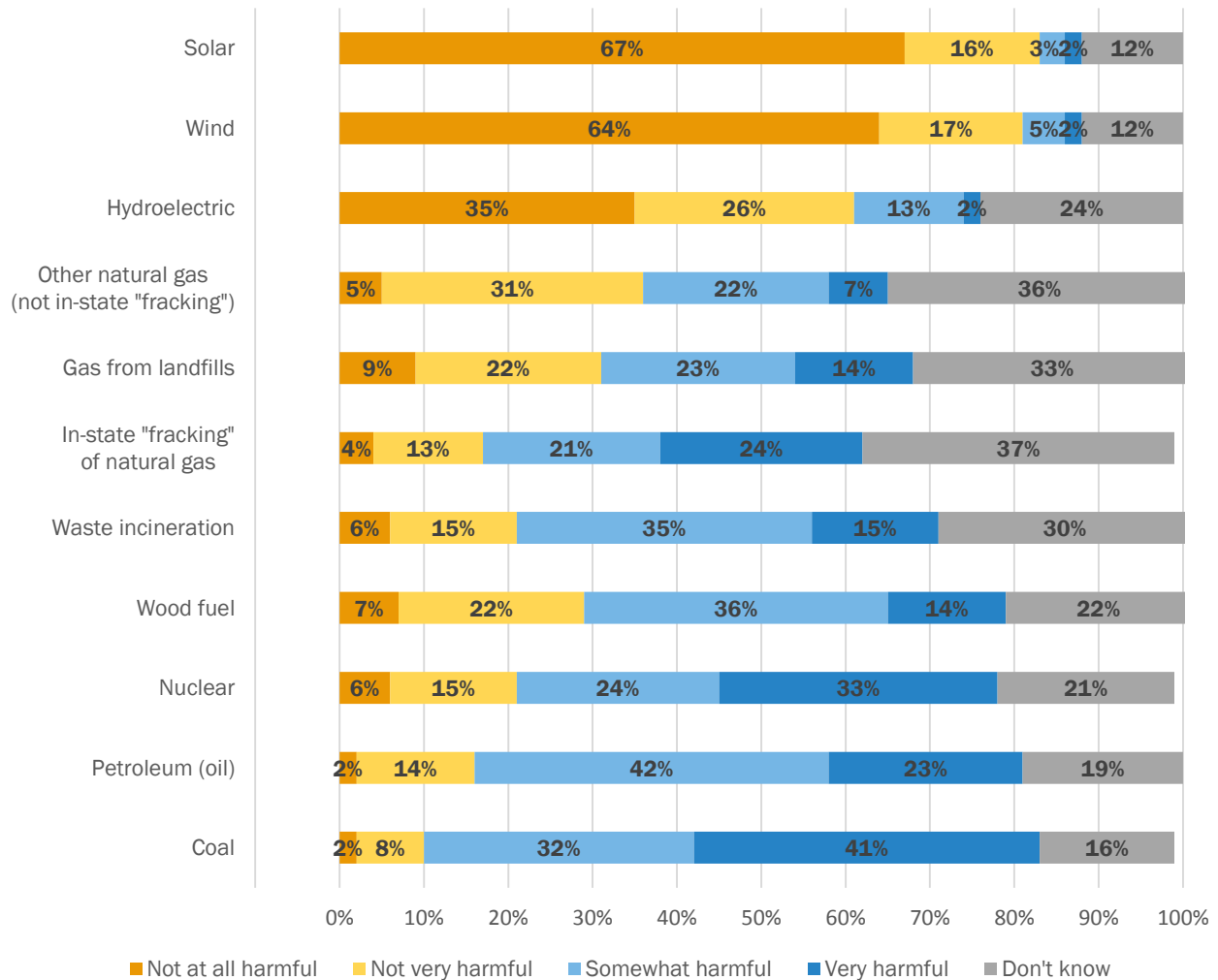
<b>Table 7: Opinion on energy sources over time</b>				
<b>Maryland should use LESS...</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>
Coal	54%	52%	50%	44%
Petroleum	51%	51%	51%	48%
Wood fuel	43%	38%	25%	27%
In-state "fracking" of natural gas	36%	33%	33%	24%
Nuclear	34%	33%	32%	31%
Other natural gas (not in-state "fracking")	16%	13%	12%	11%
Hydroelectric	8%	6%	6%	6%
Wind	5%	4%	5%	8%
Solar	3%	3%	3%	4%

## **Marylanders say the state should use more of the least harmful energy sources and less of the most harmful**

Solid majorities not only want more of Maryland's electricity to come from solar and wind energy, they also consider these two energy sources to be the least harmful to people's health. Eight in ten residents say solar and wind energy are not harmful, including more than six in ten who say they are not at all harmful to people's health. Only a handful report solar- or wind- generated electricity is unsafe for people, with a trivial two percent saying each is very harmful.

Sixty-one percent consider hydroelectricity to be generally safe for people's health. Fifteen percent say it is harmful (13% somewhat harmful, 2% very harmful). About a quarter (24%) are unable to rate the risk level of hydroelectric energy sources on people's health.

Figure 5: Please rate each of the following sources of electrical energy in terms of how harmful they are to people's health.



Conventional fossil fuels are considered the most harmful to people's health. Seventy-three percent say coal is harmful, including 41 percent rating it as very harmful and 32 percent somewhat harmful. Oil energy receives poor marks from two-thirds of Marylanders, with the largest share, 42 percent, saying it has a somewhat harmful impact on people's well-being.

A majority of residents also rate nuclear (57%) and wood (50%) energy sources to be harmful. Another two in ten are unable to provide an opinion.

Three in ten or more adults are also unsure about the health impacts that might arise from electrical energy generated from landfill gases, fracking, other natural gas sources and incineration of waste, demonstrating an opportunity for elected officials and energy experts to communicate with the public about potential energy alternatives.

## More residents view coal, oil and wood fuel as harmful

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Over the last year, more residents say that coal, petroleum and wood fuel have negative health effects. Wood fuel in particular has seen a spike in those who rate it as harmful to people's health: up four points since 2015, 19-points since 2014 and 16-points since 2013.

<b>Table 8: Energy sources that are harmful to people's health</b>				
	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>
Coal	73%	69%	72%	68%
Petroleum	65%	62%	64%	59%
Nuclear	57%	57%	58%	58%
Wood fuel	50%	46%	31%	34%
Fracking	45%	44%	46%	44%
Other natural gas	29%	26%	29%	29%
Hydroelectric	15%	13%	10%	12%
Wind	7%	3%	4%	5%
Solar	5%	4%	4%	7%

Electricity generated from solar, wind and hydroelectric sources continue to be rated as the least harmful to residents' health.

## Chapter 4: Half of Marylanders are willing to pay more for renewable energy

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Echoing the widespread support for increased use of wind and solar energy over the next several years, a majority of Marylanders say they are willing to pay more out of their own pockets to purchase electricity from these two sources.

One-half of residents are willing to pay more each month on their electricity bill in order to purchase 100% of their electricity from wind. Two in ten are willing to pay more than \$10 a month extra and about three in ten are willing to pay a modestly small amount more per month: \$10 or less.

Roughly the same findings appear when Marylanders are asked about paying more for solar energy. More than half are willing to pay more per month to purchase 100% electricity from solar power, including 17 percent who would pay an additional five dollars or less and 14 percent who would pay an extra six to ten dollars. Two in ten are willing to pay more than ten dollars more a month.

### Majorities of Millennials and Generation X are willing to pay more

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A majority of Millennials (ages 18-35) and Generation X (ages 36-51) say they are willing to pay more per month for wind- or solar-generated electricity. Baby Boomers (ages 52-70) are more split in their opinions.

More than 60 percent of Millennials are willing to pay more per month for wind energy, including 23 percent who are willing to pay more than \$10 a month. Fifty-six percent of Generation X indicate they would pay more for wind energy, including 22 percent who would be fine with adding more than \$10 to their monthly utility bill.

Even more of these younger Marylanders are willing to open their wallets for solar energy. Two-thirds of Millennials are willing to pay more for solar-generated electricity, including 26 percent saying more than \$10 a month extra would be fine. The same share of Generation X would pay more for solar energy (56%) as they would for wind energy, including 25 percent who would pay more than \$10 a month.

Figure 6: How much more would you be willing to pay each month on your electricity bill to purchase 100% of your electricity from these fuel sources? / WIND

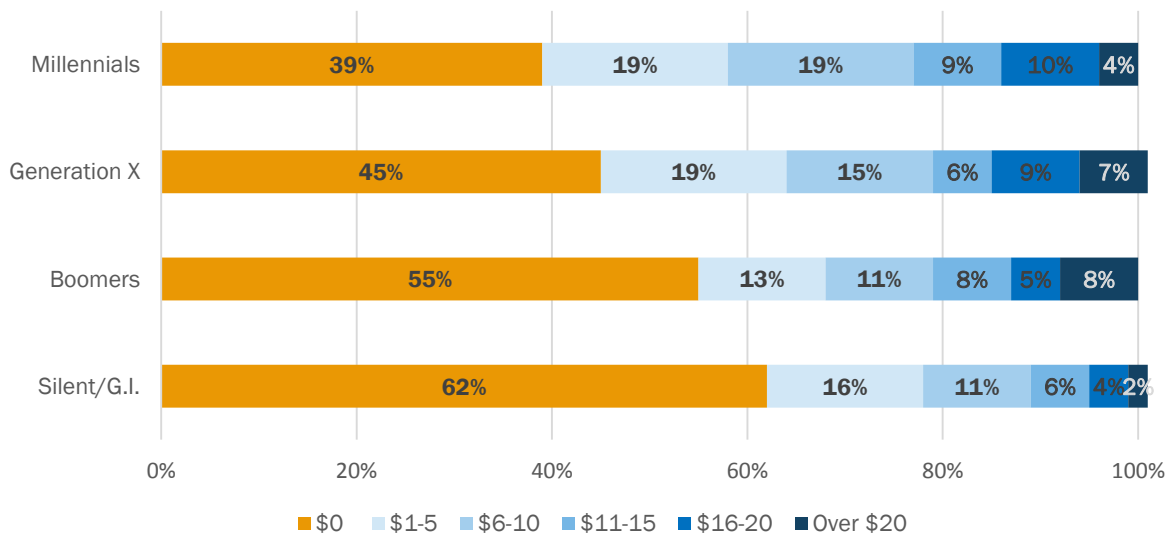
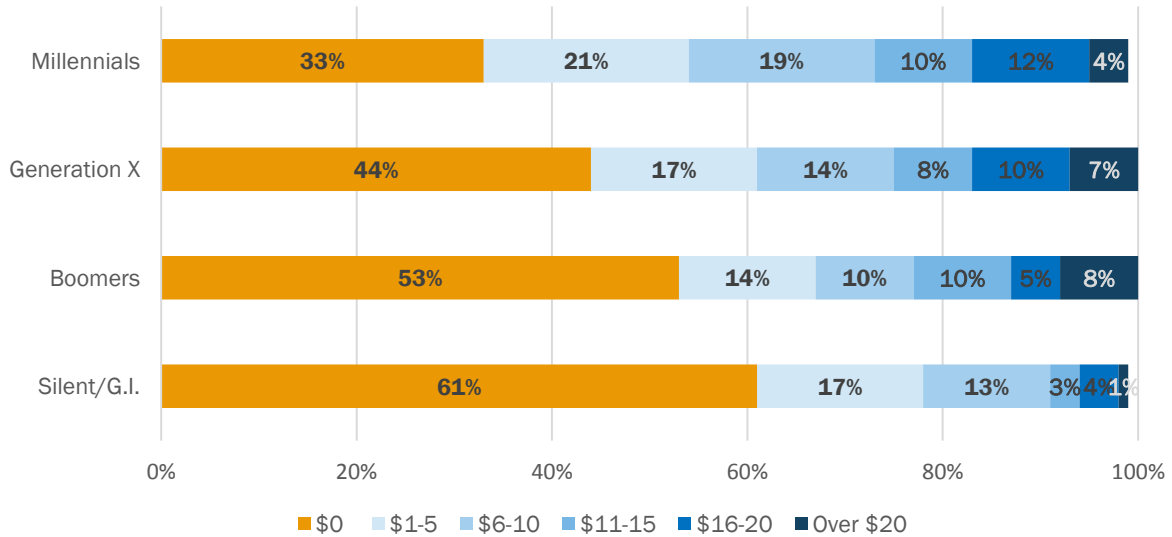


