

# Integrating Socially Led Co-Design into Consent-Based Siting of Interim Storage Facilities

Will Livingston – Presenter

Kuhika Gupta – Principal Investigator



# Consent-Based Siting

- DOE recognizes that siting nuclear facilities is a major challenge
  - Using consent-based siting as part of the solution to this challenge
- **Consent-Based Siting:** An approach to siting facilities that focuses on the needs and concerns of people and communities. It prioritizes justice, equity, informed participation, community well-being, transparency, and community right to volunteer and withdraw.
- **We hypothesize that co-design as part of the consent-based siting process can enable more positive siting outcomes by:**
  - Characterizing basic elements of the facility, site governance/management, and project
  - Centering community values, interests, and identity into project planning
  - Ensuring a mechanism for key stakeholders to have a meaningful role in the design process to achieve collective goals of the community

# Co-Design

- **Co-design:** A collaborative approach to policymaking where government officials, community members, and other stakeholders work together to create solutions for public issues
  - **Core objectives:** ensure that the people affected by a policy have a significant role in shaping it, making the outcomes relevant and accepted by the community as well as possibly improving the results by incorporating diverse knowledge
- We are developing and evaluating co-design as a mechanism for garnering durable community consent to the siting process



Community  
Design  
Workshop

Public Design  
Survey

SME Design  
Workshops

Research  
Activities

Co-Design  
Forum

Mentorship  
and Training

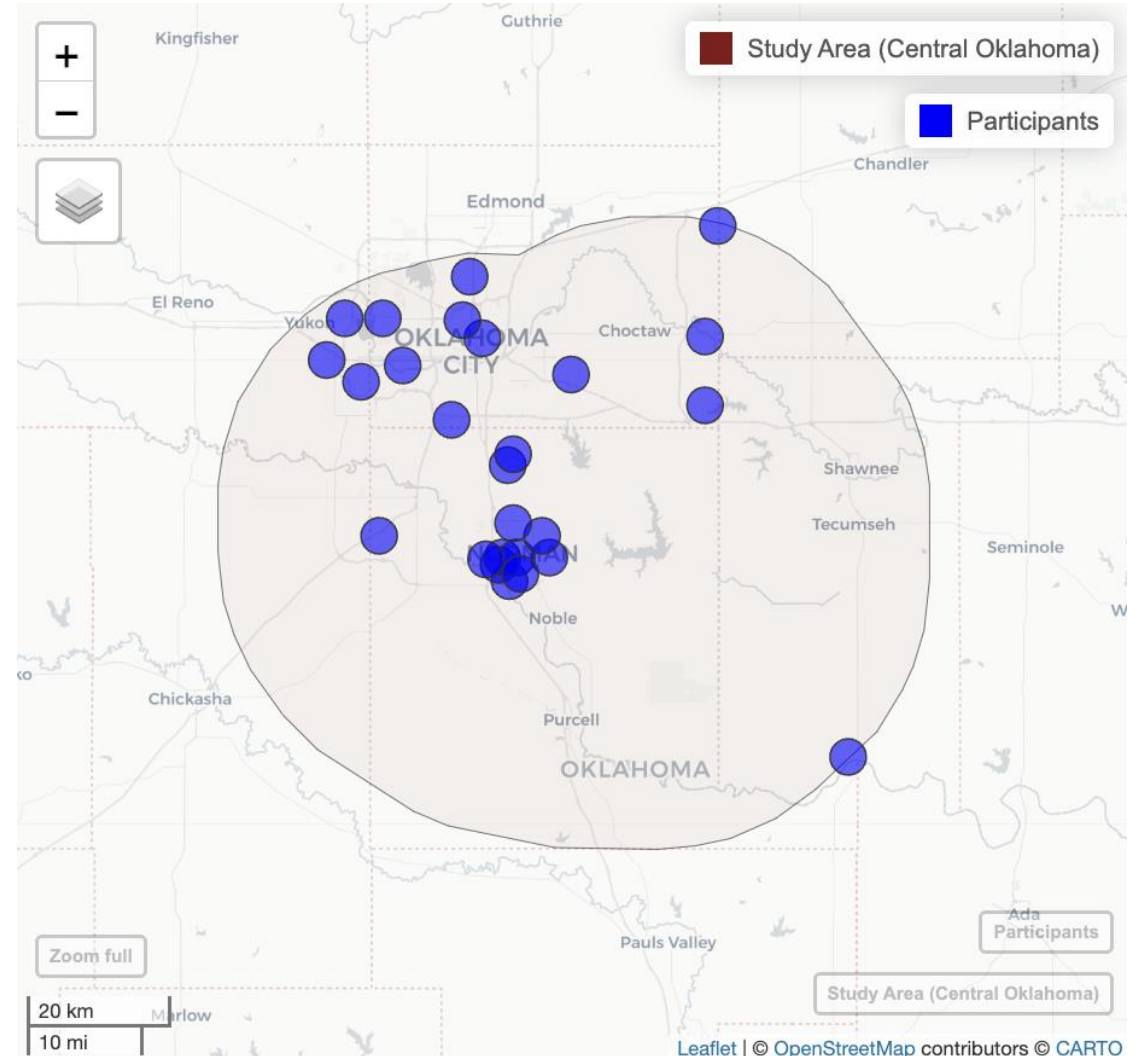
Public  
Referendum  
Survey



Do community members want to participate?

# Community Workshop

- **Mode:** Facilitated Discussion
- **Date:** April 21, 2023
- **Location:** University of Oklahoma campus
- **Sample:** 26 people living in Central Oklahoma
- **Goal:** Develop starting point of shared understanding with community members



# Community Workshop

- **Goal:** Develop starting point of shared understanding with community members
  - Before conversation about facility/other actors
- Give communities the first opportunity to think about and voice:
  - Shared Values
  - Long-Term Goals
  - Definition of Community
- Empower them for when conversation transitions to a specific facility



# Community Workshop

- Identify best practices for engaging potential host communities in collaborative design process
- Start to identify the key values the community would like to see in the co-design process
- Ending with a preliminary discussion of SNF facilitates as well as developing some preliminary design ideas



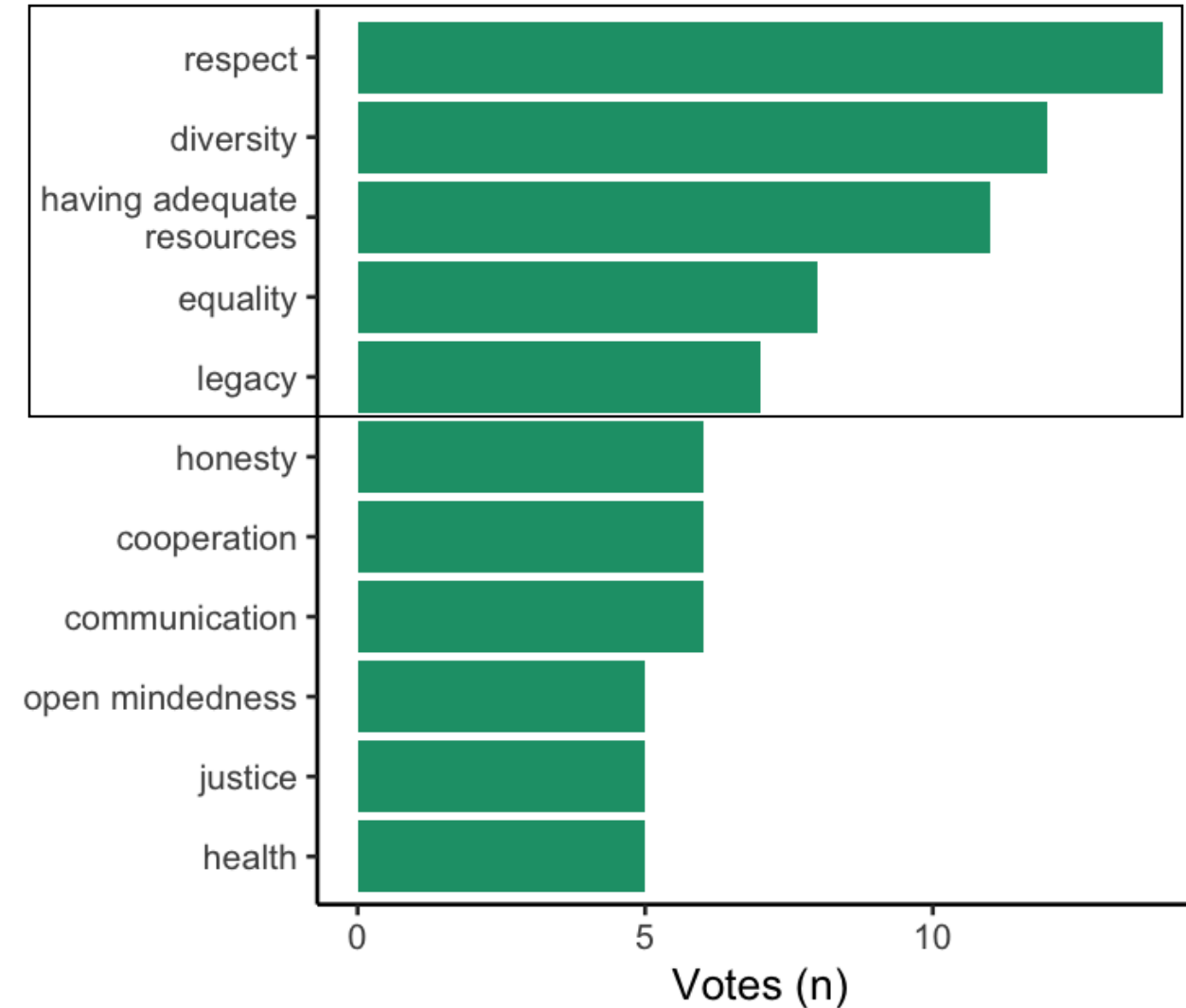



# Community Workshop

## Lessons learned:

- We were able to identify values, goals, and definitions of community from our participants
- Early prioritization of attributes was an effective frame for engaging dialogue
- What mattered most to people:
  - Having a say/being able to veto the facility
  - Economic development
  - Educational programs

