SOCIAL, POLITICAL, EARTH & ENVIRONMENTAL RESEARCH GROUP

The UNIVERSITY *of* OKLAHOMA

U.S. Energy Perceptions: 2023 SPEER Survey Findings

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July 2024

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Abstract

Using an online survey, we analyze important predictors of energy preference for both fossil fuels and renewable energy sources. This report provides new insights and confirms findings from earlier studies on energy preferences. Our results support previous research that highlights politics as a crucial determinant of energy preferences among Americans. Additionally, we find that religious factors and individual demographics play significant roles. Additionally, we find that religious factors and individual demographics play significant roles. Political affiliation, ideology, religious beliefs, gender, and biblical literalism strongly influence attitudes towards various energy sources. Conservatives, Republicans, women, and biblical literalists generally show less support for renewable energies and greater support for fossil fuels. These findings suggest that targeted communication strategies addressing gender-specific concerns and engaging with religious communities, particularly those with literal interpretations of scripture, could be effective in promoting the energy transition. We conclude with a discussion on the importance of this research for motivating social science scholarship on energy preference.

1. INTRODUCTION

Climate change presents an increasingly urgent threat to the global ecosystem (IPCC, 2021). The primary driver of this phenomenon is the combustion of fossil fuels for energy, accounting for 73% of global greenhouse gas emissions (EPA, 2022). Transitioning to renewable resources is crucial for mitigating the escalating consequences of climate change and promoting sustainable consumption and production initiatives (IRENA, 2022). However, public and legislative efforts to advance renewable energy interests frequently face rejection along partisan lines, impeding progress towards reducing carbon emissions. A successful transition away from fossil fuels and toward renewables necessitates a comprehensive investigation into the relationship between political factors and attitudes towards sustainable energy sources. Previous research has explored factors shaping public preferences for renewable energy policies, including political orientation, ideology, cultural values, and moral foundations (e.g., Bedle et al., 2024b; Bedle et al., 2023; Bidwell, 2016; Boudet et al., 2016; McCright et al., 2016). However, these studies have primarily focused on hydrocarbon energy sources (coal, oil, and natural gas) and wind and solar renewable energy.

The SPEER23 survey expands upon this research by including measures of support for nuclear and geothermal energy, as well as carbon capture and underground storage (CCUS) for atmospheric carbon reduction. While views on hydrogen energy are also included in the survey, the majority of respondents were unfamiliar with this technology, necessitating binary logistic regression for analyses. As part of the inaugural iteration of a planned annual survey, this study aims to establish a baseline to begin documenting the nuanced aspects of energy preferences in the United States. By examining these

variables alongside demographic factors along with political and religious dimensions, we seek to provide a more comprehensive understanding of the complex landscape of energy support.

2. METHODS

Data

We use data from the SPEER23 Survey. Data collection was conducted via online survey panels administered by Qualtrics, adhering to the guidelines and regulations of the University of Oklahoma Institutional Research Board (IRB approval #15823). All subjects provided informed consent. The sample consists of 2,188 U.S. adults (18+ years), recruited through quota-based sampling to match census benchmarks for age, gender, race/ethnicity, education level, and U.S. region, ensuring a large and diverse sample that approximates a representative sample of adults in the United States. For additional details, refer to the SPEER 2023 Survey report (Bedle et al., 2024a).

Measures

Respondents were asked to provide their opinion on various energy sources and technologies, indicating whether they would prefer to see less or more of each type in the overall energy mix at regional and national levels. Responses were recorded on a 6-point Likert scale ranging from "drastically decrease" to "drastically increase," with an additional option for "unfamiliar with this technology."

For regression analyses, responses for "increase" and "drastically increase" are coded as stronger support for the renewable energy sources (1), while all other responses are categorized as none or weak support (0). Variables measuring support for fossil fuels are reverse coded so that "decrease" and "drastically decrease" are coded as (1) with all other responses coded as (0). The following energy sources and technologies were analyzed:

- Decreasing oil & gas
- Decreasing coal power
- Increasing wind power
- Increasing solar power
- Increasing nuclear power
- Increasing geothermal power
- Increasing carbon capture and sequestration

We also incorporate control variables based on standard demographics and other covariates commonly associated with environmental attitudes, as identified in previous research and the literature review. These variables include:

- Political party affiliation
- Mean-centered age (with a squared term when significant)
- Gender
- Race
- Education level
- Income
- Marital and parental status

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- Religious service attendance
- Evangelical identity
- Biblical views
- Urbanicity
- U.S. region

Binary logistic regressions were employed to test relationships between these variables and energy policy support, including the aforementioned control variables.

3. INSIGHTS

Demographic Factors

Table 1: Coefficients for Binary Logistic Regressions on Energy Preferences

	Decrease Oil & Gas	Decrease Coal	Increase Wind	Increase Solar	Increase Nuclear	Increase Geothermal	Increase CCUS
Age	-.009 *	.006	-.001	.002	.006	.008 **	.022 ***
Age^2	.000	.000	.000	.000	.000 **	.000	.000
Woman	-.172	-.286 **	-.181	-.213 *	-.844 ***	-.741 ***	-.819 ***
African American	-.839 ***	-.855 ***	-.384 *	-.458 *	-.406	-.397 *	.065
Hispanic	-.479 **	-.486 **	-.535 **	-.413 *	-.080	-.450 **	-.202
Other Race	-.200	-.014	-.021	.081	-.097	-.168	.133
College Degree	.144	.207	.014	.064	.161	.043	.100
Income	.082 *	.111 **	.085 *	.145 ***	.072	.095 **	.078 *
Married	-.203	-.238 *	-.075	-.160	.002	-.079	-.303 *
Children in Home	-.214	-.387 ***	.019	.025	-.032	-.145	.218
Rural	-.271	-.481 ***	-.119	-.110	.018	.214	.056
Urban	-.030	-.141	.104	.205	.009	.009	-.014
South Region	-.045	-.120	.114	-.168	.068	.035	.061
Independent	-.099	-.017	-.445 ***	-.455 ***	.341 **	-.096	-.275 *
Republican	-.653 ***	-.659 ***	-.379 **	-.558 ***	.279	-.262	-.146
Moderate	-.729 ***	-1.064 ***	-.732 ***	-.654 ***	-.111	-.430 ***	-.423 **
Conservative	-1.365 ***	-1.314 ***	-1.336 ***	-1.083 ***	.416 *	-.441 **	-.552 **
Rel. Service Attendance	-.065 **	.010	.020	.016	.017	.015	.036
Biblical Literalist	-.691 ***	-.847 ***	-.461 ***	-.531 ***	.308 *	-.201	.021
Evangelical	-.216	-.281 *	-.077	.063	.273	-.132	.010
Pseudo R^2	.130	.148	.082	.080	.077	.060	.067

Table 1 displays results for binary logistic regression on various dependent variables for supporting or opposing energy sources. Results on demographic variables show that age negatively associates with decreasing oil and gas and positively associates with increasing geothermal and carbon capture energy sources. Women are less supportive of all renewable energy sources compared to mean and are also

