

Climate Adaptation and Resilience Stakeholder  
Workshop - April 27, 2015

Workshop Report

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# Climate Adaptation and Resilience Stakeholder Workshop

## Workshop Report

The Climate Adaptation and Resilience Stakeholder Workshop was held on Monday, April 27, 2015 at Delaware Technical and Community College in Dover, DE. The purpose of the workshop was to bring together stakeholders and interested members of the public to discuss next steps for implementation of the recommendations outlined in The Climate Framework for Delaware.

### Background

Climate change affects people, places, and resources we care about—our homes, neighborhoods, and communities, as well as beaches, wetlands, forests, rivers, and streams. These resources enhance our quality of life and support our economy. Higher temperatures, increasing rainfall, and rising sea levels are already occurring. These changes are expected to continue—and become more serious—in the coming years. Climate change is caused mainly by human activities, particularly the burning of fossil fuels that release heat-trapping gases. This is a global challenge, but we can take actions to lessen the impacts of climate change on our lives, communities, economy, and ecosystems, now and in the future.

Delaware has taken steps to prepare for the impacts of climate change and to make the state more resilient. On September 12, 2013, Delaware Governor Jack Markell signed Executive Order 41: *Preparing Delaware for Emerging Climate Impacts and Seizing Economic Opportunities from Reducing Emissions*. Executive Order 41 directs the state to address both the causes and consequences of climate change by developing recommendations to:

- Reduce greenhouse gases that contribute to climate change (climate mitigation);
- Increase resilience to climate impacts, including increasing temperatures, changes in precipitation, and sea level rise (climate adaptation); and
- Avoid and minimize flood risks that increase state liability and decrease public safety.

The goals and objectives outlined in Executive Order 41 were compiled into the Climate Framework for Delaware, which was completed in December 2014. The Framework was approved by the Cabinet Committee on Climate and Resiliency in December 2014 and submitted to the Governor's Office in January 2015. The Framework was publicly released on March 2, 2015 at a press event held in Delaware City, Delaware.

### Stakeholder Workshop

The Climate Framework directs state agencies to gather public and stakeholder feedback on the recommendations included within the report. The Climate Adaptation and Resilience Stakeholder Workshop and web-based comment forms were the two avenues utilized to collect feedback on how to move the recommendations forward into implementation.

The workshop was open to the public and included invited stakeholders who were identified by their colleagues in each of the state agencies. Agency representatives identified those stakeholders that: 1) would be most impacted by the recommendation; 2) could assist in identifying obstacles, barriers and opportunities related to each recommendation; and/or 3) would be needed in the implementation phase of the recommendations.

There were 104 attendees at the workshop, not including the 19 facilitators, recorders and event staff. Attendees represented a variety of backgrounds and sectors throughout the state, including the real estate, agriculture and industry groups, public schools, universities and colleges, local governments, and environmental organizations, as well as many others. The list of attendees is included in Appendix A.

The workshop included a plenary session in the morning, which presented background on the Climate Framework and information on the other sections of the Framework not discussed at the workshop. In the afternoon, eight breakout sessions were held where attendees could present their comments on the recommendations. Between two and four recommendations were selected to be discussed in each of the breakouts. The sessions were hosted by the state agencies that developed the recommendations, with agency staff available to answer any clarifying questions about the recommendations. Some breakout sessions had cross-cutting recommendations that impacted two or more agencies; in these cases, multiple agencies co-hosted those particular breakout sessions. Each breakout was led by a facilitator and had a recorder. This report presents the comments captured by the recorders in each of the breakout sessions.

The sessions and their hosting agencies were:

- 1A. Adapting Agriculture and Forestry (Department of Agriculture)
- 1B. Energy Efficiency and Reliability (Department of State)
- 1C. Improving Public Health and Safety (Department of Health and Social Services)
- 1D. Supporting Local Communities (Office of State Planning and Coordination, Department of Natural Resources and Environmental Control)
- 2A. Protecting Natural Resources (Department of Natural Resources and Environmental Control)
- 2B. Energy Efficiency and Resilience in Schools and Housing (Department of Education, Delaware State Housing Authority)
- 2C. Climate-Ready Emergency Management (Department of Homeland Security, Department of Transportation, Department of Natural Resources and Environmental Control)
- 2D. Economic Opportunities (Delaware Economic Development Office, Office of Management and Budget)

The attendees selected the breakout sessions of their choice to attend and provide comments either during the session or in writing after the session. Attendees were encouraged to provide feedback not only on the recommendations discussed during the breakout sessions but also on any of the other recommendations included in the Framework document.

### Stakeholder Feedback

This report is organized by breakout session. The comments and the themes of the comments are presented without attribution to speaker, and include both verbal and written comments submitted at the workshop. Comments received through e-mail or the website are included in Appendix B.

## **Session 1A: Adapting Agriculture and Forestry**

Host: Department of Agriculture

Key Recommendations:

- Changes in nutrient management and pest management
- Fire management
- Impacts from sea level rise

### **COMMENTS:**

#### **Recommendation: Evaluate response to increased susceptibility of forest wildfires.**

1. Prescribed burn times are too short (3 commenters)
2. There are certain situations that warrant open burning in the off-season. The way open burns are currently regulated makes it challenging for farmers to meet various objectives.
3. Need to be explicit about developing educational materials for public about risk management. There is a missing link in working directly with private landowners to manage their lands most effectively; and having prescribed fires on their own properties will take more consultation than necessary education to come up with adequate plans.
4. Do these standards take into account bird seasons?
5. Should work with volunteer agencies to develop standards for Delaware and enhance training. (2 commenters)
6. Delaware was in compliance with management/burn regulations and would like to be rewarded or given some type of incentive for this, perhaps expanding burn times to be through August and September.
7. EPA needs to do a better job at grasping the entire situation. (2 commenters)

#### **Recommendation: Evaluate nutrient management, pesticide application, risk assessment, fire prevention and management, and cropping practices policies that may be impacted by potential increases in the number of hot dry days per year.**

1. Needs to include animal health.
2. Wet day should be considered as well as hot, dry days.
3. Current limitation is 10 acres a month or 20 a year. There are some situations that should allow for exceeded acreage.
4. The average days for cultivating crops should increase. Then it would permit double cropping.
5. Plant breeding needs to be part of the solution.
6. What role would the government play in terms of funding?

7. Are we looking at opportunities to promote the use of renewable energy on poultry farms to offset the costs? Maybe a good idea to think about some sort of credit for energy at the farm level.
8. Invasive species control, restoration of buffers, technical specifications would be beneficial for CRPs. There's a lot of opportunity for synergy amongst these efforts.

**Recommendations: Educate landowners and agricultural operators on the possibility of, and how best to address and mitigate, loss of land due to sea level rise. AND Educate landowner and agricultural operators on the effects of saltwater intrusion through sea level rise.**

1. Keep in mind potential problems along coastlines where tillable farmland is in close proximity to marshes.
2. Salt-water intrusion frequency increases, what do we do to protect the livelihoods of the people that own these farmlands?
3. What policies can we put in place so that fallowed water isn't frequent? Maybe ones that incorporate dykes or utilize plant breeding.
4. Need to discuss erosion as often as sea-level rise. We've seen more effects from erosion than sea-level rise.
5. Build more berms. A guy with a backhoe and a bulldozer could solve most of these problems in a few days, but they're not allowed to.
6. How will land use ownership conversions play out with costs? Especially when many of farms have been in families for hundreds of years?
7. How do you find out when the threshold events occurs? What could be potential thresholds for the issues that will have us consider next steps?
8. Some type of public water system is inevitable.
9. Need a cost/benefit analysis to determine if it will ever make sense to put a huge dyke around our farmlands. Do we have enough information to make a good decision on how choices will be made?
  - a. Don't analyze the economic impact, it's defeating.
  - b. Delaware's economy is not strong enough to fund this. If this sea level rise project puts drags on the economy, we will have less money to put into the land. It has nothing to do with farmland preservation.
10. Mandated money for farmland preservation needs to go to farmland preservation. This administration mandated 10 by law, but this year only did 2 (unsure of the units the commenter was referring to: \$ millions or number of farms).

## **Session 1B: Energy Efficiency and Reliability**

Host: Department of State

Key Recommendations:

- Options for reducing greenhouse gases through alternative tariff approaches
- Consumer protection considerations
- Energy reliability in extreme weather events

### **COMMENTS:**

#### **Recommendation: Review Commission Options to help reduce greenhouse gases and mitigate climate change.**

*(Note: most comments come from 4 commenters)*

1. The Energy Efficiency Advisory Council has been working on this but there is a great deal left to do and a lot of low hanging fruit out there. Reducing the amount of energy we use would be more effective than switching to renewables.
  - a. Should do this as quickly as we can so opportunities don't pass us by. Need to move forward with this carefully but quickly.
2. Concerned with Delaware Climate – we need to look at wider scope with greenhouse gases (GHGs) if we look at GHGs out of state
  - a. We need to look outside of the state. The internal generation of power in state is lacking. Need to look at surrounding states and work with them so we can do things on a regional basis to make more progress.
3. Public initiatives should be evaluated in terms of cost. What is cost of action vs. no action? Need an evaluation of those costs first before action is taken on this.
4. Energy efficiency has been identified as a clear way to move but need to do it smartly – and with deeper investments that will make a deeper impact and longer term impact.
5. Is there a timeline for this recommendation or a schedule on how often they intend for the commission to meet?
6. Concerned that Delmarva Power just distributes electricity, doesn't generate it. As consumption goes down (with increases in energy efficiency), their revenue will decline – from their perspective, they are going to get their stream of revenue reduced – we need to evaluate how these conservation methods will affect the distribution cost of energy distributed. Will the distribution costs of the energy go up on our bill? We need to be evaluating this as we move forward. Delmarva has right to getting a certain amount of revenue, but it will derive less revenue because of renewables being implemented.
7. It is important to keep in mind that the public service commission only regulates one utility. There are maybe 13 others. So they can only affect one utility – they can do a lot for that one, but that is their realm and they can't affect more than that. Their staff will ultimately have to approve regulations, but they don't have a larger jurisdiction.

8. Energy efficiency comes from multiple sources – one concern from a private perspective in looking at methods of distributed generation there are a lot of localized problems that go into it. If we want to go to a different system, it puts more pressure on Delmarva Power to supply that energy.
9. Because of regulation, Delmarva is paying more to meet the requirements than others. So we are picking more politically driven solutions rather than economic. And it ends up with rate payers paying more.
  - a. Examples of solutions: Building your own solar utility, buying a mix of power sources (including wind)
10. The regulation is not just coming from the commission – need to understand that they are also legislated.
11. From the perspective of a developer, it is more important to have long term contracts so projects can be fundable. So if you want to expand with renewables you need to have these big contracts in place.
12. We need to move away from regulated markets that distort the market and see what comes into place on its own.
13. We would like to see more renewables sited in Delaware. We are not a good wind state at this point, but maybe we can become that with new technology. We are doing well with solar. It's important to employ our own people and keep revenues here. Less transmission costs.
14. Solar comments
  - a. Speaking on solar energy choices, we need policy changes here, we have to be thinking ahead – how can we make solar renewables more affordable? We work with low income communities that can benefit because they can only buy aggregate, maybe we can figure out something different so they can buy individually too.
  - b. The net metering system needs to be evaluated. Extra energy that is generated by solar energy by homeowners goes back to the grid – we need to make sure these free riders pay their share of the energy distribution system.
  - c. Solar subsidies are the solar industries own worst enemy – need to phase out subsidies
  - d. Regulations need to be implemented so they can't place leans against homes for solar. This needs to be better implemented and understood by public.
15. Reducing the use of electricity shouldn't be our focus; it should be on more on efficient use. Think about emitting less CO<sub>2</sub>.
16. You can't focus on one response to an issue - transportation systems also need to be evaluated. It's better to have people not using cars or not idling cars.

**Recommendation: Coordinate review of storm response procedures with all regulated utilities.**

1. Public service commission staff should consider review, but they only cover a part of the suppliers. And there is resistance from the other utilities on doing this (only one out of 10 are regulated)
2. There should be more people involved. The utilities are the experts in the field and should have the autonomy to make the decisions they need to.
3. Of the other utilities, we do have the expertise in the field in terms of repairing as storms come up. We can call outside our region for help. [During a storm] We were measuring outages in minutes and some had none at all. We didn't look to state or public service commission – we looked to a larger resource to bring in the extra help that we need. Municipalities are regulated – just not by Public Service Commission. We should be part of the conversation though.
4. We had the long term effects of some areas without power resources [after a storm]. This recommendation needs to be expanded to all power sources – it goes beyond just poles and wires.
5. We are facing stronger storms now so statistically we need to be ready for them now and into the future. We need to be sure we are more resilient. The folks running the systems are the experts and should be the ones to do this.
6. Need to have open dialog between utilities to share best practices.
7. The best answer to recovery is to have more resilience so you don't have to recover. Need to measure resiliency of electric resources. If we can measure this, we can increase it.
8. We do record data on how we do in storms, and if there is a storm, the suppliers are not measure in their supply (day to day averages) during a storm, but they do record how they perform. All utilities probably face this – they know exactly how they're doing.
9. Resiliency is the key to storm recovery. We are not doing enough to determine which substations need hardening and this has led to huge expense. This hardening is critical. As well as having a spare part inventory. Need to take a look at this more.
10. Some states build their systems so that they are able to fall down and be put back up easily. But our public here in Delaware needs more education about how others do things to see what would work better for us. Need to evaluate all of the options that are out there. The decision makers need to be educated.
11. If there is an outage, we deal with it when it happens. We just can't go through the whole state and put the entire system underground. Hardening substations is necessary though.

**Recommendation: Enhance outreach to utility consumers.**

1. (PSC) There has been a change in paradigm – as we have utility bills that go up we need to educate the public and others why this is happening.

2. There is one group of people in this room that knows how to communicate with customers and we can work together to figure out how to better do this.
3. (PSC) There is opportunity when customers contact us to explain things, but that is missing from the mass marketing programs. If there is low participation in a program you have to look at why that is, and then work on doing better mass marketing.
4. We are looking to do more energy efficiency - education becomes the critical tool in getting more people to use efficient products.
5. You have to be community oriented with your communications. Need to have a trust worthy or notable source deliver the information.
6. Especially for the low income communities, many do not own their own homes and don't realize what's available to them. They don't have the time and resources to work on these things because they are more worried about their own day-to-day survival. We need to help these people do a better job.
7. The Sustainable Energy Utility (SEU) wants to be an education source, but they have a lot to overcome. People respond more when they see money savings – and then they are more educated and want to become invested in program. How do we get people to care if they are not getting money? The SEU needs to be a part of the conversation as well.
8. The messages can't come from the utilities because no one is listening – has to be a completely different media if we want to get the message out.
9. (PSC) We have programs that have been in place for years, but no one is taking advantage of some of them. Maybe we need to educate the middle, interface people from the power company about the programs that they could have a conversation with their customers about.
10. In the legislation that created the SEU there is a prohibition on people that worked in a utility from working with SEU. But if they are experts from the private sector, maybe they should be allowed to be on their board.
11. There needs to be a lot of channels to get the message out and different kinds of messaging. Some respond to the money aspect of efficiency savings, and others respond to the moral aspects of protecting our climate.
12. There has always has been the climate debate, but we are still all pro-energy efficiency. You don't have to be a global warming believer. But we can all say energy efficiency is the way to go and we can work together on this.
13. There has to be a balance. But no one has any money, and we may be spending a lot of money on preparing for climate impact but it is important to spend on this preparation.

## **Session 1C: Improving Public Health and Safety**

Host: Department of Health and Social Services

Key Recommendations:

- Statewide Smart-911 systems
- Designated Cooling Centers

### **COMMENTS:**

#### **Recommendation: Implement statewide Smart-911 system.**

1. Sensitive populations including elderly, Medical, Police are the stakeholders of the system.
2. People with Disabilities will be supportive of the Smart-911 initiative because of its value to the public. Statewide Smart-911 will be really beneficial because you want information to be widely available to first responders. It is more cost effective if it is statewide than the way it is now.
3. The General population is not motivated, but those with special needs are more inclined to provide information because they know it is critical to them.
4. We need to separate FYI notifications from real emergencies.
5. Does the system use texting? This will make it easy to reach as many people in a short time.
6. Make fliers in all the hospitals and community centers.
7. Suggest sending fliers with school children to their parents in each county to promote smart 911. Live saves with the senior roll call system is an example of program that can be helped by the smart 911. Reason is because police have little information about elderly family member's including medical information or special needs. The cops have no basis for entering the home unless EMT requests.
8. Need to have diverse marketing effort for promoting smart-911.
9. Need to educate people about the system, because some people may feel they already have their information in another system so they need to be informed.
10. Get Agencies like Delaware Division of ageing to be involved in promoting the smart 911.
11. How do you overcome gaps in the system? If it is inconsistent you are likely unable to rollout a large campaign.
12. It's more than just having access to the systems, its people being comfortable with putting their information. With special needs notification, there was a lot of campaign but not many people responded.
13. There is medical information that may affect HIPPA. Legal ramifications of private information (HIPPA) and the social impacts (Cry Wolf syndrome).

**Recommendation: Identify sites to be used as designated cooling and heating centers.**

Facilitator: What are the Barriers?

1. Funding challenges; Schools are used as heat shelters and the challenge are they going to be available during high heat times; or have enough staffing
  - a. Are those sites also energy efficient;
  - b. Transportation to and from locations;
2. What happens when temperature rise becomes constant how we do respond?
  - a. What happens when number of impacted populations is magnified by the rising temperature?
3. Research shows number of extreme cold days will drop and heat waves will increase, we need to prepare to adapt.
  - a. Science shows people will become accustomed to high temperatures.
  - b. Should we think of long-term shelters for future impacts like schools?
  - c. List of designated locations: Religious buildings, individual residences, schools hotels, hospitals, keeping facilities already designated opened longer.
4. What about reimbursing the facilities for energy consumption?
5. Transporting people with special needs creates barriers, how to feed, volunteers needed, what they do when they get there.
6. What you do with their animals; How to deal with sex offenders; Sanitation is also a barrier.

## **Session 1D: Supporting Local Communities**

Host: Office of State Planning Coordination, Department of Natural Resources & Environmental Control

Key Recommendations:

- Climate adaptation in Comprehensive Plans
- Guidance on climate and flood resilience
- Strategies for drinking water and wastewater

### **COMMENTS:**

#### **Recommendation: Provide technical support to local governments for Comprehensive Plans and local ordinances.**

1. Small town concerns
  - a. We all went through updating ordinances regarding flood damage mitigation. Towns had model ordinances. My biggest concern is smaller towns in Sussex County that do not have the financial support to incorporate. There are so many parts of this document that might not apply to smaller communities. For example, flood plan administrator is an aspect these towns need to pick up. List of all the responsibilities suggesting mayor take on the role.
  - b. Echo concern on small town capacity to deal with this. Opt out of federal mandates (FEMA) because of inability to carry out recommendations. Recommendations for state and local are not appropriate for small towns to be able to implement. If this is modeled after federal programs, onerous for small towns. Unwilling to pass ordinances that are based on federal recommendations. Willing to do whatever anyone wants with the funding to do it. But do not have funding.
2. Doesn't include question of technical ability of officials or capacity to take on the role.
3. Maybe not just depend on comprehensive plan process. Look at development, rather than just an appendix to comp plans. But look at needed state legislation. So that if someone wants to build along coastal zones, we need to not allow state to bail out those who unwisely build in those zones against the recommendations. Should write into legislation.
4. Federal programs aimed at providing federal protection (FEMA) for property owners. Aimed at providing protection and risk for property owners. Choice to abstain impacts individuals. Need state planning office to provide assistance to local governments to be able to provide technical assistance on how to conduct cost projections. So that we don't just look at short term costs, but look at long term costs of not making those expenditures. Our real risk is that which we don't look for or plan for.
5. Emphasize importance of critical infrastructure lock in. Look at human settlement, infrastructure planning. Digest IPCC document into a 10 page summary. We can't get out of this situation without land use change. It is not what is happening in the clouds, it has to include land use change, or we can't make change. One suggestion: a short memo to mayors and councils outlining consequences by adopting in reference of their comp plans parts of IPCC.

Especially basic science and chapter 12 on infrastructure. Emphasize concept of lock in. When you build subdivisions, lock in for 100s of years. Cannot change that in the timeframe we need to get this under control. Emphasize lock in as responsibility of mayors and city councils.

6. “OSPC should facilitate meetings with local governments... 12-18 months before they begin to update their Comp plans.” When is that going to happen?
  - a. Answer from OSPC – actually, all on a rolling process. Constantly working on that. Any local jurisdiction is allowed to do an appointment. Ex. those who are most prone, may work to do something in their comp plan as an amendment before they work on legislations.
7. Our concern is protection of private property rights as we move forward. Very concerned with disclosure for property owner at the time of purchase/sell. Our biggest concern is cost – how do we pay for all of this. What are the sources of revenue that are being considered for that?
8. Seems like every time there’s talk about FEMA regulations and sea level rise, tend to lump new construction with updates to old construction. New construction – you can do a lot with. When you talk about doing renovation, impacting the little guy, who can overly burdened by this. That’s a big issue. Need to find a way to distinguish between new construction and renovation in recommendations.
9. Maybe the state could have a working group with groups working on integrating climate more in their plans. Work on sorting out different maps and so all can be on the same page.
10. In comp planning with other municipalities, not exactly an invited guest. Working together may be communities that are in conflict with each other. Sometimes looking at it raises suspicions.

**Recommendation: Provide technical assistance (TA) to Delaware communities for climate change adaptation projects.**

1. The change that needs to be place is that it must be matched with a technical expert to do sea level rise in the communities. Need to have that support to do the real work in those communities. Not enough just to give funding to the communities. Real TA program, not just a grant program.
2. Small towns, esp. western Sussex, have a hard time of finding people to run for office. Those who do have other jobs. When there are very bare bones budgets, TA is the only way of doing it. Need to have a person assigned to them to help them get started. Key here is that these towns need help.
3. Some of the appropriate adaptation measures may be very expenses. But that should not prevent TA from going to that community if the implementation funds are not right there.
4. Need to have core staff focus community-by-community rather than using larger recommendations and models. Won’t deal with the issue if you don’t work community by community on their risks. May need to redirect that program.
5. Need to help the communities identify what they want to do. Differences in engagement, there is a continuum on how to approach. First stem is helping them identify what they want to do.

Think about what their stomach is for matching/ grants/ capital projects. Then you can look more on those programmatic concepts.

6. Towns that have focused on storm prevention are more prepared to deal with sea level risk. Have to realize what is essential for their communities. Work to protect infrastructure in their town.
7. State financial liability in comprehensive plans.
8. Towns have comp plans and County has a comp plan and zoning situation. Recently experienced approval by county and these development efforts show lack of regional coordination. Need to involve multiple municipalities and towns and state as well so as to better plan. Need to look at UN document on climate change, so as to better plan. US starts local and moves up to state, but need to start with state planning and go down to the local level. We are seeing consequences of sustainable development due to lack of coordination in planning across municipalities. Everyone who is acting on this need to get together and sit down. Difference in what should be community consensus. Need to have unified construct of sustainable development.
9. If Division of Energy and Climate can help coastal management meet match, coastal management could focus more on TA. Get water and land use moved together.
10. Good leaders know how to work together. But that is the exception to the way it works. Can we tweet integration as part of the comp plan, or is there another mechanism that allows for working together directly. Is there a model from some of those good integration examples that works that we can provide better collaboration?
11. Important question. Where's the money. So, co-benefits. Again, the IPCC report. 5-year study, great data. All over the world, climate action plans would not be possible for municipalities due to economic reasons except for co-benefits. Need to focus on the benefits to individuals. Best reason is for health. Just that helps with cost effectiveness for walkability/bike ability. Just for the purpose of health, not just for energy efficiency. Don't have to talk about climate change; it's cheaper for medical bills alone. Can work with hospitals to get funding for that.
12. Huge opportunity in reaching out to the business community and even to the chambers. Presentation to the chambers on these types of things. There is so much innovation in those areas that allow the economic benefit to work around climate change.

