Who pays for the grid?

Experimental insights into the data center backlash

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Abstract

American utility grids are scrambling to meet the growing demand from hyperscale data centers. Such large load consumers with stable demand present utilities with the ideal conditions for much needed investment. But many state and local governments are banning new data center construction, primarily due to rate hike fears. Three experiments from a March 2026 national survey (N=2,187) investigate the causes of this public opposition to hyperscale data centers. Study 1 contextualizes their electricity usage relative to hospitals with no effect. But study 2's arguments that data center demand growth has little to do with rate inflation reduced appetite for bans by 13% percent. Study 3 focused on data center attributes, and water-efficient hyperscalers that ensured zero impact on rates were chosen 55% of the time. Our results imply that ratepayer protection acts can defuse rate anxiety without outright bans.

Keywords: hyperscale AI data centers, survey experiment, conjoint experiment, public opinion

For over two decades, American energy utilities and transmission grids saw little demand growth, partly due to the retreat of American manufacturing even while residential customers increased [U.S. Energy Information Administration, 2025]. Without high baseload customers, utilities were only required to make routine transmission upgrades. Combined with cheap natural gas from the shale boom, utilities decommissioned several nuclear power plants before their licenses expired. But multi-gigawatt hyperscale data centers are now inverting this. Operating 24/7, hyperscale data centers are high baseload customers. To keep up with this constant demand, utilities serving hyperscale clusters are needing to invest in new transmission and backup infrastructure. Decommissioned nuclear power plants in Michigan [Buczek, 2025], Pennsylvania [Gardner, 2025], and Iowa are being revived in partnerships with hyperscaler operators such as Microsoft and Google.

This new demand is a boon for utility companies. Large load customers provide the necessary certainty for utilities to make improvements. Virginia's Dominion Energy, which services the largest data center cluster, invested 65 billion in transmission and new capacity upgrades [Schipper and Church, 2026]. The largest grid additions, however, have been in Texas, whose capacity has grown 9% since 2024, 5 times the national average. There are other fiscal benefits. Operators bring in local property tax revenue that is being used to pay for public improvements without increasing local taxes on current residents [Office of the Governor of Utah, 2026]. Loudoun County in Northern Virginia is passing down this additional revenue as property tax discounts [Loudoun County, 2026].

However, residential ratepayers seem to have much more anxious reactions to hyperscale data centers. Their concern is that these new transmission demands will be added to their residential energy bills and the load growth will push up per kilowatt hour costs of electricity. These and other environmental concerns have now coalesced into a widespread distrust of hyperscale data centers, leading many local governments to issue bans on data center construction within their permitting authority. While many of these bans are temporary, some municipalities like Monterey Park near Los Angeles banned them permanently with an overwhelming majority of 86% [La, 2026]. New York state just became the first state to issue a one year moratorium on data centers [Ward, 2026]. The statewide ban in Maine cleared both chambers of the legislature, but was vetoed by the Governor earlier this year.

Public opinion polling on data centers (not necessarily hyperscale data centers) frequently finds that a majority of respondents in their sample would not support a data center locally. A Gallup poll of March 2026 finds that 70% of Americans oppose building a local data center [Jones, 2026]. A time series of Heatmap News polls find that opposition to data centers increased from last year June's 45% to almost 70% [Meyer, 2026]. In our sample, specifically asking about hyperscale data centers, opposition to a local data center exceeded 50%. At least 50% of our sample also wanted to ban data centers at either the national, local, or state level.

Data center proponents argue that these are overreactions to their actual impact on the grid and rates. They hypothesize that the public overestimate the resource impact in proportion to all other uses, misattribute electricity rate hikes to data centers, and discount other fiscal benefits that data centers bring. Our experiments test to what extent these arguments can persuade the public to reconsider bans on data centers and support their siting locally. Providing usage context, such as saying that data centers only consume about 5% of total energy nationwide, had no persuasive effect. However, Loudoun County's property tax discounts and the minimal impact data centers had on Virginia's residential electricity rates increased support for data centers and reduced appetite for bans. When provided this information, the support for a national ban reduced 13%. Support for a local data center increased by 5%.

As with many other large scale projects, the public opinion is a function of the specific project's attributes. Different groups of respondents also have different reactions to the same attributes. All ratepayers will be concerned about the project's impact on utility rates, but property owners will also be concerned about their property values. Studies in renewable energy siting find property values, visual character, and noise are frequently brought up by local opposition [Carlisle et al., 2016, Dällenbach and Wüstenhagen, 2022, Katkar et al., 2021]. This implies that distance from residence matters. In the case of data centers in particular, water use seems to be a source of public concern [Mytton, 2021]. Local air quality concerns are also relevant if data centers are generating their own electricity.

