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Overcoming internal barriers to industrial energy efficiency

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01 Foreword

By Mike Umiker, Executive Director, Energy Efficiency Movement (EEM)

“The cheapest energy is the energy you don’t use” is a familiar truism. But although it is not new, it doesn’t lose its validity by repeating it. The question is, how “not using energy” – or using less, at least – can be achieved and utilized as a steppingstone for cost savings and business development. Energy efficiency is the key to using less energy. Its basic principle sounds easy: achieving more with less. Getting more out while putting in less should make good business sense, as it inevitably leads to measurable results. This is especially relevant in the turbulent economic environment that we are currently experiencing. Cost reduction should always be a key selling point for corporations. And if it comes at an environmental benefit, so much the better. There is nothing wrong with doing the right thing. So, while the reasons and the rationale are known, why are things not moving the needle towards doubling energy efficiency progress by 2030? What are the barriers that need to be overcome?

“Recognizing and overcoming obstacles to energy efficiency will release substantial untapped opportunities to drive industrial competitiveness"

Mike Umiker, Executive Director, Energy Efficiency Movement (EEM)

We do understand that the logic of energy efficiency may not apply to everyone, everywhere and any time. There are different motivators that play out their advantages in various ways that do not always pertain to all sectors and regions. This may mean that the principle of achieving more output with less input can have a delayed or smaller impact even though the principle as such remains true. These motivators can be

- the cost of energy: the higher the cost, the greater the savings from efficiency measures;
- regulation: obviously, if energy efficiency is demanded by law, it should not be neglected;
- political or financial incentives: when there is an attractive stimulus, it will not fail to have an effect;
- public approval: if the social environment or the customer landscape appreciates efficiency measures, it may lead to improved reputation and enhanced business;
- be a driver of change: being a company that attracts talents because it responds to a global challenge.

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That said, the opposite can also hold true, and here we are in the middle of our topic. When you operate in a region shaped by affluence, a measure of environmental consciousness, trust in science, high energy prices and an advanced regulatory framework, one may assume that the logic is much stronger than in regions where these conditions are less established. The financial aspect is true for every region, though: whichever efficiency measure is implemented, the investment comes first, and the benefit will follow, maybe with a delay. But that investment requires a thorough analysis of the factors that lead to energy consumption so that the path for reduction becomes clear.

"Energy efficiency is not an optional upgrade — it's a critical one. In the face of rising energy demand, intensifying climate urgency, and tightening regulation, optimizing the way we use energy is the fastest, cleanest, and most cost-effective solution available. Companies can immediately lower energy demand, enhance energy security and affordability, and drive industrial competitiveness."

Erich Labuda, Member of the Executive Committee Energy Efficiency Movement, President, Motion Services Division, ABB

Equally important are matters of competitiveness. Where high energy prices endanger the competitiveness of whole economies and regions because energy is increasingly perceived as unaffordable, it may be better to invest in energy efficiency than moving industrial sites to other continents, which would only lead to more energy consumption.

Enhancing efficiency in energy use is an essential strategy for sustainable development. Unlike alternative energy sources that require investment in new infrastructure, energy efficiency relies on optimizing existing systems and partially changing equipment in favor of electrification, making it a pragmatic and immediate solution to energy and environmental challenges. It plays a pivotal role in mitigating climate change, enhancing the security of energy supply and reducing economic burdens associated with excessive energy consumption. At the 2023 UN Climate Change Conference (COP28) – the first COP to call for a transition away from fossil fuels –the Global Pledge on Energy Efficiency and Renewables was endorsed by 132 countries that account for more than 40% of carbon dioxide emissions, 37% of energy demand and 56% of gross domestic product globally. They agreed to double the annual rate of energy efficiency improvements every year to 2030 and to triple global renewable power capacity by the end of this decade. Without action on energy efficiency the climate-related benefits of this pledge cannot be achieved.

Yet, the widespread energy-efficient solutions across industries, households and public sectors remain underutilized. This paradox, often referred to as the "energy efficiency gap," reveals a complex web of barriers – economic, financial, institutional, behavioral, technological, knowledge – that impede the realization of the full potential of energy efficiency. Following our previous groundbreaking insights and surveys, this study seeks to unravel the intricate nature of these barriers, providing a comprehensive analysis of why energy efficiency remains an underexploited resource and – as the International Energy Agency clarifies[1] – an important lever to reach Net Zero by 2050. Starting from this analysis, we aim to identify ways to overcome these obstacles and barriers. We will focus less on challenges and more on solutions.

[1] International Energy Agency, *Energy Efficiency 2024* (Paris, 2024) pp. 28–29.

"Cutting energy consumption is one of the few measures that improves both the bottom line and the carbon footprint. That's why energy efficiency is not just good practice — it's smart business."

Thomas Møller, Member of the Executive Committee Energy Efficiency Movement, President, Energy Division, Executive Vice President, Alfa Laval

Financial constraints remain one of the most frequently cited barriers. Even when energy-efficient technologies promise long-term cost savings, the initial investment costs can deter businesses, particularly in contexts where access to financing is limited. Many energy users lack the capital or credit necessary to make efficiency upgrades, while financial institutions may be reluctant to offer loans due to perceived risks.

Regulatory and institutional barriers also play a significant role. Energy efficiency policies often suffer from inconsistencies, weak enforcement or conflicting incentives that fail to support widespread adoption. Continued subsidies for conventional, non-green energy sources undermine efficiency efforts by keeping prices artificially low, which reduces the motivation to conserve energy.

Behavioral and informational factors are significant additional barriers. Behavioral inertia and cognitive biases further reduce the willingness to invest in efficiency measures. Technological barriers also contribute to the challenge. While numerous efficiency-enhancing technologies exist, issues such as compatibility with existing systems, lack of technical expertise and concerns about reliability hinder their adoption. A degree of risk aversion may lead to indecisive action. Additionally, supply chain constraints and limited availability of skilled labor can further delay the implementation of energy-efficient solutions.

"Companies may currently be hesitant to adopt energy efficiency measures due to concerns about added complexity in their infrastructure. There are worries about the reliability and maintenance of systems that involve digital technologies. The perceived effort and expertise required to maintain these systems can present a significant barrier. The implementation of new strategies, partnerships, and the continuous training of the workforce are essential to solving these problems."

Prof. em. Dr. Johann Walter Kolar, Member of the Executive Committee Energy Efficiency Movement, ETH Zurich

Recognizing and overcoming obstacles to energy efficiency will release substantial untapped opportunities to drive industrial competitiveness – a potential that holds the key to a more sustainable, resilient and prosperous future. I am convinced that these opportunities are greater than the challenges.

02 Executive summary

This report explores the current state of industrial energy efficiency practices, identifies critical barriers to implementation, and proposes actionable strategies to accelerate adoption across sectors. The findings are based on a survey that was conducted between February and April 2025, with 294 organizations from various global industries. Additional qualitative insights were gathered through interviews with energy efficiency experts worldwide (see Methodology for more details). The report, and in particular the roadmap it includes, has been developed to support industrial companies across sectors and regions.

Financial concerns

Financial barriers remain the most significant challenge to implementing energy efficiency improvements in industrial sectors. Companies struggle with uncertain returns on investment, volatile energy prices, limited access to external funding, and the high upfront cost of efficient technologies. This is especially true for small and medium-sized enterprises, which often lack internal capital and are more risk-averse. Our survey findings show that 43% of respondents cite financing as their primary barrier, with North American firms particularly affected. Despite increasing budgets in recent years, 84% still believe funding is insufficient. Larger companies fare better due to easier access to capital and economies of scale. To overcome these barriers, companies are advised to create dedicated energy efficiency budgets, explore alternative financing models like “Equipment-as-a-Service,” and develop specific business cases with clear calculations of the return on investment (ROI), prioritizing quick wins to build internal support.

Adapting infrastructure

In parallel, infrastructure challenges – such as the difficulty of integrating new technologies into legacy systems and risks of production downtime – are major obstacles to energy efficiency upgrades. Many industrial facilities operate long-lifespan equipment and are hesitant to retrofit due to the cost, complexity, and potential disruption of operations. Nearly half of respondents who are facing infrastructure challenges (42%) report struggles with integrating new energy-efficient systems, especially in data-intensive environments, and cite skilled labor shortages as an additional constraint. To address these issues, companies should partner with energy service providers for audits and proof-of-concept pilots, adopt preventive maintenance programs, and phase upgrades to minimize downtime. Holistic and informed system-level thinking and phased implementation strategies are critical to ensuring reliable, cost-effective, and minimally disruptive energy efficiency improvements.

Insufficient skills

Another key challenge is the lack of skilled personnel to drive energy efficiency, with 48% of business leaders confronted reporting that skill shortages impede implementation, especially in small and medium-sized enterprises. Skills in both technical areas (e.g., audits, building automation) and complementary areas (e.g., project management, financial evaluation) are often missing. Moreover, 45% of respondents find it difficult to train their workforce effectively, with training programs often unsuitable to time, budget, or organizational priorities. As a result, even companies with access to new technologies may fail to integrate them into legacy systems, especially in energy-intensive industries. To address these issues, companies should embed energy goals into training, collaborate with external experts, and build internal capacity through knowledge sharing and compliance with standards like ISO 50001.

Strategic shortcomings

To overcome these barriers, companies must adopt a strategic approach, yet more than a third (37%) of companies surveyed who are facing strategical challenges struggle to prioritize energy efficiency avenues by impact and investment. Solutions identified includes investing in comprehensive energy monitoring systems, implementing robust data governance and analytics, and establishing clear reporting structures. Training programs tailored to energy efficiency, partnerships with experts, and participation in industry collaborations can also help build internal capacity. Organizations should familiarize teams with compliance standards like ISO 50001 and embed energy performance into their strategic goals. Without such systemic and skill-oriented efforts, energy efficiency initiatives risk remaining fragmented and ineffective.

Data and control challenges

One major barrier to energy efficiency in organizations is inadequate data and control systems. Poor data quality, fragmented energy management systems, and underinvestment in audits hinder informed decision-making and long-term improvements. In the survey, 46% of respondents facing data and control challenges admitted to struggling with collecting high-quality energy data, while 39% said their data is not processed periodically. This lack of accurate, timely, and granular data undermines the business case for energy efficiency and creates delays in internal approvals. Additionally, organizations with poor data availability tend to perceive infrastructure as a more significant barrier and may not be fully aware of financial trade-offs due to limited data insight making data collection and literacy a cornerstone of the implementation pathway for energy efficiency.

