Public and Stakeholder Engagement in Environmental Policy and Decision-making

Mahmud Farooque

Clinical Professor; Associate Director

Consortium for Science, Policy and Outcomes;

Arizona State University

mahmud.farooque@asu.edu

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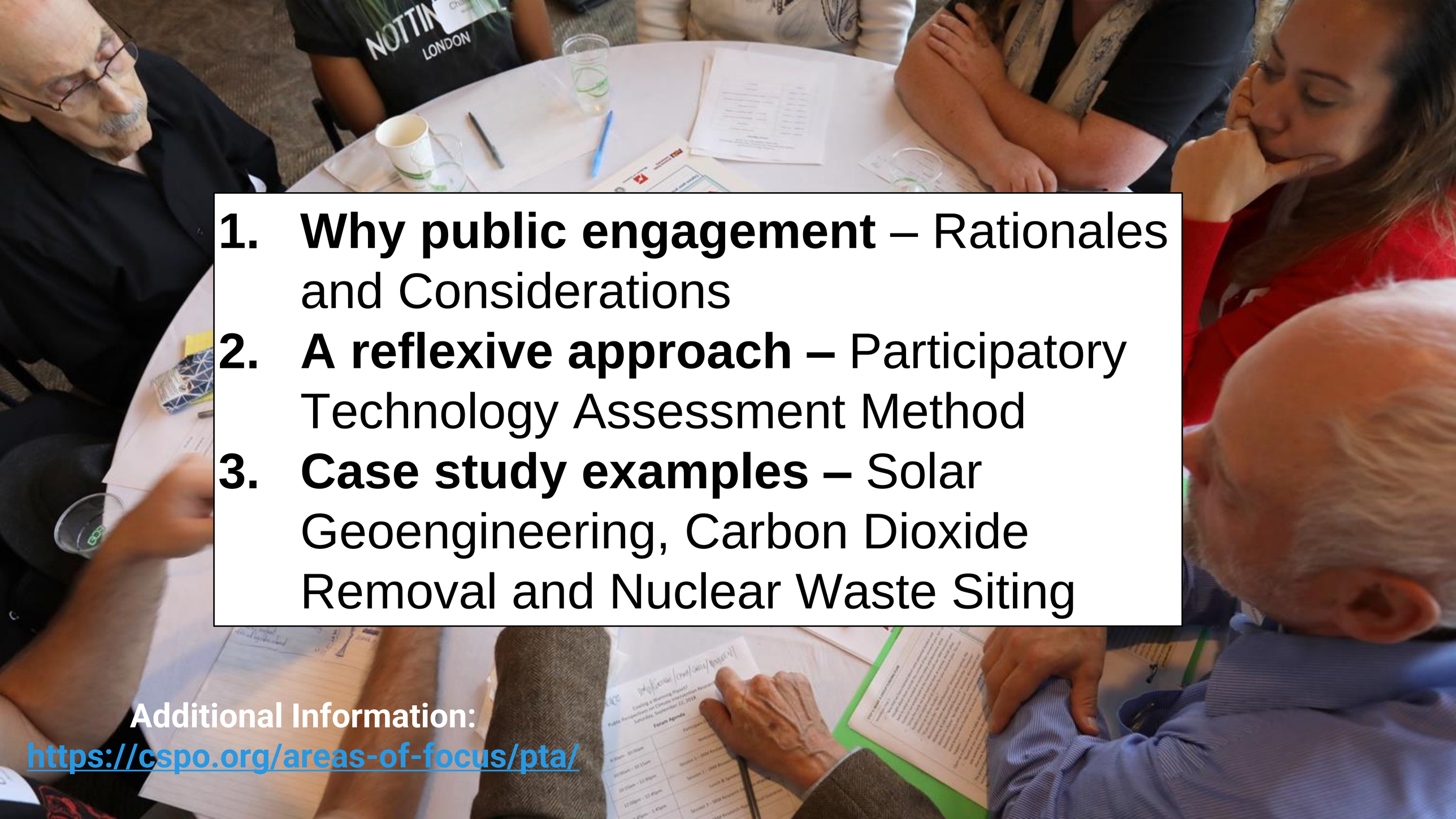
Consortium for Science, Policy & Outcomes
at Arizona State University



1. **Why public engagement** – Rationales and Considerations
2. **A reflexive approach –** Participatory Technology Assessment Method
3. **Case study examples –** Solar Geoengineering, Carbon Dioxide Removal and Nuclear Waste Siting

Additional Information:
https://cspo.org/areas-of-focus/pta/

1. Why do we need Public Engagement in Science and Technology Policy?

Normative Proposition

- Lay publics have valuable knowledge and perspectives to share
- Intentional, Informed and Inclusive deliberations lead to better societal outcomes

Science will be made more reliable and more valuable for society today not by being protected from societal influences but instead by being brought, **carefully and appropriately**, into a direct, open, and intimate relationship with those influences.

- - Dan Sarewitz, Saving Science, New Atlantis

- When done well, public participation improves the **quality and legitimacy** of a decision and builds the capacity of all involved to engage in the policy process.

- It can lead to **better results** in terms of environmental quality and other social objectives. It also can **enhance trust** and understanding among parties.

- Achieving these results depends on using practices that address difficulties that **specific aspects of the context** can present.

- U.S. National Academy of Science, Committee on the Human Dimensions of Global Change, Division of Behavioral and Social Sciences and Education, (2008)

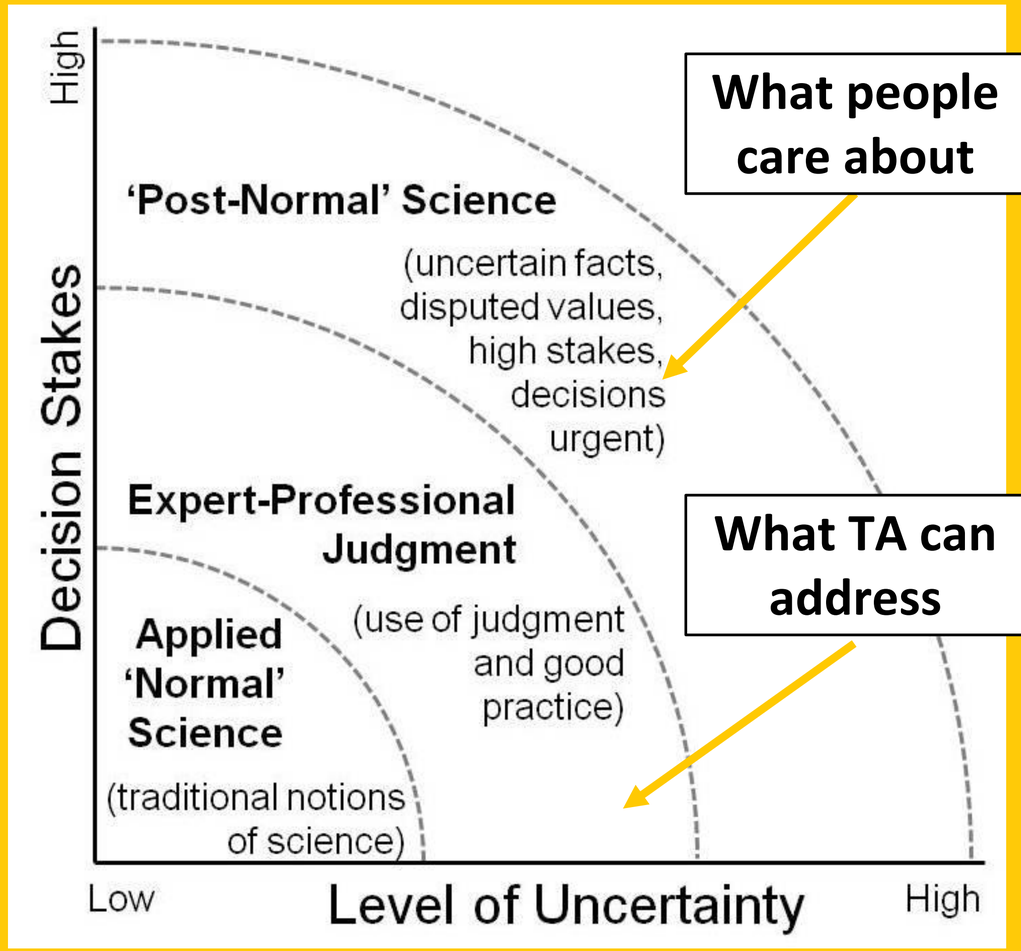
Technology Assessment (TA) can't effectively manage certain sociotechnical uncertainties

