California Consumers’ Beliefs and Trust in Electric Utilities

Christine Horne¹, Thomas Familia¹, and Emily Huddart Kennedy²

Abstract
The authors use survey and interview data from California homeowners to understand customers’ trust in their utility company. The authors find that customers' beliefs about the reliability of electricity do not predict trust. Instead, what matters are beliefs that the utility company does a bad job managing customer service, costs, and wildfires. Distrust among survey respondents aligns with interview participants’ descriptions of utility companies as powerful, greedy monopolies that benefit themselves at the expense of helpless consumers. These results have implications for the energy transition and, more generally, understanding potential challenges experienced by technocratic institutions.

Keywords
trust, electric utility, wildfires, reliability, technocracy

Trust in American institutions is eroding. Research reveals declining trust in social institutions, including government, business, media, and religion (Edelman 2021; Ghosh 2020; McGrath 2017; OECD n.d.; Rainie and Perrin 2019). Trust matters because people who trust an institution are more likely to engage with it, for example, by following its mandates, buying its products, or participating in its programs (e.g., Aguinis and Glavas 2012; Aiken and Boush 2006; Elfenbein, Fisman, and Mcmanus 2012; Vlachose et al. 2009; Wang, Beatty, and Foxx 2009). More broadly, trust has implications for the ability of communities and societies to solve collective problems (Putnam 2000; Putnam, Leonardi, and Nanetti 1993). Given the dependence of individuals on social institutions for essential goods, trust in institutions has potential implications for a range of outcomes.

We examine trust in the context of a critical infrastructure: the U.S. electric grid. The U.S. electricity delivery system is in transition, moving toward greater incorporation of renewable energy sources and distributed production of electricity (e.g., through customer rooftop solar panels), as well as increased use of information and communication technology (e.g., Satchwell and Cappers 2018; Specht and Madlener 2019). This transition is widely expected to require more communication and coordination between customers and industry actors (e.g., Mueller 2017). At present, utility companies are the main point of intersection between customers and the electricity delivery system. Emerging smart technologies enable utilities to manage the grid and interact with consumers in a dynamic way, for example, shifting use away from times of stress on the grid and treating households not only as consumers but also as producers of electricity (EERE 2017). Such engagement requires trust. However, in the United States there is evidence that people do not trust electric utility companies (Saad 2016; Tweed 2013).

We seek to understand some of the beliefs that underlie distrust in utility companies. We assess whether people’s beliefs about the reliability of electricity supply, cost considerations, and utility management of wildfires are associated with trust. We test our hypotheses using survey data collected from California homeowners and further explore people’s experiences and interpretations of those experiences through semistructured interviews conducted with residents of southern and northern California. We find that beliefs that the utility has done a bad job with customer service, keeping costs down, and managing wildfire risks are associated with distrust; beliefs about reliability are not. In addition, participants describe utility companies as self-serving monopolies with unfair advantages. Our results are relevant for utilities seeking to improve

¹Washington State University, Pullman, WA, USA
²University of British Columbia, Vancouver, BC, Canada

Corresponding Author:
Christine Horne, Washington State University, Department of Sociology, 204 Wilson-Short Hall, Pullman, WA 99164, USA
Email: chorne@wsu.edu

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (https://creativecommons.org/licenses/by-nc/4.0/) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).
their relationships with residential consumers and successfully engage with them. More generally, our findings have implications for understanding potential challenges faced by technocratic institutions.

**Literature and Hypotheses**

Trust is relational; it occurs in the context of exchange (e.g., Fehr 2009; Gambetta 1988; Levi and Stoker 2000; Mayer, Davis, and Schoorman 1995; Riegelsberger, Sasse, and McCarthy 2005). Trust refers to the extent to which one actor thinks the exchange partner is trustworthy, that is, will behave in a way that is consistent with the actor’s interests (e.g., Levi and Stoker 2000). When interacting with others, individuals may enter into interactions that have the potential for gain, but also risk losses. So, for example, a household might participate in a utility program, believing that the program will benefit them in some way. But they also run the risk that they might be taken advantage of and could lose instead of benefit. When individuals trust another actor, they will be more willing to take such risks (see, e.g., Dasgupta 1988; Fehrler and Przepiorka 2016).

In the utility context specifically, there is evidence that consumers’ trust in their electric utility is associated with greater willingness to participate in utility programs (Przepiorka and Horne 2020). If trust drives the extent to which people engage with institutions, then understanding the factors that contribute to trust or distrust is important. If people do not trust their utility, then they will not want to coordinate and cooperate with utilities on demand response (efforts to shift amount and time of use) or other initiatives. Current evidence suggests that people do not trust their utility companies (e.g., Goulden et al. 2014; Palm and Tengvard 2011; Przepiorka and Horne 2020; Saad 2016; Tweed 2013). However, the reasons for that distrust are not well understood.

We explore people’s beliefs about utility company behaviors—the extent to which they think that the utility company is doing a good or bad job at particular tasks—and examine the associations between those beliefs and trust in the utility. We focus on consumer beliefs about four utility behaviors. The first two focus on issues that utilities generally view as important—reliability of supply and quality of customer service. We also look at two characteristics that are relevant in California given its high electricity costs and challenges with wildfires and associated outages: beliefs about utility companies’ management of electricity costs and fire risks. As explained below, we expect that customer beliefs that the utility company does a good job providing a reliable supply of electricity, providing customer service, maintaining reasonable costs, and managing wildfire risks will be associated with higher trust.

The electricity industry puts substantial effort into reducing the frequency and duration of outages, placing a high priority on providing a reliable, consistent supply of electricity (e.g., EIA 2018; U.S. Department of Energy 2016; Vassell 1991). It has well-developed and enforced reliability standards and reporting requirements, and it assesses new strategies and technologies with an eye toward maximizing grid resilience (Bakke 2016; Davis 2011). Like the industry as a whole, utility companies seek to minimize outages. Despite these efforts, outages in the United States are increasing over time (e.g., Eto and LaCommare 2008; Eto et al. 2012; Howland 2020, Larsen et al. 2015). In California, 2019 alone saw more than 25,000 blackouts affecting more than 23 million customers (Bloom Energy n.d.) and multiple media accounts of frustrated customers (e.g., CBS 2019; Fuller 2019). Failures to maintain a reliable supply of electricity may affect customers’ beliefs about their utility company. If people believe that their utility company successfully provides a reliable supply of electricity, they might have greater trust in it. Accordingly, we hypothesize as follows:

**Hypothesis 1:** Consumers’ beliefs that their utility company provides a reliable supply of electricity will be positively associated with trust.

