Community Education and Behavior Change as Tools for Health and Energy Resilience in the Southwest

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ABSTRACT

Communities across the Southwest are increasingly exposed to extreme heat, rising energy costs, and growing grid strain. Strengthening resilience will require more than technological solutions; it also depends on how households interact with energy systems during periods of stress. Community-based energy education and behavior change programs can play a critical role in helping households adopt practical energy practices that improve efficiency outcomes, reduce peak demand, and protect against heat-related risks.Working families often face the greatest energy burdens but are the least likely to be reached by traditional outreach efforts. Inefficient housing, limited time, caregiving responsibilities, and language barriers can make participation in energy programs difficult, even when the benefits are clear. As a result, energy efficiency programs frequently reach households with the time, stability, and resources to engage, leaving many high-need communities without access to the education and tools that could reduce both financial and health risks.Effective energy literacy efforts must meet people where they are by working through trusted community organizations, culturally relevant education, multilingual materials, and accessible digital platforms. Community-led outreach, workshops, and social media engagement can normalize practical energy behaviors, support smarter cooling practices during peak hours, and help households prepare for extreme heat. When paired with messaging that emphasizes reliability, cost stability, and household resilience, education and behavior-based strategies become powerful complements to infrastructure investments in building a more resilient energy future. Drawing on behavioral science, public health, and energy policy literature, this paper proposes a Community-Based Behavioral Resilience Framework built around five mutually reinforcing principles: reducing cognitive burden, building trust, normalizing resilient behaviors, embedding education into daily life, and prioritizing behavioral persistence over program participation.

Introduction

Across the U.S. Southwest, particularly in Arizona and Nevada, extreme heat, rising energy costs, and structural inequality are converging to intensify household vulnerability (USGCRP 2023). Summer temperatures regularly exceed 110°F and electricity is essential for health and survival. Energy affordability is closely tied to public health, housing stability, and economic security (CDC 2024). Low-income households, renters, seniors, families with children, and communities of color often face recurring trade-offs between energy, food, rent, healthcare, and childcare, with high utility bills functioning as a chronic stressor rather than a one-time expense (Hernandez 2016; Federal Reserve Bank of St. Louis 2025), translating over into heightened health risk and financial instability. Arizona and Nevada therefore present a critical

testing ground for community-based energy education models given their extreme heat exposure, large renter populations, multilingual communities, and monopoly utility governance structures. Policy responses have largely focused on infrastructure investments and technological solutions such as grid modernization, weatherization, and demand-side management (DSM) programs. While necessary, these approaches often assume households will naturally find, understand, and adopt available programs once they exist, overlooking structural barriers such as limited time and attention, rental constraints, language access challenges, and institutional distrust (Mullainathan and Shafir 2013). Conventional outreach relies on technical messaging and information-heavy campaigns that increase cognitive burden for households already navigating daily stress, resulting in programs that often reach those with the most stability rather than those facing the highest energy burdens (World Bank 2015). This paper argues that community-based energy education should be understood not as outreach, but as distributed resilience infrastructure. Drawing on behavioral science, public health, and energy policy literature, it proposes a framework for reducing cognitive burden through trusted, community-based education that strengthens both household and grid resilience in extreme-heat regions.

Energy Burden, Health Outcomes, and Behavioral Constraints

Energy burden in the U.S. Southwest disproportionately affects low-income households, particularly renters, families with children, seniors, and communities of color (U.S. DOE 2025). While low-income households in other parts of the country struggle with affording heat in bitter winter temperatures, Arizona and Nevada families face life-safety concerns from the other end.Extreme temperatures turn energy affordability into a direct matter of household safety and health. For energy-burdened households, utility costs are not an abstract policy concern but part of an ongoing set of trade-offs (Utility Disconnections Dashboard 2025). Rising inflation has intensified monthly cash-flow stress, making high utility bills especially destabilizing (Ipsos 2025). In the summer months, when extreme heat regularly pushes temperatures about 110-120°F in Arizona and Nevada, electricity use becomes a matter of survival rather than comfort. Seniors, children, and individuals with chronic illnesses face heightened risks of heat-related morbidity, including cardiovascular stress, asthma exacerbation, sleep disruption, and mental health strain. (Kenny et al, 2010) Yet households often respond by enduring unsafe indoor temperatures (Hernández and Bird 2010). “Electricity costs have risen sharply since 2021. The average monthly electricity bill increased from $121 in 2021 to $156 in 2025, a rise of nearly 29%.” (NEADA Energy Hardship Project; BLS 2025) In this context, energy efficiency is frequently framed as an additional responsibility placed on individuals who are already navigating impossible choices.

