Business Breakthrough Barometer 2026

→ *The annual pulse check from business on the pace of the climate transition*



World Business Council for Sustainable Development

In partnership with

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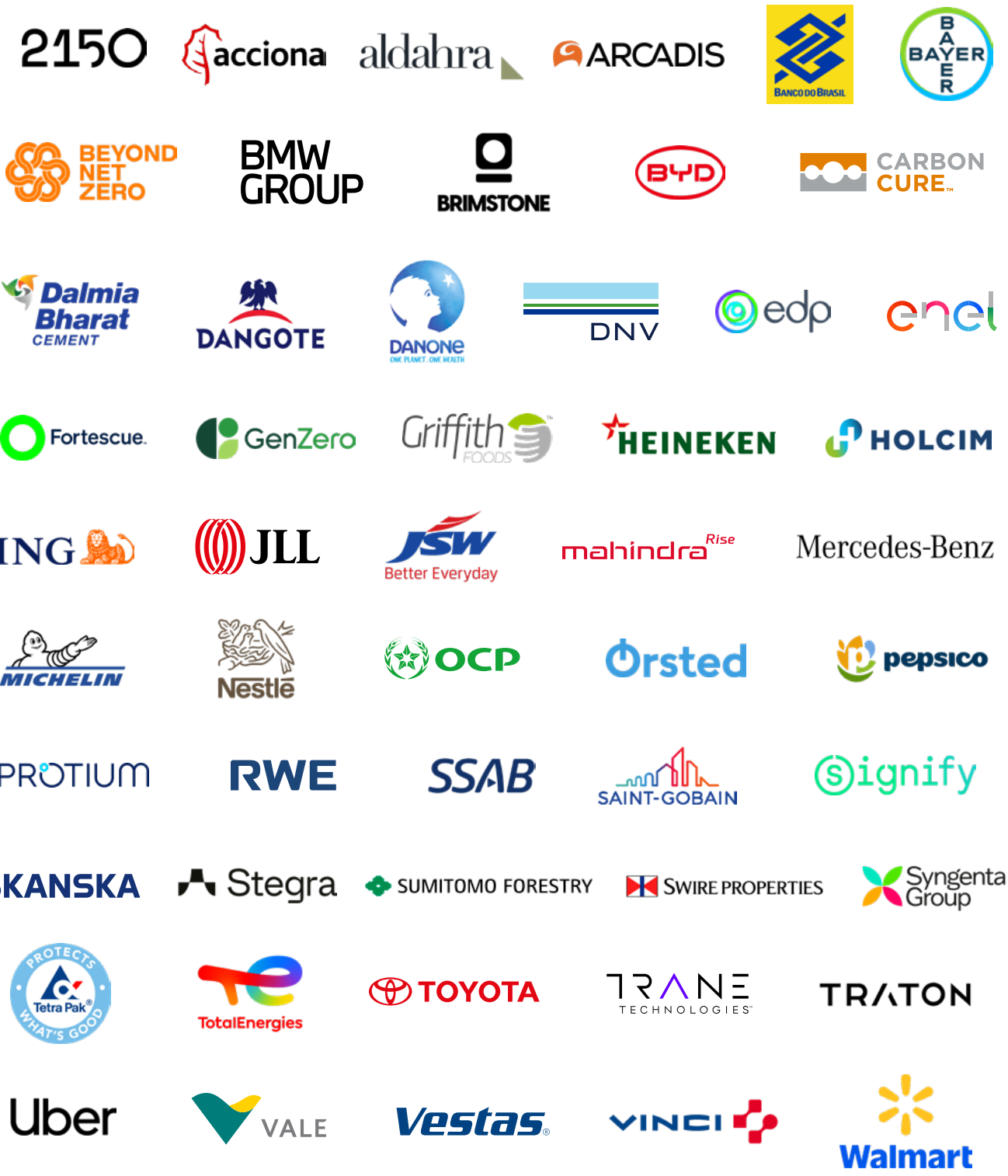
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cedes

CEMDES Consejo Empresarial para el Desarrollo Sostenible del Ecuador

CII Confederation of Indian Industry

CGLR Council of the Great Lakes Region

DERES Empresas por un Uruguay Sostenible

EPE Entreprises pour l'Environnement

econsense Forum for Sustainable Development of German Business

FIBS

Responsible Business Forum

forética

Future Up

maala

NBI National Business Initiative

Perú Sostenible

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Forewords

Is sustainability over?

It's a question I've been asked repeatedly over the past year, as economic pressure, geopolitical uncertainty and competing business priorities intensify. My answer is always the same, 'no,' but with the caveat that sustainability is changing.

The *Business Breakthrough Barometer 2026* shows that the era of sustainability driven primarily by ambition is coming to an end. What is emerging is a new, more durable phase, where sustainability is increasingly paying its way as a source of resilience and competitiveness.

Almost all business leaders expect sustainability to deliver competitive advantage over the next decade. The vast majority continue to maintain or increase their investments. Companies are scaling solutions including clean energy, electrification, circularity and regenerative agriculture because they can deliver lower costs, secure supply-chains and improve business resilience.

Yet even as these solutions prove their worth, businesses are facing a growing storm of increasing climate costs, supply chain shocks and policy reversals. Signals of a disorderly transition are intensifying, with concerns that without stronger coordination and consistent signals from governments and policymakers, these pressures will only intensify, resulting in higher costs for businesses and consumers.

This is why the message from businesses from this year's Barometer is clear: strengthening policy and action now is preferable to delaying the harder choices.

We need a renewed long-term focus, and work collectively, recognizing that sustainability is a core driver of competitive advantage, of growth opportunities and improving our future resilience. This is where the Business Breakthrough Barometer provides signposts. It gives a clear, business-led outline of where opportunities are growing, where implementation is stalling and the practical actions needed across multiple solutions to scale investment.

So, yes, sustainability is changing, but it is becoming even more essential. The task now is to reduce the risks of disorder by turning commitment into implementation.



Peter Bakker
President and CEO,
WBCSD

Forewords

A year of geopolitical turbulence would, by most expectations, have slowed corporate investment in the climate transition. Instead, the central finding of this year's Business Breakthrough Barometer is the opposite: companies are moving forward.

Nearly 90% of the 508 companies and business leaders surveyed have either kept pace or increased their climate-related investment over the past year. Even more expect their sustainability strategy to deliver competitive advantage over the coming decade. Ambition is climbing too: 38% of companies strengthened their climate targets in 2025, double the share a year ago. Only 4% weakened them.

As Climate High-Level Champions, we lead the Global Climate Action Agenda – a core part of the UN climate process – where companies, cities and investors work alongside governments to implement solutions. Businesses are not peripheral to climate action: they play a central role in delivery. Governments set direction and shape incentives. Companies then mobilize capital and orchestrate the supply chains that move the global economy, fostering together sustainable social economic development. Of the nearly 500 climate initiatives being advanced through the Action Agenda, most include a significant business component or rely on the private sector as a core implementation partner.

The Action Agenda also recognizes that the climate transition is not only about reducing emissions or making wise economic decisions. It is about improving lives. People want climate action that delivers secure food, safe air, clean water, jobs, and affordable energy. Equally, businesses depend on these factors to grow and compete.

Momentum is strong, and solutions are available. But we also know that we need to realize them faster. Around two-thirds of business leaders now see a higher risk of a disorderly transition than a year ago, driven by abrupt policy shifts, sudden changes in demand, and supply chain disruption. 85% of business leaders would prefer predictable policy strengthening over stop-and-start volatility, even when this carries higher costs in the short term. When policies change unexpectedly, capital is stranded. When permitting stalls, projects fail to move forward. Predictable and continuous policies are critical to governments, communities and businesses to move forward with solutions.

What gives us confidence is that corporate investment in sustainability is a story of innovation and competitiveness as well as social well-being. That is the spirit in which we encourage readers to take heed of this year's report: as a vision for how business and governments can together promote sustainable social economic development by implementing solutions.



Samed Ağırbaş
COP31 Climate
High-Level Champion



Dan Ioschpe
COP30 Climate
High-Level Champion

Executive *Summary*



01.

01. Executive Summary

The solutions driving the transition are no longer alternatives, they are becoming the most competitive, resilient and secure business choices.

92% **of leaders expect sustainability to be a source of competitive advantage over the next 5-10 years, with 89% maintaining or increasing investment over the past year.**

Businesses increasingly view their sustainability strategy as a route to improve resilience, manage risk and unlock future growth. The Barometer shows that 92% of business leaders expect sustainability to be a source of competitive advantage over the next 5–10 years, with 89% maintaining or increasing investment over the past year and the year ahead. This is translating into a shift in capital allocation: companies are implementing solutions that deliver lower business costs, greater supply-chain security and improved resilience including clean energy, electrification, circularity and regenerative agriculture. Solutions from electric vehicles to green buildings are also unlocking new sources of growth and customer demand making them the foundation of long-term value creation.

"If you do sustainability correctly, you can increase resilience and improve your business model."

– Executive, Road transport company

However, businesses warn that signals of a disorderly transition are intensifying, as climate costs rise.

68% **of leaders now view a disorderly transition — one that is unplanned or poorly coordinated — as more likely than a year ago as climate, policy and geopolitical volatility compound.**

Growing climate impacts, transition policy volatility and geopolitical fragmentation are translating into increased costs for business by disrupting operations, undermining investment confidence and increasing uncertainty. As a result, 68% of leaders now view a disorderly climate transition, one that is unplanned or poorly coordinated, as more likely than a year ago. Nearly half (47%) of companies reported higher climate-related costs over the past year due to supply chain disruption, damage to infrastructure and rising insurance premiums, and more expect costs to grow in the year ahead. A disorderly transition is viewed as a risk to almost all businesses (98%), 40% view it as significant or critical, yet just 15% feel fully prepared.

"The case for the agricultural transition is getting stronger and stronger, as more regions are affected by heat and by water stress."

– Executive, Food company

Businesses urge predictable policy strengthening to unlock investment and reduce risks

85% **of leaders favor strengthened policy over delays; 37% would accept higher near-term costs to reduce disruption.**

The Barometer shows that 85% of leaders favor stronger policy now, with only 4% favoring delays, and a significant share (37%) are willing to accept higher near-term costs to reduce the risks of climate disruption. Clarity and stability of transition policy and regulation is cited by over half of businesses as a key factor in investment decisions, making policy certainty a competitive advantage for countries. However, without stronger government action and international coordination businesses warn that a disorderly transition risks supply chain disruptions (42%), energy cost volatility (38%), inflation and increased prices for consumers (22%).

"We need long term, stable polices that can ensure that our investments will actually be profitable."

– Executive, Power company

The implementation challenge is now highly practical: tackle bottlenecks to scale proven solutions.

- → **For business:** Double down on proven solutions that strengthen resilience and competitiveness, whilst working across the value-chain and with governments on remaining challenges.
- → **For governments:** Strengthen policy predictably to provide the certainty that lowers the cost of investment, support demand creation, and scale clean energy and electrification as the backbone of a competitive, resilient economy.
- → **For international cooperation:** Support coalitions of the willing and individual actors to tackle the highest-leverage bottlenecks to accelerate implementation.

Introduction



02.

01. Introduction

The Business Breakthrough Barometer 2026 is the third annual report providing business-led perspectives in real time on how investments, business strategy and priorities are evolving in response to climate change and the transition to a low-carbon economy.

The climate transition has entered a new phase. Businesses have set long-term goals and solutions are increasingly proven. Yet businesses are navigating a landscape shaped by geopolitical fragmentation, shifting policy signals and rising climate impacts. Developed by WBCSD in partnership with the Breakthrough Agenda, and the Marrakech Partnership for Global Climate Action, and supported by Bain & Company and the High-Level Climate Champions, the *Barometer* provides insights for businesses, governments and international institutions on how these dynamics are impacting business priorities and what is required to accelerate implementation.

A business-driven input to the Action Agenda

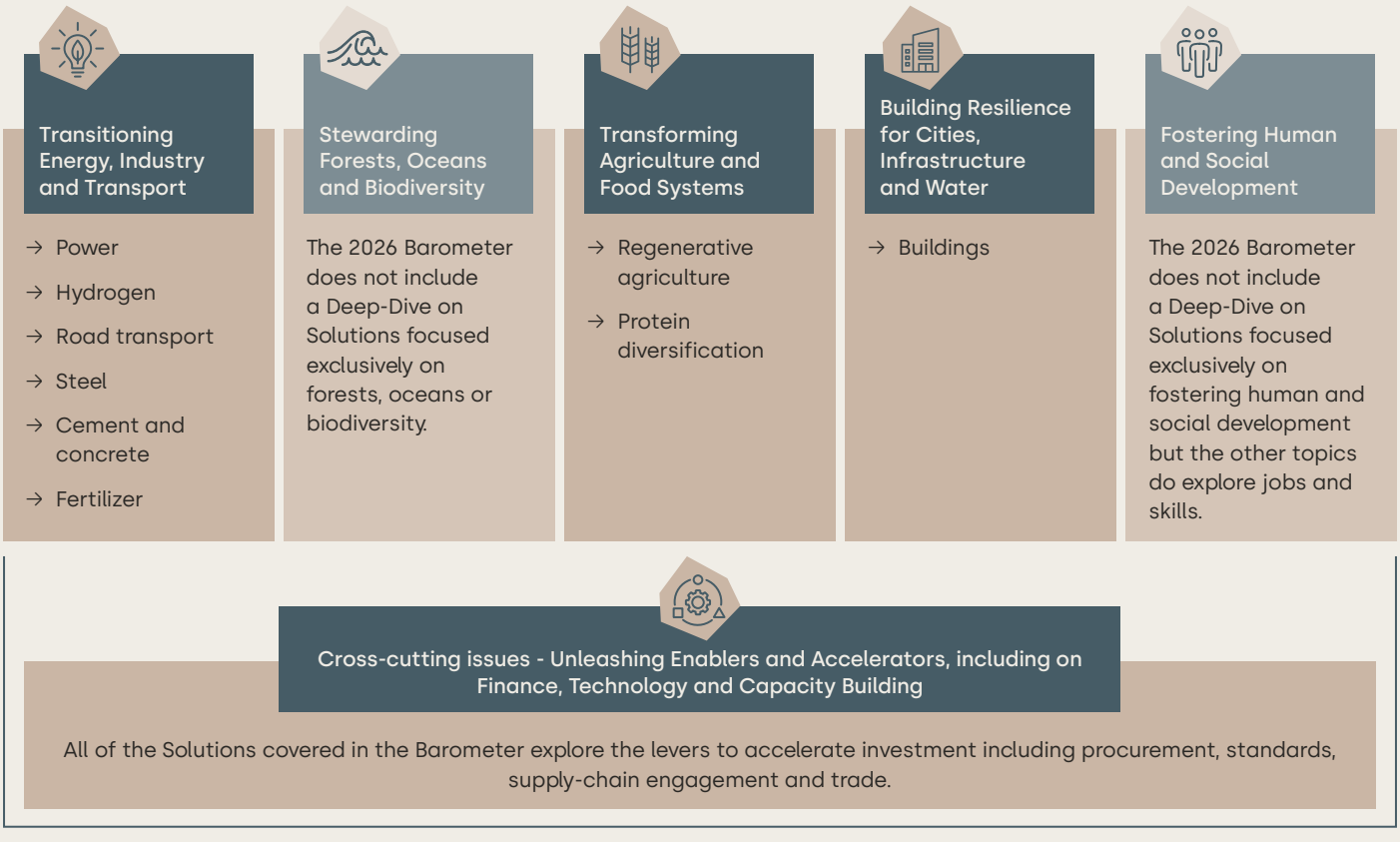
The 2025 United Nations Climate Change Conference (COP30) was a moment of inflection, from targets to implementation that accelerates investment and deployment on the ground.

COP30 saw a renewal of the Action Agenda – the mechanism that encompasses all voluntary efforts outside the negotiations – focused on identifying and mobilizing measurable progress across six thematic areas over the remainder of the decade (Figure 1).[1]

The *Business Breakthrough Barometer* contributes to this shift to implementation. It provides a grounded view from business leaders of the state of the climate transition, including a snapshot of progress on solutions across five sectors: energy, industry, transport, food systems, buildings. These solution deep-dives highlight where businesses are making progress, the bottlenecks stalling investment, and where political and business efforts must focus to accelerate implementation. We have chosen the solutions for their contribution to the Action Agenda objectives (Figure 1) and their potential to deliver significant progress on reducing global emissions and enhancing resilience. Taken together, the solutions have the potential to tackle more than half of global emissions.

The *Barometer* therefore offers a synthesis of insights to inform where businesses and governments can most effectively focus efforts through the COP31 Action Agenda and other international forums in 2026.

Figure 1: Business Breakthrough Barometer Deep-Dive Solutions included in this report and their contribution to the Global Climate Action Agenda six thematic axis.



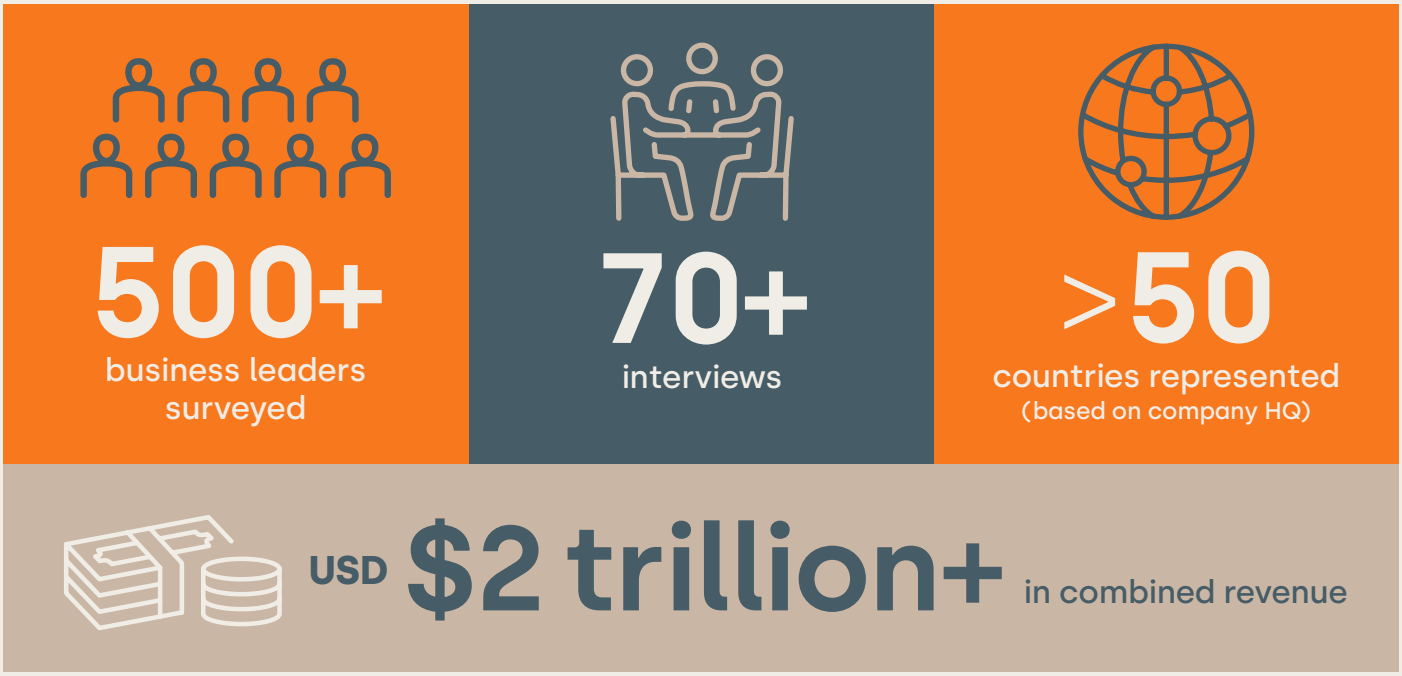
A real-time pulse check from leading businesses

The 2026 edition draws on a wide base of business input, including a survey of over 500 companies, interviews with over 70 senior executives, consultations with sector and business organizations focused on sustainability, and sector-level analysis conducted between February and May 2026 (see the Methodology). These companies span geographies, sectors and value chains within and beyond the WBCSD membership – from global multinationals to emerging innovators – and collectively represent a significant share of global economic activity. The findings reflect leader expectations and reported behavior, providing an indicator of how the transition is unfolding in practice and where markets, policy and investment are heading next. The participants are principally located in major markets, but embedded throughout global supply chains. We have placed emphasis this year on increasing insights from businesses headquartered in South America and Asia-Pacific, and have expanded it to include land-based value chains.

Who this report is for

This report provides insights for decision-makers shaping the next phase of the transition:

- **Governments:** to better understand business perception of risks, progress and opportunities by showing where policy is enabling – or constraining – investment and to identify actions that accelerate economic opportunity;
- **Businesses and investors:** benchmark progress, understand improvements across solutions, and inform decision-making and priorities for government engagement;
- **Sector and value chain initiatives:** identify where collective action is needed to unlock scale;
- **International organizations and COP participants:** inform the priorities of the Action Agenda to more rapidly accelerate implementation and investment.



Global Business *Sentiment*



03.

Section 1: The solutions driving the transition are no longer alternatives, they are becoming the most competitive, resilient and secure business choices.

92% of leaders expect sustainability to be a source of competitive advantage over the next 5-10 years.

89% maintaining or increasing investment over the past year.

Businesses expect their sustainability strategy to deliver a competitive advantage through improved resilience, risk management and future growth opportunities.

This year's *Barometer* shows that 92% of business leaders expect their sustainability strategy to be a source of competitive advantage over the next 5–10 years. These responses are consistent across all regions (Figure 2a) and sectors, with slightly higher expectations in Latin America and the Middle East and North Africa (MENA) (Figure 2b). This is driving businesses sustainability strategy today, with responses indicating that resilience and risk management are now equally important to regulatory compliance (52%). The data also shows that future growth opportunities (Figure 3) are critical for almost half of businesses (46%) surveyed. Customer demand emerged as a particularly strong driver of sustainability strategies for businesses headquartered in North America (68% of responses).

In interviews, businesses indicate that they are scaling measures such as clean power, electrification, circularity and regenerative agriculture not solely as climate measures. They are doing so because these measures are increasingly the most cost competitive, secure and resilient options available. Falling technology costs, exposure to fossil fuel price volatility, rising supply chain risks due to climate change and strengthening (if uneven) policy and regulation are shifting the economics decisively in their favor. Businesses also indicate that solutions such as electric vehicles (EV) and green buildings are emerging as a source of future market growth and customer demand. As a result, these solutions are no longer alternatives to the core business model – they are becoming the core business model, delivering lower operating costs, greater supply chain stability and long-term competitiveness.