<u>Post-Normal Science (PNS) Problems</u>

- Facts *Uncertain*
- Values in *Dispute*
- Stakes *High*
- Decisions *Urgent*

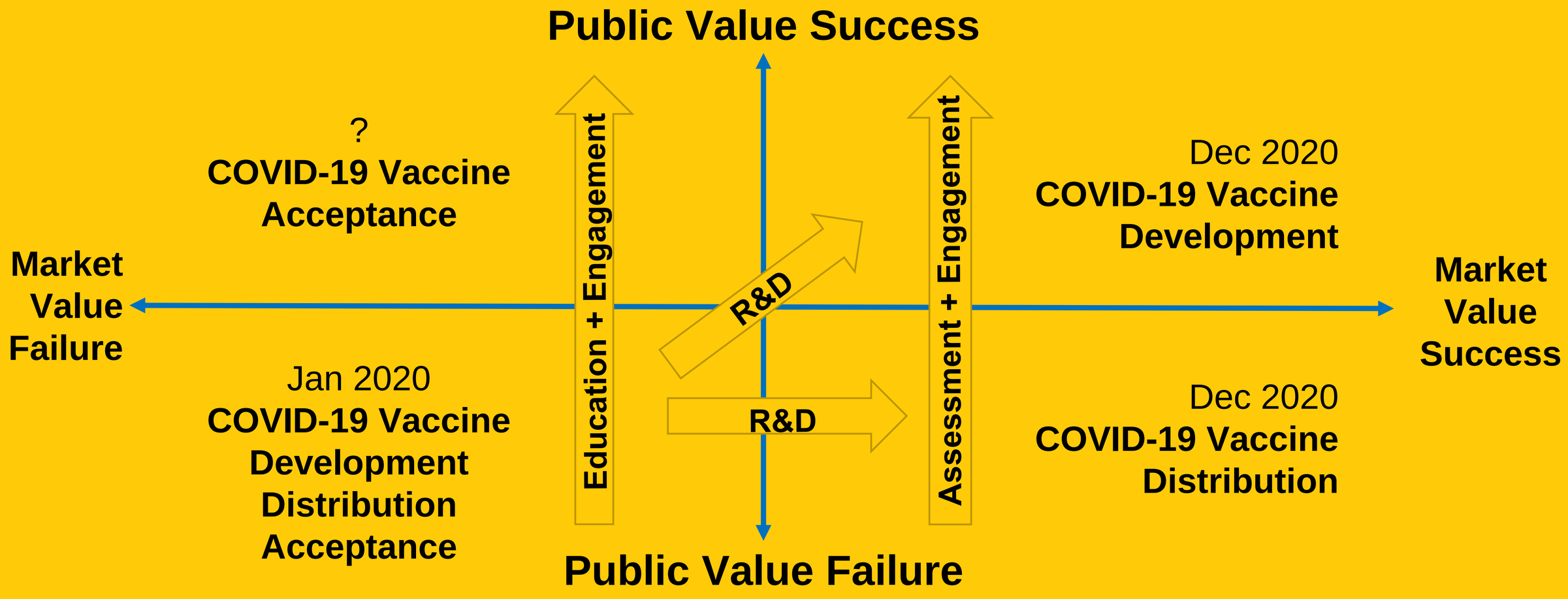
- **Requires extended societal peer review**

- **Think COVID-19!**

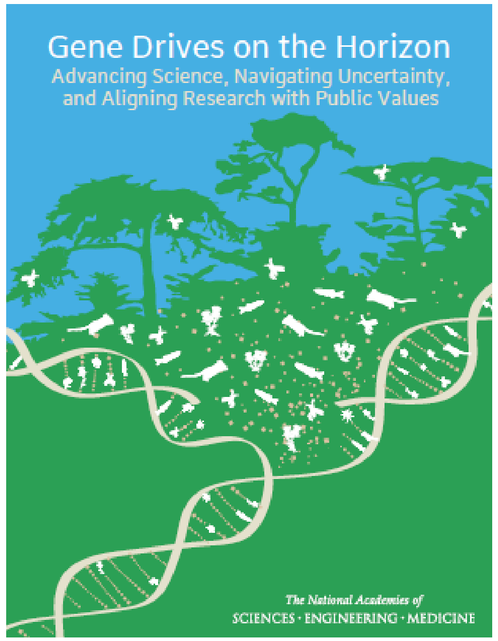


Adapted from: Funtowicz and Ravetz, 1993

Addressing Public Values, Filling Democratic Gaps



“Public Engagement Cannot be an Afterthought”



“The outcomes of Engagement may be as crucial as the scientific outcomes to decisions about whether to release a gene-drive modified organism into the environment.”

- U.S. National Academies of Sciences, Engineering, and Medicine (2016)

“This [AV development] is something we need to do with society, with the community, and not at society. And we take that very seriously. … The tech adage of ‘move fast and break things’ most assuredly does not apply to what we’re doing here.”

— Dan Amman, GM Cruise, November 2019

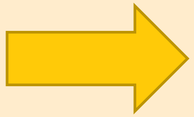
“To maximize the benefits and minimize the potential harm of technologies such as artificial intelligence and synthetic biology, we must engage nontraditional stakeholders and diverse voices in NSF research, including civic organizations, labor, local and tribal governments, farmers, and even the public at large.”

- Eddie Bernice Johnson, Chairwoman, Science, Space and Technology Committee, May 6, 2021

2. Who are the “Publics” in Public Engagement

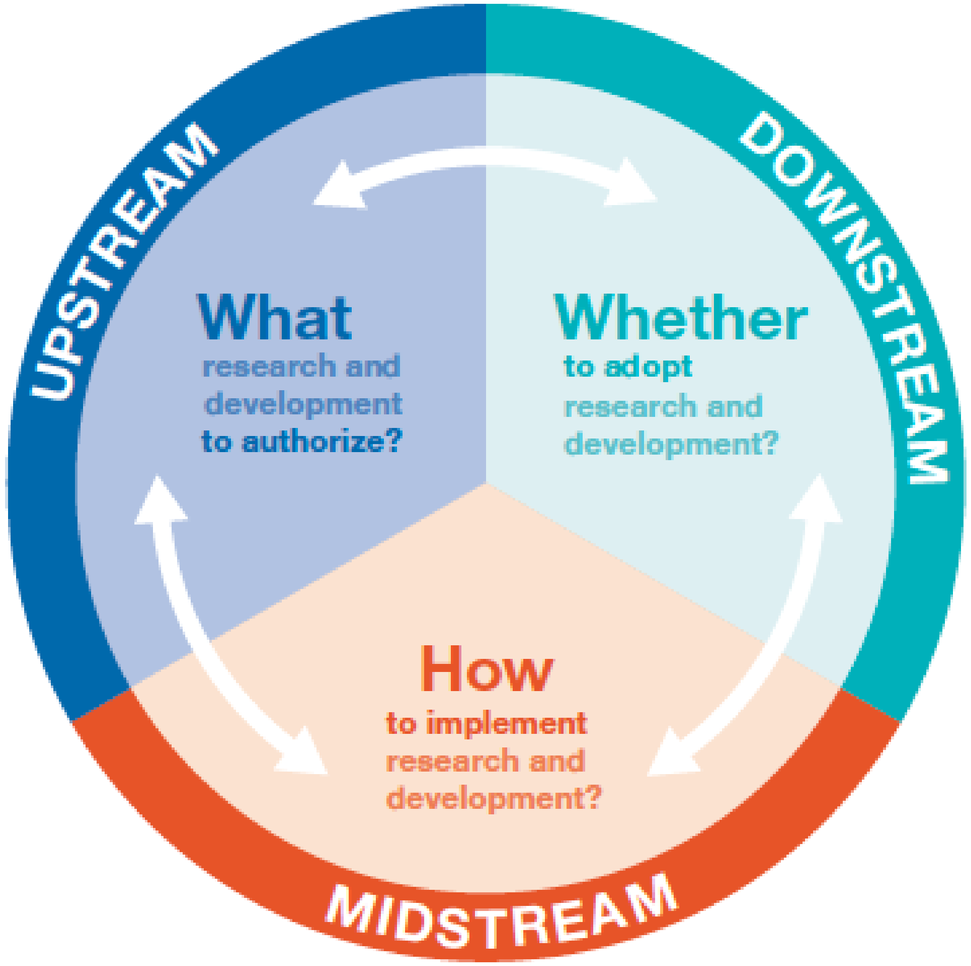
- Adapted from U.S. National Academies of Sciences, Engineering, and Medicine (2016)

