Article

Climate Change Skeptics' Environmental Concerns and Support for Clean Energy Policy: A Case Study of the US Pacific Northwest

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Abstract: Resistance to clean energy policy in the United States stems partly from public hesitancy and skepticism toward anthropogenic climate change. This article examines self-declared climate change skeptics' views of clean energy policy along a continuum of skeptical thought, spanning from *epistemic denial* to *attribution doubt*. To perform this, we use data from an online survey administered in the US Pacific Northwest and a series of pilot interviews conducted with skeptics in the same region. Results reveal that skeptics' support for clean energy policy is consistently linked with their environmental concern across the skepticism continuum. Conspiracy ideation and distrust in science lead to a reduction in support. However, the positive effect of environmental concern trumps the effects of these beliefs. Important and hopeful implications of these findings for climate change communication and policy are discussed.

Keywords: climate change; climate change skepticism; energy; energy policy; climate policy; clean energy

1. Introduction

In 2021, 36% of American energy use came from petroleum. Thirty-two percent was sourced from natural gas, 11% from coal, and 8% from nuclear energy. The remaining 12% was produced using renewable sources. Of those, the largest source was wind (27%), followed by biofuels and hydroelectricity (19%), wood (17%), solar (12%), biomass waste (4%), and geothermal energy (2%) [1].

Responsible for nearly two-thirds of global greenhouse gas (GHG) emissions, the energy sector is a significant contributor to the climate crisis. However, the US Energy Information Administration predicts energy-related US produced GHG emissions to drop only 2% by 2050 [2]. Globally, production is still predicted to rise [2]. This offers little hope for solving the climate crisis.

Unsurprisingly, the United Nations sees energy "at the heart of the climate challenge—and key to the solution" [3]. In the lead-up to the 2022 United Nations Climate Change Conference (COP27), the Biden Administration announced an energy plan intended to incentivize investment in renewable energy. This plan includes USD 100 billion for the production of electric vehicles and batteries and continued efforts to triple domestic solar generation (to 22.5 gigawatts by 2024) [4]. Legislation was also passed to expand funding for the National Oceanic and Atmospheric Administration (NOAA) and the Department of Energy (DOE) as part of a large climate bill, the Inflation Reduction Act, which promises over USD 350 billion in investments for fighting climate change by cutting US GHG emissions by up to 40% of 2005 levels [5].

Public opinion on various aspects of the Biden plan varies widely. While there is bipartisan support for one aspect, widely planting trees to capture carbon (91% of Democrats, 89% of Republicans), there are significant partisan divides on nearly everything else. Ninety percent of Democrats support requiring power companies to use more renewable energy vs. 49% of Republicans. Similarly, 48% of Democrats support incentives for the use of electric vehicles, but only 46% of Republicans do [6].

In part, the Republican resistance to clean energy policy may be due to the heightened number of climate change skeptics within the Republican party. According to the Pew

Research Center, while 88% of Democrats see climate change as a major threat to the United States, only 31% of Republicans do [7]. Further, even though only 14% of Americans do not believe that the climate is changing (and 30% do not believe that any change is caused by human behavior), the US political system is driven substantially by the views of skeptics. Indeed, 109 congressional representatives and 30 US senators continue to deny the veracity of the climate crisis—all of them Republican [8]. This represents a majority of GOP representatives (52% of House Republicans and 50% of Senate Republicans).

Given the disproportionate control that climate change skeptics have on the political system and the urgent need for radical, bipartisan climate action, it is important to assess and understand what energy-related policies climate change skeptics support. In our previous work, we have demonstrated that climate change skeptics are not wholly resistant to pro-environmental policy but, rather, there is a significant gap in support between those who believe that climate change is an orchestrated conspiracy and those who are skeptical for other reasons [9]. For example, while only 29% of skeptics who believe climate change is a hoax support investment in wind farms, 62.4% of those who do not support this investment. Skeptics who do not see climate change as an orchestrated conspiracy are also more likely to support investment in solar farms (61%), expansion of hydroelectric dams (51.6%), tax rebates for consumers who install renewable energy systems (64.7%), and tax breaks for the production of energy-efficient vehicles (54.6%). In this paper, we expand our earlier analysis to look at specific correlates of clean energy policy among skeptics.

Our survey data reveal that skeptics' clean energy policy views are consistently associated with a higher level of environmental concern across a continuum of skepticism—from *epistemic denial* to *attribution doubt*. As expected, conspiracy ideation and distrust in science led to a reduction in support for clean energy policy. However, the positive effect of environmental concern trumps the effects of these two beliefs. The nuances of these perspectives are illustrated using four case studies from our initial pilot interviews with self-identified skeptics.