Figure 2: Over the next 5–10 years, do you expect your company's sustainability strategy to be a source of competitive advantage within your sector?

Figure 2a: Global

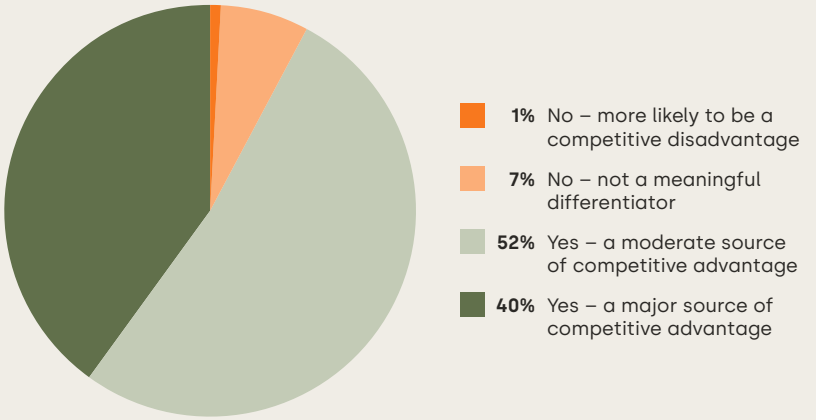
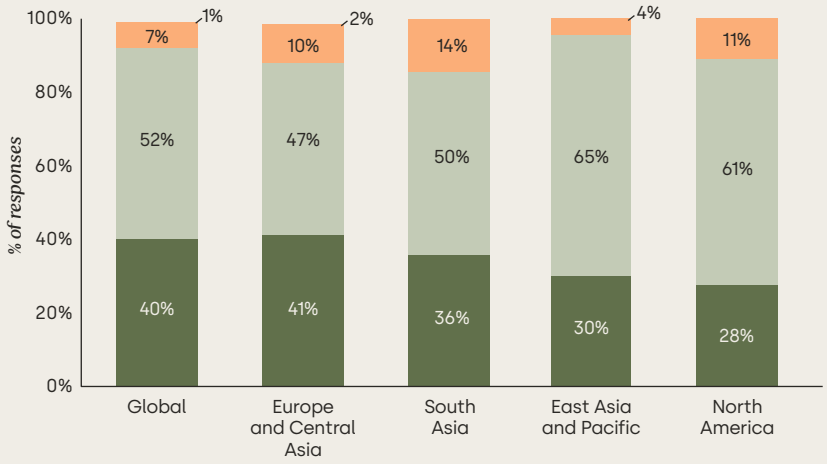


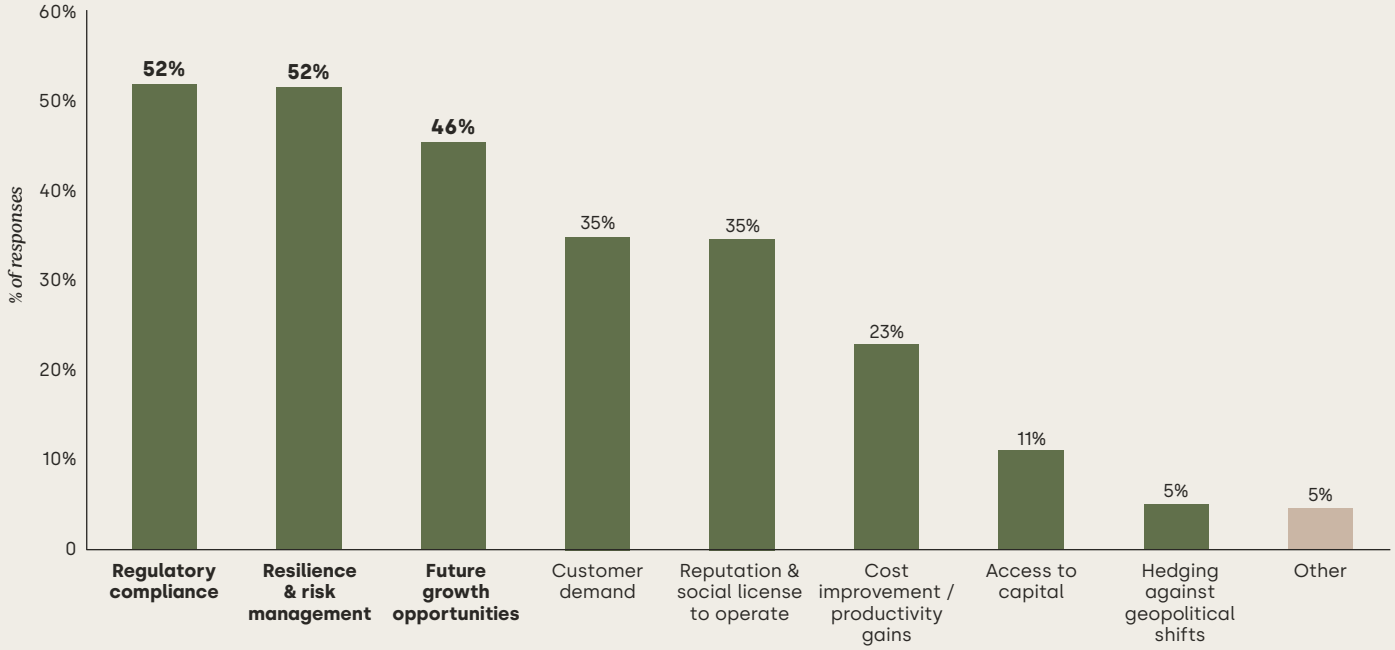
Figure 2b: Regional



WBCSD Barometer Survey Feb-May 2026 (N=508)

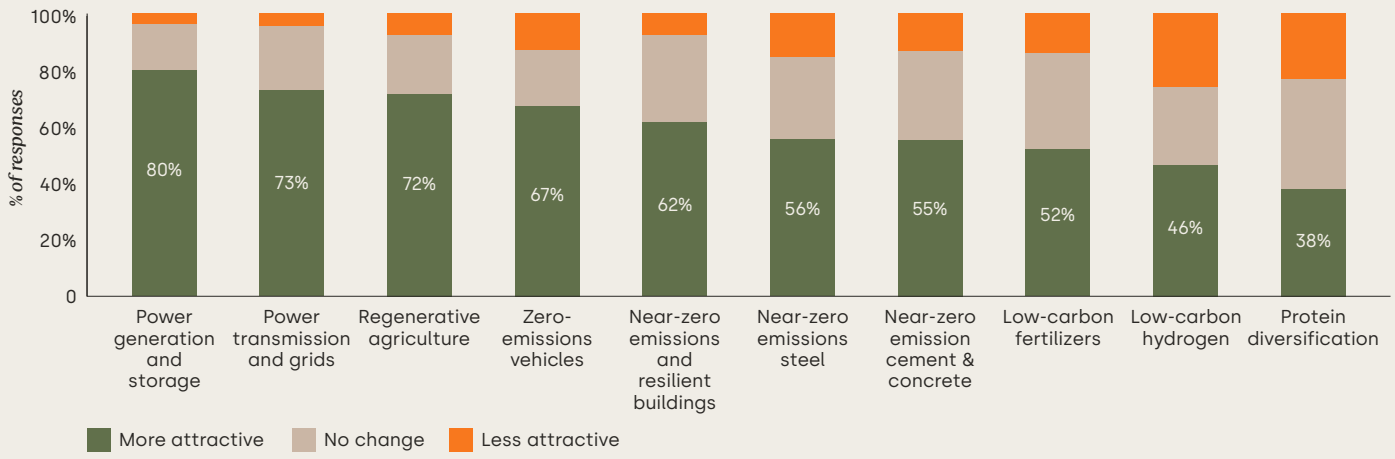
Businesses assessment of investment attractiveness of solutions underlines this, with an overall positive shift indicated for all explored in the *Barometer* over the past year – from power generation to low-carbon cement (Figure 4). However, the momentum varies depending on the maturity of the solution, with those at an earlier stage of uptake and with a continuing green premium (including protein diversification, hydrogen, fertilizer and cement) typically seeing less momentum, likely due to the investment case being more sensitive to policy support (see Section 2 and 3).

Figure 3: What are currently the main drivers of your company's sustainability strategy?



Note: Totals exceed 100% as respondents could select up to three alternatives
WBCSD Barometer Survey Feb-May 2026 (N=508)

Figure 4: Over the past 12 months, how has the investment attractiveness of the following solutions evolved?

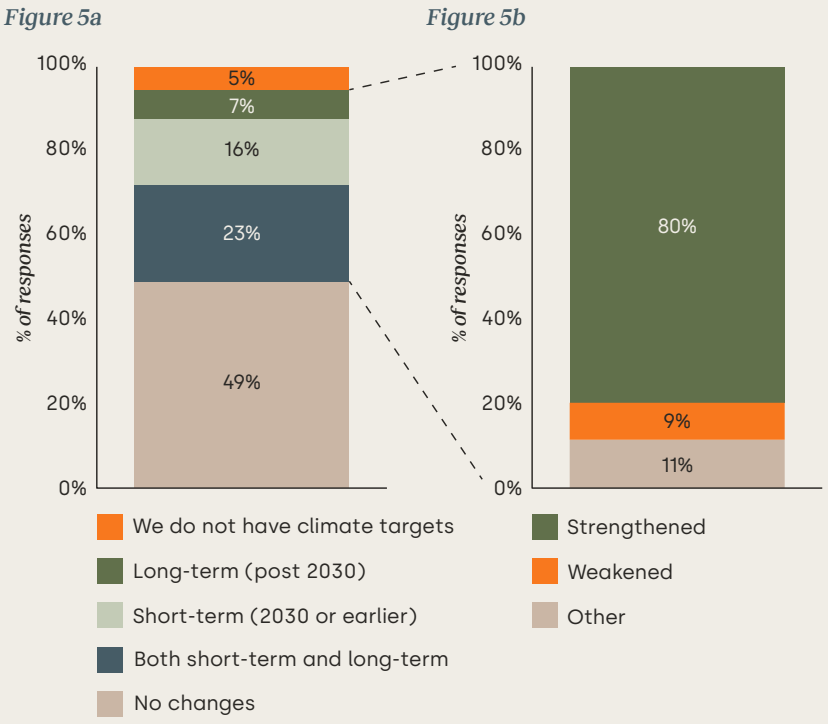


Note: Survey respondents were asked to provide responses only for the solutions that their company depends on for its transition.
WBCSD Barometer Survey Feb-May 2026 (N=508)

In this context, it is not surprising that businesses say they have maintained (49%) or strengthened (38%) their short-term or long-term climate targets, with only 4% indicating they have weakened them (Figure 5a, 5b). Business investments continue to flow towards the transition, with 89% (Figure 6a) (vs 90% in 2024) of leaders saying their company has maintained or increased spending over the past year driven by increased customer demand (59%) (Figure 6b), clearer or stronger policy support (42%) and cost reductions in low-carbon technologies (38%). Looking to the next 12 months, the same number (89%) (Figure 7) expect their investment in climate mitigation, adaption and resilience to either grow or remain stable. The data suggests investment momentum has remained strong in Europe and Central Asia, and Latin America (62% increasing investment in both regions), with the lowest increases in investment levels indicated in East Asia and the Pacific (45%).

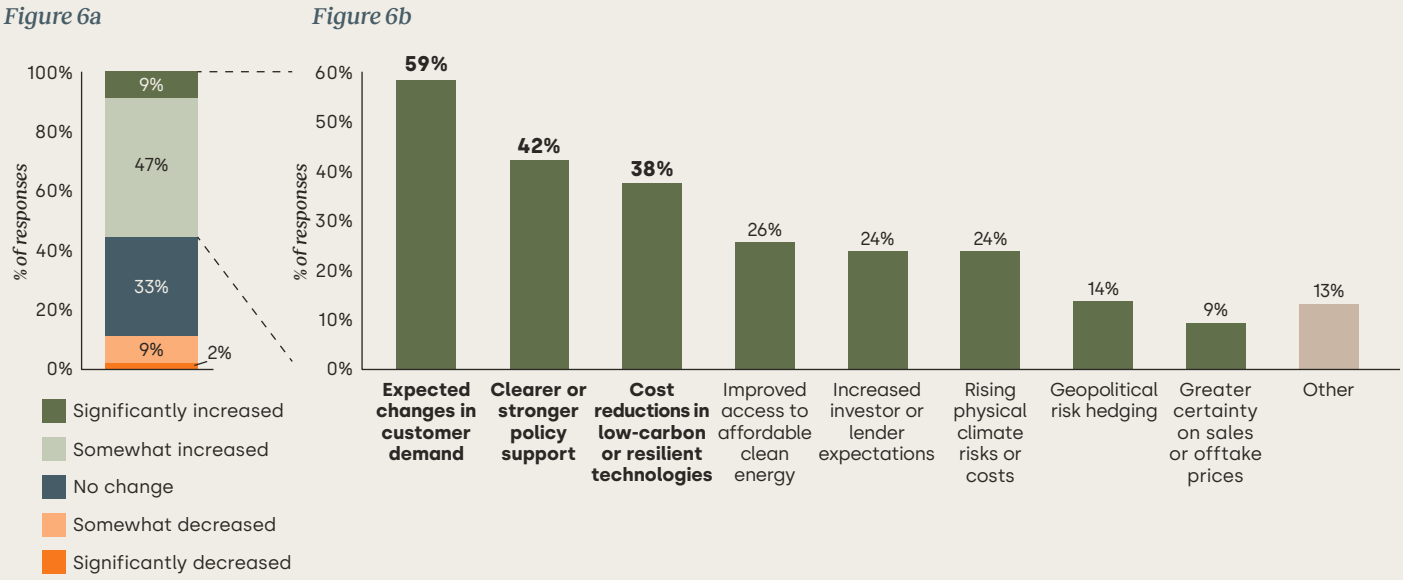
Of the 11% of businesses reducing their investments, lower investor or competing priorities (27%) and less confidence that consumer demand will materialize (23%) were the main reasons, with businesses also highlighting financing constraints and budget or spending cuts (top reasons amongst those who selected 'other').

Figure 5a: In 2025, did your company make any changes to its climate targets?; Figure 5b: How would you best describe the changes made to your company's climate targets?



WBCSD Barometer Survey Feb-May 2026 (N=508)

Figure 6a: Over the past 12 months, how has your company's total investments (CAPEX & OPEX) contributed to climate mitigation, adaptation and resilience outcomes changed compared to the previous year?; Figure 6b: What are the primary reasons for increasing investments in the net-zero transition over the past 12 months?



WBCSD Barometer Survey Feb-May 2026 (N=508)

Note: Totals exceed 100% as respondents could select up to three alternatives; Climate targets refer to company targets covering greenhouse gas emissions reductions and/or removals, including net-zero, carbon neutral, or science-based targets across Scope 1, 2 and/or 3

Progress is not uniform, with businesses focusing on areas where economics and resilience align.

1. Economics and energy shocks are accelerating the business case for clean energy and electrification.

For clean energy generation, power companies, manufacturers and building owners note that geopolitical shocks have elevated energy security and sovereignty alongside climate goals – driving investment in renewables and energy storage as the "new normal". Power generation businesses highlight that such solutions offer a structurally cheaper option than new fossil fuel capacity in core markets. Building owners, leaseholders and manufacturers say that they are rapidly embracing onsite energy generation and storage as a hedge against fossil fuel price shocks and to support independence from imported fuels.

This is backed by analysis showing that clean energy investment grew +8% year-over-year (YoY) in 2025,[3] although this was unevenly distributed. While the EU recorded an 18% rise in investments in renewables and India saw growth of 15%, China and the US were lower at more or less +4%.[4] Continued falling costs in generative technologies and batteries are driving investments, but concentrating where competitive clean energy economics combine with storage and grid readiness.[3]

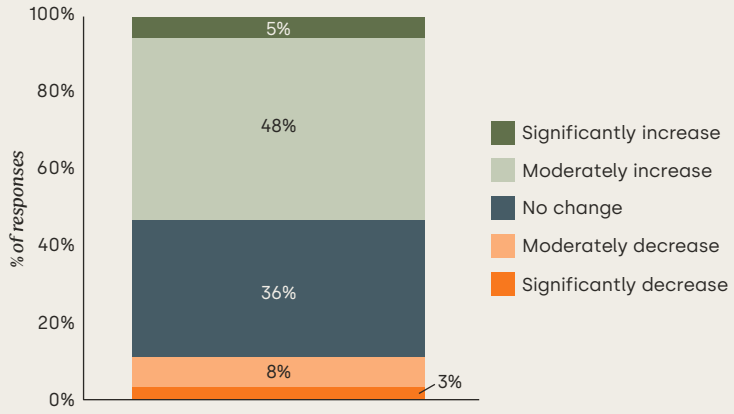
Business leaders welcomed policy developments in the past year that are speeding up grid connections, such as the UK milestone-based readiness sequencing, Australia's South West Renewable Energy Zone Access Scheme tenders for grid access rights for variable renewables and batteries, and the US MISO Definitive Planning Phase which is automating system impact studies and reducing processing time from months to days. However, business leaders caution that grid scale-up and permitting reform still lags demand (see **Section 3**).

"2025 was the best year ever in the energy transition. So, we're talking about record investment, record solar additions, record wind additions, record storage additions."
– Executive, Power company

"We are seeing Chinese solar flooding African markets, enabling the best renewable business cases we have ever seen in Nigeria and South Africa."
– Executive, Food company

"Renewables have been showing that they are the cheaper, the fastest, and the more scalable way of reaching power demand growth."
– Executive, Power company

Figure 7: Over the next 12 months, how do you expect your company's total investment (CAPEX & OPEX) contributing to climate mitigation, adaptation and resilience outcomes to change?



WBCSD Barometer Survey Feb-May 2026 (N=508)

"The more your energy bills go up, the more you're desperate to do something - so the investment case gets stronger."
– Executive, Buildings company

"There's a huge uptick in batteries and on-site generation"
– Executive, Buildings company

On electrification, businesses highlight that battery electric is increasingly the most cost-competitive option for customers in all segments in road transport, with improved vehicle technology, sustained charging infrastructure buildout (China's network grew 45% per year from 2020-2024[6]) and the continued reduction in battery costs all reinforcing the medium-term case for investment,[7] despite challenges caused by regulatory instability and an uneven pace of transition across geographies.

There is noticeable progress in freight, with an exceptional month in December 2025, when more than half of the heavy-duty trucks sold in China were electric.[8] Businesses also indicate they expect that in parts of Europe lighter trucks will rapidly reach total costs of ownership parity with internal combustion engine (ICE) vehicles.[9] Businesses also see growing appetite among consumers to switch to electric passenger vehicles as a way of reducing fuel costs, with affordable Chinese supply driving rapid uptake: Singapore reached ~45% EV share in 2025, Vietnam ~38%, Uruguay ~28% and Thailand ~22%.[10]

"Electrification, EV penetration in India sort of keep on growing at an exponential rate."
– Executive, Road transport company

In industry, food manufacturers in Southeast Asia and Africa cite the benefits of electrifying operations to remove currency exposure from fuel imports, while businesses that made investments ahead of the recent energy shocks are reaping the rewards of improved business resiliency and lower costs.

> *"We had already converted Indian facilities from LPG to electricity-based processes when the LPG supply crisis hit. Those plants were completely unaffected while competitors faced serious operational disruption."*
>
> – Executive, Energy technology company

In India, with state support, the levelized cost of electrolytic ammonia (LCOA) is approaching parity with fossil fuels, with auctions reaching USD $580–650/t compared to gray at USD $515/t in 2025.[11] Businesses say that the recent geopolitical shocks are further strengthening the energy security case for the domestic electrolytic production of low-carbon hydrogen and fertilizer, bolstering investment interest in regions with cheap, scalable renewable resources such as Brazil, India and Morocco as a hedge against fossil fuel import dependency.

> *"Where cheap renewables and shared infrastructure exist, green ammonia can move much closer to conventional (ammonia) economics."*
>
> – Executive, Technology company

Likewise, cost competitiveness and supportive trade policy are the primary triggers in a shift to electric arc furnace (EAF) steelmaking, with customer demand remaining weak when green premiums exist. EAF now accounts for ~30% of global steel capacity, cutting CO_2 emissions by roughly 70% compared to blast furnace production (see Steel solutions deep dive). EAF penetration is high across the EU, US, Middle East and North Africa (MENA), and India. EU trade safeguards, a long-term nuclear power purchase agreement stabilizing electricity costs, and accelerated permitting enabled the ~EUR €1.3 billion Dunkirk EAF investment in France. However, ArcelorMittal suspended the direct reduced iron (DRI) component of its Dunkirk project, citing high green hydrogen and energy costs that made the investment commercially unviable.

2. Material and food security and supply chain resilience through circularity and regenerative agriculture

In the food system, businesses are acutely aware that farm profitability is under significant pressure (following multiple years of below cost production in some regions), while climate volatility is destabilizing yields and increasing production risks. In response, businesses increasingly view regenerative agriculture and protein diversification as risk mitigation strategies that build supply chain resilience and strengthen national food security, especially in import-dependent regions.

Across multiple regenerative agriculture programs, businesses report increasing evidence that regenerative approaches can keep yields stable, improve productivity while reducing emissions, improving removals and strengthening resilience, supporting a stronger farm-level case beyond environmental outcomes. Projections show the regenerative agriculture market could grow by 18.7% annually until 2034, reaching up to USD $72 billion.[12] Such advances can ensure that farming remains economically attractive and supports generational transitions. Businesses emphasize that trust and long-term relationships along the entire supply chain are a prerequisite to enable adoption at scale, grounding programs in local science and ensuring practices are farmer-led, locally relevant and economically viable.

> *"The growing trend towards food security being taken more seriously means that governments are more likely to promote more resilient food systems."*
>
> – Executive, Food company

> *"We have seen how regenerative agriculture can improve farmer economics. If you solve this, you can create the right conditions for younger generations. In the case of Morocco, if people can make a living, they are inspired to stay."*
>
> – Executive, Food company

> *"If farmers are not at the center, regenerative agriculture will not scale – the transition has to start with what helps them build resilient, viable farms, backed by training, local support and long-term buying commitments."*
>
> – Executive, Food company

This year, businesses raised circularity for the first time as an increasingly important element of their strategy, embracing it from a supply assurance perspective rather than as a niche environmental objective. In the road transport industry, manufacturers are increasingly turning to circularity to reduce raw material dependency, with battery material recovery, including reclaiming secondary lithium, cobalt and nickel, particularly important.