Figure 7: How much more would you be willing to pay each month on your electricity bill to purchase 100% of your electricity from these fuel sources? / SOLAR



Older Marylanders are the least willing to pay more to purchase all of their electricity from renewable energy sources. These residents, particularly in the oldest generations, are often retired, suffer from illnesses or disabilities that restrict their abilities to work or live on fixed incomes. Six in ten of the oldest Marylanders (ages 71 or older) would not pay more for wind or solar energy, over 20 percentage points more than the youngest Marylanders, the Millennials.



Working class residents (those making less than \$50,000 a year) also do not want to pay more per month on their electricity bills. Fifty-eight percent of working class adults say they are unwilling to pay more for electricity generated exclusively through wind power, compared with 43 percent of higher income residents. Fifty-four percent of Maryland's working class will not pay more for solar energy, double digits more than the 42 percent of higher income adults who say the same.

## Twelve months later, fewer are willing to pay more

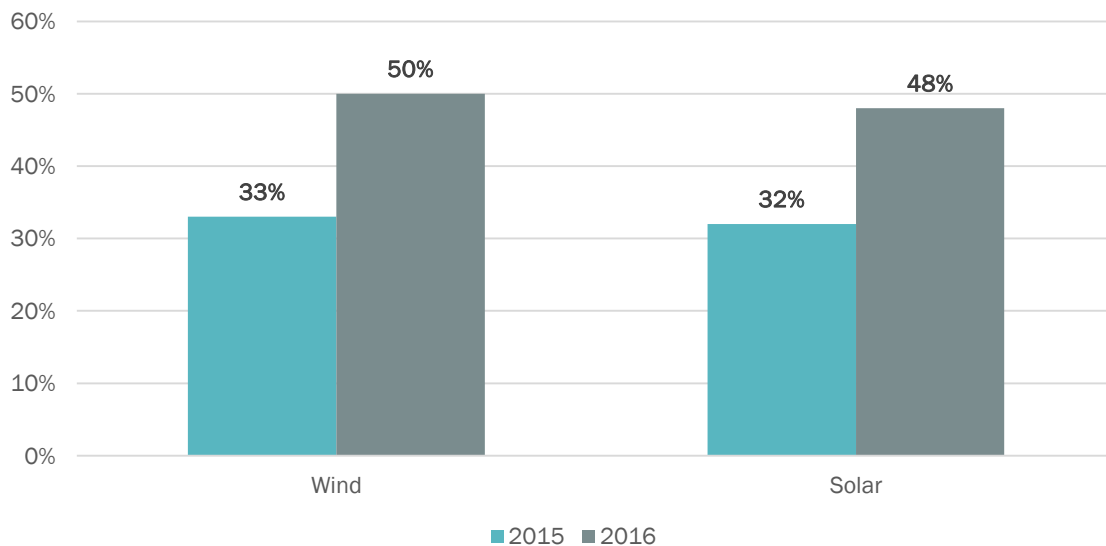
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In just the last year, there has been a huge spike in the number of Marylanders who say they are unwilling to pay more on their monthly electricity bills to purchase wind- or solar-generated power.

In 2015, one-third of residents said they would not pay more for 100% wind-generated electricity. One year later, fully one-half are unwilling to increase their monthly electricity bills by any dollar amount, an increase of 17 percentage points in twelve months.

Those willing to pay for solar-generated electricity has also declined since 2015. Thirty-two percent last year were unwilling to pay more for solar electricity, compared with the 48 percent who are unwilling this year.

Figure 8: Not willing to pay more for these fuel sources



## Chapter 5: Half are familiar with Smart Grids

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As technology develops at a rapid pace, utilities are working to integrate digital communication in order to supply energy most efficiently to consumers throughout the state. Enter Smart Grids. Smart Grids use two-way communication technologies to detect, measure and respond to energy usage in local communities. Smart appliances and devices in homes and businesses relay data about energy consumption and identify usage patterns that pass through the automated digital network to a central location. From that central location, utilities can control and adjust energy usage, limiting the need for human contractors to be onsite.

Many Marylanders have heard of Smart Grids, but it is a term that is unfamiliar to quite a few others. About half, 48 percent, of state residents have heard of the term “Smart Grid.” About four in ten do not recognize this term, and about one in ten are unsure if they have ever heard of Smart Grids.

Forty-two percent already have a Smart Meter installed in their home. An equal share, 42 percent, do not. Sixteen percent report they do not know if they do or do not have a Smart Meter in their home.

### Demographic differences in Smart Grid familiarity

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There are a number of demographic differences when it comes to awareness of Smart Grids. Sex, race, education, income and home ownership all seem to play a role.

Men are more likely than women to have heard of Smart Grids. Nearly six in ten men are familiar with Smart Grids, compared with 41 percent of women.

At 56 percent, whites are significantly more likely to have heard of a Smart Grid, compared with racial or ethnic minorities (37%).

Higher levels of educational attainment also translate to higher awareness of Smart Grids. Sixty-two percent of college graduates have heard of the term, 45 percent of those with some college but no degree and 34 percent of those with less education.

Higher-income residents tend to be more familiar with Smart Grids than working class adults. Fifty-nine percent of those with annual incomes of \$50,000 or more have heard of Smart Grids. This drops to 31 percent among lower-income adults.

Least surprising is that more homeowners than renters have heard of Smart Grids. More than half of those who own their homes (54%) are familiar with the term Smart Grid, compared with 34 percent of renters who say the same.

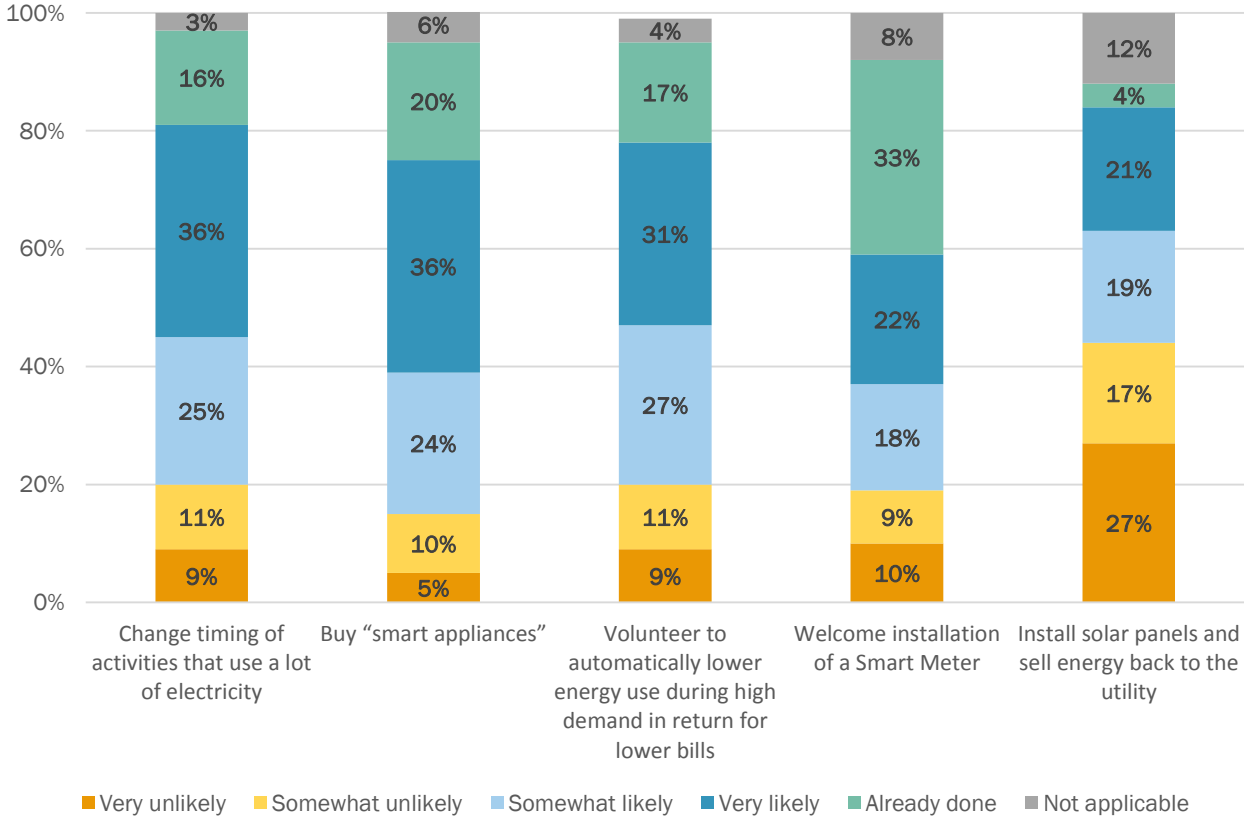
# Chapter 6: Marylanders are embracing the idea of Smart Grids and smart technology

As more local communities and utilities adopt the use of Smart Grids, there will be some changes that consumers will face as the technology is upgraded. But even though many have not yet started using the technology themselves, Marylanders are embracing the idea of Smart Grids and other smart technology, as well as the changes that may result.

When asked how likely they would be to welcome the installation of a Smart Meter in their homes, four in ten say they would be likely to do so, including 22 percent who say they are very likely to install a Smart Meter.

A range of "smart appliances" that automatically reduce energy use during high demand – like dishwashers, refrigerators and washing machines – are also increasingly available for purchase. One in five residents report they already have “smart appliances” at home. Sixty percent say the prospects of buying these appliances are fairly or very good, including 36 percent who say they are very likely to make the purchase. Two in ten say they have already bought smart appliances.

Figure 9: Smart Grids will mean some changes for consumers. How likely would you be to...



Six in ten Marylanders would be likely to change the timing of household activities that traditionally use a lot of electricity, such as drying clothes, in order to take advantage of lower electricity costs during nighttime hours. Over one-third would be very likely to do this and 25 percent are somewhat likely. Two in ten say they are unlikely to change the time of day they do certain household activities to lower their electricity bills, while nearly as many, 16 percent, say they already do this.

