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U.S. consumer attitudes and expectations about energy

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HIGHLIGHTS

- Views of energy reliability, affordability and environmental impact were surveyed.
- Consumers seem less tolerant of rising costs for gasoline than for home energy.
- Consumers are as concerned about energy's environmental impact as its affordability.
- This survey's findings add to policymaker understanding of consumer views on energy.

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ABSTRACT

Understanding public perceptions of energy is important for informing energy-related business, research and policy strategies. To this end, a new U.S. consumer survey probes core attitudes about the reliability, affordability and environmental impact of energy. Appended quarterly to the long-running monthly survey of 500 households that produces the Index of Consumer Sentiment, this instrument inherits the sample design and statistical rigor of that household economic survey. First-year results yield several notable findings. Home energy bills are viewed as unaffordable if they were to double for consumers in the lower income tercile but only if they were to triple for consumers in the upper income tercile. Regarding the cost increases deemed unaffordable, consumers report much greater sensitivity to higher gasoline prices than to higher home energy bills. Moreover, consumers express at least as much concern about the environmental impact of energy as they do about its affordability, a result that shows some regional variation but which holds across income brackets. Several other findings are of likely interest to energy researchers and policymakers, and the unique data series generated by this survey will enable deeper analyses of attitudinally related energy topics as time goes on.

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1. Introduction

Public attitudes and concerns about energy have varied over the years and, as for any commodity that becomes one of life's necessities, the subject evokes mixed feelings. Tension has always existed between consumers' concern about the affordability of energy and energy suppliers' need to profit from their investments. When household energy evolved from chopping wood to relying on industrial-scale distribution systems, reliability became a worry, as quality of life came to depend on systems beyond the control of individuals and communities. Like any extensive human activity, energy use has adverse side effects. Public concern about the health impacts of many economic activities grew over the years and by the second half of the 20th century modern

environmental policies targeted many forms of pollution including those associated with energy production and use. Energy security became a watchword as global energy markets were impacted by political strife. Such effects amplify the inherent volatility of energy markets, which entail investments that span decades and have complex dynamics that preclude long-term price stability.

Policymakers addressing energy therefore confront a tangle of competing needs and economic factors. They also face public opinions about energy sources on which communities intimately depend, of which the understanding is poor and for which households must pay with little month-to-month choice. Nevertheless, consumers do understand energy through the ways it affects their daily lives even though their knowledge of the issues may not align with that of policy analysts and energy professionals.

Stern and Aronson (1984) highlighted the need to inform energy policies by examining human factors through methods that go beyond those of traditional economic analysis. Indeed, the

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value of attitudinal research based on psycho-social models of behavior instead of classical economic models was established decades ago for studies of the general economy (Katona and Likert, 1946; Hosseini, 2011). Such methods do not presuppose economically rational consumer behavior, although it should be noted that psychological processes can be viewed as rational even though they are poorly explained by utility maximization (Katona, 1953). An attitudinal approach for assessing views about energy can build upon the foundation provided by the long-running survey of consumer attitudes (SCA, now known as the University of Michigan Surveys of Consumers; see Curtin 2002 (2004) and ISR (2004)).

Recent reviews have found that most energy-related surveys are designed to assess consumer or voter understanding, opinions and behaviors about various forms of energy, types of energy-related development, conservation and efficiency, energy policies and related social concerns such as energy security and environmental impacts (NREL 2011; Kim et al., 2012; DOE 2013). Topics are often determined by issues of the day, and of course, public perception of energy is shaped by how the issues are portrayed in the media (Shanahan 2004). Many recent surveys examine public views of climate change, related energy technologies and policy options (e.g., Borick and Rabe (2010); Leiserowitz et al. (2014a); Pew (2014)). Nevertheless, although a few polls have asked some questions for many years, there has been no long-running survey of basic consumer attitudes about energy.