The conjoint experiment disentangles these many considerations from that of the effect on rates by asking respondents to choose between a hyperscale data centers that are defined by their impact on utility rates, water-efficiency, distance to their residence, electricity source (gas vs renewable), and the center operator. A data center that uses only 500,000 gallons with zero impact on utility rates is chosen 55% of the time. In contrast, a data center that increases utility rates even while using only 500,000 gallons of water is chosen only 25% of the time.

In both experiments, dissuading concerns about electricity rates has the most persuasive effect. But the persuasive effect was also mediated by other factors such as the respondent's own estimate of the utility of the hyperscale data centers. Regular users of AI chatbots had both high baseline support for data centers and were also more likely to be persuaded by frames in experiment 2. Another mediating factor was energy portfolio preferences. Those that preferred expanding more than three of the energy sources out of coal, drilling, fracking, nuclear, solar, and wind were also more likely (by 10 points) to support data centers.

Even though the dominant concern in our sample was data center electricity use, many of the other mediating concerns have many parallels to the energy siting problem. Renewable energy advocates and operators find that despite national support for solar and wind power, local siting is frequently an uphill battle where operators have to bargain with residents on various project characteristics in a lengthy process that can produce delays, budget overruns, and even project cancellations Carley et al. [2020], Caggiano et al. [2024]. Opponents of solar energy site farmland use and visual concerns and opponents of wind energy are concerned about noise Susskind et al. [2022], Nilson et al. [2024a]. Local opponents of nuclear energy are concerned about groundwater contamination. These parallels are not merely theoretical.

Many county-level data center bans also simultaneously ban solar, battery storage, and small modular nuclear reactors [Short, 2026].

Renewable and nuclear energy advocates have now built a corpus of best practices on negotiating with siting opposition [Winter et al., 2022, Nilson et al., 2024b]. There is also a related body of empirical evidence as to how after their placement, local residents become more supportive of the project [Iqbal et al., 2022]. These strands of literature can inform the operation and expectations of data center operators. This present study's intention is to experimentally disentangle the many factors that are at play.

Main

This survey includes three randomized survey experiments, two focusing on framing arguments and the third a conjoint experiment. Respondents were recruited from a national YouGov panel in March 2026, and 2,187 registered voters participated in our study. For both survey experiments, the four outcomes are support for a (1) national ban, (2) state ban, (3) county ban, and a (4) local county data center. Respondents who supported a national ban were assumed to support a ban at more local levels. They were also asked to indicate their major concern choosing from (i) electricity utility rates and blackouts (ii) water utility rates and shortages (iii) Noise pollution and traffic (iv) groundwater contamination (v) no concerns.

Survey Experiment 1

In the first survey experiment, we test whether contextualizing data center electricity and water usage can affect sentiment. Water and electricity usage is contextualized in gallons and gigawatt hours and compared to a large hospital (Context usage 1). Then it is contextualized as a percentage of all uses of water and electricity (Context usage 2). The first control statement only includes a brief definition of hyperscale data centers and the second control statement said politicians are concerned about utility infrastructure. This second control statement was repeated before all the other context statements. See Methods for full statements.

Figure 1 shows the percentage of responses for each choice under the four frames. There is little difference between frames. Figure A.2 in the supplement does a formal test that combines the two context frames against the combined control frames and finds no significant differences between them. The frames were combined to increase power. The context frames had little impact even between partisans, and genders (Figure A.3 in supplement).

However, support differed considerably between subgroups regardless of the frame. Figure 2 correlates responses that indicate positive data center sentiment (combined across the frames) with respondent characteristics. Men are more supportive than women. Republicans are more supportive than Democrats or Independents. Postgraduate education and high AI use predicted greater support. The largest predictor of support was support for a varied portfolio of energy. Age had little effect on support, but is likely confounded by reported AI use, which was more common among younger respondents.

Survey Experiment 2

The second survey experiment repeated the same outcome questions, under three different frames for the entire sample. This is a pre-post experiment where the control is each respondent's own pre-exposure responses. Contamination from the first framing experiment is of limited concern because the samples were re-randomized. Panel A of Figure 3 shows the raw percentage outcomes and Panel B calculates the effects of the frames.