The behavioral literature consistently finds that behavior change programs *can* reduce energy consumption; however, outcomes vary substantially depending on program design, target audience, and evaluation methods (Sussman & Chikumbo, 2016). This variability suggests that simply providing people with more information is not enough to reliably change behavior;

challenging the knowledge or information-deficit model that assumes individuals fail to adopt efficient behaviors primarily because they lack awareness (Marteau, Sowden, & Armstrong, 1998). While lack of information is a contributing factor, it is rarely sufficient to explain disengagement among energy-burdened households.

Many widely used tools, such as general home energy reports, smart meter data, audits, and digital dashboards, demonstrate measurable energy savings once households engage with them. However, much of the literature implicitly assumes that customers notice these materials, understand them, trust the source, and possess the agency to act (The World Bank 2020). Program language and format create barriers by presuming baseline energy literacy, digital access, and available attention that do not reflect the lived realities of working-class, renter, and multilingual households. As a result, low participation and opt-out rates are often interpreted as lack of interest rather than misalignment between program design and community context (Frederiks, Stenner, and Hobman 2015). Evidence further suggests that long-term energy savings are more likely when interventions disrupt existing habits, provide intrinsic motivation, and change perception of future costs (Sussman & Chikumbo, 2016). Rebound effects, where efficiency gains are used to increase comfort rather than reduce consumption, complicate the relationships between technical efficiency and actual energy savings.

Recent work in behavioral and social sciences highlights the potential of social nudges, including peer comparison, group identity, and normative messaging, to influence household electricity use without restricting choice or increasing financial burden (Mochi et al., 2025). These approaches align with principles of community-based social marketing and emphasize fairness in the distribution of benefits and burdens associated with behavioral interventions. Yet utilities have largely underutilized contemporary communication channels – particularly social media – that are widely employed by private-sector actors to reach diverse, multilingual, and younger audiences. When combined with trusted community intermediaries such as faith institutions, local organizations, and culturally competent messengers, these strategies offer a promising pathway to increase engagement, normalize efficient behaviors, and translate abstract energy data into actionable guidance. Taken together, the literature supports the conclusion that behavior change is a powerful and cost-effective tool for reducing energy consumption, but only when interventions are designed with an explicit understanding of lived experience, power, and constraint. The policy challenge is therefore not simply increasing energy literacy, but redesigning programs to reduce cognitive burden while making efficient behaviors easier to adopt. This paper argues that cognitive burden is not an individual shortcoming but a resilience challenge that can be reduced through behavioral and community-based interventions.

Energy Literacy as Resilience Infrastructure

Efforts to address resilience are often dominated by infrastructure-centric solutions, overlooking the role that household behavior and energy literacy play in shaping real-world resilience outcomes. When effectively integrated, behavior-based strategies can serve as

cost-effective, scalable, and socially acceptable complements to technological and system-level investments. The core challenge is not a lack of interest among households, but a lack of available bandwidth. These communities are not inherently difficult to reach; rather, they are navigating competing and immediate demands on their time, attention, and resources. Limited energy literacy should therefore not be interpreted as indifference. It reflects how information is presented, accessed, and prioritized within the context of daily life. Under conditions where stability is not guaranteed, incremental shifts in cooling practices, appliance use, or energy management can feel insignificant compared to more immediate needs.

Designing effective interventions requires understanding both the motivations behind energy behaviors and the practical barriers that limit adoption (Energy Sector Management Assistance Program 2020). Meaningful behavior change does not require households to reorganize their lives around energy decisions; rather, it involves integrating small, practical adjustments into existing routines. Approaches that meet people where they are increase the likelihood of sustained engagement. By normalizing efficient practices as part of everyday life rather than technical interventions, energy literacy and behavior-based strategies become essential components of both grid resilience and improved household well-being.

