Industrial Capital Investment Decisions: Pathways to Energy Program Engagement

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Research Report

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The **American Council for an Energy-Efficient Economy** (ACEEE), a nonprofit research organization, develops policies to reduce energy waste and combat climate change. Its independent analysis advances investments, programs, and behaviors that use energy more effectively and help build an equitable clean energy future.

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Executive summary

Key findings

This report presents social science-informed findings drawn from qualitative interviews with industrial firms and energy program administrators, complemented by a review of the relevant literature. The findings below examine how medium- and large-sized U.S. industrial firms, particularly those in energy-intensive industries, make energy-related investment decisions and how organizational structures, decision processes, and program design features influence participation in utility- and government-run capital investment (CapEx) energy efficiency (EE) programs:

- **Program participation is triggered by project needs.** Though large incentives can occasionally generate new project ideas, most firms learn about incentives only after a project idea is already conceived. Yet conception alone does not guarantee implementation. Incentives materially affect whether projects clear internal feasibility, payback, or approval thresholds and proceed at all, making visibility at the right time in the project development life cycle more important than promotion itself.
- **Projects that "tick multiple boxes" are more likely to gain approval**. Energy-saving investments are more likely to win internal approval when they support projects tied to other strategic priorities such as productivity, safety, quality, or decarbonization than when they rely solely on cost savings for justification.
- **Program timing, from outreach to implementation, matters.** Budget cycles and narrow maintenance windows shape feasibility. Short or unpredictable program timelines deter participation.
- **Program staff can provide significant value by helping firms match incentives to emerging project needs,** but this is only possible when a long-term relationship and trusted communication channels already exist.
- **Internal "scanners"—employees who actively seek out cost-reduction opportunities—are underutilized outreach contacts.** These individuals act as information hubs or gateway agents in internal communication channels and are the first people others consult when looking for ways to reduce project costs or identify program opportunities.
- **Internal buy-in is key to advancing projects and program participation and is usually decisive when obtained.** Projects that do not secure informal approvals and multilevel internal engagement prior to submitting a project for formal review can, in some firms, result in the project being automatically declined.
- **Effective firm outreach requires more nuanced profiling**. Program administrators need more nuanced firm profiles to understand variation in decision drivers, market pressures, priorities, and internal processes rather than relying on a one-size-fits-all, cost-focused approach to outreach.

Industrial energy program participation remains often lower than desired, even when significant financial incentives are available, suggesting that simply offering financial incentives is insufficient. This gap points to the need for behavioral approaches to understanding how firms make these decisions. This report applies a social science lens to explore how medium- to large-sized U.S. industrial firms, particularly those in energy-intensive industries, make energy-related capital investment decisions and how they decide to engage with energy programs.

Combining a literature review with qualitative interviews with industrial facility staff and third-party program administrators, this research maps the factors that affect these decisions and how they can be influenced. The findings are intended for federal, state, and utility energy program designers, administrators, and implementers who want to strengthen industrial participation by better aligning engagement strategies with real-world business priorities.

The research affirms that decisions to invest in energy efficiency are shaped by organizational dynamics, strategic goals, trust, and timing rather than being fundamentally triggered by financial incentives alone. Energy efficiency investments largely emerge from identified operational needs (such as maintenance, productivity, reliability, or efficiency improvements), and firms commonly engage with programs encouraging capital investment when they fit an existing project idea or plan. Larger, more capital-intensive efficiency project investments routed through higher-level capital planning processes are more likely to be framed as strategic. For these larger projects, programs offering substantial funding can play a more salient role in spurring a project idea by improving their competitiveness within internal capital allocation processes.

Across both large and small energy projects, however, participation in CapEx improvement programs largely hinges on whether a program is discoverable during the opportunity period in which a project is being scoped or considered. Although project definition and funding considerations typically evolve iteratively, firms generally develop and refine capital projects first and then seek out funding to support them, whether the development occurred within the year or in previous cycles. Funding availability can influence scope and timing, but it is only one of several decision factors. What often matters most is whether the right internal actors know where to look or who to contact when a project is under consideration, not the overall frequency of program promotion. Information discoverability and relationship positioning at the critical points in a firm's project development process is essential; identifying which internal staff influence these information pathways is just as important as the content of the program information itself.

Other behavioral factors such as timing and predictability also strongly influence program participation. Industrial firms plan major capital expenditures months or years in advance, following strict fiscal and maintenance cycles. Programs with short, uncertain, or unpredictable funding windows—or those with inconsistent, lengthy, or slow administrative processes—introduce uncertainty and pose real production risks that discourage uptake. These risks cause companies to discount the perceived value of incentives or forgo participation altogether. Programs that offer long, predictable funding windows, minimal administrative friction, and consistent availability can enable industrial firms to plan ahead and incorporate program participation into their budgeting and maintenance schedules.

Internal communication channels within firms play an outsized role in shaping program awareness. Internal accounting practices and weak communication between engineering and finance functions remain persistent barriers to capital project approval. Interviewees easily and consistently identified internal staff (such as sustainability managers or government affairs personnel) who act as "scanners"

and serve as gateways of internal communication channels by actively identifying cost-saving and incentive opportunities and distributing that information throughout the organization.

These individuals are typically the first point of contact for engineers seeking to reduce project costs. More strategic outreach to these scanner communicators, beyond relying on existing points of contact or energy "champions," represents a valuable and overlooked channel to improve program awareness within the firm.

Financial motivations such as improved productivity and energy cost reductions remain the clearest drivers of EE investment. Incentives are valued for their ability to improve project proposal returns or make an otherwise unfavorable project financially viable, but payback period remains a strict requirement for most firms.

The strategic impact of investments often supersedes profitability as the primary driver of investment choices. In many firms, the way a project aligns with strategic objectives determines not only its perceived value but also how it moves through internal approval systems. Strategic priorities shape how projects are categorized, and those categories dictate the metrics used to evaluate them. Most energy projects fall under financially driven categories like "cost savings" that usually require short payback periods. Given that not all energy-related investments will meet those strict payback criteria, linking energy projects to other, or even multiple, strategic objectives can improve their positionality in approval processes. Tying energy efficiency improvements to product quality, risk management, or sustainability goals can help reclassify those improvements into categories with more flexible financial thresholds or alternative success measures. Thus, positioning energy projects as contributions to overall business performance rather than as isolated cost-saving efforts may increase their likelihood of approval.

Recent U.S. federal policy shifts away from decarbonization support have made firms cautious about energy-related capital investments. Nevertheless, companies with international operations or customers maintain long-term decarbonization commitments due to unabated global market and policy pressures.

To strengthen participation in energy-related programs and to encourage the associated capital investments, program designers, administrators, and implementers could

- Position CapEx energy efficiency programs as a means to achieve broader corporate objectives beyond only cost savings
- Profile firms' strategic goals, capital investment cycle timing, and project categorization systems
- Broaden engagement to multiple levels of the organization
- Leverage internal scanner staff to effectively disseminate program information
- Offer long, predictable funding windows and clearly signal program stability to reduce uncertainty and perceptions of program risk
- Offer a staged proposal process that first encourages concept proposals from industry to assess program fit before requesting full proposals from best-fit applications
- Ensure program personnel bring deep, sector-specific technical expertise
- Address labor constraints by reducing paperwork, simplifying reporting requirements, and offering staffing grants

Introduction

The industrial sector is the second-largest energy-consuming segment of the U.S. economy, accounting for roughly one-fourth of total end-use energy demand (EIA 2025b). The sector also accounts for 23% of U.S. greenhouse gas (GHG) emissions, rising to 30% if Scope 2 emissions[1] are included (EPA 2022). It is projected to become the highest-emitting sector in the U.S. economy by the early 2030s, surpassing transportation (King et al. 2024). Additionally, many of the high emitting subsectors within industry are key to the U.S. economy, accounting nationally for over 10% of its gross domestic product (GDP) (NAM 2024). Thus, the behaviors of industrial firms and other large businesses have significant impacts on both emission-reduction efforts and the spread of emissions across supply chains. While many governments and utilities have launched energy efficiency and emissions reduction programs targeting industrial businesses, participation in these programs remains limited.

Removing financial barriers alone is not enough. Even when incentives or cost savings are available, many firms do not engage. As Muthulingam and colleagues note, "the literature struggles to explain the high rates of non-adoption of these initiatives" (Muthulingam et al. 2011). This gap points to a more complex reality where internal firm dynamics, organizational culture, trust in external actors, gaps in awareness of feasible improvements, and perceived risks all play critical roles in industrial decision-making around the choice of whether to participate in programs.

This project brings a social science lens to the question of how medium to large[2] U.S. industrial firms, especially those in the most energy-intensive industries, make energy-related decisions. We explore the role of strategic goals, internal champions, cross-functional teams, and decision-making structures—especially where influence is shared or contested between facility and corporate levels. Combining a literature review with qualitative interviews of industrial facility decision-making staff, we present the factors that affect energy decisions and how they can be influenced.[3]

This report is intended for federal, state, and utility energy program designers and implementers who want to strengthen industrial participation in CapEx energy efficiency programs by understanding how firm decision-making drives or hinders engagement. By understanding how industrial firms make decisions to participate and invest, program administrators and policymakers can design more effective engagement strategies that align energy investments with real-world business priorities and realities.