The Property Tax ('Property Tax') frame told of the property tax discount Loudoun County residents received due to County surpluses from data center business property tax revenues. The Property Tax and VA electricity frame ('Property Tax + VA elec') combined the property tax discounts frame with the argument that despite running the largest data center cluster in the country, Virginia's electricity rates are below national average. The

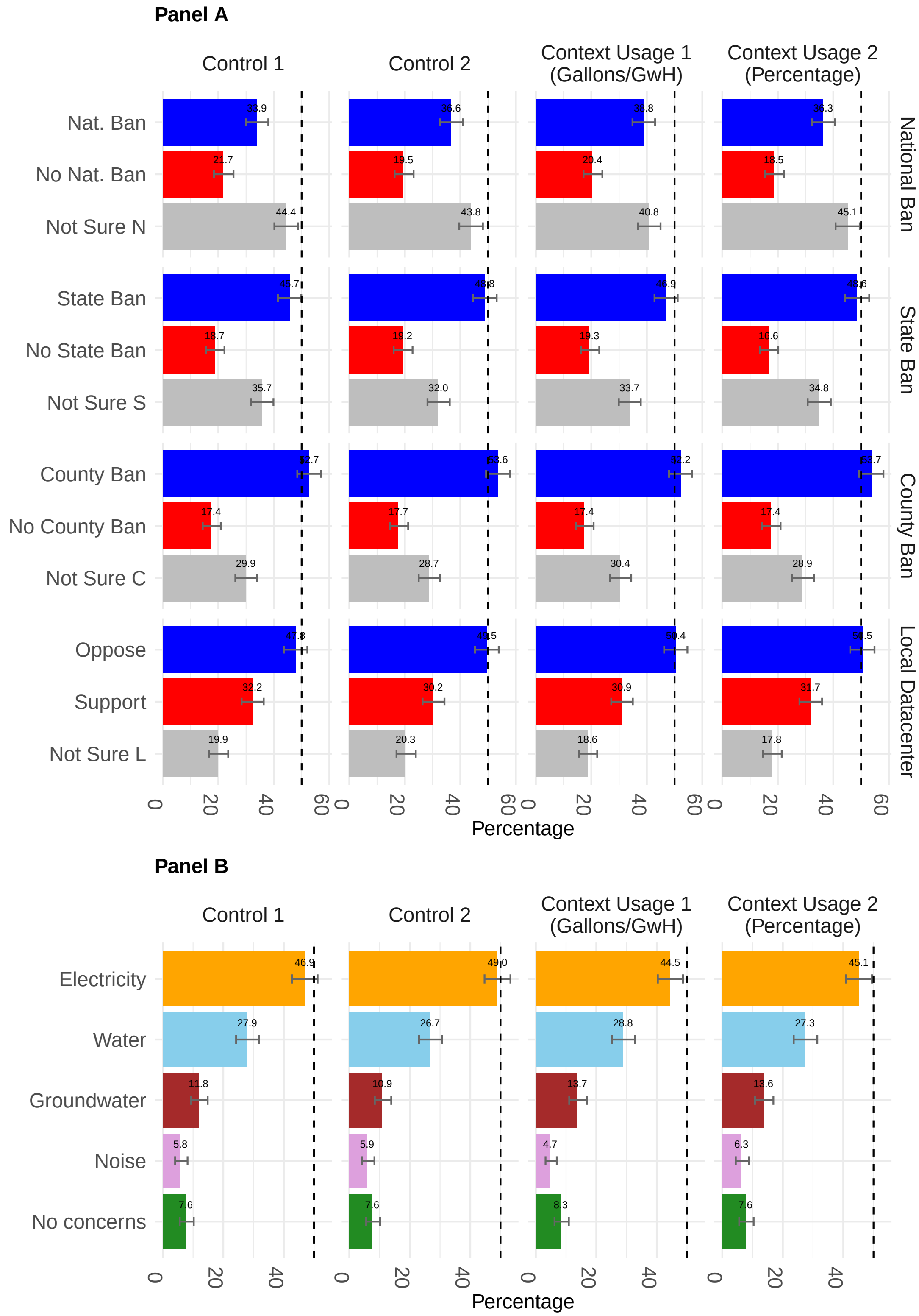

Figure 1: Percentage of responses under control and context frames in survey experiment 1