1.1. Climate Change Skepticism

Early research on climate change skepticism demonstrates the importance of individual-level, demographic factors on the phenomenon. Scholars find that people who are politically conservative, men, and those who are more religious and less environmentally minded are disproportionately more likely to be skeptical about climate change [10]. Of these factors, political conservativism emerges as the most significant predictor of skepticism [10].

Certain psychological traits also correlate with skepticism. Research suggests that people are driven to information aversion in the face of social problems that cause significant "psychological discomfort" [11]. Climate change is particularly ripe for information avoidance in that it is a complex problem over which individuals have little influence. Even in situations in which people do not intentionally avoid thinking about climate change, the topic may influence other psychological traps in that it is seen as "temporally distant" [12] or a lower priority than other social or environmental problems.

Existing scholarship demonstrates that climate change skepticism is a complicated ideological system with a variety of drivers and manifestations. For example, in examining the foundational perspectives of climate change skepticism, we find that there are three core frameworks that drive skepticism: the belief that climate change is a hoax, a profound distrust of science, and religious ideation (specifically the beliefs that climate change is God's will and/or that climate disasters are a sign of the end times as described in the Bible) [13].

These foundational frameworks may shape the perceptions skeptics develop with regard to the climate crisis. To date, scholars have found different patterns in skepticism, such as Rahmstorf's typology. Rahmstorf divides skeptics by "type" based on their perception of the crisis. He identifies three such groupings: trend skeptics—those who deny the climate is changing; attribution skeptics—those who accept that the climate is changing but deny that humans play a role; and impact skeptics—those who believe climate change is

happening and that it is human-caused but deny that it will have a significant impact on human populations [14]. Scholars have subsequently identified a fourth group, consensus skeptics—those who reject or deny the scientific consensus on this issue [10].

More recently, scholars have pointed to the role identity salience plays in the strength of one's conviction as a skeptic. For example, in prior research, we have conceptualized climate change skepticism as a continuum—from those who fervently deny the existence of climate change (epistemic denial) to those who recognize its occurrence but hold doubts about whether or not it is human-caused (attribution doubt). Epistemic doubt (those who are unsure that climate change is happening and that it is human-caused) and attribution denial (those who believe that it is happening but reject its human causes) represent points along the continuum, between epistemic denial and attribution doubt. Evidence suggests that the strength of one's identity as a skeptic strongly correlates with views surrounding the environment, trust, conspiracy ideation, religious ideation, and engagement with media, and even emotions skeptics may have experienced with regard to these topics [13].

Beyond the conceptual complexity of climate change skepticism, recent scholarship has pointed to the presence of some pro-environmental views among some skeptics. For instance, skeptics express concern about pollution and habitat loss and they support some renewable energy. Further, skeptics who have had negative environmental experiences are more likely to hold pro-environmental views [15].

1.2. Predictors of Support for Energy Policy

Despite the clear connection between energy use and climate change, scholars have found a wider selection of factors that shape one's position on energy policy, including and beyond opinion on climate change [16]. Of primary importance may be the perceived impact on the economics in a given region. For example, Olson-Hazbon and colleagues find that energy policy positions may be influenced significantly by economic benefits and the changes made to a given landscape [16]. Olson-Hazboun, Howe, and Leiserowitz also found that proximity to gas production and mining sites decreases support for renewal energy policy, suggesting that such initiatives may be viewed as an economic threat to individuals or the region [17]. Along similar lines, Greenberg found that being employed by the coal industry or having higher trust in the coal industry leads to decreasing concern about negative environmental effects among residents in Appalachia [18].

At the individual level, Olson-Hazboun and colleagues find that acceptance of climate science, political liberalism, gender (women), and education (more) increase support for pro-environmental energy policies [17]. Hsu finds that communities with well-educated populations with pro-environmental views are more likely than others to pass solar permitting processes which is, in turn, associated with an increase in residential solar use [19].

In a longitudinal study, scholars Bergquist, Konisky, and Kotcher find that generally, in the United States, there is both strong and consistent support for policies that promote renewable energy and environmental protections. The primary predictor of such support, however, is political party, wherein Democrats support such policies more than Republicans. Support decreases among both political parties when costs associated with such policies are highlighted [20].

Extant scholarship tells us, then, that the very factors that make one more likely to be skeptical about climate change are also those that make one less likely to support policies regarding energy conservation and/or investment in renewable energy systems. It also tells us, however, that skepticism is not uniform and that skeptics hold a surprising number of pro-environmental views. This suggests, then, that understanding the nuances and complexities of skeptic positions on energy could have important implications for energy policy development and deployment.