> *"If you're not willing to have mining and refining in Europe, then circularity is the only way to go."*
>
> – Executive, Road transport company

3. Energy efficiency, the substitution of materials and alternative fuels are steering pragmatic progress.

In the buildings sector, businesses indicate that corporate tenants are increasingly tying leasing and fit-out decisions to internal climate targets and environmental, social and governance (ESG) reporting requirements. In markets where green buildings are the norm, such as Hong Kong, the dynamic shifts from needing a green premium towards receiving lower returns for less sustainable buildings – a "brown discount". Private wealth and private equity are also increasingly treating the transition to sustainable buildings as a value generation and risk management opportunity rather than a compliance cost, with the focus on proven technologies such as window systems, cooling equipment and building energy management solutions, where lower operating costs provide a financially legible return on investment.

Businesses highlight that this is creating a consistent pull for certified space in high-end commercial buildings. As a result, businesses indicate that certified green buildings command premiums of 5% to 25% in rent and asset values – with LEED-certified projects growing 7% globally in 2024–25.[13] However, mass market residential buildings continue to remain largely outside the certified market and building owners report limited to no appetite from customers to pay a premium for low-carbon concrete or steel in new buildings, as these lack the clear payback logic of operational efficiency.

Cement decarbonization is progressing through near-term decarbonization levers that are cost competitive today, including clinker substitution, waste heat recovery and alternative fuels. These approaches are strongest in markets with abundant supplementary cementitious materials (SCM), such as India, where blended cements with 20–50% lower carbon content are already price-competitive with ordinary Portland cement.[14] Businesses also indicate that CO_2-injected concrete is delivering lower-carbon products at essentially the same price today.

Replacing fossil fuels in cement kilns with waste-derived and biomass-derived fuels is scaling at different rates, too. Europe leads at roughly 50% alternative fuel consumption, but is nearing practical limits due to biomass competition and kiln constraints. India is moving forward through the use of municipal refuse-derived fuel linked to waste management policy. In China, substitution is low due to the availability of cheap coal. These pathways cannot deliver full decarbonization, but demonstrate the potential for significant near-term progress.



Box 1: AI & data centers - Implications for energy, innovation and low carbon markets

Businesses report mixed implications of the scale-up of artificial intelligence (AI) and data centers, with an overall call for integrated energy system planning. Rapid energy demand growth from both electrification and digital infrastructure require coordinated investment and planning to ensure access to reliable, affordable, low carbon power and manage any impacts on water stress.

In certain sectors, AI is noted as an efficiency game changer. Across buildings, industry, energy systems and agriculture, businesses say that AI is enabling design optimization, predictive maintenance and smarter energy management, and could reduce monitoring and verification costs. It is also supporting faster R&D cycles in areas such as predictive toxicology and molecular design.

They also cite large technology companies – especially hyperscalers with public climate commitments – as key accelerants for low carbon products in the building of new data centers, for example by offering early revenue visibility for low-carbon cement and steel in North America and Europe. While still relatively narrow, this demand is helping anchor investment cases and accelerate deployment in select regions.

In the power sector, hyperscalers remain an outlier buyer segment, accounting for 49% of global contracted corporate power purchase agreement (PPA) activity in 2025[15] as they continue to sign large, long-term deals to secure the supply of clean and stable energy capacity.

However, businesses in the transport and industry sectors note that data center scale-up is driving up energy costs, increasing grid pressure, and competing with electrolytic hydrogen and EV charging. In agriculture, businesses note the need to ensure that data centers don't enhance water stress.

"I think that all that AI brought also enables better, more maximized use of the technologies."

– Executive, Power company

"As data centers compete for more electricity, it could be affecting local electricity prices."

– Executive, Buildings company

Section 2: Businesses warn that signals of a disorderly transition are intensifying, as climate costs rise.

68% of leaders view a disorderly transition as more likely than a year ago.

47% of companies experiencing higher costs from physical climate impacts.

Businesses are feeling exposed to the impacts of a disorderly transition.

Despite significant progress on the transition, businesses are experiencing compounding volatility from increasing climate costs, policy instability and geopolitical shocks. Leaders say this is causing growing systemic risks for businesses and clouding investment horizons. Over two-thirds of leaders (68%, Figure 8a) view a disorderly transition, one that is unplanned or poorly coordinated (see Box 2), as more likely than a year ago, with the greatest concern seen in North America (94%, Figure 8b).

Nearly all leaders (98%, Figure 9a) consider a disorderly transition to be a risk to their business, with 40% saying it is significant or critical; however, just 15% (Figure 9b) are confident that their businesses are fully prepared. The highest concerns are in East Asia and the Pacific, where 47% of respondents have weak confidence in their preparedness. The biggest risks that companies identify from a disorderly transition (Figure 10) are supply chain disruption (42%), abrupt policy shifts (41%) and shifts in market demand or energy volatility (both 38%). Nearly a quarter (22%) indicate that a disorderly transition could result in inflation and increased prices for consumers.

Box 2: What is a disorderly transition?

The Network for Greening the Financial System (NGFS), which develops climate scenarios used by regulators and others, defines "orderly scenarios" as those that "assume climate policies are introduced early and become gradually more stringent" with "both physical and transition risks relatively subdued". This is opposed to disorderly scenarios with "policies being delayed or divergent across countries and sectors".

Figure 8: Compared to 12 months ago, how has your view of the likelihood of a disorderly transition changed?

Figure 8a: Global

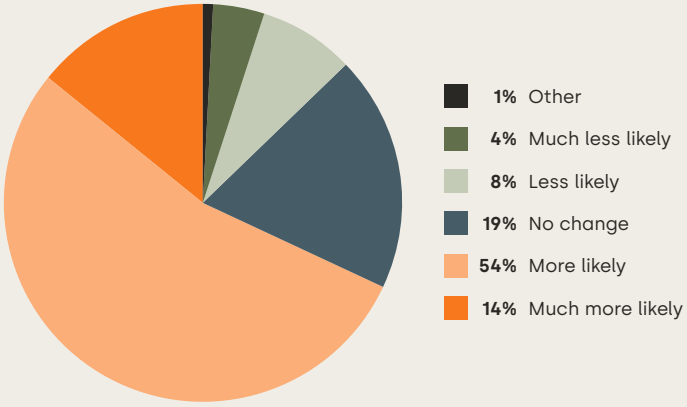
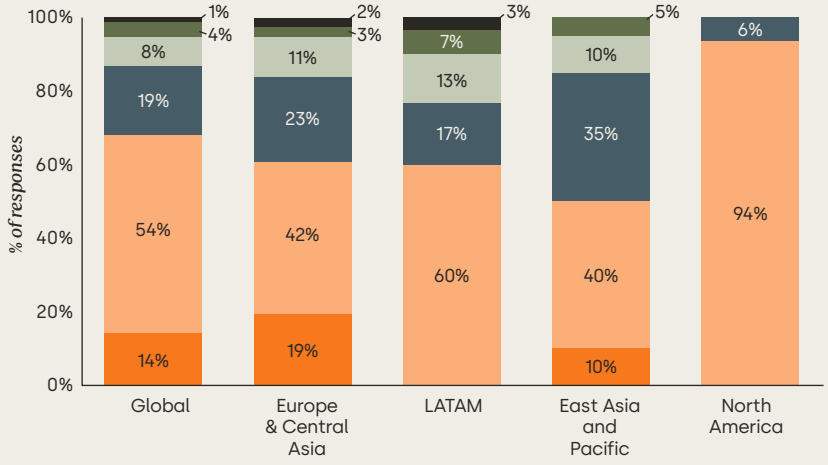


Figure 8b: Regional



Notes: Disorderly refers to a global transition to a low-carbon or net-zero economy that is unplanned or poorly coordinated, potentially resulting in abrupt policy shifts, climate tipping points, price shocks or social disruption

Excludes "I do not know response"

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Figure 9a: How significant are the risks a disorderly transition poses to your company? Figure 9b: How confident are you that your company's current business planning adequately accounts for a disorderly transition?

Figure 9a

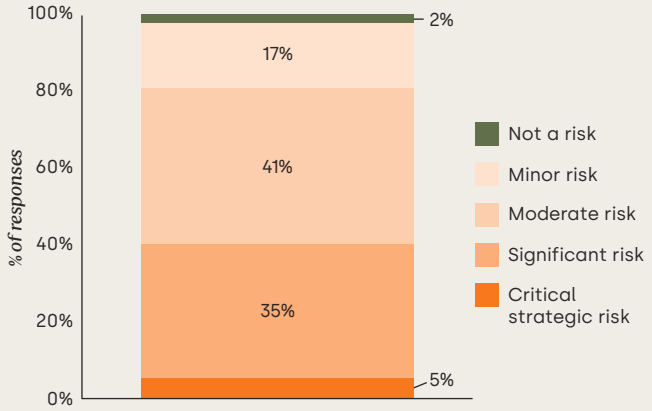
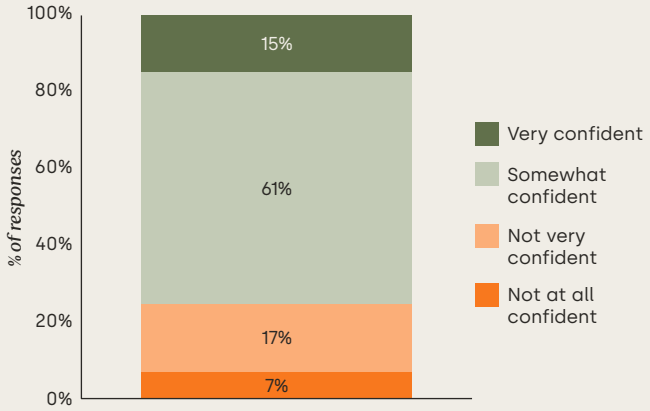


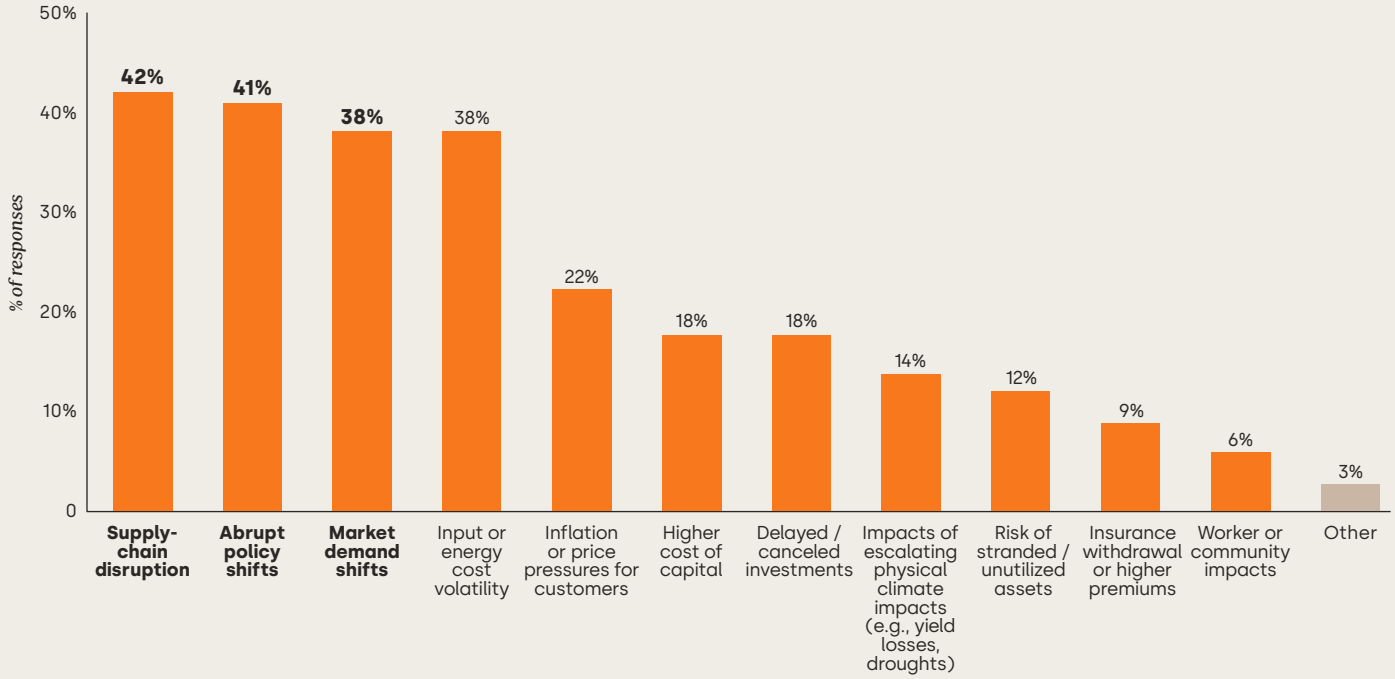
Figure 9b



Note: Disorderly refers to a global transition to a low-carbon or net-zero economy that is unplanned or poorly coordinated, potentially resulting in abrupt policy shifts, climate tipping points, price shocks or social disruption.

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Figure 10: What are the biggest risks a disorderly transition would pose for your company?



Note: Totals exceed 100% as respondents could select up to three alternatives.

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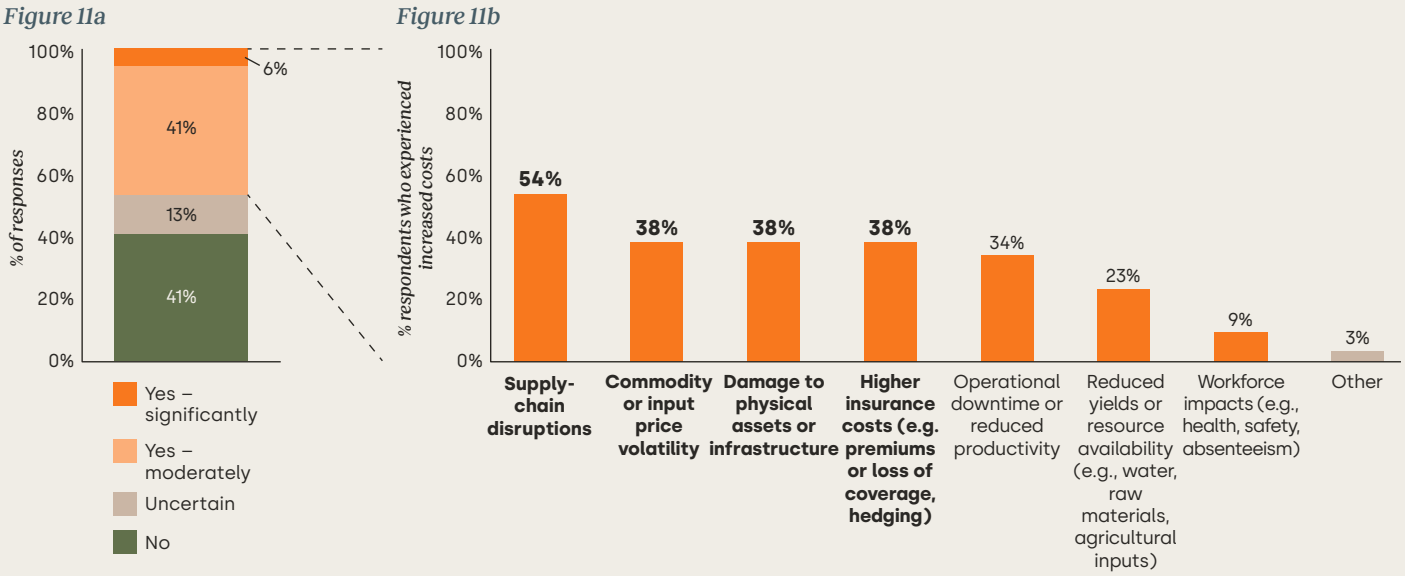
1. Climate impacts are becoming a systemic cost driver accelerating business risk, disrupting operations and pushing resilience from a peripheral concern.

Business costs from extreme weather rose for 47% of companies last year; a higher share (49%) expect these costs to increase further over the next 12 months (Figure 11a, Figure 12). Regionally, 94% of North American headquartered businesses say they experienced increased costs over the last year, compared to 60% in East Asia and the Pacific and 39% in Europe & Central Asia. Evidence shows that the US experienced the highest share of annual climate damage value, at USD $810 billion out of global total of USD $1.3 trillion in 2025.[16]

These increased costs were primarily due to (Figure 11b) supply chain disruptions (54%), commodity or input price volatility (38%), damage to physical infrastructure (38%), and insurance costs from higher premiums or loss of coverage (38%). Supply chain disruption impacts were particularly noticeable for North American headquartered businesses (80%) and for those in East Asia and the Pacific (67%).

Power sector companies note that damage to physical assets and supply chain disruptions are a significant cost driver for utilities. Business and government responses to physical climate risks vary in different sectors and regions. US states are introducing state-level mandates for wildfire mitigation and power utility resilience due to escalating climate shocks; in Portugal, extreme weather events are accelerating grid hardening; and in Asia-Pacific, climate stress combined with rapid demand growth are making grid reliability a priority. However, business leaders note that across most European countries, power sector resilience remains a discussion topic rather than operationally integrated into capital allocation.

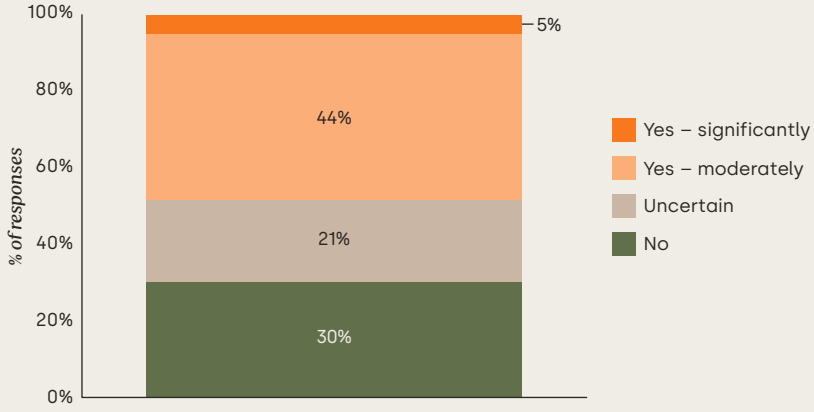
Figure 11a: In the past 12 months, has your company experienced increased costs due to physical-climate impact? Physical climate impacts include extreme weather events, heat stress, flooding, drought, or water scarcity, etc.; Figure 11b: Which factors contributed to these increased costs?



Note: In Figure 11a, physical climate impacts include extreme weather events, heat stress, flooding, drought, or water scarcity, etc.
Totals in Figure 11b exceed 100% as respondents were asked to select all factors that were relevant to their business.

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Figure 12: Over the next 12 months, do you expect physical-climate impacts to increase costs to your company?



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Across building segments, businesses state that climate resilience and adaptation have moved from a peripheral consideration to a core investment criterion, with cumulative value at risk assessments and insurability evaluations now standard components of real estate investment due diligence.

Food value-chain companies note that many farmers are already operating below cost, with increasing heat, water stress, extreme weather and pest pressures disrupting yields and slowing productivity growth. Water stress, in particular, is emerging as a critical constraint. Recent data shows that, by 2050, global commodity production could decline up to 35% across 15 key crops that account for 70% of caloric intake.[17] Although regenerative practices can stabilize yields and enhance resilience, businesses highlight that their adoption is lagging due to underinvestment and the absence of enabling policy and good market and farmer adoption conditions.

"We are increasingly factoring water stress into where and how we build infrastructure."
– Executive, Technology company

"We see a strong demand from the customers to design buildings resilient against the physical risks."
– Executive, Buildings company

"Over the last 10 years, there has been extreme weather events every year."
– Executive, Road transport company

"The case for the agricultural transition is getting stronger and stronger, as more regions are affected by heat and by water stress."
– Executive, Food company

"With regenerative agriculture, we have found a way to de-risk our value chain in the future, to protect ourselves against the impact of climate change as much as possible."
– Executive, Food company

2. Policy volatility is eroding confidence and clouding investment horizons.

Many businesses, particularly those headquartered in Europe and North America, cite policy volatility, including delays, reversals and changes in political signaling, as one of the most critical challenges affecting climate transition investment plans at present. Businesses also view this volatility as being uniquely "self-inflicted".

Businesses highlight that policy volatility makes subsequent rounds of capital commitment harder for them to unlock, as trust in the policymaking process erodes. This is particularly difficult for early movers that have set an advanced pace to meet their climate targets based on the expectations of governments delivering on their commitments.

In turn, investments for some low-carbon solutions at an earlier stage of scaling up are particularly challenging, including hydrogen, steel and cement, due to weak or non-existent customer willingness-to-pay and decades-long deployment timelines that exceed political cycles.

"If the framework changes every two years, it's very difficult to commit billions,"
– Executive, Steel company

"We make 30-, 40-, 50-year bets; cross-party alignment is essential to avoid policy reversals driven by political cycles."
– Executive, Energy company



Policy volatility that has caused delays or led to reversed investment, cited by businesses in interviews, include:

- → In road transport, business leaders flag pulled purchase incentives and shifting ICE phaseout timelines. These are forcing carmakers into prolonged and costly dual-track investment in both ICE and battery electric vehicle (BEV) platforms. Some carmakers are setting internal scope 3 and net-zero targets to anchor decisions where policy no longer provides clarity.
- → In the hydrogen and fertilizer sectors, companies report that projects with sound fundamentals are proceeding, but the pipeline of new announcements has effectively dried up. South Korea contracts for difference (CfD) cancellation, Carbon Border Adjustment Mechanism (CBAM) uncertainty, International Maritime Organization (IMO) setbacks, and UK Hydrogen Allocation Round 2 (HAR2) delays have contributed to reduced market confidence over the past year. Rising energy costs have compounded the pressure. The net result has been a market rationalization, with unviable projects exiting while those with strong fundamentals continue to advance.
- → Shifting signals from policymakers around the EU Emission Trading System (ETS) and reopening CBAM's scope are undermining the investment case for some solutions. Ongoing debate over the fertilizer exemption is creating a wait-and-see dynamic in Europe, with buyers and producers saying they are deferring decisions until the scope of the mechanism is settled.
- → Federal roll-back in the US has also hit business confidence, with companies highlighting that billions in carbon capture and utilization (CCUS) funding have been pulled, leaving projects with no viable path to deployment. Some businesses have paused all climate policy-dependent investment decisions.
- → Shifting public spending towards defense is also slowing market scale-up. For instance, businesses indicate that in Europe, the pipeline for building retrofits is weakening due to the diversion of finance from the Cohesion Fund originally earmarked for energy efficiency.

