

Building a Resilient Pittsburgh: Climate Challenges and Opportunities Deliberative Forum¹

Final Report (December 2014)

Casey Canfield & Kelly Klima
Department of Engineering and Public Policy
Carnegie Mellon University

Executive Summary

Policies to mitigate and adapt to climate change need public support to be successful. Deliberative democracy forums serve to both better inform the public of the available options and provide a way for policymakers to assess support for proposed policies.

This work uses a pilot study in Pittsburgh to explore how a deliberative democracy process affects residents' knowledge and perceptions of climate change policies. A convenience sample completed pre and post-surveys during a Deliberative Forum: "Building a Resilient Pittsburgh: Climate Challenges and Opportunities". The forum included small group discussions facilitated by moderators and an opportunity to ask questions of a Resource Panel. The surveys focused on knowledge, perceptions, and opinions related to climate change as well as mitigation and adaptation strategies. We had two primary questions:

1. How does participating in this Deliberative Forum shift knowledge and perceptions of climate change?
2. How does participating in this Deliberative Forum shift support for climate change policies?

The main conclusions from this study are summarized below. Evidence suggests that participating in the Deliberative Forum:

- Increased perceived understanding,
- Improved specific pieces of knowledge about climate change,
- Increased perceived importance of climate change,
- Did not influence support for specific policies,
- Increased perceived importance of saving money, and
- Increased perceived effectiveness of public information strategies.

Overall, participants had a slight preference for energy efficiency strategies over renewable energy and public information. There was higher support for policies that related to City operations. In addition, participants supported a stormwater fee.

This sample was highly educated and environmentally aware, which is associated with support for climate change policies. Given the nature of this convenience sample, more research is needed to extend these results to a larger population.

¹ This work was revised and published in a peer-reviewed journal: Canfield, C., Klima, K., & Dawson, T. (2015). Using deliberative democracy to identify energy policy priorities in the United States. *Energy Research & Social Science*, 8, 184-189.

1. Background

Policies to mitigate and adapt to climate change need public support to be successful. Support for climate change policies is related to both the presentation of the policy and the characteristics of the constituency. In general, policies that use incentives and have little perceived impact on behavior (e.g. efficiency measures such as driving a hybrid car) are perceived as more acceptable and effective than policies that use penalties or shift behavior (e.g. curtailment measures such as driving less) (Eriksson, Garvill & Nordlund, 2008; Steg, Dreijerink & Abrahamse, 2006). In addition, knowledge, perceptions, and demographics predict support for climate change mitigation policies. Greater support for mitigation policies is associated with increased knowledge and perceived local risk of climate change, trust in environmentalists, higher income, being black and being older (Dietz, Dan & Shwom, 2007; Zahran, Brody, Grover & Vedlitz, 2006).

Deliberative democracy serves to encourage citizens to engage in a structured discussion on polarizing issues. This serves to both better inform the public and provide a way for policymakers to assess support for various proposed policies. Building on previous work that has focused on college campuses (Cavalier et al., 2008), this work is a pilot test to explore how City government can use this process to engage citizens. In addition, we investigate how this deliberative democracy process shifts people's knowledge and perceptions of climate change policies. We have two primary questions:

1. How does participating in this Deliberative Forum shift knowledge and perceptions of climate change?
2. How does participating in this Deliberative Forum shift support for climate change policies?

2. Method

2.1. Design

All participants completed a pre-survey and post-survey for a Deliberative Forum on "Building a Resilient Pittsburgh: Climate Challenges and Opportunities". The Deliberative Forum included small group discussions as well as an opportunity to ask questions of a Resource Panel. The Forum was hosted on October 14, 2014 at Carnegie Mellon University. Both pre and post surveys focused on knowledge, perceptions, and opinions related to climate change as well as mitigation and adaptation strategies.

For climate change science, we measured *perceived understanding* ("How well do you feel you understand the issue of climate change?"), *importance* ("How important is the issue of climate change for society?"), and *climate knowledge* (e.g. "Humans are currently experiencing the effects of climate change. True/False?").

For climate change policies, we measured *City responsibility* (e.g. "Do you think the City of Pittsburgh has a responsibility to encourage and promote strategies to deal with climate change?"), *importance of benefits* (e.g. "How important is it that a

climate change strategy save money?”), *benefits knowledge* (e.g. “What benefits are associated with each strategy?”), *policy support* (e.g. “Do you think the City of Pittsburgh should do any of the following?”), and *willingness to pay* (“Would you be willing to pay a similar stormwater utility fee in Pittsburgh?”). For *policy support*, the pre-survey included strategy categories (renewable energy, energy efficiency, information) while the post-survey assessed specific strategies.

In addition, we measured *demographic information* in the pre-survey. In the post-survey, we measured *trust* (e.g. “To what degree do you trust national environmental groups in the context of the issues discussed today?”) and *pro-environmental attitudes* via a shortened New Ecological Paradigm (NEP) scale (e.g. If things continue on their present course, we will soon experience a major ecological catastrophe”) used by Dietz, Dan & Shwom (2007).

2.2. Sample

We recruited 75 participants in a convenience sample from both Carnegie Mellon University and the Pittsburgh area via advertisements on mailing lists for neighborhoods, interest groups, courses and departments. Only 60 participants completed the post-survey. Based on the pre-survey, 55% of participants were affiliated with Carnegie Mellon University. The average age was 34.9 ($SD = 18.2$) and ranged from 18 to 75. The participants were 49.3% female and 27.5% non-white. Most participants identified as either a Democrat (34.7%) or Independent (33.3%). The sample was very well educated, with 34.7% having completed a graduate degree. Participants also tended to have pro-environmental views, with a mean NEP score of 3.96 out of 5 ($SD = 0.64$).

3. Survey Results

Paired samples t-tests were conducted to assess changes between the pre and post-tests for each variable.

3.1. Understanding and Perceptions of Climate Change

After the Forum, participants reported a higher perceived understanding of climate change. In addition, participants felt that climate change was a more important issue and more likely to affect them personally. Although there was no change in perceived likelihood of local impacts, more participants acknowledged that most of the climate change impacts would be far from Pittsburgh in the post-test. These results are summarized in Table 1.

Although there was no observed change in overall knowledge score, performance improved for specific questions. The change in knowledge scores for the pre-test ($M=0.63$, $SD=0.25$) and post-test ($M=0.58$, $SD=0.35$) was not statistically significant; $t(51)=1.50$, $p=0.15$. However, the performance on individual questions varied. The summary statistics reported in Table 2 show that performance significantly improved for the question on scientific disagreement and the main energy source of carbon emissions. While Table 2 shows individual trends, Figure 1 highlights the

overall group findings. Overall, participants were very confident about the following statements (listed in order of most correct):

1. Humans are currently experiencing the effects of climate change.
2. Activities that reduce carbon emissions can have other benefits such as saving money and improving air quality.
3. Reducing carbon emissions helps to reduce the effects of climate change.
4. There is significant scientific disagreement in the scientific community that climate change exists (FALSE).

However, participants were much less confident about the following statements (listed in order of most correct):

5. Natural events that emit greenhouse gases, such as carbon dioxide, are a major cause of climate change in the last 50 years (FALSE).
6. The summer of 2014 had the highest average temperature for the entire globe.
7. In Pittsburgh, the expected rainfall is reducing due to climate change (FALSE).

In addition, as shown in Figure 2, significantly more participants identified that electricity use was the main source of carbon emissions after the forum. Overall, participants performed better on the concept statements and struggled with statements about specific impacts. In addition, it is important to note that participants were generally more confident, but wrong, regarding the influence of natural events on climate change.