The current study assesses the relationship between climate change skepticism and support for clean energy policy that would help mitigate climate change. We hypothesize the following to be associated with skeptics' support for clean energy policy—the belief that climate change is a hoax (decrease support), religiosity (decrease support), distrust

in science (decrease support), and environmental concern (increase support). We further hypothesize that, among skeptics, those who deny the existence and human causes of climate change (epistemic deniers) would have the lowest level of support for clean energy policy while those who hold doubts about whether or not climate change is human-caused (attribution doubters) would have the highest level of support, with support corresponding to the strength and salience of one's skeptic identity.

2. Materials and Methods

The data for this study come from an online survey of adults in the US Pacific Northwest (Idaho, Oregon, Washington), built using insights from a previous pilot project, which consisted of in-depth interviews with a sample of self-identified climate change skeptics in Idaho. The survey and interview protocols were both approved by the University of Idaho Institutional Review Board prior to data collection. Both the survey and interview procedures are summarized below. The methodologies are described in greater detail in a previous publication [13].

2.1. Online Survey

In late 2019/early 2020, we recruited the services of an online panel survey company, Qualtrics, to administer a survey to adults over 18 years of age living in Idaho, Oregon, and Washington. The quota sample gathered (N = 1000) is representative of US census breakdowns for gender and education. To select survey respondents who are skeptical of climate change, two screening questions were used: (1) "climate change is happening" and (2) and "climate change is caused by human activities" (yes = 1; no = 2; not sure = 3). Responses were gathered from only those who expressed doubt or denial about the physical realities and/or human causes of climate change by filtering out those who responded "yes" and "yes" to both screening questions. Of the 1000 responses collected, 988 responses were used in this project, and we were able to verify geographic location based on longitude/latitude coordinates, place names, and zip codes.

In the survey sample, 49% of respondents identified as men, 49.9% as women, and 1.1 selected the "other" category. We recoded gender into a dichotomous variable: men = 1 and women/other = 0. The sample was overwhelmingly white (89%). As such, we recoded race to white = 1 vs. other = 0. We collected education data by the highest degree earned: less than high school diploma or equivalent = 1 to doctoral degree = 8. Approximately 12% of our sample had less than a high school level of education, followed by 19% with a high school diploma, 22% with some college, and the rest with associate or higher degrees. Twenty percent of respondents had a bachelor's degree. Political ideology was measured on a scale from very liberal = 1 to very conservative = 7. While 42.4% of the sample identified as politically moderate, 15.5% identified as liberal/lean liberal and 42.2% as conservative/lean conservative. The mean age of the sample was 4.54 on a scale of 18–19 = 1 to 80 or older = 8. Of the sample, 24.7% agreed with the statement "climate change is a hoax." We measured religiosity by asking respondents how often they attend religious services, with response categories ranging from never = 1 to more than once a week = 7. While 41.6% of our sample selected "never" in response to this question, 17.2% selected "every week" and 7.3% selected "more than once a week".

In addition to the demographic controls described above (i.e., age, gender, education, political ideology, and race), our statistical models employ several theoretically informed correlates of climate change skepticism. Specifically, we measure *conspiracy ideation* using the question "climate change is a hoax" (yes = 1 and no/not sure = 0). *Religiosity* measures the frequency of religious service attendance as described above. *Distrust in science* is a previously validated and published scale that assesses skeptics' distrust in climate science and scientists. Higher values on this scale indicate higher levels of distrust [21]. Lastly, *environmental concern* is a validated 16-item scale measuring skeptics' concern for important environmental issues (e.g., coral bleaching, sea level rise, heat waves, forest fires, deforestation, air pollution) (see scale items and descriptive statistics in Table S1).

The main outcome measure is a composite scale for skeptics' *support for clean energy policy*. This six-item scale measures average support for investments in solar and wind power, tax rebates for installing renewable energy at home, tax breaks for energy-efficient vehicles, regulation of fuel efficiency standards, coal taxes, and cap and trade initiatives for reducing carbon emissions (see Table 1 for specific item wordings and descriptive statistics). The survey question asked "To what degree do you support the following initiatives?" with responses ranging from not at all = 1 to a great deal = 7. The composite scale indicated adequate internal consistency with a Cronbach's alpha value of 0.87. Higher values on the scale indicate more support for clean energy policy.

Table 1. Support for energy policies by level of skepticism: mean, standard deviation, ANOVA significance. Survey question: To what degree do you support the following initiatives? Not at all = 1 to a great deal = 7 (Cronbach's α = 0.87).