Utility companies also invest resources in providing good customer service. Although historically utilities have not been known for excellence in this area, in recent years they have paid more attention to the issue (e.g., Cohen 2004; Morgan 2019). And there is no shortage of advice telling utilities that customer service matters (e.g., Energy Central n.d.; Moerkerken et al. 2012). Utilities work to communicate changes such as installation of new smart meters, rate changes, and outages. They also seek to provide customers with good communication options, moving beyond phone calls to integrate other forms of media (e.g., Aguero, Khodaei, and Masiello 2016; Aweh et al. 2020; Energy Digital n.d.). For instance, some have developed apps to facilitate communication (e.g., Trabish 2015). Despite increased emphasis in the industry on improving customer service, there is some evidence from vignette experiments showing that a hypothetical utility’s customer service does not affect trust (Przepiorka and Horne 2020). But consumers’ assessment of a utility in a fictitious setting may differ from their beliefs about their own provider. Here we assess whether customers’ beliefs about the quality of their own utility’s customer service are associated with trust.

**Hypothesis 2:** Consumers’ beliefs that their utility company provides good customer service will be positively associated with trust.

Electricity prices vary across the United States. For example, in 2020, residents of Washington state paid 8.04 cents/kwh, whereas people in Hawaii paid 28.72 cents/kwh. As one of the 10 most expensive states in the country, California has relatively high prices: 16.89 cents/kwh (EIA 2020). We expect that as people blame utility companies for the size of their bill, they will have lower trust in their utility; if they believe their utility is effective at keeping electricity costs low, they will have higher trust.
**Hypothesis 3:** Consumers’ beliefs that their utility company is doing a good job managing electricity costs will be positively associated with trust.

Utilities are able to reduce the risk of fire through strategies such as replacing old poles, installing new technology in existing infrastructure, and removing vegetation (Jazebi et al. 2020a, 2020b; Muhs, Parvania, and Shahidehpour 2020). Another strategy is to cut power during high-risk time periods (e.g., Rhodes, Ntaimo, and Roald 2021). Recent widespread media accounts report the anger of California residents against utility companies for their management of wildfire risks, blaming utility companies for being self-serving and incompetent (e.g., Myers and Luna 2019). California’s governor was reported in the media as blaming utility greed for the states’ electricity woes (Karimi and Moon 2019). Given the negative consequences of utility mismanagement of wildfires, consumers are likely to think utility companies are acting in their own self-interest and do not care about customers. If customers believe that their utility company is not doing a good job managing wildfire risks, they will have less trust in it.

**Hypothesis 4:** Consumers’ beliefs that their utility company is adequately managing the grid to prevent wildfires will be positively associated with trust.

**Methods**

We test our hypotheses with survey data collected from California homeowners from September to December 2019 and explore customer experiences through semistructured interviews conducted with residents of southern and northern California in 2018 and 2020 (the survey instrument and statistical code are available from the authors).

**Survey Data**

Our data are part of a larger study on adoption of solar energy that examines both adopters and nonadopters of rooftop solar panels. To obtain a list of adopters, we examined county records. California requires a building permit to install solar panels in residential homes. Many counties have their permit records online. We extracted solar permit data from these records (see Appendix A for a list of counties included in the sample). Participants were randomly selected from the resulting list. We then drew a general public address-based homeowner sample matching the counties for which we have permit records. Households that were duplicated in the adopter sample were removed. Using the tailored design method (Dillman, Smyth, and Christian 2014), we mailed households a letter providing them with a link to the study and inviting them to participate. The invitation included a $1 preincentive. We then sent a postcard reminder. Then, if they had still not responded, we sent a paper copy of the questionnaire. Finally, we sent them a last reminder letter.

The total original sample was 26,246. Two hundred cases from this original sample were ineligible because the address was either a rental or nonresidential location. These cases were removed, leaving 3,402 completed and partially completed eligible surveys. The response rate (13.1 percent) was the ratio of completed and partially completed interviews to the total number of eligible surveys (26,046). Our final sample was 42 percent female. The mean age was 59 years ($SD = 14.15$ years), with 39 percent of our sample age 65 or older. Seventy-four percent of our survey participants had at least a college education. The mean income was $129,377. Sixty-nine percent of our sample was white. Our sample was thus not typical of California residents in general, in part because it focuses on homeowners. Both our adopter and nonadopter samples have characteristics consistent with those of households that are more likely to adopt solar (e.g., higher income; Barbose et al. 2020). Although the invitation letter explicitly stated that we were interested in the opinions of both those who had solar and those who did not, individuals who did not see solar as an option for them (e.g., because it was financially out of reach) may have felt that the survey was not relevant and that they had little to contribute. In addition, wildfires, outages, and evacuations during the data collection period may have reduced the response rate.

We measured respondents’ trust in their electric utility company by asking how much they trusted their electricity company to act in their best interests (1 = strongly distrust, 5 = strongly trust) (for similar approaches, see Gallup n.d.; Smets, Hooge, and Quintelier 2013). To assess respondents’ beliefs about their utility company, we asked them how good a job it did providing a reliable supply of electricity, providing good customer service, providing electricity at a reasonable cost, and maintaining the electricity system to prevent fires (1 = very bad, 5 = very good). Because very few respondents chose the “very bad” category for two of our independent variables (<3 percent for both reliability and customer support) and to be consistent across the independent variables, we collapsed the five categories into three: bad job, neutral job, and good job.

**Semistructured Interviews**

To explore the rationales underlying consumer distrust of utilities, we conducted semistructured interviews with homeowners in southern (San Diego area) and northern (Sacramento area) California in the summers of 2018 and 2020. In both locations, we began with a small number of personal contacts of the researchers and then used snowball sampling to expand the sample. Because in the United States, views on energy, particularly as it relates to climate change, are to some extent bifurcated by political ideology (Hornsey et al. 2016), we sought a sample that reflected a range of
political orientations. We interviewed participants at a time and location that was convenient for them. The southern California interviews were conducted in person. Because of the impacts of coronavirus disease 2019 in fall 2020, the northern California interviews were conducted via Zoom. Interviews lasted roughly one hour. Participants received a $20 Amazon gift card.