Table 1. Summary statistics for pre and post test ratings of perceived understanding, importance, and impact of climate change. A ranking of 5 is highest and 1 is lowest.

Variable	N	Pre-test		N	Post-test		Diff			
		Mean	(SD)		Mean	(SD)	95% CI	t-stat	p-value	
Understanding (1)	74	3.96	(0.99)	59	4.37	(0.64)	[0.18-1.1]	-3.86	0.000	***
Importance (2)	72	4.81	(0.49)	59	4.85	(0.48)	[0-0.33]	-2.06	0.044	*
Far impacts (5a)	71	2.27	(1.29)	58	2.57	(1.53)	[0.15-1.66]	-2.89	0.006	**
Local impacts (5b)	72	4.53	(0.82)	59	4.69	(0.65)	[-0.05-0.96]	-1.54	0.129	
Personal impacts (5c)	73	4.32	(1.00)	59	4.66	(0.69)	[0.12-1.21]	-2.96	0.005	**

Note: *p<.05, **p<.01, ***p<.001

Table 2. Summary statistics for pre and post test knowledge scores. The mean represents the percent answered correct.

Knowledge Question	N	Pre-test		N	Post-test		Diff			
		Mean	(SD)		Mean	(SD)	95% CI	t-stat	p-value	
Experiencing effects	71	0.99	(0.12)	59	0.98	(0.13)	[-0.05-0.12]	1.00	0.32	
Co-benefits	70	1.00	(0.00)	59	1.00	(0.00)	0	-	1.00	
Reducing carbon emissions	71	0.97	(0.17)	59	1.00	(0.00)	[-0.02-0.15]	-1.00	0.32	
Scientific disagreement	71	0.73	(0.45)	57	0.82	(0.38)	[0-0.35]	-2.06	0.04	*
Natural events major cause	61	0.61	(0.49)	54	0.59	(0.50)	[-0.09-0.42]	-0.37	0.71	
Summer 2014 hottest	41	0.90	(0.30)	38	0.92	(0.27)	0	-	1.00	
Pgh rainfall reducing	22	0.77	(0.43)	32	0.78	(0.42)	[-0.14-0.49]	-0.57	0.58	
Main emissions source	72	0.47	(0.50)	57	0.74	(0.44)	[0.14-0.71]	-4.32	0.00	***

Note: *p<.05, **p<.01, ***p<.001

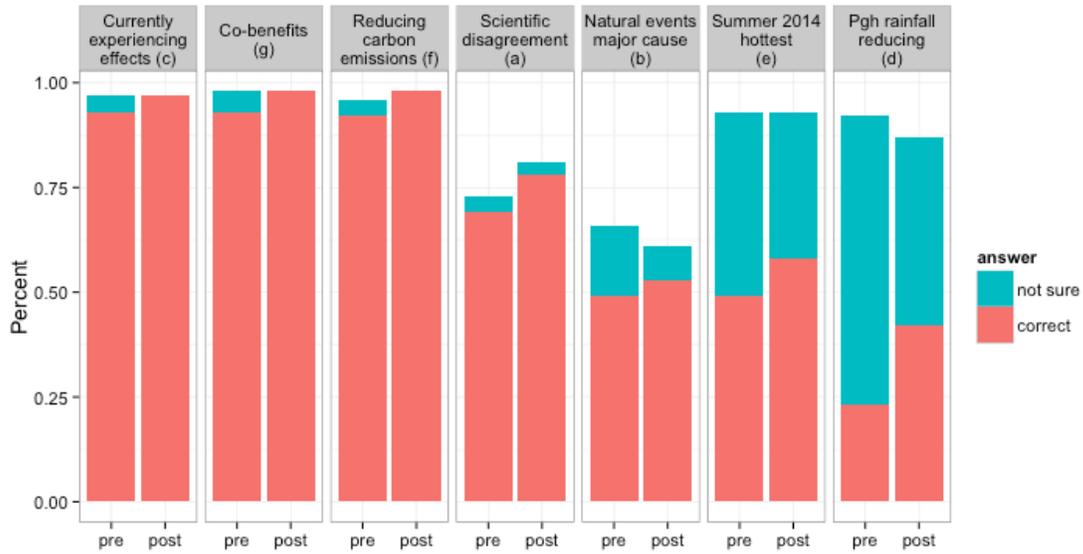


Figure 1. Climate change knowledge questions. Although participants were very confident and performed well on most concept questions, they struggled with fact questions that focused on a specific time or place.

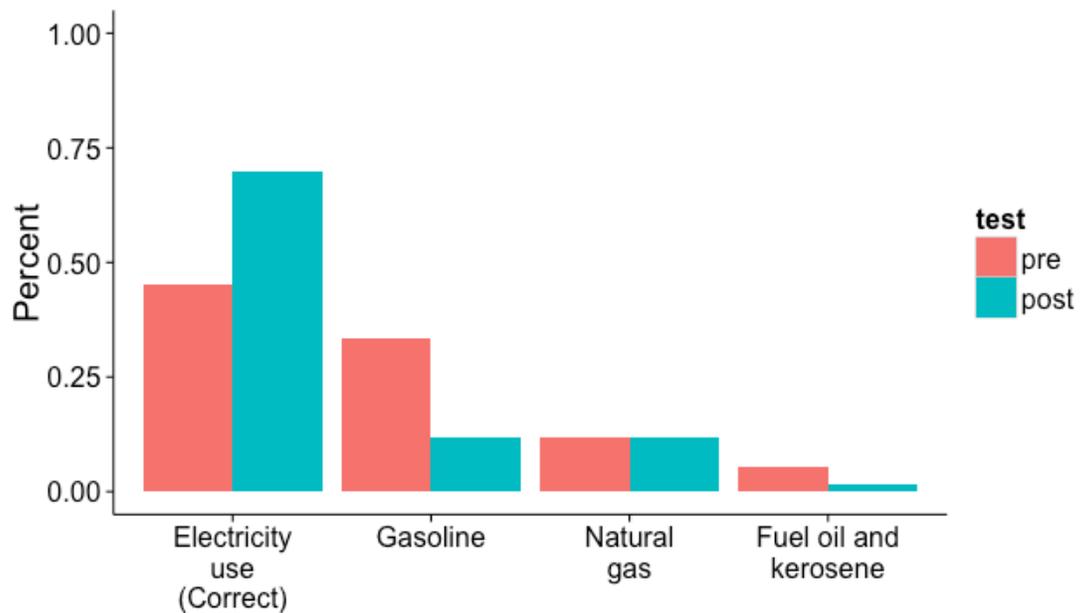


Figure 2. Knowledge of energy use with most emissions. More participants correctly identified that electricity use leads to the most emissions after the Forum.

3.2. Support for Climate Change Policies

Participants felt that the City of Pittsburgh has a responsibility to invest in both adaptation and mitigation strategies. Reducing carbon emissions was rated as the most important benefit. Although increasing energy efficiency and renewable energy were perceived as more effective strategies, participants rated the effectiveness of increasing public information higher after the Forum. These results are summarized in Table 3.

As shown in Figure 3, participants rated the importance of each benefit when considering strategies for climate change. The benefits, in order of importance, were (1) reducing emissions, (2) improving water quality, (3) improving air quality, and (4) saving money. There was a statistically significant increase in ratings for reducing emissions and saving money after the Forum.

Participants also rated the effectiveness of different strategies at achieving the benefits. The results for the pre-test are reported in Figure 4 and the post-test are reported in Figure 5. Overall, energy efficiency was perceived as the most effective strategy, closely followed by renewable energy. Increasing public information was perceived as the least effective, except for saving money. However, the perceived effectiveness increased for the public information strategy across all benefits in the post-test. There was little change in perceived effectiveness for energy efficiency and renewable energy. However, there was a small significant increase in the post-test for renewable energy in achieving reduced emissions and saving money.

