



# TOWARD CONSENSUS

ON THE **CLIMATE COMMUNICATION CHALLENGE**

Report from a Dialogue of Researchers and Practitioners

WRITTEN BY **TOM BOWMAN**

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APPROVED BY THE PARTICIPANTS

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## EXECUTIVE SUMMARY

On October 26–27, 2015, a meeting was held at the American Association for the Advancement of Science headquarters in Washington, DC to discuss the state of research into public attitudes and behavior about climate change. Participants included social science researchers who study public opinion and behavior about climate change (researchers) and those who fund, design, and execute public engagement, informal education, and communication initiatives (practitioners). This report summarizes the conclusions expressed by the participants. While there is broad agreement about the main points offered in this report, there are some areas in which experts disagree. This report does not attempt to summarize the published work of the participants or of the field in general.

The dialogue was organized around three broad questions:

1. Where does expert opinion among social scientists converge and where do important gaps remain in our knowledge?
2. How can practitioners improve public engagement strategies, tactics, and outcomes based on the knowledge held by social science experts?
3. What obstacles to effective public engagement could potentially be removed going forward?

In terms of shared perspectives, the participants accepted the three major conclusions of climate science: that human-caused climate change is happening, that it is causing harm and poses risks of much greater harm, and that the sooner climate change is addressed the lower the risks and costs will be. They also agreed that engaging with the public helps decision-makers and citizens discuss, debate, and make informed choices on their own behalf.

Participants acknowledged that effective public engagement is challenged by today's consumer-choice media landscape, which has altered long-standing relationships between the judgments of subject matter experts, policymakers, the media, and the public in ways that undermine a shared understanding of basic facts and issue priorities across society. Additionally, efforts to engage the public on climate change are challenged by a number of tendencies in human psychology. A few such tendencies include (1) prioritizing immediate, tangible concerns over longer-range and more abstract issues; (2) reliance on the fast decision-making mental process (emotions, past experience, intuition) over the slower and more difficult process of careful analysis; (3) simplifying complex information imperfectly due to various influences; and (4) preserving and defending the status quo.

In addition to the many ways in which people often become misinformed about complex scientific issues, some of which are mentioned above, participants also recognized the strong peer-reviewed evidence about the existence of a misinformation campaign, organized and financed by fossil fuel interests and various private think tanks, that has been effective in dissuading the public from engaging. The campaign has undermined public trust in the level of scientific agreement, misled people about climate science, cast doubt on society's capacity to reduce global warming cost-effectively, and equated support for climate science with a liberal political agenda.

In this landscape, and despite the work of many capable organizations, efforts to engage the public suffer from several weaknesses including: (1) lack of systemic models to help explain relationships between knowledge, beliefs, attitudes, and behavior about climate change; (2) lack of an accurate and inspiring narrative about meeting the climate challenge successfully; (3) lack of strategic planning in response to competitive challenges and changes over time; (4) insufficient and inconsistent funding; (5) infrequent collaboration between content experts, social scientists, and communication professionals; and (6) inconsistent assessment of what is and is not working. The report offers a number of recommendations in response to these challenges.

The full report also presents evidence-based information and recommendations about tactical approaches to public engagement. For example, the report discusses (1) the efficacy of certain information in building acceptance of climate science, (2) inconsistencies among various mental models of climate stability, (3) the power of political ideology in forming beliefs about human-caused climate change, (4) the public's low sense of collective efficacy, (5) the potential for certain emotions to either encourage or discourage engagement, (6) the efficacy of connecting climate science with local conditions that people notice, (7) the importance of media messaging in establishing issue priority, and (8) how issue framing can exacerbate ideological differences. The report concludes by emphasizing the importance of recognizing that how scientific evidence is communicated is crucial, and that more attention to strategic approaches for how communication can be improved is needed.

Additional details can be found in the full report.

In 2008 when relatively little social science research on climate change was being conducted, social scientists who studied American public attitudes about climate change gathered at the National Oceanic and Atmospheric Administration headquarters in Silver Spring, Maryland to assess the state of knowledge on this vital topic. This was a first-of-its-kind meeting, in which principal investigators and communication professionals from federal agencies, universities, and the private sector discussed the state of research and explored priorities for future research and public outreach.

The meeting and its subsequent report<sup>1</sup> proved to be influential in guiding further research into the issues affecting communication design and effective public engagement. Several highly significant projects and studies were influenced by, or grew directly out of, this meeting including the Yale/Mason *Climate Change in the American Mind* polling project (e.g., Leiserowitz et al., 2014), research demonstrating the importance of people's personal experiences with climate change (Akerlof et al., 2012; Myers et al., 2012), a nationwide project to activate TV weathercasters as climate educators (e.g., Placky et al., 2015), and research (e.g., Van der Linden, et al., 2014)—and a subsequent campaign led by the American Association for the Advancement of Science (<http://whatweknow.AAAS.org>) to teach and encourage the climate science community to set the record straight on the scientific consensus that human-caused climate change is happening (Maibach et al., 2014).

Seven years on, the social science literature on climate change has burgeoned. Public opinion has also evolved, with majorities of Americans believing that human activities are changing the climate<sup>2</sup> and that government and the private sector should do more to reduce global warming<sup>3</sup>. Climate change,

nevertheless, remains a relatively low priority for the majority of Americans<sup>4</sup>, both as a national policy issue and as a lifestyle choice (as evidenced, for example, by the low percentages of Americans who vote the issue, contact their elected representatives, participate in issue activism, or adopt low-carbon lifestyles).

This meeting was convened to discuss the current understanding of public attitudes and behaviors and how practitioners might improve the efficacy of public engagement.

## I. GOALS AND ASSUMPTIONS

The meeting was organized to focus on three broadly shared goals:

1. Discuss where expert opinion among social scientists converges on the issue and identify where important gaps remain in our knowledge so that the research community can speak with a more coherent voice.
2. Advise practitioners on how to improve their public engagement strategies, tactics, and outcomes based on the knowledge held by social science experts.
3. Identify obstacles to effective public engagement that could potentially be addressed going forward.