In total, we interviewed 61 participants. Sixty-four percent of our sample was female. The mean age was 55 years ($SD = 11$). Mean years of schooling was 16.22 ($SD = 2.79$), with 57 percent of our participants having a college education. Our sample was quite well off, with half making $100,000 or more. We asked participants to identify the political party and political ideology that best represented their values. Thirty-three percent of our participants were Democrats, and 43 percent were Republican. Three percent identified with the Green Party, 2 percent reported being Libertarian, 5 percent were independent, and 15 percent chose “other” or did not respond. Several participants only identified themselves in terms of political ideology (conservative, moderate, liberal) rather than party affiliation.

As noted above, the interviews were part of a larger study on solar energy and, therefore, we crafted much of the interview guide to elicit participants’ motivations to get solar energy and their perceptions of solar energy. Related to this article, we asked participants to describe their experiences with their utility company and their interpretations of those experiences.

Interviews were professionally transcribed and cleaned by the researchers. Following each interview, the interviewer completed an analytic memo describing key themes that emerged in response to our questions. We followed Saldaña’s (2011) methods for analytic memo writing, which aim at identifying emergent themes in the data prior to a full analysis of the complete data set. Once all interview data were collected, we analyzed transcripts using a line-by-line method (Saldaña 2011). The line-by-line analytic approach involved reading each transcript to identify the main themes in participant comments about their utility company. We began coding with the list of themes from the memo stage and adding and adjusting these themes throughout three iterations of data analysis. A theme refers to “an abstract entity that brings meaning and identity to a recurrent (patterned) experience and its variant manifestations” (DeSantis and Ugarriza 2000:362). The themes most closely relevant to this article are “utilities as greedy,” “utilities as monopolies,” and “consumers as powerless.” We then coded text to these thematic categories.

### Survey Results

Participants reported low levels of trust in their utility company, with only 494 (15.1 percent) indicating that they trusted or strongly trusted their utility ($M = 2.47, SD = 1.02, n = 3,262$). Participants gave utility companies relatively high evaluations for providing a reliable supply of electricity, with 2,322 (71.52 percent) rating the utility company as good or very good ($M = 3.92, SD = 0.93, n = 3,247$). About half the participants were satisfied with the customer service provided by their utility. Nearly half ($n = 1,572 [48.73 percent]$) said that their utility was good or very good in this area ($M = 3.50, SD = 0.90, n = 3,226$). Participants had relatively negative views of how their utility company managed electricity costs and wildfires. Only about a fifth ($n = 674 [20.88 percent]$) said that the utility did a good or very good job managing costs ($M = 2.81, SD = 1.00, n = 3,228$). And only about a quarter ($n = 809 [25.10 percent]$) reported that the utility did a good or very good job managing the grid to prevent wildfires ($M = 2.67, SD = 1.19, n = 3,224$). Table 1 reports the correlations between these variables.

To test our hypotheses, we ran an adjacent category logit model looking at predictors of distrust (including strongly distrust and distrust) versus neutral and neutral versus trust (trust and strongly trust). We did this analysis (rather than a...
Hypothesis 2 predicts that people who view the utility as doing a good job with customer service will also trust it. Beliefs that the utility company did an average job managing costs will be associated with trust. Both cost dummy variables explain distrust versus neutral; “good” cost explains neutral versus trust. Analysis of average marginal effects (net of covariates) shows that respondents who believe that the utility company did a moderate (versus bad) job are 23.2 percent less likely to distrust and 22.6 percent more likely to choose the neutral category. Respondents who believe that the utility company did a good job are 37.4 percent less likely to distrust and 29.7 percent more likely to choose the neutral trust category.

Hypothesis 3 predicts that beliefs about how good a job the utility company is doing in managing costs and wildfire risks will be associated with trust. Both wildfire dummy variables explain distrust versus neutral; “good” wildfire explains neutral versus trust. Analysis of average marginal effects shows that respondents who believe the utility did a moderate job (compared with a bad job) are 28.1 percent less likely to distrust and 23.0 percent more likely to choose the neutral trust category. A respondent who believes the utility did a good job is 48.5 percent less likely to distrust, 31.0 percent more likely to choose the neutral trust category, and 17.6 percent more likely to trust.

Hypothesis 4 predicts an association between beliefs about the utility’s management of wildfire risks and trust. The results show that both wildfire dummies explain distrust versus neutral and neutral versus trust (models 1 and 2). A respondent who believes the utility did a moderate (compared with a bad) job is 21.9 percent less likely to distrust, 16.2 percent more likely to choose the neutral trust category, and 5.7 percent more likely to trust. Respondents who believe that the utility did a good job are 26.2 percent less likely to distrust, 11.2 percent more likely to choose the neutral trust category, and 15.0 percent more likely to trust.

In sum, our results are inconsistent with hypothesis 1 regarding reliability; they partially support hypothesis 2 regarding customer service and costs, and they support hypothesis 3. The different results for explaining distrust versus neutral and trust versus neutral for customer service and costs are consistent with research arguing that trust and distrust may have different antecedents. The results suggest that customer service reduces distrust but does not produce trust. In contrast, cost (at least the “good” dummy variable) and wildfires explain both distrust and trust. In other words, attention to customer service seems to reduce respondents’ negative feelings. But costs and wildfires both reduce distrust and also increase trust. Positive views that a utility is trustworthy require that customers believe that utility companies are doing a good job managing costs and wildfire risks.
Interview Results

Our interviews explore participants’ experiences with their utility as well as their interpretations of those experiences, expanding on what we learn from the survey. Participant distrust seems to reflect a sense that utilities are greedy and have an unfair advantage, using their power to change policies, increase rates, and shift the consequences of their mistakes to customers. Ten participants from across the political spectrum described their utility company as “crooks,” “crooked,” or “robbers.” Other participants did not use these specific terms but still described practices they saw as untrustworthy and unethical. Participants described utility companies’ unethical practices as enabled by politicians and motivated by greed rather than the welfare of their customers.