Industrial energy efficiency programs

Government agencies across federal, state, and local levels actively support the industrial sector through policies and incentives that promote energy efficiency programs, pilot programs for new technologies, and strategic energy management. Electric and natural gas utilities oversee most initiatives focused on

[1] Scope 2 emissions refer to the greenhouse gases released at the power plants that produce the electricity a company purchases or imports for its operations (WRI 2015).

[2] We define medium as 100–1,000 employees and large as 1,000+ employees.

[3] In this research we look at U.S.-based firms. Much of the seminal literature that exists—Cooremans (2012), Solnørdal and Foss (2018), and others—focuses on and draws their conclusions based on European firms, which function in a different policy environment. Our study offers an initial glimpse into the factors driving decisions in the U.S. context, suggesting there is value in expanding this screening study into a more in-depth assessment.

facility-level energy efficiency. These serve the goals of reducing customer emissions and meeting state-mandated energy efficiency targets (Kresowik et al. 2025).[4]

Despite accounting for roughly 26% of U.S. electricity consumption, industrial customers receive a relatively modest share of total efficiency spending (EIA 2025b). In 2024, electric utilities spent about $274 million on industrial energy efficiency incentives compared to $1.92 billion for residential and $2.02 billion for commercial customers—just 6.5% of customer incentive spending (EIA 2025a). However, these investments are often directed toward large, energy-intensive facilities, making industrial programs a high-leverage component of overall energy efficiency portfolios.

Many of these utility-funded programs concentrate on specific technologies—like motors and boilers—or target particular customer segments, such as small, mid-sized or large manufacturers. These programs typically offer rebates, customized incentives, energy audits, technical assistance, and opportunities to pilot new technologies in their test beds to encourage companies to adopt more efficient systems and controls (Srinivasan et al. 2023).

A subset of industrial energy efficiency programs center on strategic energy management (SEM), which trains operations staff to spot energy efficiency opportunities during maintenance and operations and integrate energy management into routine operations. These activities, along with other incremental efficiency measures, are typically treated as operating expenses (OpEx). By contrast, larger energy efficiency or emissions reduction projects—such as major equipment replacements, system upgrades, or process changes—are typically funded through capital expenditure budgets (CapEx).

In practice, internal decision-making for participation in SEM programs is usually different from the decision process for larger-scale energy efficiency or emissions reduction investments in equipment or process changes. SEM and deemed incentive programs are usually funded through operations budgets whereas energy efficiency investments are funded from capital investment or operational expenditure budgets.

In this report, we focus primarily on larger investment and expenditure programs (unless otherwise noted), but all program types play a role in improving industrial energy efficiency performance.

Organization of this report

This report walks the reader through the industrial decision-making process from start to finish for medium-to-large energy-intensive industrial firms. It explains how CapEx energy efficiency programs are first discovered, who advances them within the company, what motivates participation, and what prevents participation. In the appendix, the report dives deeper into how characteristics of an industrial firm influence decision-making. The report ends with recommendations of how to encourage industries to participate in CapEx energy efficiency programs.

Jump to section:

Who plays a role in energy decision-making

[4] ACEEE estimates that in 2023, total utility efficiency program spending was approximately $8.8 billion, with about $6.9 billion invested in electric efficiency programs and about $1.9 billion in natural gas efficiency programs (Kresowik et al. 2025).

How companies find out about programs

What drives energy investments

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Appendix

Who plays a role in energy decision-making

Encouraging participation in industrial energy efficiency programs is not about finding the one right decision maker, but rather about understanding how multiple actors work together in the decision-making ecosystem. These roles are discussed in greater detail throughout the rest of the report.

Depending on size and organizational context, firms exhibit varying degrees of distributed site-level autonomy and centralized corporate decision-making. Because authority over energy and capital decisions can reside at different organizational levels, understanding a firm's governance model is essential for effective engagement. In organizations where authority is not fully centralized, energy-related decisions are distributed across organizational levels according to function. Top-level management tends to establish overall goals for the company, whereas lower-level employees carry out actions required to achieve those goals (Taghavi 2021). Indeed, when both upper management and local operations staff play roles in these decisions, energy efficiency initiatives are more likely to move ahead (Taghavi 2021; Papke-Shilds and Malhotra 2001; González-Sánchez et al. 2018).

Thus, engaging actors at a variety of levels can be fruitful. Top-level managers operate on the level of larger-scale, longer-term capital projects and are concerned with advancing company-wide priorities (including sustainability at many facilities regionally or nationally), whereas local operators tend to work within smaller investment envelopes that allow for quicker, lower-cost improvements at the plant level.

An interest in energy from upper management levels is helpful and conducive to energy investment at a firm. Beyond creating an energy management position at the company, the existence of an executive manager close to the operations level can foster alignment and successful energy project development between upper and lower levels. Both energy managers and executive managers close to the operations level make energy efficiency projects more likely to be approved (Taghavi 2021; Solnørdal and Foss 2018). Alternatively, empowering local operations staff to implement energy efficiency projects also makes these projects more likely to proceed (Taghavi 2021). One study found that adoption rates were lower for energy efficiency recommendations that demand greater managerial attention and scrutiny in order to clear more stringent decision criteria around cost or other elements (Muthulingam et al.

2011).[5] That said, research to date has generally neglected the role that on-the-ground or in-the-field operational and maintenance staff play in advancing energy efficiency initiatives (Smith et al. 2022).

Our interviews confirmed the involvement of staff at multiple levels in pushing energy efficiency decisions forward. Industrial firms described tiered and multistage internal approval processes in which project ideas (both energy-related and non-energy-related) move through formal project-authorization systems. Many different roles and teams are involved in project development, but authority to approve investments increases up the chain of command. Typically, two-way communication channels at each stage and across decision-making stages as well as productive feedback loops tend to advance decisions more quickly and into implementation and adoption phases.

Facility-level engineers, operators, and managers

For most of the firms we spoke to, facility engineers and/or their managers are typically the ones maintaining any day-to-day relationships with third-party program administrators (TPAs) or utilities. These primary contacts with program staff prepare action plans and compliance data. Crucially, according to our interviewees, most energy-related project ideas originate at the facility level, where engineers and operators spot opportunities in daily operations and design projects that address local priorities. However, because these staff members have limited authority and juggle many other responsibilities, their role in energy investment and program participation is largely limited to identifying and proposing project opportunities.

> *"[The engineering team, the management of the site, and other relevant groups from the plant] will get together and decide: "What projects do we want to do?"[…] We'll get the list together and then we'll propose it up to the global team for review. […] That's a monthly process where each month the different projects will get submitted to the Global CapEx Board, the global team that's responsible for divvying out all the funds for review and approval." – Plant-level engineer, food and beverage industry*

Facility-level plant managers, who typically report to a company owner, a vice president of manufacturing, or vice president of operations, and regional-level managers hold ultimate authority over whether projects move forward from the facility. Securing their buy-in can give engineering staff latitude to focus on energy projects, but it is more difficult for program administrators to engage them consistently. One TPA reported that plant managers rarely attend their regular SEM program meetings and only, in the best cases, join annual or semiannual reviews.[6]

[5] The effect of requiring increased managerial attention was equivalent to increasing the cost of implementation of the project from the average level of $19,118 to $353,293 (Muthulingam et al. 2011).

[6] This underscores the value of formal energy management systems such as ISO 50001, which institutionalize senior-level oversight by requiring "top management" with decision authority to participate in regular management reviews and energy performance oversight.

Corporate-level sustainability and energy managers

Larger organizations may employ corporate energy and/or sustainability managers who bridge site-level activities with corporate strategic goals.[7] These corporate-level managers, who have greater visibility into approval pathways and financial criteria than plant-level staff, play a critical role in advancing energy efficiency within the organization, operating as technical and strategic intermediaries between facilities and executive leadership. They work with plants and engineering staff to identify opportunities, shape project concepts, develop business cases, coordinate across sites, and help translate technical performance into financial and strategic terms that executives can evaluate, shepherding projects through internal approval processes. Critically, they are typically the ones who scan for program opportunities, functioning as informational gateways and may even serve as advisors during project conception, helping sites refine their cost estimates, assess payback potential, and preapprove proposals. They may or may not control any capital budgets, depending on the firm, but they do strongly influence which projects reach executives for consideration and how those projects are framed. Some corporate energy managers have justified dedicated funds with senior executives that may be used to pay for projects.

Corporate-level approvals are essential for moving energy investment projects forward, and sometimes a critical juncture occurs informally prior to a formal project approval process. One TPA mentioned how connecting with corporate energy managers can be especially valuable when trying to run programs across multiple facilities. Unlike plant managers, who may be focused on daily operations at individual facilities, corporate energy managers take a proactive role in making energy-related improvements across the firm, and they can act as key allies to program administrators by holding responsibility for internal energy programs, anticipating and addressing informal sources of resistance or veto authority within the organization, and using external program resources to secure buy-in from plant managers.