3. How can we engage the public?

Type of Engagement	Information Flow		
Public Communication	Sponsor		Public
Public Consultation	Sponsor		Public
Public Participation	Sponsor		Public

- (Rowe and Frewer, 2005)

4. When should we engage the public?



Schuurbiers & Fisher (2009)

Public Engagement Questions

1. **Upstream (Research):** Should we or should we not? Geoengineering, Gene Editing, Synthetic Biology, etc.
2. **Midstream (Development):** If we should, then how? Asteroid Detection and Mitigation, Automated Vehicles, Vaccine Development, etc.
3. **Downstream (Deployment)**: How do we maximize benefits and minimize harms? Internet Governance, Climate Change Response, Vaccine Distribution, etc.

Participatory Technology Assessment

A Decision-making tool to:

- Assess public value
- Manage uncertainty
- Fill democratic gaps

Participatory Technology Assessment (pTA) is an engagement model that seeks to improve the outcomes of science and technology decision-making through **dialog with informed citizens**. Participatory technology assessment involves engaging a group of non-experts who are representative of the general population but who—unlike political, academic, and industry stakeholders—are **generally underrepresented in science and technology related policymaking**.

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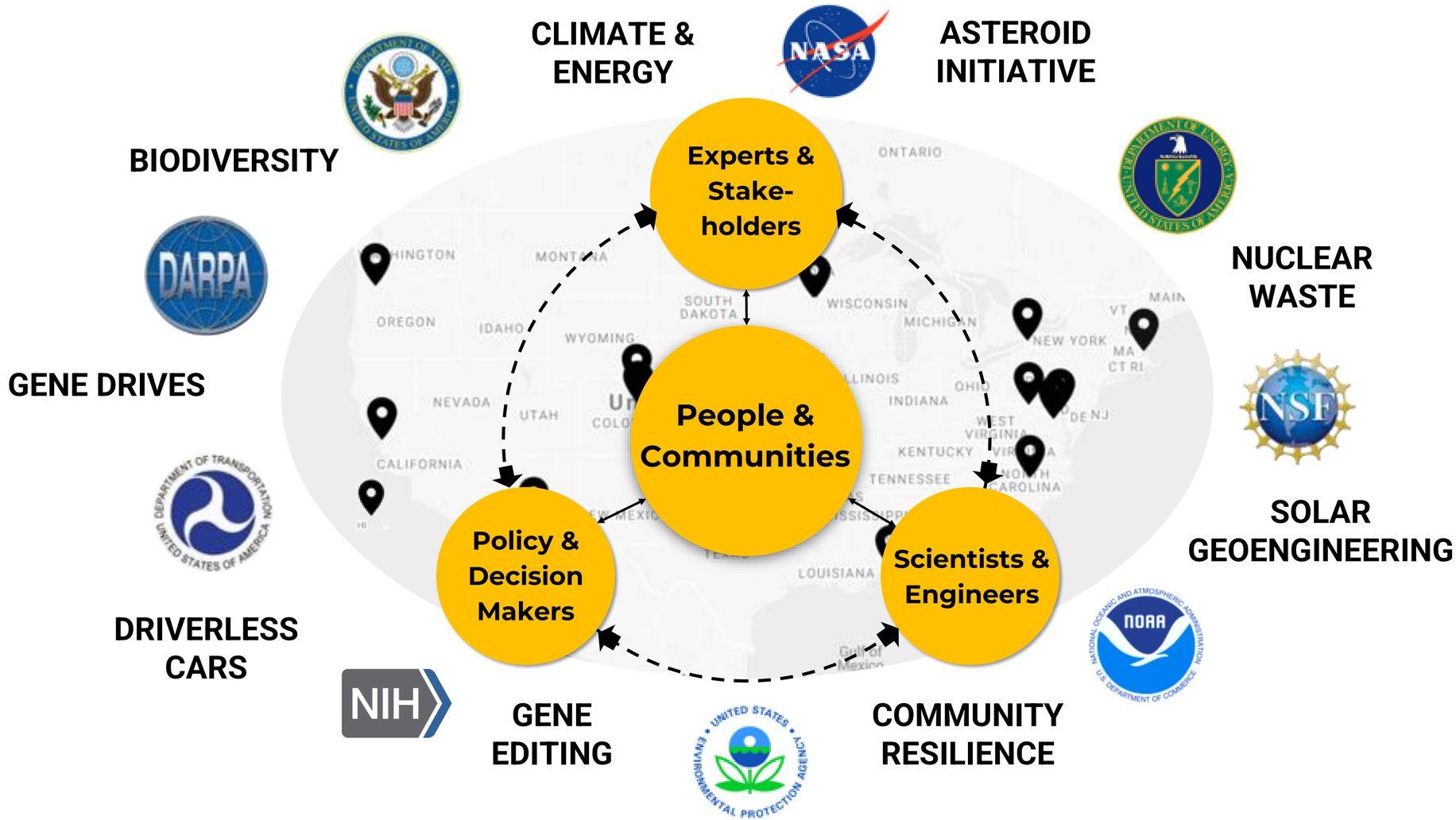
A distributed network for institutionalizing pTA as a tool for exploring public values to help inform key decisions for a 21st century alternative to Technology Assessment

- *Participation + Expertise*
- *Distributed + Agile + Collaborative*
- *Institutionally Non-partisan*
- *Inviting and integrating diverse value perspectives*
- *Continuous innovation of concepts and practices*
- *Integrated into government policy-making + wider societal deliberation + technological R&D*



50+ forums **20+** cities **3000+** citizens

CHARLES KOCH INSTITUTE
Kettering Foundation

ECAST pTA Process: 3 Deliberative Activities

Problem Framing & Design

- Literature Review
- Focus Groups
- Design Workshop

ECAST Deliberations

- Content and Protocol Development
- Recruitment and Training
- Citizen Deliberation Forums

Results & Integration

- Preliminary Results
- Results Workshop
- Reports and Briefings

Design Principles:

1. Diverse Representation
2. Deliberative Multi-Directional Learning
3. Informed Community Participants
4. Clear, Comparable, and Usable Outputs, Formats, Outcomes