Interview participants described utility companies as greedy and as profiting even as consumers struggled with ever increasing bills. Adelle, a high-income conservative, emphasized her sense that her utility provider is greedy. She said, “I don’t like how money-hungry they are.” Similarly, Ethan and Leticia, high-income Democrats, emphasized how much utilities prioritized making money: “I don’t trust these energy companies because you know they’re just looking for a buck… They don’t care for the consumers; they just want their money. So, I don’t think they’re good.” When we asked Laura, a middle-income Republican, to describe her sense of San Diego Gas and Electric, she described her dismay at the visible wealth she observed when visiting her utility company’s office and the disjuncture between that wealth and customer struggles to pay their bills. She said,

You go inside, and there’s marble floors and caterers…and I’m thinking, people are having to choose between food and paying their electric bill. There was just this immense waste, and it would make me sick when I had to go in there. I developed this unsavory opinion of how they utilized their funds, the funds of people who are paying exorbitant rates for electricity.

This general sense of utility greed was compounded by interpretations of utilities as monopolies that are unfairly protected from their mistakes and that profit at the expense of consumers. For example, Adam, an independent (who declined to share information about his income), was resentful that the utility company could turn to the state regulators to increase customer electricity rates if the utility experienced a loss. He said, “If they don’t make a profit, they just go to the Public Utilities Commission and get a rate increase…. Where’s the accountability in that?” Similarly, Mason, a high-income Libertarian, said that his utility company has not been a responsible company for the ratepayers and the CPUC [California Public Utilities Commission] has just been in cahoots with them for years. And so, they get to file bankruptcy, reorg, get out of paying all this stuff, and…rates just keep going up.

Mason described his utility company as not profitable because of its own mismanagement. He was angry that the government bailed out the company, leaving consumers suffering increased prices. He went on to say, “They recently introduced a power safety, power shutoff bill. It was so expansive. It makes no sense. It’s totally like letting them off the hook for their lack of maintenance and thoroughness.” Mason suggested that the utility company, not the customers, should suffer the consequences of their failures. Sandy, a high-income Republican, also expressed her view that customers pay for utility companies’ mistakes, saying that either through “significantly higher bills, or significantly higher taxes, we’re giving them a bailout. Either way, yeah, it’s going to cost me money. I know it.”

Participants also blamed utility companies for wildfires and resented having to bear the resulting costs. When we asked Meredith, a high-income Democrat, what her feelings were toward her utility company generally, she talked about being annoyed that it was unapologetic about requiring that consumers pay the costs associated with wildfires. She said,

After the fires, one of the things was…having rate payers pay for the damages from the fire. I think in the end rate payers pay for everything anyway, whether they’re blatant about it or they’re not. But the fact that they wanted to be so in your face about it was really annoying.

Similarly, Fred, a high-income Republican said, “I think they’re crooks, I think they back-charge us for fires that they started with their power lines and I have to pay for the fire they started in my rate hike.” Pam, a high-income Republican, blamed rising electricity prices on utility failures to take responsibility for their errors: “They raise rates constantly; they wanted to charge us for the cost of cleaning up their mistake.” When we asked Mandy, a high-income Democrat, about her views on her utility company, she described the utility as “crooks” and then elaborated,

The whole deal about charging the customers for the fires and all. I’m so not on board with those guys. The shareholders don’t suffer. It’s the customers that suffer. It’s a protected organization. I don’t trust those guys.

Participants also resented utility companies changing their policies, particularly around solar energy, in ways they felt benefited the utility at the expense of the customer and that customers were powerless to address. They explained that utility companies advocated that households install rooftop photovoltaic systems but that their actions were inconsistent with this message. For example, Jeff, a high-income political independent, highlighted how utility companies responded to losses they experienced as a result of increased residential rooftop photovoltaic use: changing the rate structure to hurt those who used solar during the day and relied on the grid for electricity at night. He said,
As much as they try to say they’re solar-friendly, they’re trying to change the way rates are done so that they charge a higher rate at night now. Because everyone is getting solar so they’re not getting as much money. So they’re going to try to shift when they charge money to screw all of us who have solar…. It really angers me that I put the system on here to save money and they’re going to change the rules around.

Similarly, Wendy, a middle-income conservative, said, “That was one thing, I think that was pretty rotten on their part is they figured out when we use our electricity most and they flipped it to make it more expensive when we’re using it.” Participants generally felt that utility companies were changing their policies in ways that hurt households that had installed solar. For example, we asked Jim, a middle-income Democrat, to describe his interactions he shared his perception that his utility company was promotional. They were really pushing solar. It was better for them, so they gave us a very good rate. That’s why it bothers me when I see now that they’re trying to change that and make solar panel owners pay more.

Dave, a middle-income Republican, expressed a similar sentiment, saying that initially there were incentives to get solar. But after people invested, utilities responded by raising their rates. They (the utility company) were “robbers. At first, there was such a big incentive and all kinds of people went solar. Then they turn around and just start raising their rates.”

These negative views were accompanied by a sense of powerlessness. Participants reported that utility companies set the rules, and there was little they could do about it. Chuck, a high-income Republican, said that “it’s kind of a one-sided street, I guess you could call it.” In part, their sense of helplessness stemmed from recognizing their reliance on electricity as an essential good. For example, Karen, a high-income Democrat, said, “I feel it’s really overly expensive and they tell us they’ll raise the rates and then there’s nothing we can do about it. You feel powerless and you have to use electricity to survive.” Participants felt that they were forced to interact with a provider they felt was self-interested and dishonest. For example, we asked Jerry, a high-income participant, to describe his hopes for the future energy grid. His answer centered on households’ gaining independence from utilities. When we asked if that was specific to his utility company or for utility providers generally, he said it related to utility companies broadly: “They’re pretty greedy. They’re extremely crooked, but what do you do? You’re kind of stuck with them. You can’t do anything else.” Participants characterized themselves as powerless: needing electricity but having no avenue to meaningfully change how their utility functioned.