Energy Policy	Full Sample (*n* = 988)	Epistemic Denier (*n* = 179)	Epistemic Doubter (*n* = 222)	Attribution Denier (*n* = 176)	Attribution Doubter (*n* = 335)	ANOVA Sig.
Investment in solar panel farms	4.14 (2.34)	3.37 (2.38)	3.69 (2.43)	4.33 (2.18)	4.79 (2.19)	*p* < 0.000
Investment in wind turbine farms	4.13 (2.33)	3.14 (2.26)	3.85 (2.37)	4.21 (2.30)	4.91 (2.12)	*p* < 0.000
Tax rebates for installing renewable energy at home	4.42 (2.28)	4.08 (2.25)	4.72 (2.40)	4.78 (2.13)	4.88 (2.21)	*p* < 0.000
Investment in nuclear energy systems	3.59 (2.43)	4.21 (2.42)	2.99 (2.34)	4.11 (2.39)	3.39 (2.43)	*p* < 0.000
Expansion of hydroelectric dams	4.04 (2.36)	3.93 (2.36)	3.33 (2.41)	4.74 (2.20)	4.26 (2.31)	*p* < 0.000
Expanding fracking for natural gas	3.19 (2.42)	3.97 (2.59)	2.67 (2.25)	3.87 (2.46)	2.76 (2.25)	*p* < 0.000
Expanding offshore drilling for oil	3.48 (2.36)	4.32 (2.43)	2.77 (2.24)	4.27 (2.27)	3.05 (2.18)	*p* < 0.000
Tax breaks for the production of energy-efficient vehicles	3.87 (2.31)	3.21 (2.17)	3.39 (2.36)	4.22 (2.28)	4.39 (2.25)	*p* < 0.000
Government regulation for fuel efficiency standards in new cars	3.81 (2.27)	3.06 (2.17)	3.46 (2.42)	3.95 (2.17)	4.44 (2.19)	*p* < 0.000
Expanding US high-speed rail	3.73 (2.39)	3.48 (2.35)	3.36 (2.46)	3.91 (2.31)	4.11 (2.39)	*p* < 0.000
Adding taxes to coal energy to make it cost more	2.66 (2.16)	2.23 (1.92)	2.78 (2.28)	2.51 (1.97)	2.98 (2.29)	*p* = 0.001
Cap and trade to limit CO_2 production	2.96 (2.29)	2.38 (2.00)	2.79 (2.29)	2.95 (2.20)	3.48 (2.46)	*p* < 0.000

Items used in the "pro-climate energy policy" scale are denoted in italics.

Given our interest in understanding the nuances of skeptic positions on energy policy, the analysis considers the energy attitudes of skeptics along with the strength of skeptic identity. To perform this, as described above, we treat skepticism along 4 points of a continuum: epistemic denial, epistemic doubt, attribution denial, and attribution doubt.

The analysis begins with using ANOVA to examine skeptics' energy policy support across this continuum. It then uses a series of multivariate OLS regression models to examine correlates of support for clean energy policy among skeptics, first for the full sample and second across the four skeptic groups as described in the preceding paragraphs. Prior to running the regression models, regression diagnostics were conducted using IBM SPSS version 24. All analysis was performed in IBM SPSS version 24.

2.2. In-Depth Interviews

Pilot interviews were conducted during the two years preceding the survey (mid-2017 to mid-2018). In total, our research team conducted 33 in-depth interviews with self-identified climate change skeptics who responded to fliers in grocery stores in Idaho

and Facebook marketplace ads, which specifically recruited participants by asking "Are you skeptical of climate change?". Of the final self-selected sample, 17 came from southern Idaho, 15 from northern Idaho, and 1 from Washington, just across the border. Nine participants were women, while the rest were men. All of our participants except one identified as white. Of those participants who revealed their education information, two had advanced degrees, eleven had finished college, six had some college, and one did not go to college.

To analyze the qualitative data, we first transcribed all of the interviews verbatim and imported the data to NVivo (Version 12), a qualitative data analysis software package. We read the transcriptions carefully and developed a codebook. We then selected one interview at random and coded it independently. Subsequently, we met in person and discussed our codes, payed attention to any discrepancies, resolved them, and made adjustments to the codebook. We then coded five additional interviews independently, again using the same procedure to resolve discrepancies. After verifying intercoder reliability using NVivo code comparison (having reached 95% agreement across all codes), the remaining interviews were coded separately. The results presented below first use survey data to identify correlates of skeptics' energy policy views. We then use interview data to elaborate on some of these views using selected case studies of interview participants.

3. Results

The results section begins with quantitative findings from the surveys. Subsequently, we turn back to qualitative data from the pilot interviews to demonstrate (via four case studies) how energy views differ across a continuum of skepticism. In this way, the interview data allow us to glean what varied policy views may look like "in real life."