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less likely to support decreasing oil and gas. Compared to White Americans, African Americans and Hispanic Americans are less supportive of both decreasing fossil fuels and increasing renewables except for nuclear and carbon capture. Those from other races do not differ from White Americans. These results are visually displayed in Figure 1, Figure 2, and Figure 3.
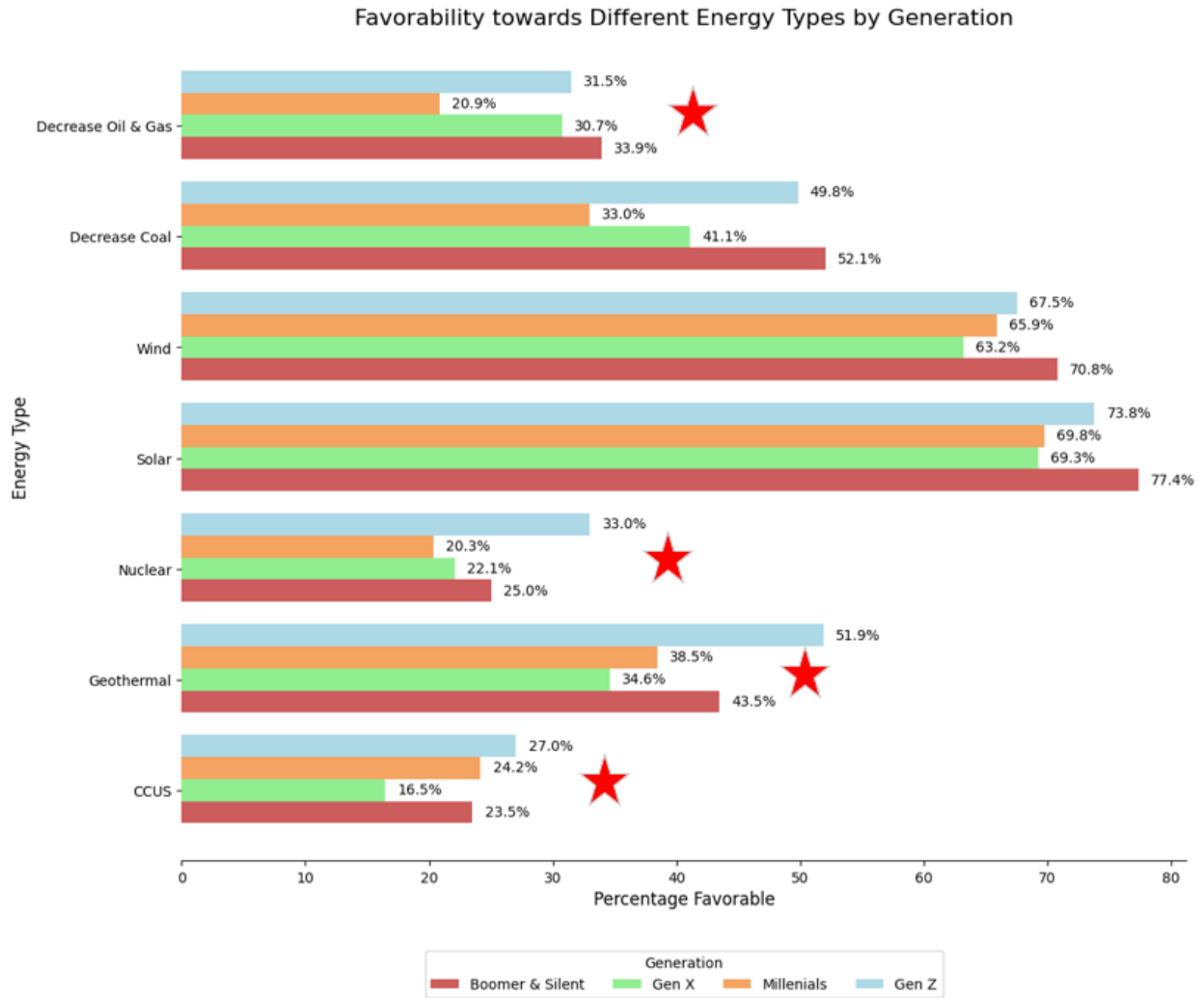

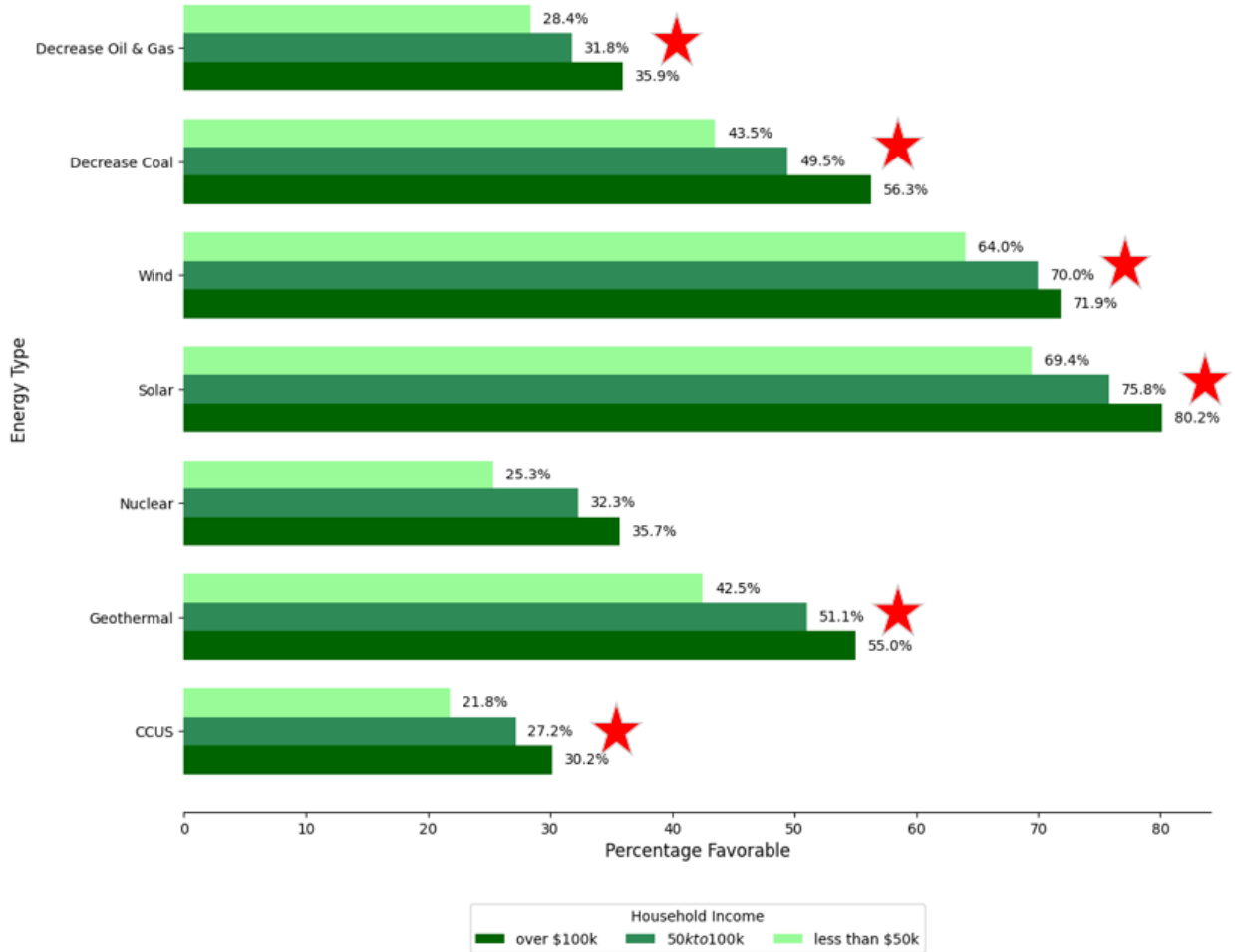Figure 1: Energy preferences by generation. Stars indicate significant differences in regression results for that energy source.