Despite this, energy policy has historically emphasized technological upgrades and infrastructure investments while comparatively underinvesting in the human behavioral dimensions of energy demand. This imbalance overlooks the well-documented benefits of behavioral modification, which are inherently low-cost, fast to deploy, and highly scalable. Evidence from demand-side management (DSM) programs illustrates a clear value proposition: residential behavioral interventions account for a small share of program spending, approximately 2 percent, yet can contribute to roughly 10 percent of realized energy savings (Fitzgerald 2019). Concurrently, energy efficiency has long been described as the “first fuel,” highlighting its role as one of the most accessible and widely available energy resources (International Energy Agency 2015). Taken together, the literature suggests that behavior-based education should be understood as resilience infrastructure: a scalable investment that strengthens both household adaptive capacity and grid resilience while complementing traditional infrastructure investments.

Programs that are simple, credible, and embedded within daily routines are more likely to produce lasting behavior change than technically sophisticated initiatives that remain disconnected from the households they intend to serve. Many existing DSM programs unintentionally exclude priority populations by assuming participants have the time, trust and energy literacy needed to engage. These households are often labeled “hard to reach,” when they are more accurately described as structurally underserved. When behavioral interventions fail to reflect cultural context, language, or varying levels of technical literacy, they become less relevant and less likely to produce sustained outcomes.

Trust is equally important. Regulated monopoly utilities are not always viewed as neutral or community-centered messengers, making behavior-focused communications more likely to be met with skepticism. This challenge is compounded by the tendency to conflate marketing with

education. Marketing emphasizes awareness, enrollment, and participation through one-way communication such as bill inserts, emails, and rebate promotions. Community-based behavioral education, by contrast, builds trust, understanding, and long-term behavioral capacity through trusted messengers, culturally relevant materials, interactive engagement, and ongoing reinforcement (McKenzie-Mohr 2011). For resilience-oriented DSM, the distinction is strategic: marketing may increase participation, but education builds the behavioral competence needed for things like adaptive cooling, thermostat management, and load shifting during extreme heat.

Behavioral interventions should also recognize who influences household energy use. Women often spend more time managing household routines and therefore shape many daily energy decisions (Energy Sector Management Assistance Program 2020; BLS 2024). Beyond time spent at home, women often function as primary educators and behavioral anchors, shaping routines related to comfort, appliance use, and energy management (ENERGIA 2019). At the same time, research suggests an information asymmetry: while women often express greater concern about the long-term impacts of energy use on future generations, men tend to report higher levels of access to energy-related information and technical knowledge (World Bank 2019a). Utility communications, billing structures, and DSM marketing are frequently directed toward the primary account holder, who are still more likely to be male. As a result, the person with the greatest influence over everyday energy practices may be the least likely to receive behavior-based guidance. Designing programs around household decision-making - not simply account ownership - can improve the persistence of energy-saving behaviors.

Taken together, these findings suggest that community-based behavioral resilience depends on reducing cognitive burden, building trust, and embedding practical guidance into everyday life. Small changes in cooling practices and load management can improve household comfort, reduce heat exposure, strengthen grid reliability, and enhance resilience during periods of extreme heat.

Community-Based Education as Resilience Infrastructure

Arizona and Nevada households are among the most vulnerable to climate-driven energy stress, yet conventional utility-led outreach and education models have produced limited uptake, particularly among energy-burdened households. This section synthesizes observed practices, documented gaps, and proposes a community-based behavioral resilience model that is both feasible and urgently needed in extreme-heat regions.

Although large-scale community-based behavioral programs remain limited in both states, existing community organizations already demonstrate many elements of this framework. Across Arizona and Nevada, organizations routinely integrate energy information into housing counseling, weatherization referrals, utility bill assistance, and extreme-heat preparedness efforts. These efforts illustrate that behavioral interventions are most effective when embedded within the broader social services and trusted community networks that households already rely upon, rather than delivered as standalone utility programs.

