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Understanding Energy in an Age of Rapid Change: A Survey Exploring Energy Literacy in the United States

Introduction

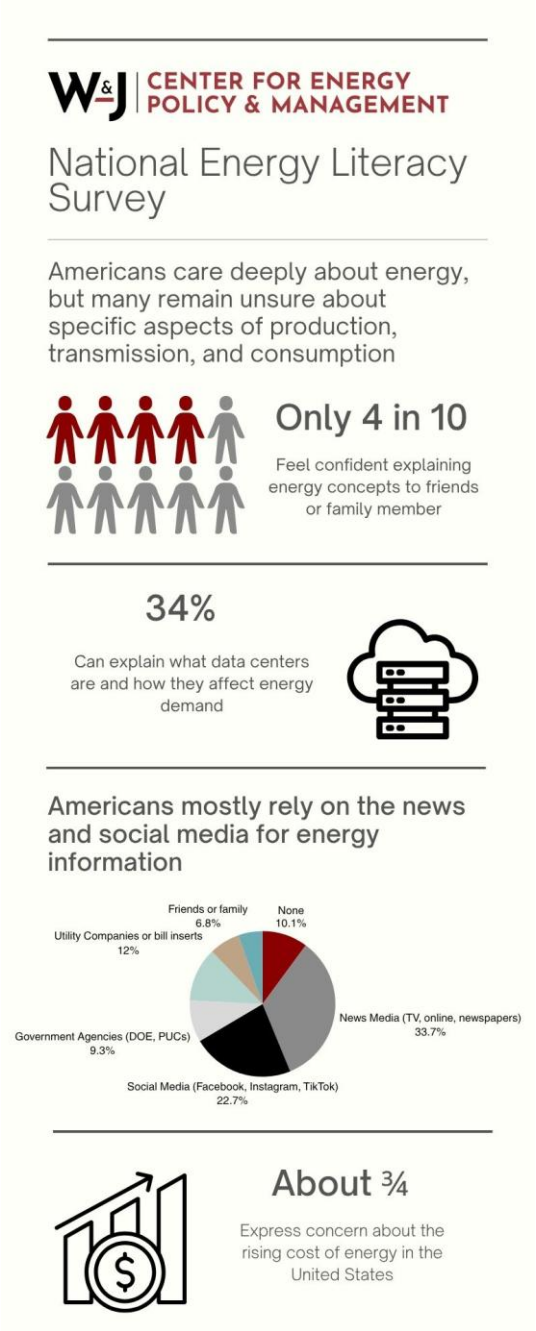
From rising electricity prices to the proliferation of data centers, energy issues are more visible than ever. Communities across the United States are being asked to weigh in on complex questions about where energy comes from, how it is distributed, and what new technologies mean for local infrastructure. Yet, new national data suggest that the public's understanding of these systems has not kept pace with their rapid evolution.

The Center for Energy Policy and Management (CEPM) at Washington & Jefferson College conducted a national survey to understand how confident Americans are in explaining key energy concepts, from traditional topics such as electricity generation and fuel prices to emerging ones like decarbonization and data centers.

The national survey of 1,263 adults reveals a public that is engaged but uncertain. Most respondents express at least some familiarity with energy topics and concern for rising energy costs; yet relatively few feel confident in explaining how energy systems function or how different sources and technologies interact. This pattern of tentative understanding points to a crucial gap in energy literacy.

The findings carry important implications for policymakers, educators, and community leaders. As new facilities, such as data centers, reshape local energy demand and states pursue ambitious climate goals, public confidence in understanding these issues becomes essential for meaningful participation in planning and decision-making.

In short, Americans care deeply about energy, but many remain unsure about the specifics of production,



transmission, and consumption. This report examines that gap and its implications for the nation's energy future.

Survey Overview

The survey was conducted by CEPM staff in partnership with Alchemer between August 1 and August 7, 2025. Alchemer, a professional online survey platform widely used in academic, business, and government research, recruited participants from a national panel of adults who complete surveys securely online. All responses were anonymous and verified for quality. The survey's margin of error was approximately ±3.0 percentage points.

Respondents rated their confidence in explaining ten energy concepts to a friend or family member. Responses were rated on a four-point scale:

- 0 = Not very confident
- 1 = Somewhat confident
- 2 = Confident
- 3 = Very confident

Results

In the survey, about four in ten Americans identified themselves as confident or very confident in explaining most energy concepts. This indicates that the majority still harbor some uncertainty, often selecting "not very confident" or "somewhat confident" for most questions.

Responses suggest that Americans are not uninformed, but instead *tentatively informed*: familiar with energy issues in broad strokes yet unsure of the technical, scientific, or policy details that underpin them.

"People experience energy every day, but they don't always feel equipped to explain what's happening behind the scenes," said Dr. Corey Young, Director of the Center for Energy Policy and Management. "That gap matters because it shapes how communities engage with major infrastructure decisions, from renewable projects to data centers."