**Recommendation: Assist local governments in developing strategies to protect wastewater treatment facilities from flooding.**

1. This recommendation is inconsistent with the findings of vulnerability analysis. This did not receive attention in the vulnerability analysis. I agree that it deserves emphasizes, but in other phase was discounted.
2. This should be expanded to include well water fields, state planning.
3. This should not be an issue. This is regulated through a permit program. Problem is that the general assembly has not increased the permit fees. Need to put pressure on general assembly.

Put the requirements into the permit requirements. Noncompliance should not be an issue. Use those fees to help in changes needed.

4. 2/3 or 1/2 of people in the state are receiving potable water from 3 big water companies. There has to be a way for DNREC to work with those agencies. How does the regulatory process, rate making, intersect with this recommendation?
5. Is this one in conflict with septic systems? If we look to questions about safe treatment facilities, you may be facilitating development in special hazard areas that previously had individual onsite septic systems. This happened in Kent County. Moved treatment facility into safe area, but facilitated development in a flood prone area.
6. This is too limited a focus point. It's all about critical infrastructure. Need to look at what you are developing as part of this.
7. It is a balance between failing systems and getting water. My understanding that projects for those systems are integrated.
8. These 4 recommendations, I keep hearing there is no one size fit all for communities/ municipalities. There are places that are fully developed. We get good help from the state. The bureaucracy is far more responsive than the legislature. Usually willing to work on that kind of adaptation for communities. We can't mandate these things through legislation.
9. The State of Delaware is not required to buyout flooding properties, though it happens because legislators want constituents to re-elect them. The State must determine when & where to fund vs. when to let nature take its course (beaches/wetlands migrate inland). Funding only delays the inevitable loss and costs ALL taxpayers. {All new construction located in flood zones on SLR maps should not get that help. For existing, probably needs some flexibility, but should not be automatic and large sums of money for a few people (buyouts) isn't the answer} Government can't fix it all. Public may not realize that and should be told. People will incur loss and they should know it/be told it. They should be proactive and start to consider the hard decisions.

#### **General comments:**

1. Biggest thing here is communication and consistency. Dover AFB going through ICE map hits on questions of sea level and flood plans. There are SO MANY maps out there. All inconsistent. This new Delaware one, FEMA map vs. Army map vs. Delaware map. Where are we going in recent plans? See numerous maps reading different ways. There has to be communication with agencies and make sure we are talking about the same thing and on the same page. Need to gain buy-in.
2. Agencies do not know how to work with communities. Communities cannot drive everything. Need support of state agencies that help to set boundaries to address the real examples that we know exist. Intentionally setting up development in flood plans... what the state needs to do is to get all agencies involved. Need to be integrated. The state needs to come up with compendium of communities that look at the context and issues. Then we can see the boundaries of what they need to do. What can we deal with or not? Cannot encourage building in these high flood areas. Need to set limits as a state agency of what you can or cannot do. Get out of work that is beyond those boundaries.

3. Delaware DGDC – work together because they are frustrated by the 100 maps too. Get involved in those conversations.
4. Is it possible to pre-assess these little towns so that they don't have to come up with a matching grant? (Coastal Management)
5. I have not seen analysis that says yes coastal towns have coastal flooding, storms, sea level rise. But we used to go to the coast to get away from the heat. So there will be a reason to move towards the coast.
6. Concerned about funding, how do we do that? Sources, suggest we treat it as we do “tax ditches.”
7. The development of this program appears to overlook the potential role of Healthcare (DPH) in the decreasing of costs of adaptation. The role of interagency communications was not stressed as a critical component but yet is critical to the success of this entire program. The same concept applies to communities within a given area as well as county plans.

## **Session 2A: Protecting Natural Resources**

Host: Department of Natural Resources & Environmental Control (DNREC)

Key Recommendations:

- Adaptation for coastal impoundments and ponds
- Shoreline management and beach preservation
- Managing for wildlife impacts and habitat changes

### **COMMENTS:**

#### **Recommendation: Adapt coastal impoundments and ponds.**

1. Need more emphasis on the concept of ‘retreat’. Part of this is not just setting the stage, but planning for their position within the landscape.
2. There is an opportunity for decision-making where adapting means restoring and maintaining coast impoundments rather than letting them go or retreat.
3. Encourage recreational use and other alternative uses for coastal impoundments. (2 commenters)
4. Compartmentalize amongst agencies so that each agency can focus on understanding the costs and benefits specific to their agency. Helps better justify costs.
5. When evaluating individual climate threats/impacts, DNREC can’t just look at how DNREC will benefit from change. DNREC does not always understand the economic costs associated with making changes or employing strategies that may be more beneficial for DNREC and the environment, but not for the finances of the organization paying for the changes. They must realize there are places facing a multitude of threats, and that they will need to focus on efforts that are of most value.
6. Funding and resources for impoundments will need to be made available.
7. How will DNREC deal with delay challenges that arise from things such as legal issues? The longer you delay, the more it costs.
8. Must increase public engagement strategies so that local community has the opportunity to become informed and actively participate.
9. Impoundment seems to be the focus in the recommendation language. Ponds need to be addressed as well, because the adaptation strategy will be very different, i.e. potential for fish passage, saltwater issues.
10. Cost-benefit analyses should be employed. Definite need for a non-emotional way to address these issues, and thus a cost-benefit analysis would help state determine whether or not a project meets criteria and how it should be addressed going forward.

#### **Recommendation: Plan for increasing demands for shoreline management and beach preservation.**

1. Redoing beaches helps protect infrastructure of town. Berms and wide beaches have protected Bethany Beach from severe damage.
2. Why does the state allow people to occupy flood prone areas or those with fire hazards?
3. Beach preservation is critical to the state's economy. If the beaches go away, so do boardwalks, and so does much of the state's tourism revenue. (2 commenters)
4. We need to decide which areas to do it in, which we don't. May not be long-term sustainable in some places.
5. With secondary beaches, scale should be a real concern. It's harder to manipulate areas that large and could adversely affect local habitats. Areas also change over time, how do we deal with it?
6. Don't have great monitoring systems for these rapidly changing conditions, and if we are to make informed decisions we cannot be operating in the dark. There is a strong need for more science and data to back up any recommendation and subsequently, the process for moving forward. (2 commenters)
7. Additional sand resources are understated. The fight for sand offshore is coming, and regional sand management may not be available forever. (2 commenters)
8. Should continue to partner with other entities, like University of Delaware, to look at alternate forms of increasing sand-like shoreline and other sand resources. (2 commenters)
9. Evaluate opportunity for new technology use.
10. Should not be expanding development in certain areas (like Broadkill Beach) and need to protect existing communities. We do not have a mechanism to make it better. Need a state level comparative resources act and/or dike safety bill. Just a matter of replacing the word 'dam' with 'dike'.
11. Need better accountability management and criteria for when you pull out of these projects, before funding is allocated.

**Recommendation: Prepare to manage different fish and wildlife species and habitat.**

1. Biggest challenge is figuring out what's invasive and what isn't. Drawing that line is important. How are we dealing with it? How are we allowing the public to deal with it? (2 commenters)
2. Need for ecologists to join the conversation. Some species are moving northward or jumping continents and the diseases they bring could create a public health issue.
3. Need to be proactive rather than reactive with our policies and should develop a management plan for incoming species now. Many have already been identified, and although we don't have the resources to deal with it formally, local students and educators are already researching these things, and thus we could have a broader umbrella. (2 commenters)
  - a. State has a limited scope however, and only deals with federally endangered species and issues of trade and possessiveness.

4. Are there areas in the state that could be protected that have not been protected yet? State Resource Area maps need to be updated.
5. Need to employ different methods of thinking for land acquisition, and targeted areas. Do we need to start thinking about where we develop intentionally? Hasn't been formalized by DNREC or state. Great opportunity here.
6. Need for outreach and education. Could turn to related organizations and non-profits to help.
  - a. Hunting, fishing, and bird-watching communities should be more engaged in management activities (surveying) and could play a big role in education. (2 commentators)
7. Need to capitalize on the changing biodiversity of Delaware. Many opportunities for recreational and commercial fishing due to migration of fish species (speckled trout, shellfish). Would be a great economic driver if we could help set the stage for it. (2 commenters)
8. There are challenges to restoration when surrounding states have different fishing laws. May be helpful to coordinate efforts and prepare others for migrations.

#### **General Comments:**

1. The state should improve communication with college professors so as to spread the knowledge and improve education of land management and stewardship decisions.
2. The mitigation strategies need to consider the carbon storage amenities our habitats provide. Precipitation and soil changes could impact how much we have.
3. All these recommendations will require increased funding, it'll be important to identify the funding stream.
4. Page D10 – Only certain entities are called out, state parks are absent from having to adhere to any recommendations. If you're going to come up with a climate adaptation plan, it should be required for all entities.
5. Having each agency look at its assets, and how to reduce this or that could create some discrepancies between how different agencies evaluate assets. This may force agencies to employ methods that may be counter-productive and could result in inappropriate development in vulnerable locations. For example, there is only one place for boat ramps in the state, but if you can't put them there, where do you relocate? To say no to an infrastructure in one vulnerable place, could mean wrong things in other places. Should be willing to help with costs and other resources.
6. No accessible boat ramps until Delaware City. Boaters bring in a lot of money. Bring public to the boat ramp so they can understand the value and use it recreationally.
7. There is an over-emphasis on flooding. This may mean missed opportunities (more resilient power grid).
8. Can't ignore the legislature, but also can't rely on them to paint an accurate picture of what the public wants.

## **Session 2B: Improving Energy Efficiency and Resilience in Schools and Housing**

Hosts: Department of Education & Delaware State Housing Authority

Key Recommendations:

- Flood avoidance in school siting
- Energy efficiency in school design
- Energy efficiency in low income housing

### **COMMENTS:**

#### **Recommendation: Improve guidelines for siting of school facilities.**

1. This recommendation is huge because the Office of State Planning Coordination has to sign off on sites for schools. Schools cannot be built in level 4 areas in the Livable Delaware Strategy. We are focused on healthy communities and healthy lifestyles and want the schools to be located in an environmentally friendly area. This is an important recommendation.
2. Schools need to be put near populations. We need to be sure to account for savings from proper site location of schools. We need to get bond money into the hands of the schools district so the schools can be located in these good locations even if they are expensive areas.
3. Buildings should be designed to not overheat. An example is England's new policies. This would be a life sustaining regulation so people don't have heat related illnesses. Then schools can also serve as heat refuge center during the day (not a shelter). Using landscaping components are the cheapest way to achieve these things.
4. Energy efficiency for schools is achievable with best practices. So it is not appropriate to put into codes. There is more costs upfront in the building of the school (could be a place for a subsidy) but then there is cost savings in the future.
  - But it is difficult to convince the funders of these offset cost savings.
5. What could be useful is providing technical assistance to the Dept. of Education or the designer of the school with an analysis of the opportunity costs in building with efficiency measures now versus without. This needs to be communicated. The decisions need to be based on the true costs of a project vs. the monetary costs.

#### **Recommendation: Promote LEED certification or Green Ribbon school design.**

1. LEED certification is received at the time of commissioning. However, that doesn't mean that the school will operate as a LEED certified building.
2. Siting of the building can be configured so it has roof space that is optimal for solar or to have passive energy saving designs.

3. Schools can be incentivized to curtail their energy use in the summer (especially during peak summer heat events). They also can be built with a better energy conservation system (so sections of the school can be shut down if need be).
4. The planning of the schools should take all of these things into consideration. Planners need to think about operations and day-to-day energy use. There should be a comprehensive plan that looks at every aspect of design and building. The plan should also look at the long run operation of a school – not solely look at up front construction costs.
5. Building in LEED design doesn't need to have extra costs if designed correctly.
6. One thing that is important in implementing these policies is the learning curve - it will eventually cost less and less to do the same thing better and better. This needs to be recognized by the involved agencies and decision makers working on this. We need to document lessons learned, provide training on these lessons, and build the skill sets of decision makers that are working on this. Build in learning opportunities as we are working to efficiency. Don't let these lessons be put on a shelf – get the information out as shared knowledge within our state and to other states as well.
7. Also teach this in the schools to the students so they understand the process and reasons why efficiency is important. And then they can educate their parents.
  - a. Yes they can do hands on learning within their own school.
8. The Schools can then be used as a learning opportunity for the larger community (as they see the building throughout civic life).
9. Architects are licensed to protect health and safety of the public – so it should be built into their licensing that they build in this manner.
10. Districts want to build schools LEED certified but they don't want to do it because it cost so much money to get the LEED certification. They'd rather be Blue Ribbon certified or just know that they are energy efficient.
  - a. Schools should be rated as a “high performance” instead of LEED if this certification boxes them in too much to standards that aren't helpful. It could encompass more aspects that are helpful and efficient.
  - b. There should be other certifications set up in DE that allow for them to be recognized as efficient but don't cost as much as LEED.
  - c. That was the effort in establishing the green ribbon award that was set up by the Governor. But maybe if schools meet certain criteria they could also be LEED certified.
  - d. We agree that schools should develop their own energy efficiency standards. And there should be resources here in Delaware that supply technical assistance that helps schools do this.
  - e. There are non-profit organizations (Delaware Valley Green Building Council) that can help with this. We should leverage their resources more. EPA also has resources that

can help with this and can send employees to evaluate schools and provide technical assistance.

**Recommendation: Evaluate energy-efficiency standards of the Low Income Housing Tax Credit Program.**

1. Same as comments above. We need to approach this with learning for decision-makers in mind; we'll reduce costs in the long run and increase the institutional capacity for us to be able to do more of this.
2. Can this recommendation encompass both new construction and already built? If already built then we need to do more upgrading of inefficient systems. Will especially help folks that are renting buildings that pay extra to run inefficient systems. City of Boulder gives financial incentives to renters to be able to upgrade systems. We need to implement this over time.
3. The Delaware State Housing Authority needs to make sure systems are tested and certified.
4. With this new climate change era – we can develop buildings that are 100% efficient or more (doing even more to reduce outside waste). We lose lots of energy going out of sewer pipes. We can capture this energy. We need to set the bar higher – say by 2025 all buildings in DE need to be 100% efficient. These are practices that are easily done already.
5. Delaware, as a small state, has the opportunity to link these initiatives together in a full range of education activities. The universities and colleges should also get involved to help develop innovation in this realm. Research how to improve our recycling and reuse of expended resources. We need to look at a bigger picture not just reducing GHGs so we are totally sustainable within our ecosystem and we have zero impact on it. We are a part of nature – our civilization should be a part of the world that integrates without harm with it.
6. Any policies should be evaluated by costs and especially to housing costs to families. Most net-zero houses cost more to build than normal ones.
7. Dept. of Energy work has shown that although there may be higher upfront construction costs, they find in the long run there are savings. And we can change our approaches over time, and then that will reduce the cost of building in the new fashion over time. Need to look at how government and non-profits work with commercial sectors so costs are entirely put upon society. Policies should be put into place that will help reduced costs to society.
8. Policies should also encourage innovation. And if there are solutions or lessons learned we need to share them.
9. From our work with the Association of Homebuilders, the largest firms in the industry have the capital to examine these issues – but it comes down to the ability to sell a product to the public. So as you go down the market, people are less able to afford to pay for these higher efficiency standards.
  - I agree with that, but it also shows broader problems with society that people aren't paid enough to purchase efficient homes or systems. Raising minimum wage would help lower income buyers to be able to afford this. Need to look at broader set of policies that will affect the outcome of this recommendation.

10. In New Castle County, low-income housing is exempt from paying impact fees to the school district. Work force housing doesn't fit into this definition. One of the incentives for low-income housing builders is this incentive to not have to pay the impact fee. So could these low-income housing units could proactively be identified as qualified for projects that will increase energy efficiency?

## **Session 2C: Climate-Ready Emergency Management**

Hosts: Department of Safety and Homeland Security, Department of Transportation & Department of Natural Resources and Environmental Control

Key Recommendations:

- Long-term strategies for extreme weather events
- Emergency response strategies for safe transit
- Improving spill containment for above-ground storage tanks and hazardous waste storage

### **COMMENTS:**

#### **Recommendation: Make programmatic adjustments to adapt to increasing levels of precipitation, flooding, and sea level rise.**

1. I don't think any program change as far as ESCs respond when evacuation: already something else going on (already moving)
  - a. DEMA can call in state police, DelDOT etc...
  - b. Expands/contracts, whatever need is → call in more people
2. There is a confusion of resiliency preparedness (long term) vs. the short term action/implementation/responding to an issue... though somewhat related.
3. Events of surprise (high tides or coastal events) more recently have been occurring more; isolated geographic events will become new normal.
4. As much as this past winter-- would typically identify weather event and begin processes; would bring in staff and sit around and do nothing; stepping back: if something on horizon activate ESC internally; then along the way evaluate who they will reach out to in terms of ESCs and bring them in to emergency center; Mechanism that will involve working with the locals, local EMAs, weather service, general public, accounts from DOT and public; to establish timely evacuation (incremental shift... need to anticipate when something is coming).
5. Response and activities start increasing but this doesn't allow more time for planning; need to start identifying mitigation measures to remove people from harm's way, or restrict construction areas.
  - a. Should be event or location driven.
  - b. Don't want to burden a lot of people reporting but nothing getting done.
6. Real time on-the-ground resources are excellent in Delaware; the biggest concerns from DelDOT:
  - a. Look at infrastructure vulnerability... look at putting things underground, infrastructure resilience programs, DelDOT has assessment ongoing that looks at where vulnerable areas are.

- b. Problem is with resources, need to take roads out of flood plains; long term planning and redirect evacuation routes.
  - c. Building design specifications into design manuals to accommodate for sea level rise (i.e. bridges, roads etc.) [do this early enough to be able to accommodate sea level rise].
- 7. Outreach and education just as important if not more; biggest challenge is getting word out to public that they live in harm's way and even if there is a mitigation project, their access route or evacuation route/ emergency services route may be in harm's way.
  - a. If coordination with media is this something that could be incorporated into this program (for public outreach)?
  - b. Important for media to know why we are saying what we say.
- 8. In terms of public education and outreach—evacuation routes are not clear and if there is an emergency and media is not available, people don't know ahead of time about emergency response: is anyone doing anything to promulgate this?
- 9. There is a perceived disconnect; blue signs for nuclear emergency—pushed through pamphlets Route 9, 72, 13 etc. based on typical hurricane routes; information disseminated thorough nuclear plants in phone books and calendars (but people don't necessarily even look at these sources of information!).
  - a. Can there be a way of putting emergency response information into a centralized link so this information on all interested party's websites, can link to DelDOT and DEMA (streamline the information).
  - b. Can (do) people use Google maps to seek out evacuation routes? Are these accurate if they exist?
  - c. Migrants (a huge portion of the population) in Delaware don't know how to get around and this is a big problem.
  - d. Could homepage of ALL agency websites (not just DEMA) clearly indicate evacuation routes? To span across all state agency websites; use a logo or simple image that could be easily recognizable.
- 10. Everything within this subject is all about preparedness; this is the real message that needs to get out; concept of neighbor helping neighbor (no agency can do this alone); need to think about problems today and not AFTER something happens-- what is the hazard you live around and how do you deal with it?
- 11. Focus on some of the [geographic] areas chronically hit by disasters—focus public outreach there.

**Recommendations: Adjust transit service in emergencies and reevaluate emergency response protocols.**

1. Can Kent and New Castle based school buses be deployed down south in emergency?)
  - a. Can there be more CDL Training? Is there a list of people who are already trained?
2. Light commuter rails as option.
3. Other challenge is large amount of school bus yards are in low-lying flood prone areas.
4. FEMA program- will bring in transit system from out of state and run transit system for state; still in draft form but will be incorporated into evacuation forms.
5. Do any state agencies have plans of resiliency? Keep evolving plans but anything on what happens after?
6. Do you rebuild road in a flood zone that you know will be gone during next storm? Have to make decision and build with design standard that is more resilient.
7. Can rebuild roads but what about utilities? Water, septic systems, etc.... no communities have retreat plans because it's so contentious and highly difficult; at some point someone will have to decide to build vs. retreat; highlights need for coordinated planning.
8. In emergency management arena after event- start looking at it as recovery process. If state is successful in obtaining presidential declaration to help recovery... It will still always be a work in progress.
9. Everyone seems to be headed in the right direction...but why is state supporting development of Fort DuPont (poster child of what NOT to do).

**Recommendation: Evaluate need for improving spill containment requirements for hazardous materials.**

1. Recommendation seems to state they have everything in place; everything is already happening.
2. What about Underground tanks? They are a completely different vulnerability and a land use issue.
  - o The incorporated areas have a handle but unincorporated residential areas in flood prone areas; definite problem to first responders. (e.g. trailer parks along Long Neck Road in Sussex County during '97 Nor'easter); still a problem today; don't know the answer of enforcement; Anticipate the same problem would occur today if a similar event were to happen.
3. Underground utilities- can minimize threat to first responders.
4. People typically discount big facilities as being risks... are they really thinking 50 years out?

- Businesses are looking at return on investments, and usually only talking about it amongst themselves; some big corporations taking this to heart; if we lose facilities on the coast need to be mindful of what we're going to do.

**General Comments:**

1. Common thread is communication; if there is a way to make sure that those communications are shared with other non-profits to make sure general public can understand them so people know what to do.
  - Communication through different languages that can reach different groups
  - So many media outlets today, hard to keep up
2. Have not emphasized the 'prolonged event' (e.g. sustained drought) and what we do in terms of our ability to mobilize resources. We never know what climate will look like and so we have to have some response to how we deal with this; this is as much a climate change issue as rising water or significant storms.
3. More difficult to talk about effects of heat (not as tangible as storms) it's more than flooding.
4. Long term chronic effects of heat on infrastructure.

## **Session 2D: Economic Opportunities**

Hosts: Delaware Economic Development Office & Office of Management and Budget

Key Recommendations:

- Climate adaptation for business & tourism
- Supporting agriculture technology
- Incorporating resilience into GSS contracting

### **COMMENTS:**

#### **Recommendation: Advocate for adoption of state recommendations for climate change adaption.**

1. When DEDO adopts these positions, should be based on market-driven forces. Should not be based on legislation, but DEDO should work in concert with legislatures to dictate legislation based on market driven concepts.
2. DE is one of the lowest lying states, we are sinking and sea level is rising. With regard to economic development, Delaware should step to the front and recognize we have this problem. With DEDO, create programs to attract innovators across the country who are working on this problem. Delaware has opportunity to say, we need you to come play with us to show us how we can work on these.
3. Question to DEDO: One of them said that for beach rentals that the owners ought to change from Sat-Sat, change weekly pattern. Can you imagine if you did the above? Well then everyone has to go to their boss and ask for different days off. I can tell you what would happen, ones available Sat-Sat would go first. What expertise does DEDO have in this? If we have a cold summer, vacation rentals will go down. When it comes to tourism, our hot weather will actually help our beach communities. Is this so revolutionary that government should manipulate people? We're so adaptable. Government takes too long to take action. Need to just decide when things need to be done and do them. That's what business does.
4. State has already done some things in terms of eco-tourism. I see business growing off-season in beach towns. More interested in what's going on in the climate. There is a lot of curiosity. Inns get a lot of questions about how is climate change affecting you? The biggest problem we have in the beach towns is a lack of transportation. We don't have a way for people to get here.
5. From an economic development standpoint need to ask, do we focus on preserving the infrastructure that we have now, or should we move that back and focus economic development away from resort communities? If we're really concerned about it, may not be sustainable to build where we are right now.
6. One of the critical questions we had in sea level rise community, who makes the decision? Do we stand and defend or do we retreat? Big question is who pays for it?
  - a. I don't think the big issue is who pays for it. Land has been heavily manipulated to allow for what we're doing now. Canals, ditching farming land. We can't do that now. Biggest impact we can have is regulatory. If we lose industrial sites, won't get another one approved due to regulation.