These goals imply a number of things about the participants' points of view and that of the intended audiences for this report.

The participants accepted the overwhelming con-

<sup>1</sup>Bowman, T. (2008) *Summary Report: A Meeting to Assess Public Attitudes about Climate Change*. Bowman Design Group.

<sup>2</sup>Saad, L. (2014) A Steady 57% in U.S. Blame Humans for Global Warming. Gallup. [http://www.gallup.com/poll/167972/steady-blame-humans-global-warming.aspx?g\\_source=CATEGORY\\_CLIMATE\\_CHANGE&g\\_medium=topic&g\\_campaign=tile](http://www.gallup.com/poll/167972/steady-blame-humans-global-warming.aspx?g_source=CATEGORY_CLIMATE_CHANGE&g_medium=topic&g_campaign=tile)

<sup>3</sup>Leiserowitz, A., Maibach, E., Roser-Renouf, C., Feinberg, G., & Rosenthal, S. (2014) *Politics & Global Warming, Fall 2014*. Yale Program on Climate Change Communication. <http://climatecommunication.yale.edu/publications/voters-prefer-candidates-who-support-climate-friendly-policies/2/>

<sup>4</sup>Riffkin, R. (2014) Climate Change Not a Top Worry in the U.S. Gallop. [http://www.gallup.com/poll/167843/climate-change-not-top-worry.aspx?g\\_source=CATEGORY\\_CLIMATE\\_CHANGE&g\\_medium=topic&g\\_campaign=tile](http://www.gallup.com/poll/167843/climate-change-not-top-worry.aspx?g_source=CATEGORY_CLIMATE_CHANGE&g_medium=topic&g_campaign=tile)

sensus among climate scientists that human activities are warming the climate system<sup>5</sup>. Participants also accepted the scientific community's conclusions that the consequences of climate change will, on balance, be harmful and that humanity has the technical capacity and financial resources needed to reduce the risks. Moreover, the participants accepted the urgency with which the science community says actions must be taken to reduce greenhouse gas emissions in order to stay below the 2°C warming limit that nearly all of the world's national leaders have signed onto.

Second, the participants believed that engaging with a wide range of audiences is critical to the process of societal change in a democracy. In this report, "public audiences" refers to the many different groups and individuals whose decisions can make a difference in either increasing or reducing greenhouse gas emissions, making communities and organizations either more or less resilient in a changing climate, or both. Such audiences are presumably not experts in climate science, economics, or the other technical fields that contribute to expert knowledge about climate change. Thus, the word "public" includes business leaders, public health leaders, elected officials and policymakers at various levels of government, leaders of faith and spiritual communities, those who are responsible for public and private sector infrastructure, educators, members of cultural institutions (museums, aquariums, zoos, etc.), community groups of various kinds, non-governmental organizations, members of the news media, and the broader public.

Implicit in the foregoing is a belief that societal change is an appropriate response to climate change. Participants generally agreed that the public should be making informed decisions about climate change rather than remaining disengaged or taking a wait-and-see approach, which the findings of climate science indicate would be risky. This suggests that government, businesses, and other actors in society

should make decisions about whether to decarbonize and increase society's resilience to climatic change, decisions that are informed by the knowledge that experts hold about climate change. Practitioners also noted that bringing stakeholders and their local knowledge and values into dialogues and planning might lead to wider community participation, more appropriate outcomes, and support for a range of actions that address risks at appropriately granular levels of detail.

To be clear, the participants expressed a preference for society to reduce the threat of global warming. How much the participants agree about specific public policy proposals, appropriate actions by businesses or households, and the appropriate role of government was not explored as part of the discussion. But the presumption was that doing a better job of communicating and engaging with the public about climate change will increase the likelihood that people will be able to make choices that reduce risks in the future.

In the sense that participants wanted to see Americans make well-informed decisions about climate risks before potentially viable options are permanently foreclosed, public engagement is an urgent matter. In this regard, public engagement initiatives must compete for attention against a host of other issues and concerns, as well as a campaign designed specifically to discredit climate science. Therefore, the engagement must be appealing, compelling, and persuasive enough to break through. The assumptions outlined above, however, distinguish public engagement from advocacy in a crucial way. The participants understand engagement to include efforts that foster better public understanding of the findings of climate science and other relevant disciplines so that decision-makers and the broader public can discuss and debate how best to respond, given their values and various other priorities. For the purposes of this discussion, "advocacy" denotes working for or against particular policy positions or the adoption of certain policies, while "engagement" refers to helping deci-

<sup>5</sup>Molina, M., McCarthy, J., Wall, D., Alley, R., Cobb, K., Cole, J., Das, S., Diffenbaugh, N., Emanuel, K., Frumkin, H., Hayhoe, K., Parmesan, C. & Shepherd, M. (2014) *What We Know: The Reality, Risks, and Response to Climate Change*. American Association for the Advancement of Science. <http://whatwewknow.aaas.org>



sion-makers and the public understand an appropriately simplified version of an inherently complicated body of knowledge (e.g., climate science, economics, and related disciplines) so that they can consider it, talk about it, and make decisions of their own choosing. Engagement also involves helping people understand which information meets the standards of rigorous scientific review and which does not.

In this connection, the participants recognized that a number of factors work against effective engagement. These factors include the inherent complexity of climate science and the fact that the impacts of climate change often seem distant and abstract, especially in comparison to other concerns that seem more immediate and tangible. People also have differing mental models about the stability of natural systems (i.e., whether human activities are likely to push the climate into new states vs. whether human activities could possibly do so). People have differing value systems, political ideologies, definitions of equality, and views about the appropriate role of government. All of these factors pose challenges to communication practitioners.

Participants were also aware of the well-documented efforts to misinform decision-makers and the public and thereby dissuade Americans from making informed choices about climate change. Highly publicized attacks on climate science and on individual climate scientists in the media and in American politics are part of this campaign. The participants accepted the inevitable conclusion that constructive public engagement must compete with such efforts, yet they looked for ways to engage that can help depolarize public discourse on the issue.