3. Geopolitical upheavals show no sign of abating, as wars continue in Ukraine and the Middle East and tariffs and energy shocks destabilize supply chains.

To boost supply chain resilience, companies are beginning to pursue local-for-local procurement policies, especially for components and technologies such as semiconductors and certain raw materials that have the highest levels of exposure to economic chokepoints. The regionalization of production is increasingly being seen as essential but could have a knock-on effect on the overall cost of the transition.

Energy price shocks are focusing attention on energy security and sovereignty. As highlighted in **Section 1**, this is accelerating appetite for renewable energy, energy storage and localized generation; however, business leaders emphasize that policy guardrails need to ensure that the push towards national energy security doesn't embed high-emissions fuels in the long term.



"It's not so much about climate change mitigation anymore, it's rather around sovereignty, or de-risking our energy supply."

– Executive, Industrial company



"We've shifted more of our focus toward domestic supply chain resilience and supply security by manufacturing critical inputs in the US."

– Executive, Cement company

Businesses note that geopolitical shocks are hitting fertilizer and food production disproportionately. Volatile gas prices are squeezing production economics. This is particularly true in Europe, where conventional ammonia margins have compressed while highly concentrated trade routes for urea, ammonia and sulfur are constraining supply, leaving importing regions vulnerable to single points of failure.

The combined effect is to raise input costs and put planting seasons and food production at risk. At the same time, it is making the localized, renewable-powered production of fertilizers and circularity increasingly rational.



"The immediate risk is not just fertilizer volume, but whether fertilizers reach the right place at the right time – which will have a ripple effect on food production."

– Executive, Fertilizer company



"The more a farmer can rely on local circularity, local fertilizers and composting, the better, because then farmers will be less dependent on external inputs."

– Executive, Food company

Section 3: Businesses urge predictable policy strengthening to unlock investment and reduce risks.

85% of leaders favor strengthened policy over delays.

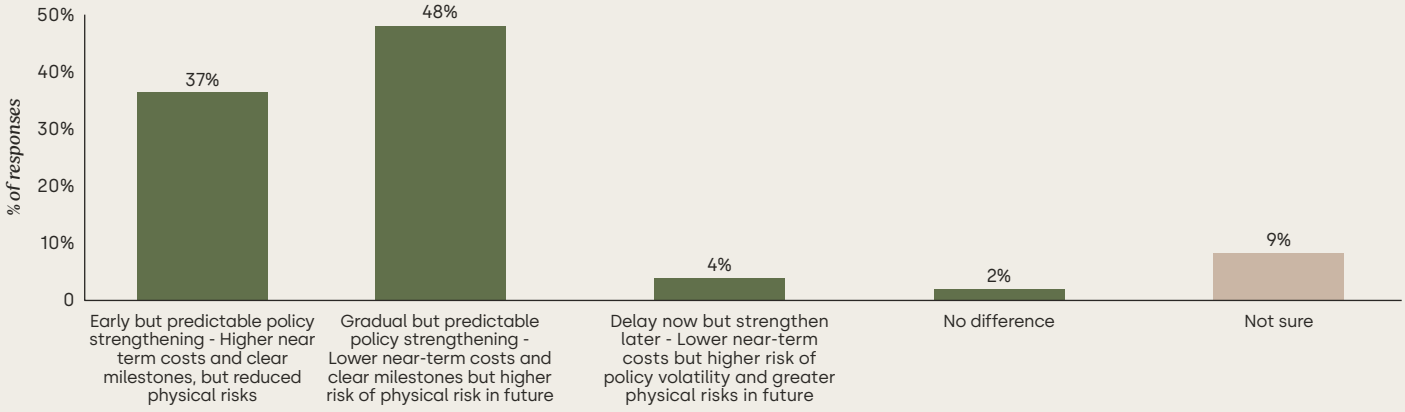
37% would accept higher near-term costs to reduce disruption

Businesses have a clear message for governments: strengthen policy predictably to manage growing transition risks and attract investment.

The risks from mounting volatility resulted in an overwhelming majority of business leaders saying that predictable policy strengthening (85%) is preferable to delay (4%) to manage transition risks and costs (Figure 13); 37% say that higher near-term costs are preferable to lower the risk of disruption. There were variations in regions, with businesses headquartered in North America having the greatest appetite for earlier strengthening with potential higher near-term costs (56%); this is lowest among East Asia and the Pacific (20%).

Company investment criteria reflect the importance of an effective policy environment, with nearly all businesses (96%, Figure 14) taking into account transition risks and opportunities when making investment decisions in countries. They cite policy and regulation clarity and stability as the most important decision factor (56%). Other significant factors are infrastructure (33%), strength of market demand (32%) and access to affordable clean energy (28%).

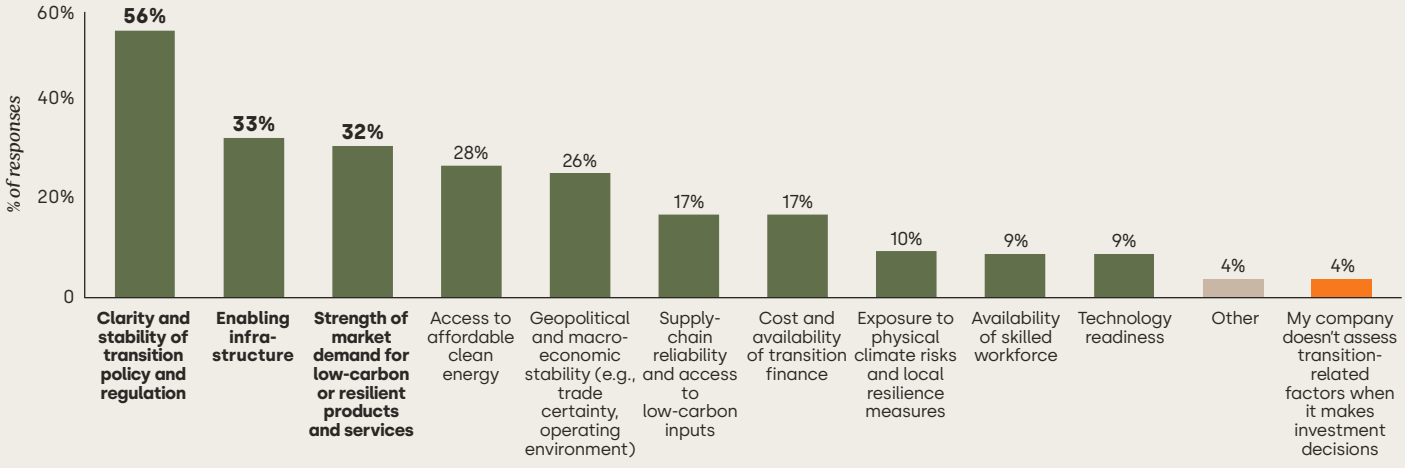
Figure 13: Which policy pathway would best support your company's transition planning and costs / risks?



Note: Excludes "I do not know response"

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Figure 14: When making investments in countries, which of these transition related factors does your company consider?



Note: Totals exceed 100% as respondents were asked to select the three most important factors.

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During interviews, businesses highlighted that ongoing policy strengthening has occurred over the past year, particularly in emerging economies, which is driving improved investment cases (Table 1). They note India for its auction-based offtake for electrolytic ammonia, Carbon Credit Trading Scheme (CCTS), formal CCUS roadmap and cement intensity targets. Together, these efforts are creating a coherent regulatory push. A few other notable developments include China's prioritization of protein diversification as a national innovation priority in its 15th Five-Year Plan, the Plan México backed with USD$ 1.5 billion in EV-linked investments, and Ethiopia's ICE vehicle import ban extension to include conventional-powered trucks.

Despite volatility, businesses interviewed for the Barometer still highlighted the EU's regulatory intent as the most ambitious globally, with the CBAM definitive phase, ETS free allocation phase-out alongside the EU-Mercosur trade agreement improving economics for several solutions. However, as noted above, they emphasize that maintaining the consistency of both policy and political signaling is critical.

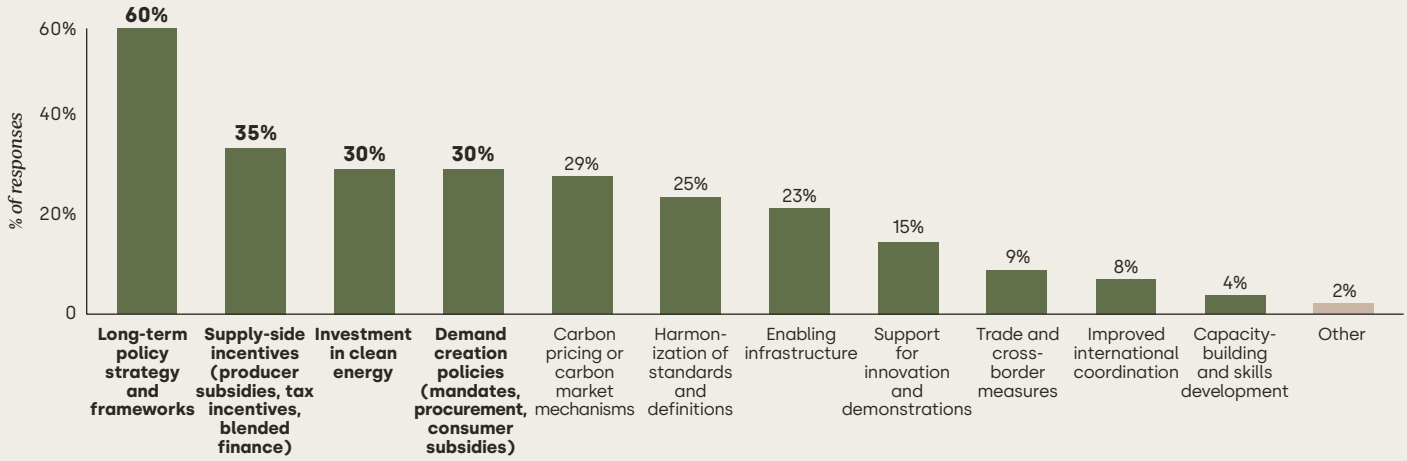
As a result, long-term policy strategy and frameworks are now the primary priority businesses highlight for policymakers this year (60%), with a number of specific policy priorities emphasized (Figure 15).

"In emerging markets, low-cost energy and strong government support make the transition commercially viable."
– Executive, Cement company

"We need stable policies. We need long term, stable policies, which can ensure that our investments will actually be profitable."
– Executive, Power company

"Stay the course, ensure predictability and address the TCO parity."
– Executive, Road transport company

Figure 15: What should policymakers prioritize over the next 12 months to accelerate private sector investment in support of climate mitigation, adaptation and resilience outcomes?



Note: Totals exceed 100% as respondents could select up to three alternatives.
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Table 1: Countries to watch, by sector

Businesses highlight the countries featured below as increasingly attractive destinations for investment given their clear policy frameworks, targeted incentives and strategic sector development. Together, they offer compelling examples of policy leadership from which other markets can draw lessons. See the Solution Deep Dives for further detail.

COP Action Agenda Axis 1: Transitioning Energy, Industry and Transport			
Power	**China** *(new this year)* Solar and wind beat the 2030 target six years early, overtaking coal; scaled supply chains keep tariffs competitive.	**India** Production-linked incentive-backed manufacturing and rapid solar growth keep India on track for 500 GW non-fossil fuels by 2030.	**Spain** *(new this year)* Sub-EU average wholesale prices and a major storage support scheme position Spain as a cost-competitive frontrunner.
Hydrogen	**Spain** *(new this year)* Low-cost renewables, EU funding access and early final investment decisions make Spain a key electrolytic hydrogen market.	**India** Renewable ammonia auction prices approach gas-based parity; Indian producers are winning export markets.	**Morocco** *(new this year)* The country has low-cost renewables and proximity to European offtake markets.
Road transport	**China** Deep supply chains, cost-competitive manufacturing and heavy-duty electrification make China the global road decarbonization benchmark.	**Mexico** Nearshoring, United States-Mexico-Canada Agreement access and fiscal stimulus anchor EV manufacturing and rapid charging build-out.	**Germany** *(new this year)* Reinstated EV subsidies, freight toll exemptions and dense battery manufacturing restore investor confidence.
Steel	**Sweden** *(new this year)* EAF conversions and a major national electrification program advance green steel toward commercial scale.	**India** Green steel taxonomy, National Green Hydrogen Mission, CCUS commitments and advancing EAF and H2-DRI pilots.	**Brazil** Abundant renewables, domestic iron ore and biomass-based ironmaking create structural low-carbon steel advantages.
Cement and concrete	**India** Binding emissions intensity targets, a CCUS budget, a 2026 carbon credit trading scheme and R&D roadmap create policy momentum for low-carbon cement.	**Germany** *(new this year)* Major Carbon Contracts for Difference scheme offers long-term contracts and investment visibility for cement; incoming EU CO_2 transport legislation supports CCUS.	**Canada** *(new this year)* Mandatory federal embodied carbon limits and Buy Clean Strategy translate procurement into demand; CCUS Investment Tax Credit and Breakthrough co-leadership reinforce leadership.
Fertilizers	**India** *(new this year)* SECI auctions and low-cost renewables bring electrolytic ammonia close to parity with gray ammonia.	**Brazil** Heavy fertilizer import dependence, abundant renewables and private investment make domestic electrolytic production increasingly competitive.	**MENA (Morocco, Qatar, Oman)** *(new this year)* The region has large-scale CCUS and electrolytic projects with deep-water port access and long-term offtake agreements.

Table 1: Countries to watch, by sector (cont.)

COP Action Agenda Axis 3: Transforming Agriculture and Food Systems			
Regenerative agriculture	**Brazil** The country combines agricultural scale, agronomic innovation capacity, and increasingly aligned public-private frameworks.	**India** Climate exposure, soil degradation and water stress are accelerating farmer demand for regenerative practices.	**USA** Regenerative agriculture is a bipartisan issue; combined with strong private sector and farmer momentum due to clear benefits, particularly for soil health.
Protein diversification	**China** China's 15th Five-Year Plan positions protein diversification as a national innovation priority, with state-coordinated R&D and processing infrastructure.	**Denmark** The country has introduced the world's first national Action Plan for Plant-Based Foods, backed by DKK 1 billion (~USD $200 million) and broad farmer and political support.	**USA** Consumer demand for protein-diverse products is rising strongly in the United States, supported by health, affordability and product innovation, with a strong innovation ecosystem and investment base. However, recent shifts in dietary guidelines could slow progress.
COP Action Agenda Axis 4: Building Resilience for Cities, Infrastructure and Water			
Buildings	**China** *(new this year)* The 15th Five-Year Plan's pivot to carbon targets and Hong Kong's green finance push strengthen signals.	**USA** *(new this year)* New York, San Francisco and Boston set decarbonization pathways via emissions standards and electrification mandates.	**Europe** *(new this year)* Denmark, Sweden, the Netherlands and France set whole-life carbon baselines (e.g., France's RE2020); a refurbishment-first approach creates durable demand.



Focus on implementation bottlenecks to scale investment.

> *"We need to shift from more roadmaps and pledges to absolute measures that unlock decarbonization on the ground. We know the technologies – we just need the regulatory and financial conditions to deliver."*
>
> – Executive, Cement company

Business leaders repeatedly emphasized that the challenge is no longer technological, but creating the economic conditions that enable scaled investment. While the specific bottlenecks to tackle vary by solution (see Solution Deep-dives and Table 2), businesses overall want governments to focus this year on policies that translate pledges and targets into sustained market growth for low-carbon goods and services. The most important priorities for policymakers highlighted for the next 12 months are supply-side incentives (35%), demand creation policies (30%), and investments in clean energy (30%) (Figure 15).

1. **Supply-side incentives:** Businesses scaling low-carbon solutions that face higher upfront capital costs, including clean hydrogen, low carbon materials and regenerative agriculture, continue to highlight the need for targeted, time-bound, supply-side incentives that reduce cost gaps and de-risk first-of-a-kind and early commercial deployments. Clear, predictable frameworks are the priority, with a variety of incentives possible, including tax credits, carbon pricing and subsidy reform.

> *"The biggest barrier to scaling soil health and regenerative agriculture is financing the initial investment and risk."*
>
> – Executive, Agricultural technology company

> *"Supply chain and production incentives are very interesting for us and our customers – it is not necessarily important which type of incentives, but more so that they are stable and consistent."*
>
> – Executive, Food processing company

2. **Demand-creation policies:** An increasingly binding constraint for low-carbon solutions that result in higher costs for customers is securing demand. Businesses continue to emphasize the need for credible demand creation policies,[18] ideally targeted at the end of the value chain through public procurement and mandates on final goods. They highlight that this enables better sharing of costs along the value-chain and greater incentivization of investment in production. For buildings and regenerative agriculture, businesses emphasize the benefits of focusing on outcomes due to a number of different implementation routes.

> *"Customers want lower-carbon steel, but they are not willing to pay more for it. That is why creating demand through mandates is such an essential lever."*
>
> – Executive, Steel company

> *"There is no premium on products from regenerative agriculture. If you ever take the cost of a program today and divide it by a can of soda, jar of mayonnaise, a pair of jeans, a gallon of fuel, you're talking less than a percent."*
>
> – Executive, Food processing and nutrition company

3. **Clean energy and electrification:** Businesses highlight that accelerated grid build-out, connection backlogs and transmission queues are the biggest bottleneck constraining existing clean power project deployment and new investments, with cascading impacts slowing the rollout of high-power EV charging stations, deep building retrofit projects, and determining the pace of EAF conversion. Businesses emphasize that integrated energy system planning is critical to balance the rapid demand growth from electrification and digital infrastructure and the importance of ensuring that electrification is not disadvantaged through electricity pricing and taxation.

> *"Electrification is moving up the agenda because it is increasingly seen as the practical route to transition and lower fossil dependence."*
>
> – Executive, Power company

> *"We need predictable, affordable energy pricing. We need grid capacity, we need transport and storage infrastructure plans, we need carbon pricing and demand-side measures... as well as carbon border adjustment mechanisms, so that you can invest in these projects and remain competitive."*
>
> – Executive, Cement company

A growing number of business leaders stress the need for greater international collaboration as the risks of policy fragmentation grow.

Business leaders continue to underline the need for international collaboration between governments to enable private sector investment, with divergent policies across countries and sectors leading to increased economic costs and supply chain risks. Some 89% rate international collaboration as important for enabling private sector investment (compared to 85% in 2025), with 59% of respondents aggregated across all regions labeling it as extremely important (Figure 16), reaching 81% in North America.

From interviews and consultations, leaders highlighted coordination on standards and certification as particularly critical, with repeated testing across jurisdictions becoming barriers to scaled markets and trade. They see fast track pathways for proven technologies and mutual recognition of certifications as ways to significantly lower transaction costs and speed market entry. As an example, they consider India's green steel taxonomy, which uses a star rating system, to be a meaningful step, but there are concerns that it sits in isolation from other frameworks.

"We need common standards, otherwise it's very difficult to compare and to create trust in the market."

– Executive, Steel company

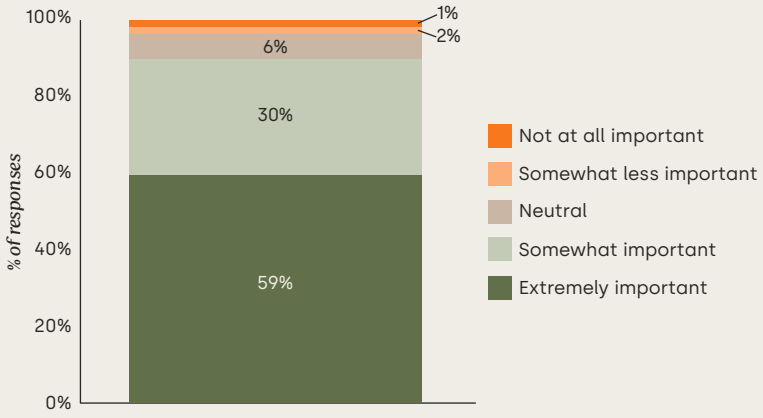
Maintaining public support is essential.

An additional point that came through from interviews and consultations was the importance of building and maintaining societal support. For land-based transitions, businesses emphasize that trust, long-term relationships and training for farmers are prerequisites for adoption at scale. Where companies have positive trade and supplier relationships and a long-standing field presence (e.g., agronomists embedded in sourcing regions and sustained relationships with farmer groups and cooperatives), it becomes much easier to layer sustainability requirements. This dynamic has been particularly visible for commodities such as coffee and cocoa, enabling faster uptake of practices such as agroforestry, soil cover and crop rotation.

"If farmers are not at the center, regenerative agriculture will not scale – the transition has to start with what helps them build resilient, viable farms, backed by training, local support and long-term buying commitments."

– Executive, Food company

Figure 16: How important is international collaboration (e.g., on standards, certifications, trade) between governments for enabling private sector investment in the transition?



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Table 2: Top policy priorities per solution reported by business leaders

This is a synthesis of the key policy priorities in energy transition that require urgent progress to accelerate investment and implementation highlighted by businesses during interviews and tested in consultations.