Behavioral resilience begins with accessibility. Language access extends beyond direct translation; literal or automated translations often fail to capture cultural context, regional language differences, and community beliefs about health, comfort, and energy use that directly shape behavior. Norms surrounding indoor temperature, ventilation, and perceived health risks vary widely, and messaging that ignores these differences may be viewed as irrelevant or counterproductive. Effective behavioral interventions therefore rely on culturally grounded framing that emphasizes dignity, household well-being, and practical resilience rather than abstract energy savings or environmental benefits. Tailoring interventions to the realities of seniors, renters, and working families - while using visual, story-based, and relatable messaging - reduces cognitive burden and improves comprehension and long-term adoption.

Behavioral intervention must also fit within daily life. Lengthy workshops, complex audits and paperwork-heavy enrollment processes are poorly aligned with the realities of energy-burdened households. More effective approaches combine brief, low-commitment touchpoints - such as pop-up events and workshops at schools, churches, and food banks - with ongoing digital reinforcement. When delivered through trusted community messengers and paired with practical support such as childcare or food, these interventions become easier to access and sustain. Rather than functioning as one-time outreach, they become embedded in existing routines, supporting habit formation while reducing cognitive burden.

This paper further proposes that social media should be viewed as normalization infrastructure rather than simply another communication channel. Social media remains an underutilized channel for , despite strong evidence that it shapes consumer awareness, decision-making, and long-term behavioral norms (Brindha & Parameswaran, 2017; Gokerik, 2024). A review of energy efficiency content in Nevada and Arizona reveals a lack of locally relevant voices, leaving energy efficiency framed as technical or niche rather than part of everyday life. As a result, many efficiency programs remain socially invisible despite their availability. Community-led social media offers a corrective mechanism: when local influencers and trusted community leaders model energy-saving behaviors within familiar cultural narratives, efficient behaviors become normalized, stigma around seeking assistance declines, and household energy management is reframed as a shared strategy for reducing heat risk and financial stress. In this framework, social media does not simply disseminate information, it creates social norms that make resilient behaviors easier to adopt. Social media does not merely disseminate information; it shapes social norms that reduce cognitive burden and normalize efficient behaviors.

Messaging That Works Across Political and Cultural Contexts

Efforts to promote energy efficiency in the United States have consistently struggled because the dominant language and framing fail to resonate with the lived realities of energy-burdened households. Even the term *energy efficiency* is either unfamiliar or conflated with renewable energy technologies. Technical terminology should be retained within policy and regulatory contexts, but community-facing messaging must explicitly translate energy efficiency

into everyday actions to manage costs, comfort, and survival. Framing efficiency as energy affordability directly addresses what households are struggling with most: inflation, rising utility bills, and the stress of balancing energy costs against rent, food, childcare, and healthcare. This framing avoids assigning blame to individuals for high bills while still offering tangible, actionable solutions that increase agency rather than guilt.

While climate change is an important driver of energy policy, climate-only framing often functions as a barrier to engagement in politically and culturally diverse contexts. Abstract or future-oriented environmental narratives do not align with the immediacy of household financial stress or extreme heat exposure currently experienced in the Southwest. In contrast, messaging centered on affordability, reliability, family protection, and preparedness reframes energy efficiency as a form of household risk management rather than ideological alignment (FEMA 2023). Summers in Arizona and Nevada routinely exceed 110-120 degrees F. Residents are more responsive to messaging that emphasizes immediate risk such as heat exposure, grid reliability, and household cost stability than to abstract climate framing. Research on heat-risk communication and behavioral message framing finds that locally relevant health and safety messaging is more likely to motivate protective action than generalized environmental appeals. (Lambrecht et al, 2021) Emergency preparedness framing elicits a sense of relevance, immediacy, and agency. Rather than inducing fear, effective preparedness messaging emphasizes control: households are reminded that there are steps that they can take now to reduce exposure to risk, lower bills, and maintain safety during extreme conditions.

Renters participation in traditional energy efficiency programs is often effectively nonexistent, because many interventions require landlord approval, property upgrades, or documentation that renters cannot easily access (ACEEE 2018). This paper therefore centers a critical distinction: behavior change efforts should not expect renters to overcome structural barriers, but instead prioritize systems-level changes that ensure renter behavior matters and renters are not overlooked.