## Community Values

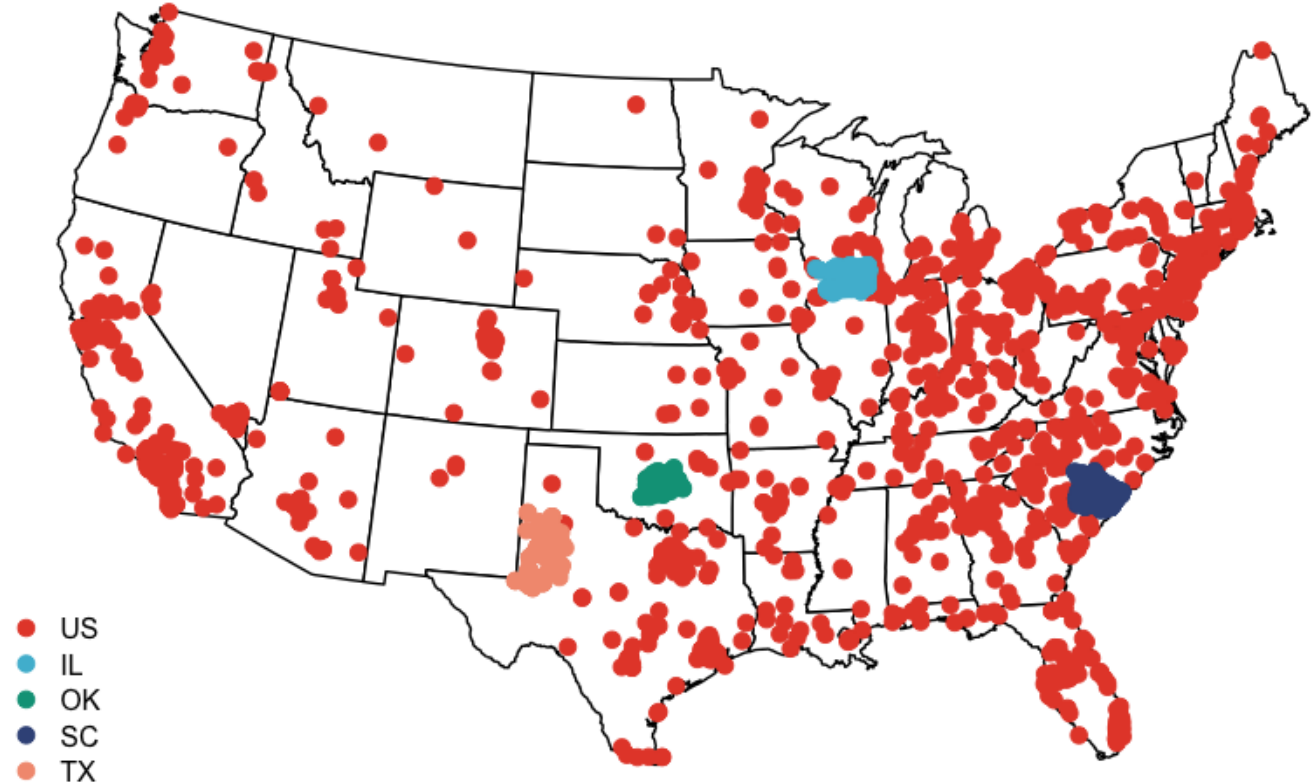




On a national scale, are people willing to participate?

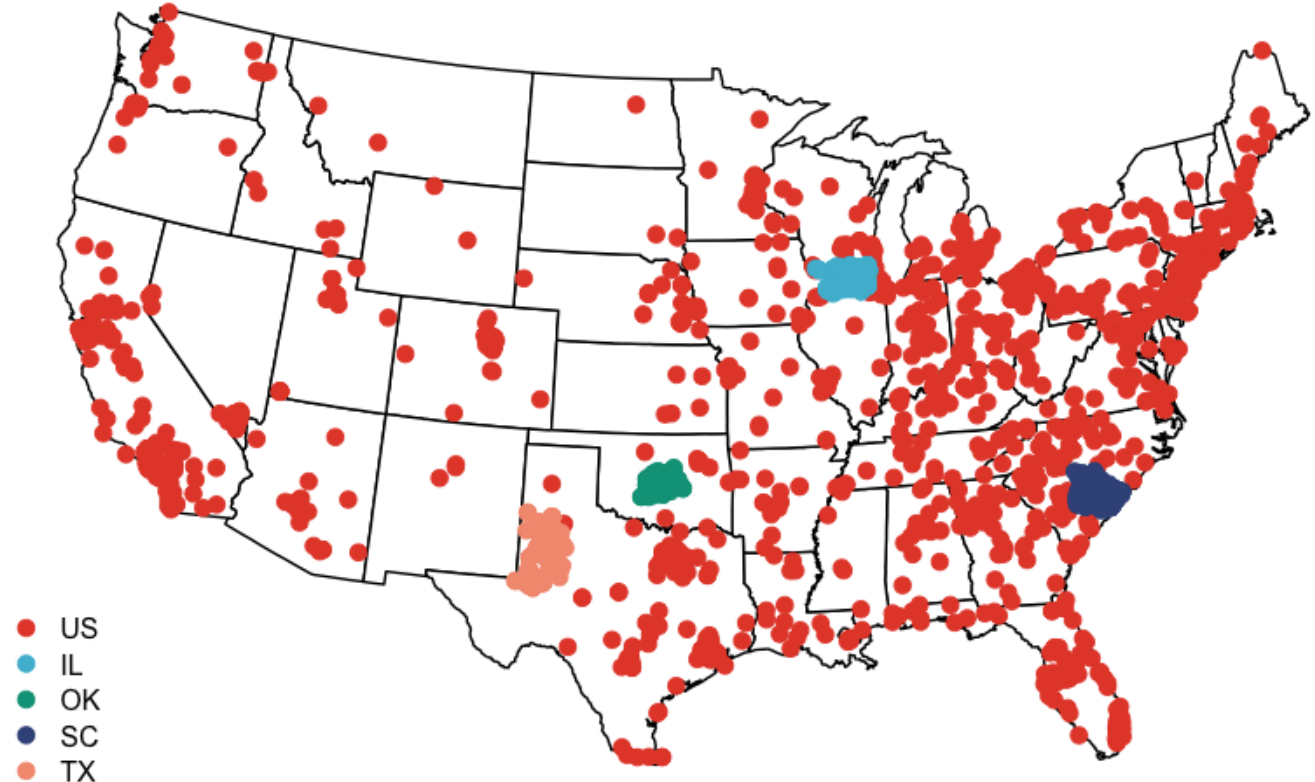
# Public Survey

- **Mode:** internet survey
- **Fielded:** 11-27-2023 - 12-22-2023  
(26 days)
- **Median time:** 25 minutes
- **Sample:** 3,297 complete responses
  - US: 1,500
  - IL: 446
  - OK: 449
  - SC: 446
  - TX: 456



# Public Survey

- Identify why people are/are not willing to participate in co-design
  - Demographics, narratives, experience
- Identify if/how co-design of a Used Nuclear Fuel Storage Facility differs from other large-scale energy facilities



# Survey Experiment

Used Nuclear Fuel  
Storage Facility

Carbon Capture  
Storage Facility

Large-Scale  
Energy Facility

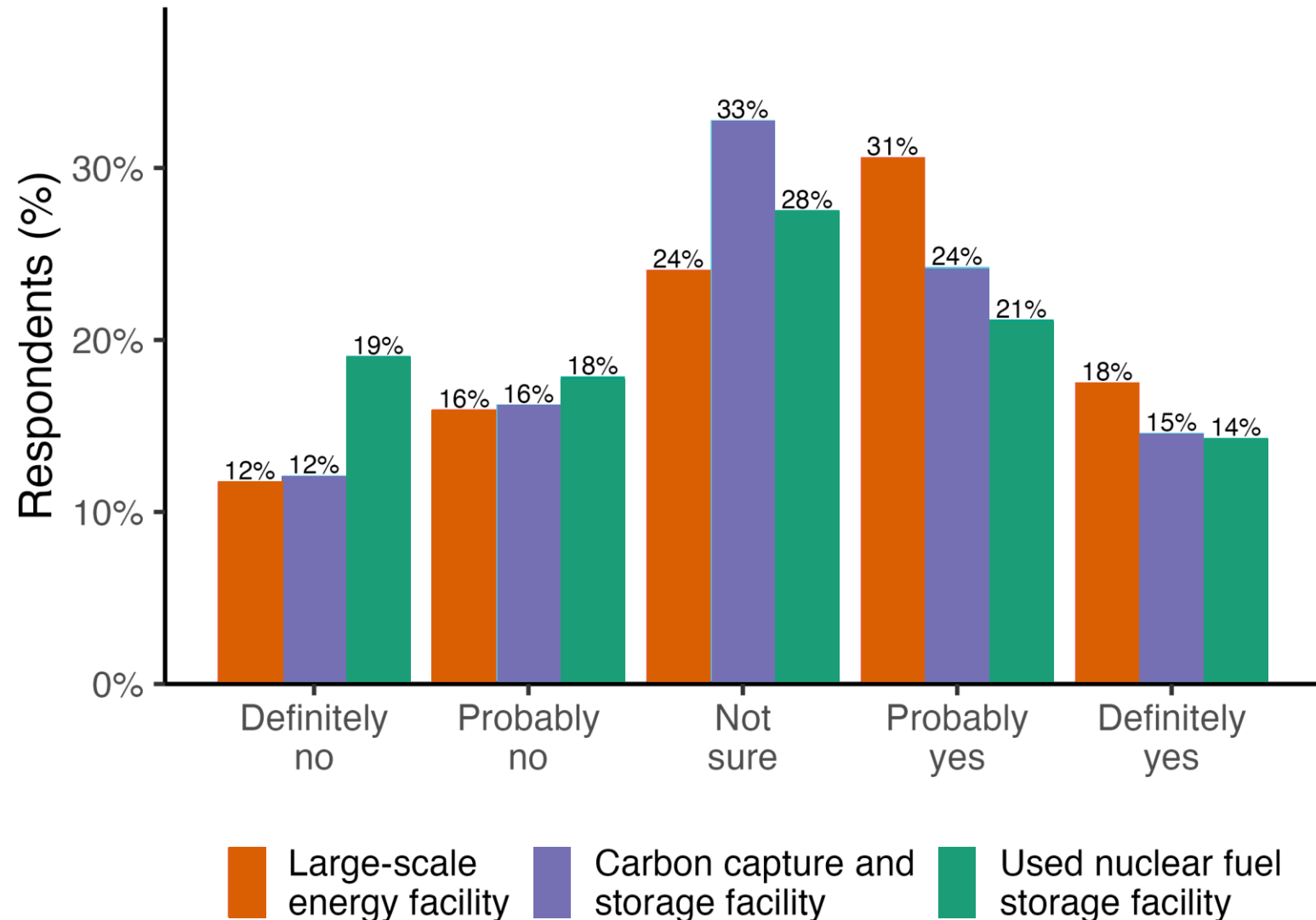
Now, imagine that community leaders are looking for volunteers to serve on a co-design committee. This co-design committee would include community volunteers who would collaborate with scientists/engineers and policymakers to design a **[facility type]** that fits the needs and identity of your community. Collaboration will involve a 90-minute meeting with scientists/engineers and policymakers every month for 12 months.

# Question: Public willingness to participate in co-design processes

Collaboration will involve a **90-minute meeting with scientists/engineers and policymakers every month for 12 months.**

- Would you **volunteer** to serve on this co-design committee?