**Recommendation: Assist in bolstering resilience in the agriculture sector.**

1. I believe this is being done already for the most part. Chickens are being bred differently. Climate controlled houses. Chickens are grown farther south than us. Tech is there. Yields are going up in other crops. Farmers are incredible adaptable. There will be places that have problems. As long as we continue to allow them to ditch, will be able to continue.
2. Prime hook refuge: lots of talk about what's the value in repairing the breach in the dike. Having to put in levies to protect properties from salt water. We have to look at the economic costs of inaction, as well as action.
3. 100% of grain crops grown in Delaware are used to feed chicken on Delmarva. If we don't address issues with grain crops, will impact the chicken industry. Need to think about the impact of that.
4. In terms of agriculture, have direct competition between tourism and agriculture. They do not mix. Anything you want to do to expand to work on economic development in tourism, keep moving that line of development further west and encroach on agriculture. Everything is developing further west. Farmer will have to ask – do I sell this for development or agriculture? State needs to ask, if we want economic development in the state, what is our priority? Tourism or agriculture.
  - o Balance can be struck. There is tourism to farmer's markets.

**Recommendation: Incorporate resilience in Government Support Services (GSS) contracting.**

1. Government should put in cost effective programs. Capacity for solar is only 14%. Why are we funding 14% solar panels to put on a state building? 14% in contrast to natural gas, which is 88-90%. DEDO should not encourage solar panels. Market would not drive itself to that without regulation.
2. State needs to look at all of the funding mechanisms and only use one, so that it can be managed more efficiently.
3. GSS is only intended to encroach upon government buildings, why does the recommendation not go beyond that to the public sector.
4. State has large budget problems. Don't know how deep this goes into the budget process. When we build public buildings, work on reducing cost of building; focus more towards a more appropriate cost.
5. One project we were all proud of was the incentives given for solar panels, taking money that someone who COULD afford to do that without state funding. Meanwhile, state schools are in trouble and collapsing because they have no money, but we focus on funding these programs when these could be used for our direct needs. We are not a wealthy state.
6. The materials, not just heating/cooling questions. But need to think about lifetime cycle of materials, which might be reason why costs are more expensive and that you can explain up front.

**General comments:**

1. We should not put any more money into Bloom energy. They are not reducing CO<sub>2</sub>. And they are acting outside of recommendations. They should not get another nickel.
2. Need to have consistency across agencies. When they go to implement, all the different agencies are using different information from Obama's document. They will not be able to actually keep track of it.
3. Delaware is in a bad situation. Huge part of that is people's incomes are not increasing. Delaware is one of the worst in the country. Average person is losing income. The middle class is shrinking and facing great economic stress. We need to stop thinking government should run the economy. Let business make decisions about business.
4. 600 agricultural acres lost to salt water intrusion. Dept. of Ag not currently monitoring the salt-water intrusion line.
5. Haven't talked about integration of utilities (gas lines, train options) down to the southern part of the state. State needs to think about infrastructure and let business do the rest.

# APPENDIX A

## Participants and Affiliations

DDA: Delaware Department of Agriculture  
 DEDO: Delaware Economic Development Office  
 DelDOT: Delaware Department of Transportation  
 DEMA: Delaware Emergency Management Agency  
 DHSS: Delaware Department of Health and Social Services  
 DNREC: Delaware Department of Natural Resources and Environmental Control  
 DOS: Delaware Department of State  
 DSHA: Delaware State Housing Authority  
 NOAA: National Oceanic and Atmospheric Administration  
 OMB: Delaware Office of Management and Budget  
 OSPC: Office of State Planning Coordination  
 UD: University of Delaware  
 USDA: U.S. Department of Agriculture

<b>Last Name</b>	<b>First Name</b>	<b>Affiliation</b>
Adkins	Jennifer	Partnership for the Delaware Estuary
Asere	Tunde	DNREC
Ashe	Jeremy	DNREC
Bacher	David	NRG Energy, Inc
Barnes	Philip	UD Institute of Public Administration
Bayer	Steve	OSPC
Becker	Ted	Mayor of Lewes
Bennett	Karen	DNREC
Biddle	Mark	DNREC
Book	Rob	Delaware Electric Cooperative
Booker	Brittanie	UD
Boutin	Brian	The Nature Conservancy
Brown	Anne	DelDOT
Brown	Bill	University of Delaware Poultry Extension
Carpenter Jr.	Dave	New Castle County Emergency Management
Carter	David	Delaware Audubon Society
Caruso	Claudia	UD
Chase	Randall	Press
Chen	Eli	WDDE Public Radio
Cherry	Phil	DNREC
Collins	Rich	Delaware House of Representatives
Cooksey	Sarah	DNREC
Coyle	Kevin	DNREC
Crisden-Boone	Deborah	Wilmington Department of Planning
Davis	Glenn	DNREC
Day	Dwayne	DelDOT
DeAngelis	Diana	Delmarva Power
DeHaven	Barb	DEDO
deMooy	Jennifer	DNREC
Edgell	David	OSPC

Ellis	Morgan	DNREC
Erickson	Mike	-
Fortunato	Howard	Home Builders Association of DE
Freeman	Shannon	Delaware Tech (Student)
Furlong	Erika	Delaware Nature Society
Gergely	Ryan	DNREC
Gillespie	Glenn	DEMA
Goggin	Brenna	Delaware Nature Society
Goodman	Todd	Delmarva Power
Goold	Megan	US Environmental Protection Agency
Gray	Mary Ellen	Assistant Planning Director, Kent County
Gray	Valerie	DNREC
Guinivan	Phyllis	Center for Disabilities Studies, UD
Harrod	John	Delaware Nature Society
Holland	Constance	OSPC
Homsey	Andrew	UD
Horton	Karen	DSHA
Hossler	Rob	DNREC
Hubbard	Tom	DE Water Association
Johnson	Stephen	DNREC
Kee	Ed	DDA
Kelly	Kevin	Leon N. Wriner & Assoc. Inc.
Keyser	Todd	DNREC
Killmer	Lew	Vice Mayor of Bethany Beach
King	Stephen	DHSS
Knotts	Pam	DOS (Public Service Commission)
Krause	Katrina M.	USDA Northeast Climate Hub
Kreiner	Andrea	Workshop Staff
Krishnamurthy	Vikram	-
Lauria	Maddy	Cape Gazette
Layton	Holly	DNREC
Legates	Dr. David	Public
Locke	Lisa	Delaware Interfaith Power & Light
Love	Susan	DNREC
Lucks	Bill	Delaware Association of REALTORS
Lynch	Scott	Delaware Municipal Electric Corporation
Magliocca	Michelle	NOAA Fisheries
Marshall	Clishona	DOS (Public Service Commission)
Mateyko	John	President, State Board of Architects
Maucher	Andrea	DOS (Public Advocate)
McGowan	Bill	USDA
McKenna	Kim	DNREC
McLaughlin	Tim	DEDO
McNealy	Wesley	Pepco Holdings
Mifflin	Trudy	OMB
Molfetta	Kristen	UD
Moore	Richard	Lewes Community Partnership

Murray	Molly	News Journal
Narvaez	Martha	UD
Neeman	Beth	OMB
Nichols	John	Public
Noyes	Tom	DNREC
Pepper	Terry	DSHS
Pflaumer	Robert	DEMA
Rambo	Doug	DNREC
Rapp	Melanie	DNREC (Public Affairs)
Rhoads	Craig	DNREC
Riggs	Carol	DNREC (Public Affairs)
Rogerson	Joe	DNREC
Rothweiler	Rebecca	Consultant
Rudy	Keith	Landmark Science & Engineering
Santella	Nicholas	Brownfield Science & Technology
Sapko	Pam	Delaware Center for Horticulture
Sarver	Matthew	Sarver Ecological, LLC
Satterfield	Bill	Delmarva Poultry Industry, Inc.
Schultz	Peggy	League of Women Voters of Delaware
Schurter	George	Mt. Cuba Center
Scoglietti	Robert	OMB
Seemans	Jordan	Consultant
Smith	Deirdre	Duffield Associates
Snyder White	Donna	Delaware 2-1-1
Sparling	Eileen	UD
Spencer	Mike	Newport Mayor
Stevenson	David	Caesar Rodney Institute
Stevenson	Glen	Milford School District
Swiatek	Bill	WILMAPCO
Sykes	John	Delaware Interfaith Power & Light
Sylvester	Stacy	DNREC
Taylor	Brett	DelDOT
Torres	Lauren	DDA
Valencik	Kelly	DNREC
Valenti	Michael	DDA
Vallee	Jennifer	Dover Air Force Base
Van Boekhold	Bahareh	DNREC
Vulinec	Kevina	Delaware State University
Walters	Laura	Coastal Point Newspaper
Watkins	Matthew	UD Institute of Public Administration
Weiss	Jeff	Chesapeake Utilities
Whitney	John	South Bethany Planning Commission
Willin	R. C.	Willin Farms, LLC
Wilson	Despina	Department of Education
Zegeye	Tigist	WILMAPCO
Zeiters	Doug	Dover Air Force Base

# **APPENDIX B**

## **Additional Feedback and Comments**

The comments were collected in a variety of methods. The DNREC Division of Energy and Climate created a webpage that allowed members of the public to submit comments on the Climate Framework for Delaware online or via the mail over a 3 month period. In-person feedback was collected at the April 27, 2015 Climate Adaptation and Resilience Stakeholder Workshop during each breakout session and at the conclusion of the workshop. Lastly, participants at the workshop could email comments directly to DNREC.

This appendix provides the feedback and comments collected through the variety of collection methods. We have divided this appendix into three components:

- Feedback collected via online and through the US mail based on the Survey Monkey survey.
- Feedback collected on the day of the April 27, 2015 Adaptation and Resilience Stakeholder Workshop.
- Additional feedback collected throughout the open comment period (March 3, 2015-May 30, 2015).

All feedback is the original feedback provided by participants, stakeholders and members of the public. The comments are presented without attribution.

Feedback Collected on the "Climate Framework for Delaware"

The Survey Monkey online survey was open to public from March 3, 2015- May 30, 2015;

responses were collected via the online platform as well as US mail.

#1

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Friday, March 06, 2015 7:18:32 PM

Last Modified: Friday, March 06, 2015 7:37:49 PM

Time Spent: 00:19:17

PAGE 1: Public Comment Form

**Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)**

The arrogance of Governor Markell to assert that Delaware reducing its greenhouse gas by 30% would have any measurable effect on any environmental parameters is beyond belief. This entire effort is an affront to Delaware businesses, taxpayers, and citizens. It is also an affront to Almighty God. Citizen prayer would be far more effective in tempering the environment than any actions being proposed by Gov Markell. My 46 years of engineering experience and education (BSEE/Magna cum Laude from Yale; MSEE/System Science, Brooklyn Poly) give me more credibility than the pseudo-science global warming zealots who rig experiments and mis-use data in false proofs of ridiculous assertions.

**Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**

The assertion in this question is flat-out FALSE. The state should always be prepared for natural disasters, which have occurred for millennia and will continue to occur even if Delaware wastes 100s of millions of dollars on climate change crony capitalism.

**Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**

The premise in the first sentence regarding "both of which are at risk," is FALSE. See previous answer for what the state should do.

**Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**

YOU ARE USING PUBLIC SCHOOLS TO INDOCTRINATE STUDENTS IN FALSEHOODS ABOUT CLIMATE CHANGE. PLEASE STOP! INSTEAD, TEACH THEM BASIC READING, WRITING, SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH, NOT HOW TO LIE WITH STATISTICS AND RIGGED EXPERIMENTS ON "CLIMATE CHANGE."

**Q5: ADAPTATION**—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):

CANCEL THIS INITIATIVE IMMEDIATELY AND PUT THE MONEY INTO MORE ECONOMIC DEVELOPMENT FOR DELAWARE. AND JACK MARKELL SHOULD BE IMPEACHED FOR THIS.

**Q6: FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

HOW ABOUT BUILDING DYKES ALONG THE DELAWARE COASTLINE? IT WORKED IN EUROPE! OF COURSE, THERE GOES THE OCEAN VIEWS!

**Q7: FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

WHEN DEVELOPERS BUILD HOUSES 50 FEET FROM THE OCEAN AT LOW TIDE, WHAT WOULD ONE EXPECT DURING STORMS? DISASTER, OF COURSE. STOP BUILDING HOMES AT WATER'S EDGE!

**Q8: If you have any other comments, please feel free to submit them here:**

I THINK YOU GET MY DRIFT. DELAWARE IS BUYING INTO PRESIDENT OBAMA'S FRAUDULENT CLIMATE CHANGE INITIATIVES. THIS IS DESTROYING DELAWARE BUSINESS OPPORTUNITIES AND RESIDENTS' WAY OF LIFE, INCLUDING RETIREES LIKE MY WIFE (PUBLIC SCHOOL TEACHER FOR OVER 30 YEARS IN PA, IN, AND VA), AND MYSELF (46 YEARS OF ENGINEERING AND PROJECT MANAGEMENT SUPPORTING DOD AND THE INTELLIGENCE COMMUNITY).

**Q9: (OPTIONAL)** Feel free to provide your name and affiliation/contact info if you would like.

[REDACTED]

#2

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Saturday, March 07, 2015 7:10:33 AM

Last Modified: Saturday, March 07, 2015 7:15:23 AM

Time Spent: 00:04:50



PAGE 1: Public Comment Form

**Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)**

encourage more people to take public transportation to work

**Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**

see above

**Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**

*Respondent skipped this question*

**Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**

run a statewide campaign encouraging people to take public transportation to work - get companies involved

**Q5: ADAPTATION—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):**

*Respondent skipped this question*

**Q6: FLOOD AVOIDANCE—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?**

forbid building in flood zones

**Q7: FLOOD AVOIDANCE—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?**

*Respondent skipped this question*

**Q8: If you have any other comments, please feel free to submit them here:**

too many people drive to work - everyone wins  
when more people take the bus - let's be the leader in public transit !

**Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.**



#3

COMPLETE

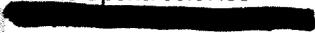


Collector: Web Link 1 (Web Link)

Started: Saturday, March 07, 2015 8:44:36 AM

Last Modified: Saturday, March 07, 2015 8:52:30 AM

Time Spent: 00:07:53



PAGE 1: Public Comment Form

Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)

*Respondent skipped this question*

Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?

*Respondent skipped this question*

Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?

*Respondent skipped this question*

Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)

*Respondent skipped this question*

Q5: ADAPTATION—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):

*Respondent skipped this question*

**Q6: FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

*Respondent skipped this question*

**Q7: FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

*Respondent skipped this question*

**Q8: If you have any other comments, please feel free to submit them here:**

I live on the edge of the bay. I have a marker at the edge. The water level has not gone above the marker in 18 years except during severe storms. The US is a leader. We have to get places like china to do more, other wise it's a waste of time and mone.

**Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.**

A concerned citizen.

#4

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Sunday, March 08, 2015 7:57:07 PM

Last Modified: Sunday, March 08, 2015 8:41:10 PM

Time Spent: 00:44:03

## PAGE 1: Public Comment Form

**Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)**

I think energy efficiency is great as are some forms of renewable energy (as long as it is not agricultural production that takes food from our tables). That said, I think electric cars are just a cover-up. Electric is generated in some very unclean and dangerous (nuclear) ways; therefore, gasoline is a much better choice.

**Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**

While I am very concerned about soot, smog, etc., and want them reduce;, carbon dioxide is not a dangerous emission and is NOT producing global warming. It's getting colder in case you haven't noticed. Don't you realize that trees and plants need CO2 to live? We need the trees and plants living to give off oxygen or we will die. Again, while I want to stress that I am all for pollution control, CO2 reduction is a sham devised to extract tax dollars for the sole purpose of making the rich richer. Stop this stupidity. If you really want to protect the environment (water, air, soil) you would stop GMO's that are contaminating natural God given plants and perverting them. You would stop the pesticides and herbicides used in Big Ag farming that are poisoning our food, soil, water, and air. These chemicals are destroying our health and will bankrupt this State and this Nation. Support organic, sustainable small farmers and you will accomplish your so called "climate change" goals. Hold Big Ag more responsible for their unsustainable farming methods that are devoid of earth friendly methods.

**Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**

What happened to the term "global warming"? Now it is "climate change" because you can't dispute that the earth is cooling, not warming, and you were wrong. What can you do for tourism and agriculture? Promote, encourage, and support small, sustainable farms and encourage local restaurants to purchase healthy, organic, sustainably raised food to serve in their restaurants.

**Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**

I think you need to change the message first and foremost. Many, many people do not buy into "climate change". I am one of those many. Go back to the drawing board and focus on eliminating pollution overall. Take a look at consumer goods and the ridiculous amount of unnecessary "packaging" of products. Focus on recycling and on sustainable farming. Educate people on how to grow some of their own food. Start there. Go visit <http://www.polyfacefarms.com/principles/> and share this with farmers.

**Q5: ADAPTATION—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):**

*Respondent skipped this question*

**Q6: FLOOD AVOIDANCE—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?**

*Respondent skipped this question*

**Q7: FLOOD AVOIDANCE—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?**

*Respondent skipped this question*

**Q8: If you have any other comments, please feel free to submit them here:**

Please focus on fixing the real problem facing this nation, GMO food and unsustainable Big Ag farming. Additionally, we all need to stop buying food that has been shipped half way around the world and has lost most nutrients. How much fuel is being consumed in the transportation of this food and (for you climate change supporters) how much pollution is produced by the transportation? Maybe you can educate people to eat healthy, non-GMO foods produced by small, in-State organic farmers. That should also fix your healthcare costs because people may get healthier.

**Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.**

*Respondent skipped this question*

#5

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Tuesday, March 10, 2015 10:54:16 AM

Last Modified: Tuesday, March 10, 2015 11:18:34 AM

Time Spent: 00:24:18

PAGE 1: Public Comment Form

**Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)**

Eliminate additional sources of greenhouse gases. In Millsboro we already have one of the number 1 polluters of greenhouse gas, Mountaire Farms as per the News Journal reporting that in 2012 they released 112,000 tons of methane gas into the air(methane is a greenhouse gas). Along with the other poultry processing plants in this area we are being murdered by greenhouse gases.

**Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**

*Respondent skipped this question*

**Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**

12 million gallons of wastewater from cleaning chickens dumped into the Indian river is a impact on tourism. who is going to want to swim in the rivers, eat fish and crabs after discharging waste into the river. The river flows into the bay and then the ocean, why make our rivers dumping grounds for industry??

**Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**

Support and advance notice of items that affect the health and welfare of the citizens of the state.

**Q5: ADAPTATION—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):**

*Respondent skipped this question*

**Q6: FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

*Respondent skipped this question*

**Q7: FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

*Respondent skipped this question*

**Q8: If you have any other comments, please feel free to submit them here:**

The State of Delaware needs to learn that there are places for industrial sites and places for residential living, the 2 do not mix. why place a industrial site that is known for pollution problems on a river and in the middle of a community? Its the old question of jobs or the environment? Mountaire and Perdue in this area cannot find enough workers to fill their needs, why add another poultry slaughter house and bring in more immigrants that will be a burden on our states government.

**Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.**

Protecting our Indian River

#6

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Tuesday, March 10, 2015 11:16:01 AM

Last Modified: Tuesday, March 10, 2015 11:22:41 AM

Time Spent: 00:06:40



PAGE 1: Public Comment Form

**Q1: 1. MITIGATION**—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)

NONE

**Q2: ADAPTATION**—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?

NONE

**Q3: ADAPTATION**—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?

NONE

**Q4: ADAPTATION**—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)

NONE

**Q5: ADAPTATION**—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state’s resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):

NONE

**Q6: FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

NONE

**Q7: FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

NONE

**Q8: If you have any other comments, please feel free to submit them here:**

It was "global warming" until it became "climate change". Of course the climate "changes", it has since time began and doesn't need government help to be regulated.

**Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.**

[REDACTED]

#7

COMPLETE



Collector: Web Link 1 (Web Link)  
Started: Friday, March 13, 2015 9:15:11 AM  
Last Modified: Friday, March 13, 2015 9:25:20 AM  
Time Spent: 00:10:09



PAGE 1: Public Comment Form

**Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)**

None. There is no reason to reduce greenhouse gas.

**Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**

God is in charge of all these things, so I do not expect the state to have to do anything.

**Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**

Pray.

**Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**

You mean community "resistance". I do not recommend anything.

**Q5: ADAPTATION—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):**

*Respondent skipped this question*

**Q6: FLOOD AVOIDANCE—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?**

*Respondent skipped this question*

Q7: FLOOD AVOIDANCE—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

*Respondent skipped this question*

**Q8: If you have any other comments, please feel free to submit them here:**

Delaware residents have survived for decades without all these state regulations.

Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.

*Respondent skipped this question*

#8

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Friday, March 13, 2015 2:42:13 PM

Last Modified: Friday, March 13, 2015 2:50:29 PM

Time Spent: 00:08:15

## PAGE 1: Public Comment Form

**Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)**

Waste of time based on delaware's size.

**Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**

Climate has and will continue to change. Problems like lack of maintenance of dikes and shoreline erosion are now portrayed as Climate risk.

**Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**

Another joke based on our ridiculous policies toward energy. Bloom subsidies and cap and trade are political jokes.

**Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**

Outreach aka propaganda?

**Q5: ADAPTATION—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):**

How much money can we spend to have no effect on any outcome?

**Q6: FLOOD AVOIDANCE—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?**

maintenance of existing dikes and dunes.

**Q7: FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

Dont build in a flood zone but dont believe in the propoganda of a 5 ft sea level rise in the next 100 years.

**Q8: If you have any other comments, please feel free to submit them here:**

How many "settled science climate models" are in place? How many of them are tracking and in agreement with the weather we have experienced over the last 20 years. Remember the carter years when we were warned about a pending Ice Age. That was the settled science of the 1970's / 1980's. And we were also told we would run out of fossil fuels in 10 years. Amazing how much smarter the "scientists" are today.

**Q9: (OPTIONAL)** Feel free to provide your name and affiliation/contact info if you would like.

*Respondent skipped this question*

#9

COMPLETE



Collector: Web Link 1 (Web Link)  
Started: Friday, March 13, 2015 4:52:20 PM  
Last Modified: Friday, March 13, 2015 4:59:21 PM  
Time Spent: 00:07:01



PAGE 1: Public Comment Form

**Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)**

The state should abandon this goal. There is no rational reason for it since Delaware emits only a miniscule percentage of greenhouse gases.

**Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**

None of these things are happening. In fact, hurricanes and tornado activity has been at historically low levels for the past several years. Go back to the things government should do, like pay employees decent wages and provide health care.

**Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**

They most certainly are not at risk. Warmer weather benefits both crops and tourism. Have you been to Florida lately?

**Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**

Absolutely none. We can't teach our children the 3 Rs. Concentrate on that.