Favorability towards Different Energy Types by Gender
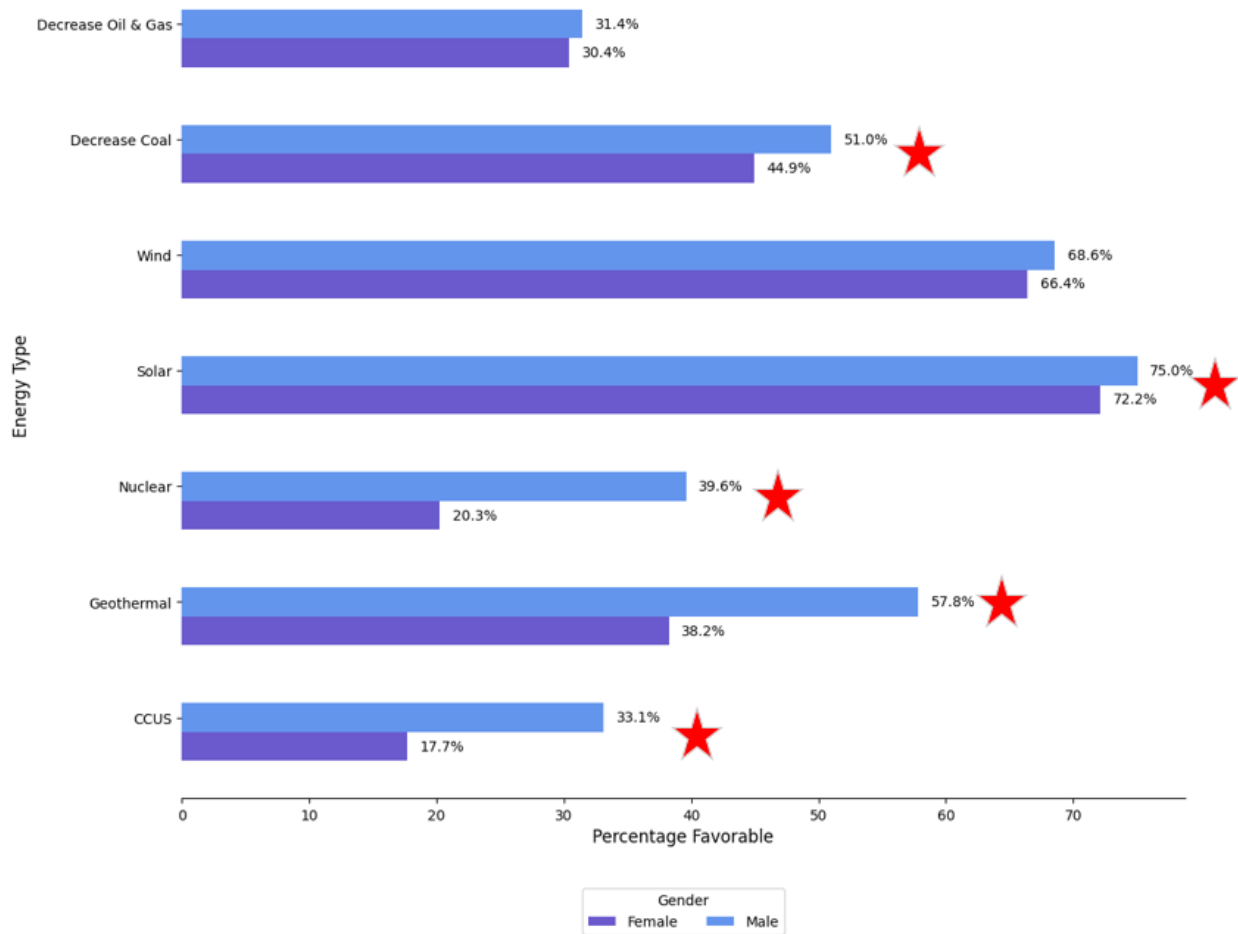
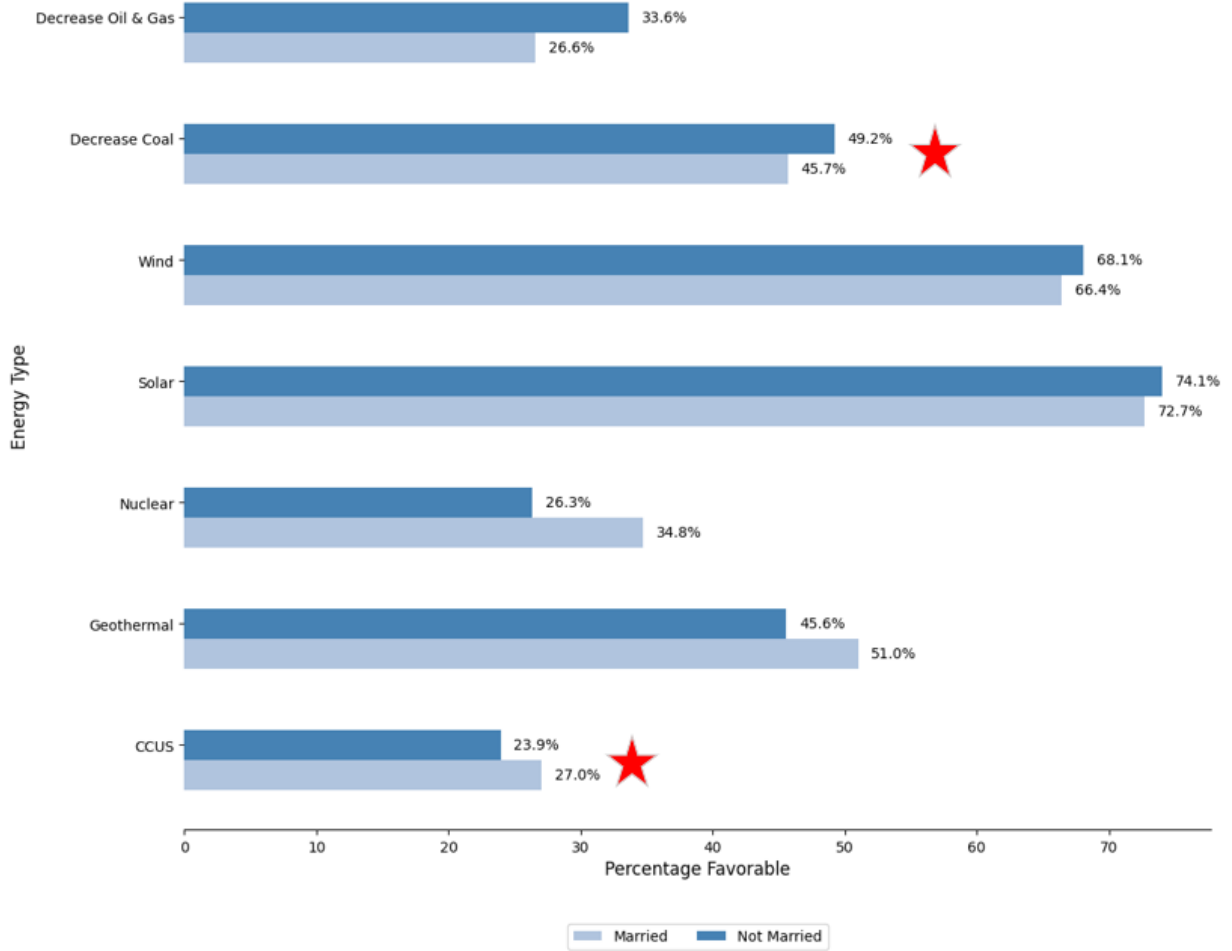*Figure 2: Energy preferences by gender. Stars indicate significant differences in regression results for that energy source.*
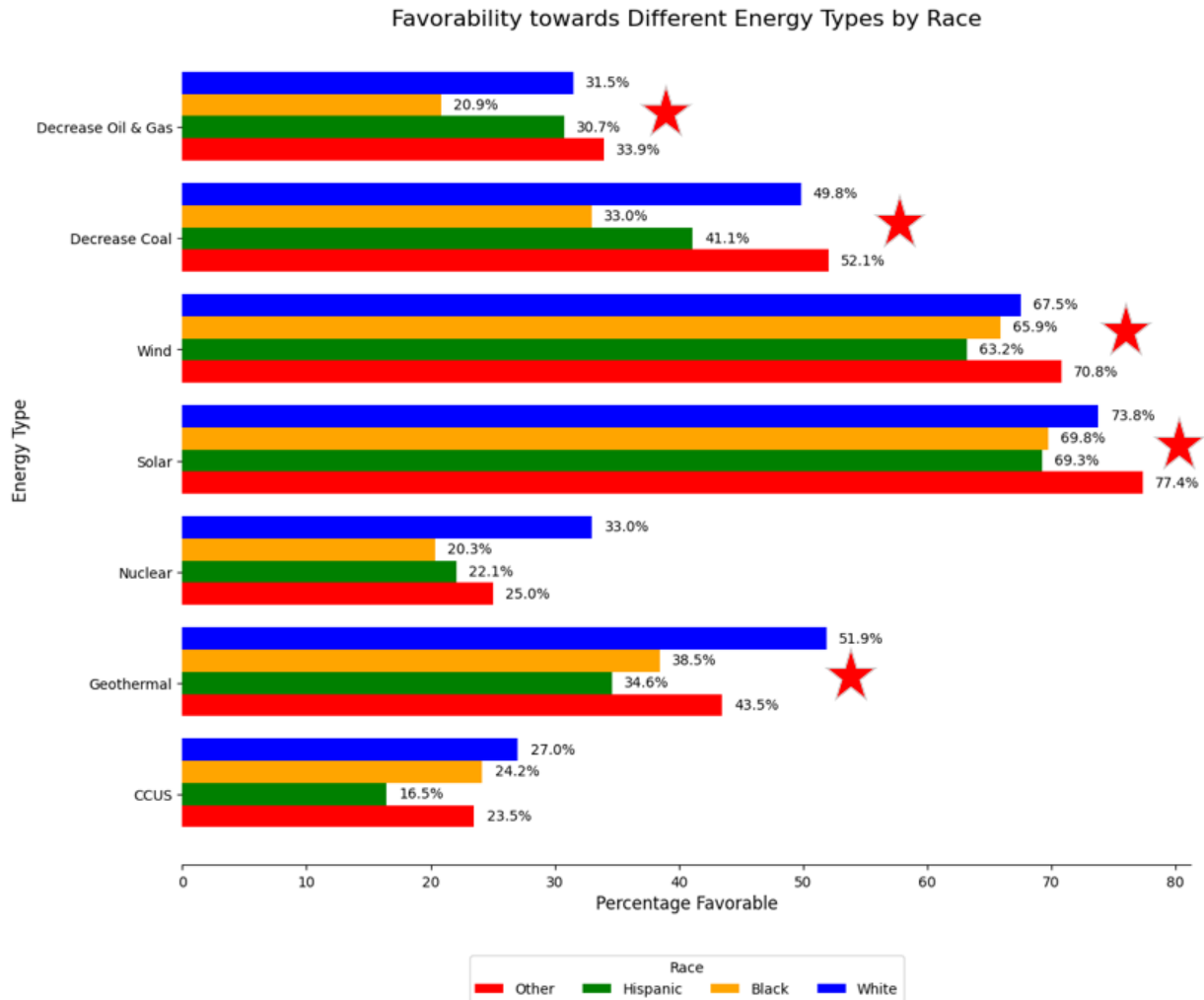
Figure 3: Energy preferences by race. Stars indicate significant differences in regression results for that energy source.