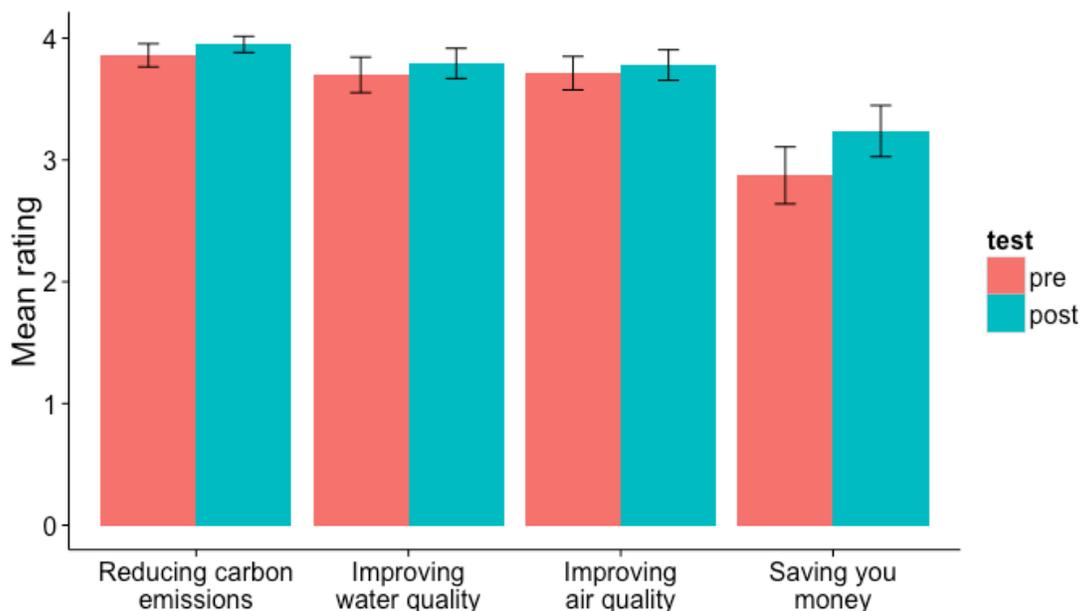


Figure 3. Mean ratings for importance of each benefit for pre and post-test. Saving money was rated as least important but rated higher after the forum.

The error bars represent a 95% confidence interval. A ranking of 4 is highest and 1 is lowest.

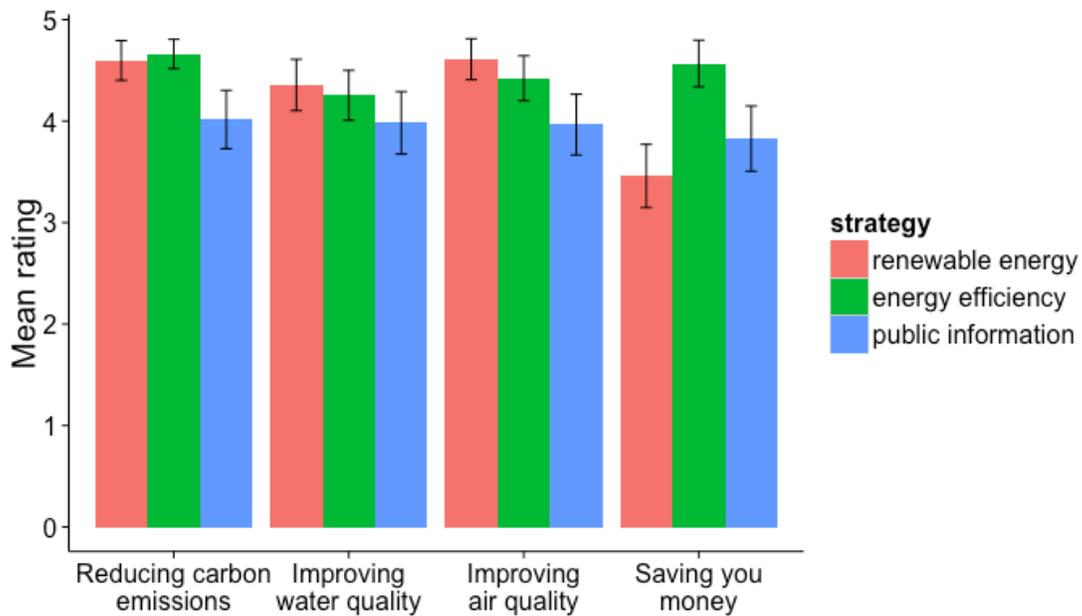


Figure 4. Pre-test ratings of effectiveness of strategies at achieving benefits. Overall, increasing public information was perceived as the least effective, except for saving money. A ranking of 5 is highest and 1 is lowest.

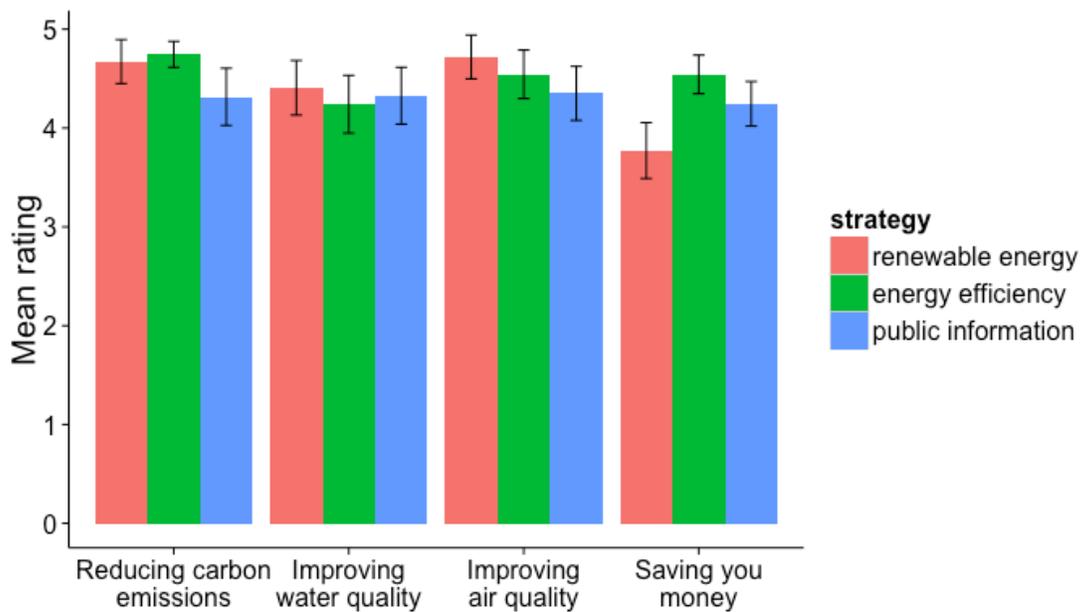


Figure 5. Post-test ratings of effectiveness of strategies at achieving benefits. After the Forum, the perceived effectiveness of public information was much closer to the other strategies. A ranking of 5 is highest and 1 is lowest.

Table 3. Summary statistics for pre and post test ratings. As indicated by max, a ranking of 4 or 5 is highest and 1 is lowest.