Barriers to energy efficiency

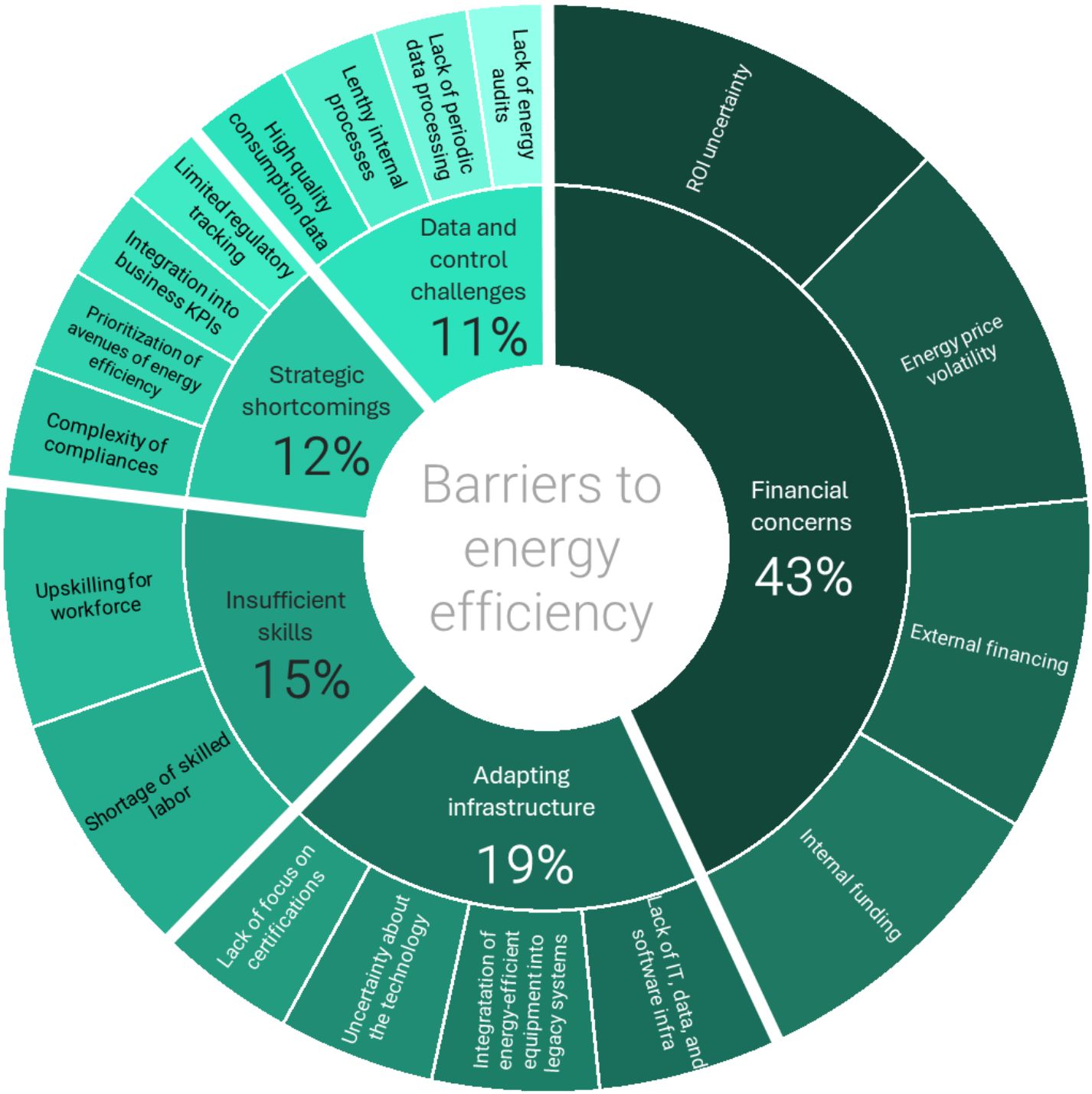
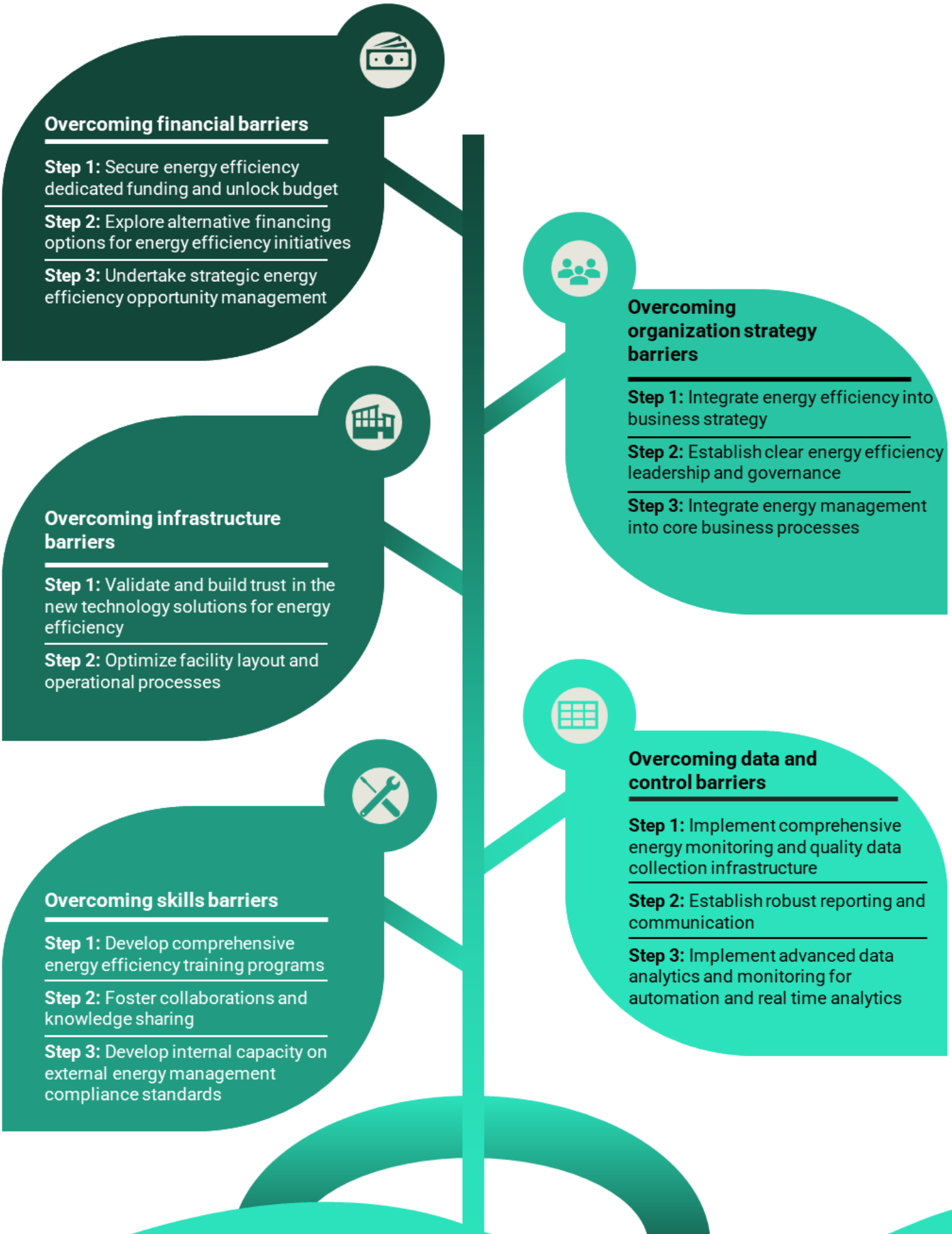


Fig. 2.1: Five key barriers to energy efficiency and what they mean. Percentages denote the number of respondents who ranked the barriers as top 1 challenge.

Roadmap: How to overcome barriers to energy efficiency



03 Navigating energy efficiency challenges in a dynamic world

Energy efficiency is a critical tool for improving competitiveness, reducing emissions and ensuring the security and affordability of energy supply. However, macroeconomic challenges – ranging from regulatory uncertainty to geopolitical risks and financial constraints – pose significant barriers to its widespread implementation. While many industries recognize the benefits of energy efficiency, shifting policies, financial limitations and inconsistent market signals complicate long-term investments in efficiency measures.

The need for industry leadership

In the current uncertain macroeconomic environment, businesses must take the lead to realize cost benefits and contribute to combating climate change. Businesses that invest in efficiency not only gain cost advantages but also future proof their operations against regulatory and market shifts. Many industry leaders recognize that energy efficiency is not just a compliance requirement but a strategic tool for cost savings, competitiveness and sustainability. With proper financial mechanisms, cultural shifts and long-term policy stability, energy efficiency can become a cornerstone of economic and environmental resilience worldwide. In addition, larger companies can lead their markets by providing training and support for their supply chains and so help develop whole industries.

Energy efficiency as a competitive advantage

Industrial players can use energy efficiency as a competitive advantage. Many companies are aligning their energy strategies with broader economic trends, such as carbon border regulations. In these cases, companies that adopt high energy efficiency standards gain a cost advantage over those that do not. There is also potential for reputational benefit when a company can prove its business case and succeeds in communicating it to its stakeholders.

Leading businesses take a proactive approach by embedding energy efficiency into their long-term strategies, independent of policy changes. By prioritizing efficiency, these companies not only reduce operational costs but also send strong signals to policymakers about the importance of energy efficiency as an economic driver.

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Financial constraints and investment challenges

Financing energy efficiency projects is widespread macroeconomic challenge. While large corporations in developed economies have access to capital for efficiency upgrades, small and medium enterprises (SMEs) in developing nations often struggle to secure funding. In India, for instance, micro, small and medium enterprises account for a significant share of industrial energy consumption. Many spend up to 30% of their production costs on energy but lack the financial resources to invest in efficiency improvements, according to the UN Industrial Development Organization (UNIDO).[2]

High upfront costs and perceived long payback periods deter many businesses from implementing energy-efficient technologies, even when these investments lead to long-term savings. Additionally, limited access to credit and high borrowing costs in some economies further slowdown energy efficiency adoption.