Legend

→ **Global top 3 priorities** (Demand creation policies, harmonization of standards and definitions and supply-side incentives)*

→ **Other priorities**

**Based on frequency of appearance across sector-level top 3 priorities, rather than aggregate survey ranking*

COP Action Agenda Axis 1: Transitioning Energy, Industry and Transport	*Priority #1*	*Priority #2*	*Priority #3*
Power	**Long-term policy strategy and frameworks** Commit to multi-year frameworks and elevate electrification as an integrated priority to deliver decarbonization, energy security and resilience.	**Enabling infrastructure** Shift to forward-planned grid access rules, remunerate storage and flexibility, fast-track permitting and accelerate coordinated grid expansion and connection reforms.	**Supply-side incentives** Deploy production and investment incentives for immature technologies, but with clear sunset provisions to ensure self-sufficiency. Design production localization ("made in") requirements carefully.
Hydrogen	**Demand creation policies** Put in place demand-creation mandates for green hydrogen, ideally at end-of-value-chain (e.g. construction, food) to drive investment.	**Supply-side incentives** Lower upfront risk through CAPEX grants or concessional finance, improve CfD mechanism design, prioritize reducing clean power costs and raise carbon price signals (e.g. ETS).	**Harmonization of standards and definitions** Develop and align carbon-intensity-based standards across jurisdictions and ensure domestic producers are not penalized compared to imports.
Road transport	**Long-term policy strategy and frameworks** Commit to stable 5- to 10-year regulatory frameworks for electrification, accelerate regional supply-chain build out, and incentivize full life-cycle impact, including via circularity.	**Demand creation policies** Maintain time-bound demand support (e.g. toll relief), enable leasing or service-based finance models, leverage public procurement (e.g. buses), and accelerate vehicle-to-grid (V2G) and vehicle-to-home (V2H) development.	**Enabling infrastructure** Coordinate charging rollout with vehicle uptake (esp. for heavy-duty corridors), expand co-financing for charging infrastructure, de-risk grid connection, and ensure competitive electricity pricing.
Steel	**Demand creation policies** Introduce public procurement mandates for low-carbon steel and strengthen carbon pricing and trade measures (CBAM, ETS) to close the green premium gap.	**Harmonization of standards and definitions** Enable interoperable standards, converge on the scrap-variable scale methodology, and establish chain-of-custody frameworks for trade.	**Enabling infrastructure** Accelerate grid build-out for EAF conversion, invest in low-carbon hydrogen infrastructure, and deploy public funding to de-risk infrastructure investments.
Cement and concrete	**Carbon pricing or carbon market mechanisms** Raise and stabilize carbon prices to unlock CCUS, provide policy stability, and strengthen confidence in CBAM durability.	**Supply-side incentives** Provide co-funding and grants to enable early CCUS deployment, use tax incentives to close cost gap, accelerate clean energy scale-up and permitting, managing data center competition.	**Harmonization of standards and definitions** Accelerate the adoption of low-carbon standards in building codes and public procurement. Develop clarity on planning approvals and industrial cluster access.

Table 2: Top policy priorities per solution reported by business leaders (cont.)

Fertilizer	**Demand creation policies** Introduce demand-creation mandates for low carbon fertilizers, ideally at end-of-value-chain (e.g.food), develop auditable book-and-claim mechanisms and support pooled offtake.	**Supply-side incentives** Provide emissions-linked production incentives tied to verified emissions production, strengthen CBAM-type measures, invest in affordable clean energy and maintain policy stability.	**Harmonization of standards and definitions** Converge on ISO-aligned life-cycle analysis (LCA) methodologies, formalize a low-carbon fertilizer taxonomy and establish dedicated frameworks for phosphate and potash fertilizer.
COP Action Agenda Axis 3: Transforming Agriculture and Food Systems			
	Priority #1	***Priority #2***	***Priority #3***
Regenerative agriculture	**Harmonization of standards and definitions** Align measurement and accountability frameworks and data systems for investors, businesses and policymakers.	**Supply-side incentives** Redirect finance towards farmers and strengthen systems to share costs and risks fairly between public and private actors and across value chains.	**Long-term policy strategy and frameworks** Build coherence across policy, finance and data systems, across markets and jurisdictions and between policy areas and thematic domains, from regenerative agriculture to conservation and restoration.
Protein diversification	**Supply-side incentives** Provide transition finance and repurpose subsidies to support farmers and producers, and invest in infrastructure and research and development (R&D) to scale diverse, sustainable protein production.	**Demand creation policies** Update national dietary guidelines based on the latest scientific evidence and work with business to create food environments that make diverse protein options the easy, affordable, accessible and appealing choice.	**Long-term policy strategy and frameworks** Integrate protein diversification into national strategies, align policies across ministries, and promote the use of science-based metrics and transparent data systems to track progress and align business action with public goals.
COP Action Agenda Axis 4: Building Resilience for Cities, Infrastructure and Water			
	Priority #1	***Priority #2***	***Priority #3***
Buildings	**Long-term policy strategy and frameworks** Maintain direction of travel and commit to implementation or targets. Set stable standards and provide visibility and predictability of pipeline for 10-20 years.	**Demand creation policies** Position energy performance as a broader economic and energy security lever, strengthen whole-life carbon disclosure in planning approvals, for investors, include sustainability specifications in public procurement tenders and incentivize the reuse and retrofit of buildings.	**Harmonization of standards and definitions** Harmonize whole-life carbon measurement rules, energy-intensity metrics and environmental product declaration (EPD) reporting across countries. Establish product classifications and certification standards and create fast-track equivalency approvals.

Section 4: What the Barometer's insights mean for accelerated implementation

Through the Barometer interviews and consultations, businesses have provided many consistent lessons in sustaining investment and scaling solutions to deliver improved competitiveness and resilience, and reduced climate impacts. These insights matter for companies making strategic decisions in a volatile environment and for those working to build a global implementation architecture that delivers real-world progress.

Insights for businesses

1. Do not step back – sustainability is increasingly core to business competitiveness and resilience.

Across sectors and markets, the direction of travel is clear: sustainability is emerging as a source of long-term competitiveness, cost stability and resilience, as both transition opportunities and risks grow.

2. Shift from ambition to execution – with a focus on targeted market-creation actions.

Leading companies are moving from broad ambition to targeted execution, focusing on solving concrete bottlenecks in their operating markets and prioritizing actions that directly deliver competitiveness and improve resilience. The *Barometer* highlights a number of proven, scalable solutions – particularly clean power, electrification, energy efficiency, circularity and regenerative agriculture – that can deliver business benefits.

3. Work across the value chain – by aligning end-markets to unlock scale.

For many companies, the remaining barriers to achieving climate targets sit beyond their direct control. Limited access to financing for small and medium-sized enterprise suppliers, weak or fragmented demand signals, weak mechanisms for green claims or a lack of standards across value chains and markets remain critical constraints. Leading businesses are responding by working more actively across their value chains to prove and develop solutions, as well as engaging with governments and finance.

4. Engage with governments to solve challenges and co-invest – not just advocate.

Businesses note that public funding models based on subsidies are becoming harder to sustain, facing growing fiscal pressure and taxpayer scrutiny. Leading businesses are seeking to support governments to solve implementation challenges, bringing capital, projects and delivery models to enable faster progress and deliver economic and social benefits.

5. Use pragmatic, cross-context framing – focused on competitiveness and value.

The interviews with businesses show a willingness to actively engage with governments, but also hesitation driven by political and market risks. The most effective business voices are those that demonstrate the need for and value of action focused on competitiveness, resilience, jobs, affordability and system efficiency that resonate across political contexts. What matters is not a single model of engagement, but having credible mechanisms to contribute.



"Resilience against fossil fuel availability and prices is a key driver of our electrification decisions. And it is becoming beneficial for our business."

– Executive, Buildings company



"Businesses need to continue to say that we are committed, willing to transform and drive this transition, and not be afraid to raise our voices on these things."

– Executive, Road transport company

Insights for international cooperation

The insights from the *2026 Business Breakthrough Barometer* are clear: international cooperation is essential, but needs to evolve in the current context. Businesses are not stepping back, but they are becoming more focused on demonstrating business value. What they are seeking now is not further pledges, but action that enables scaled investment in the real economy and reduces the risks of a disorderly transition.

The COP Action Agenda provides a critical second tier of multilateralism,[19] enabling coalitions of the willing and individual actors to mobilize resources, deploy solutions, generate learning at scale towards the goals agreed through consensus. This enables governments, businesses, investors and cities to make faster practical progress where they have appetite to act, complementing formal negotiations.

To support accelerated implementation the Action Agenda can:

- → **Demonstrate measurable progress each year,** building confidence that commitments are translating into real-world outcomes;
- → **Bring to the surface the most critical implementation bottlenecks** to focus attention on where policy, infrastructure, demand or coordination gaps are holding back investment and scale;
- → **Mobilize focused action on system shifts,** aligning political leadership and business action around levers that will unlock capital, reduce costs and drive competitiveness and resilience.

The *Barometer* provides a critical input towards an effective global implementation architecture. It offers a grounded business view of where progress is advancing, where it is stalling and, crucially, the specific implementation bottlenecks that are holding back scale and that would benefit from focused efforts through the COP Action Agenda.

The task now is to create the mechanisms that enable those who are ready to act to move faster, together.

> *"If you have some stakeholders in an area that are ready to move forward with the energy transition more quickly, then you should be mobilizing preferential lanes to do that."*
>
> – Executive, Energy company



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Solution
Deep Dives



04.

COP Action Agenda Axis 1: Transitioning Energy, Industry and Transport

The transition of energy, industrial and transport systems sit at the heart of the Global Climate Action Agenda, reflecting where emissions are most concentrated. The Global Stocktake makes clear that while clean energy deployment is accelerating, the pace remains insufficient.

Bridging this gap requires coordinated action from governments and businesses to make clean options the most affordable, accessible, and attractive options. Based on the outcomes of the first Global Stocktake, the COP Action Agenda Axis 1 has the following objectives:

i. Tripling renewables and doubling energy efficiency

ii. Accelerating zero and low emission technologies in hard-to-abate sectors

iii. Ensuring universal access to energy

iv. Transition away from fossil fuels in a just, orderly and equitable manner

The Breakthrough Agenda, launched at COP26, contributes to the COP Action Agenda by convening coalitions to develop and deliver Plans to Accelerate Solutions (PAS).[21] These identify priorities for focused action over the next three years, guiding governments, businesses, and initiatives to deepen cooperation and deliver impact.

The Barometer Solution Deep Dives directly contributes to these plans by providing a business-led view of progress towards the following goals and identifying where further effort is needed to close gaps:

→ **Power:** Ensure clean electricity is the most affordable and reliable option globally by 2030, enabling rapid electrification across sectors.

→ **Hydrogen:** Affordable renewable and low-carbon hydrogen globally available by 2030.

→ **Road Transport:** Zero emission vehicles the new normal and accessible, affordable and sustainable in all regions by 2030.

→ **Cement & Concrete:** Make near-zero- and low-emission cement/concrete the global preferred choice, with efficient production established and scaling in every region by 2030.

→ **Steel:** Near-zero emission steel the preferred choice in global markets, with efficient use and near-zero emissions steel production established and growing in every region by 2030.

→ **Fertilizer:** Achieve a global reduction in GHG emissions from production of fertilizers and optimize global nutrient use efficiency (NUE) by 2035.

The Solution Deep Dives highlight leading practices in corporate investment and value-chain collaboration, while identifying the specific actions that can close the gaps between ambition and implementation.

Global Climate Action Agenda Goal

Clean power is the most affordable and reliable option for all countries to meet their power needs efficiently by 2030

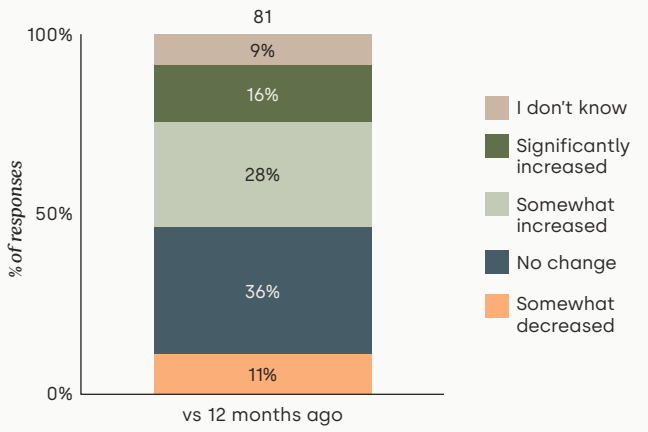
Business confidence

Business leaders are cautiously optimistic; businesses are not ignoring the barriers, but they see them as pace constraints rather than direction changers. Geopolitical shocks have highlighted fossil fuel dependence risk and reframed the narrative from climate ambition to energy sovereignty. Despite a short-term increase in fossil fuel generation to meet immediate demand due to the recent geopolitical shocks, long-term commitments in renewables accelerated amid an increasing need for energy security.

However, the global transition remains deeply uneven: Asia and the US see sustained capacity additions driven by strong demand growth, while Europe – despite continued record deployment – faces growing revenue pressure from negative day-ahead and intraday prices and falling capture rates that could constrain the pace of future additions in mature European markets. Investment is focusing on places where competitive clean energy economics combine with storage and grid readiness. Some countries stand out: China leads on planned generation, storage and grid; Spain has launched large-scale storage support; and India is seeing record capacity expansion. The next phase of the global transition depends on grid infrastructure build-out and modernization, system flexibility, and stable multi-year policy frameworks that provide the visibility required for long-horizon large-scale investment.

Investment

Power figure 1: How have your company's total investments contributing to climate mitigation, adaptation and resilience changed compared to the previous 12 months? *Survey results (N=81).*



Top 3 reasons for increasing investment contributing to climate mitigation, adaptation and resilience (as stated by business leaders)

- **Expected changes in customer demand:** A surge in power demand from artificial intelligence (AI)/data centers, electric vehicle (EV) adoption, heat pump rollout, and industrial electrification, most notably in China and India, are reshaping load profiles across developed and emerging markets.
- **Cost reductions in low-carbon or resilient technologies:** Rapidly falling battery storage costs, improved renewable-plus-storage co-location economics, and efficiency gains in wind turbines and solar panels are strengthening the investment case.
- **Clearer or stronger policy support:** Across regions, government policy is supporting investment decisions through grid permitting reform, incentives (e.g., Carbon Border Adjustment Mechanism (CBAM) and improving clarity (e.g., US tax credit rules).

> *"Investments are increasing because there are many, many opportunities."*
>
> – Executive, Power company

Source: Barometer '26 Survey (N=508); Power industry leader interviews (N=10)

Business case progress



Where businesses saw progress

Technology

Solar photovoltaic (PV) and battery costs continue to decline as performance improves. The challenge has shifted from technological innovation to system integration and scaling. Co-located solar-plus-battery systems are becoming the default in high-penetration markets.

Where progress has seen limited change or declined

Investment case

Regional economics are diverging; US investment remains stable, supported by tax credit clarity and demand growth despite policy volatility. Renewable Energy Sources (RES) cannibalization and negative prices are putting pressure on EU returns. The slow electrification of heavy industry is constraining renewable expansion, specifically where decarbonization technology for higher temperature processes remains immature and demand patterns are inflexible. Battery costs continue to fall, improving co-location economics, yet insufficient market remuneration continues to hold the storage business case back.

Customer behavior

Demand is bifurcating as hyperscalers remain active while broader companies hold back. Heavy-industry electrification is uneven and slower than expected in Europe, while data center, EV and heat pump load growth continue to accelerate. There is also resistance to switching from ICEs to EVs, and customers are wary of Chinese models. Data centers are continuously increasing demand in the US, while recent geopolitical developments are creating fresh tailwinds for demand, particularly in Europe, where energy security concerns are broadening.

Infrastructure

Businesses recognize grids as a primary constraint, with record-high interconnection queues curtailing existing projects and new demand.

Supply constraints

Trade friction and tariffs have worsened equipment constraints, particularly for US-exposed players and grid components. The concentration of components in few geographies increases vulnerability. Europe is shifting dependence from Russian gas to US gas and Chinese cleantech, raising a structural technology ownership question.

Regulatory certainty

Policy volatility and short political cycles increase the risk for long-lived infrastructure investments. EU regulation is supportive, but implementation is uneven; US policy is volatile despite improved clarity on tax credit rules. The deeper issue is market design itself: frameworks from 1990–2000 built around gas-set marginal pricing are increasingly inadequate. Regulators are experimenting (UK Contracts for Difference (CfDs), capacity mechanisms) with no clear consensus on what replaces them.

Regional nuances

Investment case:

- **US:** Investment is improving, supported by Inflation Reduction Act (IRA) tax credit clarity and structural demand growth from data centers, despite broader policy volatility.
- **Europe:** Renewables saturating the market, falling capture rates, and negative prices (e.g., ~800 hours of zero/negative prices in Spain in 2025, totaling ~10% of year[S1]) are putting pressure on returns.

Infrastructure

- **Germany:** The government approved ~2,000 km of new powerlines in 2025.[S2]

Regulatory certainty

- **Germany:** Renewables permitting and grid approval processes are fast-tracking under RED III, with acceleration zones and shorter timelines improving planning certainty. Germany is generally leading the adoption of EU regulation, positioning the country as a permitting reform model.
- **Throughout Europe:** Nordics are ahead of the curve (lower prices, more capacity-oriented generation); Spain is an exception in the Mediterranean basin thanks to the early penetration of renewables; Germany, Italy and most of Eastern Europe are still in the middle of the pack on market design and integration.

Source: Barometer '26 Survey (N=508); Power industry leader interviews (N=10)

Solar and wind now account for approximately 90% of all global energy capacity additions, with renewables growing 7% annually.

China accounts for 62% of global renewable capacity additions in 2025, followed by Europe (12%) and the US (7%). (Renewables include solar, wind, bioenergy, hydropower, and ocean and geothermal.) India is accelerating rapidly, with 20% year-over-year growth in renewable capacity. According to the International Energy Agency (IEA) Renewables 2025 Dataset, global renewable growth is highly concentrated in solar (includes solar PV and concentrated solar power) and wind, together accounting for 96% of renewable additions in 2025 and as much as 100% of additions in the US. Power fig. 2 shows renewables are growing as a share of new additions (left), while absolute volumes of coal, gas and nuclear remain stable (right). Several interlocking factors have held back fossil fuels: (i) demand growth from data centers and electrification is outpacing growth in renewables, so new loads are absorbing new clean capacity rather than replacing existing fossil generation; (ii) grid and interconnection constraints are slowing renewable energy build-out; (iii) long-duration storage has yet to scale at the pace needed to cover multi-day low-wind, low-solar periods; (iv) legacy market designs built around gas-set marginal pricing are increasingly inadequate for variable-renewable systems; and (v) firm capacity (gas, nuclear) is still needed in the near term for system reliability. As businesses progressively address these constraints, fossil displacement should accelerate.

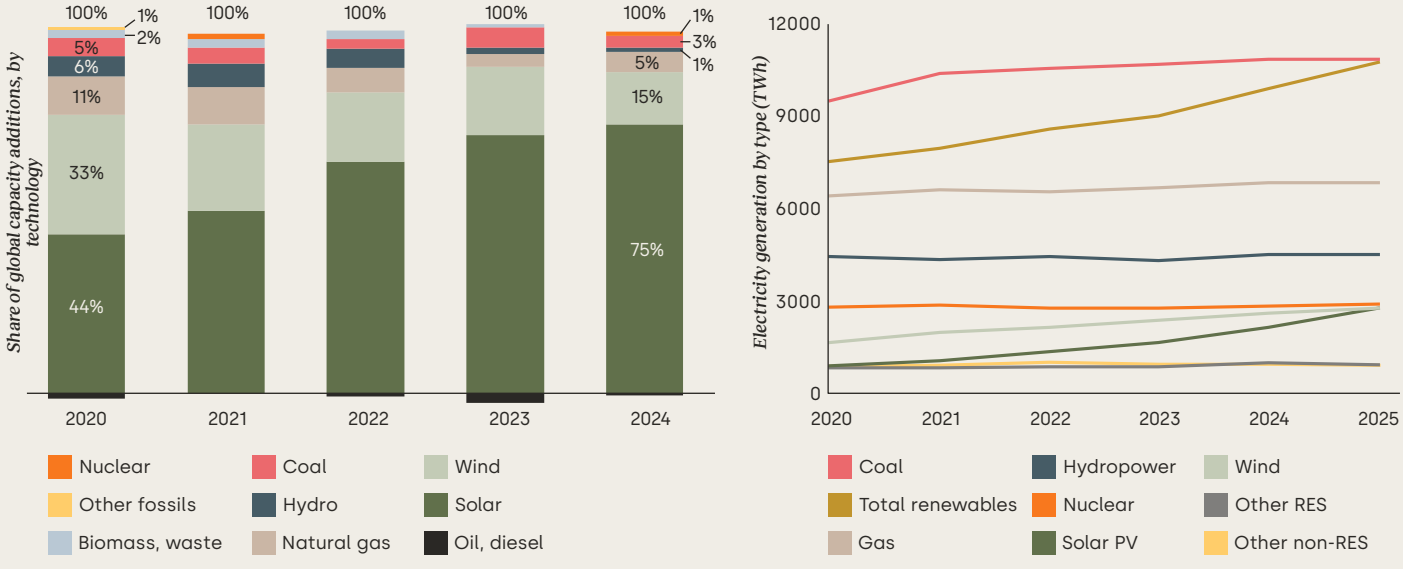
The high penetration rate of renewables is shifting the bottleneck from "build more" to "integrate better", as record curtailment and falling capture rates compress project revenues in mature solar markets.

Curtailment has risen in high-penetration markets as oversupply and network congestion lead to more wind and solar being dispatched down (Figure 3, next page left). In high-penetration mature markets such as Europe, slowing power purchase agreement (PPA) growth and limited demand flexibility mean local demand is insufficient to absorb excess solar generation. The supply-demand mismatch is structural: midday solar overgeneration is growing while evening demand spikes as solar drops off, creating a widening flexibility gap. Insufficient system elasticity is causing more negative-price hours and wider intra-day spreads, lowering project revenues and increasing volatility (Figure 3, next page right).

Short-duration battery storage is unlocking the ability of renewables to scale, but long-duration storage and monetization frameworks remain the missing pieces.