Variable	Max	N	Pre-test		Post-test		Diff 95% CI	t-stat	p-value		
			Mean	(SD)	N	Mean				(SD)	
responsibility for adaptation (6)	4	73	3.73	(0.56)	59	3.85	(0.41)	[-0.01-0.48]	-1.69	0.096	
responsibility for mitigation (7)	4	72	3.72	(0.63)	59	3.83	(0.42)	[-0.03-0.53]	-1.53	0.133	
Importance of (8):											
reducing emissions	4	71	3.86	(0.35)	59	3.95	(0.22)	[0-0.34]	-2.06	0.044	*
improving air quality	4	73	3.71	(0.51)	59	3.78	(0.42)	[-0.11-0.61]	-0.47	0.642	
improving water quality	4	73	3.70	(0.54)	58	3.79	(0.41)	[-0.06-0.68]	-1.15	0.255	
saving money	4	71	2.87	(0.86)	59	3.24	(0.70)	[0.18-1.07]	-3.83	0.000	***
Effectiveness of increasing renewable energy at (9):											
improving air quality	5	64	4.61	(0.70)	57	4.72	(0.73)	[-0.07-0.73]	-1.15	0.256	
reducing emissions	5	67	4.60	(0.70)	58	4.67	(0.73)	[0.01-0.58]	-2.19	0.033	*
improving water quality	5	59	4.36	(0.85)	54	4.41	(0.88)	[-0.15-0.92]	-0.75	0.456	
saving money	5	61	3.46	(1.06)	57	3.77	(0.93)	[0.02-1.47]	-2.07	0.044	*
Effectiveness of increasing energy efficiency at (10):											
reducing emissions	5	65	4.66	(0.51)	59	4.75	(0.44)	[-0.04-0.51]	-1.27	0.209	
saving money	5	67	4.57	(0.82)	59	4.54	(0.65)	[-0.25-0.59]	0.81	0.419	
improving air quality	5	64	4.42	(0.77)	57	4.54	(0.80)	[-0.14-0.98]	-0.80	0.429	
improving water quality	5	59	4.25	(0.82)	54	4.24	(0.93)	[-0.15-1]	-0.84	0.404	
Effectiveness of increasing public information at (11):											
reducing emissions	5	62	4.02	(0.98)	57	4.32	(0.95)	[0.2-1.29]	-3.57	0.001	***
improving water quality	5	58	3.98	(1.02)	55	4.33	(0.92)	[0.23-1.45]	-3.59	0.001	***
improving air quality	5	58	3.97	(0.99)	57	4.35	(0.90)	[0.29-1.47]	-4.06	0.000	***
saving money	5	58	3.83	(1.06)	57	4.25	(0.74)	[0.29-1.57]	-3.92	0.000	***

Note: *p<.05, **p<.01, ***p<.001

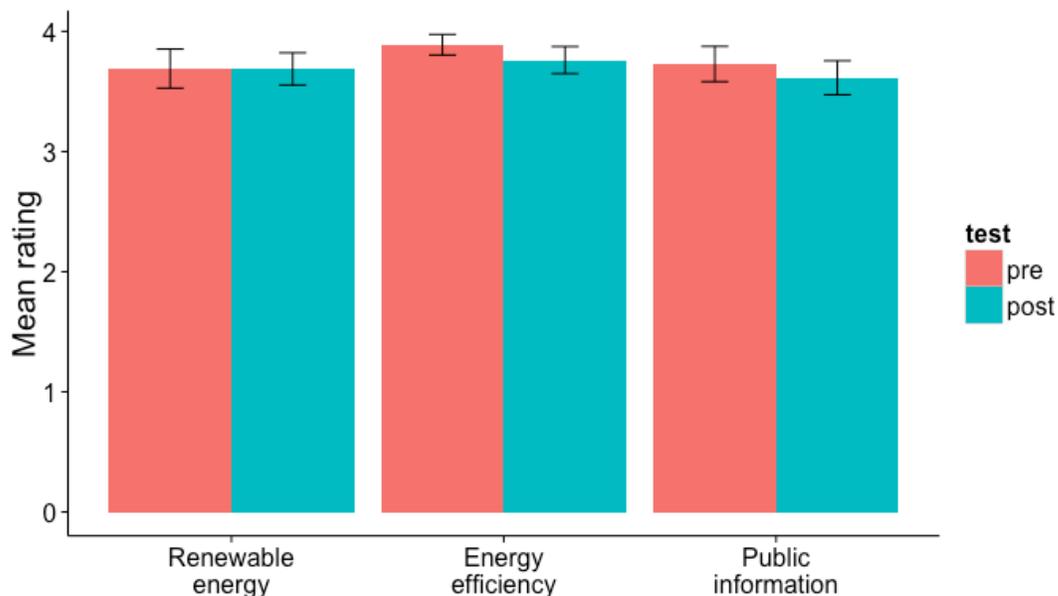


Figure 6. Support for climate change policies before and after the Forum. There was slightly more support for energy efficiency policies. There was little difference in pre and post ratings. A ranking of 4 is highest and 1 is lowest.

As shown in Figures 6 and 7, participants had a slight preference for energy efficiency strategies over renewable energy and public information. Participants

supported a stormwater fee ($M=3.52$ out of 4, $SD=0.69$). There was no evidence of a shift in support after the Forum. As summarized in Table 4, support for strategies was more strongly correlated with perceived environmental effectiveness.

As shown in Figure 8, participants trusted universities and environmental groups more than government and industry groups in the context of climate change.

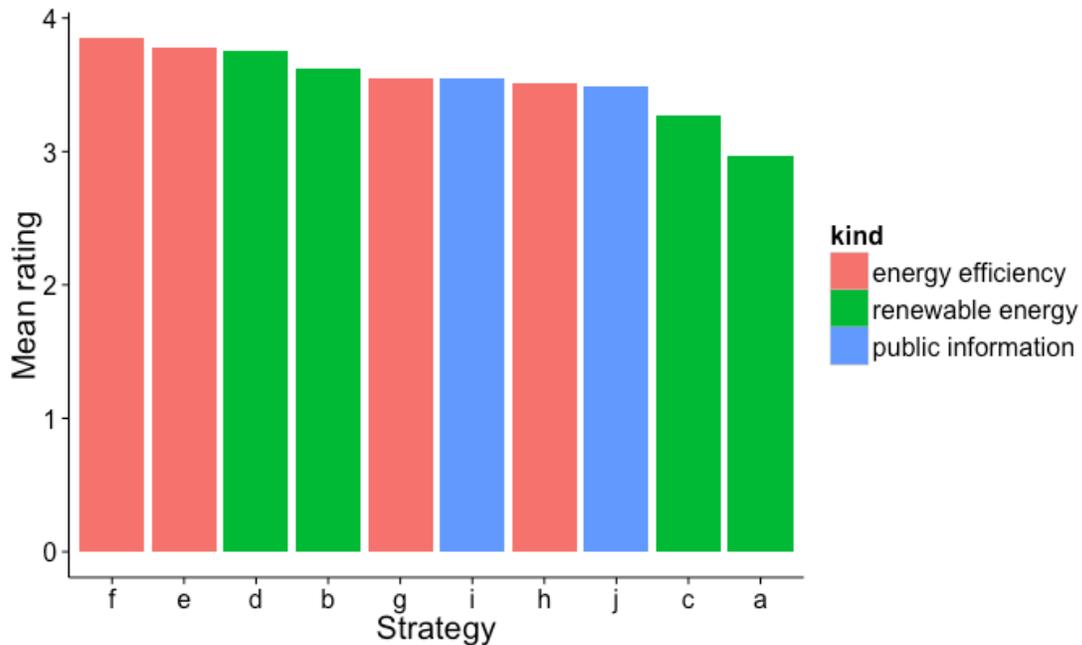


Figure 7. Support for specific climate change policies categorized as energy efficiency, renewable energy, or public information. The specific strategies included (f) install LED streetlights in business districts, (e) install LED streetlights in residential districts, (d) cooperative purchasing program, (b) City purchase 25% renewable, (g) Energy Star certification for City-County building, (i) commercial building energy disclosure, (h) energy efficiency loans, (j) online tools, (c) 10MW renewable capacity, and (a) solar energy on City buildings. A ranking of 4 is highest and 1 is lowest.