> *"Energy efficiency is a key foundation of a secure, affordable and sustainable energy future. But to unlock its full potential, governments must put the right policies and programs in place, and industry must treat efficiency as a core business strategy – not an afterthought. Without this alignment, we risk missing one of the fastest, most cost-effective tools to tackle greenhouse gas emissions and reduce costs for all."*
>
> **Brian Motherway, Head of the Office of Energy Efficiency and Inclusive Transitions, International Energy Agency (IEA)**

Infrastructure limitations and energy supply issues

Businesses also face infrastructural constraints that limit the effectiveness of energy efficiency measures. Many industrial operations in emerging markets depend on aging grid infrastructures that struggle and power generation facilities to meet growing demand. A rapid transition to renewable energy sources introduces additional challenges, as grids must adapt to intermittent power generation from sources like solar and wind.

In India, for example, industries dependent on natural gas have been vulnerable to price volatility and supply chain disruptions.[3] Energy-intensive processes like glass manufacturing, highlight the inefficiencies of gas-powered systems and the pressing need for electrification and efficiency upgrades. As industrial processes shift toward electrification, significant investments in infrastructure will be required to meet electricity demand.

Cultural and behavioral barriers to efficiency

Beyond financial and infrastructural challenges, corporate culture plays a crucial role in energy efficiency adoption, as this report explains in more detail. Many industrial organizations focus on technological solutions while disregarding the behavioral and management changes needed to maximize efficiency gains. A Study by DNV GL suggests that nearly half of the potential energy savings in energy-intensive industries could come from management and behavioral shifts rather than technological upgrades.[4] And, it is possible that energy efficiency has an image problem: achieving grand effects by a single, bold and striking measure is not how energy efficiency works in

[2] https://www.industrialenergyaccelerator.org/where-we-work/india/.
[3] https://ieefa.org/articles/small-medium-scale-industries-emerging-key-growth-drivers-indias-natural-gas-consumption.
[4] https://ee-ip.org/fileadmin/user_upload/DOCUMENTS/Content/DNV_GL_Energy_Culture_Service_01.pdf.

most cases. It is the step-by-step approach that promises to be effective, but it may be a less appealing procedure for some in the business.

Despite proven benefits, behavioral change remains understudied and underutilized in industrial energy efficiency strategies. Policymakers and industry leaders must recognize that fostering a culture of efficiency requires sustained leadership and engagement from top management.

Global climate agreements and energy efficiency

International climate negotiations have increasingly emphasized energy efficiency, yet progress remains slow. At the recent COP28 UN climate conference, global leaders pledged to double the rate of energy efficiency improvements by 2030 and to scale up efficiency investments, with initiatives like the European Investment Bank's support for SMEs and new energy efficiency roadmaps for regions such as Africa.[5] Denmark highlighted energy efficiency as a central part of its climate strategy, demonstrating how national policies can drive corporate and industrial adoption.[6] Nevertheless, industrial energy efficiency has been underrepresented in national climate commitments, with only 30% of countries including efficiency measures in their emissions reduction plans.[7]

Regulatory uncertainty and policy reversals

A persistent macroeconomic challenge to energy efficiency of recent years is the volatility of government policies. Industrial leaders require stable regulatory frameworks to plan and implement efficiency investments. However, energy efficiency standards and climate policies are often subject to change due to political shifts.

Political shifts create energy policy inconsistency across successive administrations, with climate legislation often reversed by subsequent governments. These fluctuations – such as changing dates for combustion engine phaseouts – create regulatory uncertainty that discourages businesses and governmental agencies from committing to long-term energy efficiency investments.

Despite a variety of approaches in different regions, energy affordability, energy security and competitiveness are common concerns across the world. And so is unlocking public and private sector investments to support energy transformation. Policies and regulations may differ across the world, but there is common ground, which may provide the right stimulus.

[5] https://www.youtube.com/watch?v=uMclReO7A-w.
[6] https://stateofgreen.com/en/news/countdown-to-cop29-doubling-up-on-energy-efficiency/.
[7] https://unfccc.int/ndc-synthesis-report-2023#Mitigation-including-co-benefits.

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04 Key findings

Overview

Energy efficiency is increasingly on the agenda for companies.

More than 50% of the total respondents to this Energy Efficiency Movement 2025 survey have been working on energy efficiency for more than six years. Around 84% of them perceive that their energy efficiency budget is similar or increasing year on year.

68%

perceive that their energy efficiency budget is **increasing**.

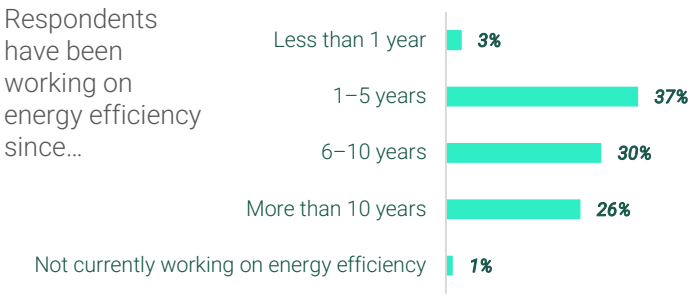

Fig. 4.1: Growing importance of energy efficiency. Left: Percentage of respondents (out of total 294) finding increasing energy efficiency budget trends. Right: Years that organizations have been working on energy efficiency.

Manufacturing is a key area of focus for energy efficiency initiatives for most organizations.

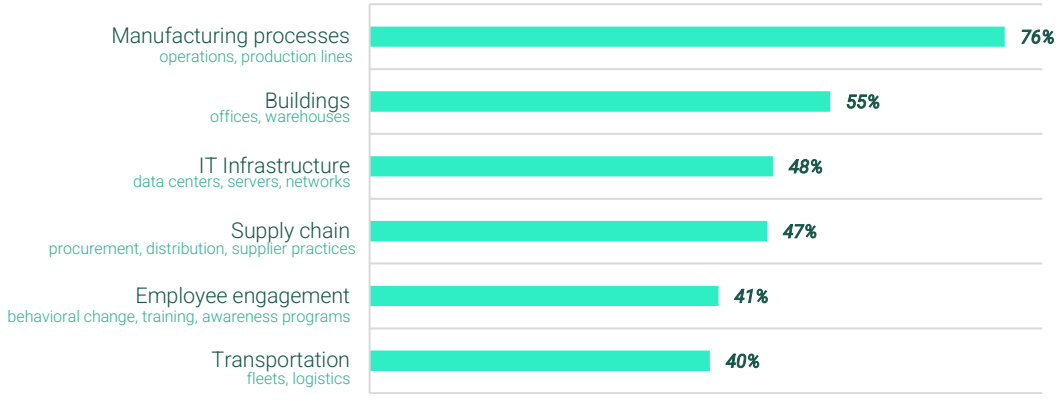

Fig. 4.2: Focus areas for energy efficiency.
Percentage of respondents (out of total 294) implementing energy efficiency initiatives in their organization.

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The majority of organizations have energy efficiency infrastructure in place as a predominant initiative.

60%

of companies invest efforts in **more than two** energy efficiency measures.

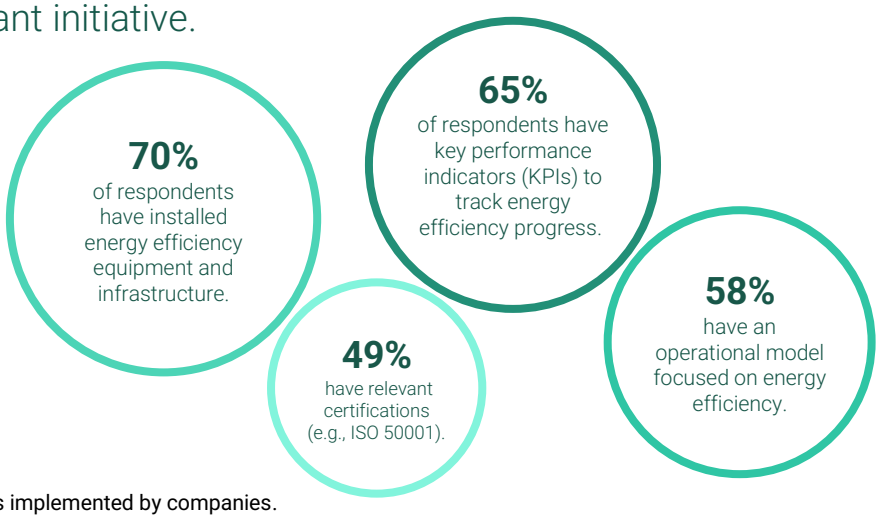


Fig. 4.3: Energy efficiency measures implemented by companies.
Percentage of respondents (out of total 294) implementing energy efficiency initiatives in their organization.

Certified organizations are significantly more likely to prioritize energy efficiency compared to non-certified ones. This may be driven by compliance requirements and structured sustainability goals, as seen in standards like ISO 50001. However, the relationship may also reflect reverse causality: organizations that already value energy efficiency may be more likely to pursue certification.

A large majority of companies have at least one department responsible for energy efficiency.

Around half of the companies have a dedicated energy management team. Organizations with such a team are significantly more likely to report year-over-year growth in their energy efficiency budgets. A focused team may have a better understanding of the return on investment.

72%

of companies have **more than one** department responsible for energy efficiency.

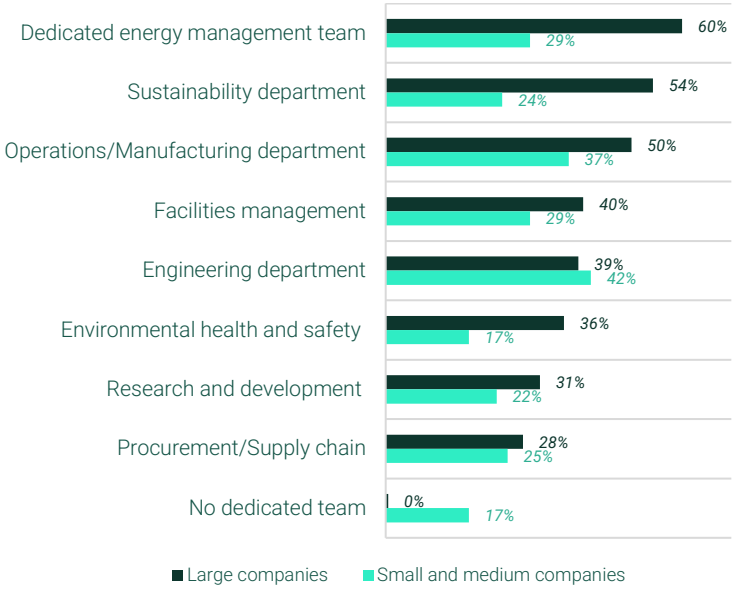


Fig. 4.4: Departments responsible for energy efficiency.
Percentage of respondents indicating which departments are responsible for energy efficiency in large and small companies (calculated separately for each company size category based on the number of respondents within that group).