Messaging, education, and DSM programs targeting renters must include actions that renters can implement independently – adjustments within the home that do not require appliance replacement or structural modifications. For example, renters can adjust thermostat settings during unoccupied hours or overnight to reduce cooling demand, and shift heat-producing activities such as laundry, dishwashing, or oven use to early morning or late evening hours to avoid peak electricity use and reduce indoor heat buildup. When recommendations are framed as practices that can be adopted immediately and repeated over time – no matter where someone lives – education shifts into habit formation. Over time, these practices normalize energy-efficient behavior while reinforcing dignity: households are not positioned as deficient or irresponsible, but as capable actors navigating constrained systems.

Trust is a prerequisite for engagement. Utilities and government agencies often lack credibility in energy-burdened communities due to rising bills, opaque pricing, and historical divestment. As a result, community-based organizations are better positioned to lead messaging

because they work alongside residents on multiple overlapping issues rather than approaching energy as a standalone concern (CDC 2015).

Southwest Energy Efficiency Project (SWEEP), a non-profit advancing energy efficiency and clean transportation in the Southwest states, operates through a partnership model that recognizes this dynamic. SWEEP collaborates with community-based organizations, utilities, and state agencies by providing deep policy expertise, regulatory insight, and educational support, while allowing trusted community partners to lead outreach and message delivery. In practice, this includes bilingual workshops delivered in partnership with organizations such as Chispa Nevada/Arizona, where policy concepts are translated into accessible language and grounded in community feedback. These partners play a critical role in testing and refining messaging, identifying points of confusion, raising new concerns or questions, and flagging when communications become overly technical or disconnected from lived experience.

Several lessons emerge from this approach. First, interest is a meaningful early metric of success, particularly in contexts where trust has been eroded and participation has historically been low. Questions asked, follow-up conversations, and repeated exposure to messaging often precede measurable behavior change. Second, feedback loops must be real: communities disengage quickly when feedback does not translate into visible changes in bills, policies, or program design. Third, while utilities in monopoly states have access to advertising budgets and customer data, values-based messaging is a behavioral design strategy that aligns energy information with existing mental models rather than requiring households to adopt new value systems.

From a scalability perspective, the most transferable elements of this model include simple, digestible messaging; compensation and resourcing for community partners; and flexibility to adapt framing to local conditions (e.g., heat versus cold risk). What must remain local is cultural interpretation – how comfort, savings, and preparedness are understood within specific communities. Public utility commissions and regulators can play a critical enabling role by asking not only what programs exist, but how they are communicated and to whom. Ultimately, reframing energy efficiency as a kitchen-table issue shifts it from a technical or political abstraction into a practical tool for reducing stress, stabilizing household finances, and rebuilding trust.

Policy and Program Design Recommendations

Translating insight into implementation requires an intentional shift from theory to practice; behavior change does not occur passively and must be deliberately embedded within policy and program design. In the Southwest, where extreme heat and peak demand increasingly test system reliability, the resilience of both the grid and households is shaped as much by how people use energy as by the infrastructure that delivers it. Investments in physical systems alone are unlikely to meaningfully reduce peak load or safeguard vulnerable populations during heat events if programs fail to account for audience reach, message resonance, trusted messengers,

competing household priorities, and the ease with which new behaviors can be integrated into existing routines. Trusted messengers function as behavioral infrastructure by translating technical energy information into trusted, actionable knowledge.

Demand response programs represent a critical and proven strategy for enhancing grid resilience in extreme-heat regions, yet current participation levels indicate substantial untapped potential. During the 2020 regional heatwave, when California experienced rolling blackouts, Arizona Public Service (APS) activated its Cool Rewards residential smart thermostat program, a measure widely credited with helping maintain grid stability in Arizona under peak stress conditions. The program has since been recognized for both its scale and operational reliability, surpassing 100 MW of peak demand savings in summer 2022 and reaching approximately 165.7 MW by summer 2024 with 96,966 enrolled households (APS DSM Annual Report 2024). Despite these strong performance outcomes, participation remains relatively modest, with SWEEP's recent estimates indicating enrollment of roughly 7.9% of APS residential customers and less than 6% of Tucson Electric Power (TEP) customers in comparable thermostat-based demand response programs (TEP Annual Demand Side Management Progress Report 2025). These figures underscore a significant opportunity: demand response is not a niche resource, but an expandable resilience asset that could deliver substantially greater peak load reductions if program design, outreach, and behavioral engagement strategies were more effectively aligned with household realities.