In sum, our interviews highlight consumers’ sense of helplessness and resentment of the power imbalance between utilities and customers. They described utilities as taking actions for their own profit without regard for their customers. Our participants saw utilities as avoiding responsibility for their mistakes and passing the consequences on to consumers.

Discussion

We find that respondents’ beliefs that their utility was doing a poor job with customer service, and badly managing costs and wildfires, are associated with distrust in the utility. Beliefs that a utility is doing a good job managing costs and wildfires are associated with trust. The interviews suggest that much of participants’ distrust and resentment stems from feelings that utilities have an unfair monopoly advantage over consumers, which they use in a self-interested way to increase their profits rather than help consumers. These findings suggest that when people interpret costs as unfair and resulting from utility company greed and power, they will be resentful. In addition, with regard to customer service, it may not be the sophistication of utilities’ technological engagement with consumers that matters but the sense that utilities change rules unfairly and change their rates structures in response to customer use patterns so that consumers will be disadvantaged no matter what they do.

Implications

Utility companies play a key role in the electricity delivery system and are, at present, the main point of intersection between customers and the electricity delivery system (e.g., Kennedy et al. 2017; Sidhoum and Serra 2017). It is unclear how utilities will adapt to increased distributed generation and solar penetration among customers, with some experts predicting a “death spiral” and exploring potential new utility strategies (e.g., Frei 2018; Riveros, Kubli, and Ulli-Beer 2019). At present, however, utilities are the main point of intersection between customers and the electricity delivery system. At least in the short run, the transition to a “smarter” more sustainable grid is likely to require that households adopt new technologies as well as engage more actively with their utility company (Bakke 2016; Frickel et al. 2017). It is possible that household distrust of their utility may actually increase people’s interest in these technologies, as well as in alternative sources of electricity, as a potential path toward increased independence from the utility. Consumers might, for example, install rooftop solar panels and household battery storage. Or they might prefer to purchase electricity from a greener source, for example, through Community Choice Aggregation or some other mechanism (O’Shaughnessy et al. 2019; Roth 2019). At the same time, mistrust may lead consumers to resist utility programs, such as installations of smart meters or demand response programs. In general, consumers may seek to distance themselves from their utility company, by adopting technologies that enable them to be more independent and/or refusing to participate in utility programs that might increase their interdependence with their utility.

More generally, our findings have potential implications for understanding challenges facing technocratic institutions. It does not appear that competence (here, a reliable supply of electricity) enhances trust. But failures (whether due to competence or not) may be interpreted in terms of the institution’s
intent (here the extent to which utility companies care about their customers). Our results suggest that technocratic institutions need to be aware not only of their competence but also of whether they are serving the interests of citizens. The temptation of experts is to assume that they know best; and they may, in terms of their technical expertise. But it is risky to hold too firmly to that assumption as doing so may prevent the institution from adequately addressing the public’s concerns regarding intent, in turn reducing trust (for a related discussion see, e.g., Sandel 2020).

Limitations and Future Research
The vast majority of our participants in both the survey and interview samples were customers of investor-owned utilities, which dominate in California (and serve nearly three quarters of U.S. customers) (EIA 2019). It is possible that people have more confidence in utilities that are structured as cooperatives or managed by their city. Future research should explore whether structuring utilities as publicly traded companies versus city agencies or cooperatives affects customer trust. In addition, our data were collected in California. Consumers in other state contexts may have different beliefs about their utility company and different energy-related concerns. Thus, the associations between utility behaviors and customer trust may vary across contexts.

Our data are limited in that they are cross-sectional and do not establish causality. People who see utilities as providing bad customer service, imposing excessive costs, and being responsible for wildfires also do not trust the utility. But our data cannot speak to whether changes in utility performance in these areas will increase trust. It is possible that low levels of trust drive perceptions of the utility company rather than the other way around, or that other factors produce covariation in those indicators. Existing research, however, provides causal evidence from hypothetical vignette experiments showing that utility behavior affects participant trust (Przepiorka and Horne 2020). Thus, the correlational evidence here is consistent with causal evidence.

In addition, the administration of the survey during an active wildfire season may have influenced our results. Respondents may have been particularly sensitive to utility management of wildfires and may have therefore viewed their utilities more harshly than they would have in other circumstances. However, we also observed concerns about the utility-wildfire relationship in our interviews conducted outside of high-fire seasons.

Our sample includes homeowners and therefore likely excludes many low-income residents. Our sample is similar in age, education, and income to the characteristics of households that are most likely to adopt solar. Because less educated, low-income, and younger individuals tend to have lower levels of trust (e.g., Rainie and Perrin 2019), our results may underestimate levels of distrust. Furthermore, because low-income households have fewer resources for dealing with increased electricity costs, outages, and wildfire-associated evacuations, they may react even more strongly to these issues than wealthier families. If so, then support for our hypotheses might be even stronger with a more representative sample.

Finally, we do not test the effects of consumer distrust on behavior. We identify factors that are associated with trust. It is reasonable to assume, on the basis of the literature on corporate social responsibility, that trust will have implications for people’s interactions with their utilities, but our data do not speak to that issue. Future research should assess the implications of trust in utility companies for consumers’ energy-related behaviors.

Conclusion
In sum, our findings are consistent with existing work establishing consumer distrust in electric utility companies. We identify beliefs that are associated with that distrust: beliefs that utilities provide poor customer service, do not do a good job managing costs, and do not manage wildfire risks and consequences well. Furthermore, we show that consumers view their utility companies as self-interested, unethical actors with unfair advantages. To the extent that effectively engaging consumers in the transition to a more sustainable electricity delivery system requires trust, addressing such characteristics of industry actors may be important. More generally, understanding and addressing people’s perceptions of institutional failures (in particular whether those failures are due to incompetence and/or self-centered motivations) may help more effectively address challenges facing technocratic institutions.