Similarly, almost six in ten residents (58%) would volunteer to have their energy use automatically lowered during times of high demand, like heat waves or severe cold, in return for lower electricity bills. Two in ten are unlikely to volunteer to have utility companies control their energy usage this way, and 17 percent say they already have.

Marylanders are more split on whether they would install solar panels on their homes or in their communities and sell the energy generated through those panels back to the utility companies, lowering their monthly bills. Forty percent say they would likely do this, compared with 44 percent who report installation of solar panels is unlikely (17% somewhat unlikely, 27% very unlikely). A handful, four percent, have already installed solar panels.

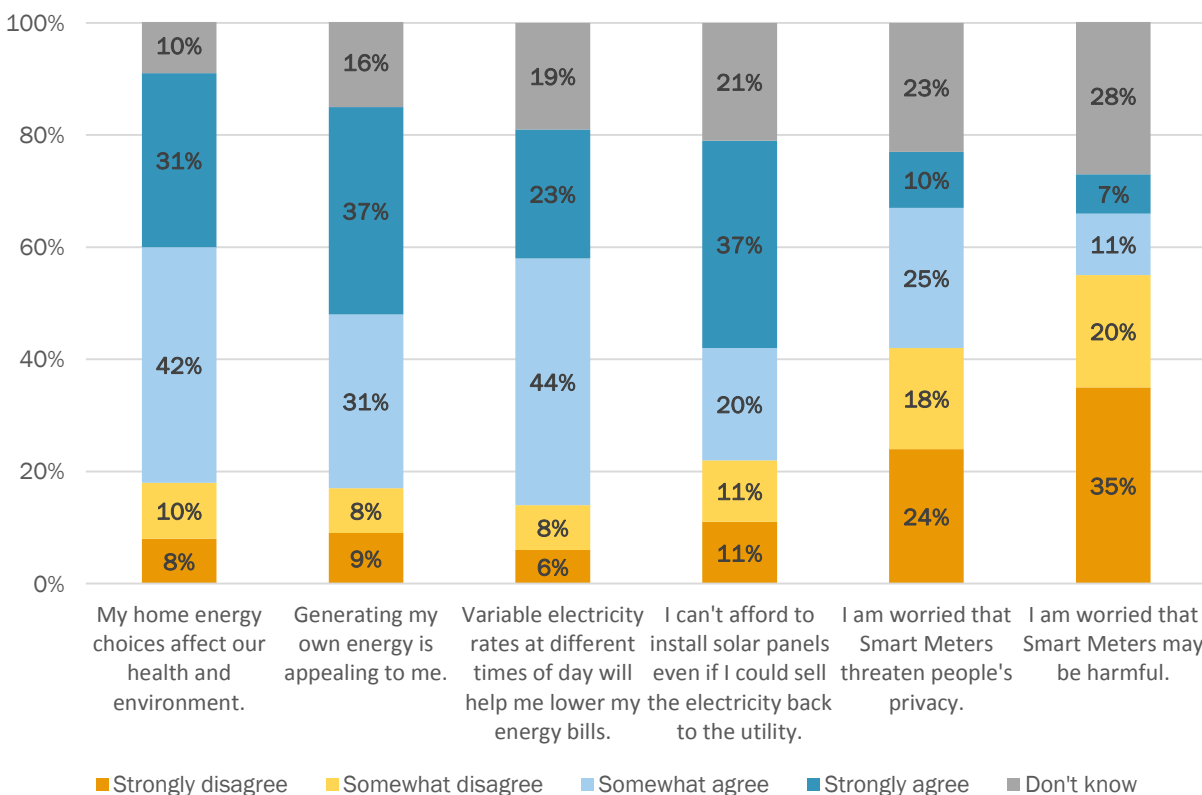
## Chapter 7: Some elements of Smart Grid systems are appealing but residents have concerns

New avenues for energy efficiency and micro-energy generation are appealing to Marylanders. Yet, many have concerns about their ability to afford installing the systems that would allow them to generate their own energy. Only small percentages voice concerns about Smart Grid deployment due to privacy issues or health effects.

Old Line State residents understand the interconnectedness of their choices and actions on their well-being and the world around them. Seven in ten agree that their home energy choices affect their health and the environment. Eighteen percent disagree with that idea and ten percent do not have an opinion.

One of the advantages of Smart Grid systems is their potential ability to easily allow residents to sell power that they generate back to their electricity provider. To that end, two-thirds express interest in generating their own energy, including over one-third (37%) who consider this is very appealing. Less than one in five are not tempted by the idea of generating their own energy.

Figure 10: How strongly do you disagree or agree with the following statements?



Two-thirds also agree that variable electricity rates at different times of day will help them lower their electricity bills. Two in ten are unsure if that is true or false.

A small percentage of Marylanders are concerned about what consequences might result from increased use of Smart Grids and smart technology, particularly in the age of regular data breaches and savvy hackers with poor intentions. More than one-third are worried that Smart Meters threaten people's privacy. A smaller number, 18 percent, go one step further and say they worry that Smart Meters may be harmful to health.

Forty-four percent say they are unlikely to install solar panels for their home or community. For a majority, money seems to be one of the major obstacles. Fifty-seven percent cannot afford to install solar panels on their homes, even if they could sell the electricity back to the utility firms for increased savings.

## Chapter 8: Less polluting transportation options are often seen as unappealing by many Marylanders

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Despite widespread concerns about climate change, Maryland residents are largely single occupant commuters and find transportation alternatives to be difficult to come by and often unappealing.

Two-thirds of Maryland adults say they almost always drive a car or truck as a single occupant to get to work, school or other primary daily activity. Another 10 percent choose this mode of transportation most of the time.

More energy efficient modes of commuting – that also reduce greenhouse gas emissions and other air pollutants – are not as widely used. Half (53%) say they never carpool or never use a train or subway (55%) for their primary daily activity. Sixty-two percent never ride a bus to get to work or school, while less than 10 percent say they ride the bus most of the time or almost always.

A sizeable percentage of Marylanders do walk to work or school (47%), although the largest share of this group only does this on occasion (35%). Nearly as many, 44 percent, never walk to their primary daily activity.

Despite efforts to expand and improve bike lanes, just 17 percent say they ever commute by bike; the largest share say they only do that sometimes (14%). Seven in 10 residents (71%) say they never use a bicycle to get to work or school.

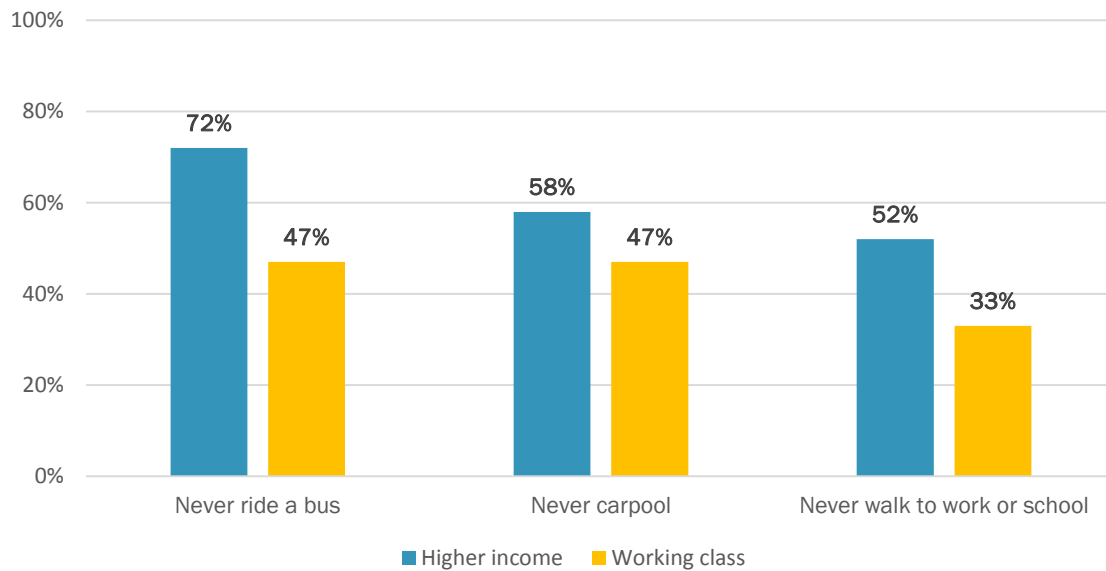
### Who travels less green?

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Higher-income Marylanders – those with annual incomes of \$50,000 or more – tend to commute less "green" than working class residents (under \$50,000/year). More than eight in ten higher-income adults drive a car or truck to work or school almost always or most of the time, a 15 percentage point edge over working class commuters.

They are also more likely to never ride a bus, carpool with others, or walk to their primary daily activity, according to the findings in the 2016 study.

Figure 11: Transportation by income level



It is important to note that chosen modes of transportation can be linked to any number and combination of factors, including personal preference, availability of options, views and perceptions of alternative transportation, physical ability, income level, and household responsibilities, to name a few.

## Making the environmentally-friendly decision isn't always an option

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Marylanders face barriers in changing their daily commute. The overwhelming majority of residents choose to drive single-occupant cars or trucks to get to work or school. Part of the reason why they choose to drive themselves is simply because using public transportation is too hard or just not feasible. Others say alternatives like biking or walking to their primary activity are also outside of what is possible for them.

But what Marylanders have told us this year is that possible or not, convenience is key and some less polluting options just will not do.

## Cleaner transportation options and actions are a mixed bag

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Seventy-one percent consider public transportation to be an implausible means of commuting. However, even if it were easy for them, Marylanders do not like this option. Six in ten (63%) would not like taking public transportation if even they could.

An even greater percentage – 81 percent – say that biking or walking instead of driving to work, school or other primary daily activity is not feasible for them. Just 19 percent say this action is easy for them. Residents are split on whether they would like doing this - 48 percent dislike the idea and 52 percent like it.

Telecommuting, or working from home or other convenient location, has become increasingly available through employers and increasingly popular among employees. But some jobs do not or



cannot allow employees to work from home. Fifty-seven percent of Marylanders say telecommuting is hard or impossible, while 43 percent say this is something they can easily to. Regardless of whether they can work from home or not, nearly three-quarters (74%) would like the option, compared with 26 percent who would dislike it.

Marylanders prefer to drive themselves, but less polluting cars are newer to today's roads, compared with gasoline- or diesel-filled vehicles. They can initially come with a heftier price tag, but with fuel savings accruing over the life of the vehicle. Just over half, 55 percent, say that purchasing or leasing a fuel-efficient car or truck is too hard for them to do or impossible, a 10-point edge over those who say doing this would be easy. But residents say they would like to outfit themselves with a fuel-efficient car by a 73%-27% margin.

Despite the appeal, if fuel-efficient cars feel hard enough for Marylanders, making the purchase or lease of plug-in electric vehicles feels like more of a pipe dream. Seven in ten adults say that acquiring an electric car like the Nissan Leaf or Chevy Volt would be too hard, while 27 percent say it would be easy. Electric vehicles, though, have less allure than fuel-efficient cars. Forty-eight percent dislike the notion of electric cars, edged out only slightly by those who like the idea (52%).