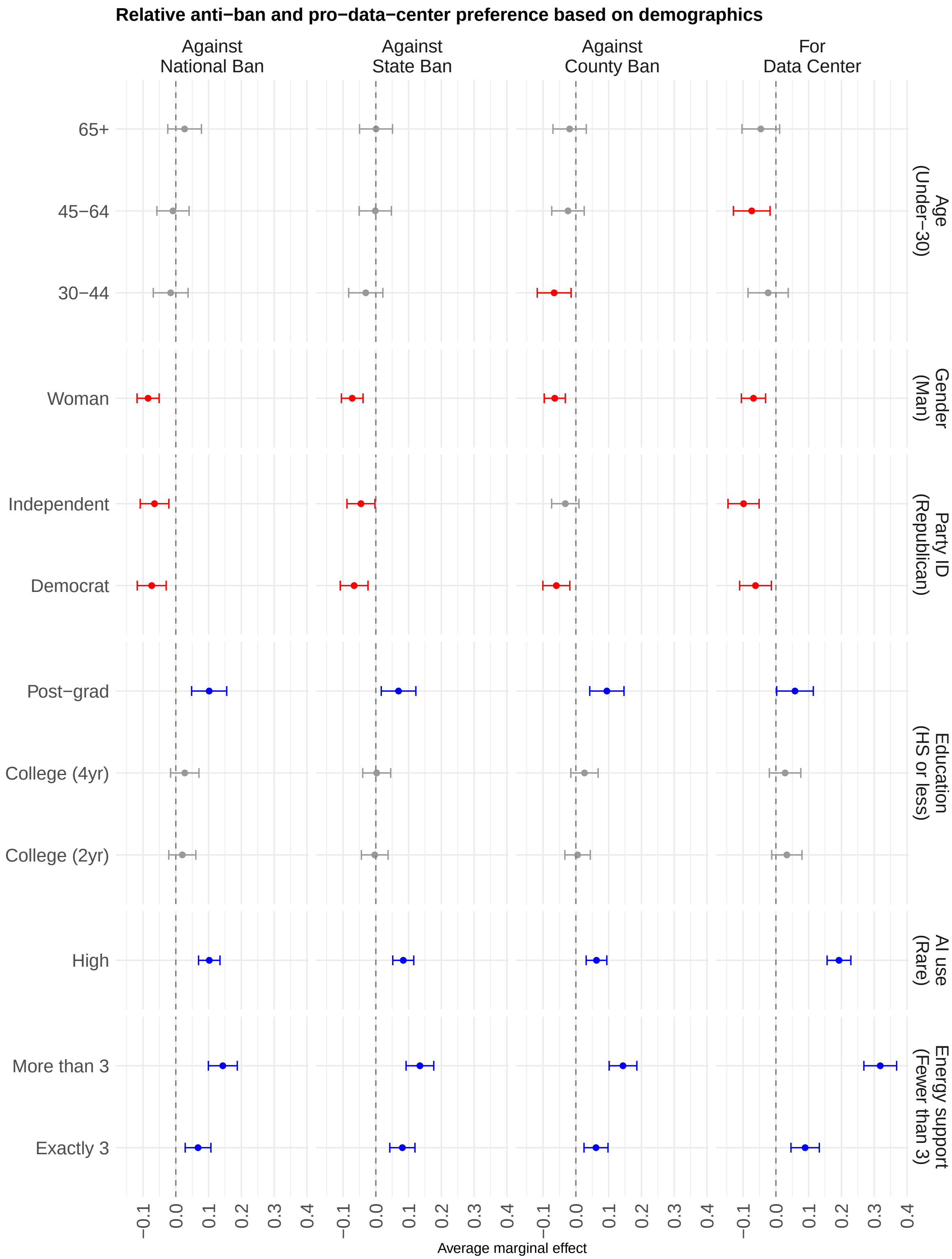

Figure 2: Subgroup differences in responses in favor of data centers

third Property Tax and Virginia electricity and Maine electricity ('Property Tax + VA elec + ME elec') frame furthered this argument by adding that the state of Maine with zero hyperscale data centers has the highest electricity utility rates. Figure 3 demonstrates these results.

The Property Tax discounts, by itself, only reduced support for a national ban with no effect on more local outcomes. Information about Virginia's low utility rates, in contrast, affected all outcomes positively towards data centers. Opposition to a national ban increased by 13%. Support for a local county data center increased by 5%, bringing the opposition and support for local data centers about even. Maine's electricity rates had little additional impact, as both frames performed somewhat similarly. Because this experiment is a pre-post experiment, we can account for how persuasion occurred. In the case of the national ban, almost all of the pro-data center effect came from persuading not sure respondents. The effect was diminished for other outcomes because there were fewer not sure respondents. Figure A.6 in the supplement has all transition matrices.

Surprisingly, in contrast to the baseline (Figures A.7 to A.10 in supplement), there was little heterogeneity in persuasive effect between partisans, or genders. High AI users and 45-64 year old respondents recorded a consistent opposition to bans at all levels and under all treatments.