The results of the survey are shown in the table below:

How confident are you in explaining to a friend or family member…	***Not very confident***	***Somewhat confident***	***Confident***	***Very confident***	***% Confident or Very Confident***
Differences between renewable & nonrenewable energy	23.4	38.7	22.5	15.4	38
How electricity is generated & distributed	25.2	38.6	24.6	11.6	36
How buildings can save energy	20.6	40.1	26.2	13.1	39
Costs & benefits of renewable energy	29.5	32.3	25.0	13.1	38
Meaning of "decarbonization"	45.4	25.8	17.7	11.1	29
Why gasoline prices change	22.3	37.8	25.4	14.5	40
Energy impacts on air quality	20.5	35.3	28.8	15.4	44
Why scientists explore alternative energy	22.7	32.6	28.3	16.3	45
What data centers are & how they affect energy demand	35.0	31.0	21.1	13.0	34
How solar panels offset home energy use	21.5	35.2	27.2	16.0	43

Where People Feel Most and Least Confident

Certain areas showed much more confidence, while others showed much less. The survey indicated:

1. Moderate Confidence on Familiar, Visible Topics

Respondents felt most confident about personal or household topics, such as saving energy in buildings (39% confident or very confident) and how solar panels work (43%). These are tangible concepts, often connected to direct experience or visible technologies.

2. Less Confidence in System-Level Concepts

Confidence dropped when questions addressed *systemic* or *abstract* issues, such as how electricity is generated (36%) or the meaning of *decarbonization* (29%). These ideas involve processes that happen far from everyday life and often use specialized policy or technical language.

3. Emerging Knowledge in New Frontiers Like Data Centers

Respondents' understanding of data centers, the facilities that store and process digital information, was limited. Only about one in three Americans (34%) reported being confident or very confident in explaining what data centers are or how they impact energy demand. This result is notable given how quickly data centers are reshaping local energy landscapes through rising electricity use, cooling demands, and new land development pressures.

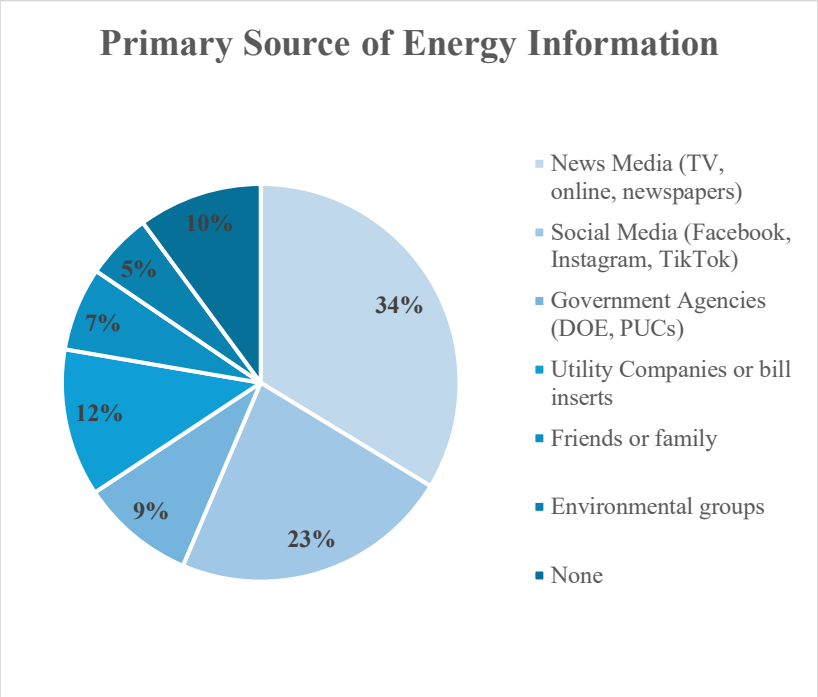
Spotlight: Pennsylvania Respondents

A subset of 43 Pennsylvania respondents provided a closer look at how energy confidence plays out in a state with deep energy roots. While the sample size is small, Pennsylvania results closely track national trends. Residents express moderate confidence overall, particularly regarding visible household energy issues, and limited comfort with policy and system concepts, such as decarbonization and data centers.

Topic	***Not very confident***	***Somewhat confident***	***Confident***	***Very confident***	***% Confident or Very Confident***
Renewable vs. nonrenewable energy	32.6	34.9	18.6	14.0	33
Electricity generation & distribution	20.9	51.2	16.3	11.6	28
How buildings can save energy	25.6	37.2	27.9	9.3	37
Costs & benefits of renewable energy	27.9	37.2	23.3	11.6	35
Meaning of "decarbonization"	41.9	34.9	11.6	11.6	23
Why gasoline prices change	23.3	39.5	25.6	11.6	37
Energy's impact on air quality	25.6	32.6	25.6	16.3	42
Why scientists explore alternative energy	20.9	46.5	16.3	16.3	33
Data centers & energy demand	37.2	34.9	18.6	9.3	28
Solar panels & home energy use	30.2	23.3	34.9	11.6	46

Sources of Energy Knowledge

Respondents were also asked about where they learn the most about energy. The most common sources of energy information were traditional news media (33.7%) and social media platforms (22.7%), which together account for more than half of all respondents. These channels often introduce energy topics in broad or simplified terms, which may help explain why many adults feel somewhat familiar with energy issues, yet still lack confidence in describing them in depth.