Participants generally agreed that by gaining a better understanding of what audience members already know and value, while also identifying the most important knowledge held by experts (e.g., climate scientists, economists, and others), practitioners might be able to (1) help audience members simplify the inherently complicated information accurately

and appropriately, and (2) facilitate conversations based on a shared understanding of the realities of the subject.

The summaries and recommendations in this report are intended to provide more background on how to effectively engage the public on climate change issues and help identify areas where further research may be warranted. The authors assume that readers are already familiar with these issues and are generally up to date with the results of various public opinion polls and surveys.

## **II. ENGAGING WITH AUDIENCES IN A HIGHLY COMPETITIVE COMMUNICATION ENVIRONMENT**

In recent years, online and social media have transformed the environment in which subject matter experts communicate with the public. Numerous authors have written about the end of the so-called “broadcast era,” in which communication flowed to virtually everyone in America through a small number of media outlets (wire services, major newspapers, radio networks, and the three broadcast television

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*Americans can and do select information outlets that reflect and reinforce their differing views on various issues.*

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networks). The limited number of shared communication channels and the repetition of the messages that they delivered were factors in establishing a shared understanding of basic facts and issue priorities across society.

But the many communication channels available today have replaced the broadcast model of shared communication. Americans can and do select information outlets that reflect and reinforce their differing views on various issues. Journalistic standards are inconsistent across the range of news and opinion



outlets found online, on the radio, and on cable television. With this fragmentation of communication channels comes a new set of challenges for building a shared understanding of basic facts and issue priorities. Not only do Americans consume different narratives about the issues of the day, those narratives often contain different interpretations of the underlying facts—up to, and including, rejection of the conclusions of society’s scientific institutions.

This new communication environment is changing long-standing relationships between the collective judgments of subject matter experts, discourse among policymakers, coverage of issues in the news media, and public opinion. Analyzing all of the factors in play is beyond the scope of this report—it is, in fact, an important aspect of social science research on issue communication. The meeting participants acknowledged that further research is needed in a

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number of different domains in order to improve the evidence base for public engagement efforts on climate change.

Participants, nevertheless, discussed various factors that are known to influence the different ways in which people interpret the climate issue, including a variety of psychological tendencies, social influences, values, ideologies, and worldviews. No single factor determines a person’s attitudes, beliefs, or behavior. Public engagement initiatives inherently involve interacting influences that act upon the formation or changes in people’s understandings, beliefs, attitudes,

and motivations. What follows is a partial list of psychological tendencies.

- Humans have a tendency to prioritize immediate, tangible concerns over longer-range and more abstract issues. This is one reason why jobs, the economy, national security, and education consistently outrank climate change as national priorities. This is also a reason why everyday concerns often trump climate change when people make purchasing and lifestyle decisions. But people can, and do, overcome this tendency when they are motivated to do so (e.g., when they perceive climate issues to be highly salient or amenable to known solutions).
- Humans have a tendency to rely on the fast decision-making mental process involving emotions, past experiences, and intuition over the slower and more difficult process of careful analysis, especially when the issues are complicated. People can, and often do, however, overcome this tendency. For example, when people experience something first hand or perhaps through the arts (fast process), the door can open to thinking more critically about the experience (slow process). As the participants noted, research indicates that first-hand experience with the changing climate tends to influence people’s attitudes and increase their confidence in the findings of climate science. The question of how best to help people move from these experiences to analysis and greater knowledge remains.
- People are either motivated or de-motivated by certain emotions. Emotions and the signaling of emotions by influential others contribute to ranking the urgency of various concerns. On the climate issue, overwhelming fear tends to paralyze people

and dissuade them from thinking about or acting on the issue. As will be noted elsewhere, however, a number of studies suggest that a combination of worry—as opposed to fear—combined with hope and interest is constructive.

- People simplify complex information; doing so is an inherent aspect of human cognition. The simplification process is imperfect, meaning that it is influenced by a person’s cultural identity, pre-existing ideology and many other factors. This is one of the reasons why collaborations between subject matter experts (e.g., climate scientists), social scientists, and communication professionals often yield helpful, accurate, and appropriate simplifications.
- People tend to be influenced by the opinions of certain people they know and interact with. These opinion leaders are not necessarily public figures or people whose professional roles give them special insight into an issue. Moreover, a person whose opinions about global warming are influential might or might not be the same person whose opinions are trusted on other topics.
- People often make consumer choices that reinforce their social status. Whether this process is conscious or unconscious in any given situation, people have a tendency to weigh how others will perceive their choices. This is just one of several factors that influence lifestyle decisions that are relevant to climate change.
- People tend to preserve and defend the status quo. Studies show that relatively few people opt out of a default behavior if doing so requires extra effort (e.g., inconvenience or higher cost). Conversely, when a new behavior becomes the new default, people can adapt quickly and then defend it, even if the new default is more expensive than an alternative option. This is one reason why some researchers and practitioners are exploring opportunities to

modify choice architecture in ways that establish lower-carbon behaviors (e.g., renewable energy) as default choices.

### **III. THE ELEPHANT IN THE ROOM: MISINFORMATION AND EFFORTS TO MISLEAD THE PUBLIC ABOUT THE FINDINGS OF CLIMATE SCIENCE**

The foregoing discussion describes a challenging communication environment for those wishing to increase public understanding and concern about climate change. Participants acknowledged a variety of ways in which people often become misinformed about complex scientific issues including, among others, the tendency to simplify complex information inaccurately and the inadvertent propagation of misunderstandings among people and organizations. The participants also recognized that efforts to intentionally misinform and dissuade Americans are exploiting these and other tendencies effectively.