Proposed Community-Based Behavioral Resilience Framework

The literature synthesized throughout this paper supports a Community-Based Behavioral Resilience Framework consisting of five mutually reinforcing elements:

1. Reduce cognitive burden
2. Build trust
3. Normalize behaviors
4. Embed education into daily routines
5. Measure persistence

Effective program design must move beyond presenting facts about the consequences of energy use and instead incorporate persuasive, context-sensitive mechanisms that actively motivate action and participation. Behavioral research indicates that individuals frequently rely on cognitive shortcuts, drawing on familiar information, prior experience, and socially accepted norms when making everyday decisions, especially for routine choices such as thermostat settings or appliance use (World Bank 2015). Under such conditions, "fast thinking" dominates, and people are unlikely to seek out additional information unless the relevance is immediate and tangible. Lived experience and social context therefore play a central role in shaping behavior, as actions that appear normal within a community are more readily adopted and sustained. Because

most behaviors are reinforced through observation, habit, and historical norms rather than entirely new reasoning processes, policy and program frameworks that incorporate tailored behavioral strategies should be treated as foundational rather than supplementary. The following recommendations are designed to operationalize these principles.

Recommendation 1: Design for How People Make Decisions

Effective policy and program design should reflect how households make decisions in real-world conditions marked by stress, lack of available bandwidth, and cognitive overload, rather than assuming consistent, rational energy optimization. Behavioral research shows that individuals prioritize immediate comfort over long-term benefits, reinforce existing beliefs, and respond more strongly to potential losses than to abstract gains (World Bank 2015). In extreme-heat regions, this means messaging framed around maintaining reliable cooling, preventing disruptions, and supporting household stability is likely to be more effective than information focused solely on future savings or environmental outcomes. Providing facts alone is rarely sufficient; programs must incorporate persuasive, context-sensitive strategies that align with daily routines, mental shortcuts, and perceived risks. Integrating behavioral design elements such as default thermostat settings, social recognition, and neighborhood feedback can leverage commitment bias and social norms to sustain action over time (Allcott and Rogers 2014; World Bank 2015). These approaches are particularly relevant where late-afternoon cooling drives peak demand, as small behavioral shifts like pre-cooling homes or adjusting appliance timing can collectively reduce grid stress and strengthen household resilience during extreme heat events (U.S. DOE 2019; World Bank 2015).

Recommendation 2: Integrate Conservation and Energy Efficiency, Do Not Conflate Them

Policy and program frameworks should clearly distinguish between energy efficiency and conservation while intentionally integrating both, rather than treating them as interchangeable strategies. Energy efficiency refers to structural and technological improvements that reduce energy use without requiring continuous behavioral effort, whereas conservation relies on ongoing behavioral adjustments such as thermostat management, load shifting, and adaptive cooling practices. In extreme-heat regions, both approaches are necessary: efficiency upgrades improve baseline performance, while conservation behaviors help manage peak demand and reduce system stress during critical periods. For example, adjusting thermostat settings during unoccupied hours or pre-cooling homes before peak periods can meaningfully reduce cooling demand and associated costs (U.S. Department of Energy 2019). Integrating both pathways ensures that households can participate in resilience efforts regardless of housing tenure, income, or access to retrofits, while reinforcing the connection between individual decisions and system-wide load management.

Recommendation 3: Build Behavioral Infrastructure Through Trusted Community Organizations

Program effectiveness is closely tied to who delivers the message, not solely to what is

being communicated. Community-based organizations, local leaders, health workers, and culturally relevant digital platforms often carry greater credibility than institutional sources, particularly in communities where trust in utilities or government entities is limited. Educational interventions delivered through trusted messengers are more likely to be perceived as supportive rather than prescriptive, increasing both engagement and persistence of behavioral change. This approach is especially important for households facing language barriers, time constraints, or information overload, as it reduces skepticism and aligns energy education with existing social networks and routines. Evidence from behavior-focused development programs shows that interventions grounded in local context, cultural norms, and relational engagement are more successful than one-size-fits-all outreach campaigns (Energy Sector Management Assistance Program 2020). Embedding energy literacy within community workshops, multilingual materials, social media, and locally tailored communication channels can therefore expand program reach while strengthening long-term resilience outcomes.