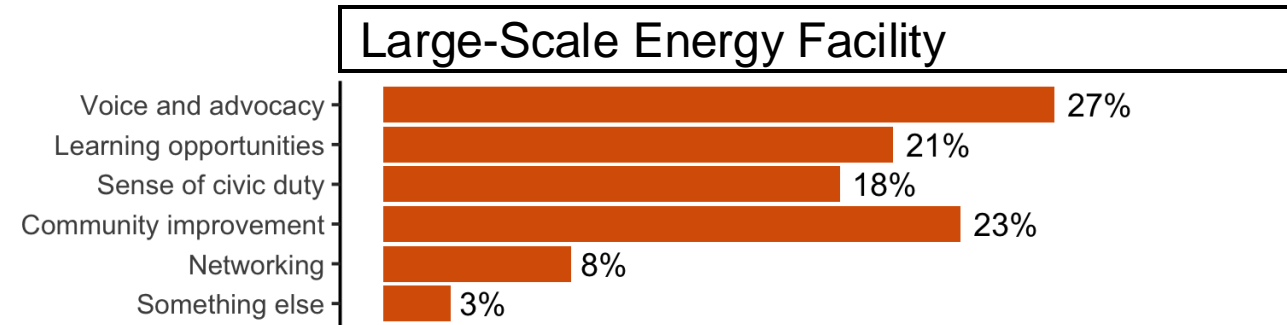
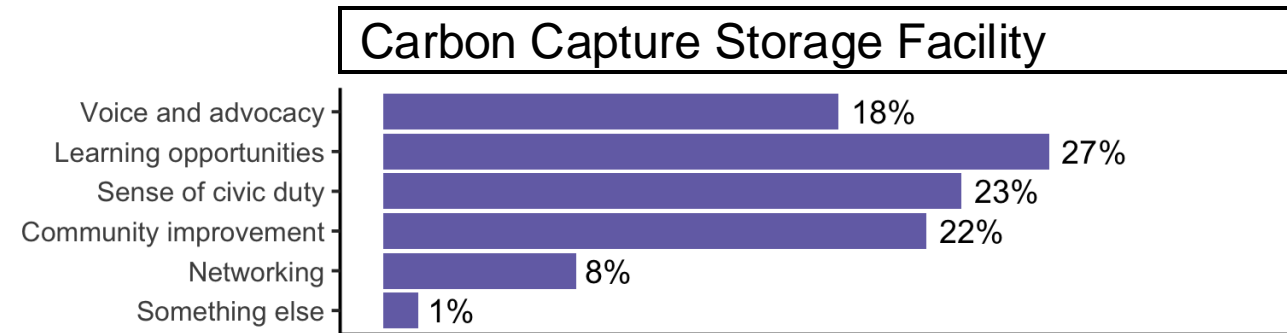
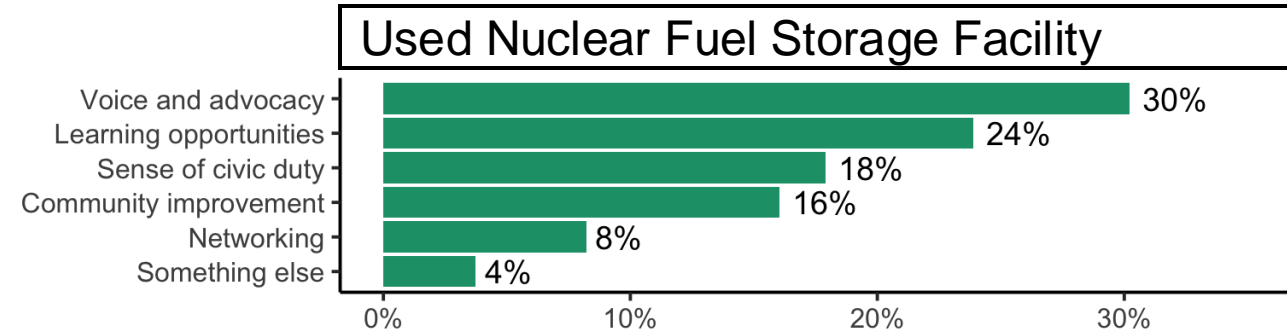
**35% of respondents were willing to participate.**



# Public willingness to participate – Why Yes?

Can you briefly explain why you **would** volunteer to serve on this co-design committee?

Voice and advocacy, civic duty, and learning were primary drivers of participation.

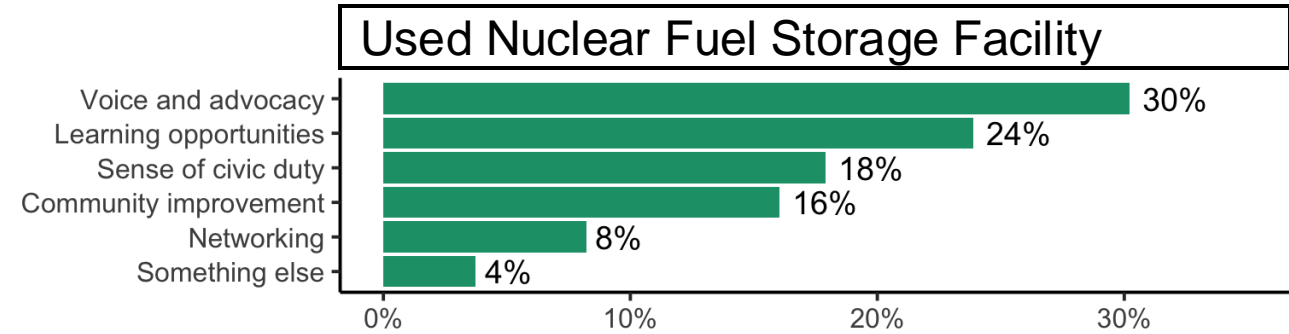


Respondents (%)

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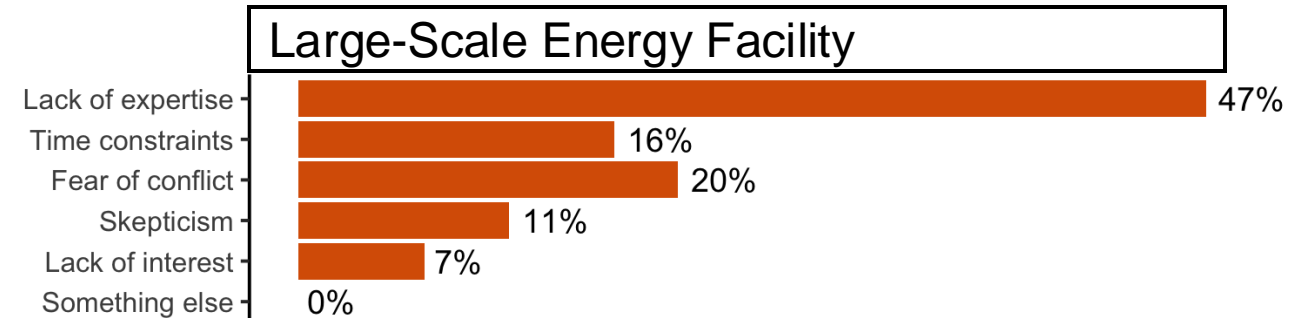
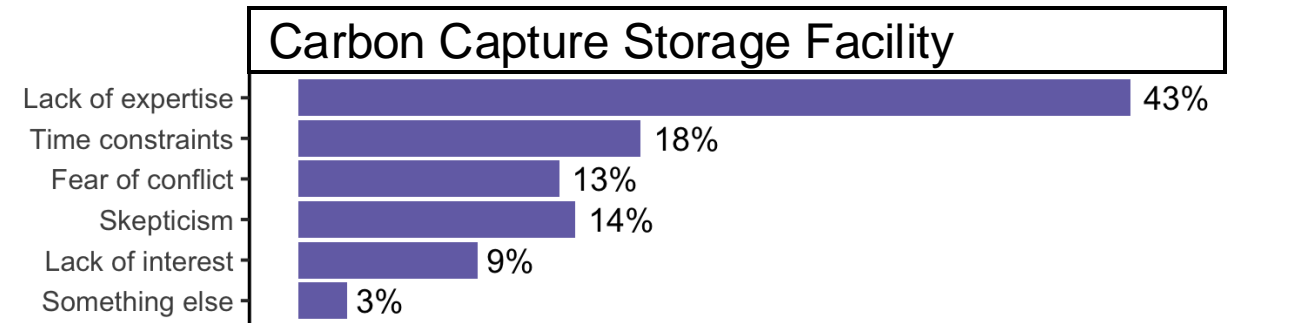
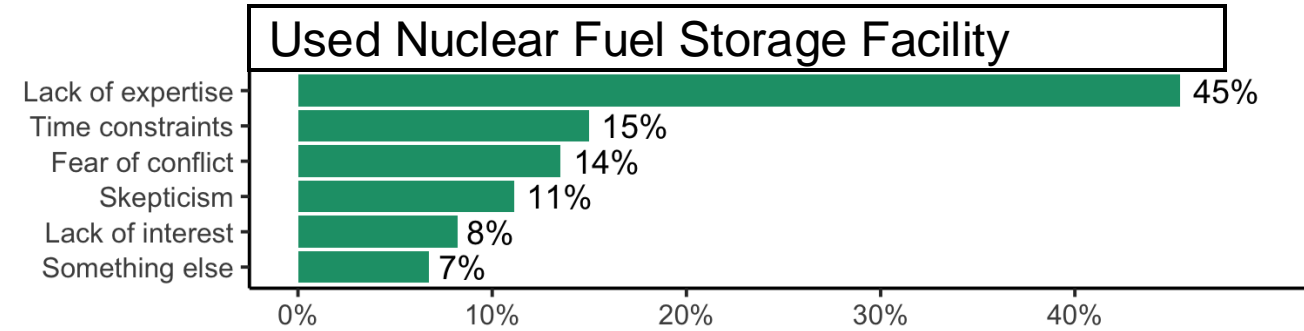
- Something else:
  - “I am a professional engineer with 40 yrs experience in power plant design.”
  - “Being an American Veteran and very concerned of the future, concerning family, friends and civic commitment”
  - “Eager to prevent danger”



# Public willingness to participate – Why Not Sure?

Can you briefly explain why you are **not sure** if you would volunteer to serve on this co-design committee?

Perceived lack of expertise, lack of interest and time constraints were primary barriers to participation.

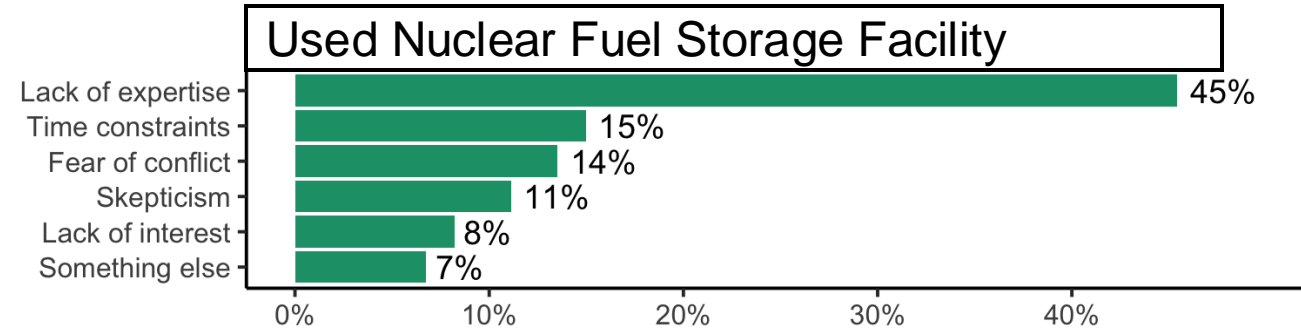


Respondents (%)

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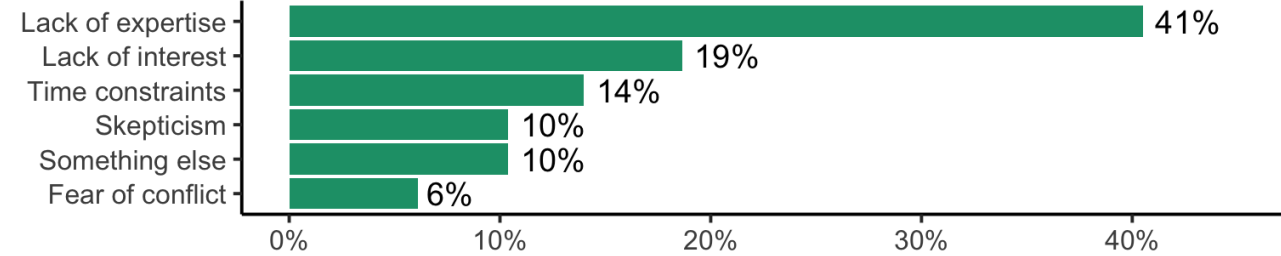
- Something else:
  - “Physical disability”
  - “Need to learn more”
  - “I have little trust that a community would really be the ones pulling the strings on any committee these days.”