Main internal barriers to energy efficiency

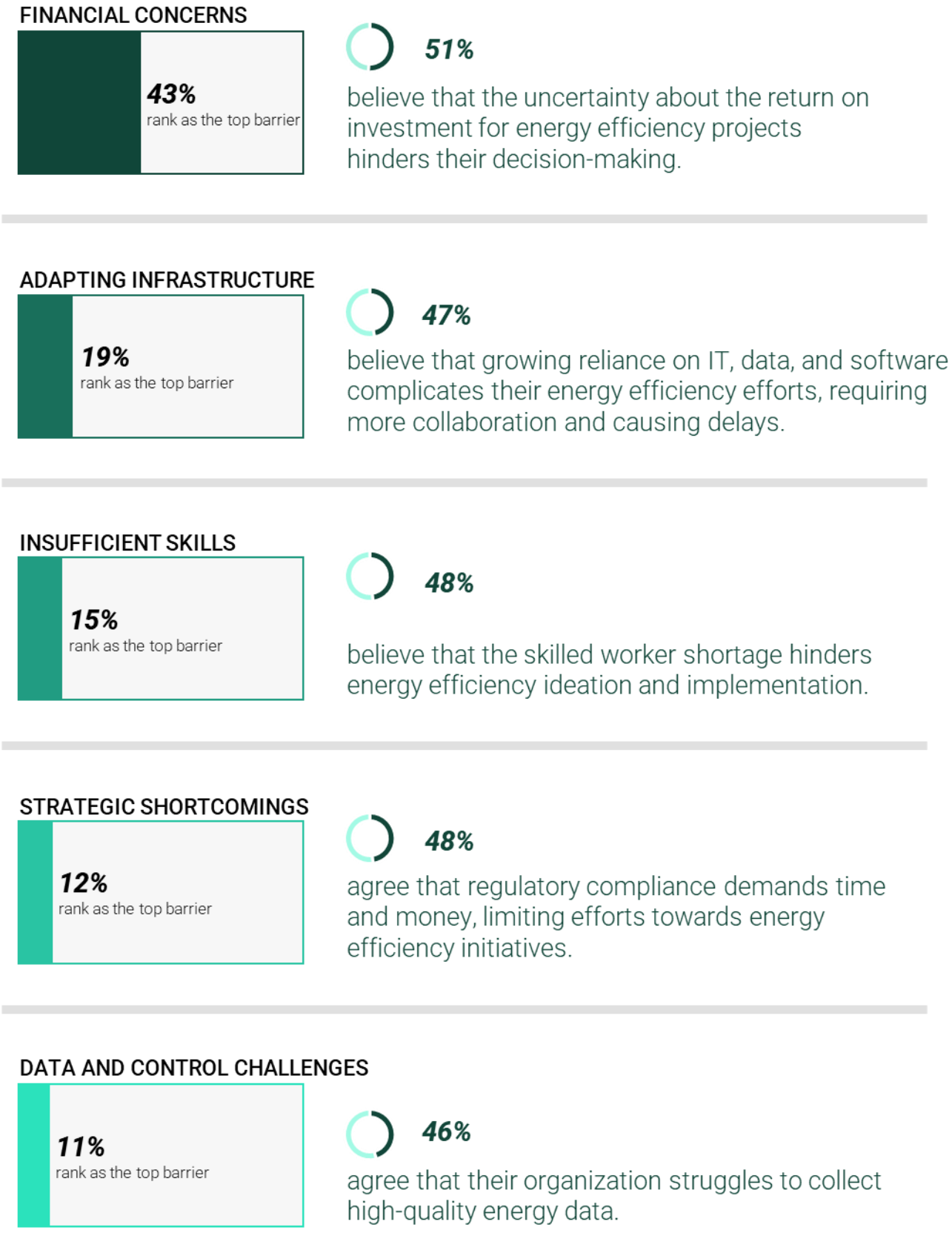
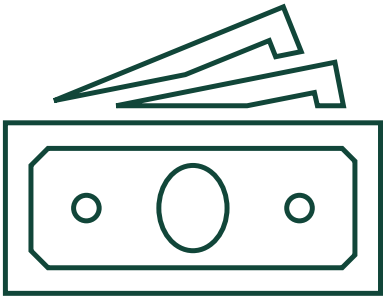


Fig. 4.5: The five barriers for energy efficiency, with selected survey results.

Financial concerns



Financial concerns can significantly hinder energy efficiency improvements in industrial companies, despite the long-term benefits and cost savings associated with such measures. These concerns can be a combination of factors, such as uncertainty about the extent and the time horizon of the return on investment, energy prices and their volatility, conditions and costs of external financing, and the (non-)availability of internal funding. In some cases, a tendency to risk aversion may also come into play.

"Although high energy prices drive an exceptional business case for energy efficiency measures, a significant portion of our clients is very conservative about capital allocation."

Pieter Teesink, Director Innovation & Technology, Flowserve

Financing is the greatest barrier

For the respondents to the survey, financial concerns constituted the greatest barrier to implementing energy efficiency measures. 38% of the respondents overall cited financing and funding issues as their greatest barrier (or 43% of the respondents who ranked the barriers in the questionnaire). The challenge is there across all regions surveyed, but North America stands out particularly, with almost half of respondents (49%) indicating that this is the largest barrier, followed by Europe (38%), and Asia-Pacific (34%). In particular, the uncertainty about the return on investment for energy efficiency projects hinders the decision-making for 51% of the participants in this survey. Other discouraging factors were the price volatility for energy (41%) and the difficulty of accessing external finance for efficiency improvements (26%).

43% of respondents rank finance as the top 1 barrier

Of all the participating companies, 84% agree that their organization does not allocate sufficient funding to implement energy efficiency projects. On the other hand, 68% of the respondents noted that their organization's budget for energy efficiency measures had increased in recent years. This figure may vary depending on the size of the company, with larger companies facing fewer challenges. Based on our data, large companies have better access to capital and can absorb upfront costs more easily than medium-sized or small companies. They also benefit from economies of scale, making energy efficiency investments more financially viable. With larger companies, the availability of internal funding also tends to be more likely. Naturally, respondents from these companies perceive external financing as less of a barrier than those without it as this makes them less dependent on external financing. Their stronger financial footing may also improve creditworthiness, making external financing easier to access if needed.

"We still see many companies that focus exclusively on the short-term future of their business and operations. That can limit sustainability initiatives that have a longer payback time. Even though a quick return on investment is attractive, I would hope to see in the future some commitment also on mid- or long-term initiatives."

Luiz Fernando Faccin, Head of Energy Efficiency, Klüber Lubrication

For less experienced companies, such as companies working on energy efficiency for less than five years, one of the primary financial barriers is the high initial cost of technologies or upgrades. Industrial equipment such as high-efficiency motors, advanced lighting systems, waste heat recovery units, or energy management systems often require substantial capital investment. For small to medium-sized enterprises, allocating funds for these improvements can be challenging, especially when the return on investment is difficult to calculate. Although even if an energy-efficient upgrade would save money over time, the payback period of two or more years may deter companies from pursuing the change, especially when budgets are tight, or the cost savings are not clearly quantified.

"Ideally, companies should look at energy efficiency first before buying solar panels or carbon offsets. If they do a complete evaluation of the energy they use and the energy they can save as they move towards renewables, they will save more money and resources. For example, they may need fewer solar panels if they improve energy efficiency first."

Courtney Tripp, Senior Manager Sustainability & Strategy, Grundfos

A large majority (75%) of the companies participating in our survey focus on implementing energy efficiency in manufacturing processes. Among them, 73% report increasing budgets for efficiency investments in this area – compared to a much smaller percentage of 53% who see growing budgets for measures beyond manufacturing.

This finding reflects a growing industry consensus: manufacturing processes offer the most significant and tangible opportunities for energy savings. In contrast, non-manufacturing measures—such as lighting and HVAC—are often seen as low-hanging fruit that have largely already been addressed, even if opportunities may not always be fully exploited yet.

Companies that are uncertain about the return on investment of energy efficiency projects also tend to view volatile energy prices as a significant barrier. These perceptions can reinforce each other: when financial returns are unclear and future energy costs are unpredictable, companies are more likely to delay or avoid taking action.

Overcoming financial barriers to industrial energy efficiency

Step 1:
Secure energy efficiency dedicated funding & unlock budget

- **Allocate a dedicated budget** specifically for energy efficiency projects by establishing a revolving fund that reinvests energy cost savings[8] into new energy efficiency initiatives.
- **Streamline internal mechanisms** to provide quick approvals for energy efficiency projects with quick payback times (<24 months[9]).

Step 2:
Explore alternative financing options for energy efficiency initiatives

- Collaborate with **energy efficiency solution providers** or partner with strategic suppliers to explore "Equipment-as-a-Service" model or models like paying for the capital expenditures (CapEx) using the continuous savings being made.
- Investigate **green bonds, government subsidies, multilateral organizations and operating expense (OpEx) models**. Research available external financing solutions (e.g., on-bill finance/on-bill repayment) and tax benefits in your region.
- Consider hiring an external **energy and research consulting firm** if internal skills and capacity are limited.

Step 3:
Undertake strategic energy efficiency opportunity management

- Create dedicated **business cases quantifying benefits** including lower energy bills, increased brand value, process resilience, etc. while developing return-on-investment (ROI) calculation methods based on different energy price scenarios to tackle volatility. Also, include possible returns from energy efficiency investments in future strategic projects (e.g., solar systems).
- Make an inventory of all possible energy-saving interventions across facilities and equipment. Then rank opportunities based on their impact, feasibility, and payback period using **cost-benefit analysis and prioritization matrices**. Involve key stakeholders like finance, operations, and sustainability in the prioritization process to ensure alignment.
- Focus initially on **"quick wins"** — low-cost, high-return initiatives to build early momentum and unlock organizational support and finance through demonstrable successes. **Define clear key performance indicators KPIs** to measure project success (e.g., energy saved, payback period, equipment uptime) and prepare a plan for performing and then scaling proof-of-concept pilot projects to different units or locations.

[8] Based on case studies of the years 2016–2024, the IEA estimates these annual savings as at least 11%; IEA Energy Efficiency 2024 report, page 60.
[9] https://report.energyefficiencymovement.com/guide/driving-efficiency-returns.