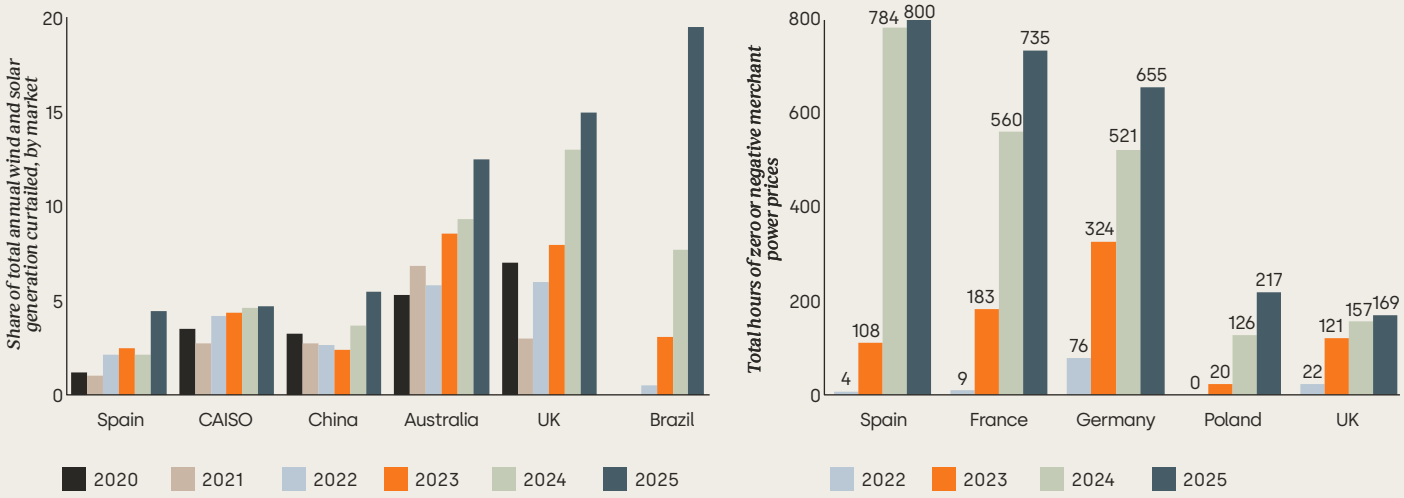
The levelized cost of short-duration battery storage has reached record lows, making batteries the key enabler of further solar scaling up by shifting excess generation into peak hours. The co-location of renewables with storage is becoming the default in high-solar markets. However, short-duration batteries only solve intra-day flexibility. Long-duration storage (beyond 8 hours) has yet to scale at pace: candidate technologies such as iron-air and thermal storage are still maturing, costs need to fall further, and commercial models for multi-day events (e.g., extended low-wind, low-solar periods) are still under development. Without a breakthrough, gas remains the default backstop for system reliability; capacity markets or equivalent mechanisms will be needed to bridge the gap.

Power figure 2: Share of global capacity additions by technology (left) and electricity generation by type, 2020–2025 (right) | *Source: BNEF 2026, IEA Electricity*



Source: Barometer '26 Survey (N=508); Power industry leader interviews (N=10)

Power figure 3: Share of wind and solar generation curtailed by market (left), total hours of zero or negative merchant power prices (right), 2020–2025 | *Source: BNEF 2026*



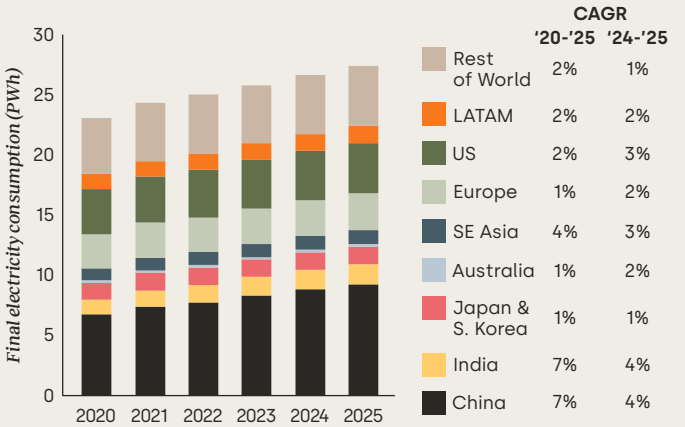
Energy sovereignty has emerged as the co-leading transition narrative alongside climate, with renewables positioned as the most scalable pathway to reduce fuel import risk and price volatility.

Business leaders consistently highlight that geopolitical shocks have moved the agenda from climate to energy security and independence. Renewables are the fastest route to secure domestic supply due to faster deployment timelines than gas or nuclear, greater near-term availability given gas turbine shortages, and resource independence from imported fuels. Across all regions, affordability and reliability are now the most salient framing for policy engagement, with renewables competing alongside gas on pure economics as load growth accelerates.

Electricity demand growth remains slow and deeply uneven, with slower-than-expected heavy industry electrification in most markets.

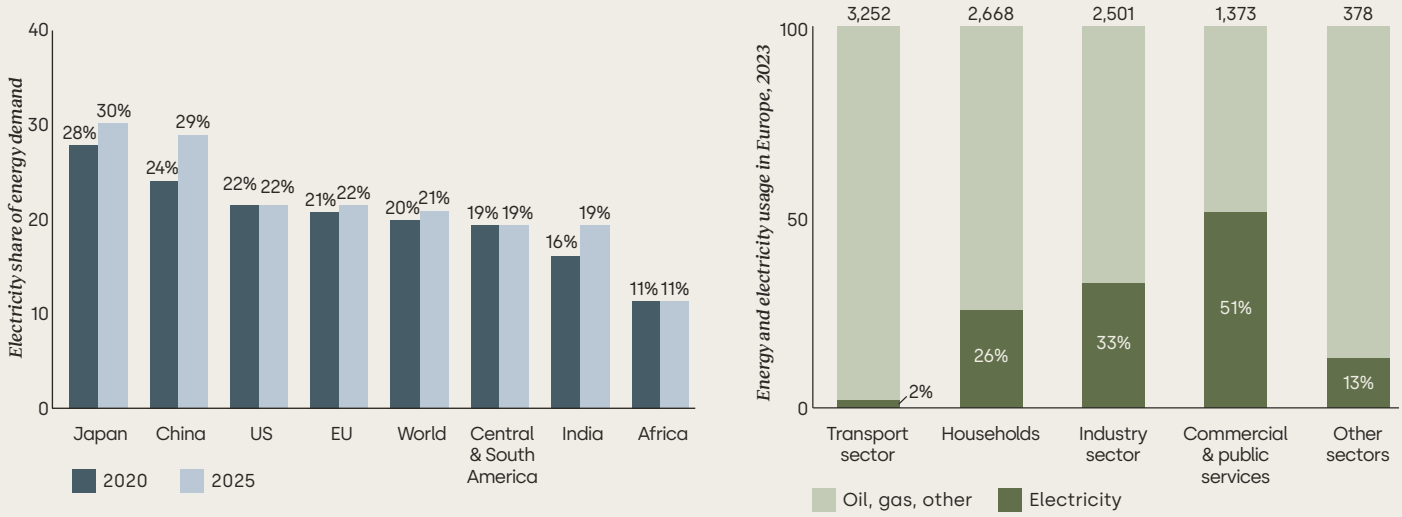
Global final electricity consumption reached ~27 petawatt-hours (PWh) in 2025 (Figure 4). Advanced economies saw demand growth rise in 2025 after a long period of stagnation, while emerging regions saw growth slowing year-over-year amid a slowdown in industry and manufacturing, uncertain trade policies and milder weather patterns. Despite the decline, Asia-Pacific accounted for two-thirds of global electricity demand growth in 2025, with most of the growth in China. Industry and the buildings sector (including cooling, heat pumps, data centers) drove global demand growth in 2025. Data centers are trending but contribute only marginally to global growth, despite being a significant driver in the US and, to a lesser extent, the EU. Industrial electrification in Europe lags, with demand declining significantly in the region since 2020.

Power figure 4: Final electricity consumption | *Source: IEA Electricity 2026*



Source: Barometer '26 Survey (N=508); Power industry leader interviews (N=10)

Power figure 5: Electrification progress 2020–2025 (left) and electrification across sectors in Europe, 2023 (right) | *Source: IEA Electricity 2026, ACER WindEurope*

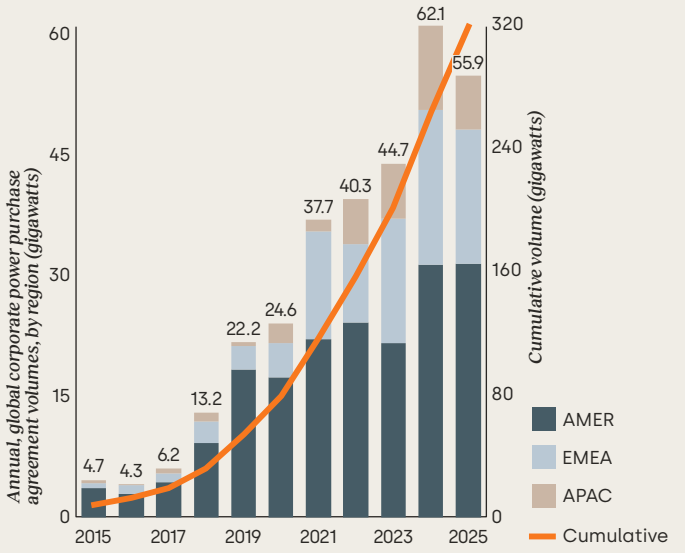


According to the IEA *Electricity 2026* report, global electricity demand growth remains slow, at 2.8% in 2025. While electrification is the key driver of the transition, progress has been slower than expected. Electricity makes up only 21% of global energy demand, up 1.5 percentage points from 2020 (Figure 5, above). China, India – and, to a lesser extent, Japan – has seen notable electrification progress since 2020, while progress in the US, EU, LATAM, and Africa has been more limited. In Europe, there is significant potential for electrification in the transport and industry sectors (Figure 5, above). However, industry leaders identify difficulties in electrification of heavy industry from both capital expenditure (CAPEX) and operating expenditure (OPEX) perspectives as decarbonization technology for higher temperature processes remains immature. Supply has become broadly competitive on economics; the next horizon is shifting end-user behavior and unlocking flexible industrial load, which will require continued technology evolution alongside policy support over the coming decades.

Clean power demand is diverging as hyperscalers drive record growth while broader corporate offtake slows amid market uncertainty.

Annual global corporate PPA volumes reached approximately 56 GW in 2025 (Figure 6). Hyperscalers (Amazon, Google, Microsoft and Meta) remain an outlier buyer segment, accounting for 49% of global PPA activity in 2025, while broader corporate offtake slowed amid policy uncertainty and greenhouse gas (GHG) Protocol scope 2 accounting ambiguity. More structured, risk-managed products are replacing standard corporate PPAs and the era of "green at any price" is giving way to demand for competitively priced, dispatchable supply. Meanwhile, hyperscalers and AI-driven data centers continue signing large, long-term deals to secure supplies from all energy sources (clean and firm capacity).

Power figure 6: Annual global corporate PPA volumes by region, 2015–2025 (GW) | *Source: BNEF 2026*



Source: Barometer '26 Survey (N=508); Power industry leader interviews (N=10)

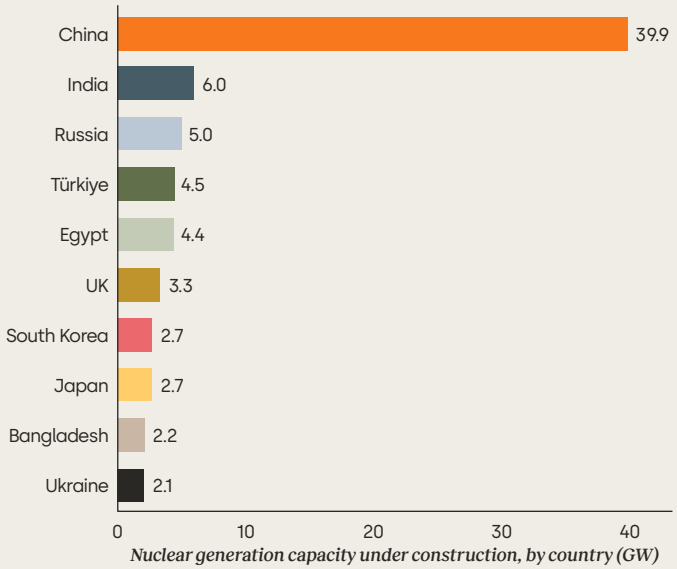
Nuclear energy is regaining strategic relevance as firm clean capacity for industrial loads and data center grows, but new construction outside China remains limited.

In Belgium, Sweden, France and the US, nuclear repositioning from legacy baseload to strategic firm clean capacity needed for 24/7 carbon-free supply. In the US, over USD $2.5 billion in Department of Energy (DOE)-backed restarts and the completion of Vogtle 3–4 represent tangible progress, though no new reactors are under construction. Currently, 78 GW of nuclear capacity is under construction globally, of which 40 GW is in China, far ahead of the second-biggest constructor, India, at 6 GW (Figure 7). In some countries, like Spain, no new capacity is being built, but the discussion has shifted from closing plants to extending their lifetimes to preserve firm baseload. Small modular reactors (SMRs) generate mixed sentiments: cloud providers are actively scaling SMR investments, while major energy players remain reserved, viewing SMRs as unlikely to emerge before the late 2030s.

Grids have emerged as the primary bottleneck for power sector decarbonization, causing backlogs for existing renewable capacity and hindering further investments while creating spillover effects in other sectors.

According to a 2026 BNEF study, connection backlogs across the major developed markets have reached nearly 3 TW in transmission queues and are most acute in Italy, Germany and the UK. The bottleneck stems mainly from storage and solar-related projects, constraining existing projects and limiting new investment. Grid planning cycles of four to five years are incompatible with large annual capacity additions. Key drivers are insufficient interconnection capacity, slow permitting, and a lack of durable, cross-cycle policy frameworks. The cascading impact extends far beyond the power sector: delayed grid reinforcements are raising costs and slowing the rollout of high-power EV charging stations, stalling deep building retrofit projects and creating uncertainty for industrial final investment decisions and financing. At the same time, business leaders say that national transmission system operator/distribution system operator (TSO/DSO) plans are each built bottom-up from their own profits and losses, with Italy alone seeing a sharp increase in power sector CAPEX this decade compared to last. This implies potential over-investment relative to what an integrated continental plan would require if TSO and DSO build-out were coordinated end-to-end.

Power figure 7: Nuclear capacity under construction by selected country, 2025 | *Source: BNEF 2026*



System flexibility is emerging as a primary lever for grid optimization, with battery storage as the most mature solution.

Increasing the flexibility of both electricity supply and demand is essential as the gap between midday solar oversupply and evening demand widens. In some markets, the supply-demand gap creates negative midday prices and curtailment, requiring both supply-side flexibility (battery storage absorbing midday excess and discharging at peak) and demand-side flexibility (shifting electricity use into oversupply periods). Supply flexibility is the primary lever today, as the baseload-like consumption profiles of heavy industry and hyperscale data centers limit demand-side flexibility in the near term. However, demand flexibility holds significant untapped potential as load-shifting, smart electrification, and 24/7 matching mature. Battery storage is commercially mature and scaling rapidly, while AI-driven grid optimization is beginning to show value, but market mechanisms to remunerate these services remain insufficient. Across the EU, UK and US, policy implementation centers on operational flexibility and market reform. US Federal Energy Regulatory Commission (FERC) Order 2222 and DOE Grid Resilience and Innovation Partnerships (GRIP) funding are accelerating distributed energy resource aggregation and grid-enhancing technology deployment. The EU Electricity Market reform rollout is addressing storage and demand response access, and the UK Smart Systems and Flexibility Plan is enabling EV smart charging and storage market participation.

Source: Barometer '26 Survey (N=508); Power industry leader interviews (N=10)

Regulators are reforming grid access rules to prioritize viable projects and accelerate connections, with the most tangible progress in Europe, although reforms remain uneven globally.

Business leaders express the need to shift from first-come, first-served to prioritizing assets that are truly financeable and buildable. The UK has replaced these queues with milestone-based readiness sequencing and has made network charges more localized and less volatile, reflecting planned grid availability. The Netherlands has introduced time-dependent transport rights, allowing curtailable grid access that bypasses full reinforcement to enable faster connection. Australia's South West Renewable Energy Zone Access Scheme in New South Wales tenders for grid access rights for variable renewables and batteries. The US Midcontinent Independent System Operator (MISO) Definitive Planning Phase has automated system impact studies, reducing processing time from months to days. However, business leaders caution that reform execution still lags demand and that retroactive changes to grid economics risk deterring the very investments these reforms are meant to unlock.

Physical climate resilience is moving from a risk function to a core investment driver, with climate damages accelerating and utilities hardening critical assets.

Annual climate damages reached USD $1.3 trillion globally in 2025, with damage to physical assets and supply chain disruptions the most significant cost drivers for utilities. Approximately 45% of power sector respondents report experiencing increased costs from physical climate impacts in the past 12 months, with 56% citing damage to physical assets or infrastructure and 38% naming supply chain disruption as contributing factors. A majority expects costs to rise further over the next 12 months. Resilience-led grid investment is uneven across regions: the US is advancing through state-level mandates; China is scaling integration and grid build-out at pace; while in broader Europe, resilience remains a discussion topic rather than being operationally integrated into capital allocation. In the US, state-level mandates for wildfire mitigation and resilience planning are tightening utility oversight due to escalating climate shocks. In Asia-Pacific, rapid demand growth and climate stress are making reliability a priority – in China, the implementation plan aims to integrate ~300 GW of new wind and solar annually from 2025 to 2027,[S3] with targets to boost transmission and energy storage to enhance system robustness. Extreme weather events in markets such as Portugal are accelerating grid hardening.



Source: Barometer '26 Survey (N=508); Power industry leader interviews (N=10)

Policy priorities

Businesses highlight four key policy priorities that require urgent progress: long-term policy strategy and frameworks, enabling infrastructure, supply-side incentives, and electrification support.

Long-term policy strategy & frameworks

Frame the transition around energy security and affordability to unlock the broadest support, rather than relying solely on climate framing.

Commit to multi-year, predictable frameworks (e.g., EU Emissions Trading System, CBAM) to unlock large-scale private investment by improving revenue visibility.

Follow the German model on permitting fast-tracking under RED III, with acceleration zones, shorter timelines, and co-located storage improving planning certainty.

Elevate electrification as a central action stream, a key route for both decarbonization and energy security and resilience.

Build strategic industrial coordination at the European level for technologies where Europe still owns the value chain (notably nuclear).

Enabling infrastructure

Shift grid access rules from fragmented, first-come, first-served queues to forward-planned frameworks (e.g., UK 2024 grid queue reform, US FERC order, Australia's REZ framework).

Develop market mechanisms that properly remunerate storage and flexibility, including capacity payments and co-location incentives (e.g., Italy battery storage tender).

Accelerate coordinated grid expansion, modernization and connection reforms with grid planning cycles aligned with the pace of renewable deployment.

Supply-side incentives

Deploy production and investment tax credits alongside blended finance (e.g., IRA credits) to de-risk capital-intensive generation and storage investments.

Phase out subsidies as technologies reach grid parity and support immature technologies, but with clear sunset provisions to ensure self-sufficiency.

Design localization requirements carefully, balancing the objective of strengthening domestic manufacturing and supply chain dependencies without significantly raising costs (e.g., EU solar panels).

Electrification support

Remove electricity cost distortions (electricity levies, taxes, fossil fuel subsidies) that disadvantage clean power compared to gas for end-users.

Develop both long-term contracting mechanisms (e.g., PPAs, CfDs) to give investors price certainty, and **short-term flexibility markets** (e.g., demand response, balancing, intraday) to value system services.

Back transport and building electrification (EVs, heat pumps) with enabling infrastructure like public charging networks.

De-risk industrial electrification via operating-cost support; heavy industry needs targeted incentives to bridge the cost gap compared to gas.

> *"We make 30-, 40-, 50-year bets. Cross-party alignment is essential to avoid policy reversals driven by political cycles."*
>
> – Executive, Energy company

> *"Today the energy transition is being held back by regulation and by permitting.... If you have some stakeholders in an area that are ready to move forward with the energy transition more quickly, then you should be mobilizing preferential lanes to do that."*
>
> – Executive, Energy company

> *"The most effective thing you could do for the cleantech revolution would be tax incentives in the style of the Inflation Reduction Act. Stop putting in place pockets of money that companies can try and grab through two-year processes. Use the tax instruments."*
>
> – Executive, Energy company

> *"Electrification is the only way to accelerate the transition. Policymakers should remove measures that distort relative competitiveness with fossil fuels."*
>
> – Executive, Energy company

Source: Barometer '26 Survey (N=508); Power industry leader interviews (N=10)

Countries to watch

China, India and Spain stand out as transformative power markets due to accelerated renewable build-up, regulatory certainty and infrastructure support.

China

- China's renewable build-out is accelerating, adding ~210 GW solar and ~51 GW wind in H1 2025, exceeding its 2030 target six years early and surpassing coal capacity.[S4]
- Scaled cleantech supply chains lower engineering, procurement and construction costs and speed delivery, enabling competitive tariffs while maintaining strong returns.

India

- Rapid solar growth and domestic manufacturing underpin a multi-GW pipeline: 500 GW non-fossil target by 2030, with ~243 GW (~50%) reached by mid-2025.[S5]
- Rooftop and hybrid round-the-clock expansion and production-linked incentive-backed manufacturing, support diversified deal flow, grid integration, and stronger supply chains.

Spain

- Spain achieved 75% clean energy generation in 2025 (55% renewable, 20% nuclear), with wholesale electricity prices 32% below the EU average.[S6]
- Renewables comprise 66% of installed capacity and targets are for 81% by 2030.[S7]
- The government introduced a USD $800 million storage support scheme in 2025, funding up to 3.5 GW of new capacity to address integration challenges from solar overgeneration.[S1]



Source: Barometer '26 Survey (N=508); Power industry leader interviews (N=10)

Policy landscape

Business leaders highlight the following **key policy developments** shaping the power sector across regions.