# Public willingness to participate – Why No?

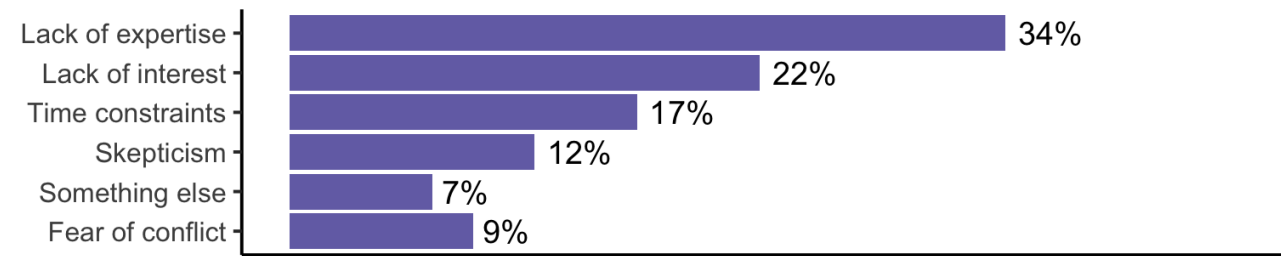
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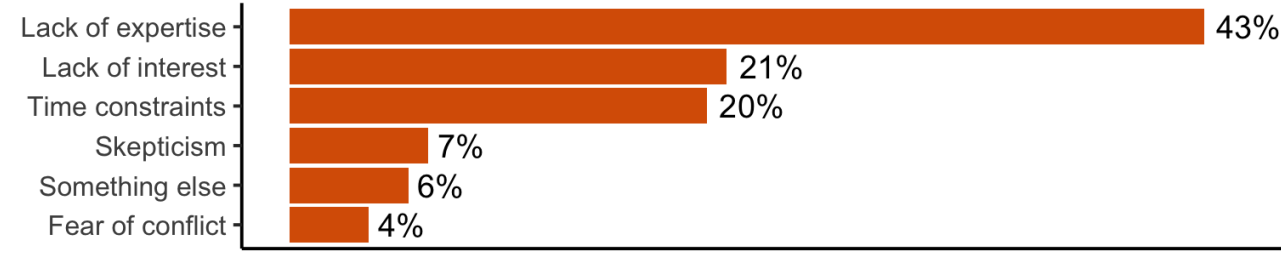
### Used Nuclear Fuel Storage Facility



### Carbon Capture Storage Facility



### Large-Scale Energy Facility

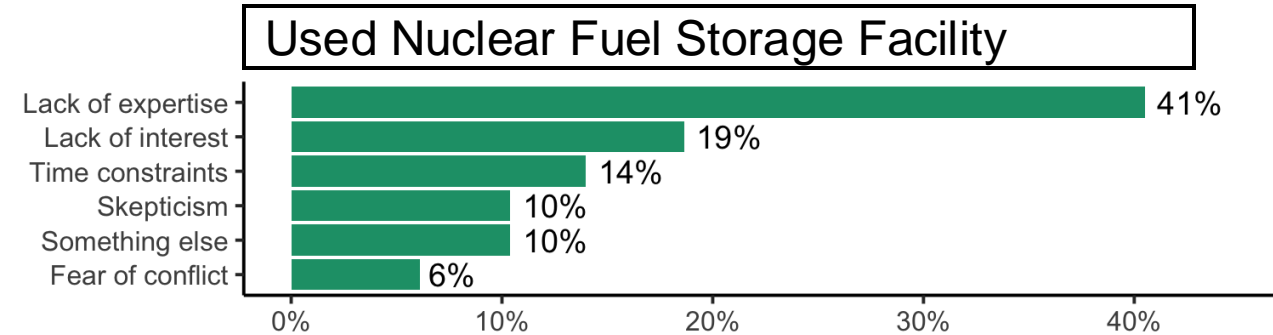


Respondents (%)


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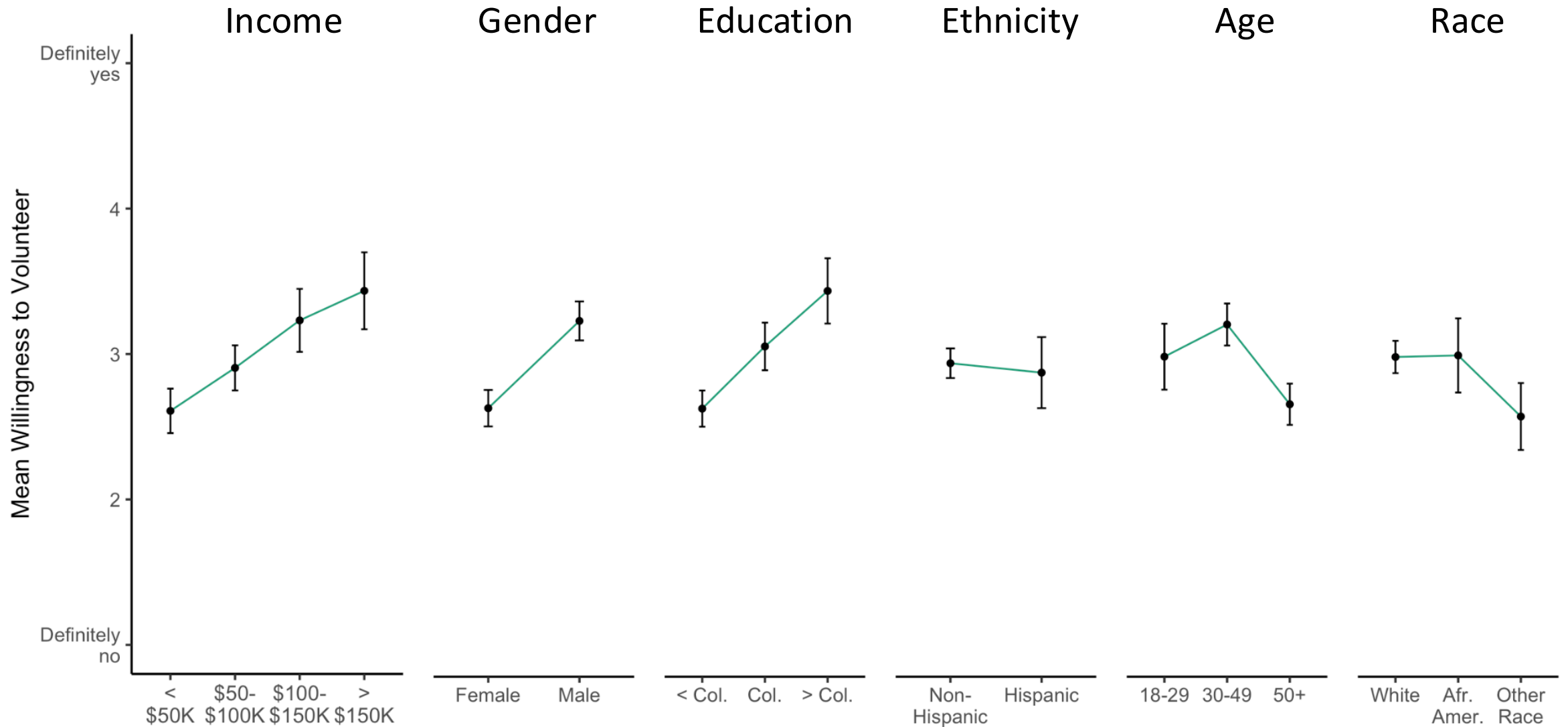


- Something else:
  - “Because I think the idea of such a facility is ridiculous and a total waste of resources.”
  - “I feel disconnected from my community”
  - “At my age not possible.”
  - “I feel these should be paid positions”

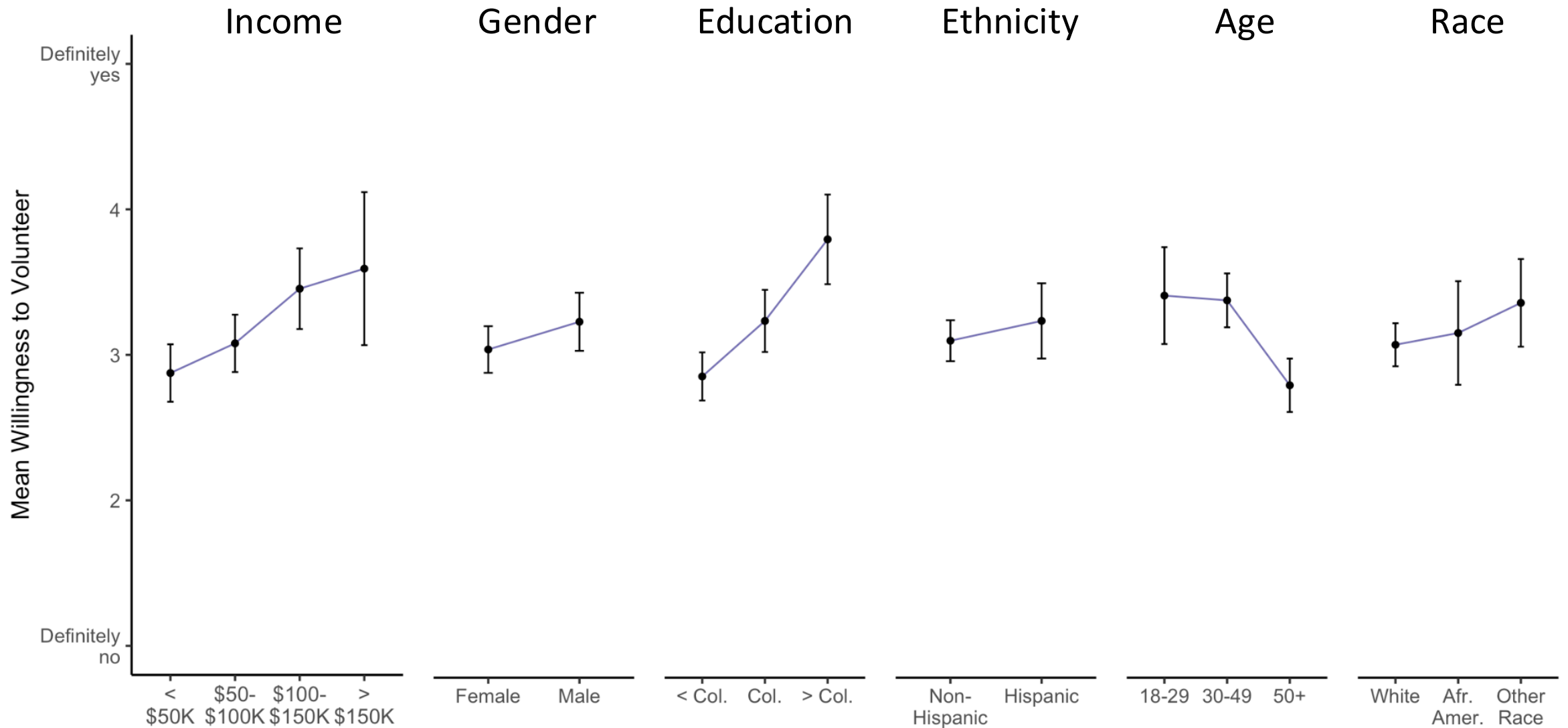


Are some people more willing to participate than others?