For example, nearly all the questions in Gallup's energy-related polling explore beliefs about specific energy issues, policy trade-offs and policymaker performance (Gallup 2014). Many questions run only when an issue is in the news. Recent surveys examine views of the Keystone XL pipeline; some earlier surveys explored views of opening the Arctic National Wildlife Refuge for oil drilling; and over the years (but not consistently) questions were asked about nuclear energy. In Gallup (2014), only one question—about how much respondents personally worry about energy affordability—probes a general attitude.

Because most existing energy surveys have been designed to inform energy policies or programs for which decision makers must weigh competing interests, questions are often posed accordingly. Event-driven effects are also evident, e.g., as seen in 2010, the year of the BP Macondo oil spill when the share of respondents who said they would prioritize protecting the environment spiked upward (Polling Report, 2014). Such results align with the findings of Bolsen and Cook (2008), who examined trends in energy policy-related public opinion since 1974 and found that support for energy resource development, such as oil and gas production in environmentally sensitive locations, correlated with energy prices.

Farhar (1994) reviewed energy-related surveys from the mid-1970s through early 1990s and found an increasing concern for environmental protection after the 1973–80 “energy crisis” period had passed. This trend coincided with greater support for energy efficiency and renewable energy. Farhar also found that while consumers expressed little interest in personal changes in behavior, they did express support for energy policy changes aligned with environmental concerns. Nevertheless, other research has shown an association between environmental attitudes and energy saving behaviors (Gadenne et al., 2011). Moreover, supplementing attitudinal variables with social context variables (such as household characteristics and income) improves explanatory power for environmental behaviors (Poortinga et al., 2004).

In order to develop an attitudinal survey that will remain relevant for energy policy over the long term, it is necessary to ask questions that will be of ongoing relevance to consumers, rather than questions that address issues of the day or the varying concerns of energy businesses, policymakers and interest groups, and

that is the approach taken here.

2. Methods

The first step in our development process was to review existing surveys to see whether any prior efforts had systematically probed basic attitudes on issues likely to be of ongoing concern to consumers. Through web and literature searches, we identified surveys that addressed energy topics (whether or not energy was their main focus) and compiled a question bank of over 250 entries (see Supplemental Information; also DeCicco et al. (2014)).

This review enabled us to eliminate topics already well explored in existing surveys and identify topics likely to be of ongoing relevance to consumers. We also convened two meetings with colleagues in energy-related disciplines, who also suggested survey options. These steps led to a list of proposed topics to test in focus groups, as given in Table 1. The emphasis was on attitudinal issues independent of specific energy sources, technologies, market developments and policies. The list was narrowed through focus groups and cognitive interviews, and then used to formulate questions for pre-testing and further refinement prior to launching the survey.

2.1. Focus groups

The proposed topics were tested with focus groups to understand how consumers think about energy issues and to learn the language they use to express their thoughts. Focus groups involve a small number of participants interviewed together by a moderator who leads semi-structured discussions on topics of interest for the survey (Krueger and Casey, 2000). The findings enable us to draft questions that consumers could readily understand and answer.

Three focus groups were convened in March and April 2013 with a total of 22 participants recruited from communities in Southeastern Michigan. Volunteers were screened so that each group had a reasonably balanced mix of in terms of gender, age and home tenure, characteristics likely to be related to individual perspectives on energy. The sessions were held in rooms designed for focus groups at the Institute for Social Research (ISR), University of Michigan, Ann Arbor. The discussions lasted about two hours each and group members were paid \$35 for their participation.

Focus group participants were clearly knowledgeable and concerned about the cost of energy. They proved able to track energy costs and bills and were well aware of gasoline prices. However, they could not answer questions about the price of home energy, such as the per kilowatt-hour price of electricity. This led us to develop questions about the dollar amounts of home energy bills rather than unit prices.

Focus group participants had a fairly strong understanding of reliability, readily relating it to whether or not the power was on in their homes. They thought of reliability exclusively in terms of electricity; when the moderator raised reliability in the context of

Table 1
Proposed energy survey topics as tested in focus groups.

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- Energy affordability
 - Energy reliability
 - Energy security
 - Economic impacts of energy
 - Environmental impact of energy
 - Energy efficiency and conservation
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The items in boldface are the topics ultimately selected for the survey.

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