Funding
The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This material is based upon work supported by the U.S. Department of Energy under Award Number DE-IA0000025. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

ORCID iD
Christine Horne https://orcid.org/0000-0001-5318-6978

References
Aguero, Julio Romero, Amin Khodaei, and Ralph Masiello. 2016. “The Utility and Grid of the Future: Challenges, Needs, and Trends.” IEEE Power and Energy Magazine 14(5):29–37.
Aguinis, Herman, and Ante Glavas. 2012. “What We Know and Don’t Know about Corporate Social Responsibility: A Review and Research Agenda.” Journal of Management 38(4):932–68.
Aiken, K. Damon, and David M. Boush. 2006. “Trustmarks, Objective-Source Ratings, and Implied Investments in
Advertising: Investigating Online Trust and the Context-Specific Nature of Internet Signals.” *Journal of the Academy of Marketing Science* 34(3):308–23.

Aweh, Amanda, Blake Casagranda, Cashel Coughlan, and Mike Patelski. 2020. “Utility Customer Care in the Digital Age: Transforming the Customer Experience to Meet Higher Expectations.” *Climate and Energy* 37(1):10–17.

Bakke, Gretchen. 2016. *The Grid: The Fraying Wires between Americans and Our Energy Future*. New York: Bloomsbury.

Barbose, Galen, Sydney Forrester, Naim Darghouth, and Ben Hoen. 2020. “Income Trends among U.S. Residential Rooftop Solar Adopters.” Berkeley, CA: Ernest Orlando Lawrence Berkeley National Laboratory. Retrieved November 20, 2020. https://eta-publications.lbl.gov/sites/default/files/solar-adopter_income_trends_report.pdf.

Bijlsma-Frankema, Sim B. Sitkin, and Antoinette Weibel. 2015. “Distrust in the Balance: The Emergence and Development of Intergroup Distrust in a Court of Law.” *Organization Science* 26(4):1018–39.

Bloom Energy. N.d. “California Power Outage Map.” Retrieved October 1, 2020. https://www.bloomenergy.com/bloom-energy-outage-map/.

CBS. 2019. “A Failure of Epic Proportions”; Anger, Frustration Greet New Round of Power Shutoffs.” CBS San Francisco. Retrieved October 1, 2020. https://sanfrancisco.cbslocal.com/2019/10/29/power-outages-pge-pacific-gas-electric-marin-san-francisco-bay-area/.

Cohen, Ethan L. 2004. “Total Customer Service: A Continuing Imperative for the Utility Enterprise.” *Electric Energy Online*. Retrieved May 11, 2022. https://electricenergyonline.com/energy/magazine/161/article/Total-Customer-Service-.htm.

Dasgupta, Partha. 1988. “Trust as a Commodity.” Pp. 49–72 in *Trust: Making and Breaking Cooperative Relations*, edited by D. Gambetta. Oxford, UK: Oxford University Press.

Davis, Kathleen. 2011. “The NERC CIP Evolution.” Retrieved June 5, 2018. https://www.cip.com/articles/powergrid_international/print/volume-16/issue-8/features/the-nerc-cip-evolution.html.

DeSantis, Lydia, and Doris Noel Ugarriza. 2000. “The Concept of Theme as Used in Qualitative Nursing Research.” *Western Journal of Nursing Research* 22(3):351–72.

Dillman, Don, Jolene Smyth, and Leah Christian. 2014. *Internet, Phone, Mail and Mixed-Mode Surveys: The Tailored Design Method*. 3rd ed. Hoboken, NJ: John Wiley.

Edelman. 2021. “2021 Edelman Trust Barometer.” Retrieved June 30, 2021. https://www.edelman.com/trust/2021-trust-barometer.

EERE (U.S. Office of Energy Efficiency and Renewable Energy). 2017. “Consumer vs Prosumer: What’s the Difference?” Retrieved October 8, 2020. https://www.energy.gov/eere/articles/consumer-vs-prosumer-whats-difference.

EIA (U.S. Energy Information Administration). 2018. “Today in Energy: Average Frequency and Duration of Electric Distribution Outages Vary by States.” April 5, 2018. Retrieved May 28, 2020. https://www.eia.gov/todayinenergy/detail.php?id=35652.

EIA (U.S. Energy Information Administration). 2019. “Investor-Owned Utilities Served 72% of US Electricity Customers in 2017.” Retrieved October 1, 2020. https://www.eia.gov/todayinenergy/detail.php?id=40913.

EIA (U.S. Energy Information Administration). 2020. “State Electricity Profiles Data for 2019.” Retrieved October 1, 2020. https://www.eia.gov/electricity/state/.

Elfenbein, Daniel W., Ray Fisman, and Brian Mcmanus. 2012. “Charity as a Substitute for Reputation: Evidence from an Online Marketplace.” *Review of Economic Studies* 79(4):1441–68.

Energy Central. N.d. “Improving Customer Experience in the Utilities Industry.” Retrieved October 1, 2020. https://energycentral.com/e/um/improving-customer-experience-utilities-industry.

Energy Digital. N.d. “How Utility Companies Can Implement Successful Social Media Strategies.” Retrieved October 1, 2020. https://www.energydigital.com/utilities/how-utilities-companies-can-implement-successful-social-media-strategies.

Eto, Joseph H., and Kristine Hamachi LaCommare. 2008. “Tracking the Reliability of the U.S. Electric Power System: An Assessment of Publicly Available Information Reported to State Public Utility Commissions.” Report LBNL-1092E. Berkeley, CA: Ernest Orlando Lawrence Berkeley National Laboratory. Retrieved May 11, 2022. https://eta-publications.lbl.gov/sites/default/files/lbnl-1092e.pdf.

Eto, Joseph H., Kristina Hamachi LaCommare, Peter H. Larsen, Annika Todd, and Emily Fisher. 2012. “An Examination of Temporal Trends in Electricity Reliability Based on Reports from U.S. Electric Utilities.” Report LBNL-5268E. Berkeley, CA: Ernest Orlando Lawrence Berkeley National Laboratory. January. Retrieved May 11, 2022. https://eta-publications.lbl.gov/sites/default/files/lbnl-5268e.pdf.

Fagerland, Morten W., and David W. Hosmer. 2012. “A Generalized Hosmer-Lemeshow Goodness-of-Fit Test for Multinomial Logistic Regression Models.” *Statistica* 12(3):447–53.

Fagerland, Morten W., David W. Hosmer, and Anna M. Bofin. 2008. “Multinomial Goodness-of-Fit Tests for Logistic Regression Models.” *Statistica in Medecine* 27(21):4238–53.