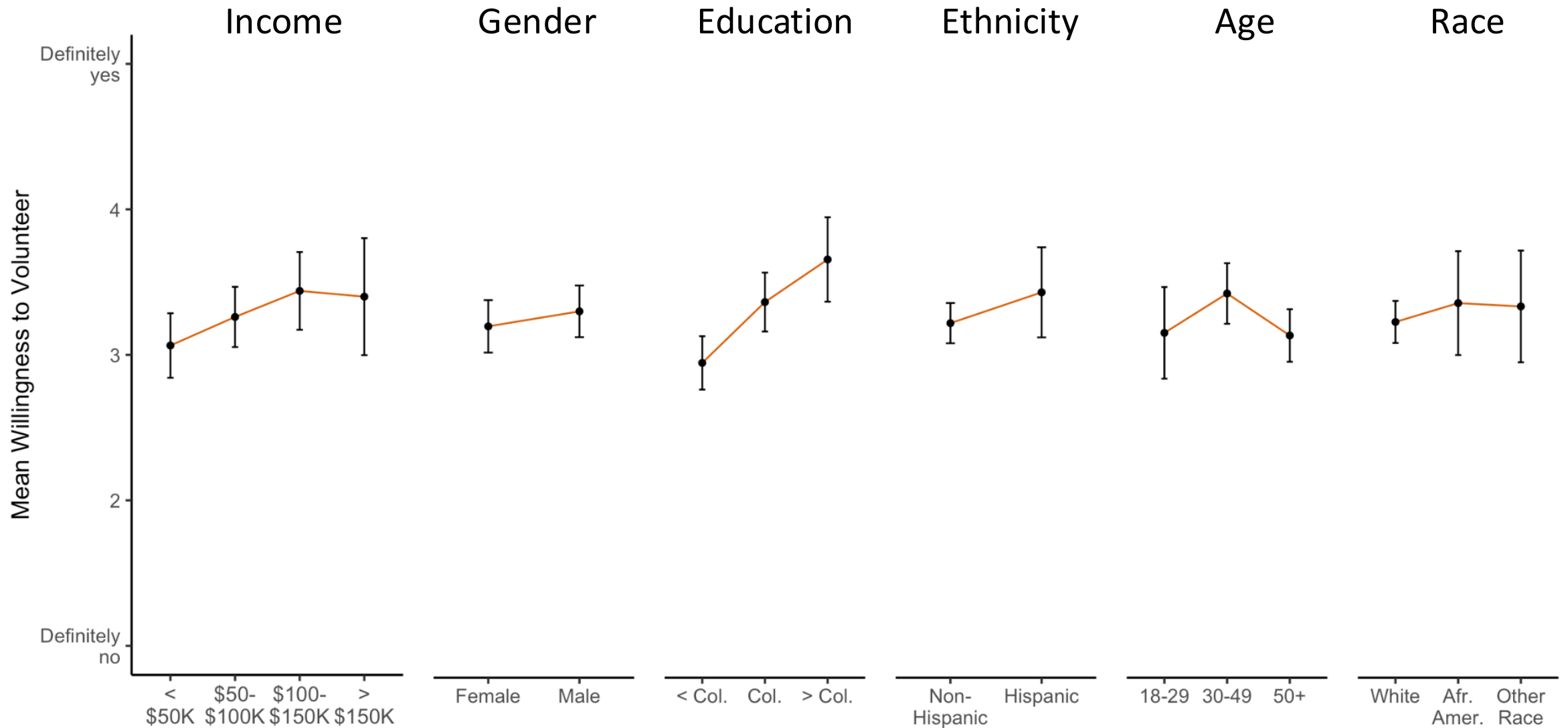
# Used Nuclear Fuel Storage Facility



# Carbon Capture and Storage Facility



# Large-Scale Energy Facility



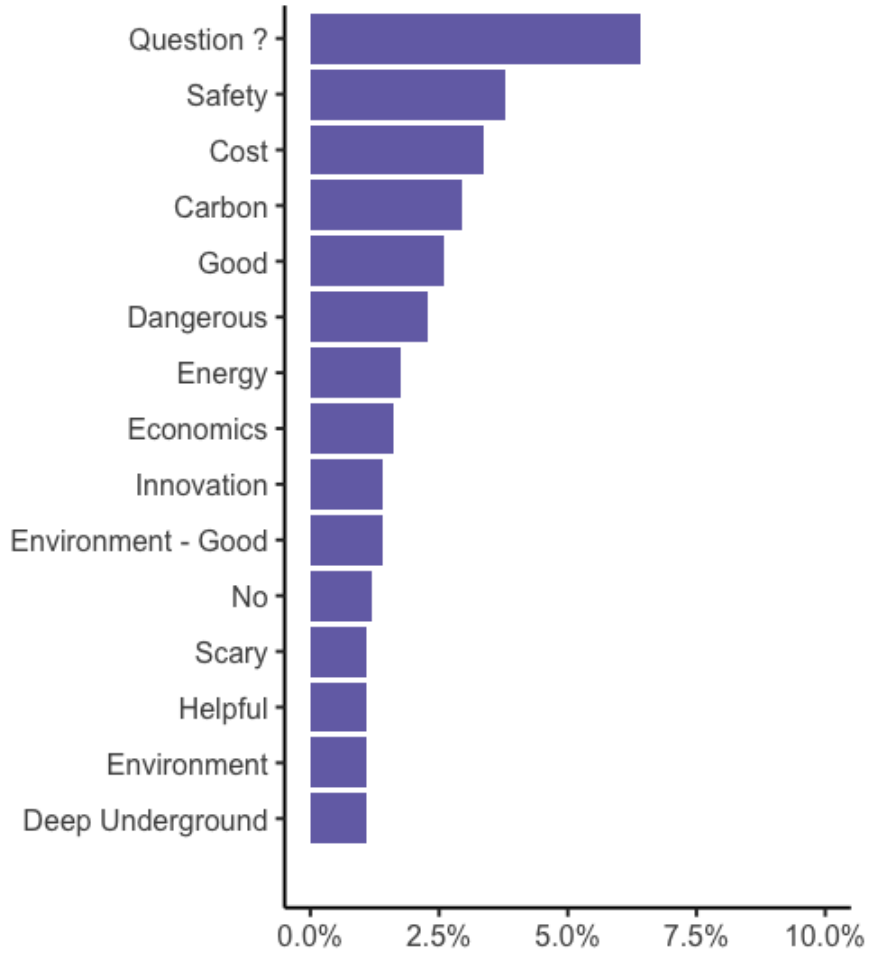




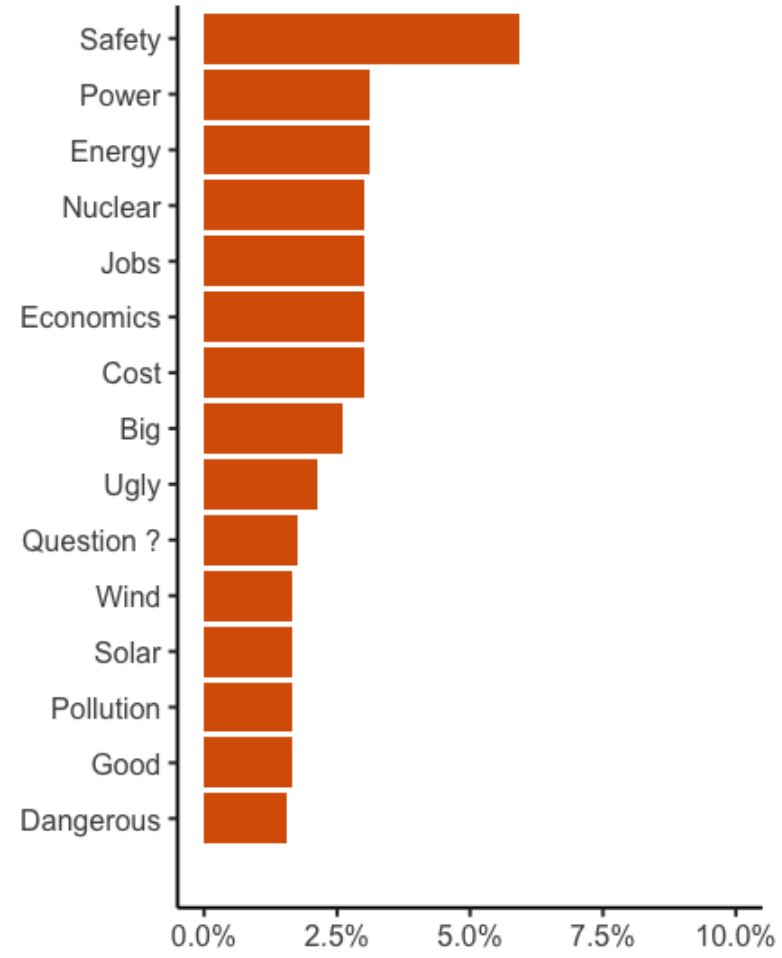
How do people perceive  
different facilities?