Socioeconomic Factors

While education does not significantly predict support for energy, income is a significant factor. Income positively correlates with support for decreased fossil fuels and correlates with supporting increased renewable energies for all forms except nuclear. A visual depiction of this relationship is displayed in Figure 4.

Figure 4: Energy preferences by income level. Stars indicate significant differences in regression results for that energy source.

Family Factors

While not as predictive as other factors, there are some significant associations between family variables and energy preference. Both married respondents and those with children in the home negatively associate with decreasing coal energy. Additionally, being married negatively associates with increasing carbon capture. Bar graphs for family variables are displayed in Figure 5 and Figure 6.

Favorability towards Different Energy Types by Marriage

Figure 5: Energy preferences by marital status. Stars indicate significant differences in regression results for that energy source.
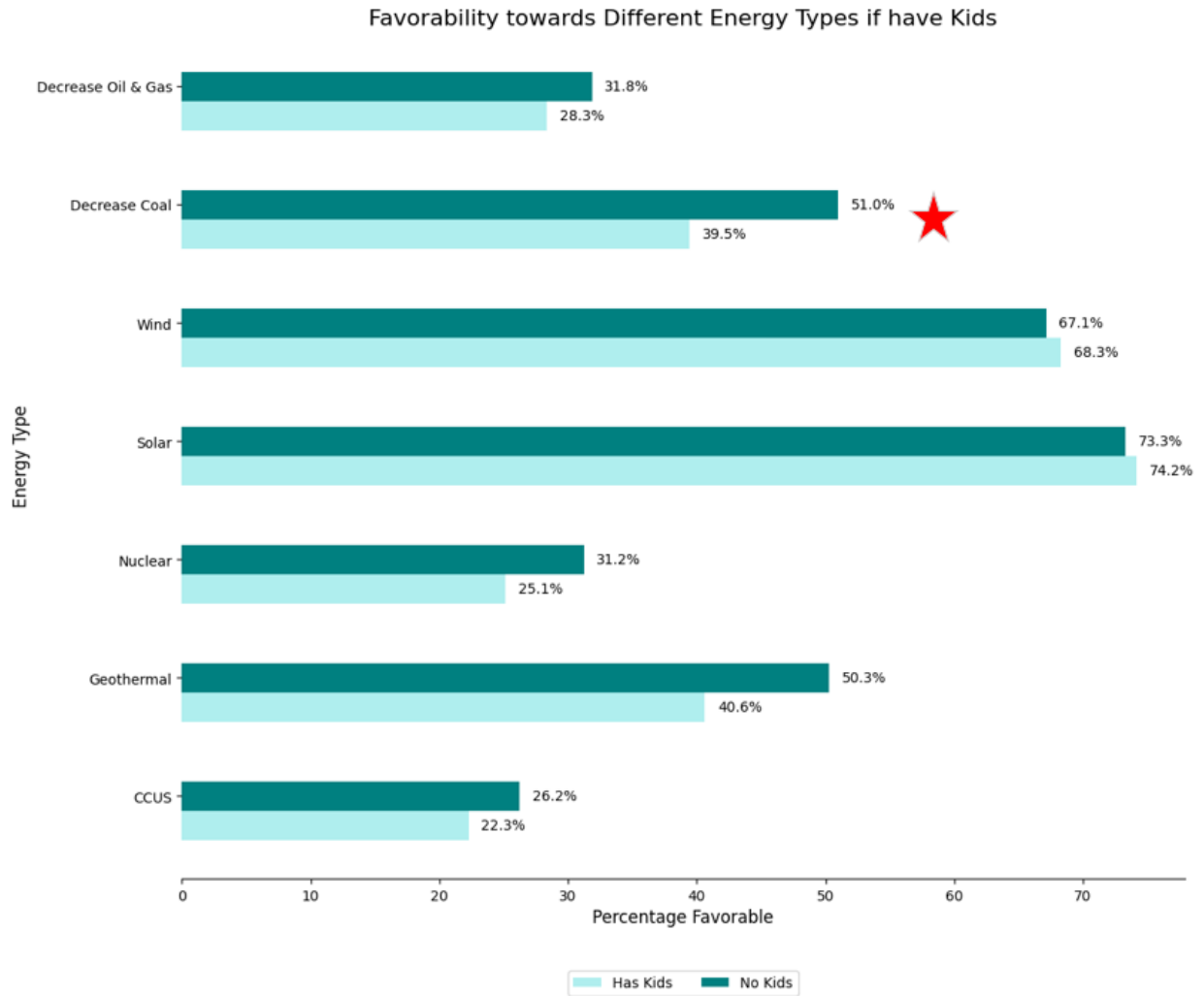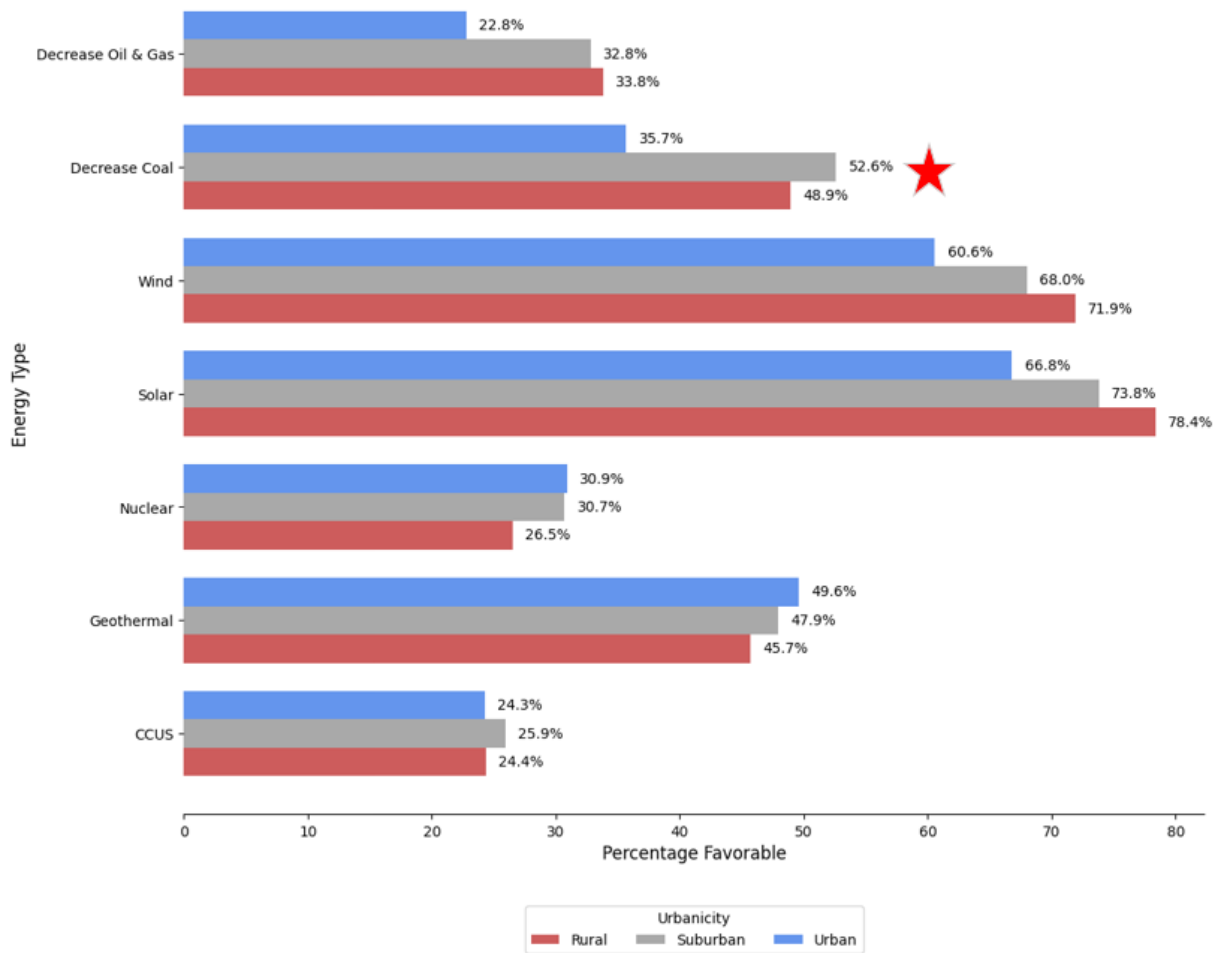
Favorability towards Different Energy Types if have Kids