Legend **N** – New | **C** – Continuation | **R** – Reform | **B** – Rollback

Region	*Key developments*
Europe	**N:** Germany accelerated grid approvals, with approximately 2,000 km of new powerlines approved in 2025 through RED III acceleration zones and shorter permitting timelines[S2] **N:** Spain introduced a USD $800 million storage support scheme in 2025, funding up to 3.5 GW of new capacity[S1] **R:** UK replaces first-come, first-served grid connections with readiness-based sequencing, reprioritizing projects after 2025 evidence checks **R:** Iberian grid reforms and Spain–France interconnection upgrade transmission infrastructure, scale battery storage and strengthen cross-border links, including the Bay of Biscay submarine interconnection
United States	**C:** IRA 48C tax credits for plants reducing emissions by >20% remains active; Round 2 tax credit announced (USD $6 billion)[S8] **B:** One Big Beautiful Bill Act (OBBBA) for clean electricity accelerates credit sunsets and disallows credits linked to restricted foreign entities, compressing qualification timelines **B:** Environmental Protection Agency (EPA) GHG standards proposed repeal of emission standards for fossil fuel-fired electric generating units removes CO_2 control requirements and reduces compliance CAPEX on coal and gas units **B:** Temporary offshore wind leasing withdrawal (Jan 2025) of all Outer Continental Shelf areas from offshore wind leasing pauses new or renewed federal wind approvals
China	**N:** Ancillary services rules are national standards for frequency and peak-shaving, beneficiary-pays cost sharing, and extending participation to virtual power plants and battery storage **R:** Spot market reform (April 2025) as per the National Development and Reform Commission/National Energy Administration notice, which mandates nationwide provincial rollout of electricity spot markets by end-2025, with defined provincial deadlines, strengthening real-time price discovery and supporting demand response and system flexibility through parallel ancillary services rules
India	**N:** Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) supports expansion of nuclear as firm clean capacity **R:** Renewable Consumption Obligation, under the Energy Conservation (Amendment) Act 2022, requires distribution companies, open-access users and captive consumers to increase renewables from 30% in financial year 2024–25 to 43% by financial year 2029–30, with sub-targets[S9]
Brazil	**N:** ANEEL storage regulation formalizes storage regulation and remuneration and mandates tendered grid-sited storage through transparent auction process; first auction volume to be announced in 2026 **N:** Curtailment compensation introduced for solar and wind producers due to grid unavailability
Middle East	**N:** Saudi Power Procurement Company launched a request for qualification for 5.3 GW solar and wind capacity, part of 43 GW target (50% renewable mix by 2030); PPAs signed for 38 GW[S10] **N:** Emirates Water & Electricity Company awarded the United Arab Emirates Khazna Solar PV (1.5 GW) project to ENGIE and Masdar, with PPA signed[S11]

Source: Barometer '26 Survey (N=508); Power industry leader interviews (N=10)

Power | External sources

Section	*Note*	*Data point*	*Source*
Business case progress	S1	Europe returns pressured by renewables market saturation, falling capture rates and negative prices (e.g., ~800 hours of zero/negative prices in Spain in 2025, totaling ~10% of year).	Red Eléctrica (Spanish System Operator)
Business case progress	S2	Germany approved ~2,000 km of new powerlines in 2025; accelerated grid approval processes under RED III, positioning the country as a permitting reform model.	Clean Energy Wire (Jan 2026)
Business intelligence	S3	In China, the implementation plan aims to integrate ~300 GW of new wind and solar annually from 2025 to 2027, with targets to boost transmission and energy storage to enhance system robustness.	Climate Action Tracker
Countries to watch	S4	China's renewable build-out is accelerating, adding ~210 GW solar and ~51 GW wind in H1 2025, exceeding its 2030 target six years early and surpassing coal capacity.	PV Tech (Aug 2025); Climate Action Tracker
Countries to watch	S5	In India, rapid solar growth and domestic manufacturing underpin a multi-GW pipeline; 500 GW non-fossil target by 2030, with ~243 GW (~50%) reached by mid-2025.	SolarQuarter (Mar 2026)
Countries to watch	S6	Spain achieved 75% clean energy generation in 2025 (55% renewable, 20% nuclear), with wholesale electricity prices 32% below the EU average.	Red Eléctrica; Ember (2025)
Countries to watch	S7	In Spain, renewables comprise 66% of installed capacity, targeted to reach 81% by 2030.	Red Eléctrica; MITECO
Policy landscape	S8	US IRA 48C tax credits: Advanced energy credit for plants reducing emissions by >20% remains active; Round 2 tax credit announced (USD $6 billion).	U.S. Department of Energy
Policy landscape	S9	India's Renewable Consumption Obligation, under the Energy Conservation (Amendment) Act 2022, requires distribution companies, open-access users and captive consumers to increase renewables from 30% in 2024–25 to 43% by financial year 2029–30, with sub-targets.	Bureau of Energy Efficiency (Ministry of Power, India)
Policy landscape	S10	Saudi Power Procurement Company launched a request for qualification for 5.3 GW solar and wind capacity, part of 43 GW target (50% renewable mix by 2030); PPAs signed for 38 GW.	ZAWYA (2025)
Policy landscape	S11	UAE Khazna Solar PV (1.5 GW): Emirates Water & Electricity Company awarded project to ENGIE and Masdar, with PPA signed.	Masdar / EWEC

Source: Barometer '26 Survey (N=508); Power industry leader interviews (N=10)

Global Climate Action Agenda Goal

Affordable renewable and low-carbon hydrogen is globally available by 2030

Hydrogen definitions

- **Low-carbon hydrogen:** Umbrella term covering both electrolytic and carbon capture and storage (CCS)-based hydrogen; the focus of this report (also referred to as clean hydrogen)
- **Clean hydrogen:** Used interchangeably with low-carbon hydrogen throughout this report
- **Electrolytic hydrogen:** Hydrogen produced by splitting water in an electrolyser powered by renewable electricity (also known today as green or renewable hydrogen); used interchangeably with renewable(-based) hydrogen throughout this report
- **CC(U)S-based hydrogen:** Hydrogen produced from natural gas via steam methane reforming (SMR) or autothermal reforming (ATR) with carbon capture and storage (also known today as blue hydrogen)
- **Conventional hydrogen:** Hydrogen produced from natural gas without carbon capture (also known today as gray hydrogen); used as the cost and emissions benchmark

Business confidence

Business sentiment on low-carbon hydrogen remains subdued. Policy uncertainty and reversals, including the South Korea contracts for difference (CfD) pause and Carbon Border Adjustment Mechanism (CBAM) uncertainty, are affecting actors along the whole value chain, from hydrogen and fertilizer producers through to downstream end-users. In addition, International Maritime Organization (IMO) setbacks and UK Hydrogen Allocation Round 2 (HAR2) delays have eroded market confidence over the past year. Rising energy costs have compounded the pressure. The net result has been a market restructuring: commercially unviable projects have exited while those with strong fundamentals continue to advance.

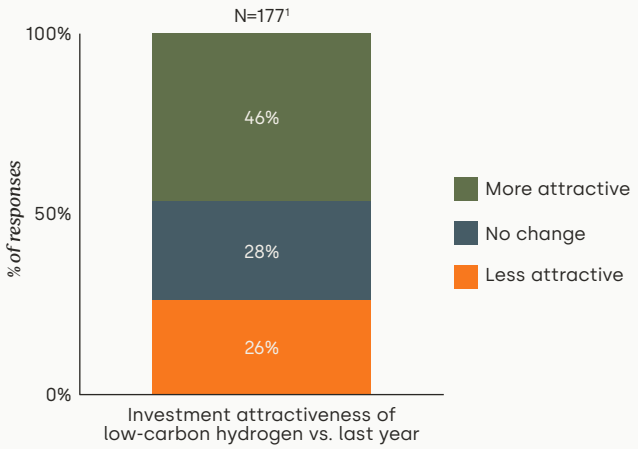
Investors are concentrating on select geographies and use cases. China, India, the Middle East and North Africa (MENA), Spain and the United States are attracting the bulk of activity. Their focus is on low-carbon ammonia for fertilizer, clean steel direct reduced iron (DRI), and refinery hydrogen replacement. In these markets, low-cost renewables, state incentives or co-located industrial demand make the economics viable. Rising fossil fuel prices and energy security concerns are reinforcing the strategic case, but most companies remain in wait-and-see mode. In the United States specifically, investors are centering their efforts on projects with secured approvals or those positioned to meet the Inflation Reduction Act (IRA) 45V construction deadline brought forward to 2027, with limited movement beyond this cohort.

Businesses nonetheless see a credible long-term pathway. The clearest and most consistent thing they need is policy reliability. They see durable contracts for difference, end-use mandates, and clear demand signals as the primary mechanism to convert the current restructuring into renewed investment. At this stage of the market, policy is the foundational enabler: it provides developers with the certainty needed to commit capital, which in turn unlocks scale and drives down the cost curve to support future voluntary demand.

Note: Barometer '26 Survey (N=508); Hydrogen industry leader interviews (N=8)

Investment

Hydrogen figure 1: Over the past 12 months, how has the investment attractiveness of the following solutions evolved? Please only provide responses for the solutions that your company depends on for its transition *Survey results (N=177).*



Note: ¹Only includes respondents who indicated that their company depends on low-carbon hydrogen for its transition

Top drivers of greater investment attractiveness (as stated by business)

→ **Cost reductions in low-carbon technologies:** Falling renewable electricity and electrolyser costs are driving down electrolytic hydrogen production costs, although progress remains concentrated in select markets, such as China and India, with direct government support.

→ **Geopolitical risk hedging:** Recent geopolitical shocks are strengthening the energy security case for low-carbon hydrogen, bolstering investment interest in domestic production as a hedge against fossil fuel import dependency.

Top drivers of lower investment attractiveness (as stated by business)

→ **Weaker or less predictable policy environment:** Policy reversals and prolonged process delays are directly preventing capital commitments, with several key markets pulling back. These include:

- South Korea's hydrogen CfD program being effectively paused under the new administration
- The US 45V construction deadline being brought forward
- UK HAR2 delays

Additionally, ongoing uncertainty around the CBAM is creating concerns across the entire value chain, from low-carbon hydrogen and ammonia producers to fertilizer-using sectors and their downstream customers.

→ **Lower confidence in customer demand and offtake:** Industrial demand for low-carbon hydrogen remains policy-contingent rather than market-driven, with voluntary offtake too limited to secure financing.



Note: Barometer '26 Survey (N=508); Hydrogen industry leader interviews (N=8)

Business case progress



Where progress has seen limited change or declined

Customer behavior

Industrial demand remains policy-contingent; voluntary willingness to pay limited to niche, constraint-driven applications. Maritime demand slowed after the IMO setback; aviation demand depends on uncertain EU Renewable Fuels of Non-Biological Origin (RFNBO) rules.

Regulatory certainty

Policy uncertainty is freezing investment decisions. Examples include UK HAR2 delays, the US 45V deadline being moved up to 2027, South Korea's CfD pause, and uncertainty around fertilizer inclusion in the CBAM. These have direct implications for downstream agricultural users of fertilizer and require engagement across the full value chain to resolve.

Infrastructure

Grid access is becoming a bottleneck for renewable-based hydrogen as data center demand drives up costs; pipelines, storage and ports remain underdeveloped.

Supply constraints

Immediate bottlenecks are muted as project rollout slows, but suppliers are not scaling capabilities amid policy uncertainty. Electrolyser supply chains are consolidating in China while Western and Indian manufacturing remains at an earlier stage.

Investment case

Project economics remain challenging for engineering, procurement and construction (EPC), labor, permitting, and compliance costs, but final investment decision (FID) discipline has tightened, with projects with strong fundamentals proceeding while weaker ones are delayed; carbon capture and storage (CCS)-enabled pathways show stronger near-term commercial viability than electrolytic at scale.

Technology

Electrolyser technology continues to improve incrementally; alkaline remains dominant. CCS-enabled hydrogen pathways advance faster as they avoid grid constraints, with autothermal reforming (ATR) technology achieving ~90% capture rates.[S1]

Regional nuances

Investment case:

China & India: Electrolytic hydrogen approaches fossil-fuel parity, driven by low-cost renewables and direct state support, narrowing the gap with conventional hydrogen.

Regulatory certainty

China, India, Brazil: Improving certainty through India's Green Hydrogen Mission, Brazil's Low-Carbon Hydrogen Development framework, and China's renewable-hydrogen prioritization in the 2026-2030 plan.

Note: Barometer '26 Survey (N=508); Hydrogen industry leader interviews (N=8)

While global low-carbon hydrogen investment dipped further in 2025, projects continued to reach operational completion as early-stage hyper projects exited, leaving a stronger and more viable pipeline.

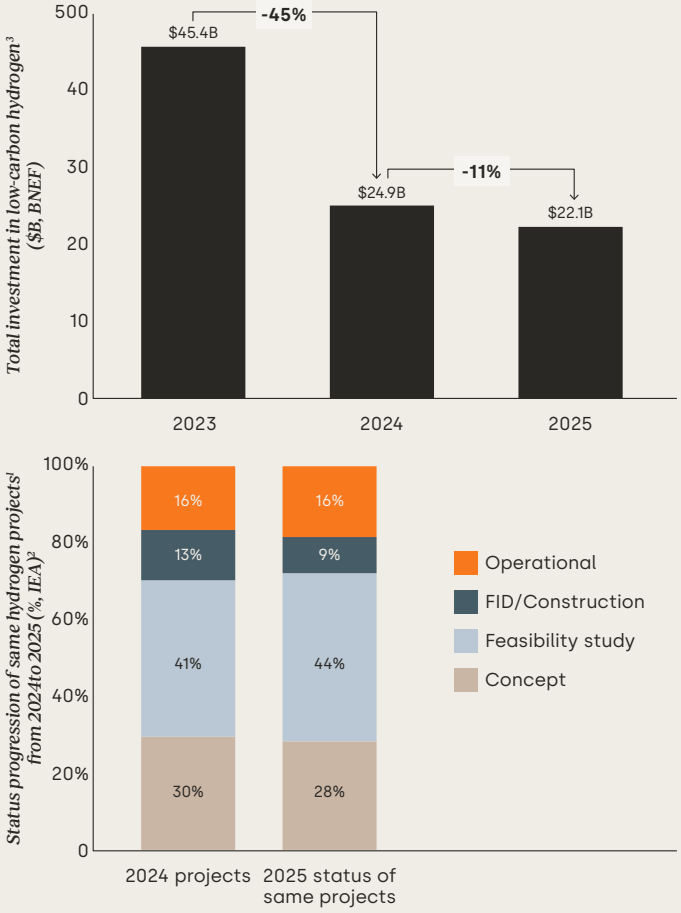
Global investment in low-carbon hydrogen fell to USD $22.1 billion in 2025, down 51% from 2023, but the rate of decline eased materially as the pipeline filtered out non-viable projects. Total project investment dropped 45% from 2023 to 2024 and a further 11% from 2024 to 2025 (Figure 2, below), with industry leaders consistently describing 2025 as a year of consolidation rather than collapse. Tracking the ~2,000 projects that appear in both the 2024 and 2025 International Energy Agency (IEA) pipeline snapshots (Figure 2, below) shows operational projects rising from 16% to 18%, while the share at FID or under construction declined from 13% to 9%. The first reflects projects with secured fundamentals progressing to completion; the second reflects tighter FID discipline, with developers pausing or walking away from projects lacking bankable offtake or affordable clean power.

China and Europe collectively retain the highest share of operational and FID-approved projects. China hosts ~720 clean hydrogen projects, 12% are already operational and another 12% under construction,[S2] supported by state-backed low-cost financing and a coordinated industrial strategy. Europe hosts ~840 projects, 9% operational and 10% under construction.[S2] The underlying regulatory architecture – the Renewable Energy Directive III (RED III), the Hydrogen Bank and Important Projects of Common European Interest (IPCEI) funding – remains structurally intact even amid uneven implementation. India (~90 projects),[S2] MENA (~100),[S2] the United States (~150,[S2] including the largest single low-carbon ammonia production facility, which reached FID in April 2025), and South America and Australia (~210 combined)[S2] host smaller project pipelines.

Projects continued to reach completion in 2025, demonstrating that viable, scaled delivery is possible. Operational projects grew across regions, led by China (+26%), Europe (+12%) and India (+50% from a small base). In Germany, BASF has integrated its 54 MW Ludwigshafen proton exchange membrane (PEM) electrolyser directly into its captive chemical complex, backed by EUR €124 million in IPCEI Hydrogen funding.[S3] JSW Energy's green hydrogen plant in India is co-located with JSW Steel under a 7-year offtake agreement, supported by India's Strategic Interventions for Green Hydrogen Transition (SIGHT) incentive scheme. The 15-year hydrogen and ammonia CfD program introduced by the Japanese Ministry of Economy, Trade and Industry (METI) has begun allocating support, with the first major award to JERA and Mitsui in December 2025.[S22]

Confirmed offtake and policy support are the common enablers of delivery across the pipeline. Yet cumulative firm offtake covers only around 5% of potential 2030 capacity from announced projects.[S4] This is why mandated demand is the dominant policy companies are asking for. Where offtake is secured, typically through public-backed mechanisms, such as Germany's H2Global, the Solar Energy Corporation of India (SECI) auctions under SIGHT, or the UK's sustainable aviation fuel (SAF) revenue certainty mechanism, mandated demand provides the foundation needed at this stage of the market to scale efforts and drive down the cost curve.

Hydrogen figure 2: Total investment in low-carbon hydrogen 2023–2025 and status progression of same hydrogen projects from 2024 to 2025 | *Sources: BNEF; IEA Hydrogen Production and Infrastructure Projects Database, IEA Global Hydrogen Review 2025, interviews with hydrogen industry leaders N=8*



Notes: [1]Includes all projects to "produce hydrogen for energy or climate mitigation purposes" (IEA); [2]Based on one-to-one tracking of each project in the 2024 pipeline to its status in 2025; [3]Includes both direct (e.g., electrolysers, pipelines, storage) and related (e.g., clean steel, clean ammonia, co-located renewables) investments

Projects advancing in 2025 follow two proven archetypes: 1) affordable and scaled, leveraging low-cost renewables and meaningful size; and 2) integrated and targeted, relying on confirmed offtake and co-location with industrial demand.

Archetype 1, affordable and scaled, places large-scale production in regions with abundant, low-cost renewables to minimize levelized cost of hydrogen (LCOH), with output typically shipped to distant demand centers. These projects depend on three conditions converging: very low-cost renewables, meaningful size to unlock financing economics, and bankable long-term offtake. Examples include AM Green's 1.3 GW Kakinada ammonia project in India,[S5] through a memorandum of understanding (MoU) with the Port of Rotterdam in 2025 to establish an India-Europe renewable molecules corridor; ACME's 3.5 GW Duqm Green H2 project in Oman,[S6] with land easement agreements for phases 2 and 3 signed in May 2025; and Envision's Chifeng plant, commissioned in July 2025 as a fully off-grid electrolytic hydrogen-ammonia facility supplying Japan's Marubeni.

Note: Barometer '26 Survey (N=508); Hydrogen industry leader interviews (N=8)

Archetype 2, integrated and targeted, favors smaller, co-located production in industrial clusters, prioritizing proximity to demand and captive offtake to enable earlier deployment. These projects rely on captive offtake within an existing industrial complex, local policy support providing supplier incentives and demand pull, and industrial cluster integration. Air Liquide's 200 MW ELYgator project in the Netherlands took FID in July 2025 backed by more than EUR €500 million and a long-term TotalEnergies offtake.[S7] In Spain, Moeve secured EUR €300 million for the Strategic Project for Economic Recovery and Transformation in Renewable Energies[S8] and Renewable Hydrogen and Storage (PERTE ERHA) funding for the 300 MW Onuba project before taking FID in March 2026.

CCS-based hydrogen production costs sit structurally above conventional hydrogen, with near parity achievable where CO_2 transport and sequestration infrastructure exists or requires limited buildout alongside public support.

CCS-based hydrogen carries a cost premium over conventional hydrogen, as CCS is an inherent addition to the production process. Reaching near parity requires one of two things: (1) existing CO_2 transport and sequestration infrastructure or limited build-out to avoid prohibitive greenfield build-out costs; (2) public support mechanisms that raise the cost of conventional hydrogen (e.g., carbon pricing) or offset the capture premium (e.g., US 45Q). In markets with low-cost domestic natural gas, CCS-based hydrogen is cheaper than electrolytic hydrogen and shows stronger near-term commercial viability at high volumes. The United States is the clearest example: CCS-based hydrogen accounts for the majority of advancing projects, with leading producers leveraging low-cost natural gas and 45Q credits to serve fertilizer, refinery and energy export markets. The picture reverses in import-dependent gas markets such as India and China, where geopolitical shocks and gas price volatility have recently raised the CCS cost floor and strengthened the relative case for electrolytic hydrogen.

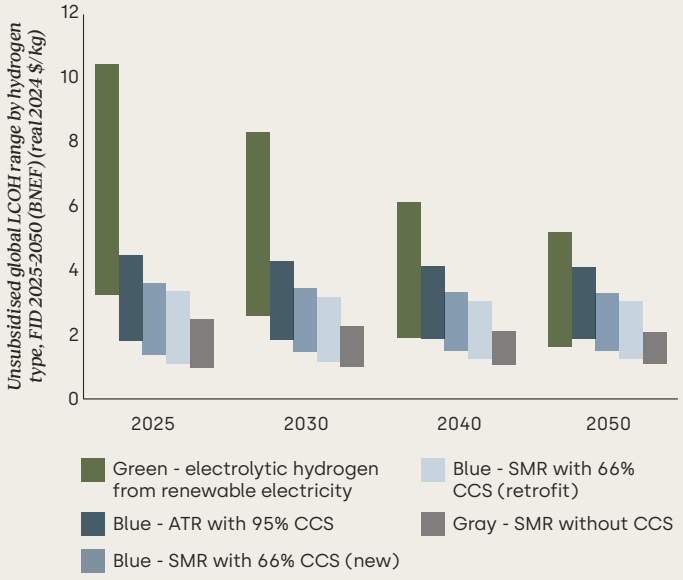
Business leaders expect electrolytic hydrogen production costs to decline materially, but parity with conventional hydrogen is only forecast by 2040-2050 and only in markets with sustained policy support

Electrolytic hydrogen production costs vary widely across geographies and are still 3–5 times larger than conventional hydrogen. While conventional hydrogen typically costs USD $1–3/kg, depending on natural gas prices, electrolytic hydrogen production costs in 2024 ranged from USD $3.5 to USD $8/kg in China, USD $5.5 to USD $10/kg in the US, and USD $6.5 to USD $10/kg in the EU.[S9] Europe is structurally exposed to higher renewable energy prices and grid charges, plus permitting and compliance complexity. The United States benefits from some lower-cost renewables in some geographies compared to the EU, but faces higher electrolyser capital expenditure (CAPEX) and financing costs compared to China. Low-cost renewables, state-backed financing, and domestic electrolyser manufacturing scale support China. India combines very low-cost renewables with state-backed demand mechanisms such as SIGHT auctions, as well as upstream state-backed support for renewables.

Business leaders identify renewable energy cost, equipment cost and policy support as drivers behind the cost gap between high-cost and low-cost geographies. The cost of renewable electricity is the main driver of electrolytic hydrogen production cost, and therefore the main driver of regional differences. Equipment costs are the second driver, with lower-cost geographies benefiting from access to Chinese-manufactured electrolysers and lower EPC costs, others face elevated CAPEX and financing burdens. State-backed policy support closes the remainder, with production-linked incentives and demand-side mechanisms (e.g., India's SIGHT auctions) lowering costs in some geographies, while grid charges and compliance requirements (e.g., the UK's Low Carbon Hydrogen Standard) add costs in others.