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Adapting infrastructure

Implementing energy-efficient technologies in industrial settings is a crucial step toward reducing carbon emissions and improving long-term cost savings. However, despite the clear benefits, many industrial companies face significant infrastructure-related barriers that hinder the adoption of energy-efficient solutions. Two of the most pressing concerns are the limited incentives for retrofitting existing systems and the risk of disrupting production during upgrades.

Integrating new technology into existing processes

Industrial facilities are often built with long life cycles in mind, and the equipment they house, such as boilers, motors, furnaces, or compressors, can operate for decades. Newer infrastructure offers significantly improved energy performance, but the initial capital investment and logistical complexities of retrofitting may pose major challenges. Many companies are hesitant to replace still-functional equipment due to the high upfront costs and uncertain payback periods. Unlike new construction projects, where energy efficiency can be integrated into the design from the beginning, retrofitting requires adjustments to existing layouts, rewiring, and often structural modifications.

19% of respondents rank infrastructure as the top 1 barrier

All respondents face challenges related to various aspects of infrastructure, such as the growing reliance on IT, data, and software – an issue identified by 47% of respondents. This technical infrastructure element often requires increased collaboration between different internal and external disciplines and can lead to delays in organizations' energy efficiency efforts. Another key challenge is integrating new, energy-efficient equipment – both hardware and software – into legacy systems. 42% percent of respondents report that their organization struggles to incorporate new equipment into existing processes.

"As a steel manufacturer, we have high energy- and carbon-intensive processes. Therefore, efficiency is key. But changing our technical infrastructure is complicated. Switching to a new electric blast furnace means an overlap with the old furnace for roughly a year, during which we need to hire extra personnel."

Tomas Hirsch, Head of Energy and Emission Trading, SSAB

To upgrade legacy infrastructure, both capital and capability are needed. The survey also found that companies experiencing a shortage of skilled workers tend to report more difficulties integrating new energy efficient technologies into legacy equipment.

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In addition, a further 35% of participants claim that uncertainty about a new technology's reliability and longevity are obstacles.

Risk of disruptions through downtime during retrofitting

Another critical concern is the potential for production disruption. In industries where operational continuity is key – such as manufacturing, chemical processing, or food production, especially in 24/7 operations — even brief shutdowns can lead to significant financial losses, missed deadlines, or contractual penalties. Upgrading to energy-efficient equipment often necessitates halting production lines, disassembling machinery, or altering workflows. This downtime is difficult to justify, especially in competitive markets where margins are tight, and customer demand is constant. It is not surprising, therefore, that for those respondents who ranked "data and control" as their top barrier, a majority of 80% think that their organization struggles to integrate new energy-efficient equipment into legacy equipment.

"Looking at systems holistically – rather than optimizing individual equipment in isolation – unlocks new efficiency potentials. Many optimum operating modes and system designs can only be found when considering the full energy flow across hydraulic, thermal, and drive systems. That's why we always ensure to go beyond single-component improvements to achieve the best possible system-wide performance for our customers."

Pieter Teesink, Director Innovation & Technology, Flowserve

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Overcoming infrastructure barriers to industrial energy efficiency

Step 1:
Validate and build trust in the new technology solutions for energy efficiency

- **Partner with energy service companies (ESCOs) or with manufacturers to perform detailed energy audits** that go beyond regulatory requirements, across all facilities and operations to establish current state and baselines against which future improvements will be measured and to identify specific improvement opportunities.
- Work with vendors and ESCOs and take inspiration from industry peers to **identify technology upgrades fit-for-purpose** for your specific improvement opportunities. Also, be realistic about the technology availability and maturity within the available timeframe and budgets.
- Implement the identified solutions at a small scale to **create a proof-of-concept for reliability and ROI**. Document learnings from the pilot, including challenges faced and corrective actions taken. Upon successful completion at the pilot stage, implement the solutions horizontally across the organization.

Step 2:
Optimize facility layout and operational processes

- Institute **preventive maintenance programs** specifically focused on energy performance of equipment.
- Assess and implement potential **re-sizing opportunities** of the equipment based upon findings from the energy audits.
- Post the successful pilot testing, **roll out energy efficiency upgrades in a phase-wise manner** to minimize operational downtime and financial risks. Ensure successful change management by upskilling internal employees on the usage of new energy efficient equipment and data platforms.

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Insufficient skills

Despite the availability of cost-effective technologies and growing regulatory pressure in many parts of the world, many managers in companies struggle to improve energy performance. One significant barrier is a shortage of relevant expertise – specifically, the limited availability of skilled personnel, resistance to adopting new technologies, and inadequate training programs within organizations. These human-centered factors can impede the successful deployment of energy efficiency initiatives and prevent companies from realizing their full potential in energy savings.

Shortage of skilled staff impacts companies

A critical obstacle is the limited availability of skilled staff who possess the technical knowledge and practical experience required to identify, evaluate, and implement energy efficiency projects. Many companies lack in-house energy experts or dedicated energy managers. This shortage means that energy-saving opportunities often go unnoticed or are not acted upon due to uncertainty or lack of capacity or proper information. Moreover, the skills required are not only technical – such as understanding energy audits, HVAC systems, or building automation – but may also include project management and financial evaluation skills, which are essential for justifying and executing investments in energy efficiency.

Almost half of the business leaders surveyed (48%) believe that the shortage of skilled workers hinders the ideation and implementation of energy efficiency. In terms of geography, skills are ranked as a top 3 barrier for European and Latin American respondents, but less prominent in other regions.

15% of respondents rank insufficient skills as the top 1 barrier

For those 15% of respondents who ranked skills as their top barrier, a subgroup of 68% believe that the shortage of skilled workers affects their ability to explore and implement energy efficiency. Of this group, 53% also think that it is challenging to equip their workforce with the skills, knowledge and mindset needed to adopt energy efficient equipment and processes.

Interestingly, we observed that larger companies are more likely than small companies to rate shortage of skilled workers as a major barrier. This may be because they have more complex or specialized energy efficiency projects that require hard-to-find skills and more defined roles that make skill gaps more obvious.

> *"Figuring out opportunities and connecting them to the right available policies with incentives can be challenging. Currently, there is a patchwork of local, state, and private funding programs. Sometimes, our clients don't have the time, personnel, or expertise to navigate this and find whether external funding for energy efficiency projects is available and how to tap into it."*
>
> **Courtney Tripp, Senior Manager Sustainability & Strategy, Grundfos**

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Training programs often inadequate

Inadequate training is another major barrier that impacts the availability of employees skilled in energy efficiency. 45% of all respondents agree that training their organization's workforce for energy efficiency adoption is challenging. Without structured training programs, however, companies not only fail to upskill existing staff but also to prepare new employees to work with emerging technologies. Training is often overlooked due to time constraints, budget limitations, or a lack of perceived importance. However, without proper instruction, even well-intentioned energy efficiency initiatives may underperform or be incorrectly implemented, leading to disappointing results and reinforcing skepticism toward such efforts.

An interesting find is that there is no noteworthy difference between small and large companies when it comes to the difficulty of training their workforce for energy efficiency. These training difficulties could be more about culture and mindset among industry and a possible lack of external resources than company size.

"Training installers on new energy efficiency technologies is a significant challenge. As a B2B wholesaler, we address this by offering certification-focused training in electric mobility, photovoltaic energy, smart building in partnership with manufacturers. This empowers electricians to progressively master innovative solutions and adapt to new energy configurations in buildings."

Clotilde Brehmer, Group Sustainability Leader for Strategic Suppliers, Rexel

The fact that many companies experience difficulties integrating new energy efficient technologies into legacy equipment – also due to a shortage of skilled workers – highlights a typical pattern in industrial operations, especially in energy-intensive sectors like manufacturing, automotive suppliers, or aerospace. Integrating modern technical solutions, such as smart drives, sensors, or digital energy monitoring, into an existing mature production environment requires a deep understanding of existing, often customized, machinery, the ability to bridge old and new technologies, and expertise in cross-functional collaboration with divisions responsible for maintenance, IT, engineering, or energy managers for instance. Without these skills, bridging old and new technologies may become a structural barrier.

"Networking through international forums like the World Green Building Council is essential for knowledge sharing and being aware of the latest solutions in your industry."

Mario Giordano, Global Head of Public & Government Affairs, Signify

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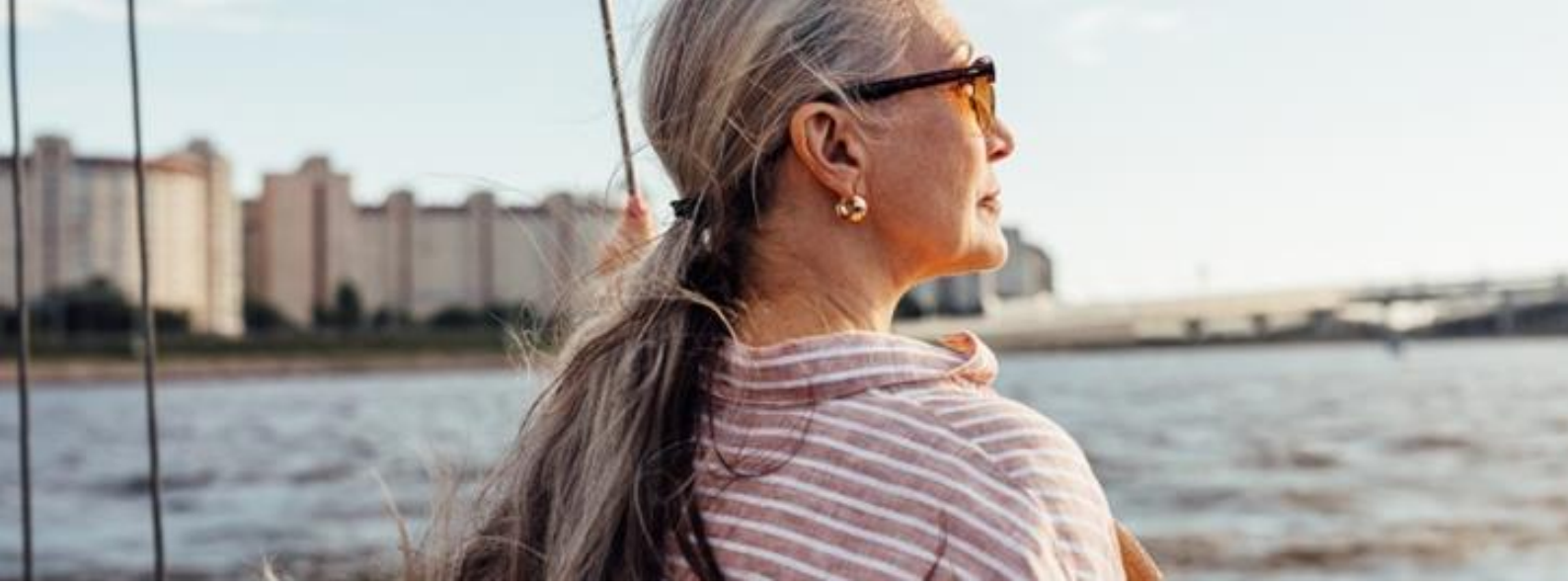

Overcoming skills barriers to industrial energy efficiency

Step 1:
Develop comprehensive energy efficiency training programs

- Design and implement **tailored training programs** internally by focusing on energy systems, technologies, and behavioral practices. Further, incorporate energy efficiency modules into employee onboarding and ongoing training curriculum e.g., by setting clear energy efficiency objectives into job descriptions.
- Leverage external partners (e.g., Association of Energy Engineers and ESCOs) and suppliers to **upskill internal employees** on the usage of new energy efficient equipment and data platforms.

