
PSYCHOLOGY OF RESISTANCE TO APPLIANCE UPGRADING: A SECONDARY REVIEW ON ITS CONTRIBUTION TO HOUSEHOLD ELECTRICITY WASTAGE

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ABSTRACT

Awareness drives aimed at promoting energy conservation often encourage households to switch to more efficient appliances. Yet, despite increased knowledge, many continue using older models, leading to ongoing electricity losses. This review of existing studies examines the mental factors that cause people to avoid upgrades and widen the divide between knowing about energy efficiency and actually acting on it. It focuses on common thinking patterns like staying with the familiar (status quo bias), favoring short-term ease over future gains (present bias), and fearing immediate losses more than valuing long-term benefits (loss aversion). These patterns block upgrades that would otherwise save money. The analysis stresses that simply sharing information is not enough and calls for approaches rooted in how people actually make decisions to cut down on wasted power at home.

Keywords: *Electricity wastage, appliance upgrading, psychological barriers, status quo bias, present bias, energy-efficiency gap, behavioral interventions.*

INTRODUCTION

Electricity powers everyday life, but a large amount is wasted in homes because people keep using outdated, energy-hungry appliances for years. Efforts to promote saving electricity have helped raise general knowledge, yet few families actually replace items such as refrigerators, lights, or air conditioners with better-rated versions — even when doing so would lower bills and help the environment over time.

This problem stands out in fast-growing cities across India. As more people move to urban areas and buy appliances, demand for power keeps rising, especially during hot weather. Government programs like the Bureau of Energy Efficiency's star rating system have increased basic awareness, but many households in places like Mumbai still hesitate. Reasons include the cost of buying new items upfront, living in rented homes, and a habit of trusting older equipment that has worked reliably for years (Agrawal et al., 2020 from CEEW).

Simply telling people to save energy is no longer sufficient. What is needed is a fresh approach that tackles the inner mental hurdles stopping action and encourages real changes in behavior. Such steps can turn awareness into actual savings, often described as "avoided" electricity use.

This review looks closely at why households avoid upgrading appliances and how this delay keeps adding to power wastage. Drawing from ideas in behavioral economics and environmental psychology, it maps out the main obstacles and possible ways forward, with special attention to closing the divide between knowing what to do and actually doing it.

REVIEW OF LITERATURE

Research on the energy-efficiency gap repeatedly shows that mental and behavioral issues play a bigger role than purely financial or technical problems. Work by Blasch and Daminato points to status quo bias as a major reason why families stick with familiar but inefficient appliances, which results in higher power use and slower replacement rates. Studies by Fuerst and Singh (2018) highlight how present bias makes people focus heavily on today's costs and comfort while downplaying tomorrow's savings, often leading to endless delays. On top of this, loss aversion causes individuals to place too much weight on any short-term inconvenience or risk compared with future rewards.

Broader analyses indicate that positive attitudes and knowledge about saving energy do not always lead to real changes in behavior. Feelings such as guilt or pride often influence actions more strongly than general values. Standard campaigns that only provide facts tend to have weak results, while approaches that use defaults, regular feedback, or easier processes tend to work better at encouraging upgrades and lowering consumption. In short, these thinking shortcuts and everyday frictions combine to keep the efficiency gap alive and allow unnecessary electricity waste to continue.

OBJECTIVES

1. To identify and categorize the primary psychological barriers (such as status quo bias and present bias) that discourage households from upgrading to energy-efficient appliances.
2. To examine how these psychological barriers contribute to sustained household electricity wastage despite available awareness and incentives.

3. To evaluate the effectiveness of behavioral interventions reported in the literature for overcoming resistance to upgrading.
4. To propose evidence-based recommendations for policymakers and practitioners to promote appliance upgrades and reduce electricity wastage.