## Chapter 9: Most say gasoline and diesel vehicles pollute the environment

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Carbon dioxide, or CO<sub>2</sub>, is the benchmark greenhouse gas used by the U.S. Environmental Protection Agency (EPA) to calculate global warming potential. CO<sub>2</sub> remains in the Earth's atmosphere for a long time, where it traps heat and contributes to the acidification of the world's oceans.

In November 2007, with the understanding that cars emit about one-third of the carbon dioxide in the state,<sup>3</sup> Maryland adopted the Maryland Clean Cars Program, which implemented the same stricter vehicle emission standards that were adopted by the state of California. According to Maryland's Department of the Environment, this program represents the first program of its kind in the state that aims to directly regulate carbon dioxide (CO<sub>2</sub>) emissions.

### Not all vehicles are created environmentally equal

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About three-quarters of Marylanders agree that the tailpipes of gasoline- or diesel-fueled motor vehicles release pollution that contributes to climate change. Just 14 percent disagree.

Three-quarters also agree that plug-in electric vehicles pollute the air less than gas or diesel vehicles, including almost half (48%) who strongly agree that electric vehicles are less polluting than traditional fuel vehicles.

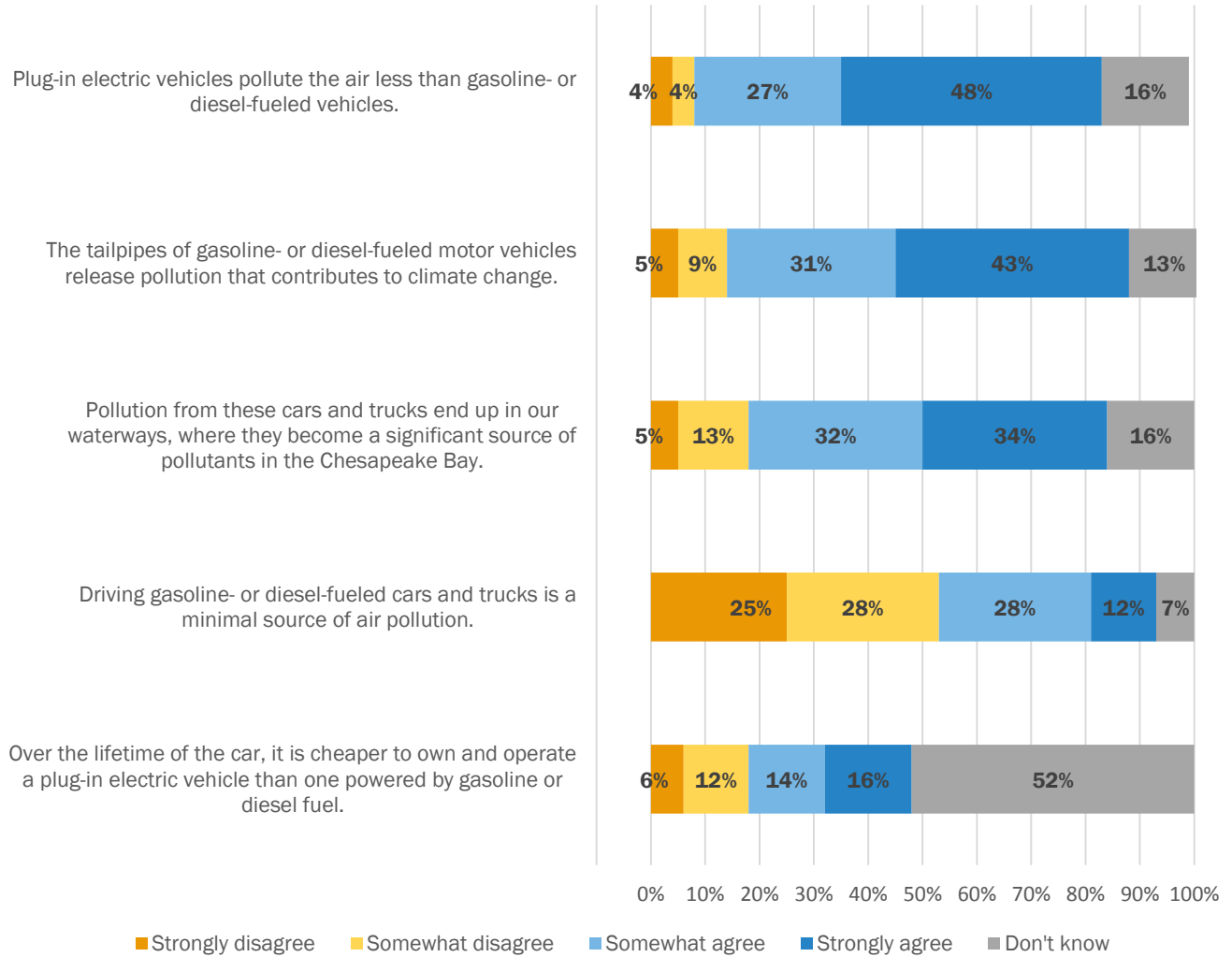
Marylanders recognize the threat that gas and diesel vehicles pose to the environment. Thirty-four percent strongly agree that pollution from these cars and trucks end up in Maryland's waterways, significantly contaminating the Chesapeake. Another 32 percent somewhat agree with that statement. Eighteen percent disagree and 16 percent do not know.

Compared with gasoline- or diesel-fueled cars and trucks, plug-in electric vehicles are newer to the market and their price-to-maintenance ratio is a big unknown for most Marylanders. When it comes to electric vehicles, people are just unsure about things like future car value, battery life and overall maintenance costs. Fifty-two percent say they do not know whether it is cheaper to own and operate an electric vehicle rather than a gas or diesel car.

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<sup>3</sup> Maryland's Department of the Environment:  
<http://www.mde.state.md.us/programs/Air/MobileSources/CleanCars/Pages/index.aspx>

Figure 12: How strongly do you disagree or agree with the following statements?



## Chapter 10: Marylanders report strong support for easing road congestion and improving air quality

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Residents of the Old Line State have to navigate one of the most congested set of roadways in the United States. To help combat road congestion and improve air quality, the state has begun implementing policies to smooth traffic woes. Majorities of Marylanders have heard about these state policies, and there is large support for the policies as well.

About six in ten residents have heard about the state promoting public transportation (59%) or making improvements to bike and pedestrian road access (58%). Half have heard about the policy for variable express lane fees based on road congestion (52%) or the state requirement that all new cars and other vehicles in Maryland be less polluting (51%).

There is only one policy asked about in the current study that does not ring a bell for a majority of Marylanders. Forty-four percent are aware that tax credits and other incentives are extended to those who purchase or lease plug-in electric vehicles, while 56 percent have never heard of this policy.

### Awareness of policies among subgroups

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When it comes to publicizing these programs, elected officials are reaching both men and women about equally. Men are slightly more aware of the variable express lane fees (55% v. 50% women) and incentives for electric equipment (48% v. 41% women).

Black or African-American residents have heard of government efforts to promote public transportation at a higher rate (69%) than whites (57%) or other minorities (54%).

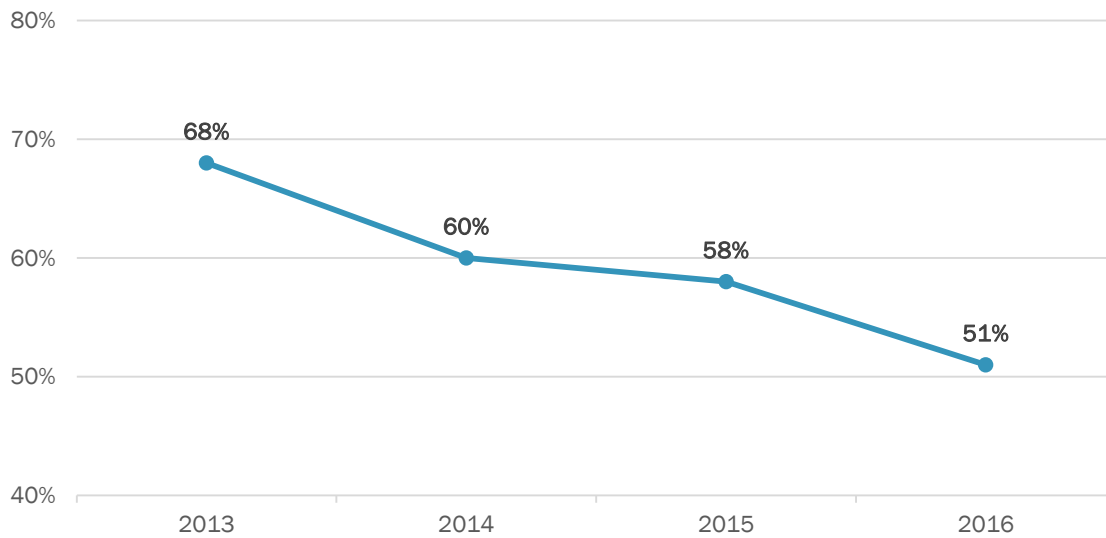
Almost two-thirds of those with less education – that is, a high school diploma or less – have heard about the improvements being made to bike and pedestrian road access, 11 points higher than college graduates (54%). College graduates, on the other hand, are much more likely to have heard about variable express lane fees based on road congestion (60% college graduates v. 39% high school or less).

### Decline in Marylanders' familiarity with one policy

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Residents have been asked about their awareness of one policy since the first poll in 2013: requiring new cars and other vehicles in Maryland to be less polluting. Over the last three years, fewer and fewer adults in the state say they have heard of this policy to improve air quality.

Figure 13: Heard of the state policy that new cars in Maryland must be less polluting



In 2013, two-thirds of Marylanders knew about the requirement for new cars and other vehicles in the state to be less polluting. A year later, awareness of this policy dropped to 60 percent. After remaining relatively steady in 2015, we see another decline to 51 percent in the current study, down seven points from a year ago and 17 points in three years.

Considering the vast majority of state commuters are single-occupant drivers, more efficient ways to raise the public's awareness on this policy certainly warrant a closer look.