Outputs and Outcomes

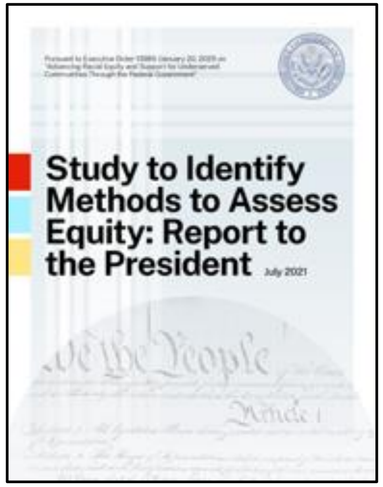
Public Reports

Scholarly Articles and Book Chapters

Informing Decisions & Policy

1. Public priorities
2. Within a choice (e.g., cost, schedule, safety of space observation of asteroids)
3. Among choices (e.g., different technical or policy options)
4. Public value mapping
5. Emerging areas of agreement – knowledge for framing future messaging
6. Insight on how the public understands S&T and handles complexity
7. Input for designing future public engagement (iterative process)
8. Anticipating emerging issues
9. Unanticipated outcomes (e.g., public makes unexpected connections)

Innovating Governance



Impacting Governance

Uncertainty

Lock-in

Moral hazard

Governance

Cooling a Warming Planet? Public Forums on Climate Intervention Research

Project, Design and Results Overview

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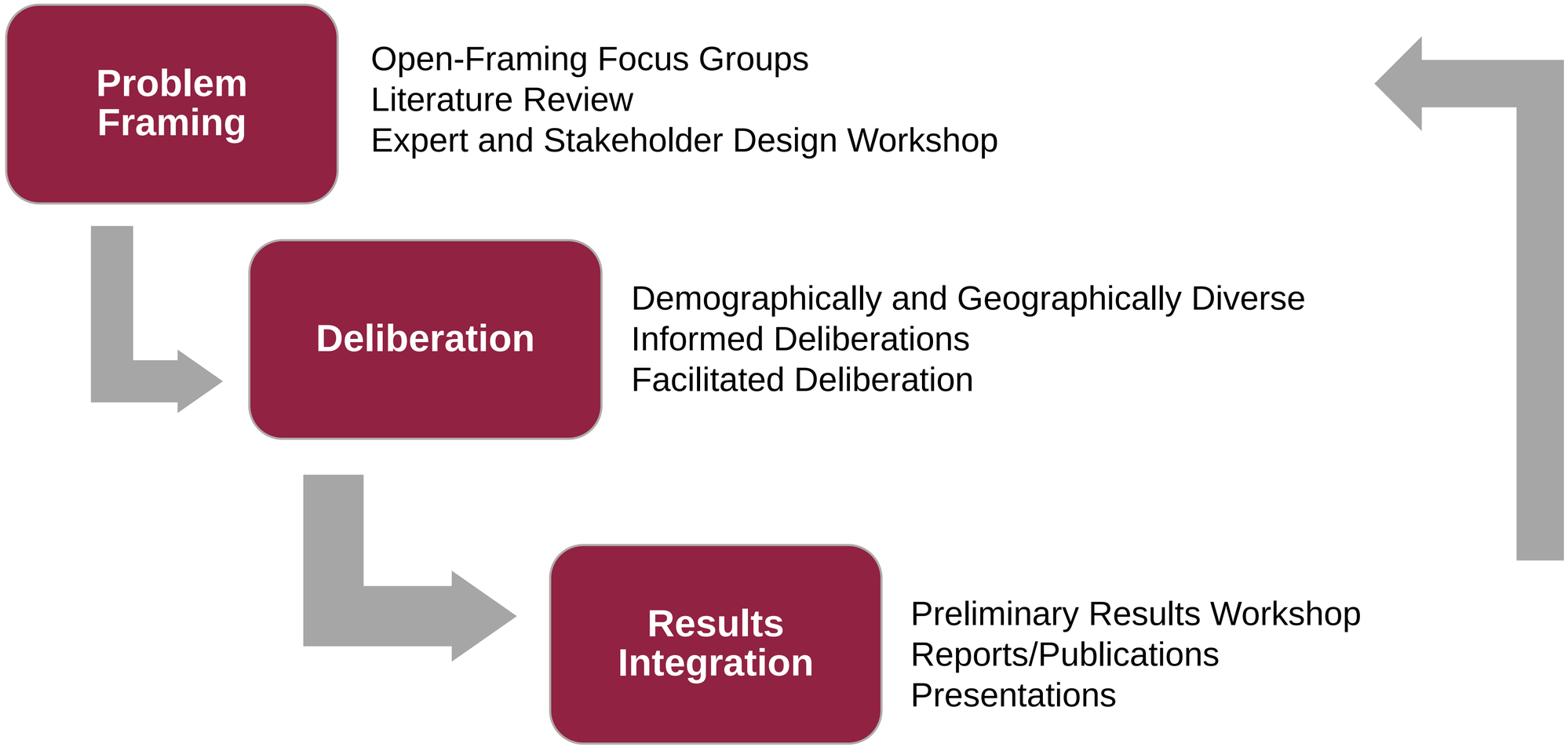
Case Study: Democratic Governance of Solar Geoengineering Research