**Q5: ADAPTATION—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):**

Build higher seawalls and jetties where needed. Use fill dirt and pump sand on the beaches. In other words, do the practical things we've always done.

**Q6: FLOOD AVOIDANCE—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?**

No. FEMA is paying a very small percentage of flood claims. We don't have much genuine flooding in Delaware.

**Q7: FLOOD AVOIDANCE—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?**

No. Go away and leave me alone!

**Q8: If you have any other comments, please feel free to submit them here:**

Where are your priorities. These state cabinet secretaries should be working on improving the economy and paying the state's bills.

**Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.**

You'll hear from me often enough.

#10

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Saturday, March 14, 2015 12:34:42 PM

Last Modified: Saturday, March 14, 2015 12:50:17 PM

Time Spent: 00:15:35

## PAGE 1: Public Comment Form

**Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)**

Large scale wind and electric vehicles are the only way to reach this level of reduction. Efficiency and solar are good, but can't get 30%, especially while enabling economic growth.

**Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**

Adaptation is only a holding strategy, as SLR will continue if mitigation is small. Serious mitigation would involve retreat, which is probably not politically feasible.

**Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**

By us and others doing mitigation.

**Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**

Educate the public

**Q5: ADAPTATION—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):**

Need concrete steps for large wind implementation.

**Q6: FLOOD AVOIDANCE—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?**

*Respondent skipped this question*

Q7: FLOOD AVOIDANCE—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

*Respondent skipped this question*

Q8: If you have any other comments, please feel free to submit them here:

*Respondent skipped this question*

Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.

[REDACTED]

#11

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Sunday, March 15, 2015 4:01:38 PM

Last Modified: Sunday, March 15, 2015 4:05:19 PM

Time Spent: 00:03:41

## PAGE 1: Public Comment Form

**Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)**

NONE. The state should abandon this goal.

**Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**

NONE. The state should abandon this goal.

**Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**

Tourism is enhanced by continuation of tax free shopping and completion of Rte. 1. Keep the beaches clean. Ignore so-called climate change initiatives.

**Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**

To date this has been propaganda. No education should be attempted without someone to speak truth to power i.e. that climate change is not "settled science".

**Q5: ADAPTATION—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):**

No more regulations. Do not enact any of these recommendations.

**Q6: FLOOD AVOIDANCE—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?**

NONE. The state should abandon this goal.

**Q7: FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

NONE. The state should abandon this goal.

Q8: If you have any other comments, please feel free to submit them here:

*Respondent skipped this question*

Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.

*Respondent skipped this question*

#12

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Tuesday, March 17, 2015 12:05:01 PM

Last Modified: Tuesday, March 17, 2015 12:06:11 PM

Time Spent: 00:01:10



PAGE 1: Public Comment Form

Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)

*Respondent skipped this question*

Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?

*Respondent skipped this question*

Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?

*Respondent skipped this question*

Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)

*Respondent skipped this question*

Q5: ADAPTATION—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):

*Respondent skipped this question*

**Q6: FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

*Respondent skipped this question*

**Q7: FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

*Respondent skipped this question*

**Q8:** If you have any other comments, please feel free to submit them here:

*Respondent skipped this question*

**Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.**

If you really want to know what the effects of global warming might be, why don't a few of you try moving to Florida. I believe there are millions of people there and it is considerably warmer than Delaware is anticipated to be.

#13

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Wednesday, March 25, 2015 7:51:14 PM

Last Modified: Wednesday, March 25, 2015 8:08:28 PM

Time Spent: 00:17:13

## PAGE 1: Public Comment Form

**Q1: 1. MITIGATION**—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)

It seems to me that nature alone can cure the hardships we place upon her. Little ponds in huge developments are a joke.

**Q2: ADAPTATION**—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?

The Ocean front will take the first big hit from climate change. We can either let people build there knowing that we will have to clean up the mess of their weather destroyed home in the near to moderate term, or stop it now!!!

**Q3: ADAPTATION**—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?

I think that it needs to back away from climate impacts. Why should a guy need to pay an attorney a fortune to get a permit for something that we all know is short term. I mean really--who thinks Dewey will be here in 15 years????

**Q4: ADAPTATION**—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)

Meetings just telling people the facts on sea level rise, which I have seen myself in my lifetime, and that when there current structure is gone--its gone, might help folks improve their business models.

**Q5: ADAPTATION**—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):

We can't drain the ocean!!

**Q6: FLOOD AVOIDANCE—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?**

Stop beach replenishment. Its just putting off the inevitable at a high cost to non-benefactors.

**Q7: FLOOD AVOIDANCE—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?**

Wherever it floods, its supposed to. We can't change nature!!!

**Q8: If you have any other comments, please feel free to submit them here:**

If my comments were taken literally it would hurt a few of my friends. I don't want to hurt anyone, but the sea level is rising. Your permitting of say the new motel at the Rudder, was just plain stupid and irresponsible. It won't be long before we are all taxed to put boulders in front of the building. Dewey, Bethany-- and I really haven't studied Fenwick, but its on the list, are all short timers. 5th stage melanoma!!!

**Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.**

*Respondent skipped this question*

#14

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Tuesday, March 31, 2015 7:28:54 AM

Last Modified: Tuesday, March 31, 2015 7:50:53 AM

Time Spent: 00:21:58

PAGE 1: Public Comment Form

**Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)**

enforce laws on major polluters like Valero, coal burners. fine them heavily if they are not in compliance.

**Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**

allow nature to take it's course along the coastal zones. dropping money into a losing battle is just not smart. do not allow any more new homes or developments along the Bay or Ocean.

**Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**

the state could finish the toll from dover to sussex county. why hasn't this been done? do not allow any more direct access to route one. slowing down tourists, bottle necks, red lights, development on top of this important tourist route is not in our best interest. get politics out of zoning; especially in the Milford area.

**Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**

scientific presentations as to what to expect, how to deal with it, and a progressive approach to development with required landscaping, hardwood preservation, habitat preservation, and open public green space. require landscaping for parking lots. and I'm not talking about a couple bushes. I'm talking shade trees to absorb runoff, shade very hot pavement, habitat for wildlife, and provide O2.

**Q5: ADAPTATION—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state’s resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):**

This survey is ridiculous really, by using terminology that most 'normal' people do not use. Who writes this shit? For example: please comment here (note the agency and recommendation title) Note the agency and recommendation title? What does that even mean? Do you think the general public knows what agencies to name. There are a myriad of them. Get real. Hire a real writer instead of a lawyer, or bureaucrat to formulate the questions.

**Q6: FLOOD AVOIDANCE—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?**

Delaware Dept of Agriculture, Forestry, and DELdot. Policy on Forestry management. Policy on allowing development along major thru corridors. Enforcement, fines, and serious, yes serious investigations into commercial, manufacturing, and energy production facilities.

**Q7: FLOOD AVOIDANCE—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?**

on the web. nobody has time to go to so-called trainings, workshops, plus this creates more CO2 from driving to them.

**Q8: If you have any other comments, please feel free to submit them here:**

Eliminate clear cut forestry in Delaware. It is stupid. Destroys habitat, indigenous plants, and reduces oxygen production. It is a blight. Archaic way to manage our woods and forests. Actually, it's not management at all but rather mismanagement. That's my suggestion for the governor.

**Q9: (OPTIONAL) Feel free to provide your name and affiliation/contact info if you would like.**

[REDACTED]

#15

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Tuesday, April 07, 2015 10:34:50 AM

Last Modified: Tuesday, April 07, 2015 11:23:54 AM

Time Spent: 00:49:04

## PAGE 1: Public Comment Form

**Q1: 1. MITIGATION—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)**

How much of the so called green house gas is generated in Delaware and how much comes over the borders? Imposing restrictions on Delaware industry for little of no gain is not only without reason but will have an impact on industry and resident finances both in taxes and the cost of utilities. Lets us our heads here. There is no evidence that greenhouse gases are the major cause of climate change and recent evidence shows that the change has leveled out or temps are falling. I see that you are using the term migration which indicates that youi are not sure that temps are rising or falling.

**Q2: ADAPTATION—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**

While the statement is true there is no evidence that they are related to actual events or connections to controllable situations. Only take actions to ones actually observed like unusual road flooding. Stop development of every bit of undeveloped land and farm land.

**Q3: ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**

They may be at risk but the risk won't be mitigated by reducing greenhouse gases by 30%. Uncontrolled development of forests, fields and farm lands for residences and shopping centers is more likely to impact farming and tourism.

**Q4: ADAPTATION—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**

Present data supprting and disputing controllable climate change and the costs and impact to react and let the public decide if they want to finance expensive projects that interfere with the states economics, cost the tax payers money and hurt industry wuth possibly no positive impace on their lives.

**Q5: ADAPTATION**—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):

Reduce the number to only those that are related to natural occurrences and do not chase the uncontrollable or perhaps fictional variables like temp rise due to greenhouse gases.

**Q6: FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

Rank them starting with the ones that are actually being experienced now to the ones that may or may not be experienced due to unreliable forecasts. Only pursue the real ones.

**Q7: FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

*Respondent skipped this question*

**Q8: If you have any other comments, please feel free to submit them here:**

There are many scientists who have real data (not prejudiced computer programs) which show that the climate is not changing as some predict. They get very little airing since many politicians and the news media like the publicity they get by scaring the public. If none of these other opinion people are on your team then your entire program is suspect.

**Q9: (OPTIONAL)** Feel free to provide your name and affiliation/contact info if you would like.

*Respondent skipped this question*

#16

COMPLETE



Collector: Web Link 1 (Web Link)

Started: Thursday, May 28, 2015 9:11:40 AM

Last Modified: Thursday, May 28, 2015 9:15:58 AM

Time Spent: 00:04:18

PAGE 1: Public Comment Form

**Q1: 1. MITIGATION**—The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)

Absolutely continuously audit all of the data rigorously!

**Q2: ADAPTATION**—Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?

Absolutely continuously audit all of the data rigorously!

**Q3: ADAPTATION**—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?

Absolutely continuously audit all of the data rigorously!

**Q4: ADAPTATION**—An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)

Absolutely continuously audit all of the data rigorously!

**Q5: ADAPTATION**—The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):

Absolutely continuously audit all of the data rigorously!

**Q6: FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

Absolutely continuously audit all of the data rigorously!

**Q7: FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

Absolutely continuously audit all of the data rigorously!

**Q8: If you have any other comments, please feel free to submit them here:**

I am concerned that the raw field data from data collection will be watered down, so publicly report the results and absolutely continuously audit all of the data rigorously!

**Q9: (OPTIONAL)** Feel free to provide your name and affiliation/contact info if you would like.

*Respondent skipped this question*

# Executive Order 41 Recommendations for Addressing Climate Change

## PUBLIC COMMENT FORM

The state of Delaware seeks public input on recommendations prepared under Executive Order 41 as described in the "Climate Framework for Delaware" report. Please provide your comments on how these recommendations may affect you, your community, or your business, as well as your suggestions on actions the state should take to meet the challenges of climate change.

1. **MITIGATION**— The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)

*Greenhouse gas reduction is a waste of time and energy if China + Korea are burning wood for 1.5 billion people and India is burning fossil fuel for another 1 billion people. The U.S. has 300 million people. We cannot put a "dent" in CO<sub>2</sub> emissions without a similar program from 3rd world countries.*

2. **ADAPTATION**— Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?

*Strategic Retreat! Sea level on Delaware shores has been rising at 12" each century for the past 300 years. Now Duke predicts 60" for the next 100 years. Are the crazy? If sea level rises 20" in the next 100 years it will be dramatic, but not a calamity. Stop the insane waste of money at Fowler Beach and allow waterfront dwellers to stay 20 years, then*

3. **ADAPTATION**— Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?

*Support Beach replenishment on public beaches where taxes are paid for tourism lodging. Abandon all public support for private beaches with 218 citizens paying no taxes. Spending \$60 million on Prime Hook, Brantwick + Starship Beach is a subsidy for 600 people. How is that sensible policy? It's political.*

4. **ADAPTATION**— An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)

*Place signs at former entrances to abandoned roads to beaches that were formerly high + dry. The public cannot fail to see the creep of sea level rise and will be careful not to build on dunes that are receding. Stop flood insurance subsidies. Pay for your own risks.*

Additional questions on other side →

# Executive Order 41 Recommendations for Addressing Climate Change

## PUBLIC COMMENT FORM

5. **ADAPTATION**— The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):

Stop rebuilding private dunes. Allow private owners to remain for 20 years or until the next flood. Don't allow rebuilding on barrier dunes. Stop flood insurance subsidies. Establish 10 year lives of strategic retreat and don't allow new buildings within retreat zones.

6. **FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

Give all old homeowners 10 years to elevate homes to 100 yr. Flood plain levels at 8' MSL or demand removal. Don't allow septic on barrier waterfronts. They will leak. Permit holding tanks that can sustain washovers.

7. **FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

Publish flood avoidance procedures and give public 5 years to adapt + comply. Stop the promotion of 5' sea level rise maps. No one believes any of those scare scenarios. Sea levels will rise, but 5' is impossible to believe.

8. If you have any other comments, please feel free to submit them here, or attach an additional page:

Delaware appreciates the awareness + discussions regarding sea level rise. We cannot affect the overall CO<sub>2</sub> in the atmosphere without a similar sacrifice from 4.5 billion folks in 3rd world countries. Why penalize + wreck our economy over a token effort that makes no difference?

(optional) Name: \_\_\_\_\_

(optional) Affiliation/contact info: Director / Developer -

Please print this form and mail to: Delaware Division of Energy and Climate, 1203 College Park Dr., Suite 101, Dover, DE, 19904

# Executive Order 41 Recommendations for Addressing Climate Change

## PUBLIC COMMENT FORM

The state of Delaware seeks public input on recommendations prepared under Executive Order 41 as described in the "Climate Framework for Delaware" report. Please provide your comments on how these recommendations may affect you, your community, or your business, as well as your suggestions on actions the state should take to meet the challenges of climate change.

1. **MITIGATION**— The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)

None. Stop taxing individuals to death and leave businesses alone.

2. **ADAPTATION**— Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?

None. You cannot fix stupid. No such thing as climate change.

3. **ADAPTATION**— Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?

God is in control of nature, Not Government.

4. **ADAPTATION**— An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)

None. Do not spend any tax dollars or use any resources ,

Additional questions on other side →

# Executive Order 41 Recommendations for Addressing Climate Change

## PUBLIC COMMENT FORM

5. **ADAPTATION**— The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):

Do not give any more power or money to 11 state agencies. You cannot stop Mother Nature. (God)

6. **FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

Build Houses on stilts in Flood Zones, Let Towns & Counties Supervise.

7. **FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

Website/ Newspaper Booklets

8. If you have any other comments, please feel free to submit them here, or attach an additional page:

State government and U.S. Congressional Delegation should stop pushing Federal Liberal, Left, Socialist Agenda on Delaware residents. Abide by our

(optional) Name: Constitution and the will of

(optional) Affiliation/contact info: The People

Please print this form and mail to: Delaware Division of Energy and Climate, 1203 College Park Dr., Suite 101, Dover, DE, 19904

# Executive Order 41 Recommendations for Addressing Climate Change

## PUBLIC COMMENT FORM

The state of Delaware seeks public input on recommendations prepared under Executive Order 41 as described in the "Climate Framework for Delaware" report. Please provide your comments on how these recommendations may affect you, your community, or your business, as well as your suggestions on actions the state should take to meet the challenges of climate change.

1. **MITIGATION**— The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)

Delaware has done enough. Climate has always been changing. The only thing correlated with it so far is solar activity.

2. **ADAPTATION**— Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?

The temperature has not increased in 16 years. How can the "State" protect people from flooding except to continue plantings along shorelines & perhaps raising them.

3. **ADAPTATION**— Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?

How are tourism & agriculture affected by climate change? I would question that.

4. **ADAPTATION**— An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)

Our children in schools are already being brainwashed. True science is always looking for new "truths". There is no such thing as "settled science." The science we have today does not support manmade climate change.

Additional questions on other side →

# Executive Order 41 Recommendations for Addressing Climate Change

## PUBLIC COMMENT FORM

5. **ADAPTATION**— The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state's resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):

As usual, this is a job-enhancing program.

6. **FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

Am not familiar with those so can't comment. However, much flooding along water ways is due to land settlements coastal

7. **FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

no

8. If you have any other comments, please feel free to submit them here, or attach an additional page:

If this were true, the President & others who espouse manmade climate change would not be leaving such a big "carbon footprint" themselves. It is interesting to me that some people think they can take the place of God.

(optional) Name: \_\_\_\_\_

(optional) Affiliation/contact info: \_\_\_\_\_

Please print this form and mail to: Delaware Division of Energy and Climate, 1203 College Park Dr., Suite 101, Dover, DE, 19904

**Investors.com**

Powered by Investors Business Daily

February 14, 2015

## **U.N. Official Reveals Real Reason Behind Warming Scare**

**Economic Systems:** The alarmists keep telling us their concern about global warming is all about man's stewardship of the environment. But we know that's not true. A United Nations official has now confirmed this.

At a news conference last week in Brussels, Christiana Figueres, executive secretary of U.N.'s Framework Convention on Climate Change, admitted that the goal of environmental activists is not to save the world from ecological calamity but to destroy capitalism.

"This is the first time in the history of mankind that we are setting ourselves the task of intentionally, within a defined period of time, to change the economic development model that has been reigning for at least 150 years, since the Industrial Revolution," she said.

Referring to a new international treaty environmentalists hope will be adopted at the Paris climate change conference later this year, she added: "This is probably the most difficult task we have ever given ourselves, which is to intentionally transform the economic development model for the first time in human history."

The only economic model in the last 150 years that has ever worked at all is capitalism. The evidence is prima facie: From a feudal order that lasted a thousand years, produced zero growth and kept workdays long and lifespans short, the countries that have embraced free-market capitalism have enjoyed a system in which output has increased 70-fold, work days have been halved and lifespans doubled.

Figueres is perhaps the perfect person for the job of transforming "the economic development model" because she's really never seen it work. "If you look at Ms. Figueres' Wikipedia page," notes Cato economist Dan Mitchell: Making the world look at their right hand while they choke developed economies with their left.

Read More At Investor's Business Daily: <http://news.investors.com/ibd-editorials/021015-738779-climate-change-scare-tool-to-destroy-capitalism.htm#ixzz3RkaMZPDk>

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# Executive Order 41 Recommendations for Addressing Climate Change

## PUBLIC COMMENT FORM

The state of Delaware seeks public input on recommendations prepared under Executive Order 41 as described in the "Climate Framework for Delaware" report. Please provide your comments on how these recommendations may affect you, your community, or your business, as well as your suggestions on actions the state should take to meet the challenges of climate change.

1. **MITIGATION**— The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)

The state should not consider any strategies to reduce greenhouse gas. Executive Order 41 needs to be defunded. Tax incentives for the private sector would encourage energy efficiency, renewable energy, electric vehicles, etc.

2. **ADAPTATION**— Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?

Increasing temperatures, changes in precipitation, and extreme weather events have effected public health and safety since the beginning of mankind. Mankind has used instinct & common sense to survive these conditions, therefore no action is needed.

3. **ADAPTATION**—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?

by the state. The only preparation the state can do is to keep evacuation routes clear for the evacuation of the people to a safer environment during a climate event.

4. **ADAPTATION**— An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)

News letters

Additional questions on other side →

# Executive Order 41 Recommendations for Addressing Climate Change

## PUBLIC COMMENT FORM

5. **ADAPTATION**— The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state’s resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):

Defund Executive Order 41 and the 11 state agencies. Quit wasting tax payer monies on research on climate change.

6. **FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

No, None, Defund Executive Order 41

7. **FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

NO Interest, let nature take its course. Stop using tax payer money to combat nature. Defund the Flood Avoidance Workgroup.

8. If you have any other comments, please feel free to submit them here, or attach an additional page:

Quit wasting tax payer monies on weather and beach controls. Close the Delaware Division of Energy & Climate offices.

(optional) Name: \_\_\_\_\_

(optional) Affiliation/contact info: \_\_\_\_\_

Please print this form and mail to: Delaware Division of Energy and Climate, 1203 College Park Dr., Suite 101, Dover, DE, 19904

Feedback Collected During the April 27, 2015 Adaptation and Resilience Stakeholder Workshop

# Climate Adaptation and Resilience Stakeholder Workshop

## Comment Form

Please indicate the breakout session topic and specific recommendation(s) for which you would like to provide input on how the recommendation(s) can best be implemented.

BREAKOUT SESSION:

2D

RECOMMENDATION:

COMMENTS:

The development of this program appears to overlook the potential role of Healthcare (DPH) in the  $\forall$  of costs of adaptation.

The role of inter agency communication was not stressed as a critical component but yet is critical to the success of this entire program. The same concept applies to ~~the~~ communities within a given area as well as to county Plans.

Name and Email/Contact Information (optional):

Please provide your comments to one of the Workshop hosts, or mail to:  
Delaware Division of Energy & Climate, 1203 College Park Drive, Suite 101, Dover DE 19904

# Climate Adaptation and Resilience Stakeholder Workshop

## Comment Form

Please indicate the breakout session topic and specific recommendation(s) for which you would like to provide input on how the recommendation(s) can best be implemented.

BREAKOUT SESSION:

Supporting Local communities, DD

RECOMMENDATION:

1-3.

COMMENTS:

The state of DE is not required to buyout flooding properties, though it happens b/c legislators want constituents to reelect them. The state must determine when <sup>where</sup> to fund vs. when to let nature take its course (beaches/wetlands migrate inland). Funding only delays the inevitable loss and costs ALL taxpayers.

[All new construction located in flood zones on SLR maps should not get that help. For existing probably needs some ~~flexibility~~ flexibility, but should not be automatic and large sums of \$ for a few people (buy-out) isn't ~~fixing~~ the answer] Government can't fix it all. Public may not realize that and should be told. \*<sup>Public</sup> People <sup>and they should know it/be told it.</sup> will incur <sup>costs</sup> loss <sup>personal sacrifice,</sup> they should also be proactive and start to consider the hard decisions (Move etc.).

Name and Email/Contact Information (optional):

Please provide your comments to one of the Workshop hosts, or mail to:  
Delaware Division of Energy & Climate, 1203 College Park Drive, Suite 101, Dover DE 19904

# Climate Adaptation and Resilience Stakeholder Workshop

## Comment Form

Please indicate the breakout session topic and specific recommendation(s) for which you would like to provide input on how the recommendation(s) can best be implemented.

BREAKOUT SESSION:

2D

RECOMMENDATION:

COMMENTS:

Concerned about funding - how do we do that? Sources, suggest we look at it as we "tax ditches".

Additional Feedback Collected Throughout the Open Comment Period (March 3, 2015-May 30, 2015)

## **FRAMEWORK FEEDBACK 5/14/15**

Here is some of my feedback on the climate framework. I think it's a good start, but would have liked to see some stronger recommendations.