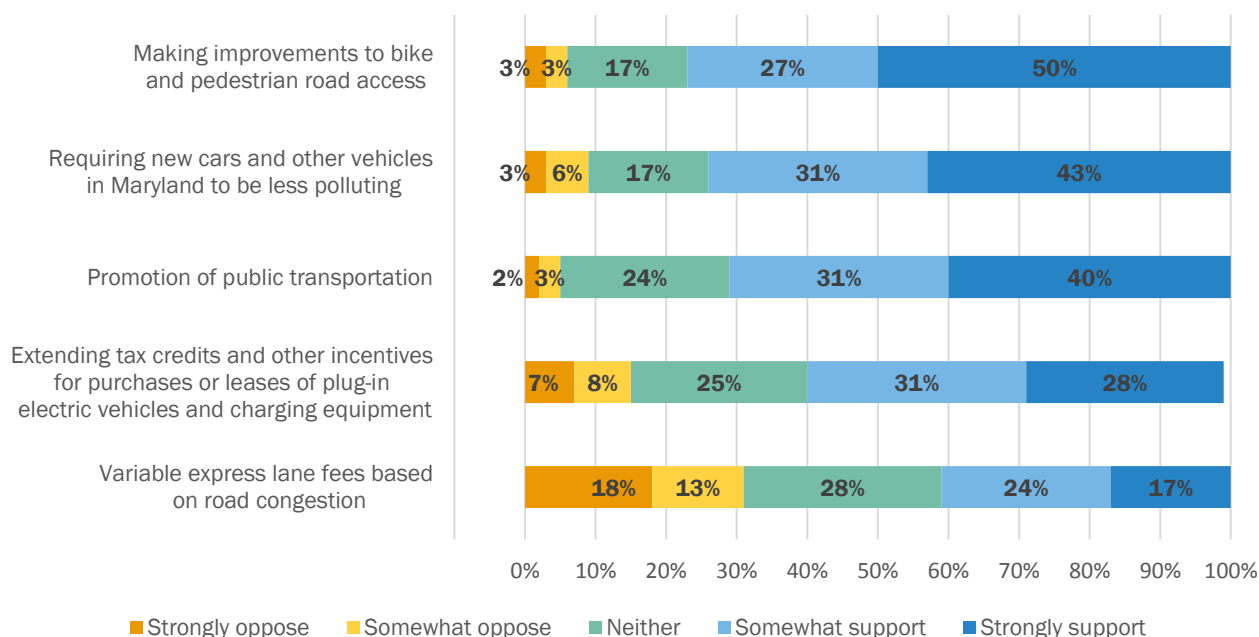
## **Bike and pedestrian policy receives widespread support**

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Most Marylanders (77%) throw their support behind improvements for bike and pedestrian access, including fully one-half who strongly support this policy. Residents are also largely in favor of requiring vehicles to pollute the environment less (74% somewhat/strongly support). Seven in ten adults back state efforts to promote the wider use of public transportation, with 40 percent strongly in support.

A narrower majority, 59 percent, also support extending tax credits and other incentives for purchasing or leasing plug-in electric vehicles and charging equipment. One-quarter neither supports nor opposes this program.

Figure 14: Maryland has begun implementing policies to alleviate road congestion and improve air quality. How much do you support or oppose this policy?



The policy that faces the most criticism among state residents is charging variable rates in express lanes based on the volume of cars on the road. Three in ten (31%) are against this policy, with 18 percent in strong opposition.

### Support for less polluting vehicles remains strong

Despite a decline in awareness for the state's mandate that new vehicles in Maryland be less polluting, support for this policy has remained stable and strong over the years. Currently, 74 percent support this policy, virtually unchanged from 72 percent twelve months ago and slightly lower than 78 percent in 2014.

	2016	2015	2014	2013
NET Support	74%	72%	78%	75%
<i>Strongly support</i>	43%	44%	49%	51%
<i>Somewhat support</i>	31%	28%	29%	24%
NET Oppose	9%	12% <sup>4</sup>	10%	7%
<i>Somewhat oppose</i>	6%	8%	5%	3%
<i>Strongly oppose</i>	3%	3%	5%	4%
Neither	17%	16%	12%	17%

<sup>4</sup> In 2015, 8.48% somewhat oppose and 3.1% strongly oppose, yielding a NET opposed of 12% due to rounding.

# Appendices

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## Appendix 1: Topline Results

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HEALTHY PEOPLE, HEALTHY PLACES:  
A SURVEY OF MARYLANDERS ON PUBLIC HEALTH, ENERGY, AND THEIR ENVIRONMENT

PRINCETON SURVEY RESEARCH ASSOCIATES INTERNATIONAL FOR  
GEORGE MASON UNIVERSITY AND  
THE JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH

TOPLINE RESULTS  
AUGUST 31, 2016

Total N=907 Maryland adults ages 18 or older  
Margins of Error:  $\pm 4.3$  percentage points for results based on Total [N=907]  
Mail data collection dates: May 21-August 1, 2016  
Questionnaire language: English only

*Topline notes: Unless otherwise indicated, percentages are based on Total answering.  
Because percentages are rounded, they may not total 100%.  
An asterisk (\*) indicates less than 0.5%.*

### INTRODUCTION

Dear Fellow Marylander,

The Johns Hopkins Bloomberg School of Public Health, in cooperation with George Mason University, welcomes a select number of households in Maryland, yours among them, to take this 15-20 minute survey about our health, environment and the energy we use.

Please have an adult in your household fill out the questionnaire. If there is more than one adult in your household we ask that the person who has had the **most recent birthday** fill out the survey, if possible. This method will provide us with a random sample of participants from the state of Maryland and each of its four regions. Answers to the questionnaire will help organizations in the state, like non-profits and local and state government agencies, better provide services to improve the health and well-being of our communities.

Thanks for taking the time to help us protect, and improve, our quality of life here in Maryland.

Sincerely,  
Peter Winch, MD, MPH  
Johns Hopkins Bloomberg School of Public Health

## **STUDY INFORMATION**

**Research procedures:** This research is being conducted to inform the work of local and state government agencies, universities, and non-profit organizations in promoting healthy people and places in Maryland. No state funds are being used in this project; it is being funded by the Town Creek Foundation of Easton, Maryland. If you agree to participate, this questionnaire will take about 15-20 minutes to complete.

**Benefits:** There are no benefits to you as a participant in completing this survey other than to further understanding of Marylanders' beliefs about public health, energy and the environment.

**Confidentiality:** Your information will be kept completely confidential. Only the George Mason University research investigators will have access to the surveys; these will be kept in a locked cabinet on the university's Fairfax campus. Both Mason and Johns Hopkins researchers will have access to the final electronic database with the survey information, in which all personal identifiers have been removed (such as addresses and contact information). Other researchers may apply to the George Mason research team to obtain access to the information.

**Participation:** Your participation is voluntary. If you decide not to participate or if you withdraw from the study, there is no penalty or loss of benefits to which you are otherwise entitled. There are no costs to you or any other party. A \$2 thank you has been included with this survey.

**Risks:** There are no risks to you from participating in this research.

**Contact:** For more information, contact Karen Akerlof at (XXX) XXX-XXXX or XXXXXXXX@XXX.XXX. If you have questions regarding your rights as a research participant, please contact the George Mason University Office of Research Integrity & Assurance at (XXX) XXX-XXXX, or the Institutional Review Board for Johns Hopkins Bloomberg School of Public Health at (XXX) XX-XXXX.

This research has been reviewed according to George Mason University procedures governing your participation in this research.

1. How much of a priority should these topics be for Maryland's General Assembly and the Governor?

	Not a priority	Low	Medium	High	Very high	Unwt. N <sup>5</sup>
a. Making public transportation more accessible and affordable	7	8	30	26	28	(896)
b. Lowering rates of asthma and respiratory disease	5	13	26	29	26	(893)
c. Reducing home energy costs	1	6	23	31	40	(897)
d. Creating jobs	*	3	11	30	56	(899)
e. Improving schools	*	2	11	30	56	(897)
f. Lowering crime	*	1	11	26	62	(895)
g. Reducing water pollution	1	3	17	33	46	(895)
h. Addressing racial inequalities	8	12	22	26	33	(891)
i. Protecting coastal areas from storms and flooding	3	15	30	29	23	(889)
j. Reducing air pollution	2	7	22	32	38	(897)
k. Addressing climate change	10	13	22	29	26	(892)
l. Expanding tax credits for renewable energy	4	11	28	28	29	(892)

2. Below is a list of potential risks to people's health and well-being. How much of a risk do you feel each of the following poses to your health and well-being?

	No risk at all	Minor risk	Moderate risk	Major risk	Don't know	Unwt. N
a. Second-hand smoke from tobacco	11	19	28	40	2	(899)
b. Exposure to chemicals, including pesticides, in food and other products	1	15	25	54	5	(903)
c. Air pollution	2	13	38	43	3	(900)
d. Extreme heat	9	24	38	26	3	(901)
e. Severe storms	8	32	36	21	3	(898)
f. Obesity	17	16	24	39	3	(896)
g. Polluted drinking water	6	19	18	50	6	(901)
h. Food-borne illnesses	6	23	30	35	7	(899)
i. Climate change	14	23	32	27	4	(899)
j. Insect-borne diseases	5	19	35	35	6	(902)
k. Flooding	15	35	32	16	2	(899)
l. Sea level rise	21	33	23	18	4	(901)
m. Pollution of local streams, rivers, and other water bodies	3	16	30	45	6	(900)

<sup>5</sup> "Unwt. N" reflects the unweighted N, or the number of respondents who provided an answer.

3. In the last 12 months, how much has your health been harmed by the following?

	Not at all harmed	Slightly harmed	Moderately harmed	Severely harmed	Unwt. N
a. Pollen	31	35	25	10	(896)
b. Extreme heat	57	25	13	5	(895)
c. Severe storm(s)	67	22	8	3	(892)
d. Tick-borne disease, such as Lyme disease	80	7	7	5	(896)
e. Mosquito-borne disease, such as West Nile virus	84	6	6	4	(894)
f. Flooding	81	12	4	3	(897)
g. Poor outdoor air quality from air pollution	52	31	12	5	(895)
h. Waterborne illness	83	9	4	3	(896)
i. Food-borne illness	71	19	6	4	(895)
j. Poor indoor air quality from mold	67	22	7	5	(895)

4. In the last 12 months, have you experienced one or more of the following?

UNWEIGHTED N=907

	% Yes
a. Water damage of your home caused by heavy rains or flooding	15
b. Impassable roads due to flooding or storm damage	17
c. Sewage overflows after strong rains or storms	6
d. Septic system failure due to higher groundwater or flooding	3
e. A storm-related power outage	45
f. No household water	8
g. No household heat (when needed)	8
h. No household air conditioning (when needed)	11
i. Lack of access to transportation	10
j. Lack of access to medical care	6
k. Lack of access to high quality/nutritious food	7
l. Insufficient financial resources to cover bills if unable to work for 1-2 weeks	21
m. None of the above	28
None selected	3

5. The following statements are possible descriptions of your community. How strongly do you disagree or agree?

	Strongly disagree	Some-what disagree	Neither disagree nor agree	Some-what agree	Strongly agree	Unwt. N
a. My community has the resources it needs to take care of community problems (resources include money, information, technology, tools, raw materials, and services).	11	13	21	35	19	(894)
b. People in my community are able to get the services they need.	9	15	20	37	20	(896)
c. My community works with organizations and agencies outside the community to get things done.	9	8	36	31	16	(895)

6. The next statements are possible descriptions of communication in your community. How strongly do you disagree or agree?

	Strongly disagree	Some-what disagree	Neither disagree nor agree	Some-what agree	Strongly agree	Unwt. N
a. My community keeps people informed (for example, via television, radio, newspaper, Internet, phone, neighbors) about issues that are relevant to them.	9	11	15	38	28	(895)
b. I get information/communication through my community to help with my home and work life.	16	13	29	28	13	(891)
c. People in my community trust public officials.	17	18	32	26	7	(892)

People's responses to life events may differ. Below are some statements that people have made.