Step 2:
Foster collaborations and knowledge sharing

- **Join industry associations and energy efficiency alliances** for collaborative learning and technology sharing. Take advantage of energy efficiency focused business platforms like the Energy Efficiency Movement.
- Create a **centralized platform or Community of Practice** where employees can contribute ideas, with careful evaluation of each submission and proper explanation for rejected ideas to ensure continued participation. **Recognize and reward** the best ideas to maintain motivation.
- Hire external experts to **fill internal skills gaps** in areas like data visualization, infrastructure upgrades, and ROI calculation.

Step 3:
Develop internal capacity on external energy management compliance standards

- Train internal auditors to **regularly assess compliance with energy management standards**. Familiarize internal teams with ISO 50001 or equivalent energy management system standards.
- Obtain **formal certification** to validate energy management practices and provide external credibility.
- Use the **management system structure as a framework** for continuous improvement in energy performance.

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Strategic shortcomings

Organizational strategy plays a crucial role in determining the success of energy efficiency initiatives in companies. While technological solutions and financial incentives are widely available, many businesses fail to capitalize on energy-saving opportunities due to strategic shortcomings at the organizational level. In particular, weak leadership, the absence of dedicated roles for energy efficiency, and the lack of clear energy-focused goals often act as major barriers that prevent companies from making meaningful progress in this area.

12% of respondents rank strategic shortcomings as the top 1 barrier

Prioritizing energy efficiency requires leadership

Weak leadership is one of the most significant strategic obstacles. When senior management does not prioritize energy efficiency or fails to communicate its importance, initiatives often lose momentum or never take off. Energy efficiency is often seen as a secondary concern, particularly when leadership prioritizes short-term financial performance, production targets, or market expansion. Without strong, visible support from top executives, employees may not feel motivated to contribute to energy-saving efforts, and middle managers may be reluctant to allocate time or resources to projects without clear executive backing. Furthermore, a lack of strategic vision results in fragmented, reactive, and uncoordinated efforts across departments. A lack of focus on organizational strategy for energy efficiency ranked among the top 3 barriers for companies in North America, particularly among larger firms.

"Our board is actively engaged in promoting more R&D for better synthetic lubricants that increase the energy efficiency of our customers' machines and reduce their footprint."

Luiz Fernando Faccin, Head of Energy Efficiency, Klüber Lubrication

37% of respondents say their organization struggles to prioritize energy efficiency avenues – such as in buildings, fleet, or manufacturing – by impact and investment. This calls for leadership with a strategic vision that includes energy efficiency as a goal worth pursuing.

"We have established an 'Energy Cell' – a dedicated group-level team comprising members from all business functions – to drive our energy efficiency strategy through structured planning and cross-functional collaboration. In parallel, we have created a platform that empowers plant managers to share their ideas directly with senior leadership, enabling both top-down and bottom-up approaches to energy efficiency improvement."

Sheethal Kumar, Environmental, Health, Safety and Sustainability Lead, Biocon

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In highly regulated markets, staff shortage may play a role as well: 48% of those respondents who ranked organizational strategy as their top barrier agree that constraints in time and money demanded by regulatory compliance limit their energy efficiency initiatives. To be effective, organizational strategy must go beyond compliance. On the one hand, regulatory compliance (e.g., for reporting, audits, or certifications) is non-negotiable and often highly resource intensive. On the other hand, the finance- and time-related resources spent on compliance leave less room for proactive energy efficiency measures. If regulatory compliance becomes the dominant activity in a sustainability department, energy efficiency projects may be sidelined.

Strategic direction needed

Another organizational barrier is the limited integration of energy-related objectives into broader strategic goals. One in five (19%) respondents say that energy efficiency is not well integrated with KPIs like overall equipment effectiveness and greenhouse gas emissions, pointing to a lack of strategic direction. Many companies either lack a formal energy policy or have one that misaligns with their business strategy. As a result, energy efficiency may be pursued in an ad hoc manner – through isolated upgrades or one-off projects rather than a sustained, measurable commitment. Interestingly, data show that large corporates see the organizational strategy as a bigger challenge compared to SMEs, and might prioritize investing resources into overcoming this barrier. For such organizations, having a structure in line with the business strategy will be key in progressing with energy efficiency programs and will help reduce decision-making time. On the other hand, SMEs handle energy efficiency more fluidly and thus are less hindered by this barrier.

"Danfoss has a group-level sustainability and energy efficiency strategy. Most energy efficiency initiatives are suggested by operations managers at factory level, ensuring the initiatives are relevant in their context."

Judith Neijzen, Head of Analysis, Danfoss

The survey also shows that companies with over five years of experience in energy efficiency see organizational barriers as significantly less challenging than newer adopters. This trend did not appear for the other four barriers assessed in the survey. This suggests a typical maturity effect in the energy efficiency journey of organizations. For less experienced companies, organizational and strategic barriers often dominate day-to-day operations, struggling with a lack of internal awareness, low leadership commitment, and fragmented responsibilities. With time, these organizational challenges tend to ease. However, other barriers may persist in areas such as infrastructure or financing. Networks like the Energy Efficiency Movement can facilitate the exchange of experience.

"Sustainability should be at the core of your strategy and integrated into your investment policy in general. However, it is mostly mature companies that can afford to invest in sustainability initiatives without expecting immediate benefits on the Profit & Loss Statement."

Artur Puzinas, International Market Director, Smart Building Energy, Sonepar

Overcoming organizational strategy barriers to industrial energy efficiency

Step 1:
Integrate energy efficiency into business strategy

- Embed energy efficiency objectives into the corporate strategy by **aligning energy goals with corporate priorities** such as cost reduction, risk mitigation, and/or environmental, social and governmental (ESG) compliance.
- Align reporting frameworks with external ESG standards (e.g., Carbon Disclosure Project, Global Reporting Initiative).
- **Leverage energy efficiency as a differentiator** in customer marketing, investor relations, and stakeholder engagement but avoid greenwashing.
- Create **dedicated KPIs for energy efficiency** and distribute ownership across the corporate structure.
- **Establish supply chain energy efficiency initiatives** by including energy performance requirements/metrics in procurement guidelines, supplier evaluations and compliance frameworks.

Step 2:
Establish clear energy efficiency leadership and governance

- Define **energy efficiency as a board-level strategic priority** and ensure executive ownership by appointing a C-suite executive or director responsible for energy efficiency initiatives. Also define clear roles, responsibilities, and reporting lines for team members.
- Form a **cross-functional energy team** with representation from operations, finance, procurement, and Human Resources to align all relevant stakeholders for holistic action and data sharing implementation of energy efficiency initiatives across departments.
- Create **accountability mechanisms** such as:
  – Energy KPIs tied to team performance evaluations
  – Integrating energy performance into executive scorecards and board-level reporting
  – Adding a contractual clause mandating each employee to contribute energy efficiency ideas within a specific timeframe (e.g., one or two years).

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Step 3:
Integrate energy management into core business processes

- Integrate **energy efficiency awareness, commitment, and practices** related to energy efficiency into regular business operations like lean management, business excellence, facility management, and data reporting to make energy efficiency a core part of how the business thinks, plans, and operates at all levels.
- Ensure that **energy considerations are factored into all business decisions**, like project design, capital expenditure approval, investment decisions, etc., from the earliest planning stages.
- **Engage suppliers and contract manufacturers** to assess their energy practices and encourage the adoption of more energy-efficient practices. Furthermore, incorporate energy efficiency topics into advocacy efforts aimed at **influencing public policy in favor of energy-efficient products and solutions** within your own or your supplier's portfolios, thereby gaining a competitive advantage.
- Explore **third-party power purchase agreements[10] (PPAs)** as a strategy to secure stable electricity prices, enabling the development of standardized ROI calculation tools for energy efficiency projects.

[10] Best practice example: https://www.greeninvestmentgroup.com/en/news/2019/signify-signs-vppa-with-green-investment-group.html#:~:text=Kisielice%20wind%20farm%20is%20a%2042-megawatt%20%28MW%29%20project,2014%20and%20consists%20of%2021%20Enercon%20E82%20turbines.

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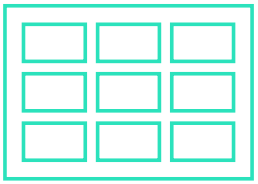
Data and control challenges



One of the most persistent and often underappreciated barriers to energy efficiency in organizations is the challenge posed by inadequate data and control systems. As companies look to reduce energy consumption, many find that their internal systems are simply not equipped to support informed decision-making or sustained efficiency improvements. This barrier often manifests in three interrelated ways: poor data quality, fragmented or siloed energy management systems, and insufficient investment in energy audits.

Data quality as an obstacle to informed decision-making

At the heart of energy management is the need for accurate, granular, and timely data on energy usage. Yet in many organizations, this information is incomplete, outdated, or inaccurate. 46% of the companies surveyed agree that their organization struggles to collect high-quality energy data. This could mean that meters are poorly calibrated, readings are infrequent, or systems only capture high-level data that lack the resolution necessary to identify specific inefficiencies. When data quality is low, it becomes almost impossible to assess the effectiveness of energy-saving measures or to build a convincing business case for further investment. Decision-makers are often left guessing, and this uncertainty discourages action.