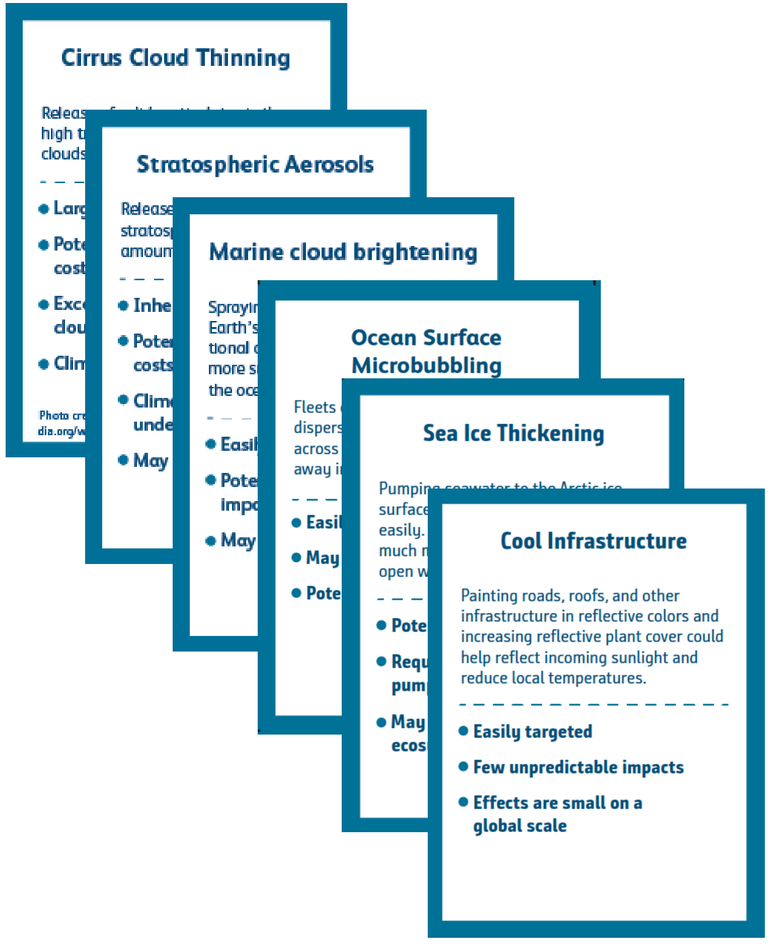
Project Timeline: Jan 2018 – April 2019

Alfred P. Sloan FOUNDATION

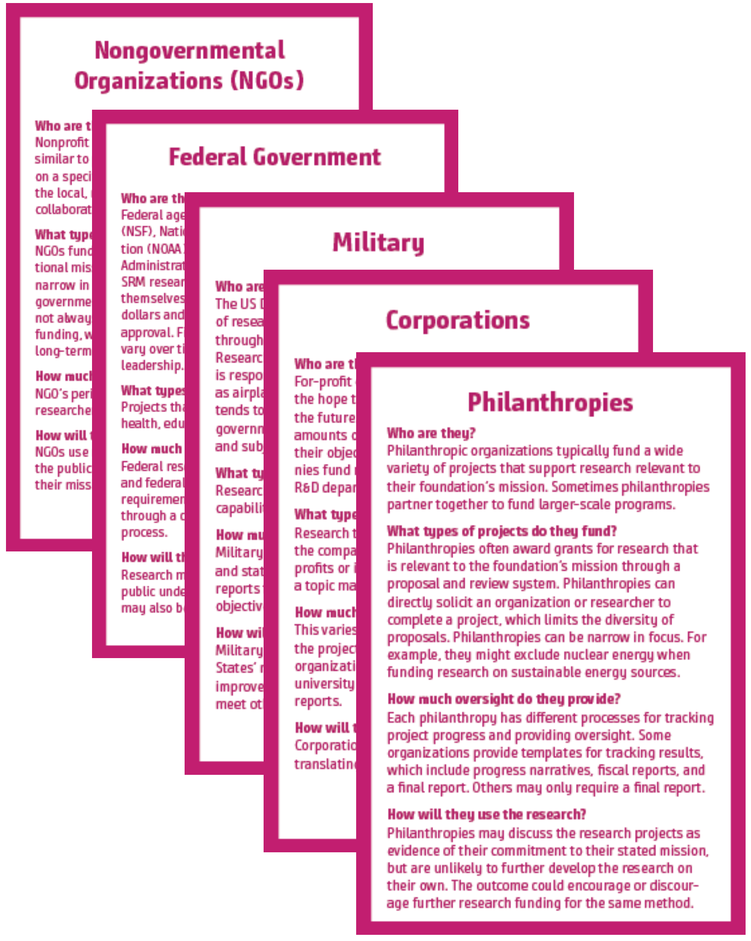


Forum Sessions

What research topics?



Who should fund research?



Who should make decisions?

Session Structure

Watch Video

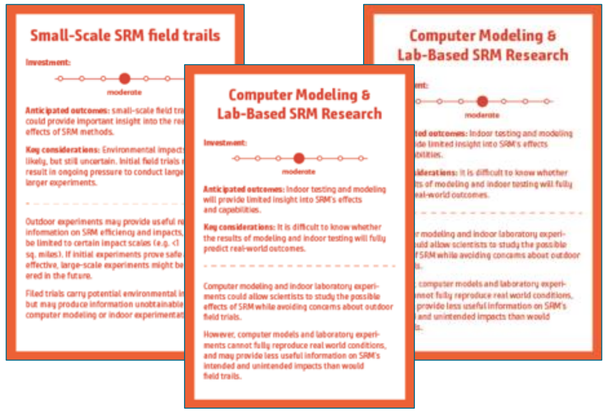
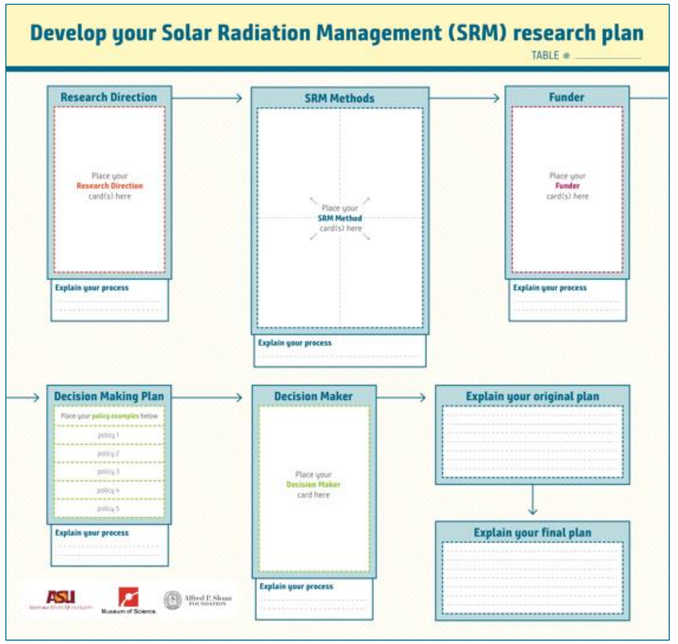


Table Discussion

Group Plans & Individual Response



Share Results

Data Collection Methods

Demographic Data

Pre and Post Surveys

Group Boards/Activities

Individual Response Sheets

Table Observer Notes

Table Recordings

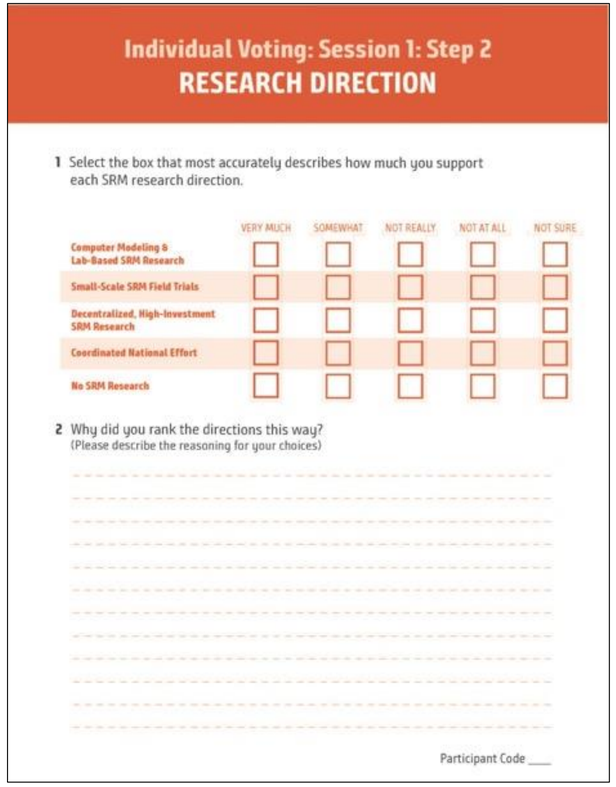
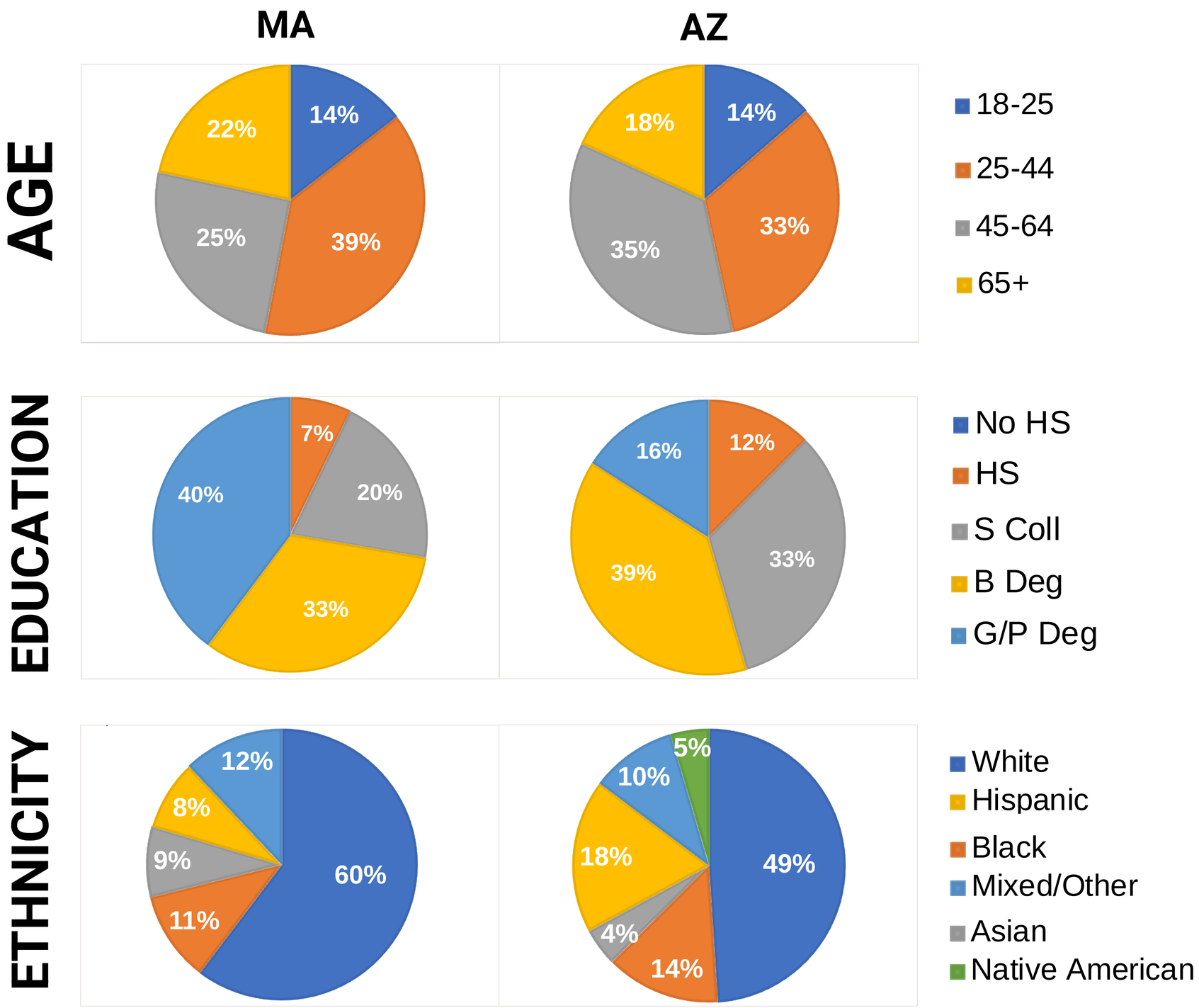