- It would have been better to engage other non-state agencies in developing the framework recommendations early in the process.
- The GHG reduction target based on a 2008 baseline can be misleading, given the sharp drop in emissions after that year.
- I would have liked to have seen a text related to the underlying impact our consumer economy has on GHG emissions (not just in Delaware).
- I would have liked to have seen supporting county and local land use strategies to encourage mixed-use/mixed-income density featured more prominently. While the PLUS process and State Strategies is a good start, we are still experiencing an increase in vehicle miles traveled, single occupancy vehicle trips to work, and the percentage of those outside walking distance to a bus stop.
- The PLUS checklist should "require" addressing climate change in local land use plans if it is a State priority.
- More attention in the Framework's Recommendations should be paid to non-municipal area of the three counties, since most Delawareans live outside of municipalities. This is particularly relevant in terms of supporting the development of new county comprehensive plans and development codes which prominently feature redevelopment and smart growth.
- It would have been good to see DeIDOT committing to robust revisions in transportation policy to support redevelopment, smart growth, VMT reduction, and emissions reductions.
- In terms of sea level rise and flooding adaptation, the State should spearhead a Statewide Fortification and Retreat Plan. Driven by not just State agencies, but all interested parties, this Plan would identify an adaptation response to all vulnerable areas in Delaware, one by one. It is important that all sectors are involved and in step with one another, as the judgment to preserve infrastructure must be dependent upon the continuing existence of surrounding industries, businesses, and communities, and vice versa.



# Inside Energy

Published by the Caesar Rodney Institute  
Center for Energy Competitiveness

**RE: Delaware Climate Plan: The Rest of the Story**

**DATE : 3/16/15**

**David T. Stevenson, Director**

For the most part, the state's new climate plan could have been titled "Let's Plan for the Storm of the Century," a basically sound idea. Unfortunately, the plan also promotes a continuing un-Constitutional effort by the state to take over land use planning from the counties and municipalities.

The plan assumes there will be catastrophic impacts from global warming, a concept which some key state leaders follow with religious like fervor. The facts show no upward trend in global average temperatures for the last eighteen years, and point to modest impacts from global warming.

Recent lawsuits have upheld local control of land use issues, as delegated by the Delaware Constitution, by over turning state attempts to write land use regulations.

The state Strategic Planning Office must approve local land use plans as it relates to state funded infrastructure such as highways. Some key goals of the climate plan are directed at influencing land use planning. The Office is adding a request that local land use plans consider climate change, and will enforce it by weighing infrastructure investment in favor of localities that include climate considerations that conform to the state plan.

Additionally, DNREC will use excessive estimates of global warming induced sea level rise, and increased rainfall to push for more control over storm water management (an issue already involved in a lawsuit), shoreline management, beach replenishment, and expanded tidal wetlands maps.

DELDOT will use the presumption of more temperature influenced high ozone days to consider driving restrictions during air quality events. DEDO will encourage real estate agents to spread out weekly beach rentals to different start dates, an idea which has some merit but will be disruptive to the tourist industry which currently caters to renters Saturday to Saturday preferences. It should be noted all of these efforts will likely lead to higher cost for private industry.

The climate plan forecasts sea level rise from greenhouse gas induced global warming at 1.5 to 5 feet by 2100, and used 3 feet to develop Flood Risk Adaptation Maps which will be used for state planning purposes. Meanwhile, the report also quotes the National Oceanic & Atmospheric Administration estimates of only 1.1 feet of sea level rise by 2100, including about half that amount from localized land subsidence at the Lewes Tide Gauge, an amount that roughly equals twentieth century sea rise.

Most of the state is not subsiding, and land height is actually increasing for estuaries from deposition of sediments from upstream erosion. **A realistic expectation is real sea level rise will total about 6 inches by 2100.** The plan also assumes rainfall will increase during major storms because of global warming. Even the UN climate change report admits no linkage has been confirmed between global warming and storm intensity.



# Inside Energy

Published by the Caesar Rodney Institute  
Center for Energy Competitiveness

The state wants to abandon the use of Federal Emergency Management Agency hundred year Flood Insurance Rate Maps which look at historic trends and current flood plain data. The complaint is that these maps don't forecast future trends. We submit the FEMA maps are updated frequently enough to be used for infrastructure planning over the likely lifespan of most infrastructure projects. The use of DNREC's Flood Risk Adaptation Maps uses questionable forecasts and will result in un-needed additional expense for both the state and private interests. The expanded wetland maps will take a large amount of private land out of development potential without compensation.

Climate change estimates will be used to force a review of electric rates by the Public Service Commission that could lead to higher rates. The Department of Health & Human Services wants to increase low income fuel assistance even though higher average temperatures would have a net impact of lowering utility bills as much more money is spent on heating than on cooling.

Every state agency has an action step in the plan to increase education of the reality and impacts of catastrophic climate change, an effort some would call propaganda.

Finally, the state has adopted a plan to reduce greenhouse gas emission by 30% by 2030 from a 2008 base year. The plan admits carbon dioxide emissions were already reduced by 25% by 2010 and so is looking for an additional 5% reduction by 2030 from new initiatives by 2030. Appendix C of the plan provides the key assumptions used in developing emission forecasts. The plan used the U.S. Energy Information Agency 2009 forecast which assumed carbon dioxide emissions would increase 0.7% a year to 2030. The more recent 2014 forecast assumes emissions will **decrease by 0.2% a year**. Using the more recent forecast shows the 30% reduction target will be met without any new initiatives.

**The legislature, and all Delaware citizens, should question any legislation, budget, or regulatory changes driven by the "Climate Framework for Delaware".**

# DeIPL COMMENTS ON CLIMATE FRAMEWORK FOR DELAWARE

## May 28, 2015

### EXECUTIVE SUMMARY

The Climate Framework makes important steps in the right direction: It recognizes that flood risks are increasing because of sea level rise and coastal storms, and that climate change is caused mainly by human activities, particularly the burning of fossil fuels. It also says that decisions involving climate change should be based on the best available science. The Framework does, however, have some shortcomings, particularly in Mitigation. Our comments include not only “too little, too late,” but also how we propose to meet targets that we think ought to be far more substantial.

### Climate Mitigation

- A greenhouse gas (GHG) emissions reduction target of 30% by 2030 was adopted, but no compelling reason for the selection was given.
- It is clear that existing federal, regional and state policies are inadequate to meet the 30% target. Most of the emissions reductions since 2008 took place in 2008-2009 as a result of the recession.
- No target beyond 2030 was discussed. We think that ambitious targets are necessary for Delaware’s future, and recommend a target of reducing GHG emissions by at least 80% by 2050, relative to 2008, with an intermediate target of 40% by 2030.
- We recommend that Delaware adopt a price on carbon (in \$ per metric ton of CO<sub>2</sub>e)\* that includes all GHG emissions in the state and increases in stages so that within decades it reaches the Social Cost of Carbon.\*\* That might best be done on a regional basis (e.g., like the Regional Greenhouse Gas Initiative (RGGI), of which Delaware is already a member.)
- Because of Delaware’s great vulnerability to sea level rise, coastal storms and flooding, we urge Delaware to become a national leader in climate

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\* For a definition of carbon dioxide equivalent (CO<sub>2</sub>e) see the Glossary of Climate Change Terms at <http://www.epa.gov/climatechange/glossary.html>

\*\* For a definition of the Social Cost of Carbon see: <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>. A commonly used figure is \$37/mtCO<sub>2</sub>e.

mitigation, and recommend that we reduce all our GHG emissions enough to put us in the 10% of states with the lowest per capita emissions.

### **Climate Adaptation**

- We regard an informed citizenry as essential for successfully addressing climate change. While many state agencies include public outreach and education to inform the public about the causes and consequences of climate change in their recommendations, there are no recommendations for the Department of Education (DOE) for public education about energy and climate in grades K-12. We recommend that DOE work with leaders of the Delaware Center for Teacher Education in the UD College of Education to make sure that teachers are properly trained to educate our children.
- More people lose their lives in the U.S. each year from extreme heat and humidity than from floods, hurricanes, lightning, tornadoes and earthquakes combined! The state of the art extreme heat warning system, ~~the Heat Health Warning System (HHWS)~~, is being used by the National Weather Service in many regions of the US to warn all residents when periods of high heat and humidity are expected and additional heat related morbidity and mortality is expected. **The Heat Health Warning System (HHWS)** has been independently reviewed and proven to save many lives through more accurate forecasting and could so do in Delaware. This system, which has already been financed and is ready for implementation, has been tailored to New Castle County and to Kent and Sussex counties, and has been tested to validate its efficacy. The Delaware Department of Health has already approved its use, and all that is necessary is for DHSS and DEMA to allow the National Weather Service to utilize HHWS as one of their forecasting tools. vulnerable people It could be used this summer to better forecast killer heat waves, saving lives of the most vulnerable Delawareans.
- With rising heat, reduction of arable land, and increasing usable water challenges, food prices will continue to rise, becoming increasingly unaffordable for many, especially low-income Delawareans. One solution to this can be found in the use of urban and small scale rural agriculture. Not only can vacant lots and properties be turned into neighborhood gardens, but these can also be used for the growing of boutique herbs and food for local restaurants, helping to both address the troublesome urban food deserts and also provide local income.

### **Avoiding and Managing Flood Risks**

- The Flood Avoidance Workgroup has developed a Flood Risk Adaptation Map and guidance to help state agencies minimize flood risks to state projects. We recommend that the Map and instructions for its use be made available to anyone who wants to use it. Training should be

available through workshops, webinars and a website that is periodically updated as new information on the rate of sea level rise (SLR) and the extent of flooding expected from SLR and coastal storms becomes available.

## DETAILED COMMENTS AND REFERENCES

The **Climate Framework for Delaware**<sup>1</sup> was developed pursuant to **Executive Order (EO) 41: Preparing Delaware for Emerging Climate Impacts and Seizing Economic opportunities for Reducing Emissions**. In EO 41 (Appendix A of the Framework), state agencies were directed to address both causes and consequences of climate change and to develop recommendations in three categories:

- Reduce greenhouse gas (GHG) emissions (climate mitigation)
- Increase resilience to climate change impacts, including increases in temperature, changes in precipitation, and sea level rise (SLR) (climate adaptation)
- Avoid and minimize flood risks – from both SLR and coastal storms

The last point is an important admission by the writers of the Framework report. An earlier report by the Sea level Rise Advisory Committee – **Preparing for Tomorrow's High Tide: Sea Level Rise Vulnerability Assessment for the State of Delaware**<sup>2</sup> – approved in May of 2012, used a 'bathtub' model for flooding that considered only SLR in assessing vulnerability. It considered scenarios with high tides by 2100 as much as 5 feet (1.5 m) higher than in 2012. That was before Hurricane Sandy in October 2012, which had a storm surge at the Battery tide gauge in New York 9 feet above the astronomically expected high tide<sup>3</sup> - much more than the ca. 1 foot SLR seen so far on the Mid-Atlantic coast during the past 100 years.<sup>4</sup>

There is another important acknowledgement on page 3 of the Framework: ***"Climate change is caused mainly by human activities, particularly the burning of fossil fuels that release heat-trapping gases."*** (*emphasis added*) Understanding the major causes of climate change is critical to climate mitigation – reducing the rate and extent of climate disruption.

A third very important statement on page 3 is: ***"Using the best available science is a foundation of sound decision making."*** Although a great deal of climate science has been established, new discoveries are being reported all the time. That means that Delaware's leaders and citizens need to become informed and then kept up to date. Tolman reported on the status of the science through 2010 at the February, 2011 meeting of the Delaware Sea Level Rise Advisory Committee, in a paper titled, **Rising Seas and Stronger Storms - Delaware's Adaptation in the Face of Uncertainty**.<sup>5</sup> One resource for keeping current is his monthly *Climate Change News* blog,<sup>6</sup> which seeks to

keep its readers up to date on energy and climate change science, public policy, public opinion, ethics and economics.

## Climate Mitigation

The Mitigation Work Group appears to have done little except to consider three targets for greenhouse gas emission reductions suggested by DNREC’s Secretary Small: 30%, 40% and 50% reductions by 2030 from a 2008 baseline. The target recommended was 30%, but no reason for the choice was given, except that it was the easiest to achieve. Furthermore, because the major drop in emissions since 2008 occurred in the first year, the recommended goal is modest indeed.

Page 11 in Chapter 1 says, “This target assumes that the 2008 baseline starts at 16.64 MmtCO<sub>2</sub>e (million metric tons of CO<sub>2</sub> equivalent), so a 30 percent reduction in 2030 would equal 11.47 MmtCO<sub>2</sub>e—a difference of 5.17 MmtCO<sub>2</sub>e. That said, this gap becomes smaller based on emission reduction policies, programs, and fuel switching implemented since 2008. Programs that were included in the federal and state policies include policies such as the Regional Greenhouse Gas Initiative, the Universal Recycling Law, and transportation fuel efficiency standards, to name a few.” It should be pointed out that non-CO<sub>2</sub> greenhouse gases like methane, nitrous oxide, and hydrofluorocarbons (HFCs) contribute only about 15% of Delaware’s CO<sub>2</sub>e emissions.

Appendix C goes through a number of federal, regional and state policies with their potential for reducing GHG emissions by 2030, and concludes that all of them together won’t reduce the state’s emissions by more than about 1.6 MmtCO<sub>2</sub>e – not enough to reach the 30% emission reduction target by 2030. Our estimated reductions of various government policies, based on Appendix C, are summarized in Table 1. Note that 0.81 MmtCO<sub>2</sub>e – nearly half of the total – is attributes to federal CAFE rules for vehicle fuel efficiency. Research conducted by Ewing et al.,<sup>22</sup> indicates that fuel and automobile efficiencies cannot keep up with population growth and an increase in driving.

Table 1. Estimated Emission Reductions of Various Government Policies, from 2008 to 2030, from Appendix C.

Policy	Type	Figure, Page Nos.	Red. MmtCO <sub>2</sub> e
RGGI	Regional	2, C7 and C8	0.20 <sup>a</sup>
LDV CAFE Rule	Federal	3, C9	0.65
HDV CAFE Rule	Federal	4, C10	0.16
Landfill gas	State	5, C12	0.28
Recycling	State	6, C14	0.17
EE Inv. Fund	State	7, C15	0.11
SB 160	State	C16	0.0014 <sup>b</sup>
Reforestation	State	8, C18	0.01
Cover Crops	State	8, C19	0.02

SEU	State	C19	0.052
<b>Total</b>			<b>1.65</b>

<sup>a</sup> The text on C8 says the power sector emissions are projected to remain at 3.81 MmtCO<sub>2</sub>e from 2011-2013, making this number 0.00.

<sup>b</sup> Page C16 says that using larger trucks to transport poultry would save 160,000 gallons of fuel and reduce emissions by 1.422 mtCO<sub>2</sub>e; it should have said 1,422 mt or 0.0014 Mmt.

The total emissions reduction expected from all current Delaware state policies is only 0.64 MmtCO<sub>2</sub>e. Appendix C does not mention the EPA's Clean Power Plan (CPP) for existing power plants, introduced in June of 2014, or what its estimated contribution to emissions reductions might be.

The Energy Information Administration (EIA) tabulates CO<sub>2</sub> emissions from fossil fuel consumption by state, by sector and by fuel from 1980 through 2012.<sup>7</sup> Data for Delaware (Figure 1) show a large drop (4.2 MmtCO<sub>2</sub>) in total CO<sub>2</sub> emissions from 2008 to 2009 (from 15.1 to 10.9), followed by a slower increase from 2009 through 2012 (1.9). Most of the large drop from 2008 to 2009 was due to reduced emissions from coal (-2.5) and petroleum (-1.8); the slower subsequent increase after 2010 was mostly due to increased emissions from natural gas (+2.8), with a smaller increase from petroleum (+0.7) and a continued drop in coal (-1.6).

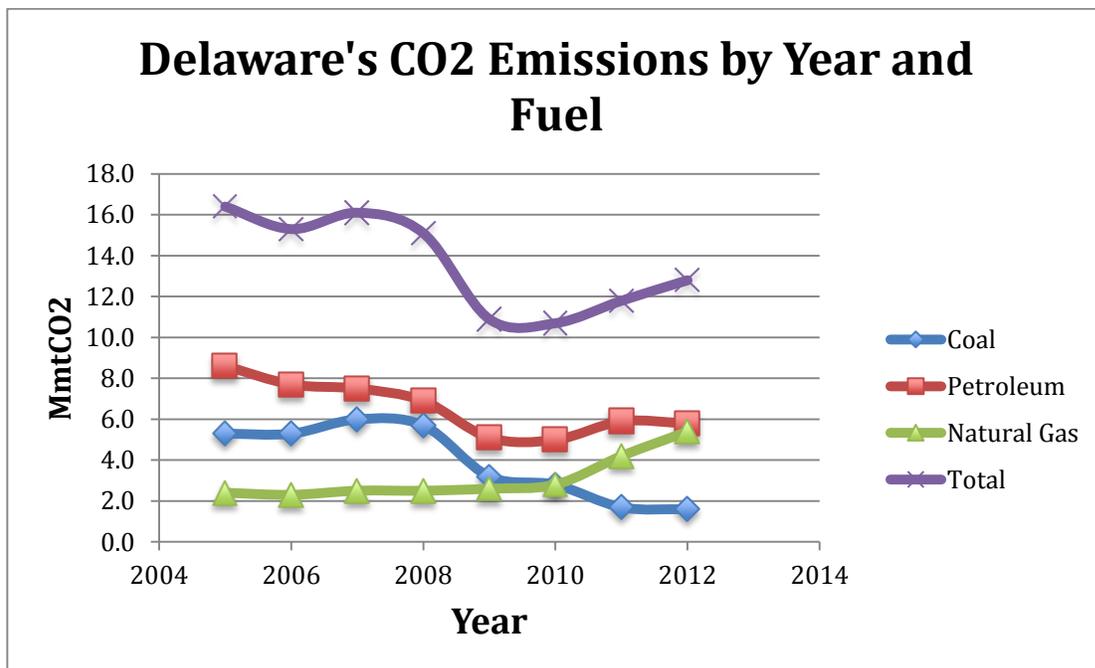


Figure 1.

Though the source of the data shown in the chart on Page 11 of the Framework report is not given, measured GHG emissions are shown only for 2008, 2009 and 2010, with all the rest projected.

Page 4 says, *“Reducing greenhouse gas emissions has been a key*

***objective for the state of Delaware, using a variety of strategies that promote energy efficiency and shifting to clean, renewable sources of energy.” (emphasis added)*** It goes on to say that Delaware’s GHG emissions between 2000 and 2010 decreased by more than those of any other state in the nation, and lists a number of actions the state has taken. Their effectiveness is summarized in Table 1 above. It and Figure 1 indicate that most of the CO<sub>2</sub> emission reductions from 2008 to 2009 were not due to state policies but to reduced burning of coal and petroleum - probably because of the recession and the loss of automobile manufacturing at GM and Chrysler.

A serious weakness of the report is that there are no Delaware targets or plans for GHG emission reductions beyond 2030. A 2007 paper in Geophysical Research Letters reports that “All emission targets considered with less than 60% global reduction by 2050 break the 2.0°C threshold warming this century, a number that some have argued represents an upper bound on manageable climate warming. ***Even when emissions are stabilized at 90% below present levels at 2050, this 2.0°C threshold is eventually broken.*** Our results suggest that if a 2.0°C warming is to be avoided, direct CO<sub>2</sub> capture from the air, together with subsequent sequestration, would eventually have to be introduced ***in addition to sustained 90% global carbon emissions reductions by 2050.***”<sup>8</sup> (emphasis added) Figures 8 and 9 in Reference 5 suggest that a 2.0°C global average surface temperature rise would, after enough time to reach thermal equilibrium,<sup>\*</sup> which could be centuries, raise sea level by about 40 m (about 130 feet) and inundate most of Delaware – hardly an acceptable outcome. Near term, we can expect about 1-3 meters of sea level rise by 2100. Even this lower amount will have severe impacts on our coastline and coastal infrastructure.

The costs of removing CO<sub>2</sub> from the atmosphere, once emitted, have been estimated to be as high as \$600/mtCO<sub>2</sub>, depending on the geoengineering technology used.<sup>9</sup>

While Delaware’s GHG emissions are only a small fraction of the world’s total, our extreme vulnerability to sea level rise and flooding suggests that we should become a national leader in reducing our emissions by at least 80% by 2050 and showing that it is possible to do so while improving our economy and protecting the health and welfare of our citizens.

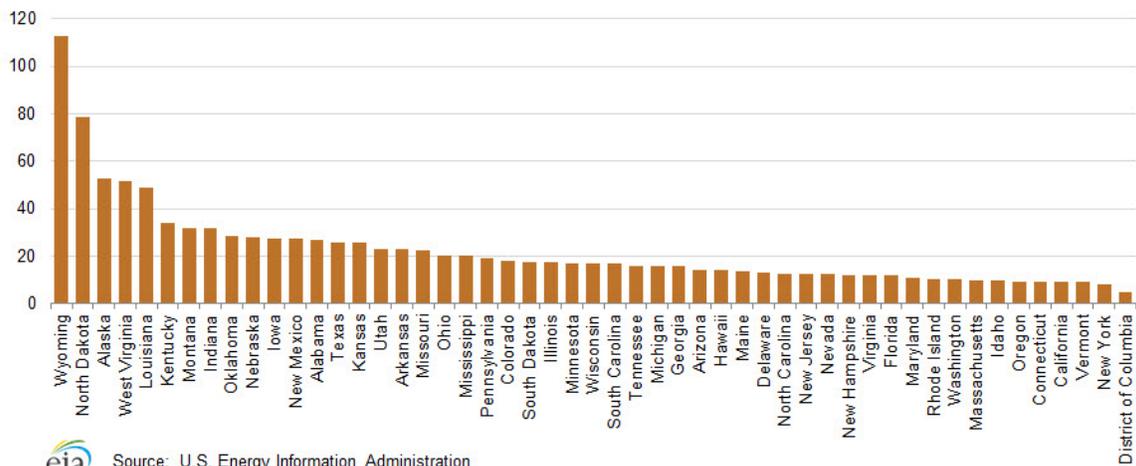
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\* By thermal equilibrium we mean that Earth’s climates, atmospheric composition and average temperature and sea level are no longer changing. The sensitivity of sea level to global average surface temperature is about 20 m/degree C (36 ft/degree F). If this sensitivity is correct, it means that we are already committed to inundation of more than half of Delaware’s current land area. See Figure 9 in Ref. 5, which shows the land still above water (light green) with a 15 m SLR.

**Delaware should really address not only how it is to reduce CO2e emissions in the 22 years between 2008 and 2030, but how to reduce them further to reach at least 80% below their 2008 level-2050.** It should be noted that California’s Governor Davis recently announced an executive order setting a greenhouse gas emissions reduction goal 40% below the 1990 level by 2030,<sup>10</sup> using the states a cap-and-trade system that puts a price on emissions of carbon from all fossil fuels used in California - including those used for transportation.

To see how much of a leadership role Delaware has with respect to other states in mitigating climate change, one useful measure is GHG emissions per capita. Figure 2 below shows the rank ordering of states<sup>11</sup> in 2011 – the most recent year for which such an EIA chart was found. Delaware ranks 17<sup>th</sup>, with New York in 1<sup>st</sup> place with the lowest per capita emissions. With Delaware not in the top third of states, it can hardly be called a climate mitigation leader. **We suggest that Delaware consider setting a goal of getting into the 10% of states with the lowest per capita CO2 emissions.** That means doing better than Oregon, as can be seen in Figure 2.