> *"A lot of times the corporate folks at multiple facilities will have an energy person… they can be very helpful in convincing the plant manager to buy into what we're trying to do." – Consultant, third-party program administrator*

Executive-level personnel

In large industrial firms, senior executives—here defined as a company's highest-ranking executive officers—are typically not involved in identifying or developing energy efficiency project ideas. Thus, they rarely engage directly with program staff, but do work closely with corporate energy managers.[8] Their role in program participation begins at the capital approval stage. As project size and capital requirements increase, proposals move through additional management layers and ultimately to a

[7] Corporate energy management is a best practice for any industrial firm within this size range of medium-to-large firms. Best practice guidance on building energy teams and corporate energy management roles can be found here: https://www.energystar.gov/sites/default/files/2024-11/Guidelines%20for%20Energy%20Management%206_2013.pdf.

[8] "Corporate energy manager" is used here as an umbrella term rather than a formal job title; corporate-level energy-related responsibilities may sit with manager or director roles in energy, sustainability, facilities, operations, or engineering departments, depending on firm structure.

senior executive team or formal capital expenditure committee.[9] At this stage, executives function primarily as financial and strategic approvers rather than technical evaluators.

> *"[When I put together a formal capital expenditure request] it goes on to the senior vice president, and then it goes to [the group of executives] that manage an area of the company requesting the capital, who will review it. They'll put together their presentation of [proposals they want to move forward and] send it on to a CapEx committee [for approval]." – Corporate-level energy and decarbonization manager, cement industry*

These decision makers weigh each proposal against the organization's broader priorities, so obstacles to energy efficiency projects may result from inherent trade-offs that must be balanced with non-energy-related goals (Cooremans 2011; Taghavi 2021). As a result, projects that identify multiple benefits to the company, or "tick multiple boxes," are more likely to gain approval. Clearly articulating additional benefits, such as contributions to productivity, increased safety, GHG reductions, or operational reliability, can materially strengthen a project's case for approval. Program administrators should position incentives and support in ways that align with multiple strategic priorities so that when projects reach the executive level in approval processes, they resonate with broader objectives, stakeholders, and investment criteria.

Summary: who plays a role in energy decision-making

To sum up, identifying which internal roles to engage when offering an energy efficiency program depends on accessibility and the structure of the firm. Connecting with corporate-level leadership can be more difficult but potentially more effective for programs benefiting multiple facilities or incentivizing long-term deeper retrofits, or for larger-scale projects that can make significant progress toward firm-level sustainability or energy goals. It can also be helpful for influencing the development of strategic goals.

If a company has a corporate-level sustainability or energy manager, or a manager that is closely tied to local operations, then that person is more likely to be the effective champion for energy efficiency programs. Given that energy-efficient operation is one of their primary responsibilities, this actor will often proactively seek out external programs for their resources. In this case, making them aware of exactly who to reach out to *when they are planning a project* is key. Instilling the knowledge of who to contact at the moment of opportunity is more important than providing program information. If possible, obtain informal buy-in from these managers prior to making an official proposal to the company.

When a company empowers local operations staff to independently invest in smaller maintenance and operations (M&O) energy efficiency upgrades, these local actors can be important contacts. Moreover, even when not empowered, these staff frequently have the ability to bring ideas to higher management levels. Making them aware of program offerings can help propel energy efficiency projects that would otherwise languish.

[9] In smaller companies (not covered in this report) owners generally retain direct authority over capital investment decisions alongside a small set of senior executives.

How companies find out about programs

The first step in program participation is program awareness. We analyzed this step through interviews with key stakeholders as there is little information available in the current literature.

Key channels for program information

Staff at industrial firms may hear about programs through a variety of channels, both external and internal. Across our interviews, the most common sources of program information were dedicated account managers from utilities or TPAs and internal staff within industrial firms (figure 1).

External channels	Internal channels	Peer networks
• Utility account managers • Third-party program administrators • Equipment vendors • Maintenance contractors • Engineering consultants	• Corporate staff • Government affairs staff • Sustainability staff • Energy procurement teams	• Industrial professionals' networks • Local and regional networks • Referrals from trusted peers or sister facilities

Figure 1. Key stakeholders for program information

External channels

In addition to peer networks (discussed below), external channels include utility account managers, TPAs, equipment vendors, maintenance contractors, and engineering consultants (Rogers et al. 2019). Among these, utility account managers and program staff are the ones most often providing program information directly, especially if they themselves maintain an active relationship with the utility or program administrator.

> *"They're major customers for their local utilities, so that local utility will assign something akin to a key account manager who will regularly meet with them. Often these key account managers have energy auditing experience or general knowledge, and they'll help walk around facilities, understand parts of it, and ensure they are getting into the programs to get funds back." – Consultant, third-party program administrator*

Traditional communication channels involve utilities or program implementers conducting regular meetings with or conducting outreach to connect with energy managers. However, other communication channels can also work.

Vendors and various other contractors are also a common way that firms learn about energy programs (Rogers et al. 2019). In cases where vendors have established, trusted relationships with facilities, they generally possess a deeper understanding of the facility operations than program staff. This familiarity can make them effective and credible messengers.

Some programs using trade ally models rely heavily on vendors or contractors to promote participation, especially in technology-specific programs. While this approach can extend the reach of program information, our interviews suggest several drawbacks to relying exclusively on trade allies. Trade allies' sales priorities can present conflicts of interest, leading them to emphasize project elements that align with their own products lines or services project (e.g., lighting) while neglecting others, resulting in fragmented or suboptimal participation rather than a holistic approach to energy management. To mitigate these limitations, some programs use hybrid models that pair trade allies or technical vendors with account managers or other program staff. This may help balance technical expertise of vendor-driven outreach with a more integrated consideration of project options.

Internal channels

Program reach depends not only on external messengers but also on how information circulates within firms. In larger organizations, specific individuals—usually corporate staff members on government affairs, sustainability, or energy procurement teams—proactively scan for cost-saving opportunities and incentive programs and disseminate that information across departments. These individuals function as internal "scanners" and communication hubs for program information. They discover opportunities through the corporate energy program network of plant participants, announcements and communication channels they subscribe to, public databases such as the Database of State Incentives for Renewables and Efficiency (DSIRE), or the utility relationships they maintain on behalf of the organization.

When project ideas emerge, these internal scanners also often serve as the first people others at the firm go to when looking for ways to reduce project costs or identify available incentives. Facility staff or engineers may even rely on these corporate teams to surface applicable programs. As a result, firms with internal scanning capacity, such as those with central energy programs, are generally more aware of available programs and may be more likely to participate in incentive opportunities than those that lack such staff capacity.

Because they already perform the kind of information-sharing that program administrators are looking to activate, these individuals represent a valuable but overlooked outreach channel. Program administrators should tap into these existing networks by asking to be introduced to these connectors in order to share program updates and opportunities through them.

Peer networks

Industrial professionals' peer networks can also be a positive source of encouragement and information for energy efficiency project adoption. Both national research and program experience demonstrated that local and regional peer networks play an outsized role in accelerating program participation. From the program administrator perspective, referrals from trusted peers or sister facilities are among the most effective outreach pathways. Taken together, the social proof of program participation and peer credibility help drive program participation.

> *"I have a regular touchpoint with my peers in the industry who work for our competitors. We are all very open about projects, saying, 'Hey, I've got this project,*

and we took advantage of this funding" – Corporate-level energy and decarbonization manager, cement industry

Formal and informal industry networks also provide a platform for program engagement. Structured cohort-based program models, such as those used in SEM programs, explicitly operationalize peer learning and accountability by convening firms to share performance data, implementation strategies, and lessons learned. However, most customer programs do not systematically leverage this cohort model, despite its demonstrated effectiveness at engaging firms in energy management practices.

Program administrators should look for opportunities to tap these networks. For example, they can encourage word of mouth among companies they work with, suggest those companies share their experience with others in their professional networks, and attend/speak/present at industry conferences and meetings, such as the Association of Energy Engineers' World Congress. Extending peer-based engagement strategies beyond SEM may represent an opportunity to strengthen participation and learning across a broader set of programs.

Typical program outreach

Program implementers typically make consistent efforts to conduct proactive outreach about program opportunities, and once contact is made, this outreach plays an important role in maintaining awareness of available programs and accessibility to information when firms are considering program-compatible projects.

Outreach is labor intensive and relationship driven

Program administrators are well aware of the challenge of maintaining visibility with industrial customers and invest substantial effort in outreach, relying on labor-intensive, relationship-driven approaches to raise awareness of program opportunities.

Outreach itself typically involves a mix of cold calls, repeated emails, and working through industrial networks. Referrals from peers, sister facilities, or other trusted industry partners such as vendors or engineering firms can also facilitate response and engagement, but when these are not available, TPAs rely heavily on repeated contact attempts with busy contacts.

Overall, outreach strategies are characterized by persistent, relationship-based processes built around warm introductions where possible and sustained follow-up when referrals are not effective. While these efforts often succeed in establishing initial contact, they do not always translate into successful or sustained engagement. When outreach is not clearly connected to an immediate or emerging project need, even persistent follow-up, particularly when it relies on generic messaging, may fail to register as meaningful from the firm's perspective.

Outreach often prioritizes senior decision makers

According to interviews, outreach typically begins by identifying a suitable point of contact who is likely to respond and engage with the program administrator. In practice, this is most often a plant engineer or maintenance staff member—someone who is accessible, familiar with day-to-day equipment needs, and well-positioned to surface potential project opportunities. In many cases, they already serve as the firm's primary interface with utilities or program administrators.