Table 4
Table 5

Who Attended



AZ: 88

MA: 83

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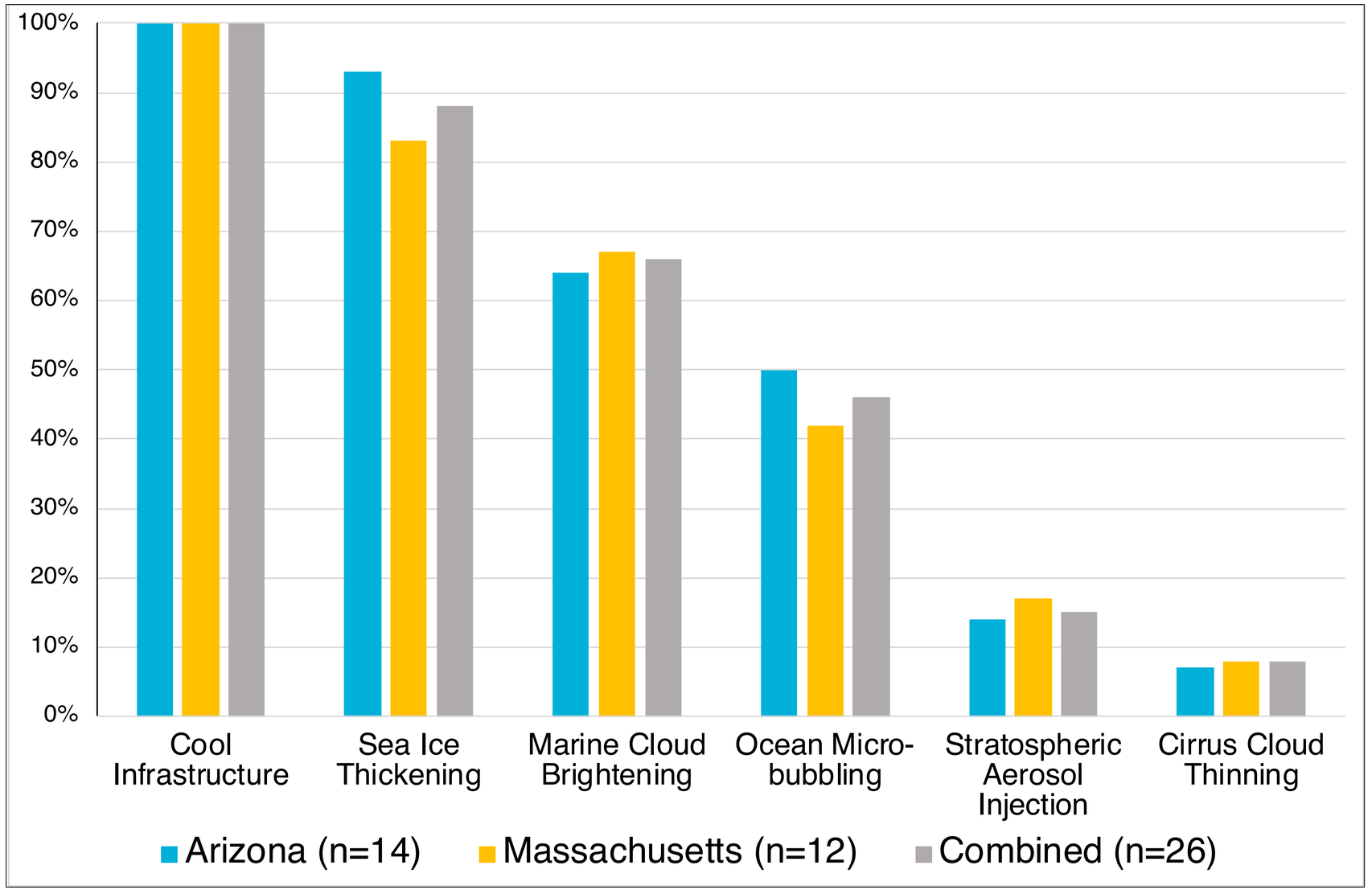
Pre – Post Survey Results

Climate Change Research Attitudes

	Combined Pre	Combined Post	Combined Pre vs. Post T-Test
Pre/Post Survey Comparison Questions	Average	Average	p
SRM research is crucial to understanding how to battle the effects of climate change.	2.7	2.4	0.027
Experts and science in general will help solve most climate change problems.	3.4	2.9	0.0074
Technology generally causes more problems than it solves.	4.7	4.9	0.37
It is important to collect data on the public's ethical concerns about SRM research.	2.3	1.8	0.0019
It is important to collect public opinion data on decisions about SRM research directions.	2.4	1.9	0.00068

Group Results: What to Research?



Narratives

Natural vs. Human-made: "They can come up with a lot of experiments that doesn't need to use a lot of energy and bad chemicals;" "Methods that focus on reflection not on altering the atmosphere."

Pragmatic: "Practical, quick,...;" "Ideal for small-scale trials."

Reversibility: "All low risk, easily stopped."