Fehr, Ernst. 2009. “On the Economics and Biology of Trust.” *Organization Science* 20(1):235–66.

Fehrler, Sebastian, and Wojtek Przepiorka. 2016. “Choosing a Partner for Social Exchange: Charitable Giving as a Signal of Trustworthiness.” *Journal of Economic Behavior & Organization* 129:157–71.

Frei, Fanny, Simon R. Sinsel, Ahmed Hanafy, and Joern Hoppmann. 2018. “Leaders or Laggards? The Evolution of Electric Utilities’ Business Portfolios during the Energy Transition.” *Energy Policy* 120(6):65–65.

Frickel, Scott, Daniela Wuhr, Christine Horne, and Meghan Elizabeth Kallman. 2017. “Field of Visions: Interorganizational Challenges to the Smart Energy Transition in Washington State.” *Brooklyn Law Review* 82:693–724.

Fuller, Thomas. 2019. “500,000 in California Are without Electricity from U.S. Electric Utilities.” Retrieved October 1, 2020. https://www.nytimes.com/2019/10/09/us/pge-shut-off-power-outage.html.

Gallup N.d. “Gallup Access.” Retrieved April 4, 2021. https://www.gallup.com/access/239201/employee-surveys.aspx.

Gambetta, Diego. 1988. “Can We Trust Trust?” Pp. 213–37 in *Trust: Making and Breaking Cooperative Relations*, edited by D. Gambetta. Oxford, UK: Oxford University Press.

Ghosh, Indraneil. 2020. “The Global Trust Crisis.” *Foreign Policy*. Retrieved July 1, 2021. https://foreignpolicy.com/2020/01/22/davos-world-leader-trust-institutions-populism-protest/.
Goulden, Murray, Ben Bedwell, Stefan Rennick-Egglestone, Tom Rodden, and Alexa Spence. 2014. “Smart Grids, Smart Users? The Role of the User in Demand Side Management.” Energy Research and Social Science 2(1):21–29.

Guo, Siau-Ling, Fabrice Lumineau, and Roy J. Lewicki. 2017. “Revisiting the Foundations of Organizational Distrust.” Foundations and Trends in Management 1(1):1–88.

Hornsey, Matthew J., Emily A. Harris, Paul G. Bain, and Kelly S. Fielding. 2016. “Meta-analyses of the Determinants and Outcomes of Belief in Climate Change.” Nature Climate Change 6(6):622–26.

Howland, Ethan. 2020. “Engineering Group Sees Increases in Power Outages, Costs.” Microgrid Knowledge Group. Retrieved October 8, 2020. https://microgridknowledge.com/microgrid-power-outages-asce/.

Jazebi, Saeed, Francisco De Leon, and Albert Nelson. 2020a. “Review of Wildfire Management Techniques—Part I: Causes, Prevention, Detection, Suppression, and Data Analytics.” IEEE Transactions on Power Delivery 35(1):430–39.

Jazebi, Saeed, Francisco De Leon, and Albert Nelson. 2020b. “Review of Wildfire Management Techniques—Part II: Urgent Call for Investment in Research and Development of Preventative Solutions.” IEEE Transactions on Power Delivery 35(1):440–50.

Karimi, Faith, and Sarah Moon. 2019. “California Governor Says ‘Greed’ to Blame for Power Outage.” CNN, October 11. Retrieved October 1, 2020. https://www.cnn.com/2019/10/11/us/california-power-outage-friday/index.html.

Kennedy, Chris, Iain D. Stewart, Angelo Facchin, and Renata Mele. 2017. “The Role of Utilities in Developing Low Carbon, Electric Megacities.” Energy Policy 106(C):122–28.

Larsen, Peter H., Kristina Hamachi LaCommara, Joseph H. Eto, and James L. Sweeney. 2015. “Assessing Changes in the Reliability of the U.S. Electric Power System.” Report LBNL-188741. Berkeley, CA: Ernest Orlando Lawrence Berkeley National Laboratory. Retrieved November 20, 2020. https://eta-publications.lbl.gov/sites/default/files/lbnl-188741.pdf.

Levi, Margaret, and Laura Stoker. 2000. “Political Trust and Trustworthiness.” Annual Review of Political Science 3:475–507.

Mayer, Roger C., James H. Davis, and F. David Schoorman. 1995. “An Integrative Model of Organizational Trust.” Academy of Management Review 20(3):709–34.

McGrath, Michael. 2017. “Beyond Distrust: When the Public Loses Faith in American Institutions.” National Civic Review 106(2):46–51.

Moerkerken, Jochem, Kim Petrick, Andreas Dullweber, and Barney Hamilton. 2012. “Turning on Utility Customer Loyalty.” Bain & Company. Retrieved October 1, 2020. https://www.bain.com/insights/turning-on-utility-customer-loyalty/.

Morgan, Blake. 2019. “5 Customer Experience Transformations from Utility Companies.” Forbes. Retrieved May 28, 2020. https://www.forbes.com/sites/blakemorgan/2019/10/15/5-customer-experience-transformations-from-utility-companies/#11a025c11345.

Mueller, Thomas S. 2017. “Consumer Perceptions of Electric Utilities: Insights from the Center for Analytics Research and Education Project in the United States.” Energy Research and Social Science 26(1):34–39.

Muh, John W., Masood Parvanja, and Mohammad Shahidehpour. 2020. “Wildfire Risk Mitigation: A Paradigm Shift in Power Systems Planning and Operation.” IEEE Open Access Journal of Power and Energy. Retrieved June 1, 2022. https://ieeexplore.ieee.org/document/9220164.

Myers, John, and Taryn Luna. 2019. “California Utilities—Not Lawmakers—Are Calling the Shots on Power Outages to Prevent Wildfires.” The Los Angeles Times, October 26. Retrieved October 1, 2020. https://www.latimes.com/california/story/2019-10-26/california-utilities-politicians-wildfire-power-outage-analysis.

OECD (Organisation for Economic Co-operation and Development). N.D. Trust in Government. Retrieved July 1, 2021. https://www.oecd.org/gov/trust-in-government.htm.