Because project approval and internal promotion usually rest with management, program success ultimately depends on securing managerial buy-in. As a result, TPAs perceive engagement at this level as

necessary for program success and actively work to connect with plant managers or corporate leaders, even if such touchpoints occur infrequently. In larger firms, outreach may begin at the corporate level, where sustainability or energy managers can signal organizational support for participation and facilitate introductions to facility staff.

To maintain visibility with those perceived to have the authority to initiate or approve projects, some program administrators prioritize their outreach directly to decision makers with project approval authority. TPAs we interviewed described actively working to sustain relationships with these "key decision makers," such as plant managers or corporate energy leads, based on the belief that these individuals are best positioned to initiate or approve energy projects.

However, focusing on reaching senior staff is labor intensive. Many TPAs reported difficulty reaching higher-level contacts and described the need for repeated follow-ups or "saturating" inboxes to elicit a response.

> *"Sometimes you need to send 5-10 emails to the same person to make it rise to the top with different messaging." – Program manager, third-party program administrator*

While managers and corporate leaders are indeed needed to approve and advance projects, engineers and maintenance staff (aside from dedicated energy or sustainability managers actively seeking new opportunities) are generally better positioned to identify viable projects as equipment needs emerge. When outreach is concentrated on senior decision makers, program information may not reliably reach these early-stage actors in a timely way.

Program information may not be discoverable where and when firms look

Most industrial firms we spoke to did not initially learn about energy efficiency programs through utility or TPA outreach initiatives but rather through internal communication channels (see information on "scanner" staff above). When project needs arise, firms often search internally or through familiar information channels and networks rather than returning to past outreach messages or external contacts such as TPAs. If program information is not embedded in these environments or visible through the channels firms already use, it may not surface at the moments when project planning decisions are taking shape.

Strengthening program visibility and engagement

Outreach effectiveness depends not just on frequency but on relevance and timing. Interviews suggest that most firms engage with energy efficiency programs primarily when a concrete project need arises, making program visibility and timely messaging especially important. Reaching staff involved in proposing and scoping projects is critical, as these actors are the ones who connect programs to projects early in the proposal development process. Maintaining light-touch, ongoing relationships with existing firm contacts allows TPAs to stay visible, even during periods when no projects are active. Prior research indicates that firms may need to hear about programs several years before moving forward with a relevant project (Russell and Young 2012), underscoring the importance of sustained, low-burden engagement that positions programs to be relevant when needs emerge. Program staff can provide significant value by helping firms match incentives to emerging project needs, but this is only possible when relationships are already in place.

At the same time, program visibility should not depend on a single relationship. Even when a strong working relationship exists, relying on a single contact is risky. First, staff turnover at facilities can quickly sever established communication channels, leaving programs disconnected from the facility. Second, even if that contact remains, their role may only cover a portion of the projects a facility pursues. In short, program visibility should not depend on a single contact or email chain, as one relationship, regardless of strength, may not reliably reach the individuals who identify or develop new opportunities. Instead of relying on a single "champion," cultivating multiple touchpoints—especially with scanner staff—helps sustain long-term engagement for program participation.

Program staff can further strengthen awareness with these staff by ensuring their programs appear wherever firms already look for information: internal databases, mailing lists, newsletters, professional magazines, trade journals, and online platforms (such as DSIRE database) where these staff typically look for efficiency or incentive resources to ensure programs are discoverable when a viable project opportunity surfaces.

In some cases, more formalized engagement can further support sustained energy management and program participation. Memoranda of understanding (MOUs), for example, are one way that some program administrators have successfully established ongoing partnerships with large customers. Under these agreements, TPAs commit to providing defined services and incentives, while customers commit to specific goals and periodic check-ins. Eversource and Efficiency Vermont have been prominent early adopters of this approach with some of their largest customers (NEEP 2016). By formalizing ongoing partnerships, these MOUs create a set of behavioral expectations that shift the mental models of engagement: Having a standing commitment increases follow-through; regular check-ins make the progress and impacts more salient; and the act of entering into an agreement establishes a default of continual energy performance improvement. As a result, conversations shift from questioning whether to pursue efficiency opportunities in any given year to determining which opportunities to pursue on an annual basis.

Finally, while senior-level engagement can play an important role in maintaining visibility, signaling legitimacy, and supporting coordination across sites, it is most effective when used strategically. Senior engagement is particularly valuable for portfolio-level coordination, formal agreements such as MOUs, or situations where no internal champion exists. However, most project-level opportunities are identified and developed through technical and operational channels before reaching senior review, and in some cases, approaching senior leadership without involving the corporate energy manager can create internal friction and undermine internal coordination. For these reasons, engagement with high-level decision makers should complement, not substitute for, outreach to early-stage project developers, corporate-level energy managers, and other internal communication staff. Aligning engagement strategies with how opportunities are identified and how information flows within a firm can increase the likelihood that programs are visible, relevant, and actionable when firms are ready to move forward.

Summary: how companies find out about programs

Industrial firms learn about energy efficiency programs through a combination of external outreach, internal communication channels, and peer networks. While utilities, TPAs, vendors, and consultants play an important role in raising awareness, firms often rely on internal "scanner" staff and trusted peer networks to identify relevant programs when project needs arise. Outreach by program administrators is typically labor intensive and relationship driven, but it does not always align with firm timing or internal information pathways. As a result, program information may not be discoverable at the moments when firms are actively scoping projects. These dynamics highlight the importance of program

visibility that is timely, embedded in firms' existing information channels, and aligned with how projects are identified, developed, and approved internally.

How program information enters capital planning

Among our interviewees' organizations, program marketing and outreach rarely serves as the true starting point for energy-related projects. Instead, most CapEx projects originate from standard operational needs (like maintenance, efficiency improvements, or other strategic priorities) and are only later connected to a relevant program opportunity.

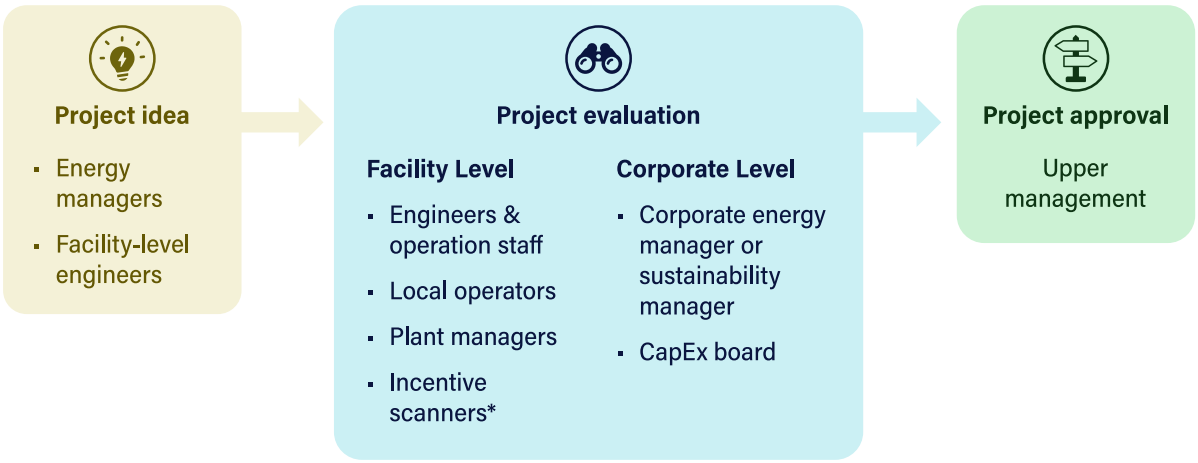

Figure 2. Overview of roles in project development process

For industrial firms to participate in programs, two conditions must be met. First, staff must know the program exists. Second, they must recognize a clear fit between the program and a project opportunity, which is in most cases a project idea that is already in motion or under consideration. In some cases, a project that was in limbo could be pushed into implementation because program incentives finally made it cost effective. Program administrators will therefore be more successful encouraging program participation if they can present relevant programs when a project is actively being considered or as part of a periodic reevaluation of former project proposals.

> *"Sometimes programs can be a way to get projects through that would not otherwise make sense ..." – Strategic director, pulp and paper industry*

The net effect of this information dynamic is that firms generally tend to design projects first and then make use of incentive opportunities if they fit the predetermined project, rather than shaping projects around program offerings. This reactive, decentralized process aligns well with prescriptive rebate programs, which map neatly onto discrete technology upgrades.

"It was absolutely mill-initiated. I initiated it. [The program administrator] never reached out to me [but] if you ask, they say, 'Oh yeah, we have [a program opportunity for you].'" – Strategic director, pulp and paper industry

The importance of internal buy-in

In organizations, informal alignment among key internal actors can be just as important as meeting formal approval criteria to achieve internal buy-in.

One interviewee, a corporate-level energy manager with an engineering background, described how this dynamic plays out in his organization. When a project developer approaches him informally with an energy-related project idea prior to any formal submission, he works together with that individual shaping and refining the proposal to ensure it reflects his expectations and anticipates those of other stakeholders. Proposals that undergo this informal codevelopment advance more successfully through formal review stages. By contrast, proposals submitted without this preliminary engagement are routinely autodeclined at the outset because they are perceived as lacking certain key inputs needed to make a decision.