# Can you tell us the first three words or phrases that come to you when you think about a [facility]?

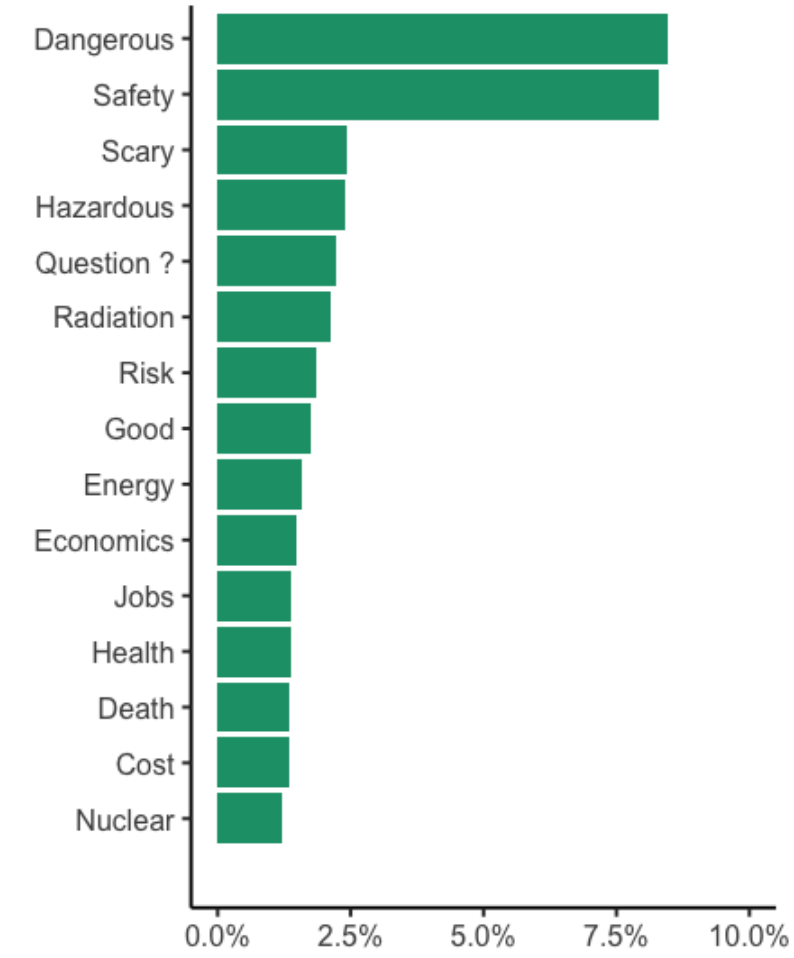
### Carbon Capture Storage Facility



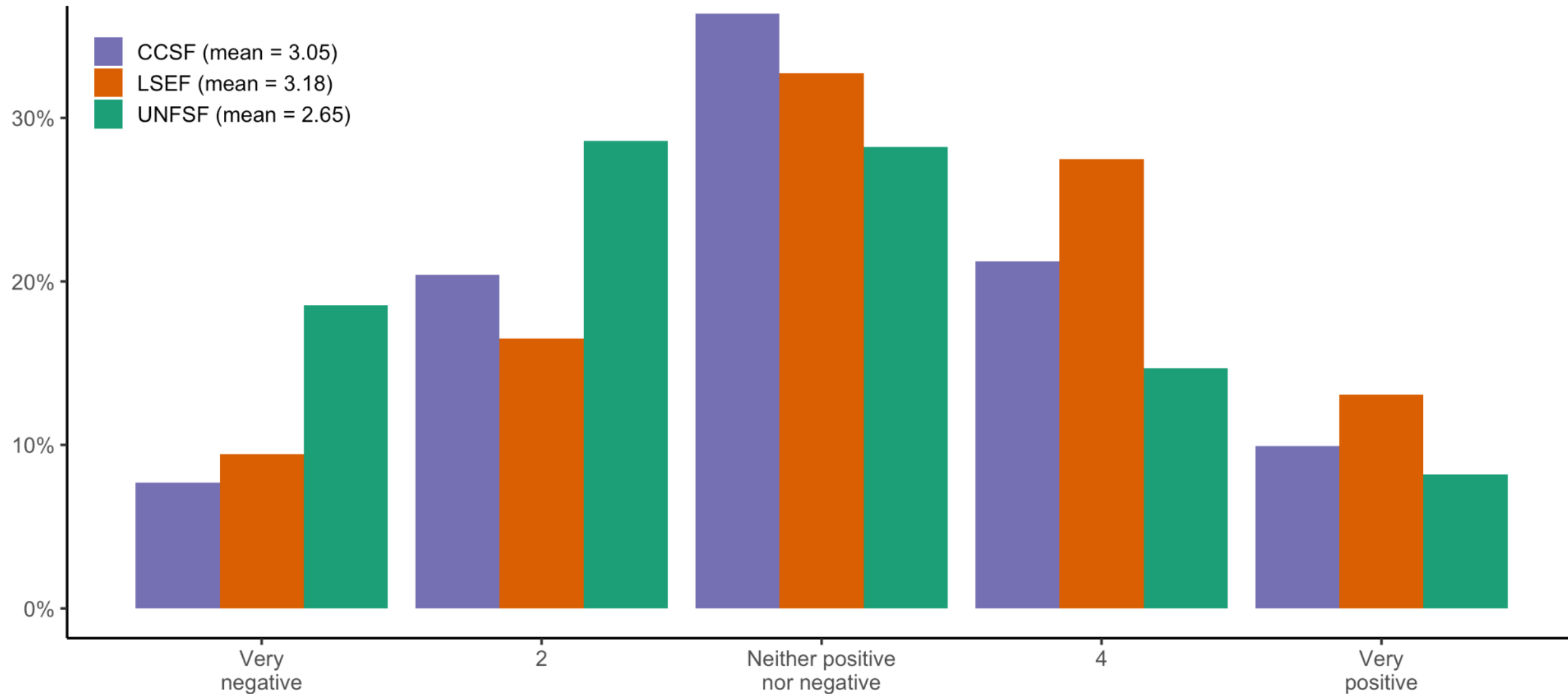
### Large-Scale Energy Facility



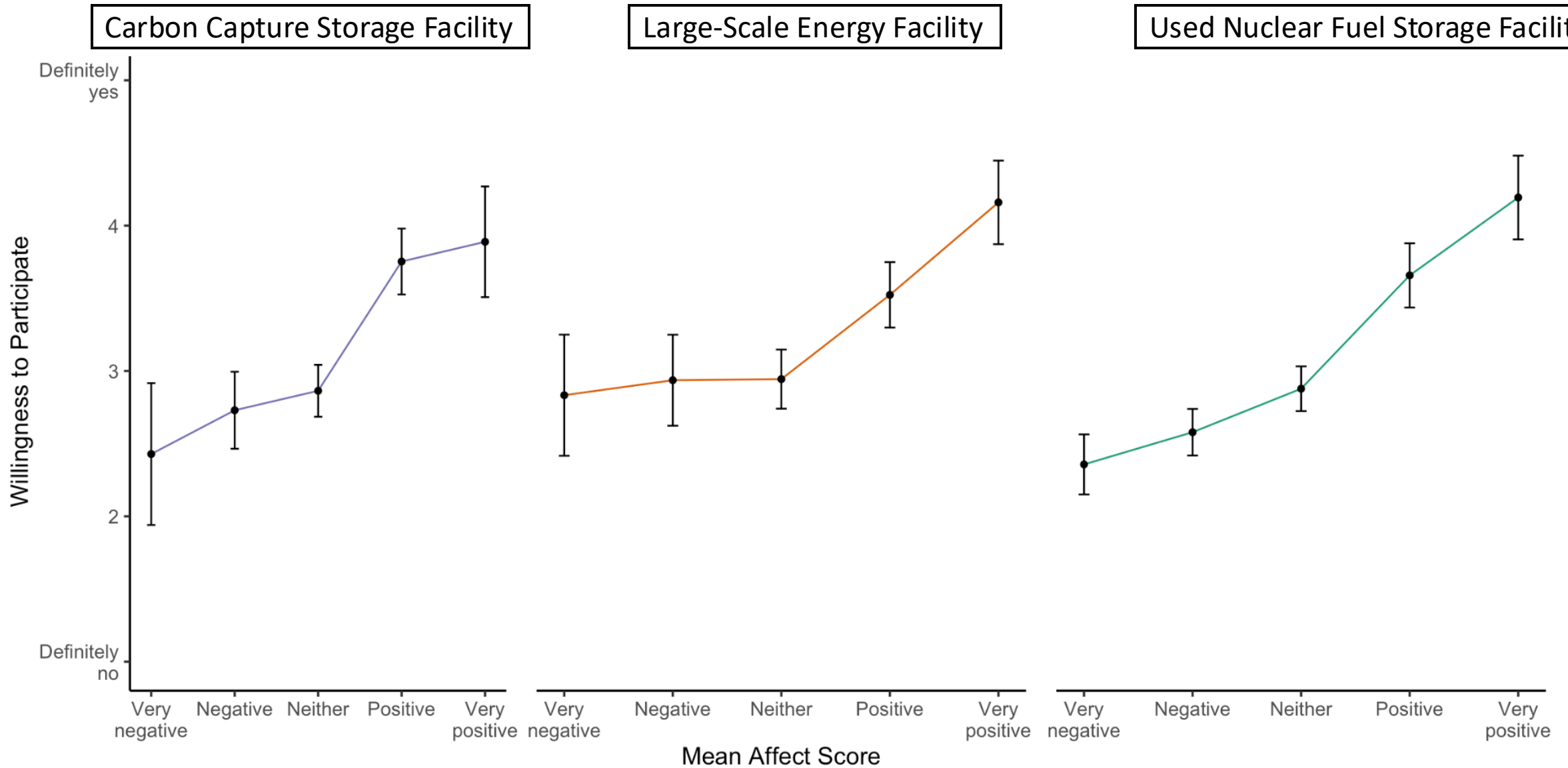
### Used Nuclear Fuel Storage Facility



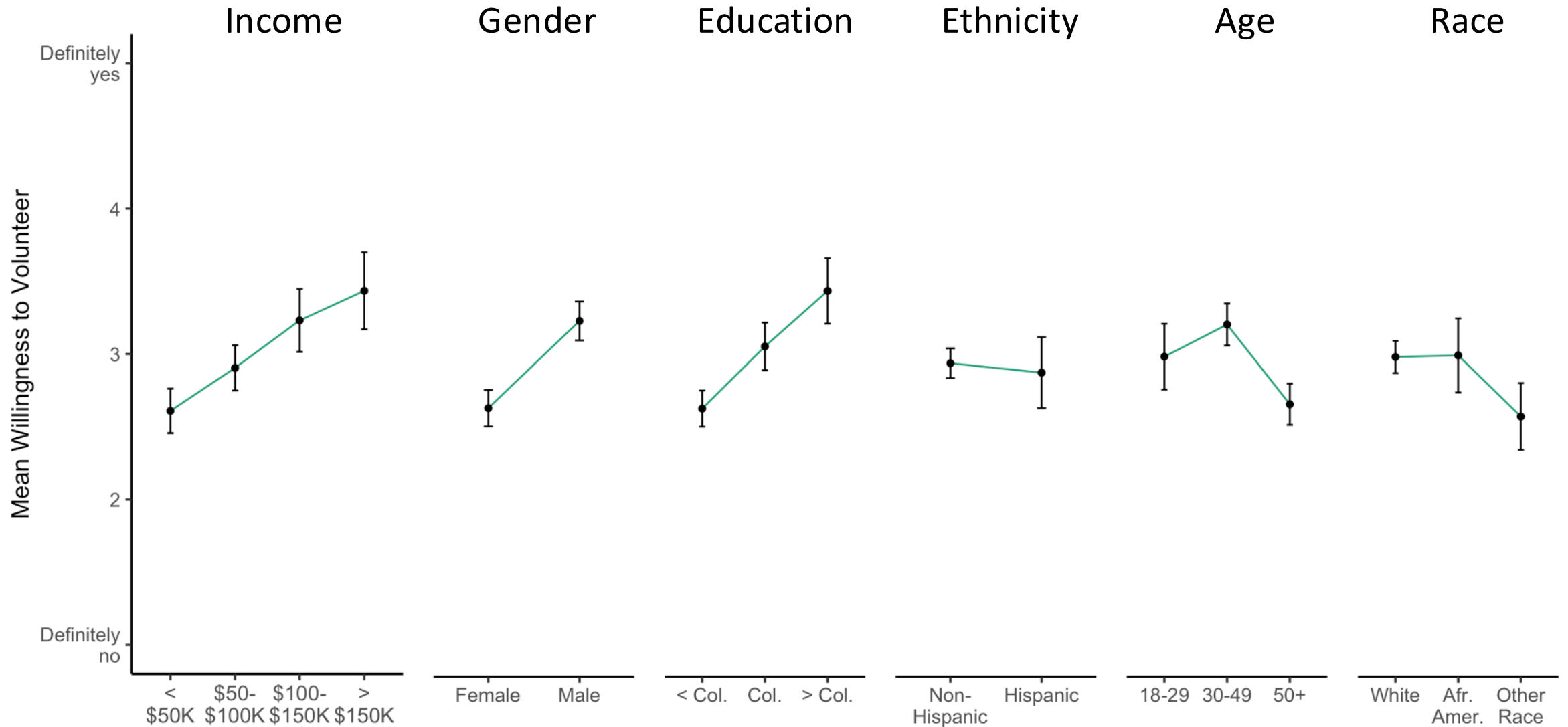
# When you think about this word or phrase, do you have positive or negative feelings?