7. For each of the following, how strongly do you disagree or agree?

	Strongly disagree	Some-what disagree	Neither disagree nor agree	Some-what agree	Strongly agree	Unwt. N
a. There is no sense in planning a lot—if something good is going to happen, it will.	41	25	17	13	3	(894)
b. I am responsible for my own successes.	3	5	5	33	54	(894)
c. I have little control over the bad things that happen to me.	18	32	21	23	6	(897)
d. I am responsible for my failures.	2	10	12	41	36	(895)

8. People deal with difficult events in different ways. Typically, when you experience stress, what do you do?

	Not at all	A little bit	A medium amount	A lot	Unwt. N
a. I concentrate my efforts on doing something about it.	1	9	36	53	(891)
b. I turn to work or other activities to take my mind off of it.	10	23	38	29	(887)
c. I try to come up with a strategy for what to do.	1	12	36	52	(890)
d. I just give up.	78	18	2	2	(889)
e. I talk to someone to find out more about the situation.	7	24	42	28	(892)
f. I sleep more than usual.	57	23	12	7	(889)
g. I look for something good in what is happening.	7	28	37	28	(888)
h. I learn to live with it.	16	36	33	16	(887)
i. I put my trust in God.	19	17	16	49	(888)

The next questions address new options in Maryland for managing our generation and use of electricity.

9. Have you ever heard the term, “Smart Grid,” in referring to new ways to generate and manage electricity?

UNWEIGHTED N=894

No	39
Yes	48
Don't know	13

10. Do you have a Smart Meter installed at your home? Smart Meters digitally monitor energy usage, convey the information wirelessly to your energy utility, and provide it to you online. They are installed for free by your electric utility.

UNWEIGHTED N=893

No	42
Yes	42
Don't know	16

11. Smart Grids will mean some changes for consumers. How likely would you be to...

	Very unlikely	Some-what unlikely	Some-what likely	Very likely	Already done	Not applicable	Unwt. N
a. welcome installation of a Smart Meter.	10	9	18	22	33	8	(881)
b. change the timing of activities that use a lot of electricity, like clothes drying, to take advantage of lower electricity costs at night.	9	11	25	36	16	3	(886)
c. buy “smart appliances” that automatically reduce energy use during high demand.	5	10	24	36	20	6	(888)
d. install solar panels either for your home or within your community and sell energy back to the utility.	27	17	19	21	4	12	(886)
e. volunteer to automatically lower energy use during high demand in return for lower bills.	9	11	27	31	17	4	(883)

12. How strongly do you disagree or agree with the following statements?

	Strongly disagree	Some-what disagree	Some-what agree	Strongly agree	Don't know	Unwt. N
a. My home energy choices affect our health and environment.	8	10	42	31	10	(890)
b. I am worried that Smart Meters threaten people’s privacy.	24	18	25	10	23	(882)
c. I am worried that Smart Meters may be harmful.	35	20	11	7	28	(885)
d. Variable electricity rates at different times of day will help me lower my energy bills.	6	8	44	23	19	(887)
e. I can’t afford to install solar panels even if I could sell the electricity back to the utility.	11	11	20	37	21	(884)
f. Generating my own energy is appealing to me.	9	8	31	37	16	(889)

The next questions address the choices about energy sources we make as a state and in our own homes.

13. Over the next several years, do you think Maryland should use less, more, or about the same amount of each of these sources of electrical energy? (Please note, no hydraulic fracturing of natural gas is currently occurring in Maryland.)

	Much less	Some-what less	Same amount	Some-what more	Much more	Don't know	Unwt. N
a. Coal	35	19	14	4	4	24	(884)
b. Petroleum (oil)	26	25	20	7	2	21	(880)
c. Natural gas extracted by hydraulic fracturing ("fracking") in Maryland	25	11	10	11	8	35	(872)
d. Other sources of natural gas	5	11	14	29	17	24	(868)
e. Wind	3	2	6	26	46	16	(884)
f. Nuclear	24	10	16	10	12	28	(879)
g. Solar	2	1	6	20	57	13	(882)
h. Hydroelectric (including dams)	3	5	17	20	29	26	(873)
i. Wood fuel	24	19	18	7	8	25	(878)
j. Incineration of waste	10	12	16	14	19	29	(880)
k. Gas from landfills	5	6	12	20	20	36	(885)

14. Please rate each of the following sources of electrical energy in terms of how harmful they are to people's health.

	Not at all harmful	Not very harmful	Somewhat harmful	Very harmful	Don't know	Unwt. N
a. Coal	2	8	32	41	16	(889)
b. Petroleum (oil)	2	14	42	23	19	(885)
c. Natural gas extracted by hydraulic fracturing ("fracking") in Maryland	4	13	21	24	37	(880)
d. Other sources of natural gas	5	31	22	7	36	(876)
e. Wind	64	17	5	2	12	(888)
f. Nuclear	6	15	24	33	21	(879)
g. Solar	67	16	3	2	12	(887)
h. Hydroelectric (including dams)	35	26	13	2	24	(882)
i. Wood fuel	7	22	36	14	22	(885)
j. Incineration of waste	6	15	35	15	30	(887)
k. Gas from landfills	9	22	23	14	33	(885)

15. How much more would you be willing to pay each month on your electricity bill to purchase 100% of your electricity from these fuel sources?

	Not willing to pay more	\$1-5	\$6-10	\$11-15	\$16-20	More than \$20 a month	Unwt. N
a. Wind	50	17	14	7	7	6	(876)
b. Solar	48	17	14	8	8	6	(878)



Maryland has the longest average commute time in the United States. The questions below ask about your driving habits and transportation preferences.

16. How frequently do you use the following forms of transportation to get to work, school, or other primary daily activity?

	Never	Some- times	Most of the time	Almost always	Not applicabl e	Unwt. N
a. Drive car or truck (single occupant)	5	11	10	67	6	(889)
b. Carpool with others	53	27	3	4	12	(881)
c. Take the Metro, subway, or light rail	55	24	2	6	12	(886)
d. Ride a bus	62	20	2	6	10	(888)
e. Bike	71	14	1	2	12	(887)
f. Walk	44	35	6	6	9	(887)

17. How long is your average daily commute to work, school, or other primary daily activity?

UNWEIGHTED N=880

10 minutes or less	14
11-20 minutes	21
21-30 minutes	15
31-40 minutes	10
41-50 minutes	10
51-60 minutes	7
More than 1 hour	7
Not applicable	15

18. Please answer two questions for each of the items below. Is it hard or easy for you to take the following actions? And, are they actions you would dislike or like doing, whether or not they are feasible?

	Is it hard or easy for you to take this action?			Would you dislike or like doing this?		
	Hard/No t feasible	Easy	Unwt. N	Dislike	Like	Unwt. N
a. Working from home	57	43	(825)	26	74	(774)
b. Biking or walking instead of driving for primary daily activities (work, school, etc.)	81	19	(836)	48	52	(785)
c. Using public transportation	71	29	(830)	63	37	(783)
d. Purchasing or leasing a fuel-efficient car or truck	55	45	(821)	27	73	(792)
e. Purchasing or leasing a plug-in electric vehicle, such as the Nissan Leaf or Chevy Volt	73	27	(819)	48	52	(792)

19. How strongly do you disagree or agree with the following statements?

	Strongly disagree	Some-what disagree	Some-what agree	Strongly agree	Don't know	Unwt. N
a. Driving gasoline- or diesel-fueled cars and trucks is a minimal source of air pollution.	25	28	28	12	7	(887)
b. The tailpipes of gasoline- or diesel-fueled motor vehicles release pollution that contributes to climate change.	5	9	31	43	13	(888)
c. Pollution from these cars and trucks end up in our waterways, where they become a significant source of pollutants in the Chesapeake Bay.	5	13	32	34	16	(888)
d. Pollution from these cars and trucks includes toxic chemicals that harm people's health, including causing cancer.	5	7	35	37	16	(885)
e. Living or working near a highway or major roadway has little to no effect on people's health.	27	37	16	6	14	(882)
f. Plug-in electric vehicles pollute the air less than gasoline- or diesel-fueled vehicles.	4	4	27	48	16	(886)
g. Over the lifetime of the car, it is cheaper to own and operate a plug-in electric vehicle than one powered by gasoline or diesel fuel.	6	12	14	16	52	(887)

20. Maryland has begun implementing policies to alleviate road congestion on highways and improve air quality. For each of the following policies, please answer two questions: Have you heard of this policy? How much do you support or oppose this policy?

	Heard of this policy			Your support for this policy					Unwt. N
	Yes	No	Unwt. N	Strongly oppose	Some-what oppose	Neither	Some-what support	Strongly support	
a. Requiring new cars and other vehicles in Maryland to be less polluting	51	49	(872)	3	6	17	31	43	(878)
b. Variable express lane fees based on road congestion	52	48	(854)	18	13	28	24	17	(877)
c. Extending tax credits and other incentives for purchases or leases of plug-in electric vehicles and charging equipment	44	56	(843)	7	8	25	31	28	(878)
d. Making improvements to bike and pedestrian road access	58	42	(839)	3	3	17	27	50	(877)
e. Promotion of public transportation	59	41	(829)	2	3	24	31	40	(877)

21. Maryland has begun implementing policies to promote new sources of energy and use energy more efficiently. For each of the following policies, please answer two questions: Have you heard of this policy? How much do you support or oppose this policy?

	Heard of this policy			Your support for this policy					Unwt. N
	Yes	No	Unwt. N	Strongly oppose	Some-what oppose	Neither	Some-what support	Strongly support	
a. Expanding rebates to help people purchase energy-efficient lighting and appliances	51	49	(867)	4	2	12	28	55	(873)
b. Updating state and local building codes to increase energy efficiency and enable electric vehicle charging	32	68	(863)	3	4	24	33	36	(871)
c. Encouraging the development of more homes with better access to public transportation, as a means to reduce sprawl, and preserve forests and farmland	29	71	(857)	4	7	22	23	44	(871)
d. Funding energy efficiency and conservation projects that serve low- to middle-income Marylanders	32	68	(856)	4	5	19	25	48	(868)
e. Requiring that Maryland's electricity suppliers provide a percentage of their total electricity from renewable energy sources	37	63	(851)	4	4	18	28	47	(869)
f. Continuing financial incentives for the generation of renewable energy (such as solar and wind)	49	51	(846)	4	3	15	27	51	(872)
g. Modernizing Maryland's electricity grid to better integrate renewable energy and incentivize efficiency	31	69	(847)	2	2	18	28	49	(870)

22. Maryland is required to evaluate the economic impacts, including to jobs and industry, of its energy and greenhouse gas reduction policies that are collectively called the “Greenhouse Gas Reduction Plan.” How likely do you think it is that these policies will accomplish the following?

	Very unlikely	Some-what unlikely	Some-what likely	Very likely	Don't know	Unwt. N
a. The policies will generate between \$2.5 billion and \$3.5 billion in total economic benefits by 2020.	13	17	21	5	44	(880)
b. The policies will create or maintain 26,000 to 33,000 jobs by 2020.	11	16	24	7	42	(880)
c. There will be no projected impacts from these policies on Maryland’s manufacturing industries.	14	18	18	7	43	(881)

23. How much do you disagree or agree with the following? Stricter environmental laws in Maryland...

	Strongly disagree	Some-what disagree	Some-what agree	Strongly agree	Don't know	Unwt. N
a. cost jobs and hurt the economy.	20	21	22	12	25	(882)
b. are worth the cost because of the public health benefits.	5	9	35	33	17	(882)
c. are worth the cost because of the environmental benefits.	6	7	34	35	18	(883)
d. can fuel economic and jobs growth.	7	11	33	21	28	(884)

We are interested in your opinion of how climate change may, or may not be, affecting your community.