Figure 6: Energy preferences by having kids under age 18. Stars indicate significant differences in regression results for that energy source.

Residential Factors

While urbanicity is not a major factor for energy preference overall, those in rural areas are less supportive of decreasing coal relative to those in suburban areas. These results are visually displayed in Figure 7 and Figure 8.

Figure 7: Energy preferences by urbanicity. Stars indicate significant differences in regression results for that energy source.

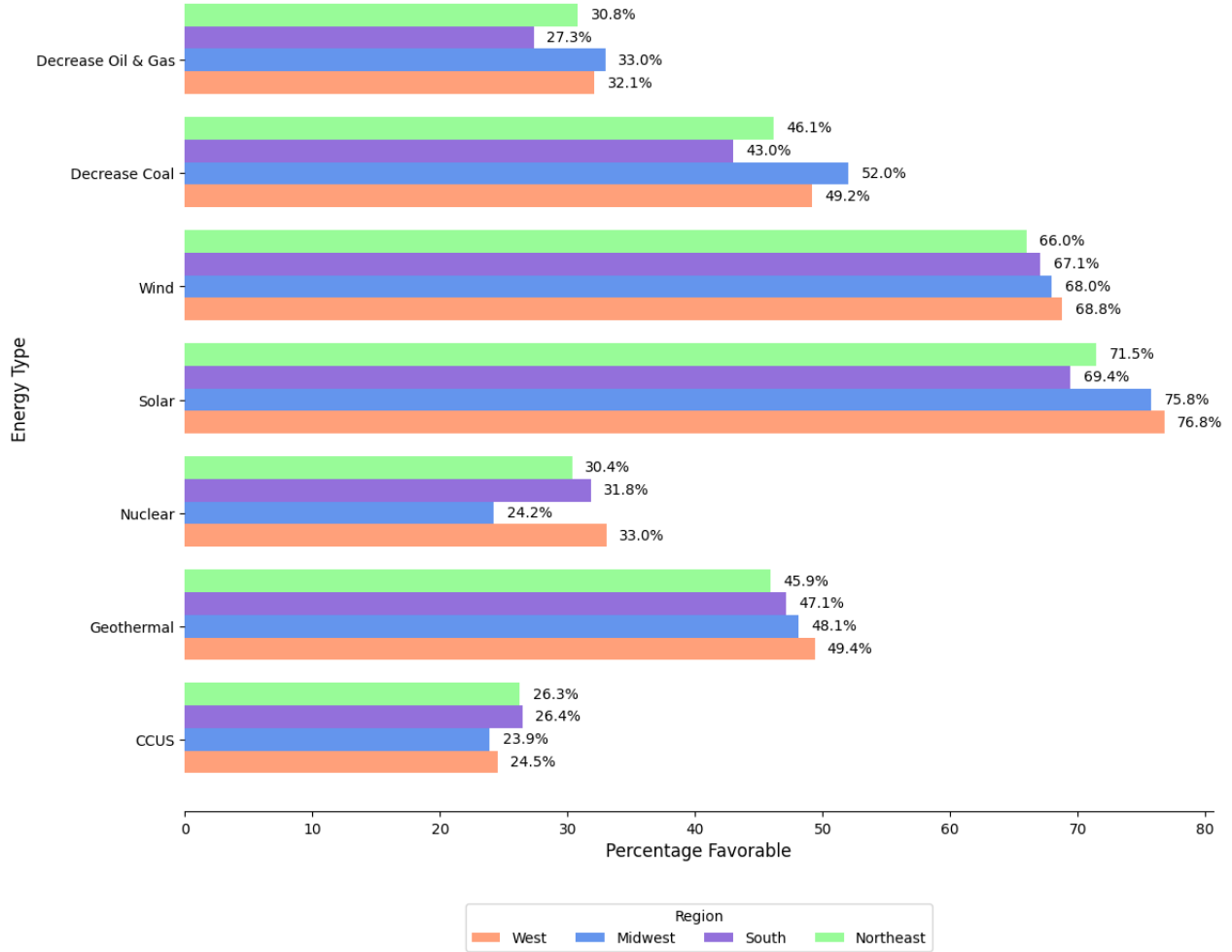## Favorability towards Different Energy Types by US Region

Figure 8: Energy preferences by geographic region. Stars indicate significant differences in regression results for that energy source. There were slight variations between regions, but none that were statistically significant.