3.1. Quantitative Analysis

Table 1 summarizes a series of energy policy initiatives that we asked survey respondents their opinions about. The summary includes mean scores and standard deviations for the full sample as well as the sample divided into four subgroups based on degree of skepticism. The one-way ANOVA results indicate comparisons of means across the four subgroups.

When observing the mean distribution for the full sample, it is evident that more than half of the skeptics in the survey support investments in solar and wind energy, the expansion of hydroelectric dams, and providing tax rebates for installing renewable energy at home. However, among respondents, there was significantly less support for adding taxes to coal energy and for cap and trade initiatives to limit carbon emissions.

Greater nuance in these perceptions becomes evident when these attitudes are examined across the four subgroups. For most clean energy policies, on average, epistemic deniers have the lowest level of support, while attribution doubters have the highest level of support. This is true for solar, wind, tax rebates for renewable energy, tax breaks for energy-efficient vehicles, fuel efficiency regulation, coal tax, and cap and trade initiatives. For these initiatives, the average scores for epistemic doubters and attribution deniers lie in the middle of the continuum.

The opposite effect is seen for energy policies that are not necessarily climate-friendly and when environmental, climate, or socioeconomic benefits are disputed, such as investments in nuclear energy systems. For these, epistemic deniers expressed the highest level of support, including for fracking and offshore drilling.

The scores were less linear in either direction for the remaining policy initiatives, specifically the expansion of hydroelectric dams and high-speed rail. (All mean differences discussed here are statistically significant).

Table 2 summarizes results from five multivariate OLS regression models for the full sample (model 1) and for the four subsamples along the skepticism continuum (models 2–4). Models 2–4 represent epistemic denier, epistemic doubter, attribution denier, and attribution doubter categories consecutively. We eliminated religiosity as a predictor from models 2–4 as it did not emerge as a significant correlate in a bivariate analysis of these subsamples.

Table 2. Standardized coefficients from multivariate OLS regression models explaining support for clean energy policy.

Predictors	Full Sample	Epistemic Denier	Epistemic Doubter	Attribution Denier	Attribution Doubter
Conspiracy ideation (climate change is a hoax = 1)	−0.03	0.10	−0.06	−0.11	−0.04
Religiosity	0.02	--	--	--	--
Distrust in science	−0.07 *	0.07	−0.07	−0.10	−0.11 *
Environmental concern	0.45 ***	0.50 ***	0.35 ***	0.44 ***	0.37 ***
Age	0.04	−0.12	0.15 *	−0.21 **	0.10
Gender (men = 1)	0.05	0.16 *	0.06	0.11	−0.05
Liberal–conservative ideology	−0.09 **	0.04	−0.13 *	−0.08	−0.04
Education	0.12 ***	0.02	0.12	0.11	0.19 ***
Race (white = 1)	0.06	0.06	0.01	0.06	0.09
N	988	179	222	176	335
F	40.57 ***	9.37 ***	8.62 ***	9.09 ***	11.70 ***
Adjusted R2	0.26	0.27	0.22	0.27	0.20

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

When analyzing the full sample (model 1), all theoretically driven predictors (i.e., conspiracy ideation, religiosity, science distrust, and environmental concern) were included, along with selected demographic controls. In this model, environmental concern emerged as the strongest correlate and was associated with a higher level of clean energy policy support ($\beta = 0.45$, $p < 0.001$). Distrust in science is associated with a lower level of support ($\beta = -0.07$, $p < 0.05$). Conspiracy ideation and religiosity did not emerge as significant correlates. Conservative political ideology is associated with a lower level of support ($\beta = -0.09$, $p < 0.01$), while education increases support ($\beta = 0.12$, $p < 0.001$).

What is most striking for models 2–4 is the prominence of environmental concern in shaping clean energy policy support among different "types" of skeptics. This variable emerges as statistically significant with moderate effect sizes in all four models (β values ranged from 0.35 to 0.50; $p < 0.001$) with the strongest effect size being reported for the epistemic denier category, i.e., those who are the least likely to believe in anthropogenic climate change.

While conspiracy ideation did not emerge as a significant predictor in models 2–4, distrust in science was associated with a lower level of clean energy policy support among attribution doubters. In the few cases where demographic controls had an effect, the effects reflected the expected associations and directions. For example, conservative political ideology was associated with lower support among epistemic doubters, and education was associated with higher support among attribution doubters.