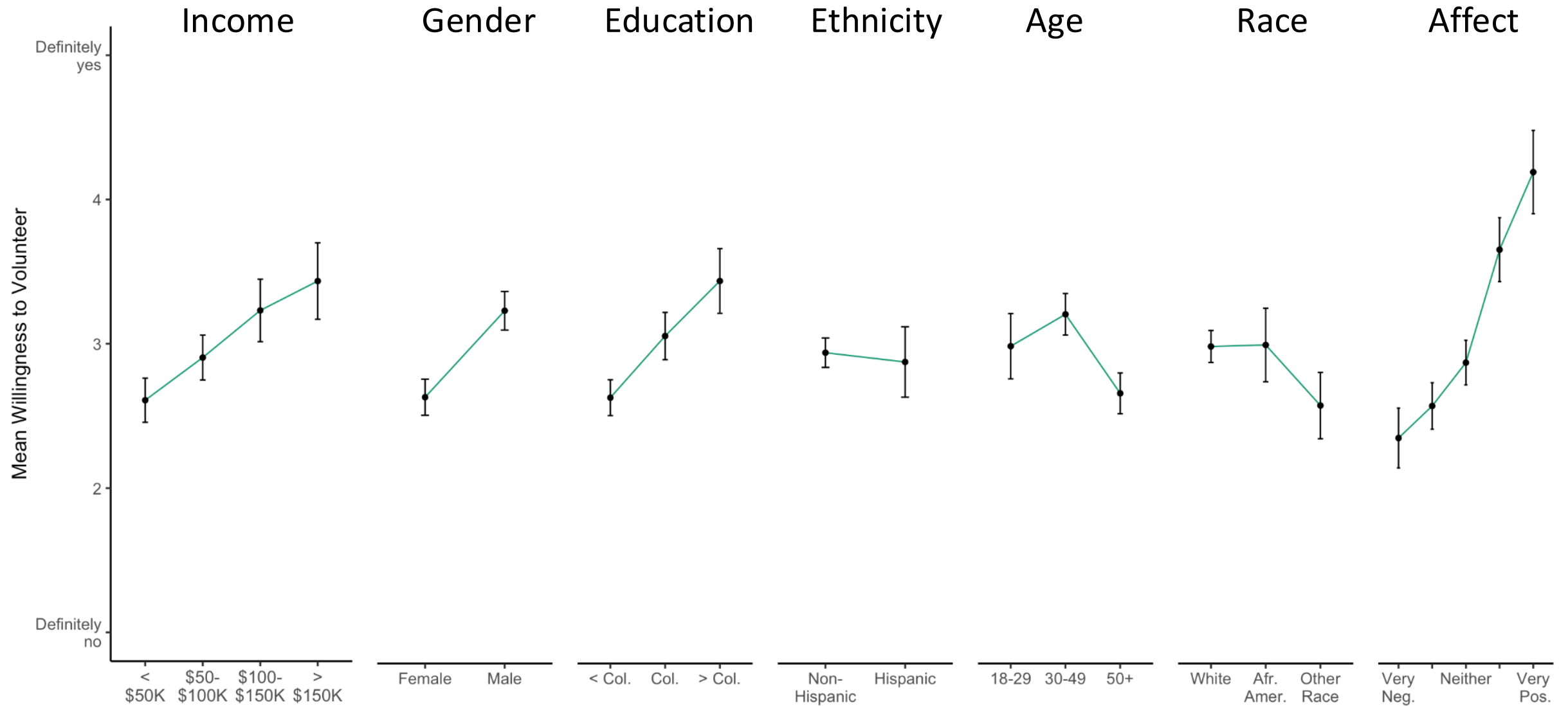
# How do emotions influence willingness to participate?



# Used Nuclear Fuel Storage Facility

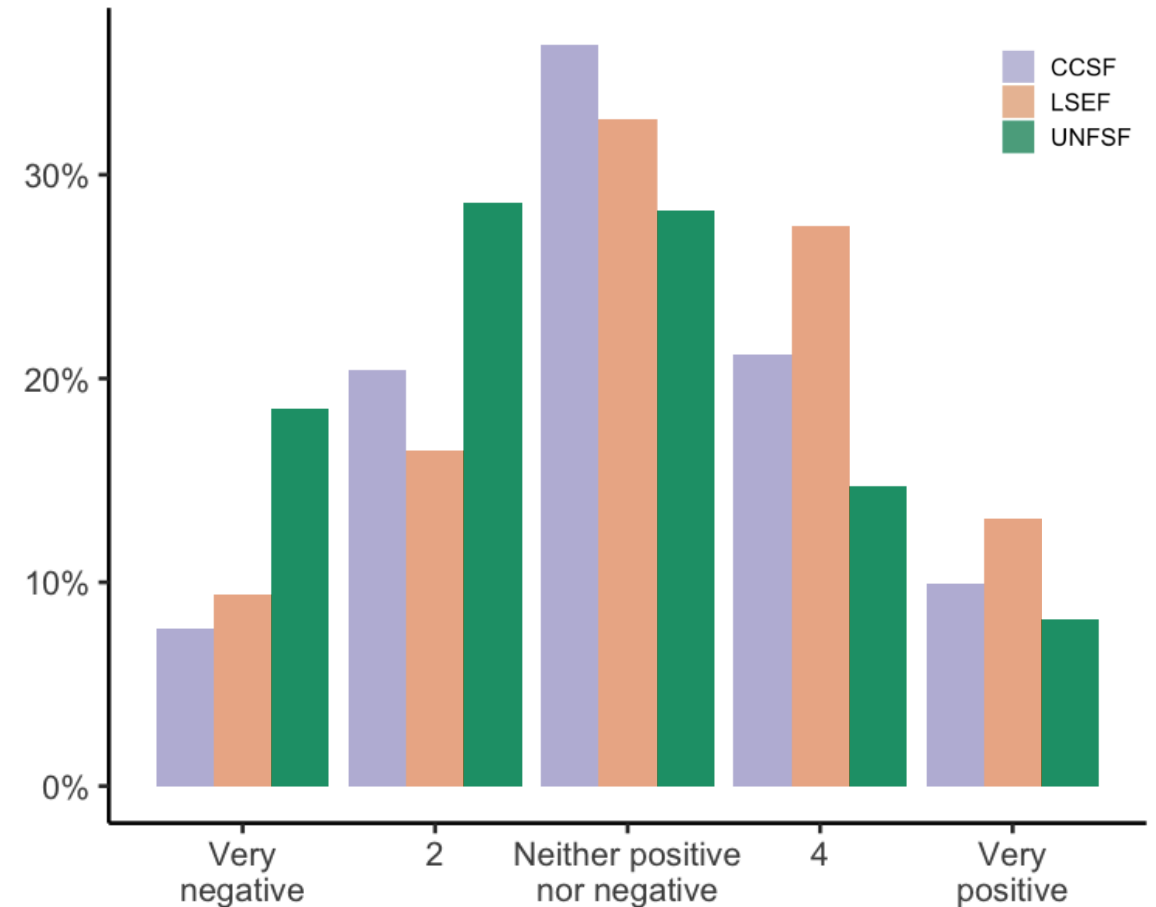


# Used Nuclear Fuel Storage Facility



# Results of National Survey

- Identified that there is overall willingness to participate in the co-design process.
  - Used Nuclear Fuel Storage Facilities are unique compared to the other two facilities.
- Some people may be more willing to participate than others.
- Also found that people with positive notions about the facility were much more willing to volunteer than those who had negative ones.





Do subject matter experts want  
to participate?



# SME Workshop

- **Mode:** Facilitated Discussion
- **Dates:** November 2 & 3, 2023 & April 18 & 19, 2024
- **Location:** Ann Arbor, Michigan & Madison, Wisconsin
- **Sample:** 26 people with a broad range of subject matter expertise of relevance to energy facility siting
- **Goal:** Identify areas for variation in design attributes and develop framework for assessing feasibility of these variable attributes

General area of expertise	# of participants
Nuclear technologists	11
Intermediaries	9
Project planners	3
Program designers	3

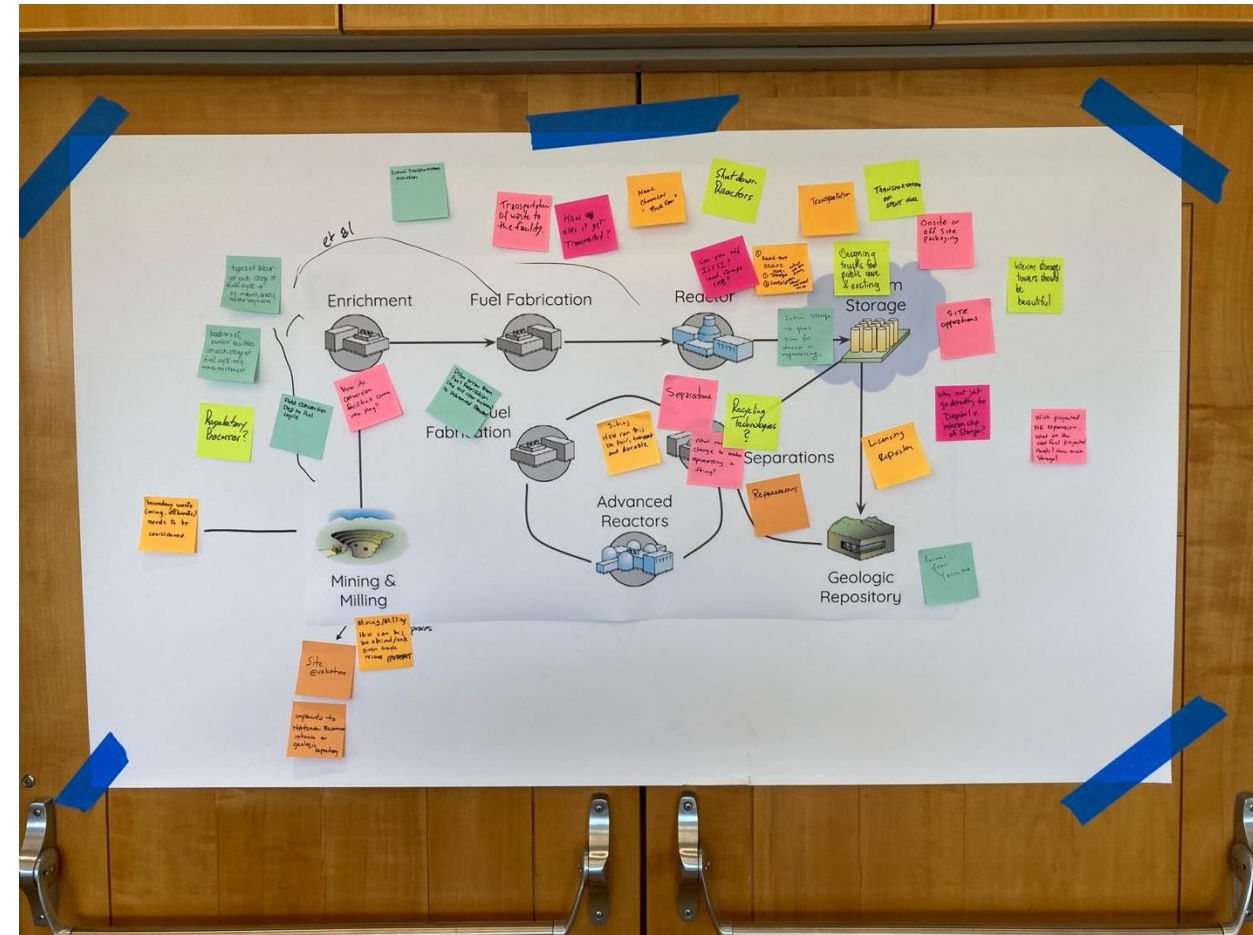
# SME Workshop

- Ann Arbor: Identify areas in the facility and program where there is potential for variability in design.
  - Facility Design, Process, Management, Etc.
- Madison: Build upon earlier workshop findings, develop a method of evaluating the design ideas of community members.
  - Not all ideas may be feasible/practical, How to determine that?