Conjoint Experiment

When asked to express their opinion of data centers, respondents impute their own priors about a data center's operational details and environmental impact. But when local siting decisions are made, the resource footprint of the proposed data center is better known. The conjoint experiment simulates this process. Each respondent is shown to competing profiles of data centers that are defined on five dimensions. Each dimension has two options. These options are labelled along the vertical axis of Figure 4 and more completely reported in the Methods. Respondents choose between one of the two competing profiles or reject both.

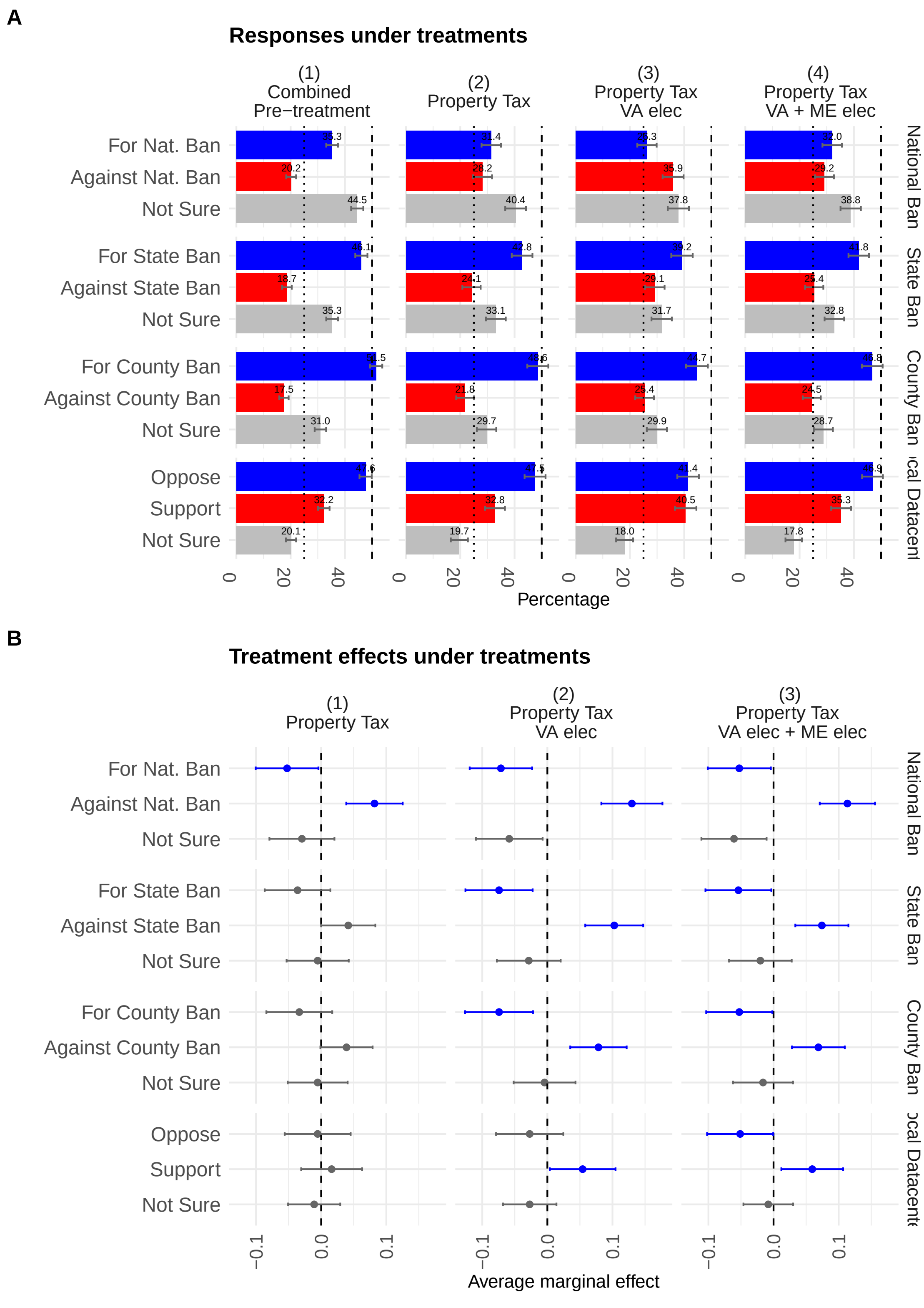

Figure 3: Results of the second survey experiment

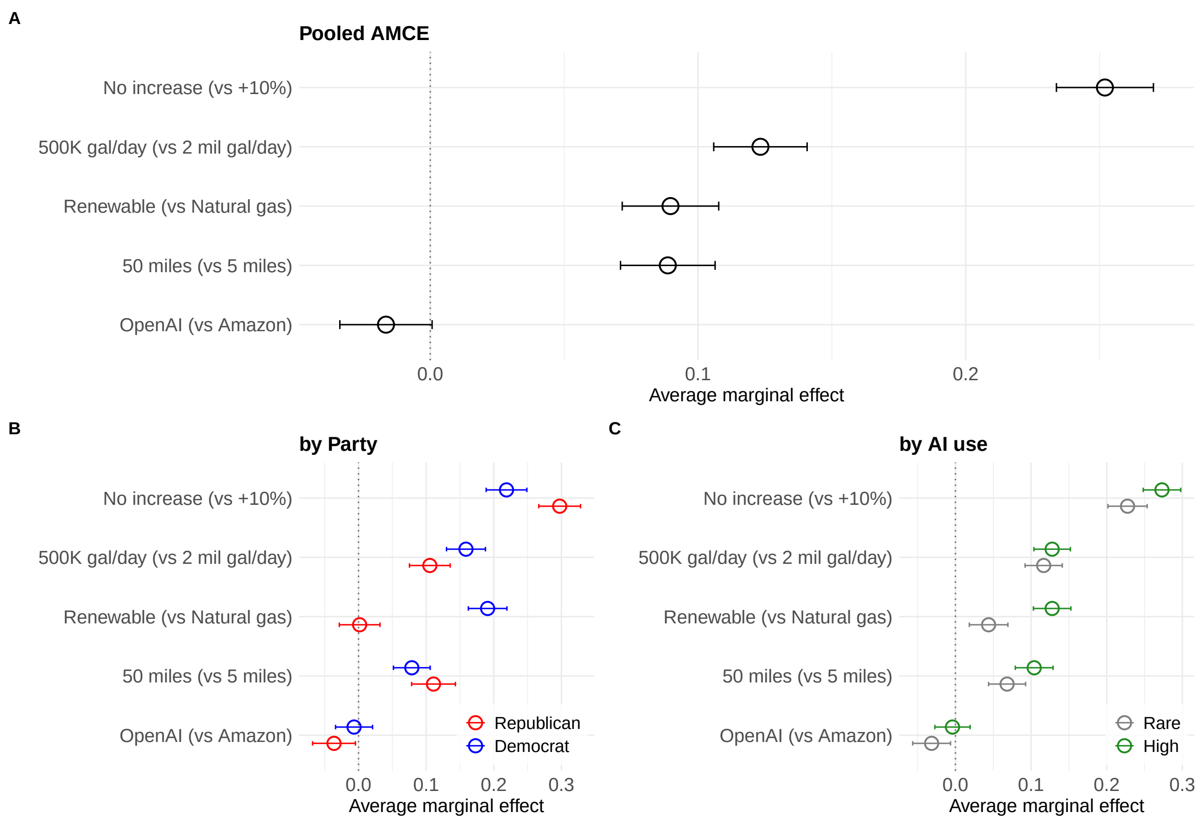

Figure 4: AMCEs of the conjoint experiment

This is repeated three times for each respondent. About 30% of the sample rejected both options across the three iterations. If both are rejected, the respondent is forced to make a choice. These forced choices are analyzed and reported in Figure A.13 in the supplement.

Panel A of Figure 4 shows average marginal component effects (AMCEs) of each dimension. These estimates are comparisons between two competing attributes. Since we have only two attributes per dimension, we only make one comparison per dimension. Guaranteeing no electric utility rate hikes increased support by 25 percentage points (pp) on average, compared to a data center that had a 10% rate increase. Using less water increased support by 12 pp and using 100% renewable energy increased support by about 9 pp. A data center more than 50 miles away was favored by 9 pp more than a data center only 5 miles away. The identity of the hyperscaler did not matter.

Panel B of Figure 4 calculate AMCEs separately for Democrats and Republicans, and high and rare AI users. Republicans are more persuaded by electric utility rate guarantees than Democrats, while Democrats are more persuaded by renewable energy use guarantees than Republicans. In Panel C, between high and low AI users, high AI users were more likely to support data centers that used renewable energy than rare AI users.

Since we allow respondents to reject both choices, we can derive a probability of any fixed data center profile being acceptable to the average respondent. This probability can then be compared to the average preferences for data centers expressed in the survey experiment. Figure 5 shows this probability for a number of profiles. Data centers that may cause an electricity rate hike are chosen only 21% of the time. Low water usage does not increase the appeal of such data centers much. But combining low water usage with a no electric rate impact increases the probability of being chosen to 54%. If such a data center is also located 50 miles away and uses 100% renewable energy, this probability further rises to 64%.