"When [my manager's manager on the CapEx board] sees a project that doesn't have my name on it, he always asks me if I know about it and approve of it. And if I don't, then they decline it. That's how it goes." – Corporate-level energy manager, food and beverage industry

Summary: how to ensure a program is part of capital planning

To become part of capital planning, programs typically need to enter the decision process after project ideas have already begun to form, rather than serving as the initial trigger for investment. Across interviews, programs were most likely to be incorporated when firms actively inquired about incentives for existing project ideas, learned about opportunities through peer networks, or received information from internal staff who scan for relevant programs. In each case, internal buy-in played a key enabling role: Programs were more likely to be considered when they were surfaced by trusted internal actors and informally vetted as projects were shaped to align with internal priorities and approval criteria.

What drives energy investments

Once an energy efficiency project is under consideration and an appropriate energy efficiency program is identified to assist the company, a firm's decision to move ahead is determined by several factors. Knowing these factors can help energy efficiency program administrators position their offerings.

Financial motivation

In general, energy consumption, per se (i.e., using less energy), is not a great motivator of efficiency investment (Pye and McKane 2000; Iten et al. 2017). The clearest and most well-known motivators of energy efficiency investments are financial. These include reductions in energy costs (including peak demand costs and other energy-related costs like water costs), increases in productivity, and reductions

in maintenance costs (Johnson et al. 2023; Solnørdal and Foss 2018; Pye and McKane 2000; Smith et al. 2022). Emphasizing the financial benefits of participating in energy efficiency programs is critical and is likely a precursor to a firm even considering a program.

However, the financial metrics used to evaluate these projects are often narrowly defined. Prior research has shown that narrow financial calculations used to assess energy efficiency investments overlook other valid measures of value used in general investment evaluations (Cooremans 2012). Viable opportunities may be rejected simply because they do not fit within legacy financial structures. Frequently these assessments also exclude non-energy benefits such as productivity gains, lower operating costs, reduced waste, and improved quality and reliability, which can materially influence payback calculations when non-energy benefits are incorporated (Pye and McKane 2000). Prior research by Cooremans (2012) showed that when non-energy benefits were incorporated into financial calculations, the majority of projects cleared those thresholds, moving many proposals from unacceptable to clearly investable.

This suggests that improving investment evaluation practices may be essential for unlocking energy efficiency potential. Encouraging firms to include non-energy benefits and alternative financial metrics for energy management such as net present value (NPV) or internal rate of return (IRR) could shift more projects from rejection to viability, even without additional subsidization (Pye and McKane 2000). Several frameworks have been developed to support this broader valuation approach. Oak Ridge National Laboratory's (ORNL) JUSTIFI tool provides a structured framework for estimating and monetizing non-energy benefits (NEBs) associated with industrial energy efficiency and decarbonization projects, including impacts on productivity, reliability, maintenance, safety, and waste reduction (ORNL 2025).

Incentives are valued but not always decisive

When available, energy incentive programs can significantly improve project proposal returns and, in some cases, serve as the differentiating factor that makes an otherwise unfavorable but *existing* project idea financially viable. Interviewees noted that certain projects that would not pass internal financial thresholds became feasible once rebates or incentives were applied.

> *"Sometimes programs can be a way to get projects through that would not otherwise make sense if the payback time were too long." – Corporate-level energy manager, food and beverage industry*

However, incentives rarely trigger projects on their own. For programs and their incentives to trigger a project on their own, the offer must be unusually generous or combined with other advantages that amplify the financial impact sufficiently—so good that the company sees the opportunity as a financial "no brainer" without a downside or with offsetting advantages that neutralize the costs (Fouiteh et al. 2024).

Instead, incentives more commonly influence decisions after a legitimate project need has already emerged. This creates a challenge for utilities and regulators that must justify incentive awards based on whether a project would have proceeded in the absence of program support. In many cases, incentives do not initiate projects, but once a project is under consideration, they can play several important roles. Incentives may strengthen the case for moving forward, accelerate project timing, or expand project scope by enabling firms to include additional energy efficiency measures. During formal evaluation,

incentives can also function as a threshold-crossing mechanism, helping projects meet internal financial criteria such as payback requirements.

Yet even with incentives, many projects remain unviable. In some cases, the payback criteria are too stringent; in others, firms may maintain perceptions that unacceptable trade-offs still exist. As one interviewee put it, "This isn't 'free money,' it's just cheap money." This distinction matters: Even when costs are covered by a program, companies may perceive risks or unwanted nonmonetary costs of time, effort, labor, or hassle.

This suggests a need for better incentive design. Program designers should consider stacked incentives that can provide a reward factor high enough to move a project from marginal to viable.

Strategic goals dominate

Despite the importance of financial motivations, strategic goals[10] can supersede them (Alcott and Mullainathan 2010; Pye and McKane 2000). Strategic goals are important drivers of investment decisions (Alkaraan and Northcott 2006; Carr and Tomkins 1996; Maritan 2001; Segelod 1997; Van Cauwenbergh et al. 1996). As Cooremans (2012) notes, "strategic character of investment projects appears as the primary driver of investment choices, while investment profitability appears as a generally necessary but insufficient condition" (p. 509). The more strategic an investment, the less restrictive the financial selection criteria become (Iten et al. 2017). From our interviews, it is clear that these goals translate relatively directly to project categorizations in formal CapEx approval systems, with each category translating to different criteria for project justification.

Energy efficiency, in itself, is not usually a strategic goal (Iten et al. 2017; Killip et al. 2019; Sardianou 2008), rather it is widely considered to fall under cost-saving initiatives. However, industrial firms often have adjacent goals related to non-energy benefits associated with such improvements. For example, reduced carbon emissions, reduced energy price risks, reduced maintenance costs, reduced waste, increased product quality, increased product throughput, increased competitive advantage, increased productivity, increased worker comfort, improved reputation, and achievement of environmental, social, and governance (ESG) goals (Accordini et al. 2021; Arnold-Keifer et al. 2025; Killip et al. 2019; Smith et al. 2022; Rohde and Cooremans 2019). Assuming the firm has one or more of these additional goals, an energy efficiency investment could be presented as a method of achieving them through lowering costs and improving payback for those strategic projects.

Project categorization impacts likelihood of approval

Conversations with interviewees reveal that the internal justification category assigned to a project reflects its strategic value and heavily influences its chances of approval. Projects justified as means of achieving improved safety, quality, productivity, or corporate sustainability goals often face lower financial approval thresholds than cost-saving projects.

> *"I would say safety projects are a thing on its own. [Quality projects too]. They don't necessarily need any payback if it's related to severe quality concerns or safety concerns. You can get all sorts of projects [approved] if it's really needed: there is no*

[10] According to Cooremans' (2011) definition, a strategic investment is one that creates, maintains, or strengthens a sustainable competitive advantage for the firm.

clear [set of] criteria for them, but for [cost] savings projects we have a payback limit." – Corporate-level energy manager, food and beverage industry

In some firms, sustainability can be more of a decisive justification for moving energy-related projects forward. Carbon reduction goals, in particular, tend to be important drivers of energy investment. Projects tied directly to these global or corporate climate commitments were treated as strategic priorities rather than discretionary spending on cost-saving initiatives.

"[We hear], "Hey, we have this corporate carbon goal. I have no idea how we're going to meet it, but we need to do the things that contribute to it ..." – Consultant, third-party program administrator

Thus, profiling a company's strategic goals and project categories and aligning capital investment energy efficiency programs with them will go a long way toward acceptance.

Mitigating risk of energy scarcity

As electrification increases overall electricity demand (WEF 2025), some regions are already experiencing tighter grid capacity and a higher risk of operational disruptions (DOE 2025). Although interviewees did not explicitly raise concerns about energy, growing uncertainty about future energy availability across the supply chain could heighten firms' anticipatory risk perceptions as they reassess their exposure to future energy reliability risks (Nadel 2025; DOE 2025). This emerging dynamic could elevate the strategic relevance of efficiency and promote a mental reframing of energy efficiency as a risk-mitigation tool, not just a cost-saving mechanism, particularly in regions where rising load and constrained capacity make reliability concerns increasingly salient. Preliminary evidence suggests that perceptions of energy scarcity may influence how firms evaluate and prioritize such investments (Lachner et al. 2025), but additional research is needed to better understand how these perceptions shape industrial investment decision-making.

Technology demonstrations

Some utilities provide test environments or live demonstrations as opportunities to show new technologies in action. Evidence suggests that when firms can observe equipment operation in conditions similar to their own facilities, uncertainty decreases, abstract value becomes more concrete, and firms can visualize how the technology might integrate into their own operations (Nadel et al. 2021). In practice, this helps shift the dominant mental frame from focusing on barriers ("this is risky") to evaluating potential ("this could work for us").

Additional factors

In addition to the factors discussed above, several other factors could be worth consideration when trying to encourage organizational engagement with energy efficiency programs. Participation in ISO 50001 or similar energy management standards may help build internal structures and practices that support readiness for external efficiency initiatives (See Appendix A for additional information). Commitment processes that unfold in staged or incremental steps may facilitate adoption by reducing upfront uncertainty and giving organizations time to assess program demands and benefits, while small

early commitments can also increase willingness to opt in fully. Likewise, presenting efficiency benefits in terms of avoided losses rather than prospective gains may activate loss aversion and strengthen cost-effectiveness arguments.