Table 4. Pearson correlations between perceived effectiveness of strategies and strategy support. Perceptions of environmental effectiveness (emissions, air quality, water quality) were highly correlated with strategy support.

Strategy Support		Perceived Effectiveness of Strategy			
		reducing emissions	saving money	air quality	water quality
Renew. Energy	City install solar energy (a)	0.46***	-0.01	0.46***	0.49***
	City purchase 25% (b)	0.02	0.20	0.50***	0.46***
	Install 10MW in city (c)	0.26	0.18	0.44**	0.39**
	Coop purchasing program (d)	0.35**	0.12	0.19	0.26
Energy Efficiency	LED residential streetlights (e)	0.35**	0.07	0.35**	0.38**
	LED business streetlights (f)	0.40**	-0.01	0.48***	0.55***
	Energy-Star for City-County building (g)	0.19	0.05	0.34*	0.39**
	Energy efficiency loans (h)	0.30*	0.15	0.28*	0.29*
Public Info	Commercial energy disclosure (i)	0.14	0.03	0.18	0.16
	Online tools (j)	0.49***	0.45***	0.49***	0.50***

Note: *p<.05, **p<.01, ***p<.001

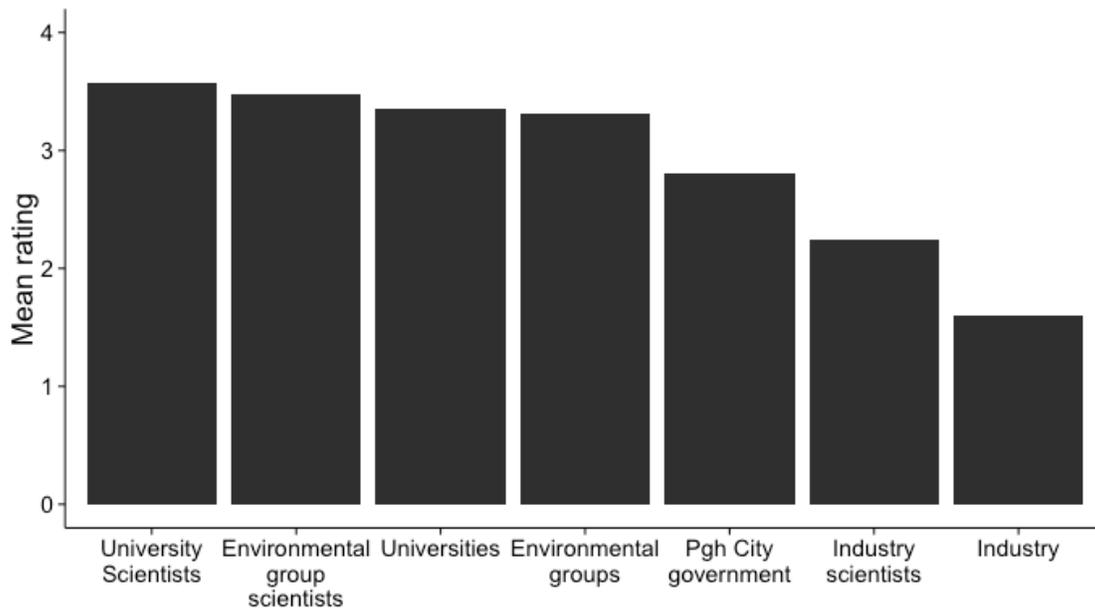


Figure 8. Trust in groups for climate change information. Participants trust universities and environmental groups more than government and industry. A ranking of 4 is highest and 1 is lowest.

4. Event Feedback

Participants reported a high likelihood of participating in a Deliberative Forum again. The conversation was rated as engaging, enjoyable, and intellectually stimulating. The small group deliberation and resource panel were most useful for broadening understanding of what the City is already doing. The resource panel was rated as the most informative. The results are summarized in Table 5.

Table 5. Event ratings. A ranking of 4=highest and 1=lowest.

Variable	N	Mean	(SD)
Likelihood of participating again	52	3.25	(0.56)
Participating in conversation:			
engaging	55	3.64	(0.52)
enjoyable	55	3.51	(0.54)
intellectually stimulating	55	3.45	(0.57)
frustrating	55	1.67	(0.86)
Small group deliberation broadened understanding of:			
what City is already doing	55	3.16	(0.81)
what City is considering for future	54	3.09	(0.76)
co-benefits of strategies	54	2.89	(0.90)
adaptation strategies	55	2.85	(0.87)
challenges of climate change	55	2.82	(0.92)
mitigation strategies	55	2.80	(0.85)
Resource panel broadened understanding of:			
what City is already doing	53	3.32	(0.83)
what City is considering for future	53	3.26	(0.86)
co-benefits of strategies	52	2.81	(0.91)
challenges of climate change	52	2.79	(0.89)
mitigation strategies	53	2.79	(0.93)
adaptation strategies	53	2.75	(0.94)
How informative were:			
resource panel	54	3.28	(0.76)
group discussions	54	3.13	(0.73)
written materials	52	3.02	(0.78)

5. Discussion

Participation in the Deliberative Forum increased perceived understanding and improved specific knowledge about climate change. Although there was no observed change in overall knowledge score, performance improved for specific questions and uncertainty decreased. However, even after the Forum, approximately half of the participants still considered natural events to be a major cause of climate change.

In addition, participants felt that climate change was a more important issue and more likely to affect them personally after the Forum. Participants tended to focus on local and personal impacts. As a result, they seemed to discount the impacts that are expected further away.

Participation in the Deliberative Forum did not significantly influence support for climate change policies. Participants reported that the City of Pittsburgh has a responsibility to invest in both adaptation and mitigation strategies. Reducing carbon emissions was rated as the most important benefit overall. Although increasing energy efficiency and renewable energy were perceived as more effective strategies, participants rated the effectiveness of increasing public information higher after the Forum. Participants had a slight preference for energy efficiency strategies over renewable energy and public information. There was higher support for policies that related to City operations (installing LED streetlights, 25% renewable energy, Energy Star certification). In addition, participants supported a stormwater fee.

Given the nature of this convenience sample, these results cannot be extended to a larger population. This sample was highly educated and environmentally aware, which is associated with support for climate change policies (Dietz, Dan & Shwom, 2007; Zahran, Brody, Grover & Vedlitz, 2006). As a result, more research is needed to extend these results to a larger population. Future work should examine question wording, identify a more diverse sample, and explore misconceptions.

6. References

- Cavalier, R., Attari, S., Dawson, T., & Schweizer, V. (2008). A Deliberative Poll on Climate Change. In *UNITAR-Yale Conference on Environment and Democracy*, May 10-11, in New Haven, CT, USA.
- Dietz, T., Dan, A., & Shwom, R. (2007). Support for Climate Change Policy: Social Psychological and Social Structural Influences. *Rural Sociology*, 72(2), 185–214.
- Eriksson, L., Garvill, J., & Nordlund, A. M. (2008). Acceptability of single and combined transport policy measures: The importance of environmental and policy specific beliefs. *Transportation Research Part A: Policy and Practice*, 42(8), 1117–1128.
- Steg, L., Dreijerink, L., & Abrahamse, W. (2006). Why are Energy Policies Acceptable and Effective? *Environment and Behavior*, 38(1), 92–111.
- Zahran, S., Brody, S. D., Grover, H., & Vedlitz, A. (2006). Climate Change Vulnerability and Policy Support. *Society & Natural Resources*, 19(9), 771–789.