24. Do you think that climate change is currently happening?

UNWEIGHTED N=895

Yes	77
No	10
Don't know	13

25. If you answered either yes or no, how sure are you?

	UNWEIGHTED N=676 Climate change is happening	UNWEIGHTED N=107 Climate change is not happening
I'm not at all sure	2	14
I'm somewhat sure	27	40
I'm very sure	41	27
I'm extremely sure	30	19

26. If you think climate change is currently happening, what do you think is causing it?

UNWEIGHTED N=843

Caused entirely by human activities	14
Caused mostly by human activities	31
Caused about equally by human activities and natural changes in the environment	30
Caused mostly by natural changes in the environment	9
Caused entirely by natural changes in the environment	2
I don't think climate change is happening	5
Don't know	9

27. To the best of your knowledge, what percentage of the following people think climate change is happening?

	0 to 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	Don't know	Unwt. N
a. People in my region of Maryland (Western, Central, Southern, Eastern counties)	6	14	23	18	10	30	(888)
b. Maryland residents (statewide)	4	11	24	20	8	32	(886)
c. People in the United States	3	14	30	18	9	26	(885)
d. Climate scientists	3	4	6	12	53	22	(885)

28. How much do you think climate change is currently harming...?

	Not at all	Only a little	A moderate amount	A great deal	Don't know	Unwt. N
a. you personally	20	27	30	14	8	(888)
b. people in your community	15	23	33	14	16	(887)
c. people in Maryland	12	19	36	18	16	(893)

29. Which of the following do you think is likely to occur in your community as a result of climate change over the next 10-20 years?

UNWEIGHTED N=907

	% Yes
a. Hotter weather	72
b. Colder weather	46
c. Heavier rains	52
d. More frequent droughts	36
e. Wildfires	23
f. Increased air pollution	53
g. Warming of cold-water streams	35
h. Longer growing season	18
i. More severe storms	63
j. Rising coastal sea levels	47
k. Increased water pollution	46
l. Increased harmful bacteria and toxins with warmer waters	53
m. There are no likely effects from climate change	9
None selected	4

30. Which of the following resources in your community do you think may be harmed by climate change in the next several years?

UNWEIGHTED N=907

	% Yes
a. Public water supplies	53
b. Public sewer systems	33
c. People's health	59
d. Transportation/roads/bridges	31
e. Historical sites	20
f. Coastlines	54
g. Wetlands	46
h. Forests	42
i. Wildlife	51
j. Chesapeake Bay	60
k. Aquatic life, such as fish and crabs	57
l. Agriculture	53
m. Fishing/seafood industry	57
n. Private wells/septic systems	33
o. Privately owned land/buildings	22
p. There are no local risks from climate change	11
None selected	4

31. How much do you support or oppose state and local governments taking action to protect your community against harm caused by climate change (if any)?

UNWEIGHTED N=856

Strongly oppose	7
Somewhat oppose	7
Somewhat support	28
Strongly support	47
Don't know	12

The information below will be used to ensure that the survey is representative of people in Maryland.

32. Are you:

UNWEIGHTED N=885

Male	44
Female	56

33. How old are you?<sup>6</sup>

UNWEIGHTED N=790

18-29	15
30-49	36
50-64	29
65 or older	20

34. Do you rent or own your home?

UNWEIGHTED N=871

Rent	28
Own	68
Other (specify)	3

35. Are any children living in your household?

UNWEIGHTED N=892

Yes	35
No	60
Not applicable	5

36. What is the age of the youngest child?

UNWEIGHTED N=730

Less than 1 year	4
1-6 years	16
7-12 years	8
13-18 years	15
No children	57

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<sup>6</sup> Respondents were asked to write in their exact age. Ages have been grouped into categories in this topline.

37. What is the highest degree or level of school that you have completed?

UNWEIGHTED N=895	
Less than high school	4
High school or GED	26
Some college, no degree	22
Associate's degree	8
Bachelor's degree	17
Advanced degree beyond a bachelor's degree	22

38. Which of the following broad categories describes your household's total approximate annual income before taxes?

UNWEIGHTED N=839	
Less than \$10,000	5
\$10,000 – \$14,999	5
\$15,000 – \$24,999	9
\$25,000 – \$34,999	7
\$35,000 – \$49,999	12
\$50,000 – \$74,999	18
\$75,000 – \$99,999	13
\$100,000 – \$149,999	18
\$150,000 or more	13

39A/B. Think of this ladder as representing where people stand in their communities. People define community in different ways, please define it in whatever way is most meaningful to you. Where would you place yourself on this ladder, first for your community, and then for Maryland?

	UNWEIGHTED N=846 Q39A Your standing in your community	UNWEIGHTED N=841 Q39B Your standing in Maryland
10 - Highest standing	6	5
9	6	5
8	14	12
7	18	15
6	13	15
5	19	18
4	7	8
3	9	6
2	4	8
1 - Lowest standing	4	7

40. Generally speaking, do you think of yourself as politically...

UNWEIGHTED N=888	
Very conservative	11
Somewhat conservative	22
Moderate, middle of the road	39
Somewhat liberal	20
Very liberal	9



41. Do you happen to know where people who live in your neighborhood go to vote?

UNWEIGHTED N=896

No	6
Yes	80
Don't know	14

42. How often would you say you vote?

UNWEIGHTED N=898

Never	9
Seldom	6
Part of the time	10
Nearly always	25
Always	48
Don't know	2

43. What ethnicity do you consider yourself?

UNWEIGHTED N=858

Hispanic or Latino	7
Not Hispanic or Latino	93

44. What is your race?<sup>7</sup>

UNWEIGHTED N=877

White	62
Black or African American	27
Asian	4
American Indian or Alaska Native	*
Native Hawaiian or other Pacific Islander	*
Other	5
Mixed race	2

Race/Ethnicity Summary table

43. What ethnicity do you consider yourself?

44. What is your race?

UNWEIGHTED N=878

White, non-Hispanic	59
Black or African American, non-Hispanic	26
Hispanic	7
Other/Mixed race, non-Hispanic	8

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<sup>7</sup> Respondents were allowed to select 1 or more races. Those who selected more than one are coded as "Mixed race."

45. How would you describe your primary current occupation, or former occupation, if retired?

UNWEIGHTED N=886

Blue collar or service industry	22
Clerical	7
Managerial or professional	44
Student	4
Homemaker	7
Other/not applicable	15

46. In the last 12 months, have you personally experienced one or more prolonged periods of stress of 1 month or longer in relation to circumstances in everyday life, such as work, health, or a family situation? (Stress refers to feelings of irritability, tension, nervousness, fear, anxiety, or sleep disturbances.)

UNWEIGHTED N=885

I have not experienced a prolonged period of stress	41
One period of prolonged stress	20
More than one period of prolonged stress	26
Constant stress	14

47. Have you ever been told by a doctor or health care provider that you have one or more of these conditions?

UNWEIGHTED N=907

	% Yes
a. Asthma	12
b. COPD	5
c. Hypertension	24
d. Coronary heart disease	5
e. Stroke	2
f. Diabetes	12
g. Cancer	9
h. Weak or failing kidneys	2
i. Arthritis	21
j. Hepatitis	2
k. None of the above	46
None selected	3

Please provide any additional comments for us below.

UNWEIGHTED N=907

Wrote comment	17
No comment	83

INFO1. Would you like any additional information about some of the topics in the survey? If so, please mark the topics of interest...

UNWEIGHTED N=907

	% Yes
a. Home energy efficiency	13
b. Flooding protection	5
c. Protection against heat waves	7
d. Energy bill assistance	12
e. Energy fuel choices and health	10
f. Home and community renewable energy generation	10
g. Smart grid	13

Thank you for completing the survey!

Please use the enclosed postage-paid envelope to return this survey.



**GEORGE MASON UNIVERSITY AND  
THE JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC  
HEALTH**

**HEALTHY PEOPLE, HEALTHY PLACES:  
A SURVEY OF MARYLANDERS ON PUBLIC HEALTH,  
ENERGY, AND THEIR ENVIRONMENT**

**METHODOLOGICAL REPORT**

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August 2016

## SUMMARY

The Healthy People, Healthy Places Survey, jointly sponsored by the Center For Climate Change Communication at George Mason University (GMU) and the Johns Hopkins Bloomberg School of Public Health, obtained interviews with a sample of 907 households in the state of Maryland. The survey was conducted by Princeton Survey Research Associates International (PSRAI). Data were collected by postal mail by the Scantron Corporation from May 21 to August 1, 2016.

Details on the design, execution and analysis of the survey are discussed below.

## DESIGN AND DATA COLLECTION PROCEDURES

### *Sample and Questionnaire Design*

A sample of 4,201 Maryland households were randomly selected from Survey Sampling International's household address databases, based primarily on U.S. Postal Service delivery route information. In contrast to the previous waves of this study where sampling took place at the regional level, sampling for the 2016 study was a simple random selection of households at the state level. Sample was provided to PSRAI by GMU.

In addition to sample design, George Mason University also developed all mailing materials including the mail questionnaire. Prior to printing or mailing any materials, GMU submitted and received approval for all mailing materials from Johns Hopkins' IRB. The Scantron Corporation, with a location based out of Columbia, PA, supplied, printed and distributed all mailings, developed the scannable questionnaire form, and processed and scanned all returned questionnaires into an electronic data format in accordance with an approved data codebook. PSRAI coordinated the mailings and data collection with Scantron, cleaned, processed and weighted the survey data, and produced the reporting and analysis.

### *Contact Procedures*

Data were collected by mail from May 21 to August 1, 2016. Requests for participation were sent to a total of 4,201 Maryland households. Each household was sent up to four mailings. All mailings were freighted to Maryland and distributed by a local Maryland post office. Progress was monitored regularly throughout the data collection period.

On April 20, 2016, advanced letters on Johns Hopkins letterhead were mailed to all 4,201 sampled households. The letter was signed by Dr. Peter Winch, a Professor in the Social and Behavioral Interventions Program in the Department of International Health at the Johns Hopkins Bloomberg School of Public Health. The letter explained that a survey about public health, energy and Maryland's environment would be arriving soon and encouraged the household's participation. *(All letters can be found in the Appendix.)*

On May 21, 2016, the initial survey mailings on Johns Hopkins letterhead were mailed to 4,200 sampled households.<sup>8</sup> Each packet contained a questionnaire booklet, a postage paid return envelope, a \$2 bill, and a cover letter signed by Dr. Peter Winch. This cover letter explained the survey and encouraged participation by an adult member of the household, age 18 or older. If there was more than one adult in the household, instructions indicated that the person in the household who has had the most recent birthday should complete the enclosed questionnaire.

On June 16, 2016, postcard reminders to non-responders were mailed to 3,626 households. Excluded from the postcard mailing were households that had already completed the survey, refused to participate, or had both previous mailings returned as undeliverable.