Political Factors

Results for political affiliation show that compared to Democrats, political independents are less supportive of increasing wind, solar, and carbon capture energy and more supportive of increasing nuclear energy. Republicans are less supportive of decreasing fossil fuels and increasing wind and solar energy compared to Democrats. Results for political orientation show that compared to liberals, moderates are less supportive of decreasing fossil fuels and increasing wind, solar, geothermal, and carbon capture energy. Additionally, conservative (relative to liberals) are less supportive of decreasing fossil fuels and increasing wind, solar, geothermal and carbon capture energy. Furthermore, conservatives are more supportive of increasing nuclear energy compared to liberals. Results for political factors are visually displayed in Figure 9 and Figure 10.

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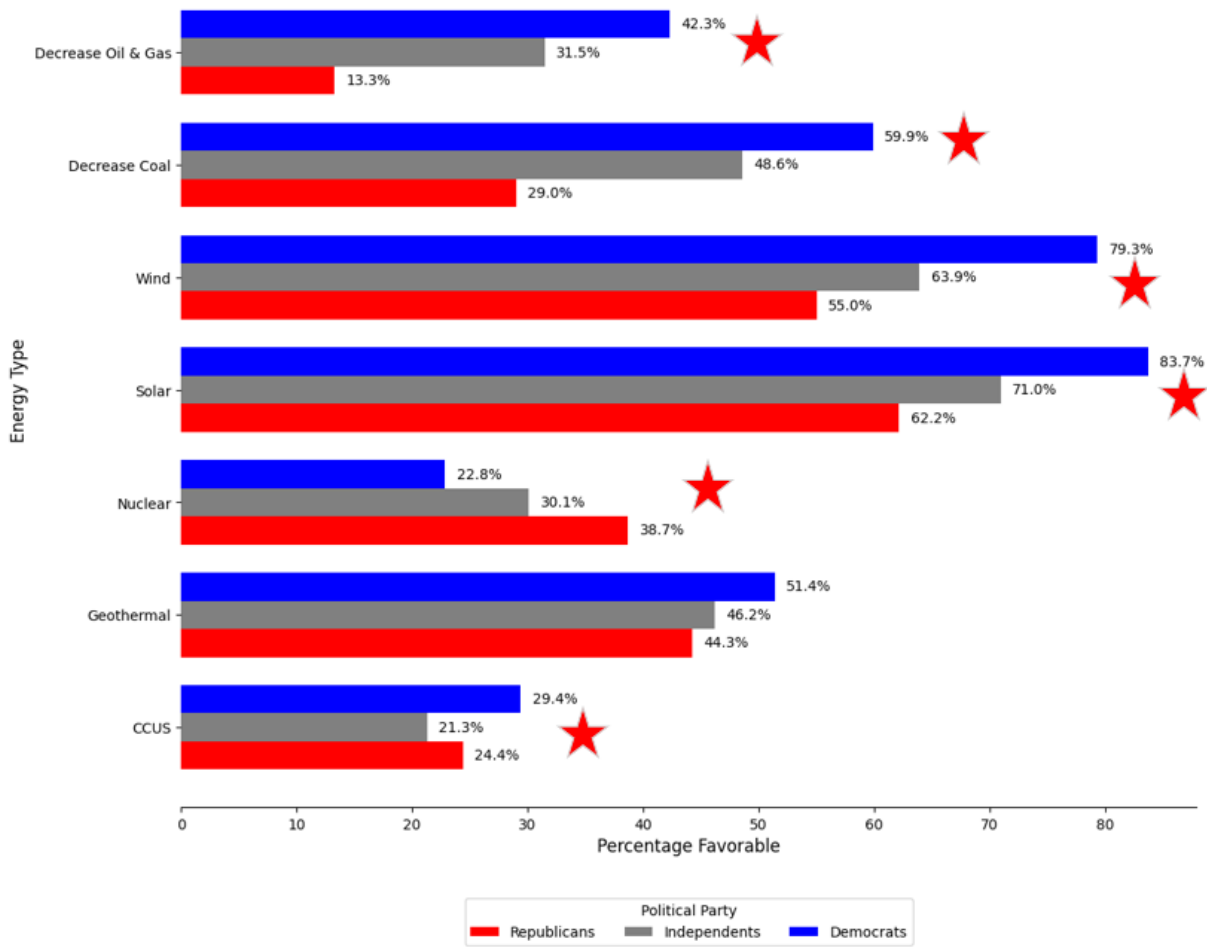*Figure 9: Energy preferences by political party. Stars indicate significant differences in regression results for that energy source.*

Favorability towards Different Energy Types by Political Ideology
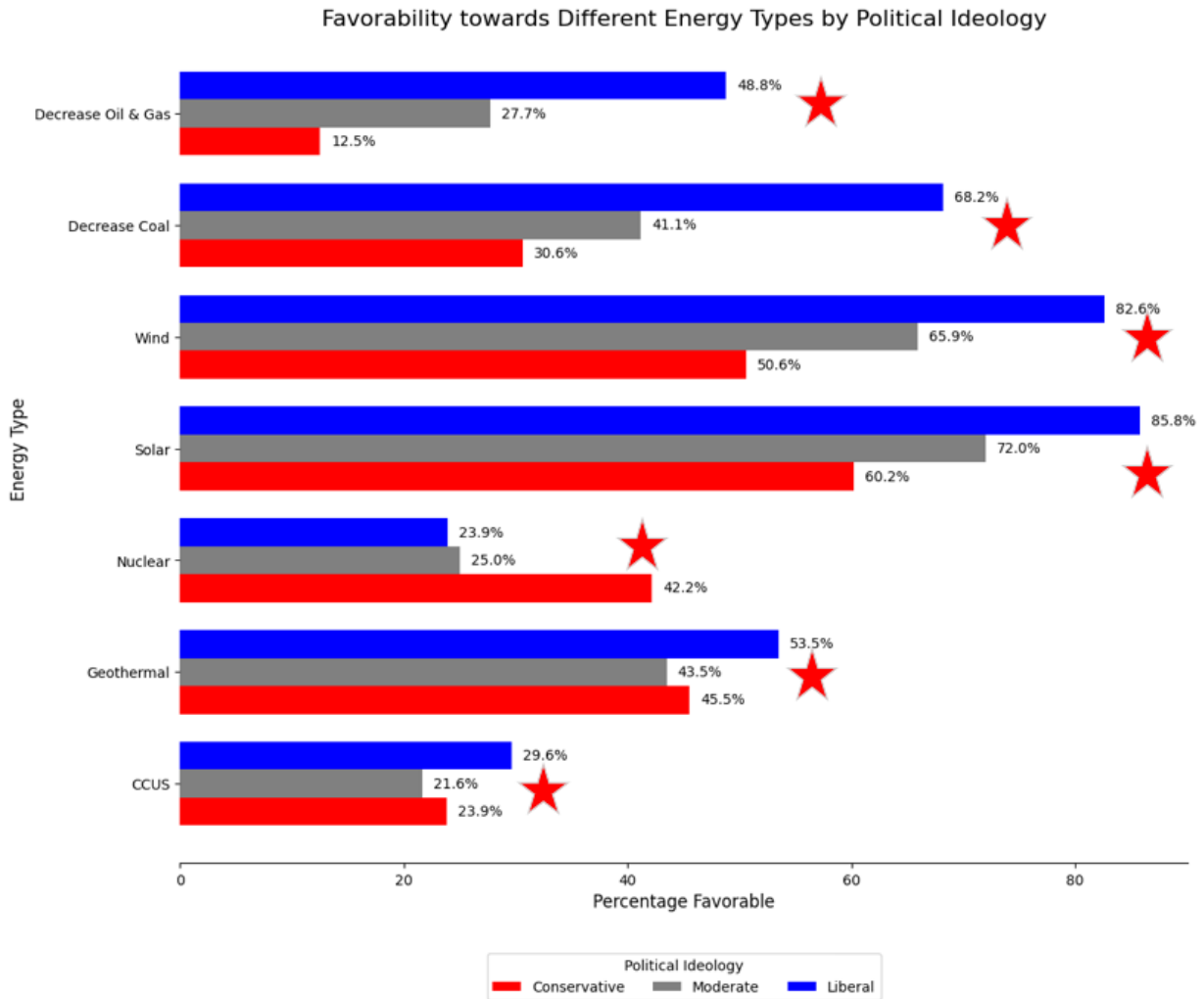
Figure 10: Energy preferences by political ideology. Stars indicate significant differences in regression results for that energy source.