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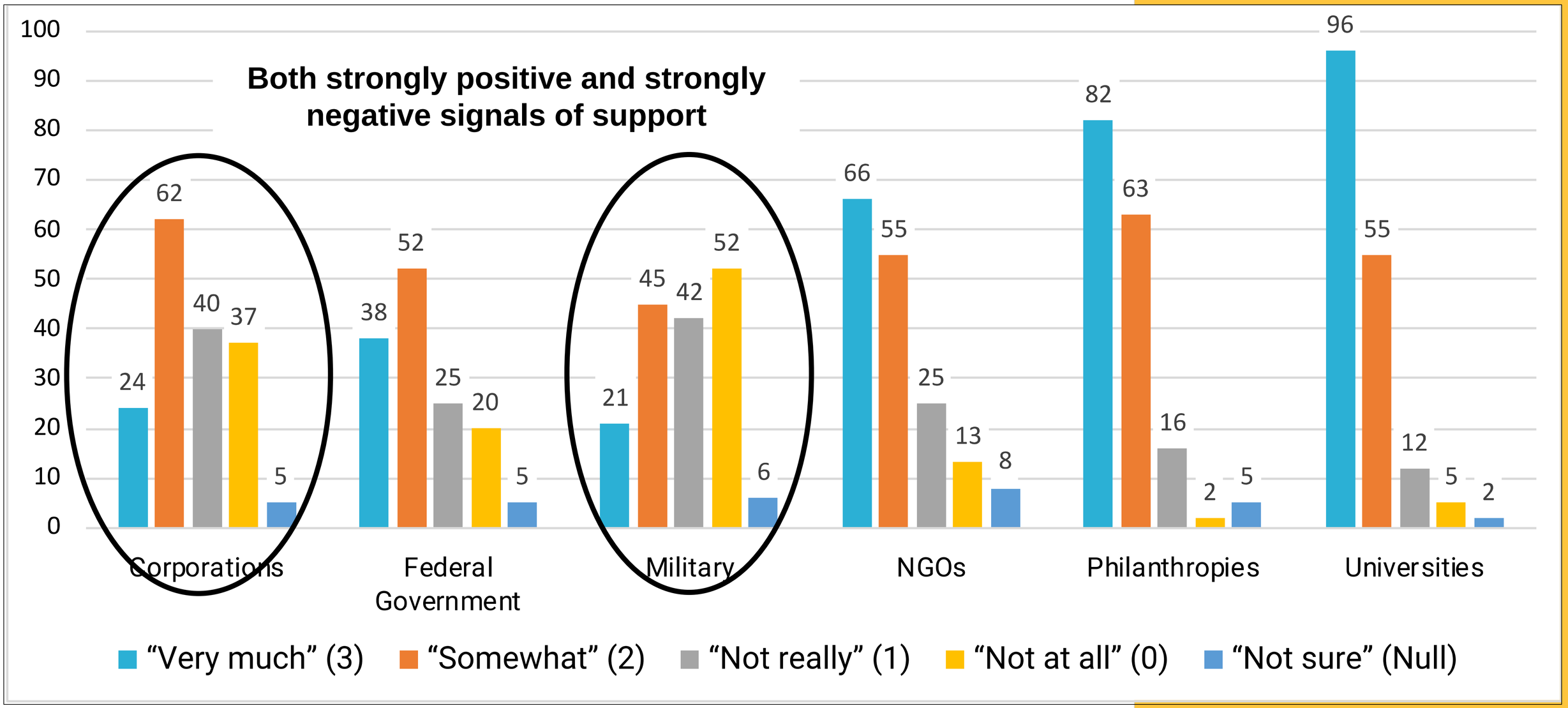
Individual Funder Support Ratings



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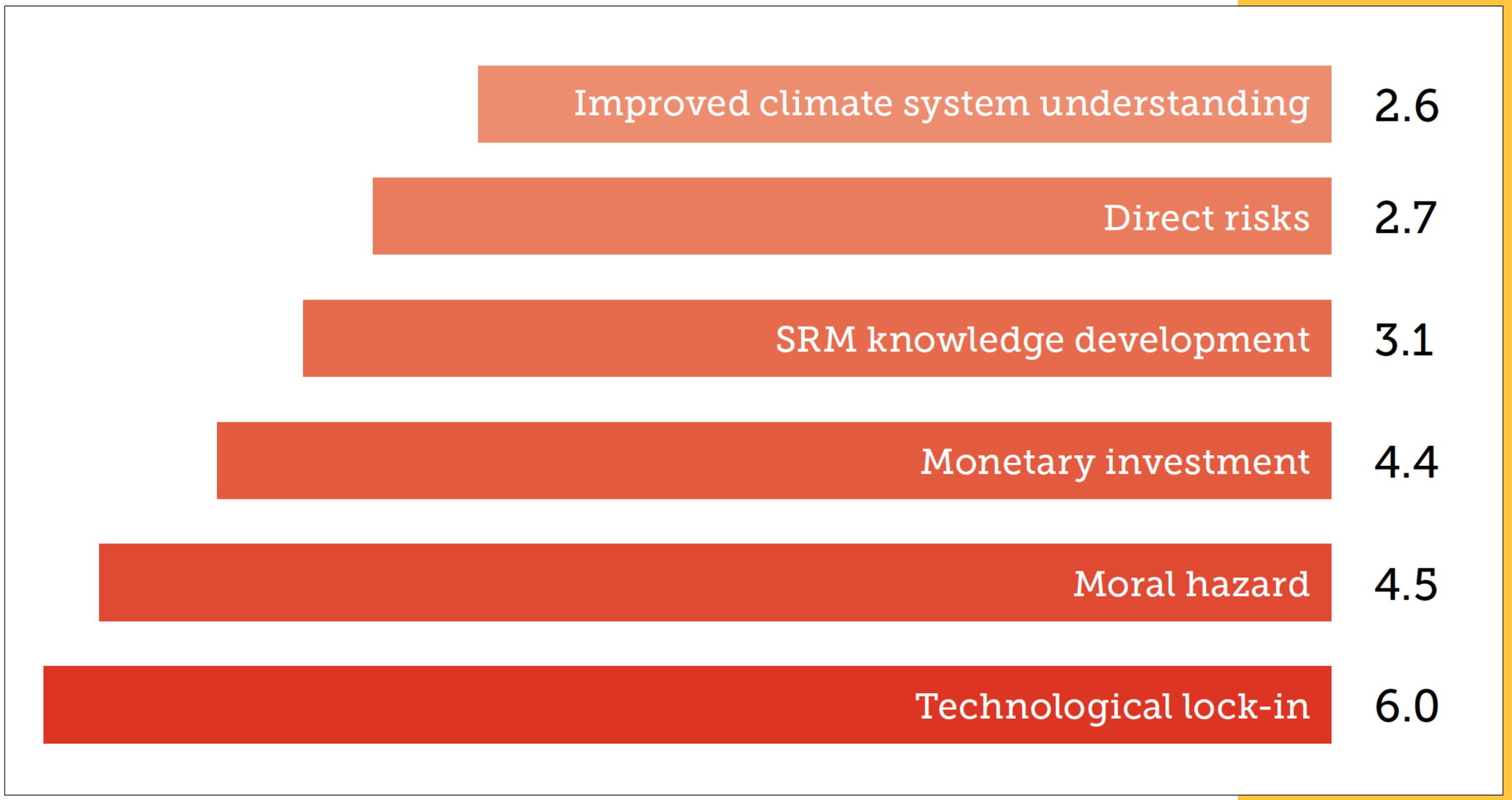
Issues to Consider



Conditional Acceptance

PRIMARY/SECONDARY THEME	# of Statements
Research Process – *conditions related to research methods, data collection, outcomes, and approaches.*	
Data accuracy and reliability	53
Computer and lab research first	33
Small-scale research first	17
Context-specific research	6
Many approaches strategy	6
National-scale research first	3
Economic Cost – *concerns about the cost of SRM, including political implications.*	
Large-scale research expensive	17
Small-scale research cost effective	17
Funding is political	6
General statements about cost	6
Private funding preferred	5
Cost isn't a factor	1
Cooperation – *assertions that cooperation is necessary or difficult to achieve.*	
Leads to agreement	12
International cooperation necessary	9
Agreement is difficult	8
Leads to diverse ideas	5

PRIMARY/SECONDARY THEME	# of Statements
Risk & Uncertainty – *concerns about risk associated with the conductance and outcomes of research.*	
Unspecified risk	35
Environmental risk	24
Moral hazard	14
Reversibility of research	8
Social impact	3
Energy consumption of research	2
Governance – *conditions related to governing the research process.*	
Appropriate governance necessary	35
Public engagement necessary	11
Oversight and accountability	8
Researcher autonomy	2
Transparency	1
Property rights	1