Discussion

The data center buildout may be America's newest growth engine. Almost 90% of 2025 Q1 economic growth can be attributed to data center construction. Hyperscaler demand for large power loads are also reviving the ancillary industry of electricity generation. From a national interest point of view, data centers are a lucky break. Yet national interests and local interests are frequently in conflict, particularly when the permitting authority lies locally and the benefits are dispersed nationally [Boudet, 2019]. Decades of renewable energy literature has documented this conflict. A variety of local concerns ranging from contamination fears to cultural significance of the land have stalled utility scale renewable energy projects. Nuclear installations face even more spirited opposition and viable plants have been forced shut by water contamination concerns as recently as 2021.

This national-local conflict is further intensified by the large energy consumption of hyperscale data centers. A combination of geo-political incidents and inflationary pressures

Figure 5: Probability of selection of fixed data center profiles

rapidly increased electricity costs for residential consumers across the United States. Even if residents do not attribute these rising electricity costs to data centers, there is widespread anxiety about their load demand. Almost 50% of the respondents in the sample reported electric utility rates as their major concern about data centers.

Data center proponents lament that these concerns arise out of exaggerations of the actual impact hyperscale data centers have, while discounting their benefits. They contend that a better context for data center resource use will soften the opposition. Our first survey experiment tests this claim and finds no evidence that providing context persuades respondents in favor of data centers. This disconnect is familiar to nuclear energy advocates. The public frequently overestimates the radioactivity of nuclear energy facilities but informational treatments to the contrary do not increase support for them.

What does work is information that even with their large resource footprint data center impacts on residential electric utility rates are minimal and more than compensated for by their fiscal benefits. Surprisingly, though property tax discounts resulted in larger savings, the frame with only this information had the least impact, implying that much of the anxiety about data centers is linked to anxiety about electricity bills. The conjoint experiment confirms this. Hyperscale data centers that guarantee zero electricity rate impact are chosen 45% of the time. Combined with water-efficiency this support increases to 55%. No other attribute had a larger effect on the support for data centers.

The results have important implications for state and local permitting authorities and utility regulators that are faced with pressures to ban data centers. The public concerns can be dissuaded in large part by imposing that data center related costs are defrayed by the data centers. Codifying these guarantees at a state level can relieve local permitting pressure to the extent that the major concern is electricity rates. Congress also seems to be taking this view with its ratepayer protection bill. Many grids are also relaxing the permitting process for data centers to provide their own power. Data centers with excess power generation could be contributors to the grid even reducing spot prices and residential bills.

Methods

The survey was fielded by YouGov. YouGov selected potential subjects from their opt-in panel to be representative of U.S. registered voters. 2,187 U.S. registered voters were interviewed online, March 13-20, 2026. YouGov provided sample weights, estimated using gender, age, race, and education based on the American Community Survey, as well as 2020 Presidential vote, 2024 Presidential vote, and baseline party identification. The sample weights range from 0.1 to 4.6, with a mean of 1.0 and standard deviation of 0.4. Results reported in this paper are weighted. YouGov estimates a 2.3% sample margin of error.

The experiments in the survey were pre-registered before we had access to the data. The survey experiment's pre-registration is accessible at `https://osf.io/tgp4h/files/g5cmf`. The conjoint experiment's pre-registration is at `https://osf.io/hbvsn/files/gpm6z`.

Survey experiment 1

The first survey experiment randomized across four groups with about 500 respondents in each. See Figure A.1 in the supplement for demographic balance across the groups. Regardless of their allocated treatment, they responded to the following outcome items.

1. Do you support a moratorium (ban) [on hyperscale data centers] on a national level? {Support a ban, Oppose a ban, Not Sure }

2. Do you support a moratorium (ban) [on hyperscale data centers] in your state only allowing other states to decide for themselves? {Support a ban, Oppose a ban, Not Sure}

3. Do you support a moratorium (ban) [on hyperscale data centers] in your county only allowing other counties to decide for themselves? {Support a ban, Oppose a ban, Not Sure}

4. Assuming no type of moratorium (ban) is in effect, what would be your level of support for the placement of a hyperscale data center in your county? {Support, Oppose, Not Sure}

5. Regardless of your support level, what is your major concern about the placement of hyperscale data centers locally to you? {Water utility rates and shortages, Electricity utility rates and blackouts, Noise pollution and traffic, Groundwater contamination, No concerns}

Respondents who supported a national moratorium on data centers were skipped to questions 4 and 5 above, since a national moratorium will imply a state and county moratorium. Similarly, respondents who supported a state moratorium were skipped over to questions 4 and 5, assuming that a state level moratorium implies a county moratorium.