Appendix: Additional Analysis

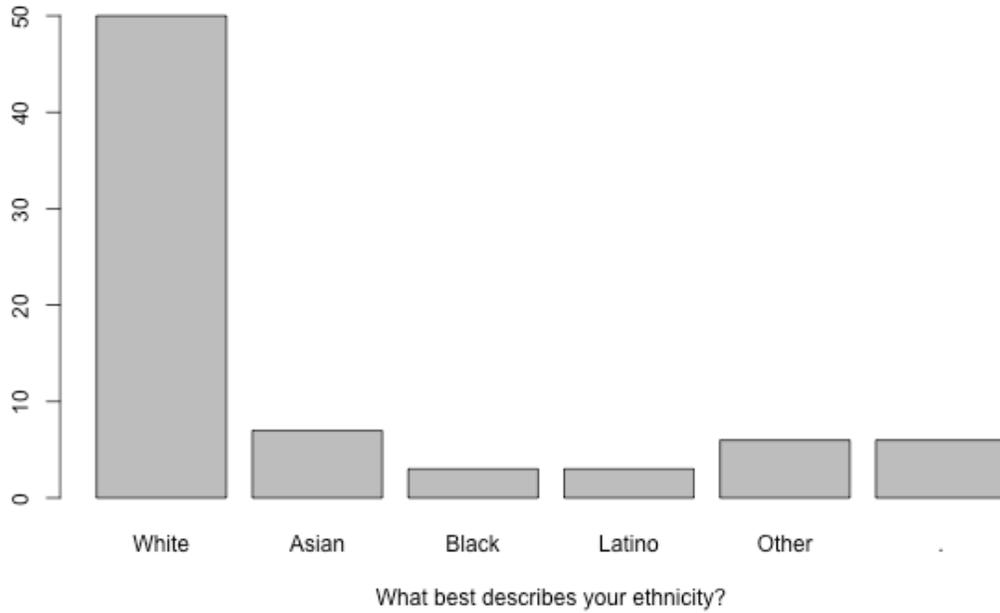


Figure 9. The sample was 27.5% non-white. The “.” indicates no response.

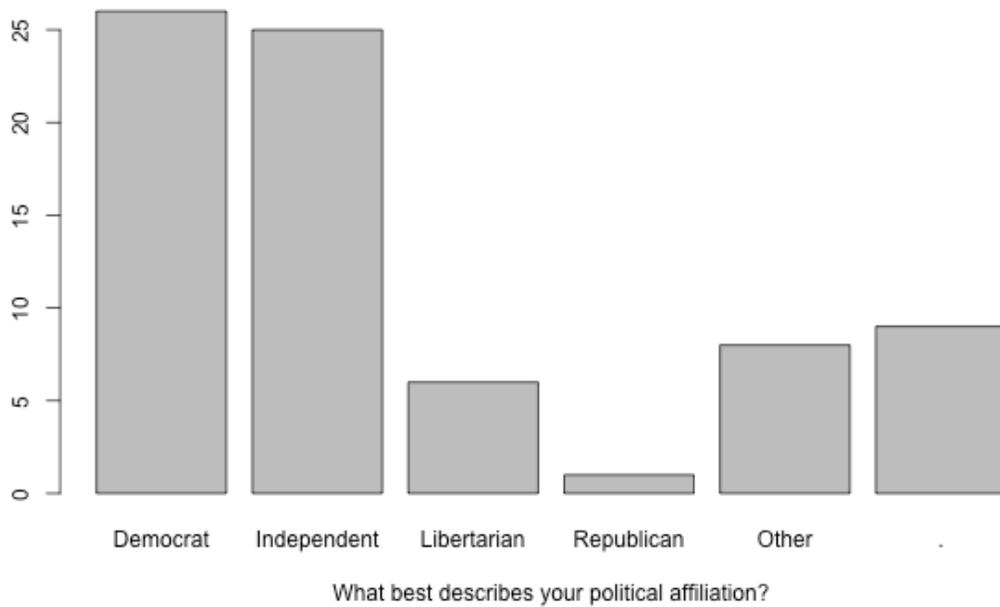


Figure 10. Most participants identified as Democrat or Independent. The “.” indicates no response.

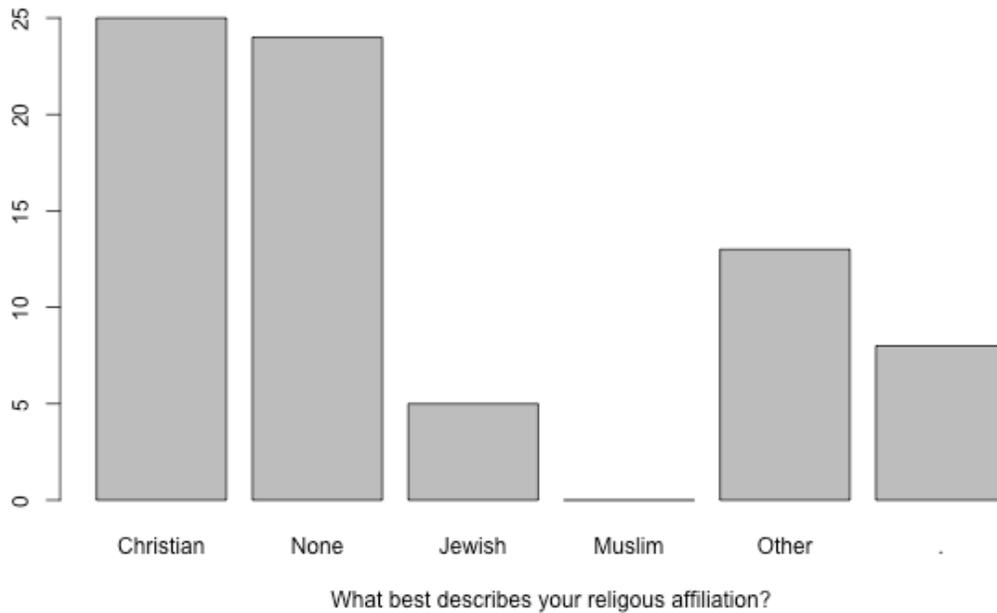


Figure 11. Most participants identified as Christian or None. The “.” indicates no response.

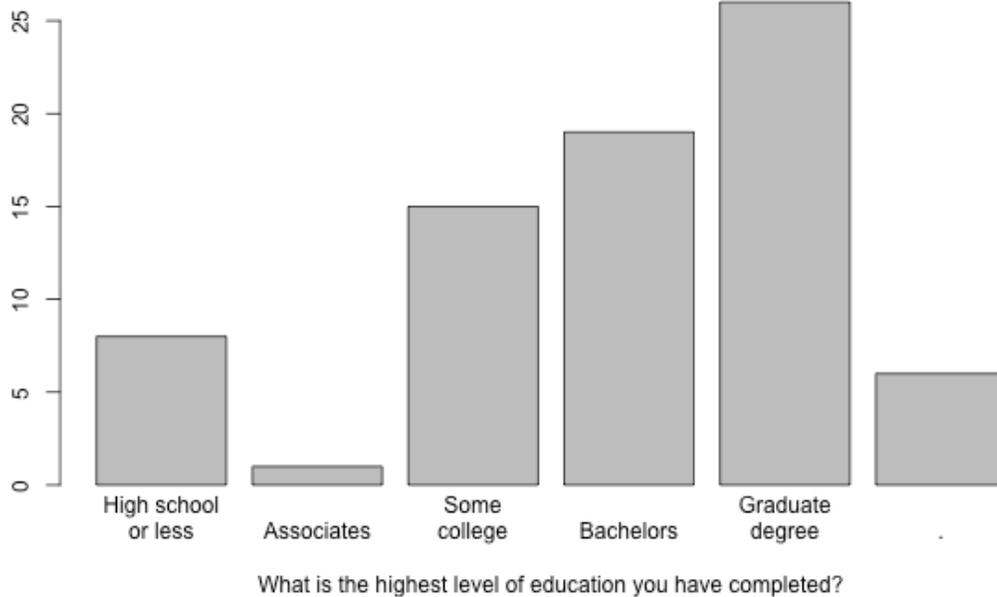


Figure 12. Approximately 35% of participants had completed a graduate degree of some sort. The “.” indicates no response.