3.2. Qualitative Analysis

Our quantitative findings indicated that support for clean energy policy among climate change skeptics is complicated. The level of skepticism (epistemic denial → attribution doubt) demonstrates the nuanced nature of the associations between skepticism and energy policy views. In this section, we present four case studies from our initial qualitative interviews to further explicate the nuance within skeptics' energy policy views.

As we mentioned, more than half of the skeptics in our sample support investment in renewable energy systems, including wind, solar, and hydroelectric power. However, the strength of this support varies along with the level of their skepticism.

Consider James first (all participant names used are pseudonyms). James is one of several epistemic deniers that we interviewed. James denies that the Earth's climate is

changing and believes that climate change is a hoax. He contends that Al Gore and other elitists are advancing the myth of climate change. As evidence, he points to the hypocrisy of people who speak publicly about climate change. For example, he reflects:

I'll believe it's a crisis when the people who tell me it's a crisis start acting like it is a crisis. So, when people fly—when movie stars fly their private jet airplanes to Switzerland for a climate change conference, that tells me that they don't believe it. Right? If, if they believed it, they wouldn't be living the way they are doing. And, so, when, or when you look at the size of Al Gore's mansion. How many BTUs are involved in heating that puppy?

When asked why Al Gore and others would manufacture this conspiracy, James argues they seek power: "I think the motive is to aggrandize state power. For other people it is to get people to feel guilty so they are more easily manipulable".

James does not trust scientists. He denies the scientific consensus on climate change, saying "the argument that comes up again and again and again, which is 98% of all scientists agree that climate change is the thing. Number 1, they don't. That's the first thing. That's a false claim". He further argues that scientists advance the narrative of climate change to claim fame.

These perspectives drive James to a low level of environmental concern and a rather cynical view of renewable energy. In arguing against investment in solar energy, he makes an argument more commonly used against the oil lobby, suggesting that there is a strong solar and wind lobby seeking to profit from investment in renewable energy:

Somebody is going to have to manufacture those solar panels. And if they get a government contract, they are going to make out like a bandit. Somebody is going to manufacture those monstrosity wind things and those windmills, it, over the life of the windmill. . . Somebody manufactures those windmills. Somebody makes the solar panels, and they have lobbyists in Washington DC. And those lobbyists want them to vote this way because it's a chocolate pie for them.

For James and other epistemic deniers, investment in renewable energy systems is either unnecessary and/or driven by greed. They have a broad distrust of science, scientists, and the political system, which drives their rejection of investment in renewable energy.

Unlike James, our interview participant Greg is uncertain as to whether or not the Earth's climate is changing, offering concern about the temperature readings and placements on which he believes this conclusion is determined. He is an epistemic doubter. He offers a bit more grace to scientists and climate science more broadly. He does not believe that scientists and politicians are intentionally trying to deceive the public. Rather, he believes that financial pressures drive scientific research and shape the type of work that is published. He suggests that scientists will choose to work on projects they know will be funded and, as a result, choose not to offer contrarian opinions: "I've got a hundred thousand dollar grant to go study this stuff for a year, guess what? I'm going to study it! . . . My understanding of real faculty, and by that I mean tenured professors, you know publish or perish, you gotta be part of the group".

His positions on the environment and energy policy reflect these more moderate attitudes toward science. Unlike James, he says that regulations for pollution may be necessary. "To a small degree it's a good idea. It can get out of control, but it can get out of control on the other end as far as "Gee the sky's the limit, go crazy, pollute all you want, you know Tragedy of the Commons, that sort of thing" so, yeah, I'm for limited government regulation".

For epistemic deniers and doubters, their trust in science and the scientific process, along with their environmental concerns (which are sometimes related), shape their support and perceptions of needed energy policy. Given their relative lack of trust in science compared to attribution deniers and doubters, epistemic deniers and doubters are less supportive of clean energy policy, especially when it involves government intervention or regulation.

In contrast, attribution deniers and doubters show different rationales for their positions on renewable energy. Bill, for instance, is an attribution denier. He believes that the Earth's climate is changing but denies that humans contribute to the crisis. He states, "I

am extremely skeptical that climate change is caused by human causes. . . I am 99% certain that these are not caused by humans". He worries that there is a conspiracy shaping the narrative of anthropogenic climate change. "I was thinking maybe this climate change stuff isn't caused by humans, maybe somebody is or some group is deliberately manipulating the data in order to produce the results they want and since then I've heard of a few other articles that basically help to add to that theory so. . ." Like other skeptics, Bill suggests that perhaps some scientists are influenced by funding sources. He contends, "It's a matter of following the money. Who's paying for these studies?".