Participants accepted the strong peer-reviewed evidence that such efforts have been organized and financed by a combination of fossil fuel interests and various private think tanks<sup>6</sup>. These efforts have involved centralized strategic planning and dissemination of messages and tactics through a combination of grassroots organizations (both naturally-occurring and contrived), reports by private think tanks, and media pundits. The evidence indicates that messages have been intended to undermine public trust in the level of scientific agreement, mislead people about climate science, and cast doubt on society’s capacity to reduce global warming cost-effectively. The funding of contrarian scientists and publication of their work outside of peer-reviewed journals have been central to the strategy, along with the promotion of industry-sponsored best-case forecasts for fossil fuels combined with discouraging forecasts for renewable energy. Messaging tactics used in these efforts have

<sup>6</sup>Brulle, R. J. (2013) Institutionalizing Delay: Foundation Funding and the Creation of US Climate Change Counter-movement Organizations. *Climatic Change*, 122, 681-694. See also Dunlap, R.E. & McCright, A.M. (2011) in Dryzek, J.S.; Norgaard, R.B. & Schlosberg, D. (Eds.) *Organized Climate Change Denial, The Oxford Handbook of Climate Change and Society*. Oxford University Press, 144-160.

demonized and sought to intimidate individual scientists, as well as scientific institutions—insinuating that the scientific enterprise itself is corrupt. Further, denial messages have insinuated that support for climate science indicates a liberal, partisan political agenda and a bias toward excessive regulation of society and the economy.

These aggressive and persistent attacks on climate science intentionally undermine the role science plays in informing deliberations about public policy. On the climate issue, specifically, the organized opposition strategy has corrupted public understanding and confidence in basic and settled scientific facts—and in the institutions whose role it is to advise elected officials on scientific matters—such that the two political parties assert very different versions of reality.

#### **IV. ADDRESSING WEAKNESSES IN PUBLIC ENGAGEMENT ON CLIMATE CHANGE**

Participants called attention to stark differences between the capacities of the denial campaigners—their strategic, financial, organizational, and communication resources—and those of climate engagement practitioners. Denial campaigns benefit from strategic planning, generous and consistent funding, networks of organizations and individuals who faithfully execute the campaigns, powerful industry lobbies, political leaders who espouse such views, and news and opinion outlets that can be relied upon to broadcast selected talking points consistently and often. To the degree that communicating about climate change takes place in competition with a misinformation campaign that is well financed, ever present, and national in scope, the deck appears to be stacked in favor of dissuasion and denial.

In comparison, the climate change communication community is not without capable resources, including strong press relations and media capacities, information dissemination networks, networks of

educational and cultural institutions, and vocal corporate and business trade associations. But participants noted that the work that these and other organizations do is not necessarily coordinated around a

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shared theory of change or as quickly responsive to changing conditions in the communication landscape, nor are comparable levels of funding available to generate sustained competitive momentum. As a result, compared to top-down, well-funded misinformation and dissuasion campaigns, the climate engagement community is hindered by a number of structural vulnerabilities including:

- lack of systemic models to help explain some of the relationships between knowledge, beliefs, attitudes, and behavior about climate change;
- lack of a widely adopted, accurate, inspiring narrative about meeting the climate challenge successfully;
- lack of strategic planning in response to competitive challenges and changes over time;
- lack of sufficient and consistent funding for public engagement;
- lack of sufficient collaboration between content experts, social scientists, and communication professionals to develop engagement plans and design and test messages with various audiences; and
- lack of systematic updates on what is working, what is not working, and what is changing in the societal context on this issue.

Participants agreed that the community of content experts, social scientists, practitioners, and funders

should work together to overcome these deficiencies. Each of the recommendations that follow would make an important contribution, but they can also be seen as components of a more strategic overall approach to public engagement.

#### **A. THE NEED FOR SYSTEM MODELS OF KNOWLEDGE, BELIEFS, ATTITUDES, AND BEHAVIOR**

Several researchers discussed the value of creating a comprehensive system model that diagrams the complex relationships—including feedbacks—between attitudes, beliefs, knowledge, consumer behavior, and civic behavior on the climate issue. No single, comprehensive model yet exists on any issue; but social science knowledge is advanced by the creation of many models—some of them competing—to explain smaller aspects of information processing, attitudes, behaviors, and so forth. Participants agreed that creating such models on climate-related issues would help practitioners design engagement programs more systematically and focus their resources with greater assurance that their efforts will be effective.

#### **B. THE NEED FOR A SOLUTIONS NARRATIVE: APPROPRIATELY-SIMPLIFIED INFORMATION ABOUT RESPONDING TO CLIMATE CHANGE**

Considerable resources have been devoted to identifying the most important information about climate science and simplifying this knowledge accurately and appropriately for public audiences. The research literature, combined with many years of practitioner experience, has created a deep knowledge base about translating complex climate science information for non-scientist audiences. Additionally, messaging studies have shown that explaining how the greenhouse effect works or the level of scientific consensus—each in very simple terms—increases confidence in the findings of climate science.

One critical gap remains: relatively few Americans are confident that society is capable of reducing global warming or doing so without causing serious

economic harm. Multiple studies suggest that this omission is one of the reasons why climate change remains a low priority in the United States and why the public is not highly motivated to tackle the challenge. Participants noted that the climate science community and science communication organizations have never given “climate solutions” sufficient attention, in part because the subject matter extends beyond their expertise.

Practitioners noted that a number of existing analyses provide raw material for refining key knowledge and messages, and building a coherent nar-

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*... relatively few Americans are confident that society is capable of reducing global warming or doing so without causing serious economic harm.*

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ative about mitigating global warming. A rigorous approach to this process might involve collaborations between communication practitioners, social science researchers, and a range of content experts—for example, experts in adaptation and mitigation, infrastructure, energy, business, innovation and market behavior, economics, the built environment, transportation, agriculture and forestry, urban and rural systems, policy mechanisms, law, etc.—in order to prioritize the information and ensure accurate simplification. Such an effort would establish the knowledge base—expressed in plain language and accessible graphic figures—around which messages about potential responses and actual success stories could be developed and tested.