Recommendation 4: Measure Behavioral Resilience Rather Than Participation

Finally, program evaluation frameworks should move beyond short-term participation metrics and instead prioritize behavioral persistence, comprehension, and resilience-related outcomes. Traditional DSM programs often emphasize enrollment numbers, rebate uptake, or initial engagement, yet these indicators provide limited insight into whether households actually understand and sustain new energy practices over time. Given that behavioral savings can account for a disproportionate share of program impacts relative to their cost, tracking persistence of actions such as load shifting, adaptive cooling, and thermostat management is essential for assessing true effectiveness (Fitzgerald 2019). Metrics should also incorporate co-benefits, including improved thermal comfort, reduced shutoff risk, and enhanced household stability during extreme weather events. By redefining success to include durable behavior change and quality-of-life improvements, program administrators can better capture the full value of education-centered interventions and justify continued investment in behavior-based resilience strategies. Participation is an intermediate outcome; resilience is the policy objective.

These recommendations underscore that effective resilience planning in the Southwest requires more than technological deployment and marketing; it demands program designs that reflect how people actually think, live, and make decisions about energy use. Integrating behavioral science and trusted community engagement can transform individual household actions into measurable system benefits, including improved grid reliability, healthier indoor environments, and greater household stability during extreme heat. When education is community-based, culturally relevant, trust-centered, and embedded into daily life, behavior change becomes both scalable and sustainable. In this sense, policy and program design that prioritize human behavior alongside infrastructure investments are not supplementary measures, but essential components of building healthy, adaptable, and resilient communities.

Conclusion

This paper argues that community-based energy education should be recognized as resilience infrastructure rather than supplementary outreach. Behavior change and community education must be elevated from peripheral outreach to core resilience strategies in the Southwest and beyond. The evidence throughout this paper points to a consistent finding: the primary barrier is not a lack of interest, but a lack of bandwidth and ineffective education efforts. Households facing high energy burdens, caregiving responsibilities, and economic instability are not disengaged, they are cognitively overloaded (U.S. DOE 2025). Consequently, energy efficiency messaging often reaches those who already possess the time, institutional trust, and stability to engage, while the households most at risk of heat exposure and service disruption remain underserved. Effective resilience-oriented programs must prioritize trust, clarity, and accessibility over volume of information. Simple, actionable messaging delivered through trusted community organizations, local leaders, and culturally relevant social media can outperform traditional utility marketing. When local influencers and community-based messengers model energy-efficient behaviors within familiar narratives, efficiency becomes normalized rather than exceptional, reducing stigma and reinforcing peer-based learning. This approach also clarifies a critical distinction: marketing raises awareness, but education builds comprehension, trust, and sustained behavior change. Programs that technically exist but are poorly communicated, culturally misaligned, or delivered by untrusted sources remain socially invisible in practice, regardless of their theoretical availability. Finally, actionable program design must reflect how households live, make decisions, and manage energy in extreme heat conditions. This includes integrating both conservation and efficiency, leveraging social norms and nudges, and accounting for intra-household dynamics such as gender roles that shape daily energy use and information access. Low-effort behavioral actions such as pre-cooling, thermostat scheduling, passive cooling, and appliance timing can collectively reduce peak demand, improve thermal safety, and strengthen household stability when embedded into routine life. Framed around reliability, comfort, and self-reliance, community-based education offers measurable co-benefits: safer indoor temperatures, improved health outcomes, reduced shutoff risk, and enhanced grid reliability. Physical infrastructure increases a community's capacity to withstand stress. Community-based energy education does the same by increasing households' capacity to make informed decisions before, during, and after extreme heat events. Treating community-based behavioral education as resilience infrastructure shifts the focus of policy from changing individuals to designing systems that reduce cognitive burden, strengthen trust, and make resilient energy behaviors the easiest behaviors to adopt. As utilities and policymakers invest billions in strengthening the grid, they should recognize that the resilience of the system ultimately depends on the resilience of the people using it. Building that capacity deserves the same intentional planning, sustained investment, and long-term commitment that we already devote to the physical infrastructure of the energy system.

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