Despite his concerns about scientific funding, Bill does have some strong environmental concerns. He is worried especially about pollution, and this concern drives his attitude toward renewable energy. Bill says, "I do think that exploring alternate energy sources is a great idea, especially solar energy. I want to see more into that. Hydroelectric I think we could be doing a lot more of, it would be nice to get away from more of these energy generators such as coal that pollute the environment and go into more sustainable ones".

What gives him pause is his worries about corruption in the business sector that will undermine renewable energy investment. He believes that oil companies are buying electric and alternatively sourced auto companies to shut them down: "You see with the oil industries purchasing all these fuel source cars and solar cars and things like that, and then they don't do anything with the patents because it doesn't help out their bottom line".

Though attribution deniers share some concerns about scientists and the scientific process with epistemic deniers and doubters, they tend to offer more grace to scientists. They also hold greater levels of environmental concern—especially regarding the topic of pollution. This concern further drives them to support renewable energy, despite any misgivings about scientists.

Attribution doubters extend this support for clean energy policy forward further. For example, Karen is an attribution doubter. She believes that the Earth's climate is changing but is unsure as to whether or not humans really contribute to the crisis. She says, "How could [humans] possibly have such an impact cause there's so much that goes into such a huge system? Like I would imagine that our. . . our affect would be so miniscule that it couldn't even be affective. That's what my practical mind would tell me".

Karen does not believe that politicians are corrupt. She, instead, critiques them for their focus on funding research instead of efforts that could improve pollution. She remarks, "so raising money for climate change but they use their money to study climate change, not to prevent it, you know what I mean. . . Instead they put the money toward "research" . . . (laughs) it's like, okay this is like where I start to like okay then, so are you guys really worried about weather change or are you just worried about data?" For Karen, then, both her personal logic and decisions about the government's use of research funding shape her doubt about anthropogenic causes of the climate crisis.

Despite these hesitations, Karen has significant concerns about the environment. She is particularly concerned about pollution and air quality, as well as water quality. These concerns drive her to support investment in renewable energy and greater regulation for businesses. She suggests that one solution might be government incentives for clean energy: "Offer grants. Offer like "Hey, here's two billion dollars to change your factory up and do clear, clean, clean production of whatever it is you're producing". Boom. There you just changed this whole town". Karen offers a similar suggestion to promote the development of energy-efficient vehicles: "Make smart cars more readily available and affordable. Boom. That'd be huge. Instead, they're just like a novelty and only the rich can afford them".

4. Discussion and Conclusions

This research indicates the complexity of climate change skeptics' attitudes toward clean energy policy. First, it is important to recognize that not all skeptics oppose climate-friendly energy policy, nor are skeptics' attitudes on these issues alike. There are significant degrees of variation, based on the strength of skepticism and associated factors, that should be taken into consideration when designing climate change communications and policy.

Among specific energy policies, preliminary work suggests that skeptics are more supportive of solar, wind, hydro, and home renewable energy systems than they are of coal taxes and cap and trade initiatives. Epistemic deniers have the lowest level of support for wind, solar, and home renewables, while attribution doubters have the highest level of support for these initiatives. Additionally, we found that skeptics who care more about the environment and skeptics who are less distrustful of science are more likely to support clean energy policy.

Crucially, our quantitative analysis demonstrates that the primary factor in shaping skeptics' position on clean energy policy is their level of environmental concern. This remains true for the entirety of the continuum of skeptical thought, as seen by the results presented in Table 2. At the same time, when holding constant other pertinent demographic measures (i.e., age, gender, political ideology, education, and race), conspiracy ideation and distrust in science appear to be relatively less important as predictors of skeptics' energy views.

Using our qualitative data, we can understand some of these relationships and their complexities in more depth. For the epistemic deniers in our sample, there is a general sense that climate change is not something that one needs to be concerned about. Moreover, aside from pollution, people in this category see little reason to be concerned about the environment writ large. The reasons for this vary. For some, it is because climate change is a hoax; for others, it is because climate scientists are untrustworthy; and yet for others, it is because the Earth will make the needed adjustments. Moreover, political ideology underscores the position of epistemic deniers in that it shapes the degree to which they reject government intervention in energy policy.

For epistemic doubters, our qualitative data show a similar pattern, but there is a slight increase in concern about pollution and a corresponding willingness to see governmental energy regulations. In turn, we see less adherence to conspiratorial thinking on climate change and a slightly lower or more nuanced distrust of scientists. Attribution deniers are, in turn, more concerned about habitat loss, pollution, and other environmental issues and are, as a result, more interested in state and federal interventions for clean energy policy initiatives. They also are less likely to see climate change as a hoax and to distrust climate science. Finally, attribution doubters show greater environmental concern and associated support for clean energy. They further show greater trust in climate science and lower levels of conspiracy ideation. As a result of these confounding and complicated ways of understanding the relationship between climate change and energy, we may not see a clear and consistent association between some of these variables in our survey data; that is, apart from the environmental concern variable we discussed above.