> *"It is important to leverage data to make an accurate business case that supports the customer's buy-in to the energy efficiency projects."*
>
> **Luiz Fernando Faccin, Head of Energy Efficiency, Klüber Lubrication**

40% of respondents also state that they need to deal with lengthy and time-consuming internal management approvals regarding energy efficiency initiatives, which make it difficult to take swift action. These slow processes may be exacerbated by inadequate data collection and processing systems. This is reflected in our finding that 39% admit that their energy data is not processed periodically, leaving company leadership without consistent insight into energy efficiency. This highlights a strong link between efficient data processes and efficient energy management.

11% of respondents rank data and control challenges as the top 1 barrier

Relationships with other barriers

Some of the barriers examined in this survey are interrelated: Evidence from this survey suggests that companies with poor data availability see infrastructure barriers as greater challenges compared to companies with well-functioning data processing. Interestingly however, they do not see financial barriers as a greater challenge. A possible reason is that data-savvy companies may be more aware of cost-benefit trade-offs and upfront investments, whereas companies with poor data systems may not have progressed far enough to encounter cost constraints.

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Not surprisingly, 80% of those respondents who marked data and control as their top barrier, correspondingly face challenges collecting high-quality data. This indicates that organizations may have to invest into digital energy monitoring energy systems for effective data management. Yet, 16% of this group are unconcerned about audit budgets for energy efficiency – possibly underestimating the challenge. When companies need to evolve beyond traditional audits, they will need a higher level of data quality and availability, which will be hard to realize. However, in the energy efficiency field, regulatory audits tend to be simpler than self-initiated audits, which aim for systematic improvements tailored to specific sites or scopes. Many companies underinvest in audits, either due to financial concerns or to a lack of internal expertise.

"Energy efficiency starts with precise measurement – down to each individual machine – to build a reliable consumption baseline. By first tapping into in-house expertise, companies can gain deeper insights into operational inefficiencies and make more informed decisions when adopting energy-efficient technologies, even before involving external consultants.

Sheethal Kumar, EHS and Sustainability Lead, Biocon

Often, the difference in ambition between regulatory compliance and self-initiated audits is reflected in siloed systems, when, for example, facilities management, production operations, and sustainability teams rely on separate platforms and reporting structures, with limited interoperability or data sharing. This fragmentation hinders a cohesive energy management strategy.

"We are in the process of fitting future-ready data collection systems at our central distribution centers, warehouses, and SKUs, so that we can collect holistic data in the future about energy consumption and efficiency at different sites."

Artur Puzinas, International Market Director, Smart Building Energy, Sonepar

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Overcoming data & control barriers to industrial energy efficiency

Step 1:
Implement comprehensive energy monitoring and quality data collection infrastructure[11]

- Identify data needed to establish an effective energy system and deploy monitoring equipment like internet of things IoT sensors across critical machinery and energy hotspots to **capture detailed usage data**.
- Implement **data governance protocols** ensuring accuracy, consistency, and security of energy data. Can hire an external partner to design data governance and management structures for the company.
- Connect data streams to a centralized **energy management information system (EMIS)** to manage, analyze, and monitor energy usage across all the operations.

Step 2:
Establish robust reporting and communication

- **Provide regular updates** for internal teams and senior management using infographics and visual dashboards to showcase savings, emissions reductions, and other outcomes.
- Inspire broader participation and boost reputation by **highlighting achievements and best practices** across the organization.
- Develop **communication strategies** that highlight energy efficiency achievements to key stakeholders.

Step 3:
Implement advanced data analytics and monitoring for automation and real time analytics

- Apply advanced **analytics and generative artificial intelligence (AI) solutions** to uncover hidden inefficiencies, anomalies, and trends in energy use.
- Generate **automated reports** with actionable insights to support operations and finance teams.
- Develop **predictive analytics or digital twins** to simulate energy-saving scenarios and evaluate options.

[11] https://report.energyefficiencymovement.com/guide/building-an-efficiency-foundation.

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05 Walking the talk: case studies from Core Movers[12]

New ABB campus integrates energy efficiency from the beginning

Greenfield development: ABB's new production campus in New Berlin, Wisconsin, sets new standards.

ABB's new campus in New Berlin, Wisconsin, US, stands as a flagship example of how industrial facilities can be both high-performing and energy efficient. The campus features a highly automated production facility, enhancing the efficiency and capacity for producing industrial variable frequency drives. The site incorporates a comprehensive set of sustainability features including geothermal heat pumps that eliminate reliance on natural gas and allow more efficient electricity use. Additional technologies implemented include high-efficiency HVAC systems, better insulation, rooftop solar panels, smart building controls, and electric vehicle charging stations. Collectively, these measures are expected to deliver a 45% reduction in energy use, well above the industry average. Consolidating operations into a single modern facility further enhances its efficiency.

"ABB's New Berlin campus sets a new benchmark for industrial sustainability, achieving a projected 45% energy use reduction. Transforming an ambitious vision into a future-ready facility, this business case is sure to inspire other corporations."

Elena Pazzini, Head of Motion Sustainability, ABB

As a greenfield development, the project offered a unique opportunity to embed sustainability from the very beginning. This allowed for a holistic approach, enabling the team to evaluate all available options and select the most effective, cost-efficient, yet sustainable solutions. Cross-functional collaboration was essential in overcoming both technical and financial hurdles. Real estate, engineering, finance, and sustainability teams worked closely to align the building design with energy efficiency goals while exploring all available incentives, grants, and investment mechanisms. Digital tools further supported the process, enabling accurate simulations and scenario planning. This strategic investment not only enhances ABB's production capabilities but also reinforces its dedication to innovation and environmental responsibility.

[12] Core Movers are distinguished members of the Energy Efficiency Movement who demonstrate exceptional leadership and commitment to advancing energy efficiency in industry. These organizations make energy efficiency a fundamental part of their business strategy and maximize their contribution to creating a more sustainable future.

Ammonia heat pump recovers waste heat at Alfa Laval production plant

The Alfa Laval ammonia heat pump saves 85% of energy and reduces CO_2 emissions by 146 metric tons per year.

As one of the world's largest heat exchanger suppliers, Alfa Laval supports customers with products that boost energy efficiency and performance in their processes. At its own Gunnesbo site in Lund, south Sweden, Alfa Laval operates an innovative system to recover heat. The low-temperature waste heat that is generated here is being recovered via an innovative ammonia-based heat pump system. This solution is able to meet the heating requirements of the entire factory and corporate headquarters. The waste heat alone is able to accommodate both space heating and hot water demand. This not only reduces CO_2 emissions by roughly 146 metric tons per year, but it also makes good business sense: Prior to the heat pump installation, Alfa Laval purchased around 3,700 MWh of district heating. Today that number can be reduced by an estimated 85% thanks to process heat recovery. The investment paid for itself in under three years.

"By choosing natural refrigerants and our own plate heat exchangers, we've created a solution that paid for itself in under three years – proving efficiency is simply good business."

Anna Celsing, VP Group Sustainability, Head of Sustainability, Alfa Laval

The heart of the newly designed system is a flooded semi-welded evaporator, combined with an Alfa Laval U-turn separator. It absorbs the thermal energy of the oil cooling system, which is heated to around 40°C in the factory's plate production pressing operations. After compression, the heat pump, delivers the heat from the semi-welded condenser to the buildings' heating-water circuit, thus boosting the water temperature to 65°C. The system is keeping the ammonia filling to a minimum, benefitting these compact heat exchangers, and thus needs no more than 40 kg of ammonia. In total, the heat pump has a heating capacity of 827 kW.

06 Methodology

The survey was conducted with the understanding that energy efficiency is a strategic lever for reducing energy consumption, lowering costs, and creating a more sustainable business environment. The objective of the study was to get a picture of common barriers to implementing energy efficiency at scale in industry and understand how companies can overcome them.

These barriers may exist at several levels – technical, financial, human, external, internal, or a mixture of these. This survey focused on a selected range of internal barriers and aimed to identify actional solutions. To identify these barriers, the team first developed a number of hypotheses based on knowledge and experience and validated these using current secondary research. This led to a reduced number of five pivotal barriers, which were then corroborated through an online questionnaire and a series of in-depth expert interviews.

The target population of the survey were professionals knowledgeable about their organization's energy efficiency efforts, including decision-makers, influencers, and implementers across various industries as defined by the MSCI Global Industry Classification Standard (GICS).[13] Of these, we specifically targeted representatives of energy-intensive sectors, such as

- Industrials – GICS: aerospace & defense, construction & engineering, industrial machinery, logistics, transportation (air, ground, water, and transportation infrastructure)
- Energy – GICS: oil, gas, coal, renewables
- Information technology – GICS: software, hardware, semiconductors, IT services
- Materials – GICS: chemicals, construction materials, paper, forestry, mining & metals

to explain the biggest groups among our respondents. In all, the survey yielded 294 valid responses from eight industries across five regions.

Fig. 6.1: Survey respondent roles.

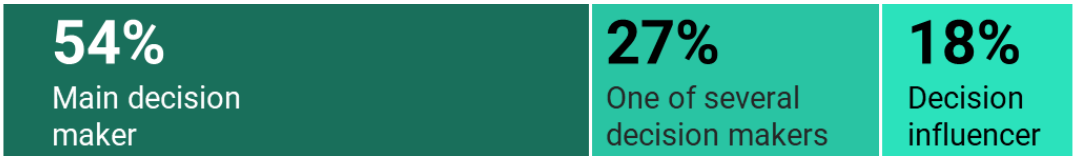

Fig. 6.2: Survey respondent responsibilities.

[13] See https://www.msci.com/our-solutions/indexes/gics.