Summary: how to position industrial energy efficiency programs

To sum up, industrial energy efficiency programs should be positioned as methods to achieve financial and nonfinancial strategic goals. Program administrators should gather data on the firm's strategic priorities and project categories prior to making an approach. If a firm has a sustainability or carbon-related goal, this can be particularly useful for promoting energy-related capital investments. Educating customers can also increase the chances of investment. Program implementers can offer industrial customers low- or no-cost services such as site visits or technology demonstrations to assess fit, reduce uncertainty, and better understand program requirements and benefits.

What inhibits program participation

In addition to the factors that can make energy efficiency programs more appealing, a few negative factors can get in the way of participation. Removing or mitigating these barriers will help industrial firms move ahead. Barriers can generally be classified into three main categories: economic, behavioral, and organizational (Rohdin et al. 2007; Sorrell et al. 2000; Killip et al. 2019). Economic refers to financial constraints, behavioral refers to processes and perceptions, and organizational refers to the people within the organization and the complexity of the approval process. These were all reflected in our interviews.

Skepticism about program impact and sufficiency

A persistent barrier to program participation is the mental model many firms have around energy efficiency and its value toward achieving industrial strategic goals—a model shaped by a clear scale bias. Some firms view upgrades through a lens that privileges large, transformative process changes and downplays smaller, incremental ones. As a result, the component-level swaps typically offered through utility programs can be categorically perceived as too minor or superficial to matter. In sectors like cement, meaningful improvements mean deep process optimization and decarbonization, not incremental measures such as lighting or motor upgrades. As one interviewee put it, even a 25% reduction in electricity use would be dwarfed by the demands of future carbon capture systems. Because large future obligations dominate their mental framing, the smaller gains from efficiency may be perceived as irrelevant by comparison.

This suggests that for some firms operating with this mental model, energy efficiency is interpreted primarily as a marginal cost-control tool rather than a lever that can materially impact the plant's long-term trajectory or strategic commitments.

Economic and capital constraints

As noted earlier, financial motivators are a major driver of energy efficiency investments. Conversely, strict financial thresholds can act as significant barriers. Most industrial firms require short payback periods or high returns on investment before approving projects. Low or volatile energy prices weaken the cost savings argument, as projected cost savings may not meet those internal benchmarks, causing even projects that would yield long-term returns in other ways to stall out.

Limited access to capital

Limited access to capital can also be a recurring barrier. Capital scarcity, whether internal due to competition with other priorities or external due to limited financing options, makes even cost-effective projects hard to advance. To the degree possible, decreasing upfront capital requirements can smooth the road to implementation. Firms may prefer to use internal capital to avoid interest or loss of equity, but in cases where internal capital is constrained for large projects, low-interest financing could be one solution, particularly when interest payments are tax deductible.

> *"The [internal] competition for capital is brutal; everybody wants money to fund projects. Capital is very expensive." – Strategic director, pulp and paper industry*

Government policy at all levels shapes the financial landscape in which firms make investment decisions. Conversations with TPAs and industrial professionals suggest that in a policy environment that deprioritizes emissions reduction and clean energy goals, momentum for energy investments has slowed. As one TPA noted, federal changes have fostered "uncertainty in business overall, making it harder to move forward with anything" as projects stall due to that uncertainty. We have heard reports that TPAs and industrial customers are seeing the impacts of tariffs on CapEx energy programs through raised equipment costs or constrained budgets.

> *"In terms of investments in general, it's [currently] a lot harder to get things approved. There is a [much] higher bar and threshold for that across the board for any project." – Corporate-level energy manager, food and beverage industry*

This creates an opening for utilities or third-party program administrators to position energy efficiency programs as tools for boosting competitiveness, particularly for industrial firms facing international competition.

Accounting practices

Under Financial Accounting Standards Board (FASB) requirements, incentive payments from utilities are not accounted for as simple cash rebates, but as income, cost offsets, or bill credits that trigger specific internal accounting treatments. Costs are not always allocated directly to the project or facility that incurred the investment cost. When this occurs, incentives that appear straightforward and beneficial at the project level may later be blocked during financial review due to accounting treatment of incentives or third-party financing structures and rejected on administrative or compliance grounds rather than technical or economic ones (Russell and Young 2012).

Additionally, these constraints are not always apparent during project development. Project engineers and technical staff typically focus on technical feasibility and operational performance and are not familiar with financial accounting standards, or how incentive payments are treated within internal accounting systems, nor are they generally in contact with financial staff during project development. As a result, accounting-related barriers may only surface late in the approval process, after projects have already been scoped and advanced.

Program design should take into consideration financial accounting and its impact on decision-making. Where possible, program administrators should engage or consult finance staff alongside corporate energy managers when supporting project justification.

Risk perceptions

When decision makers within industrial firms evaluate energy investment and program opportunities, they consider not only financial metrics but also the potential risks those opportunities might introduce. Although energy efficiency projects are typically lower risk than many new process improvements and often deliver reliable returns over time, even modest uncertainty about timing, funding, or process can make a program appear riskier than proceeding independently.

Uncertainty about program reliability

Several interviewees expressed a growing skepticism toward federal and state government grants and subsidies, especially in the case of large CapEx projects focused on major equipment or process changes, informed by both direct experiences as well as industry anecdotes about canceled government grant programs due to shifting industrial policy priorities. These responses reflect perceived risks associated with funding and with incentives like tax credits, which may be subject to change in such environments.

Because these risks raise uncertainty about whether incentives will ultimately materialize, firms may discount their value in financial analyses (Greene 2011). As a result, firms are reluctant to anchor investment decisions around incentives they perceive as uncertain or fragile to policy changes. This trend is likely to deepen firms' preference for developing "shovel-ready" projects independently and only seeking funding as a secondary step, further limiting the influence of CapEx energy programs on which investments move forward in the first place. Federal and state program administrators can mitigate these perceptions by demonstrating program durability and predictability.

Though utility incentives are generally more reliable, some firms may still worry that shifting policy environments could affect their longevity or funding levels. By designing and messaging programs as financially self-sustaining, utilities can further signal resilience and instill confidence to improve participation.

Timing

Industrial projects must align with both operational schedules and capital budgets, making timing a critical factor in whether firms can participate in CapEx energy programs or make energy-related capital investments. As one participant put it, "Sometimes the best return will be a big project, but sometimes you'll do the smaller one just because it fits better in the [annual] budget." Although capital budgets are discussed on an annual basis, firms frequently plan investments within multiyear budgeting cycles shaped by market conditions (e.g., supply chain constraints, demand fluctuations) and broader corporate macro strategies (e.g., production expansion or contraction plans, corporate decarbonization targets).

From a program design perspective, government solicitation timelines are often misaligned with these industrial planning realities. Public programs typically release solicitations only after annual funding is appropriated and must obligate funds within a limited timeframe to demonstrate spending to the appropriators. As a result, solicitations may allow only short response periods that, given their internal approval, engineering, and scheduling requirements, are difficult for industrial firms to meet.

In the cement sector, for example, major equipment upgrades can only occur during narrow (e.g., three-week) maintenance windows when production is paused. Because these shutdowns are planned far in advance and tightly scheduled, there is little flexibility to accommodate delays, as once the window has passed, many capital improvement projects cannot proceed until the following year. This creates a strong incentive to avoid any process that introduces timing uncertainty.

Programs with short or unpredictable funding windows—or those with lengthy administrative requirements—can therefore pose real risks to production schedules. As one interviewee explained, the added administrative steps and slow approvals of certain incentive programs in their state have led their company to forgo participation altogether and opt out of the energy efficiency rider program, despite having had interest in similar program offerings in other states.

> *"[These pieces of equipment] have long lead times and we need them installed during certain times of the year… a lot of those programs, as I've seen them… There's a lot of back and forth that takes too long." – Corporate-level energy and decarbonization manager, cement industry*

Industrial CapEx energy efficiency programs should offer long, predictable funding windows and consistent availability to allow industrial firms to plan and align participation with their budgeting and maintenance schedules. Organizations conducting program outreach should time their efforts to align with firms' fiscal and capital planning cycles to ensure information reaches decision makers in a timely way, to incorporate those programs into budgets and project selection.

Lack of expertise

Industrial firms report that external consultants often lack sufficient understanding of their specialized technologies and production systems (Taghavi 2021). Our interviewees from the cement and pulp and paper sectors substantiate this view, explaining that program value is improved when program staff or other advisors already deeply understand their firms' industrial processes. Some participants noted frustration when consultants from outside their industry attempted to provide guidance. When program staff or third-party consultants come from outside the sector, they are generally less familiar with the realities of industrial operations, and their recommendations can seem overly generic, not useful, or even misguided. Lengthy back-and-forth conversations with external engineer evaluators and program administrators can exacerbate concerns about risks to internal timelines. This lack (or perceived lack) of industry-specific expertise erodes trust and reduces firms' willingness to participate in programs.