#### **C. THE NEED FOR STRATEGIC PLANNING**

Practitioners decried the lack of community-wide strategic planning capability in the climate engagement and communications community. This community includes a large number of individuals and organizations (many of them effective, yet small) and networks

(many of them active, yet informal) working in a diffused manner with different audiences according to different objectives, operating cultures, messages, and theories of change. Their accomplishments in the face of a powerful, nationwide disinformation campaign have been remarkable, but practitioners agreed that they have also been insufficient.

Giving decision-makers and the public the capacity to make informed choices, along with motivating them to do so before desirable options are permanently foreclosed, calls for much greater strategic planning and coordination. This might involve marshaling tested messages, messengers, and other engagement resources and deploying them to meet timely objectives.

Participants asked how, even in the absence of a robust strategic planning capability, practitioner networks might operate more strategically. One possible answer lies in targeting certain audience groups. For example, many businesses and government agencies are engaging in adaptation planning within their organizations and with their respective constituencies. Practitioners noted that middle managers in both the public and private sectors might be required to address climate adaptation and feel comfortable doing so as part of their job responsibilities. Yet many of these people do not feel free to discuss mitigation options due to the politicized and seemingly partisan nature of the issue. In such instances, greater strategic planning might emphasize sharing best practices and establishing consistent metrics for program evaluation, while also helping managers address the mitigation aspects of resilience within their professional roles. Clarifying the difference between advocacy and decision support might help communicators and managers engage productively.

Participants noted that the strategies that are important today might not be appropriate as conditions change over time—even within the span of a year or two. Participants saw the lack of strategic planning and coordination capacity as a significant obstacle to achieving public engagement goals.

#### **D. THE NEED FOR SIGNIFICANT AND CONSISTENT FUNDING**

While a number of organizations have sustained their efforts over many years, a great many opportunities—including opportunities to expand projects with proven efficacy—have been lost due to insufficient funding, inconsistent funding, or a lack of resources needed to take them to scale. In simple terms, the community of content experts, social scientists, and practitioners needs stronger and more consistent financial backing for public engagement. Participants recognized that short-term funding for individual projects tends to compartmentalize success and knowledge in isolated pockets, even within the climate communication community. Higher levels of funding and greater continuity would allow experienced professionals to remain active in the field, as opposed to completing ad hoc projects, and then moving on to other opportunities that are unrelated to climate change. It would also allow organizations to build their capacity, allow successful engagement trials to go to scale, and support follow-on programs that help audiences take next steps.

#### **E. THE NEED FOR MORE COLLABORATION BETWEEN CONTENT EXPERTS, SOCIAL SCIENTISTS, AND PRACTITIONERS**

Researchers have long recognized the value of lending their expertise to engagement programs through coaching, up-front evaluation of audience characteristics, and testing of messages and intervention methods. While it is useful to summarize social science evidence and practitioner experiences from time to time, participants agreed that, at the end of the day, one needs to do research and evaluation in order to facilitate good outcomes. But the use and quality of evaluation in public engagement programs on the climate issue is inconsistent, perhaps due to budget constraints, lack of experience and expertise, and lack of consistent evaluation standards. This situation encourages practitioners and funders to rely on their own professional experience, knowledge of social science, and intuition, which means that some initiatives are sophisticated and evidence based while

some others rely mostly on guesswork or repetition of what the practitioners and funders have always done.

Researchers agreed that establishing a collaborative practice—or “shop”—with a high level of social science expertise, availability, and sufficient financial resources would be of great benefit to practitioners and researchers alike. Some suggested that such a capacity might be housed within a university and might involve collaboration with experts in many locations around the country, as has been accomplished to varying degrees on other issues.

In the absence of a well-organized social science operation on climate change, participants recognized the need for more frequent collaboration between practitioners and researchers. Collaboration implies doing many more field experiments in order to build the knowledge base, plus finding ways to distribute research and survey results to practitioners more effectively. As noted above, even sharing knowledge and research results across the community of content experts, researchers, and practitioners is an ongoing challenge.

#### **F. THE NEED FOR SYSTEMATIC UPDATES ON WHAT IS WORKING, WHAT IS NOT WORKING, AND WHAT IS CHANGING**

Participants agreed that the climate change community lacks the kind of periodic program review that exists, for example, in the public health community. While partial efforts do exist on climate change, practitioners lack the financial and assessment resources they would need to fulfill this potential. As noted above, the standards of evaluation used by various engagement programs vary, and disseminating results across the practitioner community has proven to be challenging.

Filling this gap would require tracking a number of engagement initiatives and assessing their effectiveness on a periodic basis. The results would yield a field guide for public engagement design that describes various efforts (e.g., their objectives, circumstances, audiences, tactics) and assesses whether there is good, mixed, or no evidence that they are effective.

## **V. SPECIFIC RECOMMENDATIONS FOR IMPROVING PUBLIC ENGAGEMENT EFFORTS**

While the 2008 report contained a number of straightforward recommendations to practitioners, the discussions in 2015 were more nuanced. The interactions between knowledge, attitudes, and behavior are complex and not fully understood on highly studied issues, such as health behavior, let alone the relatively less studied issue of climate change. Sometimes education influences attitudes, which in turn leads to behavioral changes. Sometimes behavioral changes lead to changes in attitudes and understanding. Most often, however, the models do not explain most of the variation in people’s behaviors—short term or long term. What follows, then, is a discussion of various factors that have been studied on climate issues, along with recommendations that participants agreed are appropriate, plus relevant questions that have yet to be answered.

### **A. ON KNOWLEDGE AND BELIEFS**

**Mechanistic Knowledge**—Few Americans can explain the mechanism that drives global warming. There is strong evidence that learning how global warming works increases trust in climate science and concern about the issue. There is also good evidence that asking a person to explain how global warming works before revealing the answer is more effective in changing beliefs than leading with the correct answer.