Figure 2. Per-capita energy-related carbon dioxide emissions by state, 2011  
metric tons carbon dioxide per person



eia Source: U.S. Energy Information Administration

Another weakness in the Mitigation section of the Framework is the absence of any discussion of the economics of climate change, which should include both the marginal costs per metric ton of CO<sub>2</sub>e for sources and sinks,\* and the costs to society if the concentrations of GHGs continue to increase. One of the best-known attempts to quantify the economics is the **Stern Review on the Economics of Climate Change**,<sup>12</sup> issued by the British government in October 2006. Some of its findings are the following:

- The benefits of strong, early action on climate change outweigh the costs.
- The scientific evidence points to increasing risks of serious, irreversible impacts from climate change associated with business-as-usual (BAU) paths for emissions.
- Climate change threatens the basic elements of life for people around the world – access to water, food production, health, and use of land and the environment.
- The impacts of climate change are not evenly distributed – the poorest countries and people will suffer earliest and most.
- Central estimates of the annual costs of achieving stabilization between 500 and 550 ppm CO<sub>2</sub>e are around 1% of global GDP, if we start to take strong action now (2006). (Stern later revised his annual cost estimate upward to 2% of world GDP.)
- Annual costs to the world economy of delayed action or inaction could range from 5% to 20% of global GDP.
- The transition to a low-carbon economy will bring challenges for competitiveness but also opportunities for growth. Policies to support the development of a range of low-carbon and high-efficiency technologies are required urgently.
- ***Establishing a carbon price, through tax, trading or regulation, is an essential foundation for climate change policy. (emphasis added)***

The U.S. GDP in 2013 was \$15.5 trillion, while Delaware's Gross State Product (GSP) was \$56 billion.<sup>13</sup> Stearns 1-2% recommendations for climate change spending would be \$155 -\$310 billion for the U.S. and \$560 million-\$1.2 billion for Delaware in 2013!

The EPA and other federal agencies use something called the Social Cost of Carbon (SCC) to estimate the marginal cost to society of emitting a metric ton of CO<sub>2</sub>e in a particular year, or of reducing emissions by a ton.<sup>14</sup> Though the numbers are quite uncertain, depending on the discount rate used for

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\* Regions or processes that predominately produce CO<sub>2</sub> are called sources of atmospheric CO<sub>2</sub>, while those that absorb CO<sub>2</sub> are called sinks. See Carbon Cycle Science at: <http://www.esrl.noaa.gov/research/themes/carbon/>

future damage from current emissions and how one includes low probability but high cost damage, the SCC does give some idea of what price should be placed on GHG emissions for the maximum economic efficiency. A recent Stanford University study reported that the SCC for GHG emissions may be much higher than the currently used value of \$37/mtCO<sub>2</sub>e – perhaps as high as \$220 per ton.<sup>15</sup> The article says, “***One major finding of the new study is that the damages associated with reductions in economic growth rates justify very rapid and very early mitigation that is sufficient to limit the rise of global temperature to 2 degrees Celsius above pre-industrial levels.***” (emphasis added)

McKinsey and Company published a study in 2007 titled, **Reducing US greenhouse gas emissions: How much at what cost?**<sup>16</sup> The Executive Summary says:

“Consensus is growing among scientists, policy makers and business leaders that concerted action will be needed to address rising greenhouse gas (GHG) emissions. The discussion is now turning to the practical challenges of where and how emissions reductions can best be achieved, at what costs, and over what periods of time.

Starting in early 2007, a research team from McKinsey & Company worked with leading companies, industry experts, academics and environmental NGOs to develop a detailed consistent fact base estimating costs and potentials of different options to reduce or prevent GHG emissions within the United States over a 25-year period. The team analyzed over 250 options, encompassing efficiency gains, shifts to lower-carbon energy sources, and expanded carbon sinks.”

The central conclusion was:

“The United States could reduce greenhouse gas emissions in 2030 by 3.0 to 4.5 gigatons\* of CO<sub>2</sub>e<sup>17</sup> using tested approaches and high-potential emerging technologies. These reductions would involve pursuing a wide array of abatement options available at marginal costs less than \$50 per ton, with the average net cost to the economy being far lower if the nation can capture sizable gains from energy efficiency.”

Figure 3<sup>18</sup> shows the incremental costs for achieving a U.S. 3.0 gigaton CO<sub>2</sub>e emission decrease by 2030. The cost would be about \$50 billion/year or \$1.1 trillion through 2030 – roughly 1.5% of the investment in the U.S. economy expected from 2007 to 2030. The main feature to notice about the graph is that there are many viable options for reducing GHG emissions at \$50/mtCO<sub>2</sub>e or less, some of which have negative costs, i.e. they actually reduce costs to the economy. (Note that the marginal cost of reducing emissions using distributed solar PV is shown at about \$30/mt; the current cost is probably much less because of a large drop in the price of solar panels since 2007.)



There are several options for imposing a price on carbon, ranging from a carbon tax to a cap and trade system or various hybrids of the two.<sup>21</sup> There are also many options for how the money raised could be spent, including replacing aging roads and bridges.

Because 34% of the CO<sub>2</sub> emissions in Delaware have their source in transportation, an effective mitigation program ought to include a plan to reduce vehicle miles traveled (VMT). Extensive research by Ewing Reid et al.<sup>22</sup> shows that improved efficiencies in both cars and fuels will be wiped out by population growth and an increase of automobile usage. The only alternative is to reduce VMT. Proposed legislation being introduced in the Delaware Senate this session would offer incentives from DelDOT for local governments to encourage denser, mixed use housing that would be multi-modal, thus helping to reduce VMT. A study by Frank et al. in Washington<sup>23</sup> found that a 5% increase in walkability reduced VMT per capita by 6.5%.

It is clear that current government policies at the federal, regional and state levels are quite inadequate to meet the GHG emission goals for 2030 and 2050 that are needed for Delaware to protect itself from serious damage from climate change – especially from flooding due to sea level rise, storm surges and heavy rainfall. ***We propose that Delaware seriously explore a price on carbon that puts an increasing price on carbon emissions from all sources.*** This could be done at the state level or preferably at a regional level, such as by an expansion of the Regional Greenhouse Gas Initiative, of which Delaware is a part.

We can learn from existing systems that are growing rapidly across the globe. A good place to start would be to see what other states, provinces and countries are doing. California has a cap-and-trade system that now includes the transportation sector as well as electricity generation.<sup>24</sup> Alaska collects a royalty on oil produced there and returns part of it to all state residents each year – a kind of fee and dividend system.<sup>25</sup> British Columbia (B.C.) put a direct carbon tax on GHG emissions in 2008, starting at \$10/mtCO<sub>2</sub>e, which was increased to \$30 in 2012.<sup>26</sup> The revenue generated is now about \$1 billion a year with the following results;

- B.C. now has the lowest personal income tax rate in Canada.
- Fuel use has dropped by 16% in B.C., while it increased by 3% in the rest of Canada.

B.C.'s GDP has slightly outperformed the rest of Canada since 2008.

### **Climate Adaptation**

The Centers for Disease Control and Prevention (CDC) has a website on climate change risks to human life and health.<sup>27</sup> It says, “Extreme heat events, or heat waves, are a leading cause of extreme weather-related deaths in the United States. The number of heat-related deaths is rising. For example, in 1995, 465 heat-related deaths occurred in Chicago. From 1999 to 2010, a total

of 7,415 people died of heat-related deaths, an average of about 618 deaths a year.” On a poster on the same page it says that extreme heat causes more death each year than from floods, hurricanes, lightning, tornadoes and earthquakes combined. It also says that those most at risk are adults over 65, children under 4, people with existing medical problems like heart disease, and those without access to air conditioning. It also gives advice to stay cool, stay hydrated, and stay informed.

The Framework report on page 29 says, “The mission of the Delaware Department of Safety and Homeland Security (DSHS) is to promote and protect the safety of people and property in Delaware.” Among the four recommendations from the DSHS is, “Consider alteration to policies regarding worker safety in an increased temperature environment,” but the safety of the public in the new environment is not addressed, despite the fact that Delaware’s most vulnerable citizens are ones in underserved neighborhoods in urban heat islands, such as Wilmington, and in rural communities with limited access to cooling centers.

The Social Services Division of the Department of Health and Social Services (DHSS) has a recommendation on page D7 “To consider creating mobile State Service Centers” that could be used during periods of extreme heat. “to access DHSS benefit systems and records” and provide site-specific/community-based services, and another on page D8 to “Identify sites to be used as designated cooling and heating centers,” but there appears to be coherent plans to warm vulnerable populations, inform them on what to do, make sure that adequate refuge space is available, or help those without transportation get to the refuges. For those 65 and older, a friend or relative should call to check on them twice a day during periods of extreme heat.

## References

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<sup>1</sup> The Climate Framework for Delaware. Dec., 2014. At:  
<http://www.dnrec.delaware.gov/energy/Pages/Climate-Framework.aspx>

<sup>2</sup> **Vulnerability Assessment**, Delaware Coastal Programs, Approval date: May, 2012.  
At:  
<http://www.dnrec.delaware.gov/coastal/Pages/SLR/DelawareSLRVulnerabilityAssessment.aspx>

<sup>3</sup> The Battery (Manhattan) tide gauge data. Private communication from Delaware Coastal Programs.

<sup>4</sup> Sea level rise of just over 1 foot (0.3 m) has been seen at the Lewes tide gauge over the past 100 years. See Page 7 of Reference 2.

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<sup>5</sup> Rising Seas and Stronger Storms - Delaware's Adaptation in the Face of Uncertainty. Feb. 2011. At:

<http://www.dnrec.delaware.gov/coastal/Documents/SLR%20Advisory%20Committee/Meeting%204%20Feb.%2015%202011/TolmanSLRAdapt021511.pdf>

<sup>6</sup> *Climate Change News*, monthly blog. At: <http://tolmanccnews.blogspot.com>

<sup>7</sup> **State CO2 Emissions**, U.S. Energy Information Administration, Data from 1980 through 2012, Release date: March 4, 2015. At:

<http://www.eia.gov/environment/emissions/state/>

<sup>8</sup> Andrew J. Weaver, Kirsten Zickfeld, Alvaro Montenegro and Michael Eby, **Long term climate implications of 2050 emission reduction targets**, Geophysical Research Letters, Oct. 2007. At:

<http://onlinelibrary.wiley.com/doi/10.1029/2007GL031018/full>

<sup>9</sup> Victoria Schlesinger, AlJazeera America, **Can carbon dioxide removal save the planet?** April 12, 2014. At: <http://america.aljazeera.com/articles/2014/4/12/can-carbon-dioxidereovalsavetheplanet.html>

<sup>10</sup> **California governor calls for drastic cuts in gas emissions by 2030**, The

Guardian, April 29, 2015. At: <http://www.theguardian.com/us-news/2015/apr/29/california-new-greenhouse-gas-emissions-goal>

<sup>11</sup> **State-Level Energy-Related Carbon Dioxide Emissions, 2000-2011**. U.S. Energy Information Administration, Data through 2011, Release date: Aug. 24, 2014. At:

<http://www.eia.gov/environment/emissions/state/analysis/>

<sup>12</sup> **Stern Review on the Economics of Climate Change**, At:

[http://en.wikipedia.org/wiki/Stern\\_Review](http://en.wikipedia.org/wiki/Stern_Review)

<sup>13</sup> Table 1. **Real GDP by State, 2010-2013**. Downloaded from U.S. Bureau of Economic Analysis. Release date: June 14,, 2014. At:

[https://www.bea.gov/newsreleases/regional/gdp\\_state/gsp\\_newsrelease.htm](https://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm)

<sup>14</sup> **The Social Cost of Carbon**, U.S. EPA, updated in 2013. At:

<http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>

<sup>15</sup> Ker Than, **Estimated social cost of climate change not accurate, Stanford scientists say**, Stanford News, Jan. 12, 2015. At:

<http://news.stanford.edu/news/2015/january/emissions-social-costs-011215.html>

<sup>16</sup> **Reducing US greenhouse gas emissions: How much at what cost?** McKinsey & Company, 2007. At:

[http://www.mckinsey.com/client\\_service/sustainability/latest\\_thinking/reducing\\_us\\_greenhouse\\_gas\\_emissions](http://www.mckinsey.com/client_service/sustainability/latest_thinking/reducing_us_greenhouse_gas_emissions)

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<sup>17</sup> A reduction of CO<sub>2</sub>e emissions of 3.0 to 4.5 GtCO<sub>2</sub>e would have reduced carbon emissions of about 6 GtCO<sub>2</sub>e in 2007 by 50 to 75% by 2030. For total U.S. energy-related CO<sub>2</sub> emissions per year see Table 1 from Ref. 7.

<sup>18</sup> The figure was copied from page 5 of Ref. 15.

<sup>19</sup> **The Economists Statement on Climate Change, *Redefining Progress***, 1997. At: <http://rprogress.org/publications/1997/econstatement.htm>

<sup>20</sup> **Carbon Fee and Dividend Explained**, Citizen's Climate Lobby. At: <https://citizensclimatelobby.org/carbon-fee-and-dividend/>

<sup>21</sup> Various options for putting a price on carbon are reviewed under **Pricing Mechanisms** at <http://priceoncarbon.org>.

<sup>22</sup> **Projected Growth in CO<sub>2</sub> Emissions from Cars and Light Trucks** Source: Reid Ewing et al., *Growing Cooler: The Evidence on Urban Development and Climate Change*, Washington, D.C.: The Urban Land Institute. 2008  
<http://www.uli.org/ResearchAndPublications/Reports/~~/media/Documents/ResearchAndPublications/Reports/GrowingCooler.aspx>

<sup>23</sup> Frank, L. D., J. F. Sallis, T. L. Conway, J. E. Chapman, B. E. Saelens and W. Bachman (2006). **Many Pathways from Land Use to Health: Associations between Neighborhood Walkability and Active Transportation, Body Mass Index, and Air Quality**. *Journal of the American Planning Association* 72(1): 75-87.

<sup>24</sup> **California Cap and Trade**, Center for Climate and Energy Solutions. At <http://www.c2es.org/us-states-regions/key-legislation/california-cap-trade>

<sup>25</sup> Steve Quinn, **Alaska residents to get \$1,884 payout from oil royalty fund**. Reuters, Sept. 17, 2014. At: <http://www.reuters.com/article/2014/09/17/us-usa-dividend-alaska-idUSKBN0HC2E320140917>

<sup>26</sup> **Price on Carbon**, Linda Swift of LWV of Berkeley, Albany, Emeryville, CA. At: <http://priceoncarbon.org>

NOTE: This website has a lot of other great information on climate change, and been endorsed by the US League of Women Voters. Linda (Diz) Swift, its Webmaster, is a PhD geologist who lives in Berkeley, CA.

<sup>27</sup> **Climate Change**, CDC. At: <http://ephtracking.cdc.gov/showClimateChangeExtremeHeat.action>

# Executive Order 41 Recommendation for Addressing Climate Change PUBLIC COMMENT FORM from DeIPL May 28, 2015

The state of Delaware seeks public input on recommendations prepared under Executive Order 41 as described in the “Climate Framework for Delaware” report. Please provide your comments on how these recommendations may affect you, your community, or your business, as well as your suggestions on actions the state should take to meet the challenges of climate change.

- **MITIGATION**— The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)

## **STRATEGIES**

**Reduce CO<sub>2</sub> equivalent (CO<sub>2</sub>e) emissions in the State from all sources by:**

- **Placing an increasing price on carbon until it equals to the Social Cost of Carbon**
  - **Strengthening the Renewable Portfolio Standard to 80% or more renewable energy sources for electricity by 2050**
  - **Promoting offshore wind energy for Delaware in collaboration with neighboring states**
  - **Reducing transportation CO<sub>2</sub> emissions; in particular, by:**
    1. **Reducing vehicle miles traveled. DeIDOT should provide preferential funding for compact complete community districts that are characterized by mixed used, unlimited densities and multi-modal transportation.**
    2. **Promoting use of electric and alternative vehicles**
    3. **Promoting the use of mass transit and van pooling**
  - **Promoting energy efficiency**
  - **Developing strong and effective coordination between DeIDot and local, county and state land use planning agencies**
- 
- **ADAPTATION and MITIGATION** — **Subsidized housing and special development, such as Downtown Development Districts should be designed for maximum sustainability, including near net zero energy usage through maximum energy efficiency and distributed solar with use of available green space for natural cooling and neighborhood gardens.**
  - **ADAPTATION**— **Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?**
    - **Upgrade event forecast accuracy by supporting the use of the existing state of the art Heat Health Warning System (HHWS), which is used in about 40 regions across the US and ready for use in Delaware, segmented by New Castle County and Sussex/Kent counties. This system has been funded, developed, and tested and is ready for deployment by the National Weather Service.**

- **Prepare a communication plan to use all forms of media including radio and TV, websites, iPhones, etc . to warn citizens of extreme weather events. This would include neighborhood associations and non-government organizations (NGOs) in particular for high density urban areas.**
  - **For those 65 and older, a friend or relative should call to check on them twice a day during periods of extreme heat.**
  - **Prepare emergency instructions ahead of time for what people should do.**
  - **Designate heat refuges in all parts of the state for extreme heat, cold or flooding, utilizing volunteer NGOs, such as community and/or senior centers, houses of faith, educational institutions as they are able.**
  - **Prepare a database of individuals/groups likely to need help in evacuating organized by location for rapid deployment of transportation. Models for these “buddy systems” can be found in Philadelphia and other major cities.**
  - **DHSS to work with County coroners to capture mortalities that were exacerbated by extreme weather, such as heat waves.**
  - **Arrange free and accessible transportation for those in need during extreme weather events.**
  - **Strongly support recommendations to identify additional sites for cooling and heating centers, especially located in close proximity to low-income neighborhoods.**
- **ADAPTATION—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?**
    - **Encourage research for adaptable crops and livestock.**
    - **Purchase farm property in western Delaware for use by farmers whose land becomes flooded or is destroyed by salt intrusion in eastern Delaware.**
    - **Continue and step-up programs on purchases of open space.**
    - **Encourage urban agricultural for small scale commerce and personal use.**
    - **Strengthen codes for rental properties to encourage increased energy efficiency.**
  - **ADAPTATION— An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)**  
 Effective mitigation and adaptation will depend will require informed citizens of all ages. Delaware should:
    - **Provide meetings, workshops, newsletters, training and technical assistance for adults.**

- **Promote K-12 education on the basic science and consequences of climate change.**
  - **Develop courses for technical schools and universities to train students for jobs that address the demands and impacts of climate change.**
- **ADAPTATION**— The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state’s resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):
  - **Nothing is mentioned under the Education Recommendations that education should be provided for children, youth and adults about the scientific reasons for climate change, its adaptation, and mitigation and costs.**
  - **Under DNREC recommendations: Many brownfield sites tend to be located in or near areas that are subject to flooding or storm surge. A monitoring plan should be set up to check toxic levels at these sites that have been cleaned up to affirm that they are stable and are not a public safety issue.**
  - **The Dept. of Agriculture should support the creation and management of urban community gardens, which would be used for both personal and commercial boutique purposes.**
  - **To continue to better mitigate greenhouse gases, PSC should include externality evaluation with all rate requests.**
  - **All appropriate state owned or leased buildings should have applied reflective roof coatings when not used as green roofs. This will reduce overall energy usage and extend the life of the roof.**
- **FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?
  - **No mention is made of the state departments’ responsibility to coordinate, educate and possibly provide partial funding to the county and local governments for flood avoidance.**
- **FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?
  - **The Map ~~it~~ should be made available to anyone who requests ~~it~~ the map;**

- **People who are interested in building or buying homes or businesses near the coast should have access to the map;**
  - **The map should be updated as new information becomes available;**
  - **Training should be made available through workshops, webinars and a continuously updated website.**
- 
- **If you have any other comments, please feel free to submit them here, or attach an additional page: See the attached comments titled DeIPL COMMENTS ON CLIMATE FRAMEWORK FOR DELAWARE.**

(optional) Name: **John Sykes, President; Lisa Locke, Executive Director**

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(optional) Affiliation/contact info: **Delaware Interfaith Power and Light (DeIPL)**

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**Please print this form and mail to: Delaware Division of Energy and Climate, 1203 College Park Dr.,  
Suite 101, Dover, DE, 19904**

**LEAGUE of WOMEN VOTERS OF DELAWARE COMMENTS ON  
CLIMATE FRAMEWORK FOR DELAWARE  
In Response to Item 8 in the Public Comment Form  
May 22, 2015**

**EXECUTIVE SUMMARY**

The Climate Framework makes important steps in the right direction: It recognizes that flood risks are increasing because of sea level rise and coastal storms, and that climate change is caused mainly by human activities, particularly the burning of fossil fuels. It also says that decisions involving climate change should be based on the best available science. The Framework does, however, have some shortcomings, particularly in Mitigation. Our comments include not only “too little, too late,” but also how we propose to meet targets that we think ought to be far more substantial. Framework comments relative to the mitigation of the effects of climate change also overlook those land use options that have the potential to reduce vehicle miles traveled.

**Climate Mitigation**

- A greenhouse gas (GHG) emissions reduction target of 30% by 2030 was adopted, but no compelling reason for the selection was given.
- It is clear that existing federal, regional and state policies are inadequate to meet the 30% target. Most of the emissions reductions since 2008 took place in 2008-2009 as a result of the recession.
- No target beyond 2030 was discussed. We think that ambitious targets are necessary for Delaware’s future, and recommend a target of reducing GHG emissions by at least 80% by 2050, relative to 2008, with an intermediate target of 40% by 2030.
- We recommend that Delaware adopt a price on carbon (in \$ per metric ton of CO<sub>2</sub>e)\* that includes all GHG emissions in the state and increases in stages so that within decades it reaches the Social Cost of Carbon.\*\* That might best be done on a regional basis (e.g., like the Regional Greenhouse Gas Initiative (RGGI), of which Delaware is already a member.)
- Because of Delaware’s great vulnerability to sea level rise, coastal storms and flooding, we urge Delaware to become a national leader in climate mitigation, and recommend that we reduce all our GHG emissions enough to put us in the 10% of states with the lowest per capita emissions.

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\* For a definition of carbon dioxide equivalent (CO<sub>2</sub>e) see the Glossary of Climate Change Terms at <http://www.epa.gov/climatechange/glossary.html>

\*\* For a definition of the Social Cost of Carbon see: <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>. A commonly used figure is \$37/mtCO<sub>2</sub>e.

- We recommend that the Department of Natural Resources and Environmental Control (DNREC) recognize CO<sub>2</sub> as a pollutant; this is an important step which this agency must take in regulating CO<sub>2</sub> emissions by Coastal Zone industries.
- Since CO<sub>2</sub> emissions from transportation comprise such a large portion of Delaware's GHG emissions, we recommend that every possible action be taken by state agencies to reduce vehicle miles traveled (VMT), including support of development dense enough to make public transit viable. Improving connectivity between areas of reduced stress bicycle riding,\* so that children can safely walk or ride bikes to school, will also help to reduce VMT.

### **Climate Adaptation**

- We regard an informed citizenry as essential for successfully addressing climate change. While many state agencies include public outreach and education to inform the public about the causes and consequences of climate change in their recommendations, there are no recommendations for the Department of Education (DOE) for public education about energy and climate in grades K-12. We recommend that DOE work with Dr. Jennifer Merrill,<sup>1</sup> Research Manager in the UD College of Earth, Ocean and Environment and Amy Trauth-Nare,<sup>2</sup> the Associate Director of Science Education at the Professional Development Center for Educators in the UD College of Education and Human Development, to make sure that teachers are properly trained to educate Delaware's children about climate change.
- More people lose their lives in the U.S. each year from extreme heat and humidity than from floods, hurricanes, lightning, tornadoes and earthquakes combined! Delaware should develop a Heat Health Warning System to warn all residents when periods of high heat and humidity are expected, inform them on what to do, work with NGOs to provide cool places of refuge, and provide transportation to get there if needed.
- We recommend that every municipal and county government be required to include in its comprehensive development plan, at the time of the plan's updated submission to the Office of State Planning Coordination, a section relative to adaptation to the effects of climate change.
- We recommend that DNREC begin work immediately on a disaster recovery plan, which would provide a framework for action. We need both short-term and long-term goals and policies agreed upon in advance by stakeholders, with well-defined responsibilities.