Religious Factors

Results for religious factors show that religious service attendance is negatively associated with decreasing oil and gas. Biblical literalism negatively associates with decreasing fossil fuels and increasing wind and solar energy. Literalism positively associates with increasing nuclear energy. Evangelical affiliation negatively associates with decreasing fossil fuels. Visual representations for results regarding religious factors are displayed in Figure 11, Figure 12, and Figure 13.
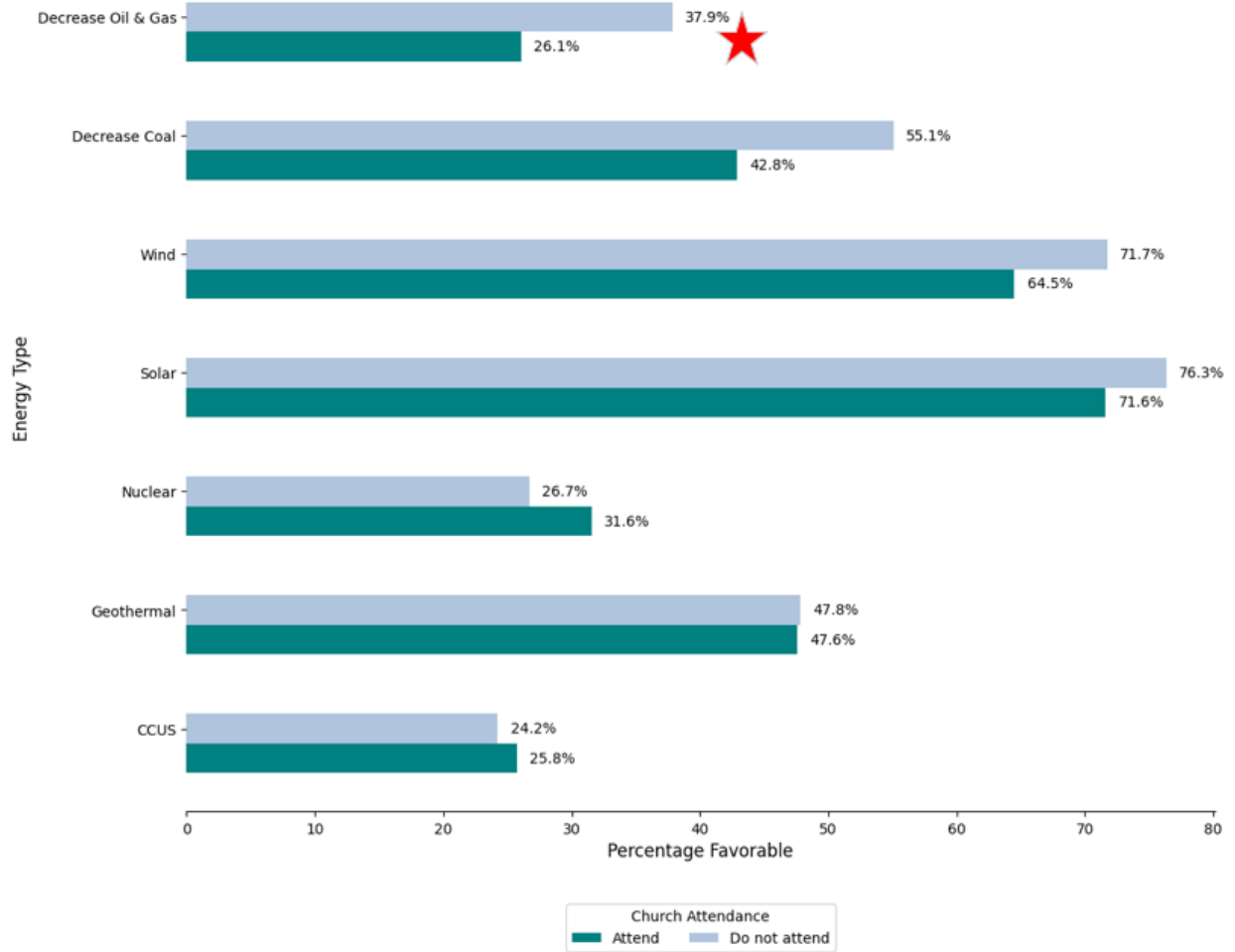
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Figure 11: Energy preferences by church attendance. Stars indicate significant differences in regression results for that energy source.
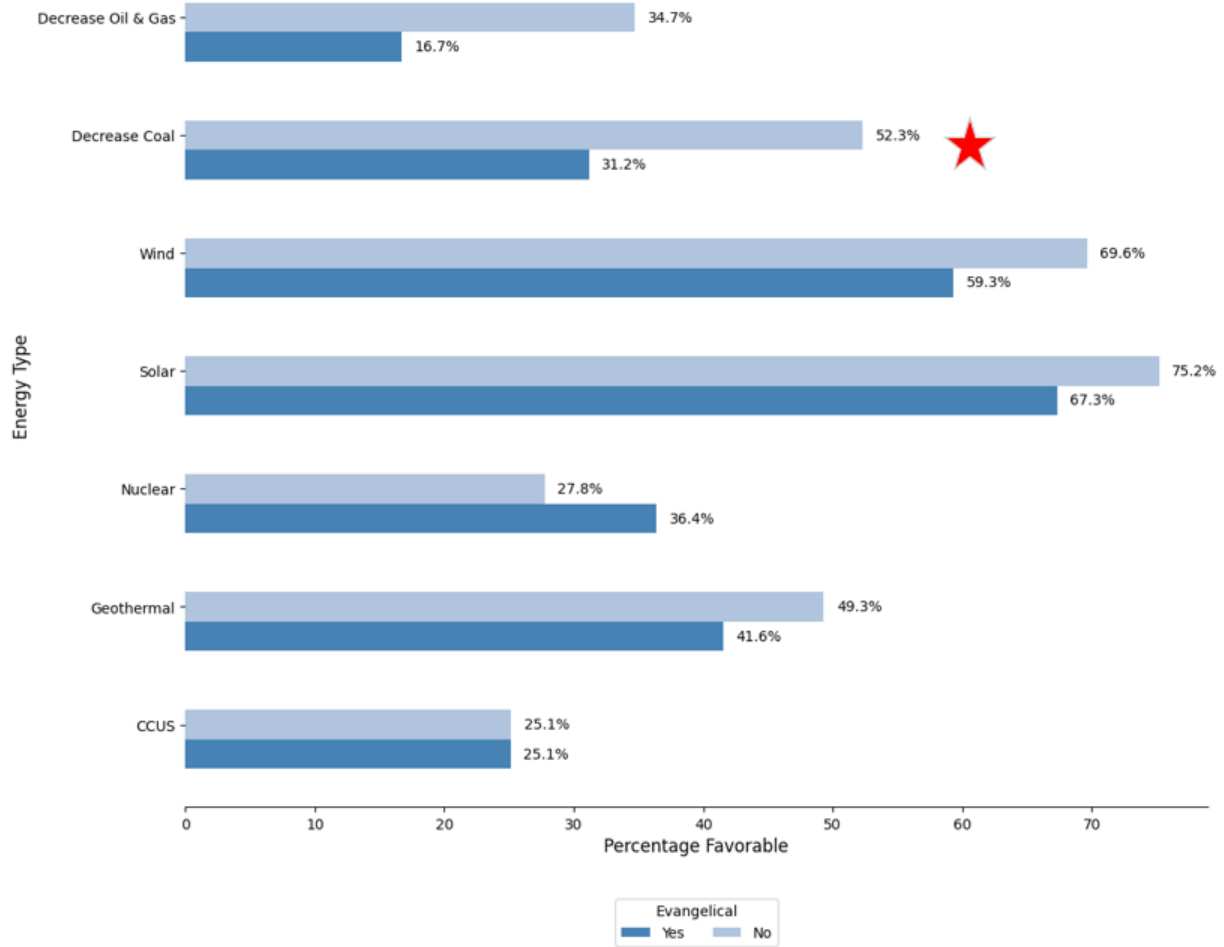
Figure 12: Energy preferences by evangelical affiliation. Stars indicate significant differences in regression results for that energy source.