# SME Workshop

- Establish a foundation in shared professional values
- Discuss history of facility siting and lessons learned, challenges of participatory design
- Challenge SMEs to imagine how to integrate communities
- Structured participation based on established principles allowing SMEs to be more creative and consider the value of community participation
- Engage with SMEs to understand their views about the co-design process



# SME Workshop (Ann Arbor)

The participants took part in a professional value selection activity

Ann Arbor: Focus on Individual Professional Values

Madison: Focus on Shared Professional Values

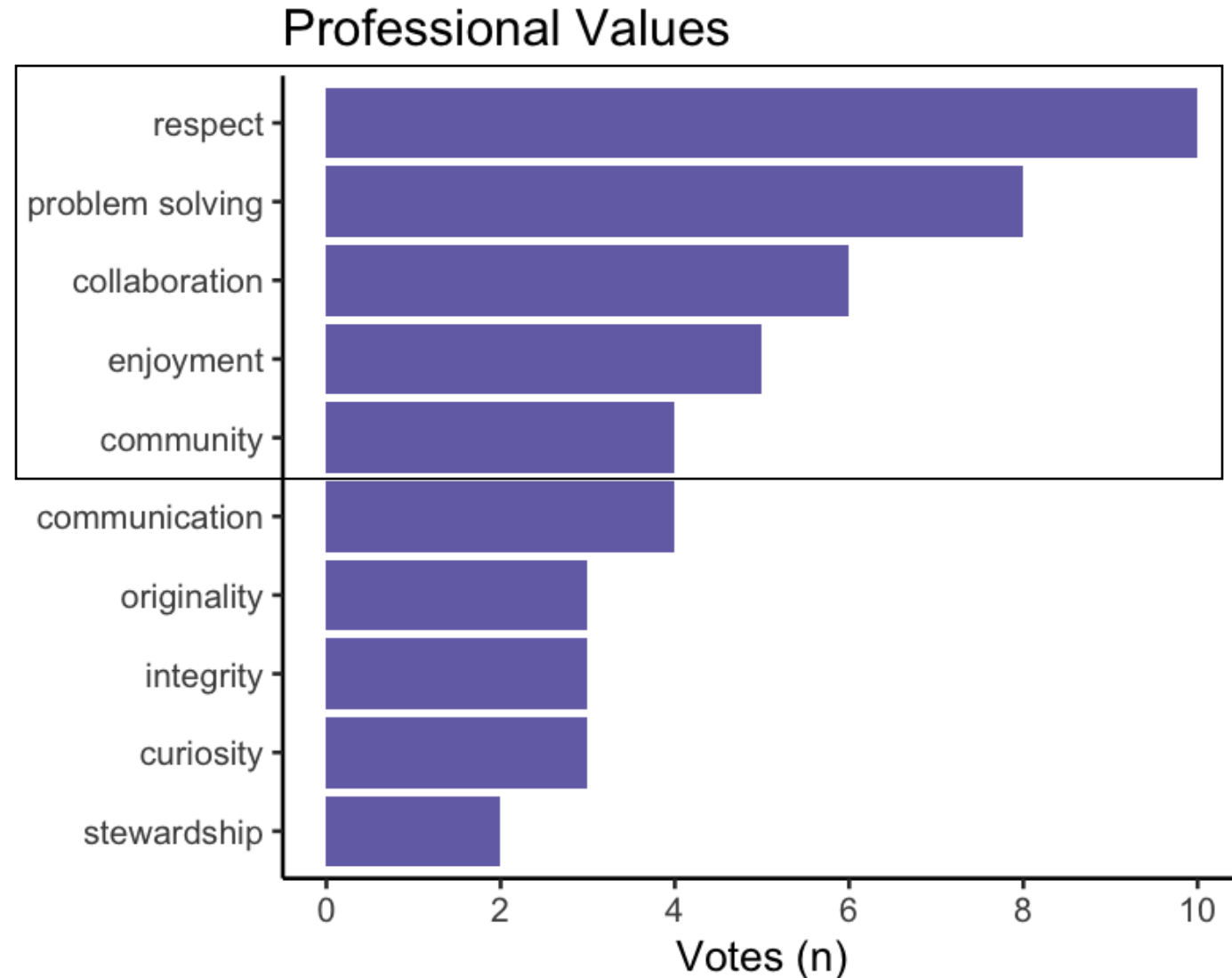


# SME Workshop (Madison)

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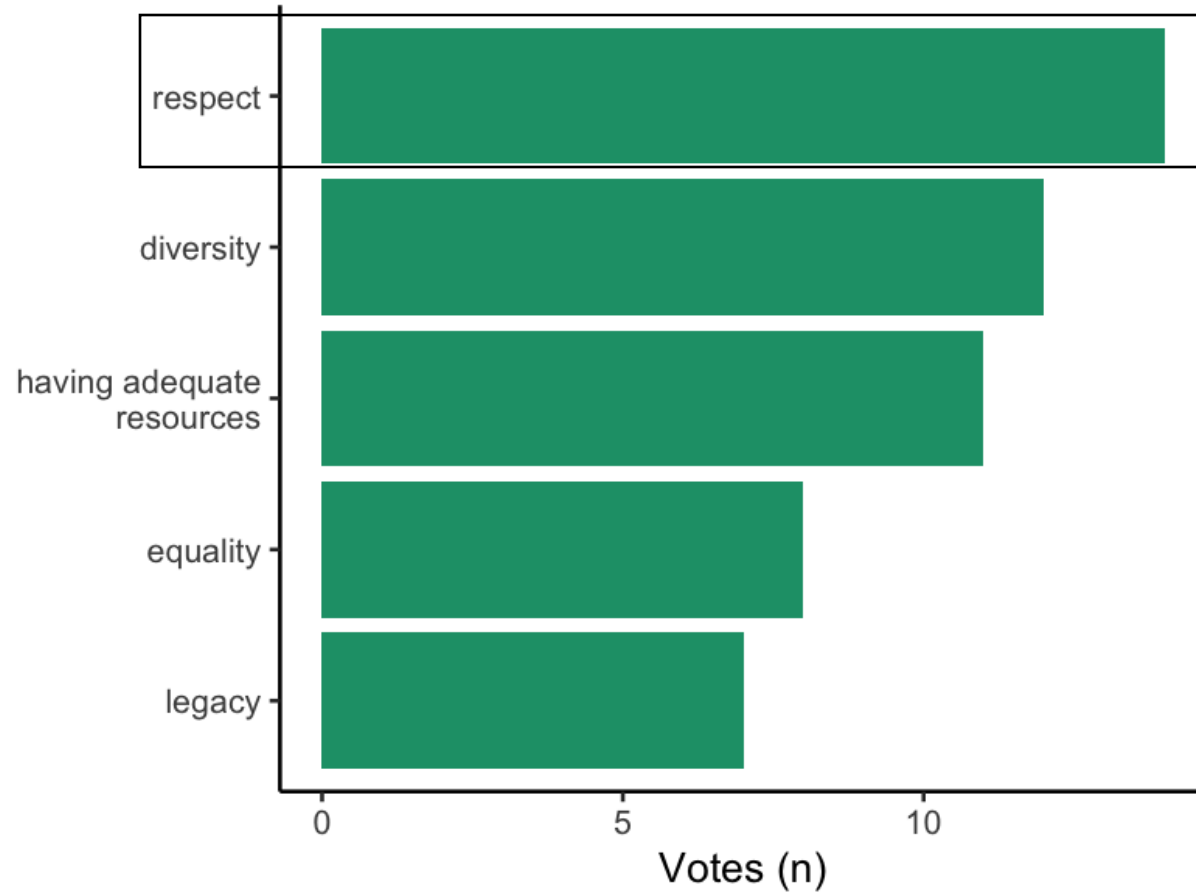
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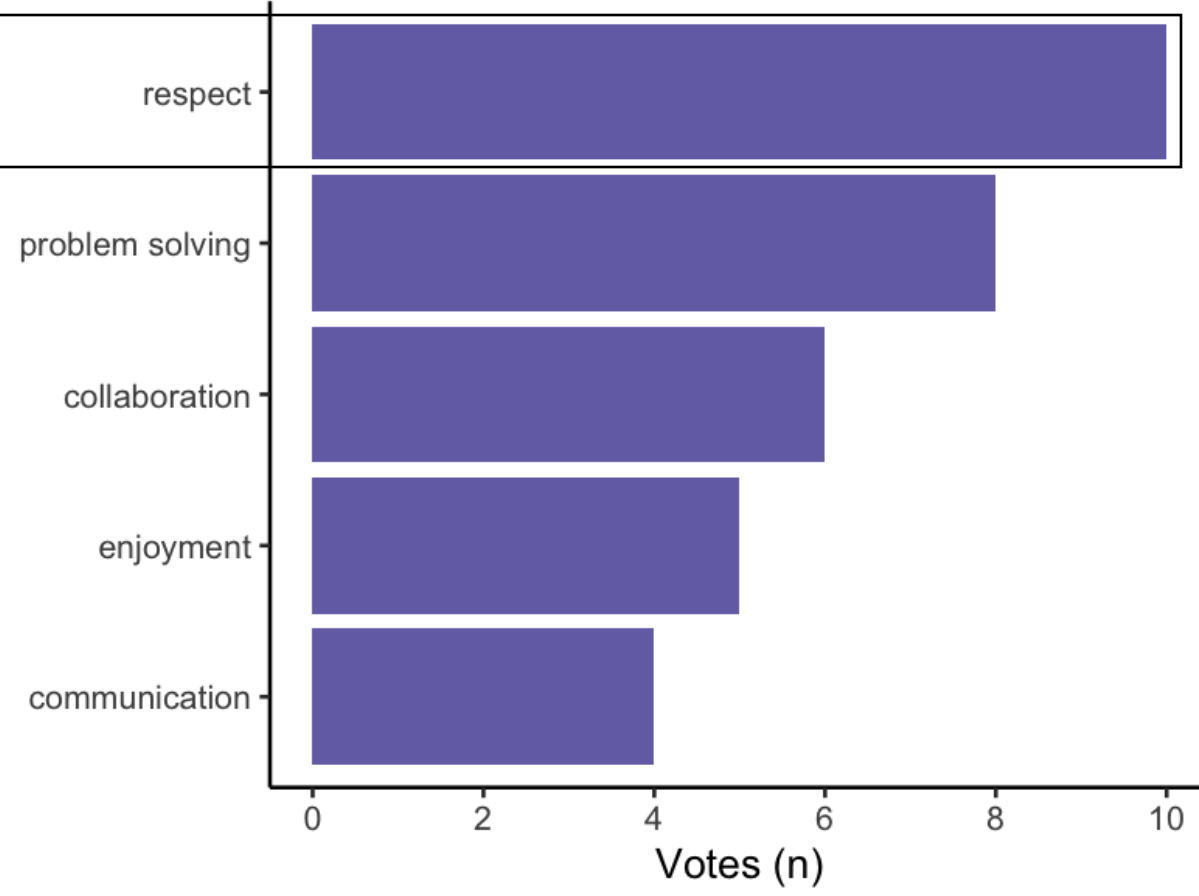



# Community & Professional Values

## Community Values



## Professional Values





What happens when we bring  
community members and  
SMEs together?

# Co-Design Forum

## Recently concluded

- September 26 – 27, 2024
- Norman, Oklahoma
- Brought together both SMEs (6) and Community members (16) from the previous workshops
- Provide a space for knowledge and value sharing between the two groups
- Develop a hypothetical preliminary design for an interim storage facility, integrating ideas from both the SMEs and Community members







What's next for the project?



Community Design Workshop

Public Design Survey

SME Design Workshops

Co-Design Forum

Mentorship and Training

Public Referendum Survey

Research Activities

# Thank you!

Will Livingston