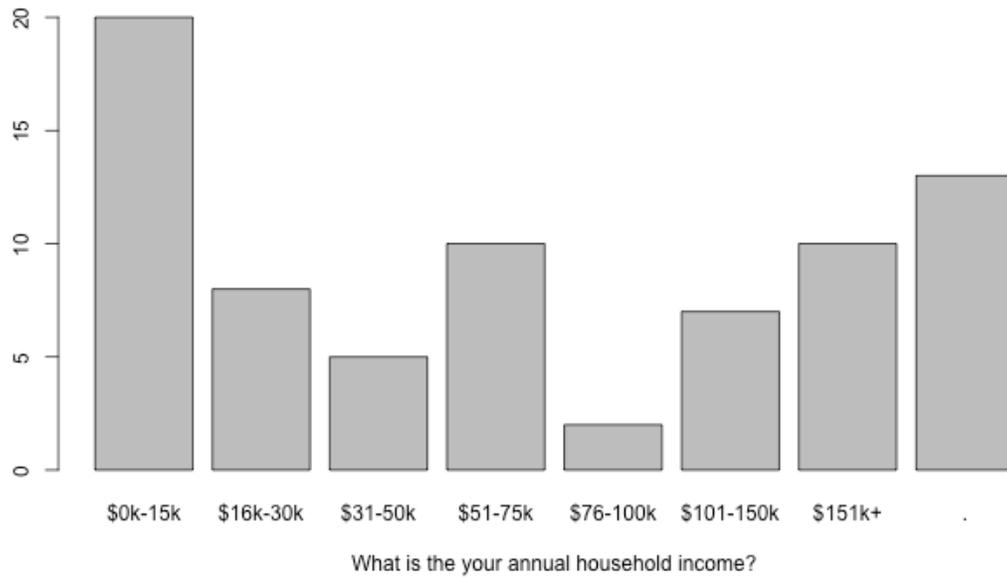


Figure 13. Most of the participants in the \$0-15k annual income group were students. The “.” indicates no response.

Appendix: Pre-test

Part 1. Questions About Climate Change

Please mark the most appropriate answer for each question.

1. How well do you feel you understand the issue of climate change compared to the average person?

Very well	Somewhat well	Average	Somewhat poorly	Very poorly	Not sure
<input type="checkbox"/>					

2. How important is the issue of climate change for society?

Very important	Somewhat important	Neither	Somewhat unimportant	Very unimportant	Not sure
<input type="checkbox"/>					

3. Please indicate if the following statements are true or false.

	True	False	Not sure
a. There is significant disagreement in the scientific community that climate change exists.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Natural events that emit greenhouse gases, such as carbon dioxide, are a major cause of climate change in the last 50 years.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Humans are currently experiencing the effects of climate change.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. In Pittsburgh, the expected rainfall is reducing due to climate change.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. The summer of 2014 had the highest average temperature for the entire globe.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Reducing carbon emissions helps to reduce the effects of climate change.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Activities that reduce carbon emissions can have other benefits such as saving money and improving air quality.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Which energy use in Pittsburgh leads to the *most* carbon emissions? Please choose only one answer.

- Electricity use – for residential, commercial, and industrial sectors
- Fuel oil and kerosene – for residential heating
- Gasoline – for transportation
- Natural gas – for heating and cooking in residential, commercial, and industrial sectors

5. To what extent do you agree or disagree with the following statements?

	Strongly agree	Somewhat agree	Neither	Somewhat disagree	Strongly disagree	Not sure
a. Climate change will mostly affect areas that are far away from here.	<input type="checkbox"/>					
b. My local area is likely to be affected by climate change.	<input type="checkbox"/>					
c. I will be directly affected by the impacts of climate change.	<input type="checkbox"/>					

Part 2. Questions About Strategies

6. Do you think the City of Pittsburgh has a responsibility to encourage and promote strategies to *deal with* climate change (often called adaptation)?

Definitely yes	Probably yes	Probably not	Definitely not	Not sure
<input type="checkbox"/>				

7. Do you think the City of Pittsburgh has a responsibility to encourage and promote strategies to *help prevent* climate change (often called mitigation)?

Definitely yes	Probably yes	Probably not	Definitely not	Not sure
<input type="checkbox"/>				

8. How *important* is each benefit when considering strategies for dealing with and preventing climate change?

	Very important	Somewhat important	Somewhat unimportant	Very unimportant	Not sure
a. Reducing carbon emissions	<input type="checkbox"/>				
b. Saving you money	<input type="checkbox"/>				
c. Improving air quality	<input type="checkbox"/>				
d. Improving water quality	<input type="checkbox"/>				

9. How effective is *increasing renewable energy* (such as wind and solar) at achieving these benefits?

	Very effective	Somewhat effective	Neutral	Somewhat ineffective	Very ineffective	Not sure
a. Reducing carbon emissions	<input type="checkbox"/>					
b. Saving you money	<input type="checkbox"/>					
c. Improving air quality	<input type="checkbox"/>					
d. Improving water quality	<input type="checkbox"/>					

10. How effective is *increasing energy efficiency* (in residential, commercial, and municipal buildings) at achieving these benefits?

	Very effective	Somewhat effective	Neutral	Somewhat ineffective	Very ineffective	Not sure
a. Reducing carbon emissions	<input type="checkbox"/>					
b. Saving you money	<input type="checkbox"/>					
c. Improving air quality	<input type="checkbox"/>					
d. Improving water quality	<input type="checkbox"/>					

11. How effective is *increasing public information* (such as online tools for residents or public reporting of commercial energy use) at achieving these benefits?

	Very effective	Somewhat effective	Neutral	Somewhat ineffective	Very ineffective	Not sure
a. Reducing carbon emissions	<input type="checkbox"/>					
b. Saving you money	<input type="checkbox"/>					
c. Improving air quality	<input type="checkbox"/>					
d. Improving water quality	<input type="checkbox"/>					

12. Do you think the City of Pittsburgh should do any of the following?

	Definitely Yes	Probably Yes	Probably Not	Definitely Not	Not Sure
a. Increase renewable energy generation (such as wind and solar).	<input type="checkbox"/>				
b. Increase energy efficiency in residential, commercial, and municipal buildings.	<input type="checkbox"/>				
c. Increase public information about energy use (such as online tools for residents or public reporting of commercial energy use).	<input type="checkbox"/>				

13. Pittsburgh’s aging water management infrastructure is no longer able to handle flooding, which leads to sewage overflows and contamination of waterways. Cement does not soak up water, so it contributes to flooding. In Portland, residents voted to pay a monthly stormwater utility fee that covers the city’s costs of improving flooding infrastructure. The fee is based on the amount of cement found on their private or rented property (approximately \$6-16). Renters pay less than single family home owners, but both groups can get up to 100% discount by using a rain barrel, drywell, eco-roof, cistern, etc to collect rain water.