A very simple explanation has proven to be effective. In its brief form: “Earth transforms the Sun’s visible energy into infrared light [heat]. Infrared energy leaves Earth slowly because it is absorbed by greenhouse gases. As people produce more greenhouse gases, energy leaves Earth even more slowly, raising Earth’s temperature even more than it has already gone up.”<sup>7</sup>

**Social Knowledge About the Scientific Consensus**—The high level of scientific agreement about climate change has been intentionally misrepresented and is poorly

<sup>7</sup><http://www.howglobalwarmingworks.org/in-under-1-minute-ba.html>.



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*There is strong evidence that hearing a message about the level of scientific consensus—especially after guessing the answer first—increases both trust in climate science and concern about climate change.*

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understood by the American public. There is strong evidence that hearing a message about the level of scientific consensus—especially after guessing the answer first—increases both trust in climate science and concern about climate change.

The following statement has proven to be effective: “Based on well-established evidence, about 97% of climate scientists have concluded that human-caused climate change is happening.”<sup>8</sup>

There is strong evidence that both of these revelations—mechanistic knowledge and social knowledge—often facilitate deeper engagement with the climate issue. Other beliefs and knowledge might also lead to deeper engagement, but none have yet been identified.

**Four Key Beliefs that Increase the Priority of the Climate Issue—**

There is strong evidence that four key beliefs—that global warming is happening, human caused, dangerous, and solvable—are important. Multiple studies show that among these four beliefs, low confidence in society’s capacity to solve the climate challenge is the most significant missing ingredient.

Studies have shown that majorities of Americans hold beliefs about the reality, human causation, danger, and solubility of a range of other top national priority issues. This evidence suggests that improving acceptance of all four beliefs might contribute to higher prioritization of climate change. However, this is speculative; whether high levels of acceptance would increase the priority of climate change is not yet known.

Participants noted the broader lack of a solutions

<sup>8</sup><http://whatwewknow.aaas.org>. See also Myers, T.A., Maibach, E., Peters, E. & Leiserowitz, A. (2015) Simple Messages Help Set the Record Straight about Scientific Agreement on Human-Caused Climate Change: The Results of Two Experiments. *PLoS ONE* 10(3): e0120985. doi:10.1371/journal.pone.0120985. pmid:25812121

narrative. Scientists and science-based institutions have been reluctant to talk about solutions to the climate challenge because the culture of science strongly discourages them from going beyond the boundaries of their research. In the defense of science itself, the scientific community has drawn a cautious line between explaining the results of research and discussing response options (the latter is often conflated with advocating for specific policies).

**Mental Models about the Climate System—**There is strong evidence that across the range of attitudes about global warming (e.g., those identified in *Global Warming’s “Six Americas”*), people express differing views of how nature works. For example, those who deny the reality of global warming often exhibit a mental model in which nature returns to a safe and familiar equilibrium, even after humanity pushes the system very hard. Conversely, many of those who are alarmed about global warming exhibit a model in which equilibrium is much more precarious: relatively slight disruptions can push nature into unfamiliar and dangerous states. These are the two polar extremes. Other Americans exhibit mental models in which nature can be perturbed to varying degrees before shifting into new, undesirable states. It is not yet clear how practitioners might help people align their mental models with the scientific understanding of the climate system.

**Expectations of Positive Outcomes—**There is suggestive evidence that people’s expectations about achieving positive outcomes (e.g., better health, greater pleasure and comfort, cost savings, a sense of doing well by the planet and others, improved social status, and enhanced self-image) through climate-related poli-



cies and actions might be important. There is growing evidence that intrinsic motivations are more potent than some extrinsic motivations—more potent, at least, than financial motivations.

#### **Some Unanswered Questions—**

- In addition to the mechanistic and social knowledge mentioned above, what other thoughts and knowledge increase issue engagement?
- There is strong evidence that personal experience with the changing climate is influential. What information best reinforces its influence?
- What are the feedbacks that reinforce or undermine lasting change in knowledge, attitudes, and beliefs?
- How might effective messages about the solvability of climate change be formulated and expressed?

#### **B. ON SOCIAL FACTORS**

**Political Ideology and Related Deeper Worldviews—**There is strong evidence that worldviews, political ideology, and political party affiliation have a large influence on belief or disbelief that human-caused climate change is happening. This is one way in which the climate issue triggers powerful associations with attitudes about the role of government and free markets, personal liberty and social responsibility, and individualist versus egalitarian views on governance.

Going into a major election cycle, communication practitioners will confront a highly divisive communication environment, in which the two major political parties espouse wildly different stances on climate change. Democratic presidential candidates are calling for national policies to reduce global warming while all of the Republican candidates have come out against such policies. At the two extremes, each party's adherents trust different informants, different messages, and interpret the social implications of acting to reduce global warming differently. This is an

area in which the cognitive process of filtering and simplifying complex information is clearly mediated by competing values, worldviews, and political ideologies.

**Collective Efficacy—**There is strong evidence that, when it comes to global warming, people's sense of collective efficacy is very low. Americans are simply not convinced that society can solve the climate challenge. This problem was identified in the 2008 report, and it persists today.

Participants also noted that Americans exhibit low levels of trust in government and corporate leadership, as well as in their own ability to make a difference through consumer choices or civic actions. It is worth noting that doubt is easier to promote than efficacy because, when in doubt, people tend to opt for the status quo and await further developments. In the absence of conviction that the climate problem is serious and solvable, the tendency to wait and see comes naturally. Researchers and practitioners alike strongly advised shifting away from doom-and-gloom forecasts to messages that build a sense of efficacy in the capacity of communities, the nation, and the world to solve the climate crisis.

**Supportive Social Networks—**As noted earlier, there is strong evidence that some people are much more influential than most other people in shaping public opinion—at both the micro level (i.e., in social networks) and at the macro level (i.e., in society at large). These opinion leaders are highly influential; people are more strongly influenced by those they know and interact with than by distant experts (only climate scientists are more trusted on global warming than those we know).

**Supportive Social Norms—**People are strongly influenced by positive social norms in general, and there is good evidence that this phenomenon applies to energy efficiency and other climate-relevant behaviors. The

influence extends to descriptive norms (most people in my group do “X”), as well as injunctive norms (most people in my group approve of “X”).