### **Avoiding and Managing Flood Risks**

- The Flood Avoidance Workgroup has developed a Flood Risk Adaptation Map and guidance to help state agencies minimize flood risks to state projects. We recommend that the Map and instructions for its use be made available to anyone who wants to use it. Training should be available through workshops, webinars and a website that is periodically updated as new information on the

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\* By "reduced stress bicycle riding" we mean biking that is comfortable for most bicyclists in terms of low traffic volume, low speed, and no major crossings.

rate of sea level rise (SLR) and the extent of flooding expected from SLR and coastal storms becomes available.

- We feel strongly that property owners should be required to disclose to potential buyers - through Delaware's **Seller's Disclosure of Real Property Conditions Report**,<sup>3</sup> - all current information and maps relative to projected sea level rise, storm surge, and saltwater intrusion. The maps and flooding projections must be updated by DNREC as new information becomes available.
- We recommend that State Administration never again promote the development or redevelopment of land that lies in a floodplain, as it did in the case of Fort DuPont. This recommendation is in line with a partial description of the Flood Avoidance Workgroup's emphasis: "avoidance of current and future flood risk."

## DETAILED COMMENTS AND REFERENCES

The **Climate Framework for Delaware**<sup>4</sup> was developed pursuant to **Executive Order (EO) 41: Preparing Delaware for Emerging Climate Impacts and Seizing Economic opportunities for Reducing Emissions**. In EO 41 (Appendix A of the Framework), state agencies were directed to address both causes and consequences of climate change and to develop recommendations in three categories:

- Reduce greenhouse gas (GHG) emissions (climate mitigation)
- Increase resilience to climate change impacts, including increases in temperature, changes in precipitation, and sea level rise (SLR) (climate adaptation)
- Avoid and minimize flood risks – from both SLR and coastal storms

The last point is an important admission by the writers of the Framework report. An earlier report by the Sea level Rise Advisory Committee – **Preparing for Tomorrow's High Tide: Sea Level Rise Vulnerability Assessment for the State of Delaware**<sup>5</sup> – approved in May of 2012, used a 'bathtub' model for flooding that considered only SLR in assessing vulnerability. It considered scenarios with high tides by 2100 as much as 5 feet (1.5 m) higher than in 2012. That was before Hurricane Sandy in October 2012, which had a storm surge at the Battery tide gauge in New York 9 feet above the astronomically expected high tide<sup>6</sup> - much more than the ca. 1 foot SLR seen so far on the Mid-Atlantic coast during the past 100 years.<sup>7</sup>

There is another important acknowledgement on page 3 of the Framework: ***"Climate change is caused mainly by human activities, particularly the burning of fossil fuels that release heat-trapping gases."*** (emphasis added) Understanding the major causes of climate change is critical to climate mitigation – reducing the rate and extent of climate disruption.

A third very important statement on page 3 is: ***"Using the best available science is a foundation of sound decision making."*** Although a great deal of climate science has been established, new discoveries are being reported all the time. That means that Delaware's leaders and citizens need to become informed and then kept up

to date. Tolman reported on the status of the science through 2010 at the February, 2011 meeting of the Delaware Sea Level Rise Advisory Committee, in a paper titled, **Rising Seas and Stronger Storms - Delaware's Adaptation in the Face of Uncertainty**.<sup>8</sup> One resource for keeping current is his monthly *Climate Change News* blog,<sup>9</sup> which seeks to keep its readers up to date on energy and climate change science, public policy, public opinion, ethics and economics.

## Climate Mitigation

The Mitigation Work Group appears to have done little except to consider three targets for greenhouse gas emission reductions suggested by DNREC's Secretary Small: 30%, 40% and 50% reductions by 2030 from a 2008 baseline. The target recommended was 30%, but no reason for the choice was given, except that it was the easiest to achieve. Furthermore, because the major drop in emissions since 2008 occurred in the first year, the recommended goal is modest indeed.

Page 11 in Chapter 1 says, "This target assumes that the 2008 baseline starts at 16.64 MmtCO<sub>2</sub>e (million metric tons of CO<sub>2</sub> equivalent), so a 30 percent reduction in 2030 would equal 11.47 MmtCO<sub>2</sub>e—a difference of 5.17 MmtCO<sub>2</sub>e. That said, this gap becomes smaller based on emission reduction policies, programs, and fuel switching implemented since 2008. Programs that were included in the federal and state policies include policies such as the Regional Greenhouse Gas Initiative, the Universal Recycling Law, and transportation fuel efficiency standards, to name a few." It should be pointed out that non-CO<sub>2</sub> greenhouse gases like methane, nitrous oxide, and hydrofluorocarbons (HFCs) contribute only about 15% of Delaware's CO<sub>2</sub>e emissions.

Appendix C goes through a number of federal, regional and state policies with their potential for reducing GHG emissions by 2030, and concludes that all of them together won't reduce the state's emissions by more than about 1.6 MmtCO<sub>2</sub>e – not enough to reach the 30% emission reduction target by 2030. Our estimated reductions of various government policies, based on Appendix C, are summarized in Table 1. Note that 0.81 MmtCO<sub>2</sub>e – nearly half of the total – is attributed to federal CAFE rules for vehicle fuel efficiency. Research conducted by Ewing et al.,<sup>22</sup> indicates that fuel and automobile efficiencies cannot keep up with population growth and an increase in driving.

Table 1. Estimated Emission Reductions of Various Government Policies, from 2008 to 2030, from Appendix C.

Policy	Type	Figure, Page Nos.	Red. MmtCO <sub>2</sub> e
RGGI	Regional	2, C7 and C8	0.20 <sup>a</sup>
LDV CAFE Rule	Federal	3, C9	0.65
HDV CAFE Rule	Federal	4, C10	0.16
Landfill gas	State	5, C12	0.28
Recycling	State	6, C14	0.17
EE Inv. Fund	State	7, C15	0.11

SB 160	State	C16	0.0014 <sup>b</sup>
Reforestation	State	8, C18	0.01
Cover Crops	State	8, C19	0.02
SEU	State	C19	0.052
<b>Total</b>			<b>1.65</b>

<sup>a</sup> The text on C8 says the power sector emissions are projected to remain at 3.81 MmtCO<sub>2</sub>e from 2011-2013, making this number 0.00.

<sup>b</sup> Page C16 says that using larger trucks to transport poultry would save 160,000 gallons of fuel and reduce emissions by 1.422 mtCO<sub>2</sub>e; it should have said 1,422 mt or 0.0014 Mmt.

The total emissions reduction expected from all current Delaware state policies is only 0.64 MmtCO<sub>2</sub>e. Appendix C does not mention the EPA's Clean Power Plan (CPP) for existing power plants, introduced in June of 2014, or what its estimated contribution to emissions reductions might be.

The Energy Information Administration (EIA) tabulates CO<sub>2</sub> emissions from fossil fuel consumption by state, by sector and by fuel from 1980 through 2012.<sup>10</sup> Data for Delaware (Figure 1) show a large drop (4.2 MmtCO<sub>2</sub>) in total CO<sub>2</sub> emissions from 2008 to 2009 (from 15.1 to 10.9), followed by a slower increase from 2009 through 2012 (1.9). Most of the large drop from 2008 to 2009 was due to reduced emissions from coal (-2.5) and petroleum (-1.8); the slower subsequent increase after 2010 was mostly due to increased emissions from natural gas (+2.8), with a smaller increase from petroleum (+0.7) and a continued drop in coal (-1.6).

## Delaware's CO2 Emissions by Year and Fuel

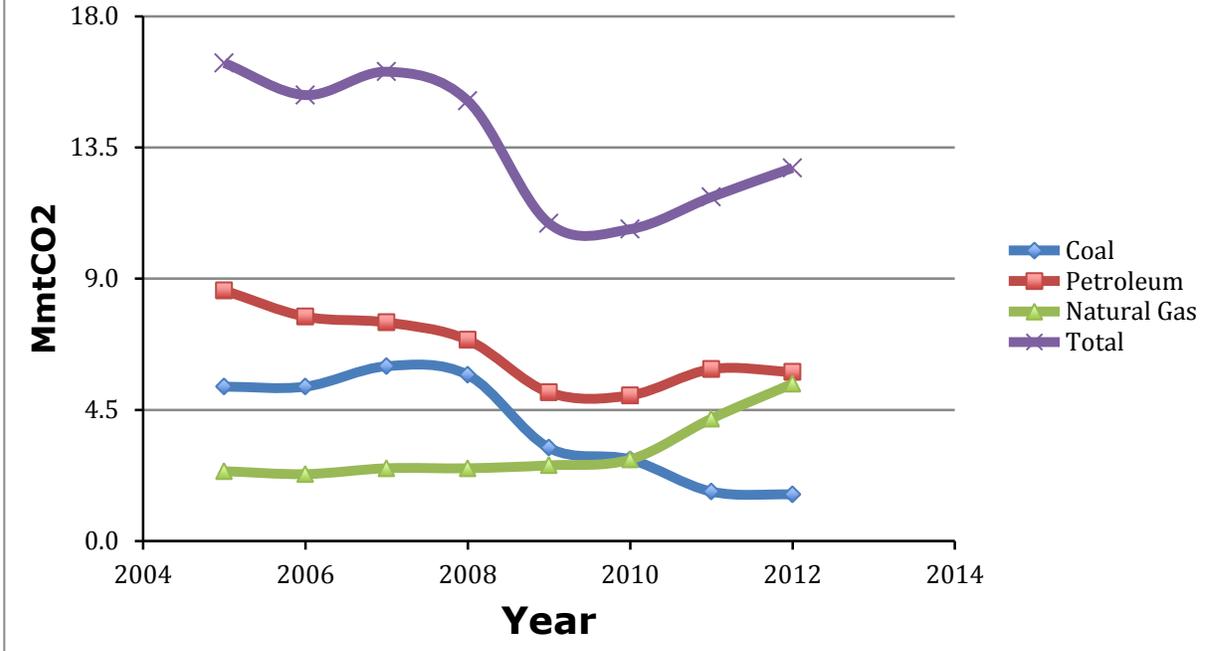


Figure 1.

Though the source of the data shown in the chart on Page 11 of the Framework report is not given, measured GHG emissions are shown only for 2008, 2009 and 2010, with all the rest projected.

Page 4 says, ***“Reducing greenhouse gas emissions has been a key objective for the state of Delaware, using a variety of strategies that promote energy efficiency and shifting to clean, renewable sources of energy.”*** (emphasis added) It goes on to say that Delaware’s GHG emissions between 2000 and 2010 decreased by more than those of any other state in the nation, and lists a number of actions the state has taken. Their effectiveness is summarized in Table 1 above. It and Figure 1 indicate that most of the CO2 emission reductions from 2008 to 2009 were not due to state policies but to reduced burning of coal and petroleum - probably because of the recession and the loss of automobile manufacturing at GM and Chrysler.

A serious weakness of the report is that there are no Delaware targets or plans for GHG emission reductions beyond 2030. A 2007 paper in Geophysical Research Letters reports that “All emission targets considered with less than 60% global reduction by 2050 break the 2.0°C threshold warming this century, a number that some have argued represents an upper bound on manageable climate warming. ***Even when emissions are stabilized at 90% below present levels at 2050, this 2.0°C threshold is eventually broken.*** Our results suggest that if a 2.0°C warming is to be avoided, direct CO<sub>2</sub> capture from the air, together with subsequent sequestration, would eventually have to be introduced ***in addition to sustained 90% global carbon emissions reductions by 2050.***”<sup>11</sup> (emphasis added) Figures 8 and 9 in Reference 5 suggest that a 2.0°C global average surface temperature rise would, after enough time

to reach thermal equilibrium,\* which could be centuries, raise sea level by about 40 m (about 130 feet) and inundate most of Delaware – hardly an acceptable outcome. Near term, we can expect about 1-3 meters of sea level rise by 2100. Even this lower amount will have severe impacts on our coastline and coastal infrastructure.

The costs of removing CO<sub>2</sub> from the atmosphere, once emitted, have been estimated to be as high as \$600/mtCO<sub>2</sub>, depending on the geoengineering technology used.<sup>12</sup>

While Delaware's GHG emissions are only a small fraction of the world's total, our extreme vulnerability to sea level rise and flooding suggests that we should become a national leader in reducing our emissions by at least 80% by 2050 and showing that it is possible to do so while improving our economy and protecting the health and welfare of our citizens.

***Delaware should really address not only how it is to reduce CO<sub>2</sub>e emissions in the 22 years between 2008 and 2030, but how to reduce them further to reach at least 80% below their 2008 level by 2050.*** It should be noted that California's Governor Davis recently announced an executive order setting a greenhouse gas emissions reduction goal 40% below the 1990 level\*\* by 2030,<sup>13</sup> using the states cap-and-trade system, which puts a price on emissions of carbon from all fossil fuels used in California - including those used for transportation.

To see how much of a leadership role Delaware has with respect to other states in mitigating climate change, one useful measure is GHG emissions per capita. Figure 2 below shows the rank ordering of states<sup>14</sup> in 2011 – the most recent year for which such an EIA chart was found. Delaware ranks 17<sup>th</sup>, with New York in 1<sup>st</sup> place with the lowest per capita emissions. With Delaware not in the top third of states, it can hardly be called a climate mitigation leader. ***We suggest that Delaware consider setting a goal of getting into the 10% of states with the lowest per capita CO<sub>2</sub> emissions.*** That means doing better than Oregon, as can be seen in Figure 2.

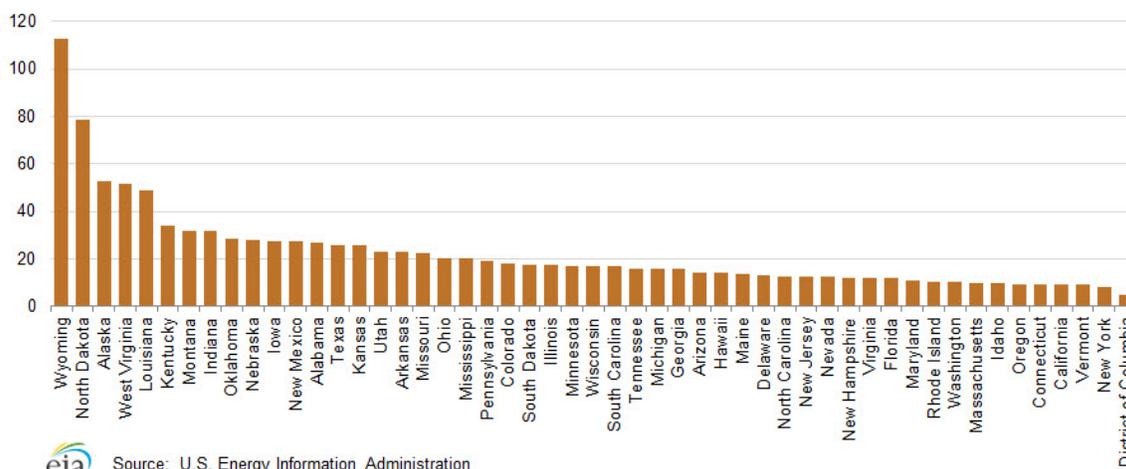
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\* By thermal equilibrium we mean that Earth's climates, atmospheric composition and average temperature and sea level are no longer changing. The sensitivity of sea level to global average surface temperature is about 20 m/degree C (36 ft/degree F). ***If this sensitivity is correct, it means that we are already committed to inundation of more than half of Delaware's current land area.*** See Figure 9 in Ref. 8, which shows the land still above water (light green) with a 15 m SLR.

\*\* California's goal of 40% below its 1990 level is actually 42% below its 2008 level, since California's CO<sub>2</sub> emissions were lower in 1990 than they were in 2008, based on the emissions data in Ref. 10.

Figure 2. Per-capita energy-related carbon dioxide emissions by state, 2011

metric tons carbon dioxide per person



Source: U.S. Energy Information Administration

Another weakness in the Mitigation section of the Framework is the absence of any discussion of the economics of climate change, which should include both the marginal costs per metric ton of CO<sub>2</sub>e for sources and sinks,\* and the costs to society if the concentrations of GHGs continue to increase. One of the best-known attempts to quantify the economics is the **Stern Review on the Economics of Climate Change**,<sup>15</sup> issued by the British government in October 2006. Some of its findings are the following:

- The benefits of strong, early action on climate change outweigh the costs.
- The scientific evidence points to increasing risks of serious, irreversible impacts from climate change associated with business-as-usual (BAU) paths for emissions.
- Climate change threatens the basic elements of life for people around the world – access to water, food production, health, and use of land and the environment.
- The impacts of climate change are not evenly distributed – the poorest countries and people will suffer earliest and most.
- Central estimates of the annual costs of achieving stabilization between 500 and 550 ppm CO<sub>2</sub>e are around 1% of global GDP, if we start to take strong action now (2006). (Stern later revised his annual cost estimate upward to 2% of world GDP.)
- Annual costs to the world economy of delayed action or inaction could range from 5% to 20% of global GDP.
- The transition to a low-carbon economy will bring challenges for competitiveness but also opportunities for growth. Policies to support the development of a range of low-carbon and high-efficiency technologies are required urgently.

\* Regions or processes that predominately produce CO<sub>2</sub> are called sources of atmospheric CO<sub>2</sub>, while those that absorb CO<sub>2</sub> are called sinks. See Carbon Cycle Science at: <http://www.esrl.noaa.gov/research/themes/carbon/>

- ***Establishing a carbon price, through tax, trading or regulation, is an essential foundation for climate change policy. (emphasis added)***

The U.S. GDP in 2013 was \$15.5 trillion, while Delaware's Gross State Product (GSP) was \$56 billion.<sup>16</sup> Stearns 1-2% recommendations for climate change spending would be \$155 - \$310 billion for the U.S. and \$560 million - \$1.2 billion for Delaware in 2013!

The EPA and other federal agencies use something called the Social Cost of Carbon (SCC) to estimate the marginal cost to society of emitting a metric ton of CO<sub>2</sub>e in a particular year, or of reducing emissions by a ton.<sup>17</sup> Though the numbers are quite uncertain, depending on the discount rate used for future damage from current emissions and how one includes low probability but high cost damage, the SCC does give some idea of what price should be placed on GHG emissions for the maximum economic efficiency. A recent Stanford University study reported that the SCC for GHG emissions may be much higher than the currently used value of \$37/mtCO<sub>2</sub>e – perhaps as high as \$220 per ton.<sup>18</sup> The article says, ***“One major finding of the new study is that the damages associated with reductions in economic growth rates justify very rapid and very early mitigation that is sufficient to limit the rise of global temperature to 2 degrees Celsius above pre-industrial levels.” (emphasis added)***

McKinsey and Company published a study in 2007 titled, **Reducing US greenhouse gas emissions: How much at what cost?**<sup>19</sup> The Executive Summary says:

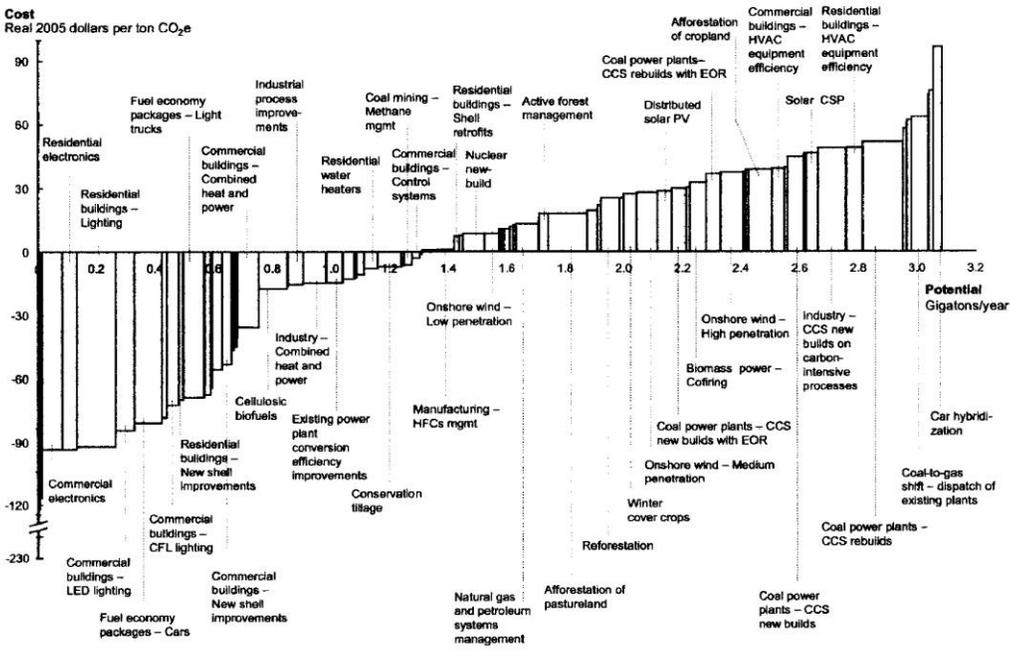
“Consensus is growing among scientists, policy makers and business leaders that concerted action will be needed to address rising greenhouse gas (GHG) emissions. The discussion is now turning to the practical challenges of where and how emissions reductions can best be achieved, at what costs, and over what periods of time. Starting in early 2007, a research team from McKinsey & Company worked with leading companies, industry experts, academics and environmental NGOs to develop a detailed consistent fact base estimating costs and potentials of different options to reduce or prevent GHG emissions within the United States over a 25-year period. The team analyzed over 250 options, encompassing efficiency gains, shifts to lower-carbon energy sources, and expanded carbon sinks.”

The central conclusion was: “The United States could reduce greenhouse gas emissions in 2030 by 3.0 to 4.5 gigatons\* of CO<sub>2</sub>e<sup>20</sup> using tested approaches and high-potential emerging technologies. These reductions would involve pursuing a wide array of abatement options available at marginal costs less than \$50 per ton, with the average net cost to the economy being far lower if the nation can capture sizable gains from energy efficiency.”

Figure 3<sup>21</sup> shows the incremental costs for achieving a U.S. 3.0 gigaton CO<sub>2</sub>e emission decrease by 2030. The cost would be about \$50 billion/year or \$1.1 trillion through 2030 – roughly 1.5% of the investment in the U.S. economy expected from 2007 to 2030. The main feature to notice about the graph is that there are many viable options for reducing GHG emissions at \$50/mtCO<sub>2</sub>e or less, some of which have negative costs, i.e. they actually reduce costs to the economy. (Note that the marginal cost of reducing emissions using distributed solar PV is shown at about \$30/mt; the current cost is probably much less because of a large drop in the price of solar panels since 2007.)

Exhibit B

U.S. MID-RANGE ABATEMENT CURVE – 2030



Source: McKinsey analysis

Figure 3. Incremental costs (in 2005 dollars/mtCO<sub>2</sub>e) for reducing U.S. GHG emissions by 50% (3.0 GtCO<sub>2</sub>e) by 2030, from the 2007 McKinsey report.