The four frames in the first survey experiment were as follows.

A **Control 1**: As you may know, hyperscale data centers are facilities that house the servers that power the internet, apps, and artificial intelligence. In the wake of the rapid growth of hyperscale data centers in the past five years, some politicians are proposing a moratorium (ban) on further expansion of these data centers.

B **Control 2**: Control 1 + The politicians are concerned that the water and electricity use of the data centers are putting stress on utility infrastructure.

C **Context usage 1**: Control 2 + For some context, a hyperscale datacenter can use about 110 million gallons of water per year and 1000 gigawatt hours of electricity per year. In comparison, a large hospital would use about 60 million gallons of water per year and 20 gigawatt hours of electricity per year.

D **Context usage 2**: Control 2 + A federal government report projects that hyperscale data centers will be consuming at least 3% of total electricity generated in 2028 and at least 0.02% of all water withdrawals in 2028.

To estimate effects, the samples that received the **Control 1** and **Control 2** frames were combined together as one control set. The samples that received the two context frames were combined together as the treatment group. The samples were combined to increase power, but the effects were nonetheless insignificant (See supplement's Figure A.2).

Estimates were calculated using multinomial logistic regression with sample weights. The exact implementation in the `R` software was as follows,

- A model of `outcome` on treatment indicator and covariates for age, gender, partisanship, and education was estimated using the `nnet::multinom` call.
- The resulting model object is then used to calculate a prediction change and averaged over the sample with the relevant sample weights using the `marginaleffects::avg_comparisons` function.

Survey experiment 2

For the second experiment, the entire sample was re-randomized into 3 groups with about 700 respondents in each. Figure A.5 in the supplement shows the demographic balance across this second randomization.

Because these samples are randomized, any effect from the first survey experiment is unlikely to be have a systematic effect, but can reduce the precision of the estimate if past exposures matter. We include indicators for the type of treatment the respondent received in experiment 1. Since the previous experiment had little effect between the control and context frames we assume that the effect on precision is small.

The three random samples received the following prompts before answering the same questions 1 to 4 on data center bans as the previous survey experiment.

P **'Property Tax'**: Loudoun County in Virginia has the largest number of data centers in the United States. The property taxes paid by data centers in Loudoun County reduced homeowner property taxes from 1.2 to 0.8 percent. For the median property in Loudoun County, this is a saving of $3000 a year.

Q **'Property Tax + VA elec'**: 'Property Tax' + Data centers now account for more than 21 percent of the county's electricity consumption. Despite this large demand, residential electricity rates in Virginia have remained below the national average since 2010.

R **'Property Tax + VA elec + ME elec'** 'Property Tax + VA elec' + Maine, by contrast, has no hyperscale data centers, but its residential electricity rates have remained well above the national average over the same period.

Estimates in Panel B of 3 were produced similarly using the two calls to `nnet:: multinom` and `marginaleffects:: avg_comparisons`. In the call to `nnet:: multinom`, instead of the vector of covariates, a string of indicators for what survey experiment 1 treatment indicators were used. This was to control for any contamination from the first survey experiment.

Conjoint experiment

In the conjoint experiment, each respondent made three choices between two binary profiles, with each profile consisting of five dimensions. The five dimensions and their respective (binary) attributes are as follows.

Company {OpenAI, Amazon}

Location {5 miles from your home, 50 miles from your home }

Power {Powered by 100% renewable energy from wind and solar, Powered by a local natural gas plant}

Water {Consumes approximately 500,000 gallons of water per day for cooling; comparable to a large hospital or midsize golf course, Consumes approximately 2 million gallons of water per day for cooling; comparable to four large hospitals or four midsize golf courses}

Rates {Local utilities estimate the data center could increase residential electricity bills by about 10%, The company has pledged to pay electricity rates high enough to cover all infrastructure costs, so residential bills would not increase}]

To obtain the average marginal component effects reported in Figure 4 all profile choices were arranged into a panel with respondent's identifier and six rows for each respondent (three rounds of choosing between two data centers). Rejected profiles are marked with zero in the choice indicator. Some respondents reject both options. A logistic model is implemented through the `glm` where the choice indicator is regressed on the profile characteristics of company, location, power, water, and rates. Then a call to `marginaleffects::avg_comparisons` produces the average predicted change between each profile characteristic. Standard errors are clustered at the respondent level.

Responses that reject both choices are forced to choose in a follow-up question. For the forced choice analysis, the same procedure above is used but with an updated choice indicator.

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