O’Shaughnessy, Eric, Jenny Heeter, Julien Gattaciecca, Jenny Sauer, Kelly Trumbull, and Emily Chen. 2019. “Empowered Communities: The Rise of Community Choice Aggregation in the United States.” Energy Policy 132(June):1110–19.

Palm, Jenny, and Maria Tengvall. 2011. “Motives for and Barriers to Household Adoption of Small-Scale Production of Electricity: Examples from Sweden.” Sustainability: Science, Practice, and Policy 7(1):6–15.

Przepiorka, Wojtek, and Christine Horne. 2020. “How Can Consumer Trust in Energy Utilities Be Increased? The Effectiveness of Prosocial, Proenvironmental, and Service-Oriented Investments as Signals of Trustworthiness.” Organizations and Environment 33(2):262–84.

Putnam, Robert D. 2000. Bowling Alone: The Collapse and Revival of American Community. New York: Simon & Schuster.

Putnam, Robert D., Robert Leonardi, and Raffaella Nanetti. 1993. Making Democracy Work: Civic Traditions in Modern Italy. Princeton, NJ: Princeton University Press.

Rainie, Lee, and Andrew Perrin. 2019. “Key Findings about Americans’ Declining Trust in Government and Each Other.” Pew Research Center. Retrieved July 1, 2021. https://www.pewresearch.org/fact-tank/2019/07/22/key-findings-about-americans-declining-trust-in-government-and-each-other/.

Reimann, Martin, Oliver Schilke, and Karen S. Cook. 2017. “Trust Is Heritable, Whereas Distrust Is Not.” Proceedings of the National Academy of Sciences 114(27):7007–12.

Rhodes, Noah, Lewis Naimo, and Line Rood. 2021. “Balancing Wildfire Risk and Power Outages through Optimized Power Shut-Offs.” IEEE Transactions on Power Systems 36(4):3118–28.

Riegelberger, Jens M., Angela Sasse, and John D. McCarthy. 2005. “The Mechanics of Trust: A Framework for Research and Design.” International Journal of Human-Computer Studies 62(3):381–422.

Riveros, Juliana Zapata, M. Kubli, and Silvia Ulli-Beer. 2019. “Prosumer Communities as Strategic Allies for Electric Utilities: Exploring Future Decentralization Trends in Switzerland.” Energy Research and Social Science 57(August):101–219.

Roth, Sammy. 2019. “California’s Biggest Utilities Are Losing Their Monopolies. Is That a Good Thing?” The Los Angeles Times, February 7. Retrieved July 6, 2021. https://www.latimes.com/business/la-fi-monopoly-utilities-california-20190207-story.html.

Saaed, Lydia. 2016. “Restaurants again Voted Most Popular US Industry.” Gallup News. Retrieved October 8, 2020. http://news.gallup.com/poll/194570/restaurants-again-voted-popular-industry.aspx.

Saldana, Johnny. 2011. Fundamentals of Qualitative Research. New York: Oxford University Press.

Sandel, Michael J. 2020. The Tyranny of Merit: What’s Become of the Common Good? New York: Farrar, Straus.
Satchwell, Andrew J., and Peter A. Cappers. 2018. “Recent Developments in Competition and Innovation for Regulated Electric Utilities.” *Utilities Policy* 55(C):110–14.

Sidhoum, Amer Ait, and Teresa Serra. 2017. “Corporate Social Responsibility and Dimensions of Performance: An Application to U.S. Electric Utilities.” *Utilities Policy* 48:1–11.

Smets, Aurelie, Marc Hooge, and Ellen Quintelier. 2013. “The Scale Validity of Trust in Political Institutions Measurements over Time in Belgium: An Analysis of the European Social Survey, 2002–2010.” Retrieved October 1, 2020. https://www.europeansocialsurvey.org/findings/details.html?p=2364.

Specht, Jan Martin, and Reinhard Madlener. 2019. “Energy Supplier 2.0: A Conceptual Business Model for Energy Suppliers Aggregating Flexible Distributed Assets and Policy Issues Raised.” *Energy Policy* 135:110911.

Trabish, Herman K. 2015. “What Do Utility Customers Want? There’s an App for That.” *Utility Dive*. Retrieved October 1, 2020. https://www.utilitydive.com/news/what-do-utility-customers-want-theres-an-app-for-that/408797/.

Tweed, Katherine. 2013. “Survey: 76% of Consumers Don’t Trust their Utility.” Retrieved October 8, 2020. https://www.greentechmedia.com/articles/read/consumer-trust-in-utilities-continues-to-nosedive.

U.S. Department of Energy. 2016. “Maintaining Reliability in the Modern Power System.” Retrieved May 28, 2020. https://www.energy.gov/sites/prod/files/2017/01/f34/Maintaining%20Reliability%20in%20the%20Modern%20Power%20System.pdf.

Vassell, Gregory S. 1991. “Northeast Blackout of 1965.” *IEEE Power Engineering Review* 11(1):4.

Vlachose, Pavlos A., Argiris Tasmakos, Adam P. Vrechopoulos, and Panagiotis K. Avramidis. 2009. “Corporate Social Responsibility: Attributions, Loyalty, and the Mediating Role of Trust.” *Journal of the Academy of Marketing Science* 37(2):170–80.

Wang, Sijun, Sharon E. Beatty, and William Fox. 2004. “Signaling the Trustworthiness of Small Online Retailers.” *Journal of Interactive Marketing* 18(1):53–69.

**Author Biographies**

**Christine Horne** is a professor of sociology at Washington State University. She studies the emergence, enforcement, and application of social norms. Recent research focuses on the energy transition and emerging smart grid.

**Thomas Familia** is a PhD student at Washington State University. He previously spent over a decade employed in the electric utility industry in Oregon, first as a long-term energy forecaster for a private electric utility company and then as an energy resource planning representative for the Oregon Public Utility Commission. He studies green energy transitions with a particular focus on institutional trust and environmental justice.

**Emily Huddart Kennedy** is an environmental sociologist in the Department of Sociology at the University of British Columbia. Her research on the relationship between sustainable consumption and social inequality is published in *Social Forces*, the *British Journal of Sociology*, *Environmental Sociology*, and other venues. Her forthcoming book, *Eco-Types: Five Ways of Caring about the Environment* (Princeton University Press) will be published in October, 2022.