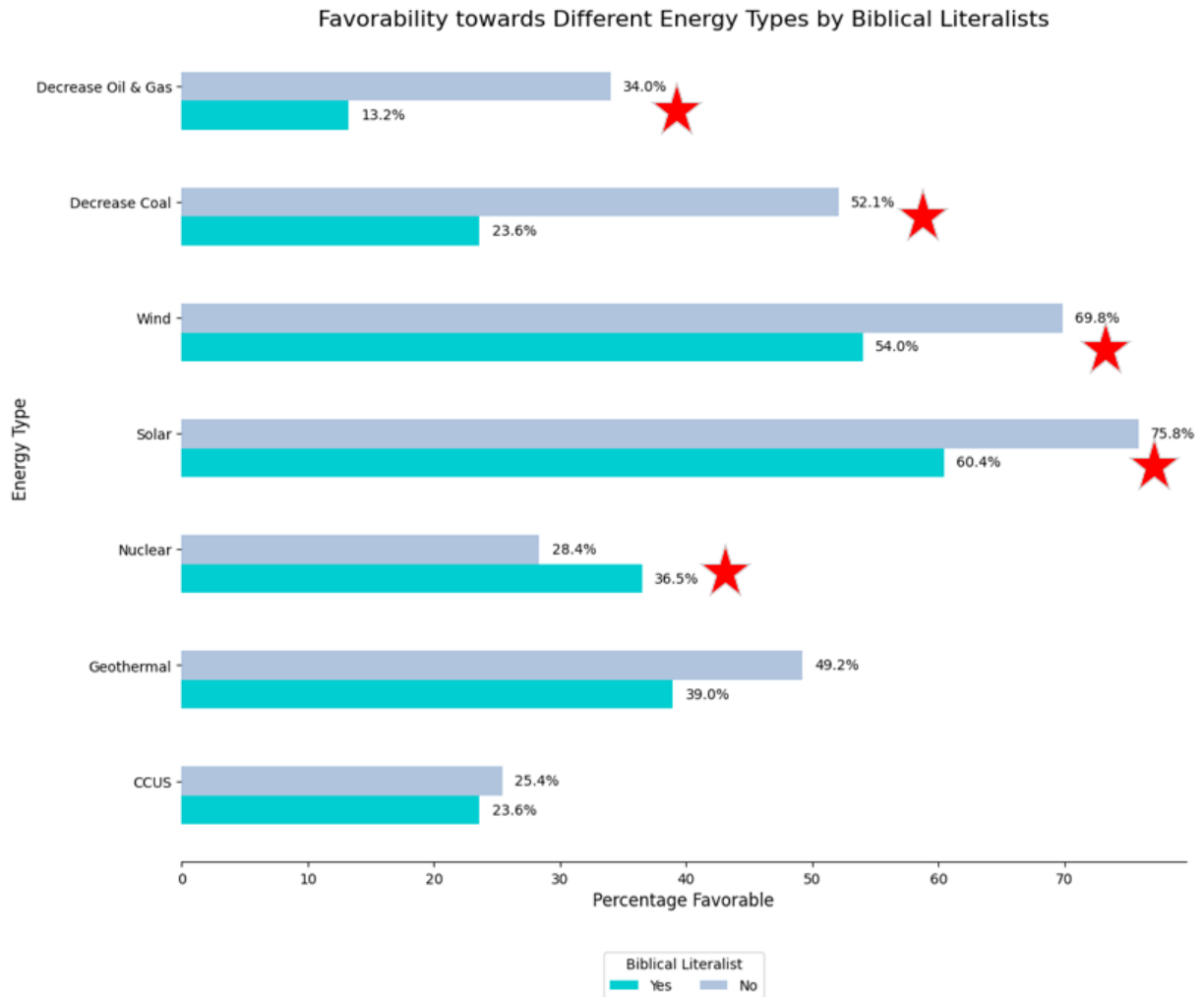Favorability towards Different Energy Types by Biblical Literalists

Figure 13: Energy preferences by biblical literalism. Stars indicate significant differences in regression results for that energy source.

4. CONCLUDING THOUGHTS

Results from this report offer both new insights along with replication of previous studies on energy preference. Our findings replicate previous studies (e.g. McCright & Dunlap., 2011; McCright et al., 2016; Milfront et al., 2021; Bedle et al., 2023;) that politics are a fundamentally important factor for determining energy preferences among Americans. We also find that religious factors and individual demographics are also largely important. Interestingly, other factors such as residence, family, and socioeconomic status are less important.

This research is vitally important considering that the global transition to renewable energy sources is crucial for mitigating climate change and ensuring long-term environmental sustainability. As we face increasingly urgent climate challenges, understanding and addressing these underlying determinants of energy preferences is essential for fostering broader public support for sustainable energy solutions and accelerating the transition away from fossil fuels. The political polarization surrounding energy preferences presents a significant obstacle to implementing effective policies and achieving widespread

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adoption of renewable technologies. By identifying key factors influencing energy attitudes, particularly among conservative and religious demographics, this study provides valuable insights for developing targeted communication strategies and policy approaches. Future research building on these findings will be critical in informing evidence-based policies and initiatives that can bridge ideological divides and promote a more unified approach to addressing our energy and climate challenges.

References

Bedle, H., Beutel, A.M., Garneau, C.R.H. (2024a). SPEER23 Survey Report: Investigating Climate, Weather, and Energy Attitudes in the United States through the Lens of Social and Psychological Factors.

Bedle, H., Garneau, C. R., & Stanfield, R. (2024b). The Role of Moral Foundations in the Energy Transition.

Bedle, H., Garneau, C. R., & Vera-Arroyo, A. (2023). Clustering energy support beliefs to reveal unique sub-populations using self-organizing maps. Heliyon, 9(7).

Bidwell, D. (2016). The effects of information on public attitudes toward renewable energy. Environment and Behavior, 48(6), 743-768.

Boudet, H., Clarke, C., Bugden, D., Maibach, E., Roser-Renouf, C., & Leiserowitz, A. (2014). "Fracking" controversy and communication: Using national survey data to understand public perceptions of hydraulic fracturing. Energy Policy, 65, 57-67.

Environmental Protection Agency (2022). Sources of Greenhouse Gas Emissions. https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions

Intergovernmental Panel on Climate Change (2021). Sixth Assessment Report. Geneva, Switzerland: IPCC. Retrieved from https://www.ipcc.ch/assessment-report/ar6/

International Renewable Energy Agency (2022). Renewable Energy and Climate Change. Abu Dhabi: IRENA. https://www.irena.org/climatechange

McCright, A. M., & Dunlap, R. E. (2011). Cool dudes: The denial of climate change among conservative white males in the United States. Global environmental change, 21(4), 1163-1172.

McCright, A. M., Marquart-Pyatt, S. T., Shwom, R. L., Brechin, S. R., & Allen, S. (2016). Ideology, capitalism, and climate: Explaining public views about climate change in the United States. Energy Research & Social Science, 21, 180-189.

Milfont, T. L., Zubielevitch, E., Milojev, P., & Sibley, C. G. (2021). Ten-year panel data confirm generation gap but climate beliefs increase at similar rates across ages. Nature communications, 12(1), 4038.

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