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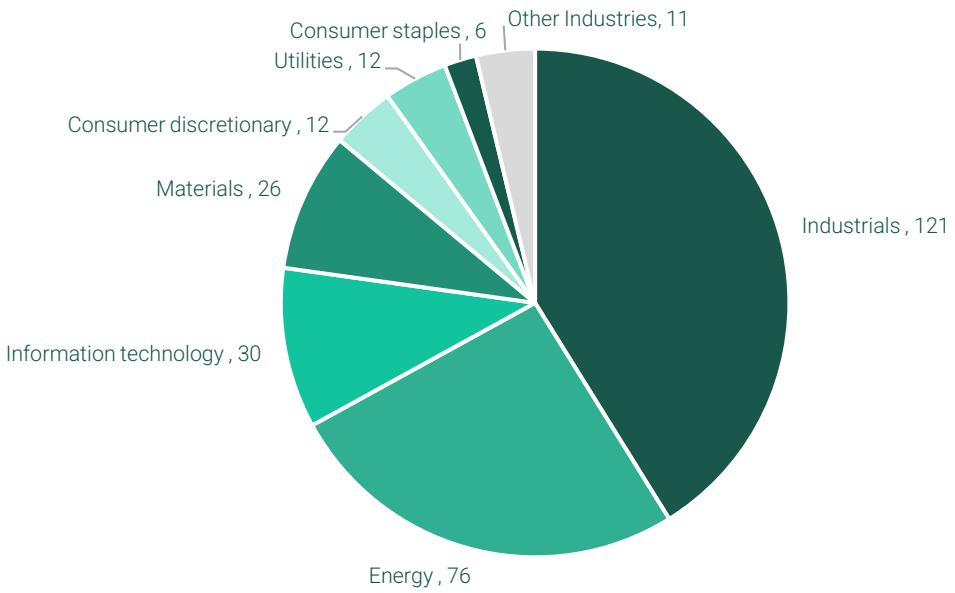

Fig. 6.3: Industry representation among respondents; absolute numbers.

Survey design

Data were collected through an online survey distributed by email, ensuring accessibility and ease of completion. Addressees were approached from both the Energy Efficiency Movement network (the "Movers") and a general sample of companies approached through a specialized agency. 27% of the respondents were EEM Movers. The non-EEM Movers helped to limit possible bias from the results.

The geographic scope was global, in principle, even though collecting responses from Latin America and Africa, in particular, proved difficult. The majority of respondents came from the Asia-Pacific region and Europe, followed by North America.

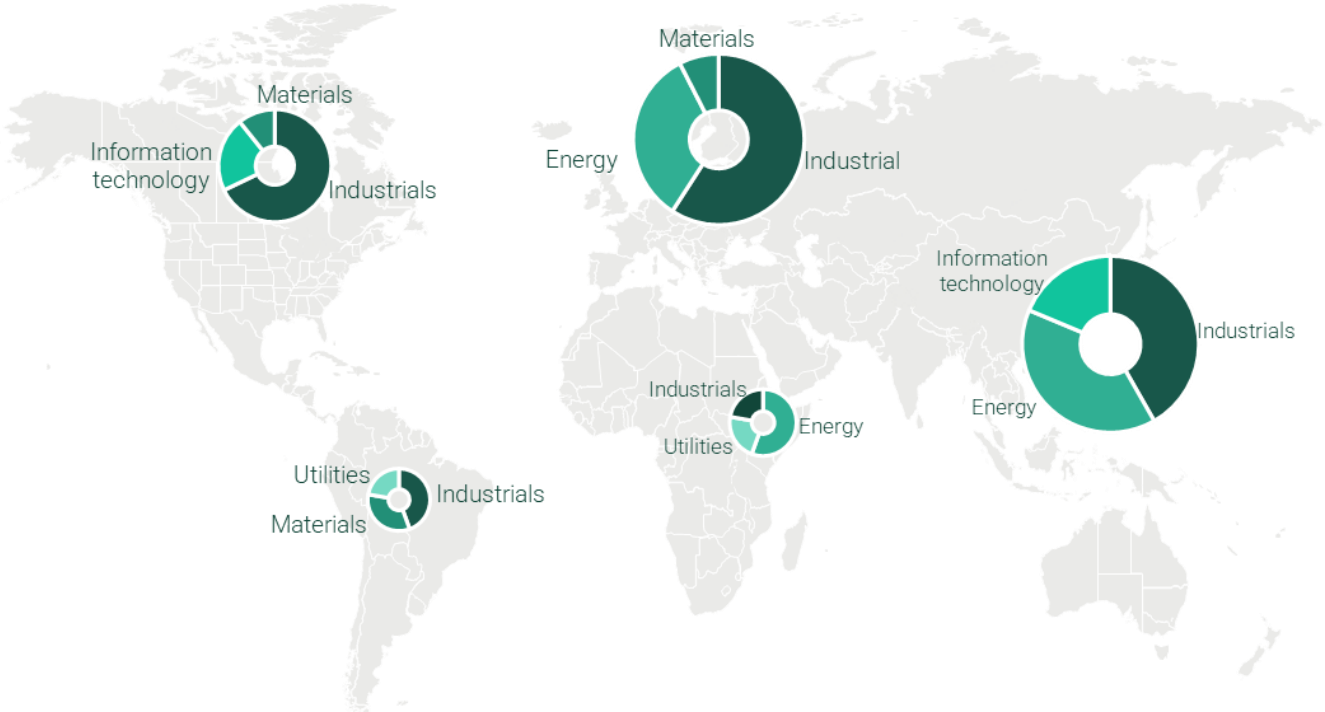

Fig. 6.4: Top 3 respondent industries across geographies; pie size is proportional to the number of responses.

Most respondents came from larger companies from upwards of 1,000 employees.

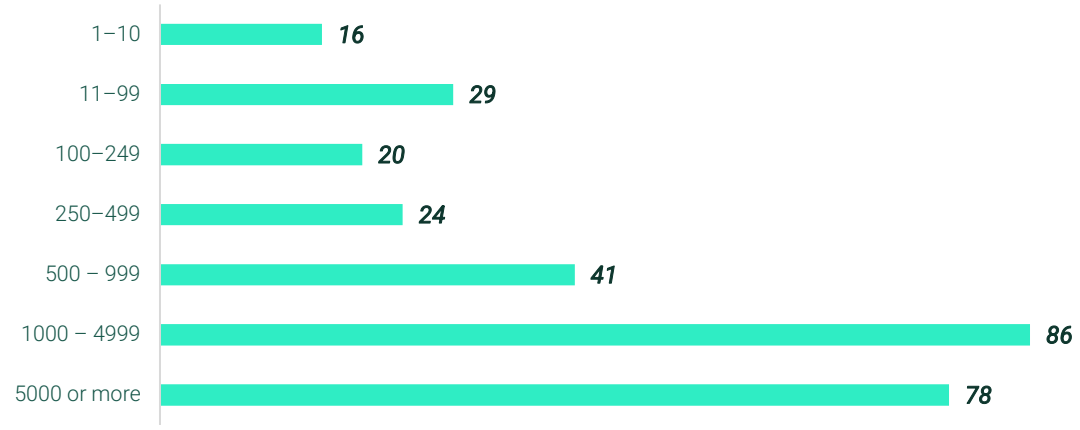

Fig. 6.5: Response count across company sizes (left: number of employees); right: number of respondents.

Questionnaire and interviews

The questionnaire included closed-ended questions (radio buttons, checkboxes, rating scales) and open-ended options for qualitative insights. A conditional logic was applied to tailor questions based on responses. Thus, if the priority level of energy efficiency is low for an organization, the survey aimed to understand the factors behind that low prioritization.

The survey was conducted anonymously. The online questionnaire was open for five weeks until Sunday March 30th, 2025. Following tests, a processing time of about ten minutes was assumed.

The data was analyzed in MS Excel using a range of statistical methods, including t-tests assuming unequal variances, ANOVA, chi-square tests, correlation analysis, and regression analysis. These tests were applied to examine patterns in perceived barriers to energy efficiency across different organization sizes, industry sectors, and budget trends. A 5% significance level ($p < 0.05$) was used to determine statistical validity and to ensure robustness in the interpretation of the results. The results are accurate within a margin of error of ±5.7% at a 95% confidence level, based on a sample size of 294 respondents.

Out of the total of 294 responses, 260 participants ranked the five given barriers. Therefore, all percentage figures related to barrier rankings in the report are based on these 260 respondents. The results shown in Figure 4.5 only include those who selected “Strongly agree” or “Agree” with the statements, excluding any respondents who selected “Don't know” from this sample.

To gain deeper insights into the nature of internal barriers and how to overcome them as well as to capture best practice from energy efficiency leaders, ten in-depth interviews were conducted among selected questionnaire respondents. The insights are integrated into the report’s narrative and highlighted through selected quotes. The roadmap to overcome key barriers has been developed based on insights from the survey and supplemented by interviews with internal and external experts. It also reflects additional analysis and informed perspectives from Accenture and Energy Efficiency Movement teams.

07 Further reading

International Energy Agency

Energy Efficiency 2024 (Paris: IEA, November 2024).

https://www.iea.org/reports/energy-efficiency-2024

Energy and AI (Paris: IEA, April 2025).

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United Nations

United Nations Environment Program Copenhagen Climate Centre: *The Climate Technology Progress Report 2024* (Copenhagen: UNEP-CCC, 2024).

https://unepccc.org/climate-technology-progress-reports/

Energy Efficiency Movement

The Case for Industrial Energy Efficiency (Zurich: EEM, November 2023).

https://www.energyefficiencymovement.com/insights/main/industrial-efficiency/

From Insight to Implementation. Business Perspectives on Energy Efficiency Investments (Zurich: EEM, April 2024).

https://www.energyefficiencymovement.com/insights/main/investment-readiness/

European Commission

Draghi, Mario: *The Future of European Competitiveness*, parts A and B (Brussels: European Commission, September 2024).

https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en

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08 Imprint and acknowledgments

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About

The **Energy Efficiency Movement (EEM)** is a non-profit association empowering the adoption at scale of energy efficiency within industry. The Movement accelerates energy efficiency in industry by sharing knowledge, enabling training and fostering collaboration. We unite industry leaders and leverage their collective expertise and resources to drive the world towards net zero. The EEM was launched in 2021 as a voice of industry and now serves more than 500 organizations in 40-plus countries.

Accenture is a leading global professional services company that helps the world's leading organizations build their digital core, optimize their operations, accelerate revenue growth, and enhance services – creating tangible value at speed and scale. We are a talent- and innovation-led company with approximately 801,000 people serving clients in more than 120 countries. Accenture joined the Energy Efficiency Movement as a Mover in 2023.

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Peer readers:

Jayanta Chaudhuri, Director, Marketing, Alliances & Partnership, Alliance for an Energy Efficient Economy (AEEE)

Rosa A. García, Energy Efficiency and Cooling Specialist at Sustainable Energy for All (SEforALL)

Prof. em. Dr. Johann Walter Kolar, Member of the Executive Committee EEM, ETH Zurich

Emma Mooney, Energy Analyst in the Office of Energy Efficiency and Inclusive Transitions, IEA

Tom Ramsson, Technical Advisor, Motors and Industrial Products at CLASP

Tobias Vernersson, Business Development Manager Energy Efficiency, Alfa Laval

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