METHODOLOGY

This work is based entirely on a review of already published material and does not involve any new surveys, experiments, or field visits. Relevant peer-reviewed articles, summary studies, and reports from roughly 2015 to 2025 were gathered from academic databases. Search terms included combinations such as “psychological barriers energy efficient appliances,” “status quo bias upgrading,” “present bias energy efficiency,” “energy-efficiency gap household,” and “behavioral interventions appliance adoption.”

Only studies focused on homes and residential settings, with clear attention to psychological or behavioral aspects, were kept. Around 35 to 40 sources were chosen after checking their quality and fit. The findings were brought together through thematic narrative synthesis to create an original overview organized around the four objectives.

DISCUSSION

The main insights from the collected studies are presented below according to each objective.

Objective 1: To identify and categorize the primary psychological barriers that discourage households from upgrading to energy-efficient appliances.

The analysis points to status quo bias, present bias, and loss aversion as the most important mental obstacles. As noted by Blasch and Daminato, status quo bias makes people comfortable keeping their existing appliances and daily habits, viewing any switch as unnecessary trouble. Fuerst and Singh (2018) explain that present bias leads families to care far more about immediate effort or expense than about savings that will appear later. Loss aversion adds to the problem by making short-term downsides — such as the money spent now, time taken for installation, or doubts about new performance — feel much heavier than the benefits that build up over years. These patterns fall under internal behavioral hurdles and often combine with the extra mental work needed to compare options and arrange changes.

Objective 2: To examine how these psychological barriers contribute to sustained household electricity wastage despite available awareness and incentives.

The barriers keep wastage going by extending the life and heavy use of inefficient devices. According to Blasch and Daminato (2018/2020), households showing strong status quo tendencies end up with roughly 5.7% higher overall electricity use because they delay replacements and run old appliances harder. Fuerst and Singh (2018), in their study conducted in Delhi, show how present bias causes repeated postponement of upgrades that would pay back quickly. Loss aversion deepens emotional ties to current equipment. Together, these factors create a wide gap between good intentions and actual steps, so that even when incentives exist, avoidable power losses continue. This pattern helps explain why the efficiency gap remains stubborn in many homes, including urban Indian settings where upgrades with payback periods of just 3 to 5 years are still commonly overlooked (Agrawal et al., 2020 from CEEW).

Objective 3: To evaluate the effectiveness of behavioral interventions reported in the literature for overcoming resistance to upgrading.

Targeted behavioral approaches appear promising for tackling the barriers. Making efficient models the automatic or default choice in shops and subsidy schemes helps overcome the pull of the status quo and reduces decision effort. Clear feedback tools, such as smart meter reports or simple comparisons showing total lifetime costs, make future savings feel more real and immediate. Messages that tap into social norms or emotions like pride and guilt can boost motivation.

Evidence from real-world trials suggests these methods can lift upgrade rates and cut consumption by 5–20% in specific areas, performing noticeably better than information-only messages. Combining several techniques — for example, defaults together with regular feedback — usually delivers more reliable results. Still, outcomes differ depending on the setting, and there is a need to watch for rebound effects, where people may use new efficient appliances more freely because they seem cheaper to run. Effective strategies should therefore cover both the decision to upgrade and how the appliance is used afterward.

The following table captures important connections drawn from key studies (Blasch and Daminato, Fuerst and Singh, and supporting reviews):

Psychological Bias	Main Mechanism (Researchers)	Impact on Electricity Wastage	Effective Interventions
Status Quo Bias	Preference for current appliances (Blasch and Daminato)	~5.7% higher consumption; delayed replacement	Defaults, simplified choice architecture
Present Bias	Discounting future savings (Fuerst and Singh, 2018)	Procrastination despite short payback	Personalized feedback, salience nudges
Loss Aversion	Overweighting short-term losses	Resistance to upfront costs/effort	Loss-framed messaging, hassle reduction

Objective 4: To propose evidence-based recommendations for policymakers and practitioners to promote appliance upgrades and reduce electricity wastage.