Strikingly, only a small share of respondents relies on government agencies (9.3%) or utility companies (12.0%), sources that tend to offer more technical, policy-focused, or localized energy information. Even fewer respondents rely on environmental groups (5.4%) or friends and family (6.8%).

These patterns suggest that Americans are learning about energy indirectly rather than through direct communication from the institutions that develop, regulate, or deliver energy. As a result, people may encounter energy topics episodically, in the context of news events, political debates, or viral social media content, rather than through structured or explanatory resources that build systems-level understanding.

Interpreting the Results: A "Middle Ground" in Energy Understanding

These findings paint a more nuanced picture than simple knowledge gaps. Most Americans are neither uninformed nor fully fluent. Instead, they occupy a middle ground where familiarity coexists with uncertainty.

In this sense, energy literacy is not just about what people know, but how confident they feel applying that knowledge. Confidence influences whether citizens participate in local hearings, share information, or engage in policy debates about the energy transition. As communities face decisions about renewable energy projects, grid modernization, and data center development, confidence in explaining energy concepts becomes a foundation for effective civic participation.

Policy and Education Recommendations

The results of the survey reveal a public that is attentive to energy issues but lacks confidence in explaining them. This finding carries important implications for policymakers, educators, and civic leaders. Strengthening public understanding of energy systems will be crucial for achieving policy

objectives, fostering trust in infrastructure decisions, and equipping citizens to participate in a rapidly evolving energy landscape.

Below are five recommendations for action that can help close the "confidence gap" identified in this study.

1. Translate Technical Language into Plain Terms

Energy and climate conversations often rely on specialized vocabulary, including terms such as decarbonization, grid reliability, distributed generation, and resilience, which can exclude or confuse the general public. Policymakers, educators, and communicators should adopt plain-language explanations that connect directly to everyday experiences.

2. Connect Household Experience to System-Level Change

Survey respondents felt most confident about personal or visible issues, such as saving energy at home or understanding solar panels, but less confident explaining how these actions connect to the broader energy system. Outreach and education should bridge that gap. Public materials, K–12 curricula, and community workshops can illustrate how individual choices (home efficiency, EVs, rooftop solar) interact with grid operations, fuel supply, and emissions. Linking personal experiences to system-level outcomes helps residents see themselves as part of the energy transition, rather than as passive observers.

3. Build Energy Literacy into Civic and Workforce Education

Energy literacy should not be confined to environmental science or engineering programs. Civic education, workforce training, and public policy curricula all provide opportunities to integrate knowledge of energy. State education agencies, local governments, and workforce boards could:

- Include basic energy systems content in high school civics or economics courses
- Offer adult education workshops on local energy infrastructure and utility planning
- Partner with colleges and universities to create short "Energy 101" modules for public officials, zoning boards, and interested residents.

4. Engage Local Governments and Planning Bodies

Townships, boroughs, and counties are increasingly faced with decisions about renewable energy projects, electric vehicle infrastructure, and data centers, often with limited public understanding of their energy implications. The Center for Energy Policy and Management recommends targeted outreach to local elected officials and planning commissions, helping them understand energy projects in their context. This could include:

- Regional workshops on emerging energy technologies
- Plain-language guidance on evaluating local energy proposals
- Public briefings linking state energy policies to local land-use decisions
- Supporting local governments with nonpartisan, evidence-based resources will build capacity where community engagement begins

5. Prepare for the Public Conversation on Data Centers

The rapid expansion of data centers presents a new kind of energy challenge, one that blends digital infrastructure, electricity demand, and land-use planning. The survey found that only one in three Americans feels confident explaining what data centers are or how they affect energy use. This

lack of understanding could complicate future discussions about project siting, grid capacity, and sustainability.

Conclusion

The findings suggest that, although the American public is engaged, a sense of uncertainty prevails. Although most adults are aware of significant energy issues, they often lack the confidence to explain how energy systems operate or how emerging technologies, such as data centers and electrification, integrate into the broader picture. This "confidence gap" is significant because it influences the quality of public participation in decisions that shape the nation's energy future.

For policymakers and educators, the message is clear: building an informed and confident public is not an afterthought, but rather it is a prerequisite for a successful energy transition. As new infrastructure is planned and as technologies like artificial intelligence drive demand for electricity, citizens who understand the basics of energy generation, transmission, and sustainability will be better equipped to engage constructively in local and national debates.

Closing this gap requires consistent communication, accessible education, and collaboration among government, academia, and communities. The Center for Energy Policy and Management's findings point to both a challenge and an opportunity: to make energy not just a technical topic, but a shared public conversation that empowers every American to participate in shaping a resilient and equitable energy future.