**Social Capital**—There is also good evidence that trust in others and in the availability of people and institutions that can help is important. Building social capital increases hope and confidence about engaging in the issue.

**Some Unanswered Questions**—

- Beyond the opinion leadership mentioned earlier, in what other ways is talking about climate change important? If climate talk is important, how can practitioners promote more of it?
- Hispanics and Latinos are emerging as the majority demographic in many parts of the United States. How can practitioners engage with this audience more effectively?

**C. ON EMOTIONS, AFFECT, AND VALUES**

**Worry and Hope**—Participants widely recognized that engendering feelings of intense fear and despair tends to paralyze people. Much of what the news media reports involves worst-case scenarios, and there is strong evidence that this approach is counterproductive. Conversely, there is suggestive evidence that worry and hope—and especially a combination of the two—motivates people to engage. In order to engender worry and hope, researchers suggest avoiding doom and gloom messages. Instead, they suggest focusing on changes that are already occurring in places that people care about, and combining these observations with dialogue and messages about the efficacy of responses.

In this context, participants discussed the inherent lack of emotion in the reporting of scientific information and by scientists themselves. Several studies suggest that scientists have understated the severity of the potential impacts of climate change out of a desire in their professional culture to avoid using

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*Much of what the news media reports involves worst-case scenarios, and there is strong evidence that this approach is counterproductive.*

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highly emotional language. Participants, however, did not agree on whether scientists ought to express the more dangerous, yet lower probability, risks, or their personal concerns in more emotionally honest terms.

**Anger**—Inspiring anger toward polluters who profit at the expense of others has been an effective tool on a wide variety of environmental issues, although its applicability to climate change is not yet fully understood. Climate change is often framed as a consequence of everyone’s behavior (energy consumption), rather than the actions of specific energy producers who have knowingly acted to forestall policies that might reduce their profitability. There is strong evidence that anger about corruption and deception comes easily to many Americans, including those who are dismissive about global warming. However, there is also good evidence that people resist a framing that implies that they, themselves, have been duped as a result of the corruption.

**Psychological Distance**—The term “psychological distance” can be used to mean two different things. As noted earlier, perceptions that climate change will only harm other species and people who are far away in time and/or geography contribute to the low salience of the issue. In this sense, a person’s psychological distance from risk is thought to dissuade people from engaging. For this reason, researchers encouraged practitioners to focus on local relevance.

There is also suggestive evidence that giving people a sense of psychological distance from their own strongly negative emotions helps them engage and remain engaged. Therefore, providing distance from paralyzing fear or feelings of guilt or of having been

duped might be helpful. This issue, however, requires further exploration.

**Moral Engagement**—Climate change is often framed in ethical terms: that is, in terms of our obligations to other people, other species, and future generations. Religious leaders, including Pope Francis and many others, have spoken about people’s intrinsic concern for their children, their communities, and the wider world. Little evidence exists, however, about which values are most influential in people’s thinking about climate change or how influential these values might be in various circumstances.

**Some Unanswered Questions**—

- In addition to worry, hope, and anger, what other emotions increase issue engagement? How do they matter, and in what contexts?
- Which values are most influential and for whom? Are certain values universally influential or are values always audience-specific?
- How can content experts and practitioners communicate the levels of threat accurately and effectively to those who are unaware without increasing fear?
- How might practitioners stimulate the motivating power of anger without polarizing and politicizing the issue more than is already the case?
- How can practitioners generate more enthusiasm for climate solutions? Is it possible to inspire something like Beatlemania about a clean-energy and climate-stable future? If so, how?

**D. ON CONTEXT AND PROXIMITY**

**Attributes of Behaviors, Infrastructure, and Products and Services**—There is strong evidence that, for a variety of reasons, concerns about climate change do not always translate into climate-friendly behaviors. The beneficial behaviors, products, or services may be

too costly, too time consuming, or too inconvenient. Social marketing programs that reduce these barriers offer an important means of increasing beneficial behaviors and use of beneficial products and services.

Some businesses are having success changing perceptions and the behavior of some consumers by making climate-friendly products and services more desirable in terms of cost, convenience, style, and other non-climate-related attributes. For example, Solar City sells renewable energy to consumers at prices below utility rates; and Tesla Motors is redefining electric vehicles as stylish, high-performance status symbols.

Additionally, there is good evidence that access to appropriate infrastructure, such as energy-efficient buildings and desirable mass transit, helps people engage on the climate issue. Conversely, it is more difficult for people to engage when low-carbon options are not readily available to them.

**Social Structures and Policies**—There is strong evidence that people adapt easily to a new policy status quo and are then biased to retain it. In other words, the status quo bias that can make climate action difficult initially can work to sustain climate policies once they are in place. Likewise, people are less likely to choose behaviors that they perceive to be beneficial if doing so creates inconvenience. Conversely, people are less likely to opt out of climate-friendly behaviors if doing so requires extra work. Thus, researchers and practitioners agreed on the great potential for engaging choice architects who can make climate-friendly choices the default options.

**The Media Environment**—There is strong evidence that, as highly adept social learners, people are sensitive to the media environment they expose themselves to. The relative absence of climate change coverage in news and entertainment media signals the relative lack of importance of the issue, thereby contributing to low issue salience. The media environment, moreover, has often treated the issue as contested—sometimes intentionally so and sometimes inadvertently

(via “false balance” news coverage). Through issue framing, media coverage also helps to shape how the public comes to understand the issue: for example, as an environmental issue, a political issue, and a scientific issue rather than as a health issue, public safety issue, or moral issue.

Participants noted that framing of climate change as an environmental issue has played into a meme that protecting the environment is fundamentally at odds with promoting economic prosperity. For some Americans, this framing resonates with perceptions that environmental activists oppose free enterprise. Some politicians, for example, frequently equate actions to reduce global warming with large-scale governmental intrusion into every aspect of people’s lives, which they oppose. Conversely, the environmental framing also triggers a meme that says corporations are inherently irresponsible when it comes to protecting and conserving natural resources, including the climate system. For some pundits, climate change resonates with the idea that capitalism is inherently unsustainable and should be replaced. Such positions reflect the extremes on a spectrum of views, but these ideologies resonate strongly among different groups of people.