Holding conversations around climate change and implementing policies for mitigation and adaptation have become especially difficult in the United States due to the topic being heavily politicized [10]. Public opinion on the topic is polarized along political party lines. Furthermore, and as we have pointed out earlier, those with skeptical views about climate change continue to hold disproportionate control over the US political system, preventing urgent, bipartisan climate action that is necessary to slow the pace of climate change.

In this context, our research offers some important insights and hope toward finding common ground, improving climate change communication, and moving climate-friendly energy policies forward. Our suggestions in these areas are based on the crucial finding that skeptics' clean energy policy support is linked to their environmental concerns. This is a hopeful insight because our previous work demonstrated that skeptics do hold pro-environmental views in several areas, such as curbing pollution and reducing habitat/species loss [15]. As such, messaging about energy policy targeting climate change skeptics can and should tap into these environmental concerns.

In this regard, we find potential in the ideas of climate change scholars and communicators who are advocating for a "rebranding" of carbon emissions as "pollution," highlighting and making explicit the link between climate change and air pollution. Promi-

nent climate communicator Susan Hassol once stated that pollution is a "better word" than emissions, "because everyone understand that pollution is harmful" [22]. Our research provides empirical support for this assertion but also extends this to suggest that making explicit the connection between climate change and pollution may increase support for clean energy policy among skeptics. In this sense, the growing popularity of terms such as "carbon pollution" and "climate pollution" in climate change messaging may not be accidental or without merit. This reframing goes beyond an issue of terminology or individual attitude change but also carries with it some institutional and structural implications. For example, consider that the recent amendment to the Clean Air Act, which categorizes GHG emissions as a form of "air pollution", allowing the US EPA to continue to regulate carbon emissions in the United States [23].

Broadly, our research suggests that factors that increase pro-environmentalism, specifically environmental concerns, may also increase clean energy policy support among skeptics. Prior research identifies a number of such factors including direct personal experience with the environment (including childhood experience), knowledge, education, worldviews, place attachment, and proximity to toxic environmental sites [24]. Methods that increase pro-environmentalism, perhaps by way of manipulating these factors, may in turn increase clean energy support. For instance, while we cannot purposefully expose people to different positive and negative environmental experiences, we may be able to use indirect mechanisms such as storytelling, fiction, film, or virtual reality to create similar experiences, which may change individual levels of environmental concern and likely the associated energy views. Other indirect exposures, such as accounts delivered via media or through education, may replicate some of the impacts of direct experience by recalling one's previous personal experience, engaging with pro-social emotions, or expanding empathy for others [25,26].

Ultimately, our research highlights the greater nuance in skeptics' perspectives regarding climate-friendly energy policies. In short, while deniers among skeptics may oppose most of these policies, doubters' views may be amenable to change. As such, communicators should better target their messages to specific audiences. For example, while doubters and deniers may be open to discussing policies to curb pollution, doubters may be more open to discussing environmental destructions of all forms and even connect some of these to climate change. Coupling messages about climate policies with other issues that skeptics already care about, such as energy independence, economic opportunity, and pollution, may increase support for these policy initiatives, paving the way to implement them at a larger, societal scale.

In this context, social scientists like us have a responsibility to inform/educate the political leadership about where public perceptions rest and how rapidly they are indeed changing [27]. Political leaders, including Republicans in Congress, may then feel compelled to make different, bipartisan policy choices in the face of overwhelming public support for certain energy policy initiatives, such as investments in wind and solar power and tax rebates for at-home renewable energy installations. While some scholars have questioned the extent to which public opinion actually drives energy policy in the highly polarized political climate in the United States, recent legislative decisions, such as the Inflation Reduction Act (IRA)—which claims to have "set forth a new era of American innovation and ingenuity to lower consumer costs and drive the global clean energy economy forward"—suggests that, over time, individual perceptions and collective action may indeed carry some material effects via political outcomes [28].

In closing, it is important to note that this study employed cross-sectional data and quota sampling and cannot be generalized to skeptics overall. Future research should address sampling and coverage limitations. Beyond surveys and interviews, future research should also consider employing novel methods, such as social media data mining and natural language processing models, to examine online discourses surrounding skeptics and their viewpoints. While the current study offers an empirical exploration of skeptics' clean energy perceptions, future research should also expand this line of work into developing a

deeper, theoretical understanding of the meanings behind these views, and in particular how social identities and ideologies intersect with skeptics' attitudes and behavior [29–31].

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