> *"[The program hires] consultants who serve as advisors, but the conversation is very difficult. […] In my experience, energy management in a large industry doesn't come down to replacing lights and motors — It's really knowing and optimizing your process. […] If I went to a chemical plant, I would be lost trying to find a parallel to what I know. That's what I think I see with some of these programs, [the advisors lack the industry knowledge needed to understand the process]" – Corporate-level energy and decarbonization manager, cement industry*

While a lack of industry-specific expertise can hinder program effectiveness, this gap also presents an opportunity for utilities to play a more proactive role. Several utilities have begun to do this by developing sector-specific technical capacity, either through dedicated in-house engineering teams or by hiring external experts on a targeted basis. When program personnel or third-party experts do possess the right industry expertise, they can play an important legitimizing role, helping leadership understand and trust the energy efficiency and decarbonization work that in-house engineers and professionals are driving.

Lack of labor resources

Another major internal barrier is the lack of dedicated staff time and labor resources for energy management. The time and expertise required to identify opportunities, prepare technical materials, and navigate program processes can easily exceed what firms are prepared to allocate.

> *"We are involved in ISO 50001 and ENERGY STAR. […] To add anything else, it would have to fill a void that we haven't recognized yet. Most of these programs are time-consuming. […] We try to be very selective about what we participate in [and how we allocate staff]." – Corporate-level energy and decarbonization manager, cement industry*

TPAs we spoke with recognize this challenge and acknowledge the difficulties firms face in securing labor resources for program application and participation. One effective way to address this barrier is to provide financial support that offsets the labor costs associated with participation, such as funding for dedicated energy management capacity or external technical assistance. A range of proven approaches exists to address workforce constraints. Over the past four decades, these strategies have been successfully deployed across energy efficiency and demand-side management programs. Examples include contracting with outside technical service providers, supporting on-staff energy managers, providing support for an external energy contractor to serve as energy management services, and offering performance-based assurances or guarantees to reduce implementation risk. For example, DTE has provided large customers with dedicated budgets for efficiency projects, which can increase flexibility in how firms resource staff for participation (Srinivasan et al. 2023). Additionally, Wisconsin's Focus on Energy program illustrates a centralized, long-running delivery model in which external technical assistance and implementation support reduce the need for firms to dedicate internal staff time to energy project development and participation (Giffin et al. 2009). By offsetting these internal burdens, programs can make it easier for firms to engage without monopolizing limited staff capacity.

Administrative burden

Applying for many government or large-scale incentive programs requires extensive paperwork, upfront engineering work, and ongoing reporting. These obligations can contribute to perceptions that program participation is resource intensive and costly. One interviewee described the process of securing an external engineer evaluator as redundant and expensive, adding administrative friction before they determine eligibility for the program.

"The biggest obstacle is that many programs require a lot of information that you cannot develop until you spend engineering money. […] It depends on what it is, but we find that sometimes either the state or federal authorities require such massive paperwork that it's almost not worth trying." – Strategic director, pulp and paper industry

Due to these constraints, firms tend to be highly selective about which opportunities they pursue. Companies often need to invest significant engineering effort in developing detailed project plans and technical estimates before they even know whether funding will be approved. This dynamic of upfront investment for uncertain returns on investment can discourage participation in programs.

The combination of upfront engineering costs and long administrative processes can make programs feel burdensome or, as discussed above, risky given any resulting timeline pressures. When the decision to participate means staff must divert time from core operations to complete paperwork, the perceived value of participation declines sharply. If utilities and TPAs provide cost-benefit analyses early or adopt multistage application processes that allow project concepts to be reviewed before asking firms to commit significant internal resources, they can reduce firms' cognitive burden, make participation easier to evaluate, and alleviate concerns about jeopardizing project timelines or operational focus. More broadly, government agencies should coordinate to develop more integrated programs and incentives. Better alignment of application timelines, eligibility rules, and reporting requirements across related programs can further reduce administrative burden and increase the likelihood that firms seriously consider external financial assistance.

Summary: what inhibits program participation

In summary, economic, behavioral, and organizational barriers limit participation in industrial CapEx energy efficiency programs. Program administrators should design programs that reduce real and perceived financial risk, reflect how firms make decisions, and expand firms' capacity to act on program opportunities. Programs can minimize financial barriers by offering attractive financing options and stable incentives that are resilient in the face of changing policies. Behavioral barriers emerge in contexts of uncertainty and when firms lack trust in program guidance. To address behavioral barriers, programs should provide advisors with deep knowledge of firms' industrial processes and organizational structures, as a perceived lack of industry expertise undermines trust and firms' willingness to participate. Programs can also address organizational barriers by directly funding the energy management labor, whether within the firm or through an external consultant, to help firms prioritize investments and complete the extensive paperwork and reporting required by programs. Importantly, planning around budget cycles and firms' calendars can facilitate program participation. Offering long, predictable funding windows and consistent availability encourages program participation.

Other insights

Changes in focus in the current policy environment

Where recent years saw a strong wave of carbon reduction commitments, according to our interviewees, much of the current conversation appears to have turned away from talk of

decarbonization and instead turned toward cost pressures and energy reliability. Because our sample is small, we cannot draw conclusions about current trends, but one third-party program administrator described what they see as a cooling of the decarbonization momentum across their portfolio: "The bandwagon is still moving, but some people may have stepped off."

But what some see as a shift away from a focus on decarbonization does not appear to be occurring across all industrial firms or sectors (Jones 2025). In fact, U.S. firms are showing steady progress in emissions reduction. Companies with international ownership or operations, in particular, continue to keep decarbonization high on their agenda given international policy requirements and customer expectations.

> *"There are still many companies—especially foreign-owned ones—with strong, [consistent] goals in [carbon reduction]." – Program manager, third-party program administrator*

Many international firms continue to view decarbonization as a long-term inevitability because they remain subject to global market demands and policy requirements. They recognize these pressures are unlikely to fade simply because the U.S. discourse has cooled on climate. To maintain their competitive position and avoid being caught unprepared in the years ahead, they therefore continue to invest in decarbonization and energy efficiency. Although open talk of decarbonization or emissions may have diminished, firms are continuing their decarbonization and energy efficiency efforts under reframed language, commonly around cost savings, operational efficiency, or building competitiveness, all of which energy savings directly support.

Decarbonization can be a useful benefit to highlight for some firms, but program administrators should be ready to frame programs in terms of non-decarbonization benefits as well. For some firms, benefits such as improved product quality, increased productivity, and increased competitiveness could be more important. This underscores the need for program administrators to profile firms in nuanced ways—to understand their specific drivers, market pressures, priorities, and processes—rather than relying on a one-size-fits-all cost-focused approach.

Recommendations

Below, we summarize recommendations for outreach, engagement, program design, and policy, based on our review of the literature and our interviews with key stakeholders.

Recommendations for outreach and engagement

Awareness of program opportunities is a necessary but insufficient condition for program participation. Programs must be discoverable and salient during the windows in which firms are actively considering a relevant project, since participation most commonly follows internally developed project ideas, rather than being initiated by the availability of an incentive. This reflects the importance of outreach timing, alignment with firms' information channels, and fit with internal decision processes.

- *Leverage existing relationships and operational touchpoints while engaging beyond a single point of contact*. Utility key account managers, program staff, and other trusted intermediaries can reduce friction by building on established relationships, particularly when firms are already

considering a project. However, relying on a single contact limits visibility into how projects originate and move toward approval and creates vulnerability to staff turnover or role changes. Maintaining light-touch awareness through existing relationships and channels, particularly with local operations and engineering staff, using peer networks, industry events, and routine utility communications can further sustain visibility until a relevant project need arises.

- *Engage across project development roles, not only formal decision makers*. Project ideas typically emerge and take shape among operational, engineering, and maintenance staff before reaching formal approvers. Focusing outreach exclusively on senior or designated decision makers risks missing the stage at which projects are scoped, bundled, and justified. Programs that engage earlier-stage project actors gain visibility into emerging needs and improve the likelihood that program support is integrated into projects before key design and budget decisions are set.
- *Position programs as a responsive resource rather than a stand-alone offering*. Program engagement is more likely to occur once a project is already under consideration, making perceived responsiveness more relevant than advanced promotion of specific offerings. Thus, program administrators should emphasize their availability as a resource in messaging for when a project need emerges instead of promoting individual incentives in isolation.
- *Prompt firms to identify deferred or "stand-by" projects and evaluate whether program incentives or support could help those projects move forward*. Program administrators should discuss firms' backlog of previously deferred projects, if they have such a list, and assess whether incentives or technical support could help those projects clear financial constraints and move into implementation during re-evaluation cycles.
- *Profile firms' planning, budgeting, and production cycles and align outreach and follow-up pathways with that timing*. This can help support engagement when projects are actively under consideration. Internal decision processes and capital planning cycles are constrained to when firms can act, limiting the effectiveness of outreach that is not synchronized with these windows.
- *Target outreach to internal staff who actively scan for funding and incentive opportunities, a critical but largely overlooked opportunity*. These individuals are known within the firms as resources and are typically the first point of contact for project developers seeking ways to reduce costs on projects they already plan to pursue. Getting program information into these internal information channels can help ensure that relevant program resources are available at the precise time they are needed for consideration.
- *Frame program benefits in terms of firms' strategic objectives*. When a program is under consideration, program implementers should make efforts to align the benefits with the strategic goals of the firm. Companies with sustainability goals, for example, will soften their financial restrictions on investment projects that are well-justified as helping achieve those goals.