Many economists think that the most efficient and effective way to reduce carbon emissions is to put a price on carbon for each ton emitted into the atmosphere, and let the market determine the best technologies. **The Economists Statement on Climate Change**, cosigned by 2500 economists, including nine Nobel Laureates, said, “The most efficient approach to slowing climate change is through market-based policies... such as carbon taxes or the auction of emissions permits.”<sup>22</sup>

The Citizen’s Climate Lobby is trying to get what it calls a national fee and dividend system through the U.S. Congress.<sup>23</sup> The fee would be based on a scheduled rising cost per ton of CO<sub>2</sub>e emitted from the burning of fossil fuels, and levied at the mine, wellhead, or point of import. The schedule might involve a fee of \$10 per ton of CO<sub>2</sub> emitted the first year, and then increase by \$10 per ton each year thereafter. A \$10 per ton fee would raise the price of gasoline about 10¢ per gallon and the price of electricity about 0.5¢ per kWh, if most of the electricity is produced by natural gas, as it is in Delaware. The money would be divided and returned to all households as a dividend. While it would be good if this could be done on a national scale, Washington is currently so factional and dysfunctional that any serious climate legislation is unlikely to pass anytime soon. Leadership is likely to come from the states or associations of states.

There are several options for imposing a price on carbon, ranging from a carbon tax to a cap and trade system or various hybrids of the two.<sup>24</sup> There are also many options for how the money raised could be spent, including replacing aging roads and bridges.

It is clear that current government policies at the federal, regional and state levels are quite inadequate to meet the GHG emission goals for 2030 and 2050 that are needed for Delaware to protect itself from serious damage from climate change – especially from flooding due to sea level rise, storm surges and heavy rainfall. ***We propose that Delaware seriously explore a price on carbon that puts an increasing price on carbon emissions from all sources.*** This could be done at the state level or preferably at a regional level, such as by an expansion of the Regional Greenhouse Gas Initiative, of which Delaware is a part.

We can learn from existing systems that are growing rapidly across the globe. A good place to start would be to see what other states, provinces and countries are doing. California has a cap-and-trade system that now includes the transportation sector as well as electricity generation.<sup>25</sup> Alaska collects a royalty on oil produced there and returns part of it to all state residents each year – a kind of fee and dividend system.<sup>26</sup> British Columbia (B.C.) put a direct carbon tax on GHG emissions in 2008, starting at \$10/mtCO<sub>2</sub>e, which was increased to \$30 in 2012.<sup>27</sup> The revenue generated is now about \$1 billion a year with the following results;

- B.C. now has the lowest personal income tax rate in Canada.
- Fuel use has dropped by 16% in B.C., while it increased by 3% in the rest of Canada. B.C.'s GDP has slightly outperformed the rest of Canada since 2008.

It is vital that DNREC recognize CO<sub>2</sub> as a pollutant so that CO<sub>2</sub> emissions from grandfathered industries within our protected Coastal Zone can be regulated. Delaware's Coastal Zone Act<sup>28</sup> requires that DNREC's Secretary consider the environmental impact of a grandfathered industry within the Coastal Zone, including "probable air ... pollution likely to be generated by the proposed use." Yet DNREC does not ask that CO<sub>2</sub> emissions be included within this requirement. According to a 2014 Yale study, 77% of Delaware adults support regulating CO<sub>2</sub> as a pollutant.<sup>29</sup> The public wants to see this regulation, and our planet's excessive CO<sub>2</sub> emissions demand it.

Because 34% of the CO<sub>2</sub> emissions in Delaware have their source in transportation, an effective mitigation program ought to include a plan to reduce vehicle miles traveled (VMT). Extensive research by Ewing et al.<sup>30</sup> shows that improved efficiencies in both cars and fuels will be wiped out by population growth and an increase of automobile usage. Therefore, a plan to reduce VMT must accompany any efforts in the direction of fuel and/or vehicle efficiency. Proposed legislation being introduced in the Delaware Senate this session, called "Complete Community Enterprise Districts", would offer incentives from DelDOT for local governments to encourage multi-modal, dense, mixed-use development, thus helping to reduce VMT. A housing density of 15 dwelling units per acre is normally considered sufficient to provide full-service transit.<sup>31</sup> A study by Frank et al. in Washington<sup>32</sup> found that a 5% increase in walkability reduced VMT per capita by 6.5%.

Welcome legislation enacted last year requires that new Delaware schools be sited within residential communities. As new schools are built this law will help to transition many of our children from school bus use to walking and biking. Prior to 1969 school children were much more likely to walk or ride bikes to school than they are today.<sup>33</sup> Safe Routes to School says that if U.S. school children were to return to

those days we could keep 1.5 billion tons of CO<sub>2</sub> out of the air each year. In a talk at the Walkable Bikeable Delaware Summit, May, 2015, Peter Furth, Professor of Civil Engineering at Northeastern University, and Andrea Trabelsi, Transportation Planner with Whitman, Requardt & Associates, showed how relatively simple connections among Delaware's many islands of low-stress bicycle routes might greatly improve our children's ability to bike or walk to places they want to reach, including school.<sup>34</sup>

## **Climate Adaptation**

While half of the recommendations (4 total) from the Department of Agriculture involve educating landowners and agricultural operators (Page 19) on the effects of sea level rise, there are none from the Department of Education involving the education of children in grades K-12 about climate change causes and impacts – even though these will be extremely important for the future of the state! DOE seems to be unaware of the excellent work going on in K-12 education at the University of Delaware by Drs. Jennifer Merrill<sup>1</sup> and Amy Trauth-Nare.<sup>2</sup>

The Centers for Disease Control and Prevention (CDC) has a website on climate change risks to human life and health.<sup>35</sup> It says, "Extreme heat events, or heat waves, are a leading cause of extreme weather-related deaths in the United States. The number of heat-related deaths is rising. For example, in 1995, 465 heat-related deaths occurred in Chicago. From 1999 to 2010, a total of 7,415 people died of heat-related deaths, an average of about 618 deaths a year." On a poster on the same web page it says that extreme heat causes more death each year than from floods, hurricanes, lightning, tornadoes and earthquakes combined. It also says that those most at risk are adults over 65, children under 4, people with existing medical problems like heart disease, and those without access to air conditioning.. It also gives advice to stay cool, stay hydrated, and stay informed.

The Framework report on page 29 says, "The mission of the Delaware Department of Safety and Homeland Security (DSHS) is to promote and protect the safety of people and property in Delaware." Among the four recommendations from the DSHS is, "Consider alteration to policies regarding worker safety in an increased temperature environment," but the safety of the public in the new environment is not addressed.

The Social Services Division of the Department of Health and Social Services (DHSS) has a recommendation on page D7 "To consider creating mobile State Service Centers" that could be used during periods of extreme heat. "to access DHSS benefit systems and records" and provide site-specific/community-based services, and another on page D8 to "Identify sites to be used as designated cooling and heating centers," but there appears to be no coherent plans to warn vulnerable populations, inform them on what to do, make sure that adequate refuge space is available, or help those without transportation get to the refuges. For those 65 and older, a friend or relative should call to check on them twice a day during periods of extreme heat.

Although the Office of State Planning Coordination recommends that the PLUS process include in its protocol an encouragement to consider future climate impacts and to improve community resiliency in county and municipal comprehensive plans, this would be voluntary. Consideration of climate impacts ought to be required sections in comprehensive plans. Concern is often expressed that the state might unduly interfere with local affairs, but by a simple requirement that the subject be

addressed, and without outlining how the specifics are worked out, there is plenty of latitude for local initiative.

DNREC must begin at once to plan for disaster recovery in the event of climate change-triggered calamities. This document, **State Disaster Recovery Planning Guide**<sup>36</sup> describes in detail how such a plan might be prepared. Many of the League's concerns would be addressed in a far-reaching disaster plan, ranging from mass care and sheltering to rebuilding. Particularly unanswered Delaware questions are: Who will pay for the re-building of infrastructure and private property damaged by the disaster? What will the state do about Prime Hook Road? Will we be allowed to rebuild in the same manner and on the same sites as before the disaster? From where will the funding come? Many people found that the Glenville disaster recovery was an ad hoc effort, which could have been much more streamlined with advance planning. "The failure to link hazard mitigation and disaster recovery has resulted in repeated disasters over time even in those locations where large amounts of federal, state, private, sector, and individual resources were expended to repair communities following previous events." The **State Disaster Recovery Planning Guide** includes helpful examples of how other states have expressed this level of preparedness.

## Flood Avoidance

An issue not directly addressed by the Flood Avoidance Workgroup was how to discourage building or buying real property in areas at risk of flooding from sea level rise, heavy precipitation events and storm surge. The League strongly supports disclosure of the Flood Risk Management Map and Design Guidance Document (described on Page 41 of the Framework) to potential buyers by builders or property owners wishing to sell. The seller should also make the prospective buyer aware of the risk of sea level rise, storm surge, and salt water intrusion with the Seller's Disclosure of Real Property Condition Report,<sup>3</sup>

## References

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<sup>1</sup> Jennifer Merrill. At: <http://www.ceoe.udel.edu/our-people/profiles/merrillj>

<sup>2</sup> Amy Trauth-Nare. At: <http://www.pdce.udel.edu/programs/science-education/>

<sup>3</sup> State of Delaware **Seller's Disclosure of Real Property Condition Report**. Approved by the Delaware Real Estate Commission (effective 12/01/2013). At: <http://www.kirshtitle.com/pdfs/DREC%20Property%20Disclosure%20Final%20Effective%2012%201%2013.pdf>

<sup>4</sup> The **Climate Framework for Delaware**. Dec., 2014. At: <http://www.dnrec.delaware.gov/energy/Pages/Climate-Framework.aspx>

<sup>5</sup> **Vulnerability Assessment**, Delaware Coastal Programs. Approval date: May, 2012. At: <http://www.dnrec.delaware.gov/coastal/Pages/SLR/DelawareSLRVulnerabilityAssessment.aspx>

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<sup>6</sup> The Battery (Manhattan) tide gauge data. Private communication from Delaware Coastal Programs.

<sup>7</sup> Sea level rise of just over 1 foot (0.3 m) has been seen at the Lewes tide gauge over the past 100 years. See Page 7 of Reference 5.

<sup>8</sup> C. A. Tolman, **Rising Seas and Stronger Storms - Delaware's Adaptation in the Face of Uncertainty**. Feb. 2011. At: <http://www.dnrec.delaware.gov/coastal/Documents/SLR%20Advisory%20Committee/Meeting%204%20Feb.%2015%202011/TolmanSLRAdapt021511.pdf>

<sup>9</sup> C. A. Tolman, *Climate Change News*, monthly blog. At: <http://tolmanccnews.blogspot.com>

<sup>10</sup> **State CO2 Emissions**, U.S. Energy Information Administration, Data from 1980 through 2012, Release date: March 4, 2015. At: <http://www.eia.gov/environment/emissions/state/>

<sup>11</sup> Andrew J. Weaver, Kirsten Zickfeld, Alvaro Montenegro and Michael Eby, **Long term climate implications of 2050 emission reduction targets**, Geophysical Research Letters, Oct. 2007. At: <http://onlinelibrary.wiley.com/doi/10.1029/2007GL031018/full>

<sup>12</sup> Victoria Schlesinger, **Can carbon dioxide removal save the planet?** Aljazeera America, April 12, 2014. At: <http://america.aljazeera.com/articles/2014/4/12/can-carbon-dioxidereovalsavetheplanet.html>

<sup>13</sup> **California governor calls for drastic cuts in gas emissions by 2030**, The Guardian, April 29, 2015. At: <http://www.theguardian.com/us-news/2015/apr/29/california-new-greenhouse-gas-emissions-goal>

<sup>14</sup> **State-Level Energy-Related Carbon Dioxide Emissions, 2000-2011**. U.S. Energy Information Administration, Data through 2011, Release date: Aug. 24, 2014. At: <http://www.eia.gov/environment/emissions/state/analysis/>

<sup>15</sup> **Stern Review on the Economics of Climate Change**, At: [http://en.wikipedia.org/wiki/Stern\\_Review](http://en.wikipedia.org/wiki/Stern_Review)

<sup>16</sup> Table 1. **Real GDP by State, 2010-2013**. Downloaded from U.S. Bureau of Economic Analysis. Release date: June 14,, 2014. At: [https://www.bea.gov/newsreleases/regional/gdp\\_state/gsp\\_newsrelease.htm](https://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm)

<sup>17</sup> **The Social Cost of Carbon**, U.S. EPA, updated in 2013. At: <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>

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<sup>18</sup> Ker Than, **Estimated social cost of climate change not accurate, Stanford scientists say**, Stanford News, Jan. 12, 2015. At: <http://news.stanford.edu/news/2015/january/emissions-social-costs-011215.html>

<sup>19</sup> **Reducing US greenhouse gas emissions: How much at what cost?** McKinsey & Company, 2007. At: [http://www.mckinsey.com/client\\_service/sustainability/latest\\_thinking/reducing\\_us\\_greenhouse\\_gas\\_emissions](http://www.mckinsey.com/client_service/sustainability/latest_thinking/reducing_us_greenhouse_gas_emissions)

<sup>20</sup> A reduction of CO<sub>2</sub>e emissions of 3.0 to 4.5 GtCO<sub>2</sub>e would have reduced carbon emissions of about 6 GtCO<sub>2</sub>e in 2007 by 50 to 75% by 2030. For total U.S. energy-related CO<sub>2</sub> emissions per year see Table 1 from Ref. 10.

<sup>21</sup> The figure was copied from page 5 of Ref. 19.

<sup>22</sup> **The Economists Statement on Climate Change, *Redefining Progress***, 1997. At: <http://rprogress.org/publications/1997/econstatement.htm>

<sup>23</sup> **Carbon Fee and Dividend Explained**, Citizen's Climate Lobby. At: <https://citizensclimatelobby.org/carbon-fee-and-dividend/>

<sup>24</sup> Various options for putting a price on carbon are reviewed by Linda Swift under **Pricing Mechanisms** at <http://priceoncarbon.org>.

<sup>25</sup> **California Cap and Trade**, Center for Climate and Energy Solutions. At: <http://www.c2es.org/us-states-regions/key-legislation/california-cap-trade>

<sup>26</sup> Steve Quinn, **Alaska residents to get \$1,884 payout from oil royalty fund**. Reuters, Sept. 17, 2014. At: <http://www.reuters.com/article/2014/09/17/us-usa-dividend-alaska-idUSKBN0HC2E320140917>

<sup>27</sup> **Price on Carbon**, Linda Swift of LWV of Berkeley, Albany, Emeryville, CA. At: <http://priceoncarbon.org>

NOTE: This website has a lot of other useful information on climate change, and has been endorsed by the US League of Women Voters. Linda Swift, its Webmaster, is a PhD geologist who lives in Berkeley, CA.

<sup>28</sup> **Title 7, Chapter 70, Delaware Code, Coastal Zone Act**. At: <http://delcode.delaware.gov/title7/c070/index.shtml>

<sup>29</sup> **Yale Project on Climate Change Communication**, 2014. At: <http://environment.yale.edu/poe/v2014/>

<sup>30</sup> **Projected Growth in CO<sub>2</sub> Emissions from Cars and Light Trucks** Source: Reid Ewing et al., *Growing Cooler: The Evidence on Urban Development and Climate Change*, Washington, D.C.: The Urban Land Institute. 2008. At:

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<http://www.uli.org/ResearchAndPublications/Reports/~//media/Documents/ResearchAndPublications/Reports/GrowingCooler.ashx>

<sup>31</sup> **Transit Oriented Development**, Victoria Transport Policy Institute, 2014. At: <http://www.vtpi.org/tdm/tdm45.htm>

<sup>32</sup> Frank, L. D., J. F. Sallis, T. L. Conway, J. E. Chapman, B. E. Saelens and W. Bachman (2006). **Many Pathways from Land Use to Health: Associations between Neighborhood Walkability and Active Transportation, Body Mass Index, and Air Quality**. Journal of the American Planning Association 72(1): 75-87. At: [http://www.researchgate.net/profile/Brian\\_Saelens/publication/232928984\\_Many\\_Pathways\\_from\\_Land\\_Use\\_to\\_Health\\_Associations\\_between\\_Neighborhood\\_Walkability\\_and\\_Active\\_Transportation\\_Body\\_Mass\\_Index\\_and\\_Air\\_Quality/links/02e7e52ded08281e9b000000.pdf](http://www.researchgate.net/profile/Brian_Saelens/publication/232928984_Many_Pathways_from_Land_Use_to_Health_Associations_between_Neighborhood_Walkability_and_Active_Transportation_Body_Mass_Index_and_Air_Quality/links/02e7e52ded08281e9b000000.pdf)

<sup>33</sup> **Safe Routes to School: Creative and Safe Solutions to School Bus Cuts**, National Statistics on School Transportation. At: [http://saferoutespartnership.org/sites/default/files/pdf/school\\_bus\\_cuts\\_national\\_stats\\_FINAL.pdf](http://saferoutespartnership.org/sites/default/files/pdf/school_bus_cuts_national_stats_FINAL.pdf)

<sup>34</sup> Furth, Peter G., **Level of Traffic Stress** <http://www.northeastern.edu/peter.furth/projects/level-of-traffic-stress/>

<sup>35</sup> **Climate Change**, CDC. At: <http://ephtracking.cdc.gov/showClimateChangeExtremeHeat.action>

<sup>36</sup> University of North Carolina at Chapel Hill, **State Disaster Recovery Planning Guide**. At: [http://coastalhazardscenter.org/dev/wp-content/uploads/2012/05/State-Disaster-Recovery-Planning-Guide\\_2012.pdf](http://coastalhazardscenter.org/dev/wp-content/uploads/2012/05/State-Disaster-Recovery-Planning-Guide_2012.pdf)

# Executive Order 41 Recommendation for Addressing Climate Change PUBLIC COMMENT FORM May 22, 2015 from LWVDE

The state of Delaware seeks public input on recommendations prepared under Executive Order 41 as described in the “Climate Framework for Delaware” report. Please provide your comments on how these recommendations may affect you, your community, or your business, as well as your suggestions on actions the state should take to meet the challenges of climate change.

- 1. MITIGATION**— The Mitigation Workgroup recommends a climate mitigation target of 30% greenhouse gas reduction from a 2008 baseline by 2030 be adopted by the state of Delaware. What strategies should the state consider in order to achieve this goal? (e.g., energy efficiency, renewable energy, electric vehicles, etc.)

## **STRATEGIES**

**Reduce CO<sub>2</sub> equivalent (CO<sub>2</sub>e) emissions in the State from all sources by:**

- **Placing an increasing price on carbon (with a rebate to the public) until it equals the Social Cost of Carbon**
  - **Promoting and increasing energy efficiency**
  - **Strengthening the Renewable Portfolio Standard to 80% or more renewable energy sources for electricity by 2050**
  - **Promoting offshore wind energy for Delaware in collaboration with neighboring states**
  - **Reducing transportation CO<sub>2</sub> emissions; in particular, by:**
    - 1. Reducing vehicle miles traveled. DeIDOT should provide preferential funding for compact complete community districts that are characterized by mixed use, increased densities and multi-modal transportation.**
    - 2. Promoting the use of electric and alternative vehicles**
    - 3. Promoting the use of mass transit and van pooling**
    - 4. Filling in the gaps in bike/walking trail systems so that people, especially school children, can walk or bike to their destinations.**
- 2. ADAPTATION**— Increasing temperatures, changes in precipitation, and extreme weather events have direct effects on public health and safety. What actions should the state take to prepare and protect the public from climate-related risks?
    - **Prepare a communication plan to use all forms of media including radio and TV, websites, iPhones, etc . to warn citizens of extreme weather events.**
    - **For those 65 and older, a friend or relative should call to check on them twice a day during periods of extreme heat. This recommendation might be promoted and implemented by faith-based communities or other community groups.**
    - **Prepare emergency instructions ahead of time for what people should do.**
    - **Designate refuges in all parts of the state for extreme heat, cold and flooding.**
    - **Prepare a clear chain of command for ordering an evacuation; inform citizens of safe evacuation routes prior to an evacuation order.**
    - **Prepare a database of individuals/groups likely to need help in evacuating organized by location for rapid deployment of transportation.**

- **Arrange transportation for those in need**
3. **ADAPTATION**—Two of the major economic drivers in the state of Delaware are tourism and agriculture, both of which are at risk as a result of climate change. How can the state best prepare to ensure the economy is able to adapt to climate impacts?
- **Encourage research for adaptable crops and livestock.**
  - **Utilize land preservation tools such as TDRs, conservation easements, etc.**
  - **Continue and step-up programs on purchases of open space in order to help protect important tourism and recreational industries.**
4. **ADAPTATION**— An important component of adaptation is public education and outreach. What types of programs would you like to see to help you better understand the projected impacts, as well as prepare and improve community resilience? (e.g. meetings, workshops, newsletters, trainings, technical assistance, etc.)  
Effective mitigation and adaptation will depend will require informed citizens of all ages. Delaware should:
- **Provide meetings, hands-on projects, workshops, newsletters, training and technical assistance for adults.**
  - **Promote K-12 education on the basic science of climate change and its mitigation, adaptation and costs. Nothing is mentioned in the Framework about the education of children and youth.**
  - **Develop courses for technical schools and universities to train students for jobs that address the demands and impacts of climate change.**
5. **ADAPTATION**— The 11 state agencies who participated in Executive Order 41 identified and proposed over 150 recommendations to help improve the state’s resiliency to climate change. If you have general comments or comments about how to take action or partner with the state on specific recommendations, please comment here (note the agency and recommendation title):
- **Under DNREC recommendations: Many brownfield sites tend to be located in or near areas that are subject to flooding or storm surge. A monitoring plan should be set up to check toxic levels at these sites that have been cleaned up to affirm that they are stable and are not a public safety issue.**
  - **Under Office of State Planning Coordination: Every municipal and county government should be required to include in its comprehensive development plan, at the time of the plan’s updated submission to the Office of State Planning Coordination, a section relative to adaptation to the effects of climate change.**
  - **Under DNREC recommendations: The Department must begin at once to plan for disaster recovery in the event of climate change-triggered calamities. This document has helpful suggestions: [http://coastalhazardscenter.org/dev/wp-content/uploads/2012/05/State-Disaster-Recovery-Planning-Guide\\_2012.pdf](http://coastalhazardscenter.org/dev/wp-content/uploads/2012/05/State-Disaster-Recovery-Planning-Guide_2012.pdf).**

6. **FLOOD AVOIDANCE**—Eleven key state programs and policies were identified that should be modified to incorporate the flood avoidance provisions of Executive Order 41. Are there any additional state programs and policies that should be modified to include flood avoidance provisions?

- **No mention is made of the state departments’ responsibility to coordinate, educate and possibly provide partial funding to plan for flood avoidance at the county and local government level.**

7. **FLOOD AVOIDANCE**—The Flood Avoidance Workgroup created the Flood Risk Adaptation Map and step-by-step guidance to help state agencies minimize flood risks to state projects. While developed for state agency use, the maps and guidance will be available for use by non-state agencies when they are finalized. Do you have interest in using these products and if so, what is the best way to provide them to you (e.g. trainings, workshops, webinar, website, etc.)?

- **The LWV’s Environmental Committee would like to be able to use the map.**
- **It should be made available to anyone who requests it.**
- **People who are interested in building or buying homes or businesses near the coast should have access to the map.**
- **Property owners should be required to disclose to potential buyers - through Delaware’s Seller’s Disclosure of Real Property Conditions Report - all current information and maps relative to predicted sea level rise and flooding in that area.**
- **The map and flooding projections should be updated as new information becomes available.**
- **Training should be made available through workshops, webinars and a continuously updated website.**

8. If you have any other comments, please feel free to submit them here, or attach an additional page: **See the attached comments titled LEAGUE COMMENTS ON CLIMATE FRAMEWORK FOR DELAWARE.**

(optional) Name: \_\_\_\_\_

(optional) Affiliation/contact info: **The League of Women Voters of Delaware**

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**Please print this form and mail to: Delaware Division of Energy and Climate, 1203 College Park Dr., Suite 101, Dover, DE, 19904**