Would you be willing to pay a similar monthly fee in Pittsburgh?

Definitely yes	Probably yes	Probably not	Definitely not	Not sure
<input type="checkbox"/>				

14. Any additional comments?

Part 3. Questions About You

Please mark the answer that most fits you.

15. Are you affiliated with Carnegie Mellon University?

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

16. What is your age? _____

17. Which of the following best describes your gender?

If other, please specify: _____

Male	Female	Other
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Which of the following best describes your ethnicity? Please check all that apply.

If other, please specify: _____

African American/ Black	Asian/ Asian Pacific Islander	Hispanic/ Latino	Caucasian/ White	Other
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. Which of the following best describes your political affiliation?

If other, please specify: _____

Democrat	Republican	Independent	Libertarian	Other
<input type="checkbox"/>				

20. What is your religious affiliation?

If other, please specify: _____

Christian	Jewish	Muslim	Other	None
<input type="checkbox"/>				

21. What is the highest level of education you have completed?

High school or less	2 year college (Associates)	Some college	4 year college (BA, BS)	Graduate degree (MS, PhD, MD, JD)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. What is your annual household income?

\$0-15k	\$16-30k	\$31-50k	\$51-75k	\$76-100k	\$101-150k	\$151k+
<input type="checkbox"/>						

Appendix: Post-test

This only includes the questions that are not repeated from the pre-test. The post-test used questions 1-11 and 13-14 from the pre-test.

12. Do you think the City of Pittsburgh should do any of the following?

	Definitely Yes	Probably Yes	Probably Not	Definitely Not	Not Sure
Increasing Renewable Energy Generation					
a. Use solar energy on all City buildings with solar access by 2020.	<input type="checkbox"/>				
b. Purchase 25% of electricity for city operations from renewable sources.	<input type="checkbox"/>				
c. Install 10 megawatts of renewable energy capacity (~4% of the size of an average coal plant) within the City by 2020.	<input type="checkbox"/>				
d. Establish a cooperative purchasing program for renewable energy for residents and small businesses to reduce cost by buying as a group.	<input type="checkbox"/>				
Increasing Energy Efficiency					
e. Install high-efficiency LED streetlights in residential districts.	<input type="checkbox"/>				
f. Install high-efficiency LED streetlights in business districts.	<input type="checkbox"/>				
g. Get Energy Star certification for the City-County building by improving energy efficiency.	<input type="checkbox"/>				
h. Establish a fund to provide loans for energy efficiency improvements to private residences and small businesses.	<input type="checkbox"/>				
Increasing Public Information About Energy Use					
i. Require commercial buildings to disclose their energy use.	<input type="checkbox"/>				
j. Develop online tools to help residents track and manage energy use.	<input type="checkbox"/>				

Part 3. Questions About You

Please mark the answer that most fits you.

15. To what degree do you trust the following groups in the context of the issues discussed today?

	Very well	Somewhat well	Somewhat poorly	Very poorly	Not sure
a. National environmental groups	<input type="checkbox"/>				
b. Scientists working for environmental groups	<input type="checkbox"/>				
c. Coal, oil, and gas companies	<input type="checkbox"/>				
d. Scientists working for industry	<input type="checkbox"/>				
e. Universities	<input type="checkbox"/>				
f. Scientists working at universities	<input type="checkbox"/>				
g. Pittsburgh City government	<input type="checkbox"/>				

16. Please indicate the degree to which you agree with the following statements:

	Strongly agree	Mildly agree	Neither	Mildly disagree	Strongly disagree
a. The so-called "ecological crisis" facing humankind has been greatly exaggerated.	<input type="checkbox"/>				
b. If things continue on their present course, we will soon experience a major ecological catastrophe.	<input type="checkbox"/>				
c. Humans are severely abusing the environment.	<input type="checkbox"/>				
d. The balance of nature is strong enough to cope with the impacts of modern industrial nations.	<input type="checkbox"/>				
e. The earth is like a spaceship with limited room and resources.	<input type="checkbox"/>				

Part 3. Questions About the Event
Please mark the appropriate answer.

17. To what degree did participating in this conversation feel:

	Very much	Somewhat	Slightly	Not at all
a. Engaging?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Enjoyable?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Intellectually stimulating?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Frustrating?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Did the small group deliberation broaden your understanding of:

	Very much	Somewhat	Slightly	Not at all
a. The challenges of climate change?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. What the City is already doing to confront climate change?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Mitigation strategies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Adaptation strategies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Co-benefits of strategies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. What the City is considering doing to confront climate change in the future?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. Did the Resource Panel broaden your understanding of:

	Very much	Somewhat	Slightly	Not at all
a. The challenges of climate change?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. What the City is already doing to confront climate change?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Mitigation strategies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Adaptation strategies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Co-benefits of strategies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. What the City is considering doing to confront climate change in the future?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. How informative did you find:

	Very much	Somewhat	Slightly	Not at all
a. The written materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. The group discussions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. The Resource Panel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. Knowing what you know now, if you had the opportunity to participate in another deliberative event, would you?

Definitely yes	Probably yes	Probably not	Definitely not	Not sure
<input type="checkbox"/>				

Additional comments:

Appendix: Pre Comments

I'd like clarification on the use of the word "responsibility"- I often think of it more like "ability" (as in, "Ability to respond") though I understand it more generally means "obligation" or "requirements". Yes, the citizens of Pittsburgh have the capacity to implement strategies that help prevent and deal with CC, but no, I don't see them as obliged to do so. (Personally, I hope they do, but anyway-) Also- I checked 12 "not sures" because i imagine i have incomplete information- so much of those questions depends on other factors- how much will renewable energy replace Co2-produced energy forms- will they only enable a continually growing economy? will increased efficiency lead to increased or decreased energy use (Jecuan's paradox)? increased or decreased size of buildings? Etc.

I'm interested in learning more about what public education actually does achieve (Q11). Thanks for organizing this!

Thank you for this program/initiative

Public information is better received by peer to peer communication- instead of online tools

Where is sustainable path in localizing the cases where solar energy and wind energy comes from? Are we really making decisions In a conscious way

I would rather have rain barrels than a sewer fee

Appendix: Post Comments

Depends on my ability to reduce the fee if I am charged as a renter and can't install anything to discount the cost, well that sucks

As a transient resident, I just wonder how this fee in particular affects college students

Help citizen build rain garden in their backyard. Develop more side walk like in front of August Wilson Center

Only if you can show me that is where the money goes.

This would be more effective & efficient if designed & implemented on a multi-municipal, watershed basis rather than just the city

The issue is bigger than flooding. Should use the public awareness for flood prevention to educate and build awareness for other water issues. Education on climate issues and benefits of different policies & including efficiency & stormwater issues needs to be a priority. People don't understand these issues.

Yes if it includes an incentive program for large developments to also contribute

I liked "Green IQ" How can this be incorporated into "understandable" and nonthreatening educational materials and marketing tools for other citizens?

Appreciate the opportunity to discuss though it seems the end result is already pre-determined. More taxes.

A lack of structure to the conversation- and a lack of material that connected the social justice issues involved in climate change resilience

The panel has focused on the goal solutions that can be applied in the city of Pittsburgh. I don't understand how aware the study is in the air condition (quality) that is taking the system life. Your citizens are dying, so is the nature you are extracting from. The time to act is now and the solutions require such urgency.

To broaden the spectrum of social issues that are caused by environmental exploitation, will require a more diverse panel. I am thankful for the open space to discuss, but there is much more that has to be done.