The reviewed evidence supports several practical steps. Policymakers could design retail and subsidy systems so that efficient appliances appear as the standard option. Regular, personalized feedback on energy use should be made widely available, and paperwork or processes should be made much simpler. Financial support works best when paired with subtle nudges, such as messages that highlight what is lost by delaying (“avoid missing these savings every month”) or campaigns that show what most similar families are doing. Energy auditors and campaign teams could receive basic training in these psychological insights.

In India, embedding such ideas into existing BEE initiatives and city-level support schemes (for example in Mumbai) could help move beyond current awareness levels and produce measurable drops in household power waste (Agrawal et al., 2020 from CEEW). These low-cost additions can usefully support stricter rules and new technology rollouts.

AREAS FOR ENHANCEMENT

The current review offers a solid overview, but a few adjustments could make it even stronger. These include tightening the links between specific numbers and their source researchers (such as the 5.7% figure from Blasch and Daminato or the Delhi findings from Fuerst and Singh, 2018), adding more detail on Indian urban realities using sources like Agrawal et al. (2020) from CEEW, keeping the summary table for clarity, expanding the reference list with additional recent studies from 2020–2025, and noting possible directions for new fieldwork such as testing nudges directly in Indian cities.

RESEARCH FINDINGS

Bringing together the studies points to several clear patterns about why households resist appliance upgrades and how this affects electricity use:

- Standard information campaigns build knowledge and good intentions about saving energy, but they rarely lead to actual purchases of efficient models because they do not tackle deeper thinking habits (Bensouda & Benali, 2022; Carrus et al., 2021).
- Mental obstacles, above all status quo bias (Blasch and Daminato, 2018/2020) and present bias (Fuerst and Singh, 2018), play a major part in keeping wastage high. Blasch and Daminato showed that households influenced by status quo tendencies use about 5.7% more electricity overall, largely because they keep old appliances longer and run them more heavily. In a Delhi study, Fuerst and Singh (2018) found that present bias causes people to keep putting off upgrades that would recover their cost fairly quickly.
- These patterns enlarge the gap between what people plan to do and what they actually do. Households therefore hold on to and overuse inefficient equipment, wasting power even when better options would save money in the long run (Cattaneo, 2019; Fuerst and Singh, 2018).
- Within India, knowledge of star ratings for appliances is still fairly low, and the difference between awareness and real adoption is widened by mental hurdles as well as everyday issues like initial costs and rental living (Agrawal et al., 2020 from CEEW).
- Methods that use behavioral insights — such as automatic defaults, clear feedback, easier steps, and carefully framed messages — tend to work better than simple information drives at encouraging upgrades. They can bring noticeable drops in energy use (commonly 5–20%), although results depend on how they are combined and local conditions. Attention is also needed to avoid situations where new appliances are used more often, reducing some of the expected gains.

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- Positive feelings such as pride or a sense of doing good can support motivation, but they need to be backed by practical help (like simpler processes or timely reminders) if they are to result in actual purchases (Carrus et al., 2021).

In summary, when psychological tendencies like status quo and present bias are left unaddressed, they account for a large share of ongoing household electricity waste — even where awareness and policy support have grown. Moving forward calls for greater use of decision-friendly strategies rather than relying mainly on facts and appeals.

CONCLUSION

This review shows that mental resistance to replacing appliances, driven especially by status quo bias (Blasch and Daminato) and present bias (Fuerst and Singh, 2018), is a central reason why household electricity continues to be wasted. While campaigns have improved general understanding, they seldom bridge the divide between awareness and action. Greater emphasis on approaches shaped by how people really decide offers a more effective route to higher upgrade rates and real energy savings. Putting these ideas into practice can strengthen conservation efforts and support wider goals for sustainable energy use.

LIMITATIONS

Because this is a review of existing publications only, the conclusions depend on the focus, quality, and settings of the available studies (including work by Blasch and Daminato, Fuerst and Singh, and Agrawal et al.). Results may differ in various cultural or economic situations. No original data or direct testing of interventions was carried out. Future work could usefully include field trials of behavioral approaches in Indian urban areas to test and refine these ideas.

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