Climate change has also been framed in terms of sacrifice. This framing presumes that wealthy societies—especially in the United States—must diminish their quality of life in order to allow other nations to climb out of poverty. Like the environmental framing, this approach plays into divisive definitions of justice, equality, and America’s role in the world. The sacrifice framing also conflicts with an alternative framing in the global business community that says developing low-carbon energy resources could be the biggest economic opportunity in history. Another alternative framing says that reducing the dominance of fossil fuels would increase consumer choice and enhance personal liberty while making communities healthier and more prosperous. Additional research will be needed in order to

identify message frames that contribute to depolarizing public discourse

**Messengers**—There is good evidence that known, trusted messengers are more influential than just about anyone else. Only climate scientists are more trusted on global warming than those with whom people share interpersonal relationships. This is why encouraging opinion leadership and fostering conversation about climate change appear to be effective engagement strategies.

In the realm of public figures, unlikely combinations of trusted messengers (so-called “strange bedfellows”) are thought to have a positive influence, but it is not yet clear which messengers would be most influential or how strong their influence might be. This is one reason why some researchers recommend presenting appropriately simple messages frequently through a variety of trusted messengers—both known persons and public figures.

**Some Unanswered Questions**—

- Americans have expressed a willingness to pay a little more to mitigate climate change, but would a majority support an all-out effort to decarbonize society if they believed such an effort might succeed?
- Would combinations of unexpected messengers (“strange bedfellows”) be effective? If so, which strange bedfellows matter most, and to whom? How influential might they be?

**E. ON INCREASING THE PRIORITY OF CLIMATE CHANGE IN PUBLIC POLICY**

In 2008 researchers suggested that increasing the size of the “issue public” for climate change—meaning those who could not feel more strongly about the

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*As a result, it seems that policymakers currently do not feel that they must address climate change in order to satisfy their constituents.*

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issue than they already do—might be an effective way to raise the priority of climate change in discourse about public policy. The suggestion was based on observations that issue publics for a wide variety of other issues (e.g., Social Security, education) have a disproportional influence on policymaking and policy discourse. Researchers noted that the potential issue public for reducing global warming was among the largest ever measured on any issue, yet these highly concerned citizens had not become politically active about climate change. Researchers noted that issue publics tend to become politically active in response to legislative threats to the issues they care about.

In 2015, as in 2008, the issue public for reducing global warming still does not appear to have coalesced into a self-aware or politically engaged constituency. Relatively few Americans see themselves as civic actors, activists, or members of an issue-oriented public on climate change. Surveys of civic behavior bear this out: among the most alarmed Americans, only a small percentage contact decision-makers about global warming or vote on the issue. As a result, it seems that policymakers currently do not feel that they must address climate change in order to satisfy their constituents.

One way to increase public interest in mitigating global warming might be to engage people with observations about emerging threats to society in the places people care about and to combine this information with hopeful messages about desirable and achievable outcomes. There is suggestive evidence that such approaches might not trigger strong ideological reactions. There is also suggestive evidence that discussing how to make communities more resilient to climatic changes that are already underway might increase people's interest in avoiding greater risks through mitigation.

#### **Some Unanswered Questions—**

- Do successful adaptation actions increase positive perceptions and/or the likelihood of mitigation actions?

#### **F. ON INCREASING CLIMATE-FRIENDLY CONSUMER BEHAVIOR**

In 2008 researchers encouraged practitioners to focus on modifying social norms in ways that favor climate-friendly behavior because norms often take precedence over cognitive understanding and self-perceptions. Encouraging behavior change, however, is challenging. For a variety of reasons, promoting new consumer behavior requires overcoming an inherent bias, as well as perceptions about cost, inconvenience, and desirability that often favor the status quo. In 2015 researchers suggested that resetting default conditions so that climate-friendly behaviors are automatic—as opposed to encouraging people to opt out of default behaviors in order to choose climate-friendly options—might be an effective way to facilitate change.

#### **Some Unanswered Questions—**

- Would changing enough default behaviors alter the default attitudes about collective efficacy or the benefits of reducing global warming?
- How can choice architecture be beneficially used in various contexts?

## **VI. CONCLUSION**

As our understanding of public knowledge, attitudes, beliefs, and behaviors about global warming advances, the questions facing practitioners become more nuanced. Practitioners noted that their work inevitably involves the interplay between social-science knowledge, evaluation, and creative invention. As Henry Ford famously said, “If I had asked them what they wanted, they would have said faster horses.” This speaks to the value of evaluating the effectiveness of many different engagement programs in order to share knowledge about what is already working, not working, and changing over time. Participants expressed a strong desire to make public engagement activities more strategic and evidence-based, along with a desire for more collaboration and sharing of knowledge. Funders, researchers, practitioners, and

content experts should find ways to collaborate more often, share their knowledge more broadly, evaluate the efficacy of their work more frequently and thoroughly, and support approaches that are working more widely and at much greater scales.

Perhaps the most salient outcome of this meeting, however, is to acknowledge the community's level of frustration. There was a frank assertion that increasing public understanding and concern is not simply a matter of overcoming innate human tendencies to ignore an issue that seems complicated, abstract, distant in time and space, and sometimes terrifying. Rather, participants acknowledged how difficult it is to compete against an intentional campaign that makes effective use of these and other tendencies

in order to distort public understanding and stir up passions against societal change. Practitioners work in an environment where an able opponent inflames ideological biases and politicizes scientific information and where the opponent is willing to undermine important social institutions (e.g., science and science institutions) and attack the character and careers of individuals in order to win.

Therefore, if there is a singular message coming out of this meeting it is that the community must recognize that how scientific evidence and the scientific consensus are communicated is crucial, and that a more strategic approach to the "how"—not only the "what"—is urgently needed.