On June 29, 2016, a follow-up survey mailing on Johns Hopkins letterhead was mailed to 3,589 households. Excluded from the follow-up survey mailing were households that had already completed the survey, refused to participate, or had the first two mailings returned as undeliverable. Each packet contained a questionnaire booklet, a postage paid return envelope, and a cover letter signed by Dr. Peter Winch. Affixed to each cover letter was a sticky note indicating a study deadline of July 15 and offering participants a chance to be entered into a raffle for a gift card.

## **WEIGHTING AND ANALYSIS**

Weighting is generally used in survey analysis to compensate for sample designs and patterns of non-response that might bias results. The sample was weighted to match Maryland adult general population parameters.

The weighting adjusted sample demographics to known population parameters. The sample was balanced to match parameters for sex, age, education, race/ethnicity, region and population density. The basic weighting parameters came from an analysis of the U.S. Census Bureau's 2014 American Community Survey data. The population density parameter was derived from Census 2010 data at the county level.

Weighting was accomplished using SPSSINC RAKE, an SPSS extension module that simultaneously balances the distributions of all variables using the GENLOG procedure. Weights were trimmed to prevent individual interviews from having too much influence on the final results. The use of these weights in statistical analysis ensures that the demographic characteristics of the sample closely approximate the demographic characteristics of the national population. Table 1 compares weighted and unweighted sample distributions to population parameters.

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<sup>8</sup> Upon receiving the advance letter, one household indicated they are part-time residents and were removed from further mailings for this study.

**Table 1: Sample Demographics**

	<u>Parameter</u>	<u>Unweighted</u>	<u>Weighted</u>
	<u>Gender</u>		
	Male	47.4	32.9
	Female	52.6	64.7
	missing	2.4	2.7
	<u>Age</u>		
	18-34	30.1	11.4
	35-44	16.8	9.9
	45-54	19.0	12.7
	55-64	16.7	20.7
	65+	17.4	32.4
	missing	12.9	14.3
	<u>Education</u>		
	HS Grad or less	36.2	16.0
	Some College/Assoc Degree	28.4	26.1
	College Graduate	35.4	56.6
	missing	1.3	1.5
	<u>Race/Ethnicity</u>		
	White/not Hispanic	55.0	69.8
	Black/not Hispanic	28.4	15.4
	Hispanic	8.2	3.9
	Other/not Hispanic	8.4	7.7
	missing	3.2	3.6
	<u>Region</u>		
	Capital	35.9	31.9
	Central	46.2	51.6
	Southern	5.7	4.2
	Eastern shore	7.8	7.2
	Western	4.4	5.2
	<u>County Pop. Density</u>		
	1 - Lowest	2.5	2.8
	2	14.0	12.6
	3	12.7	16.3
	4	60.0	57.3
	5 - Highest	10.8	11.0



### Effects of Sample Design on Statistical Inference

Post-data collection statistical adjustments require analysis procedures that reflect departures from simple random sampling. PSRAI calculates the effects of these design features so that an appropriate adjustment can be incorporated into tests of statistical significance when using these data. The so-called "design effect" or *deff* represents the loss in statistical efficiency that results from unequal weights. The total sample design effect for this survey is 1.71.

PSRAI calculates the composite design effect for a sample of size  $n$ , with each case having a weight,  $w_i$  as:

$$deff = \frac{n \sum_{i=1}^n w_i^2}{\left( \sum_{i=1}^n w_i \right)^2} \quad \text{formula 1}$$

In a wide range of situations, the adjusted *standard error* of a statistic should be calculated by multiplying the usual formula by the square root of the design effect ( $\sqrt{deff}$ ). Thus, the formula for computing the 95% confidence interval around a percentage is:

$$\hat{p} \pm \left( \sqrt{deff} \times 1.96 \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \right) \quad \text{formula 2}$$

where  $\hat{p}$  is the sample estimate and  $n$  is the unweighted number of sample cases in the group being considered.

The survey's margin of error is the largest 95% confidence interval for any estimated proportion based on the total sample—the one around 50%. For example, the margin of error for the entire sample is  $\pm 4.3$  percentage points. This means that in 95 out every 100 samples drawn using the same methodology, estimated proportions based on the entire sample will be no more than 4.3 percentage points away from their true values in the population. It is important to remember that sampling fluctuations are only one possible source of error in a survey estimate. Other sources, such as respondent selection bias, questionnaire wording and reporting inaccuracy, may contribute additional error of greater or lesser magnitude.

*Response rate*

Table 2 reports the disposition of all sample records released. The response rate estimates the fraction of all eligible sample that was ultimately interviewed. The response rate is based on AAPOR response rate #3 as set forth by the American Association for Public Opinion Research. Thus the response rate for the sample was 24 percent.

Total Sample Released	4201
Non-response, unknown eligibility <b>U</b>	3178
Refused <b>R</b>	23
Ineligible <b>IN</b>	93
Completed <b>I</b>	907
e= estimated eligibility $(I+R)/(I+R+IN)$	90.9%
Response Rate $I/[I+R+(e*U)]$	23.7%

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## **CODING AND EDITING**

The completed questionnaires were returned to Scantron and scanned into an electronic data file. All handwritten open-end question responses were recorded verbatim by Scantron coders and entered into the electronic data file. PSRAI thoroughly examined completed questionnaires to ensure proper completion and checked to ensure the data responses matched the responses in the questionnaire booklets. Any notes from respondents, problems or inconsistencies were dealt with by PSRAI staff. Problems were reconciled whenever possible and cleaned in the data file.

- If there are multiple response to a question that should only have one response and that question has no 'other specify' option, the question was recoded as 'No answer' in the data if there is not some indication of which answer is right (e.g. one crossed out and the second circled multiple times).
- If there are multiple response to a question that should only have one response and that question has an 'other specify' option, the question was recoded as 'other' and the responses entered into the specify field in the data.
- If applicable, 'other specify' responses were back-edited if they fit into the existing answer categories/codes.

In addition to open-end response categories for specific questions, respondents also had the opportunity to make any additional comments at the end of the survey.

## **DATA ENTRY AND VERIFICATION**

The data were entered, verified, and cleaned to correct for any scanning entry errors, appropriate question sequence (i.e., skip patterns), valid response ranges, and other logical inconsistencies.

[DATE]

[Name of city] Resident  
[Address1], [Address2]  
[City], [State] [Zip]-[Zip4]

Dear [Name of city] Resident:

The Johns Hopkins Bloomberg School of Public Health, as part of a research project with George Mason University, is requesting your help with an important study being conducted about public health, energy and Maryland's environment. Your household was selected at random from among all residents in Maryland. In the next few days you will receive an envelope containing our questionnaire. We hope you will participate.

We would like to make it as easy and enjoyable as possible for you to participate in the study. I am writing in advance because sometimes people like to know ahead of time that they will be asked to fill out a questionnaire. The success of this study will rely on the generous help of people like you who are willing to take about 15-20 minutes of their time to answer our questions.

As a token of our appreciation, we will be sending you \$2 in the envelope containing the questionnaire. Please keep your eyes open for that envelope in the mail; it should arrive in the next several days. This project is funded by the Town Creek Foundation of Easton, Maryland; no state funds are being used. You are not under any obligation to participate, but I hope you will be willing to help us. Most of all, I hope that you enjoy taking the survey and the opportunity to tell us about your views on the health of Maryland's people and environment.

Best wishes,



Peter Winch, MD, MPH  
Johns Hopkins Bloomberg School of Public Health

*Princeton Survey Research Associates International (PSRAI), a national polling firm, will conduct this survey for us, with data collection provided by Scantron. If you have any questions, you may contact XXXXXXXXXXXX of PSRAI at XXXXXXXXXXXXXXX@psrai.com. You may also contact Project Director XXXXXXXXXXXX at (703) XXX-XXXX or XXXXXXXXXXX@gmu.edu at George Mason University.*

Appendix 2b: Cover letter for initial survey mailing

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[DATE]

[Name of city] Resident  
[Address1], [Address2]  
[City], [State] [Zip]-[Zip4]

Dear [Name of city] Resident:

I am writing to request your help with an important study being conducted about public health, energy and Maryland's environment. One important way for us to learn about these issues is to ask people who live in the state to share their thoughts with us. Your household is one of 4,200 homes that have been randomly selected for this study being conducted by the Johns Hopkins Bloomberg School of Public Health and George Mason University, and funded by the Town Creek Foundation in Easton, Maryland.

Please have an adult (age 18 or over) fill out the survey. If there is more than one adult in your household, please have the person in your household who has had **the most recent birthday** complete the enclosed questionnaire if possible. This ensures we hear from a random sample of people who live in the state.

The questions should only take about 15-20 minutes to answer. By taking this time to share your thoughts, you will help us understand how to better develop future public health services for Marylanders, such as programs that assist communities during heat waves and other extreme weather events. As a way of saying thank you for participating, we have enclosed a small token of appreciation. No state funds are being used in this project. You are not under any obligation to participate, but I hope that you will consider participating, and will enjoy taking the survey.

I look forward to hearing your thoughts. Thanks for taking this time to help us better protect our quality of life here in Maryland.

Best wishes,



Peter Winch, MD, MPH  
Johns Hopkins Bloomberg School of Public Health

*Princeton Survey Research Associates International (PSRAI), a national polling firm, will conduct this survey for us, with data collection provided by Scantron. If you have any questions, you may contact XXXXXXXXXXXX of PSRAI at XXXXXXXXXXXXXXXXXXXX@psrai.com. You may also contact Project Director XXXXXXXXXXXX at (703) XXX-XXXX or XXXXXXXXXXX@gmu.edu at George Mason University.*

## Appendix 2c: Postcard reminder

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Last week a questionnaire was mailed to you because your household was chosen for a study of Marylanders' opinions about public health, energy and our state's environment.

If someone at your address has already completed and returned the questionnaire, we thank you. If not, please have the adult in your household who has had the **most recent birthday** do so right away. This method aids us in obtaining a random sample of state residents.

I am very grateful for your help in this study.



Peter Winch, MD, MPH



[DATE]

[Name of city] Resident  
[Address1], [Address2]  
[City], [State] [Zip]-[Zip4]

Dear [Name of city] Resident:

In April we sent a letter inviting you to complete a questionnaire on the health and wellbeing of Maryland's people and environment. While you are not under any obligation to participate, to the best of our knowledge, we have not received it yet, and wanted to be sure that it had not been lost in the mail.

We are writing again because of the importance that your questionnaire has in helping us to get accurate results that truly represent the state's residents. Therefore, we hope that the adult in your household who has had **the most recent birthday** will fill out the questionnaire (another copy of which is enclosed) and return it to us soon. This will help ensure that we hear from a random sample of adults in every household.

The questions should only take about 15-20 minutes to complete. We hope that you enjoy answering the questions and sharing your thoughts with us. We look forward to hearing your opinion on these important issues.

Best wishes,



Peter Winch, MD, MPH  
Johns Hopkins Bloomberg School of Public Health

*Princeton Survey Research Associates International (PSRAI), a national polling firm, will conduct this survey for us, with data collection provided by Scantron. If you have any questions, you may contact XXXXXXXXXXXX of PSRAI at XXXXXXXXXXXXXXXXXXXX@psrai.com. You may also contact Project Director XXXXXXXXXXXX at (703) XXX-XXXX or XXXXXXXXXXX@gmu.edu at George Mason University.*