Recommendations for program design

Program administrators can strengthen firms' motivation and ability to invest in energy efficiency by designing programs in ways that expand organizational capability, reduce administrative burdens, and increase access to relevant technical knowledge. Programs that lower cognitive, staffing, and capital barriers are more likely to support successful program participation and project implementation.

- *Reduce administrative burdens*. Industrial energy efficiency programs generally involve large funding amounts, which necessitates robust application, reporting, and verification requirements but strain firms' capability to engage. Where possible, simplifying the applications and reporting requirements can lower cognitive and administrative barriers to participation. When complexity cannot be reduced, programs can offset internal resource constraints by providing targeted staffing support or direct technical assistance. Programs can also conduct "sludge" audits that can help identify and remove unnecessary administrative friction without eliminating essential oversight or accountability requirements.
- *Offer a two-stage program application process*. In stage one of a multiyear selection process, firms submit brief concept proposals that undergo a stage-gate review. Concepts that are prequalified for funding are then invited to submit full proposals once projects are sufficiently developed for internal review. Although relatively uncommon to date, this approach can reduce firms' administrative burden by allowing them to defer full application development until project timing and internal alignment are clearer, minimizing upfront effort on projects that are unlikely to advance.
- *Lower capital barriers through financing offerings*. Reducing upfront capital requirements through financing mechanisms (e.g., grants, investment subsidies, tax credits, or on-bill financing) could enhance both project feasibility and perceived value, thereby strengthening firms' motivation and opportunity to pursue energy investments.[11]
- *Expand access to practical energy efficiency knowledge*. Providing low- or no-cost education through on-call technical experts, facilitated peer learning, discounted energy audits, or (if available) test beds for new energy-efficient equipment under real-world plant conditions can increase knowledge, reduce cognitive biases and related resistance, and make investment more likely.
- *Ensure sector-specific credibility of program advisors*. When program advisors engage directly with firms during onsite visits, they should demonstrate understanding of the firm's operations and industry context. Without this credibility, firms may need to devote additional time and resources to educating their advisors, reducing the likelihood that advisors' recommendations are taken seriously and acted upon.

Recommendations for policy

U.S. industrial firms are operating in multiple policy environments: international, federal, regional, and state.

- *China and the European Union are major trading partners with significant energy- and carbon-related policies*. U.S. policymakers and firms should consistently scan for recent developments in trade policy by these partners to look for ways to support energy-related projects in their facilities.
- *The federal policy environment has moved from decarbonization to a focus on competitiveness, investment, and improved energy infrastructure*. Specifically, all capital projects can take advantage of favorable tax treatments in the One Big Beautiful Bill Act of 2025, such as the permanent 100% bonus depreciation for short-lived investments, the immediate expensing of

[11] One innovative approach from RI Energy—currently used for OpEx projects but may also be used for CapEx projects—is on-bill financing, in which companies pay back their loans through the savings from the project.

research and development costs, and a new 100% deduction for structures associated with tangible production (through 2031) (Hulehan 2025). Scanners and decision makers in firms should understand this new benefit for energy-related projects.

- *The federal government continues to operate Industrial Training and Assessment Centers (5s) that provide valuable resources for firms looking to improve and/or validate energy savings projects*. Project leads can take advantage of this free resource to reduce some upfront engineering costs. Although states may not be able to match the federal government's ability to accelerate larger-scale capital-intensive measures, state policy has unique potential to foster advancements in energy efficiency in other critical arenas, including energy management, decarbonization targets, and workforce development (EnergyWerx 2025; Kresowik et al. 2025). At a time of uncertain federal policy, states have the ability to create certainty for project investment, by setting durable and dependable policies on energy efficiency and decarbonization.

Conclusion

Industrial energy efficiency programs designed to spur capital investment help firms realize environmental and financial goals as well as a host of non-energy-related strategic goals. Understanding how efficiency investment decisions are made can strengthen program design, improve program promotion, and increase the energy savings and carbon emission reductions that these programs are designed to achieve.

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Appendix A – characteristics of industrial firms

Characteristics can influence decision-making and messaging

In terms of organizational barriers, several characteristics of industrial firms can make energy efficiency investments and program participation less likely or more likely. These have to do with the size and hierarchical roles within the firms, as well as their structures, cultures, and whether they have adopted energy efficiency standards. External market pressures can also influence these internal practices.

Leveraging strengths of bigger and smaller firms

Larger industrial firms (in terms of number of employees, revenue, or market share) can leverage certain inherent advantages to invest in and adopt energy efficiency measures (Hrovatin and Dolšak 2016; Kostka et al. 2013; Solnørdal and Foss 2018).

This could be because larger firms, given their scale, consume more energy and thus have more to gain from efficiency improvements (Cooremans and Schönenberger 2019). They also tend to have greater financial and organizational resources, which they can devote to learning about energy-efficient technologies (Groot et al. 2001; Solnørdal and Foss 2018), investing in equipment and process upgrades (Trianni et al. 2013; Solnørdal and Foss 2018), addressing energy costs strategically (Solnørdal and Foss 2018; Trianni et al. 2013), and meeting regulatory or reputational expectations related to environmental performance (Cagno et al. 2016; Cagno et al. 2022; Solnørdal and Foss 2018).

Smaller firms, however, may face a relatively heavier burden when energy costs rise and can therefore be strongly motivated to improve efficiency. Although their resources are more limited, they benefit from generally having less strict formal investment criteria, fewer implementation challenges (Trianni et al. 2013), and closer trusted relationships with their external information sources. These relationships can facilitate tailored solutions for their needs and limited budgets focused on adequate and/or available technology options, which in turn may speed up the decision-making process (Solnørdal and Foss 2018).

As a result, policy and program design may need to differ by firm size—for larger firms, program implementers may want to prepare more detailed and strategic information about efficiency investments (and spend more time discussing them), whereas with smaller firms, the priority is likely reducing financial barriers and minimizing labor hours required for application and reporting.

Relatedly, the hierarchy within firms and the level of empowerment of local plant managers and building operators can affect a firm's decision to invest in energy efficiency. In a series of interviews with industry representatives, Taghavi (2021) identified three types of hierarchical approaches for energy efficiency goal setting and action: top-down, hybrid top-down/bottom-up, and disconnected top-down/bottom-up. When goals are set strictly from top management (top-down), the firm has large long-term efficiency goals, but no tactical short-term goals. When goals are cooperatively set both by top management and local plant managers/building operators (hybrid top-down/bottom-up), they end up being a mix of predefined longer-term goals, complemented by short-term tactical goals. When goals are set by top management, but also independently set by local plant managers/building operators (disconnected top-down/bottom-up), this typically results in lofty high-level long-term goals (perceived as unrealistic or not well thought out by local staff) as well as practical (but often unrelated) short-term strategic projects.

Taghavi (2021) also showed that the more responsibility for energy and energy decision-making is located within local plant operators, the more likely firms were to make energy efficiency investments. This is because, when energy efficiency is made a part of traditional operational performance objectives

at the local level, investments in efficiency are considered alongside other investments to improve operations and cost savings, which matter especially at the plant level.

Company standards can help or hurt

Some firms have committed to certain energy efficiency standards or practices that could change the likelihood of related investments. Previous research has particularly focused on commitment to the ISO 50001 standard.

The International Organization for Standardization created ISO 50001 as a global, voluntary standard that provides a framework for organizations to establish, implement, and maintain an energy management system. Firms that have adopted this standard reduce their energy consumption by 4.1% in the first year and about 3.4% each year thereafter for 12 years (Fitzgerald et al. 2023). A key requirement of the standard is that organizations follow a plan-do-check-act approach that requires monitoring and communicating energy use information. Most importantly, included within the standard's criteria is commitment by "Top Management" to support the organization's energy efficiency program with their personal support, providing budget and staff time, and regular management reviews. Facilities making a public commitment to this standard are therefore more likely to be interested in energy efficiency investments (Taghavi 2021). This group does not need to be "sold" on a program but rather needs practical information about meeting program requirements, budgets and timelines.

Internal culture and external competition

Internal energy-use culture within an organization, as well as perceived competitiveness of the marketplace can also influence energy efficiency investments. In interviews, Taghavi (2021) found that the bottom-up energy efficiency work at several industrial firms was driven by young employees with a passion for environmental sustainability and energy efficiency. These employees functioned as champions for energy efficiency program participation at the plant level.

Externally, a competitive marketplace and a desire to increase a firm's competitiveness can influence efficiency investments. This works for both companies that have a competitive advantage and those that want to gain one. Firms with a competitive advantage and high bargaining power have the market influence and financial resources necessary to take pro-environmental actions (Ulubeyli 2013). Firms lacking competitiveness sometimes look to energy efficiency as a path for their survival (Cooremans 2012; Burcher and Lee 2000; Chen 1995; De Bodt and Bouquin 2001; Martins et al. 2022; Putterill et al. 1996). This is especially true for trade-exposed firms facing stiff international competition and substantial energy costs (Groot et al. 2001; Hrovatin and Dolšak 2016; Kostka et al. 2013; Solnørdal and Foss 2018). Thus, positioning CapEx energy efficiency programs as a way to gain a competitive edge, whether domestically or internationally, may be an effective outreach strategy in competitive industries, even when a firm is not currently a market leader.