Three-quarters of participants set **some sort of condition** on SRM research

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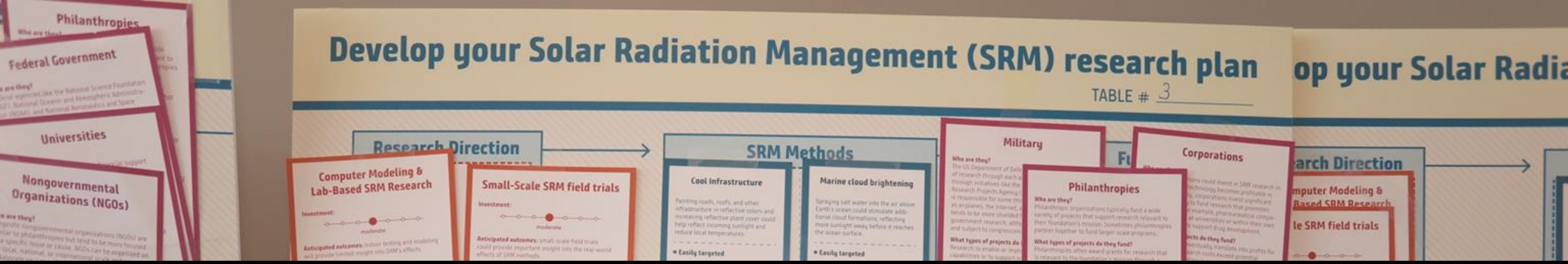

"Keep things small; govern transparently, flexibly, and inclusively; learn from past mistakes and be prepared to reverse course.
Proceed—but with caution."

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at Arizona State University

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Museum of Science

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Public Forums on Carbon Dioxide Removal in the United States and Canada and their Application to Governance Frameworks

Project Funding from:

Alfred P. Sloan FOUNDATION

Project Aim

Aim 1

Research informed **public views** on CDR technology research, development, and deployment with emphasis on ocean-based approaches in six regions in the U.S. and Canada using Participatory Technology Assessment (pTA) methodology. (Phases 1 & 2)

Aim 2

Research **modes of governance** of CDR technology research, development, and deployment with emphasis on ocean-based approaches in the U.S., Canada, and globally. (Phases 1 & 2)

Aim 3

Inform and integrate public views (Aim 1) into modes of governance (Aim 2) for CDR technology research, development, and deployment with emphasis on ocean-based approaches in the U.S., Canada, and globally. (Phase 3)

CDR pTA Project Stages

Phase 1: Problem Framing

- Literature reviews
- **25 Stakeholder interviews**
- **3 Focus groups**
- **Design workshop**

Phase 2: Citizen Deliberation

- Forum design & dev.
- Forum site selection
- Evaluations, test & training
- **6 Public forums in USA and Canada**

Phase 3: Results Integration

- Preliminary analysis
- **Results workshop**
- **Policy Briefs**
- **Research Publications**
- **Conference and Meetings**

Consortium for Community Engagement Innovation and Learning on Consent Based Siting in Arizona (CCEIL-AZ)

Arizona State University

scistarter
Science we can do together.

Museum of Science®

DOE's Consent-based Siting for Interim Storage Program: DE-FOA-0002575

U.S. DEPARTMENT OF ENERGY
NUCLEAR

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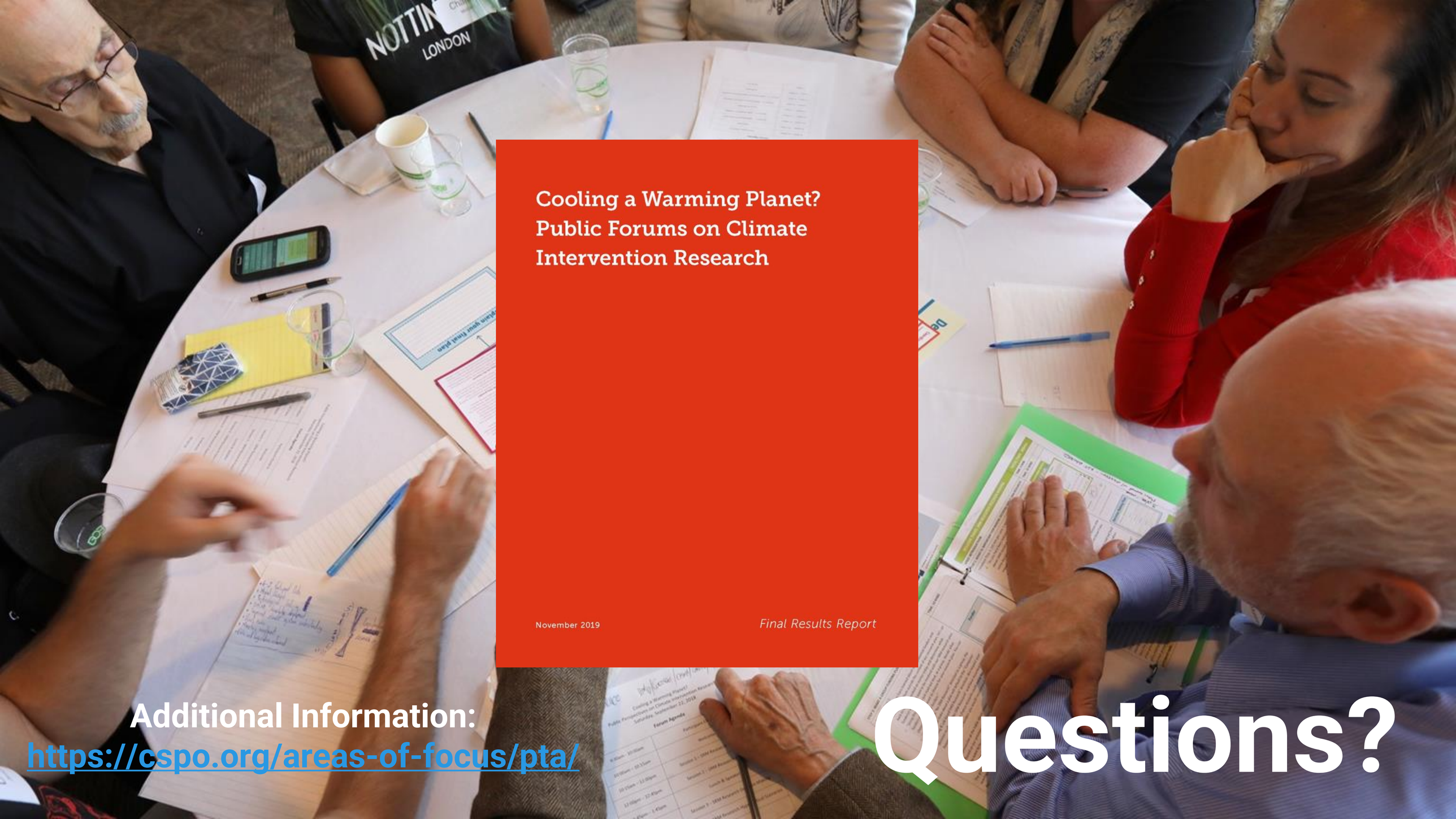
Overview of Process

Public Values Assessment for CBS

Overall approach guided by Participatory Technology Assessment

- Co-development: Communities, stakeholders, experts, and project team working together
- Developing a variety of engagement methods to inform deliberative forums, including focus groups, storytelling, and citizen science.
- Qualitative and quantitative analysis of public values captured through surveys and participant observations
- Equity and justice considerations to be integrated throughout the project
- Project evaluation focused on 1) participant activities, 2) project process, and 3) project outcomes



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Questions?