Even by 2040–2050, unsubsidized electrolytic hydrogen only approaches parity with conventional hydrogen at the lower end of the range. BNEF modeling indicates that lower renewable electricity costs and falling electrolyser CAPEX will reduce production costs by roughly 50% by 2050 (Figure 3). Yet reaching parity with conventional hydrogen still requires sustained policy support, whether through production incentives or carbon pricing. China, India and parts of the Middle East exhibit a faster path to parity, driven by cheap renewables, low electrolyser costs, and direct state support. In import-dependent gas markets, geopolitical shocks raise the cost baseline of conventional hydrogen, narrowing the gap and strengthening the case for a domestic renewable value chain.

Hydrogen figure 3: Unsubsidized global LCOH range by hydrogen type, FID 2025–2050 | *Sources: BNEF, IEA Global Hydrogen Review 2025*



Notes: Green = electrolytic hydrogen from renewable electricity; Blue = hydrogen from natural gas with CCS; Gray = hydrogen from natural gas without CCS; SMR = steam methane reforming; ATR = autothermal reforming

Note: Barometer '26 Survey (N=508); Hydrogen industry leader interviews (N=8)

Hydrogen | China deep dive

China is the largest hydrogen market globally, accounting for ~35% of global demand. Through 2050, domestic demand will grow from ~35 Mt in 2023 to ~95 Mt in 2050, with 80–90% supplied by renewable-based hydrogen, largely driven by rising demand in steel, power and transport. On the supply side, electrolytic hydrogen capacity doubled to 250–300 kilotons per annum (ktpa) in 2025, representing roughly 50% of global electrolytic capacity but less than 1% of China's total hydrogen production. Businesses announced roughly 1 million metric tons of additional green capacity in 2025, indicating a rapid scale-up plan. Cost trajectories indicate that renewable-based hydrogen is on track to reach parity with CCS-based hydrogen by 2030–2035 and with conventional hydrogen beyond 2040, even as direct subsidies gradually phase out.

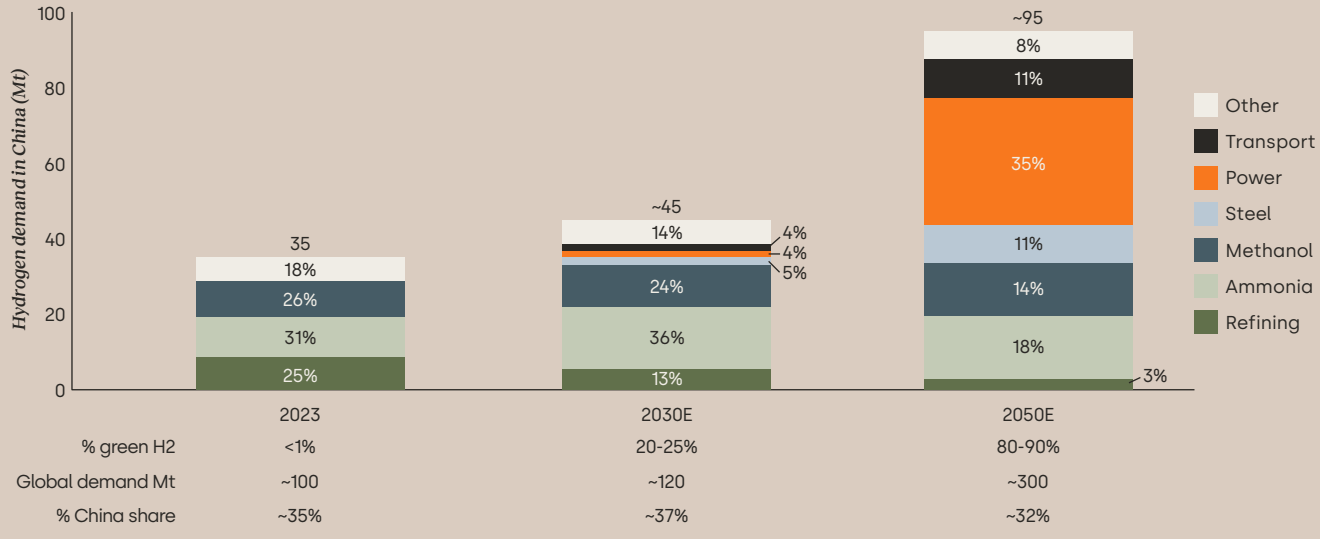
Alkaline electrolysers currently dominate the Chinese market, with ~94% share, but next-generation technologies are gaining momentum. Alkaline remains the most mature and cost-effective route at ~USD $1.5–2/kg of hydrogen, supported by proven reliability and high single-unit capacity. Projections show that PEM, anion exchange membrane (AEM) and solid oxide electrolyser cell (SOEC) technologies will reach a combined 30–40% market share by 2030,[S15] driven by their greater operational flexibility and higher conversion efficiency.

Chemicals are responsible for the bulk of green hydrogen deployment in China, where substituting conventional hydrogen offers a clear and immediate demand pathway. Ammonia and methanol pilots dominate today (e.g., Jilin ammonia, Ningxia electrolysis), with chemicals accounting for ~82% of hydrogen demand.[S12] By contrast, transport, power and steel applications remain at an early stage. Fuel cell electric vehicle (FCEV) rollout has lagged expectations, with ~18,000 vehicles and ~350 refuelling stations deployed; power applications are nascent, but technology is maturing as a long-duration flexibility tool; and steel pilots (e.g., HBIS DRI demonstration, Baowu's 1 million metric ton hydrogen shaft furnace) are laying the groundwork for scaling up tied to China's 2060 net-zero target.[S13]

To advance energy security and industrial leadership, China is accelerating the scaling up of green hydrogen through four reinforcing policy levers. The first is strategic national planning, with hydrogen expected to be a priority as part of the 15th Five-Year Plan (2026–2030), backed by capacity targets and subsidy support. The second is an expanded green electricity direct connection that bypasses grid fees and transmission losses, reducing LCOH by 25–45%.[S14] The third is the maturing national carbon market, with improvements in green hydrogen competitiveness by 5–15% through carbon pricing.[S15] The fourth is electricity-hydrogen coupling, driving ~25% of green hydrogen demand by 2050 by positioning hydrogen as a flexibility tool in the power system.[S16]

The scaling up of China's green hydrogen is set to reshape global markets, mirroring the playbook seen in electric vehicles, batteries and solar photovoltaics (PV) at domestic scale-up, followed by aggressive global exports once cost parity is reached. State-funded learning curves are driving electrolyser CAPEX steadily down, while innovation is also extending into end-use applications such as steel, ammonia and methanol. This is positioning Chinese players to lead globally on application technology rather than equipment alone. For non-Chinese players, two imperatives emerge: first, it is essential to participate in innovation now to avoid being locked out; second, it is imperative to identify and build on local advantages to compete when the global push begins.

Hydrogen figure 4: Hydrogen demand in China (Mt) Note: Includes all types of hydrogen | *Source: White Paper on China's Hydrogen Energy and Fuel Cell Industry; NEA China, IEA, Industry research report*



Note: Barometer '26 Survey (N=508); Hydrogen industry leader interviews (N=8)

Policy priorities

Businesses highlight three key policy priorities that require urgent progress over the next 1–3 years: demand creation policies, supply-side incentives, and harmonization of standards and definitions.

Demand creation policies

Establish public-backed demand mechanisms, including auctions, contracts for difference and aggregation platforms, as the foundational means to unlock offtake at this stage of the market. Examples include Germany's H2Global, the UK's SAF revenue certainty mechanism, India's SECI green ammonia auctions under SIGHT, and the Japan METI 15-year hydrogen and ammonia CfD program.

Set mandates at the end of the value chain (e.g., construction, food, transport) or incentivize uptake in sectors with the margin to absorb the green premium (steel, chemicals). RED III RFNBO sub-mandates in transport and minimum RFNBO shares in aviation SAF are key examples, alongside China's green energy targets for heavy industrial users.

Raise carbon price signals by ensuring that Emissions Trading System (ETS) reforms reach levels that meaningfully close the gap between fossil and clean energy alternatives. Protect CBAM integrity by not creating temporary exclusions for original CBAM-covered core products such as fertilizer, which undermine the strongest demand-creation signal in the market.

> *"Near-term, guaranteed demand creation is first and foremost on the list for us. It sits in that mandated space, green public procurement, mandates for green commodities or fuel."*
>
> – Executive, Fertilizer company

Supply-side incentives

Lower upfront project risk through CAPEX grants and concessional financing, such as China's state-backed low-cost financing or Brazil's Hydrogen Act / Low Carbon Hydrogen Development Program (PHBC) funding for low-carbon hydrogen hubs.

Improve CfD mechanism design and duration to match the investment horizon of large-scale projects. Leaders see the US 45V tax credit as insufficient as the construction deadline was brought forward to 2027

Prioritize reducing renewable electricity costs since CfDs cannot compensate for structurally expensive grids resulting in worsening project economics. For example, business leaders flag that UK electricity prices result in a minimum LCOH of GBP £6-6.50/kg (~ USD $8-8.75/kg) from energy input alone, which cannot compete with MENA, India or China.

> *"You can't commit capital when you don't know whether you've won a CfD. We need CfD mechanisms that match the investment horizon, not ones that stall for years."*
>
> – Executive, Hydrogen company

Harmonization of standards and definitions

Develop carbon-intensity-based standards using market-based certifications, such as those from The Fertilizer Institute (TFI) and Ammonia Energy Association (AEA), which are maturing but need broader industry awareness. Government-linked standards across jurisdictions remain fragmented and require alignment so producers compete on an equivalent basis.

Recalibrate classification thresholds and recognize low-carbon derivatives as overly strict production criteria undermine supply. Examples include the US exclusion of low-carbon ammonia from lowering carbon intensity to be eligible for 45Z clean fuel credits and the EU RFNBO classification norms for SAF, which are currently too strict and lock out African producers.

Ensure consistent standards for domestic producers compared to imports. For example, UK half-hourly temporal matching requirements under the Low Carbon Hydrogen Agreement are not imposed on imports, while double-stacking prohibitions prevent the use of hydrogen in SAF and e-fuel production, distorting competitiveness.

> *"We need to shift to carbon-intensity-based standards, not colors, so that everyone competes on an apples-to-apples basis and investment decisions are simpler."*
>
> – Executive, Energy company

Note: Barometer '26 Survey (N=508); Hydrogen industry leader interviews (N=8)

Countries to watch

Spain, India and Morocco are emerging as attractive hydrogen markets, combining strong production economics with clear export pathways and complementary policy support.

Spain

- → Strong fundamentals: Access to low-cost wind and solar combined with multiple EU funding programs (Hydrogen Bank auctions, Innovation Fund, PERTE ERHA national funding ~USD $1.3 billion).[S16]
- → Early FIDs emerging: Moeve made the FID for its 300 MW Onuba hub in March 2026, supported by EUR €300 million PERTE ERHA funding.[S8] However, a significant gap remains between the national 12 GW target and realistic near-term delivery.[S10]
- → Grid connection bottleneck: Business leaders highlight intensifying competition for grid access, including from higher-paying demand sources such as data centers, leaving hydrogen projects at a disadvantage.

India

- → Cost competitiveness near parity: Renewable-based ammonia auction prices reached ~USD $600/t, approaching parity with gas-based ammonia (~USD $515/t);[S11] recent gas price shocks have pushed renewable ammonia below gas-based ammonia in parts of Asia.
- → Securing international offtake: Indian producers are increasingly competing for export markets. For example, AM Green's Kakinada secured a 500 ktpa European offtake with Uniper[S5] and signed an MoU with the Port of Rotterdam for an India-Europe renewable molecules corridor.
- → Compliance tension with EU export markets: Business leaders note that power banking arrangements that work domestically do not currently meet EU RFNBO temporal correlation requirements, creating a regulatory gap that could constrain export volumes.

Morocco

- → Strategic export positioning: The country combines low-cost renewables and proximity to European offtake markets, positioning it as a viable alternative energy source for Europe.
- → EU regulatory headwinds: EU's non-biogenic CO_2 classification rules create headwinds for North African producers seeking to valorize industrial process CO_2, blocking a key e-methanol and SAF revenue stream that would otherwise strengthen project economics.
- → Domestic integration model: OCP Group's green hydrogen platform aims to replace ~3 Mt/year of conventional ammonia imports by 2032[S12] through self-use, reducing reliance on imported fossil-based feedstock.



Note: Barometer '26 Survey (N=508); Hydrogen industry leader interviews (N=8)

Policy landscape

Business leaders highlight the following **key policy developments** shaping the hydrogen sector across regions.

Legend **N** – New | **C** – Continuation | **R** – Reform | **B** – Rollback

Region	*Key developments*
United States	**C:** 45Q tax credits under IRA / One Big Beautiful Bill Act (OBBBA) 2025, with the USD $85/t credit for carbon capture continuing to support CCS-based hydrogen projects, underpinning most of the US pipeline's advancements. **B:** 45V under IRA construction deadline moved up to 2027 (from 2033), tightening timelines for project developers; credit value unchanged.
France	**N:** Hydrogen CfD Scheme (~EUR €4 billion) provides long-term (15-year) operating support, with a strike price cap of ~EUR €4.3/kg. Funding released against project milestones and confirmed buyers.[S13] **B:** Revision of 2030 hydrogen capacity target from 6.5 GW to 4.5 GW, reflecting market readiness delays and international competition, but without rollback of production-linked subsidies.[S14]
Netherlands	**N:** OWE (Opschaling Waterstof via Elektrolyse) Hydrogen subsidy scheme, with ~USD $820 million awarded to 11 large-scale hydrogen production projects, totaling 600 MW of electrolysis capacity.[S15]
Spain	**N:** PERTE ERHA ~USD $1.3 billion in funding supports large hydrogen valleys integrating production, industry and infrastructure. The first project funded was Moeve's ~400 MW Andalusian Green Hydrogen Valley in 2025.[S16]
China	**N:** 15th Five-Year Plan (2026-2030) prioritizes electrolytic hydrogen as a strategic future industry, aiming for industrial-scale growth, regional self-sufficiency, and applications in heavy industry, transport and energy storage.
India	**N:** The Green Hydrogen Certification Scheme defines carbon-intensity monitoring, reporting and verification (MRV) methodology for all electrolytic hydrogen projects, requiring approval by an authorized auditor by 30 June 2026. **N:** The Gujarat Green Hydrogen Policy targets 30 GW of electrolyser capacity and 3 million tons per annum (MTPA) of green hydrogen by 2035, complementing the National Green Hydrogen Mission.[S17]
Oman	**C:** The National Hydrogen Strategy targets 8–15 GW of electrolyser capacity and 1.0–1.5 MTPA of green hydrogen production by 2030.[S18]
Chile & Australia	**N:** The Chile National Green Hydrogen Strategy 2026-2030 aims to produce 1.6 MTPA of electrolytic hydrogen by 2040 (S19). **C:** Australia Hydrogen Production Tax Incentive (HPTI) under Future Made in Australia round 2 provides USD $1.30/kg refundable tax offset for renewable hydrogen production. Australia pledged USD $283 million to support Orica's Hunter Valley Hydrogen Hub, which will produce up to 12 metric tons of electrolytic hydrogen daily using a 50 MW electrolyser.[S20]
Morocco	**N:** 2025 milestone with six projects selected by the government for the feasibility stage, with a cumulative planned investment of ~USD $33 billion.[S21] **C:** National Hydrogen Offer with up to ~30% investment support to anchor electrolytic hydrogen projects.
South Africa	**N:** The Hydrogen Environmental Impact Assessment (EIA) guidelines (first publication) include end-use-based (export, clean steel, mobility) approval timelines for hydrogen projects. **N:** The Green hydrogen potential atlas guides production and generation siting, anchoring South Africa's emerging position as an export-oriented hub.
Japan	**N:** METI hydrogen and ammonia CfD program bridges the cost gap between clean and conventional ammonia through ~USD $20 billion (~3 trillion yen) in 15-year price-gap support. METI advanced the first major CfD allocation with JERA and Mitsui in December 2025[S22]

Note: Barometer '26 Survey (N=508); Hydrogen industry leader interviews (N=8)

Hydrogen | External sources

Section	*Note*	*Data point*	*Source*
Business case progress	S1	CCS-enabled hydrogen pathways advance faster as they avoid grid constraints, with ATR technology achieving ~90% capture rates.	Rystad Energy
Business intelligence	S2	China hosts ~720 clean hydrogen projects, 12% already operational and another 12% under construction; Europe hosts ~840 projects, 9% operational and 10% under construction; India (~90 projects), MENA (~100), the United States (~150), and South America and Australia (~210 combined) host smaller project pipelines.	IEA Hydrogen Production and Infrastructure Projects Database / Global Hydrogen Review 2025
Business intelligence	S3	In Germany, BASF has integrated its 54 MW Ludwigshafen proton exchange membrane (PEM) electrolyser directly into its captive chemical complex, backed by EUR €124 million in IPCEI Hydrogen funding.	BASF press release
Business intelligence	S4	Cumulative firm offtake covers only ~5% of potential capacity in 2030 from announced projects.	IEA Global Hydrogen Review 2025
Business intelligence	S5	AM Green, through its 1.3 GW Kakinada ammonia project in India, signed an MoU with the Port of Rotterdam in 2025 to establish an India-Europe renewable molecules corridor, and secured a 500 ktpa European offtake with Uniper.	Ammonia Energy Association
Business intelligence	S6	ACME signed land easement agreements for phases 2 and 3 of its 3.5 GW Duqm Green H2 project in Oman in May 2025.	OPAZ (Public Authority for Special Economic Zones and Free Zones, Oman)
Business intelligence	S7	Air Liquide's 200 MW ELYgator project in the Netherlands made its FID in July 2025, backed by more than EUR €500 million and a long-term TotalEnergies offtake.	Air Liquide press release
Business intelligence	S8	In Spain, Moeve secured EUR €300 million of PERTE ERHA funding for the 300 MW Onuba project and made its FID in March 2026.	Moeve press release
Business intelligence	S9	2024 electrolytic hydrogen production costs range from USD $3.5 to USD $8/kg in China to USD $5.5 to USD $10/kg in the US and USD $6.5 to USD $10/kg in the EU.	IEA Global Hydrogen Review 2025
Countries to watch	S10	A significant gap remains between Spain's national 12 GW target and realistic near-term delivery.	Hydrogen Europe — Spain PNIEC update
Countries to watch	S11	Renewable-based ammonia auction prices reached ~USD $600/t, approaching parity with gas-based ammonia (~USD $515/t).	Press Information Bureau, Government of India
Countries to watch	S12	OCP Group's green hydrogen platform aims to replace ~3 Mt/year of conventional ammonia imports by 2032 through self-use.	OCP Group — Investment Plan
Policy landscape	S13	France Hydrogen CfD Scheme (~EUR €4 billion) provides long-term (15-year) operating support, with a strike price cap of ~EUR €4.3/kg, and funding released against project milestones and confirmed buyers.	Strategic Energy Europe
Policy landscape	S14	France revised its 2030 hydrogen capacity target from 6.5 GW to 4.5 GW, reflecting market readiness delays and international competition, but without rollback of production-linked subsidies.	Strategic Energy Europe
Policy landscape	S15	Netherlands OWE (Opschaling Waterstof via Elektrolyse) Hydrogen subsidy scheme: ~USD $820 million awarded to 11 projects in large-scale hydrogen production, totaling 600 MW of electrolysis capacity.	Rijksoverheid
Policy landscape	S16	Spain's PERTE ERHA ~USD $1.3 billion in funding supports large hydrogen valleys integrating production, industry and infrastructure. The first project funded was Moeve's ~400 MW Andalusian Green Hydrogen Valley in 2025.	Centro Nacional del Hidrógeno (CNH2) / MITECO

Note: Barometer '26 Survey (N=508); Hydrogen industry leader interviews (N=8)

Section	*Note*	*Data point*	*Source*
Policy landscape	S17	Gujarat's Green Hydrogen Policy targets 30 GW of electrolyser capacity and 3 million MTPA of green hydrogen by 2035, complementing the National Green Hydrogen Mission.	Mercom India
Policy landscape	S18	Oman's National Hydrogen Strategy targets 8-15 GW of electrolyser capacity and 1.0–1.5 MTPA of green hydrogen production by 2030.	Hydrom — Oman Green Hydrogen Strategy 2024
Policy landscape	S19	Chile's National Green Hydrogen Strategy 2026-2030 aims to produce 1.6 MTPA of electrolytic hydrogen by 2040.	Green Hydrogen Organisation (GH2) — Chile country profile
Policy landscape	S20	Australia pledged USD $283 million to support Orica's Hunter Valley Hydrogen Hub, which will produce up to 12 metric tons of electrolytic hydrogen daily using a 50 MW electrolyser.	ARENA (Australian Renewable Energy Agency)
Policy landscape	S21	Morocco's 2025 milestone saw six projects selected by the government for the feasibility stage, with ~USD $33 billion in cumulative planned investments.	PV Magazine
Policy landscape	S22	The Japanese METI hydrogen and ammonia CfD program provides ~USD $20 billion (~3 trillion yen) in 15-year price-gap support, bridging the cost gap between clean and conventional ammonia. The METI advanced the first major CfD allocation with JERA and Mitsui in December 2025.	S&P Global Commodity Insights



Note: Barometer '26 Survey (N=508); Hydrogen industry leader interviews (N=8)

Global Climate Action Agenda Goal

Make zero-emissions vehicles the new normal and accessible, affordable and sustainable in all regions by 2030.

Business confidence

Regulatory instability and an uneven pace of transition across geographies have challenged business confidence in the road transportation transition. Yet the overall sentiment is more positive than last year, with improved vehicle technology, sustained charging infrastructure build-out, and continued battery cost declines reinforcing the medium-term investment case, even as near-term planning remains complicated by policy uncertainty.

In the passenger segment, the picture is sharply geographically divided. China has crossed a self-sustaining tipping point with electric vehicle (EV) penetration above 50%, while emerging economies such as India, Thailand, Vietnam, Singapore and Mexico are accelerating on the back of affordable Chinese supply. Meanwhile, Europe is growing but underperforming expectations and the US has broadly stalled, both weighed down by policy headwinds.

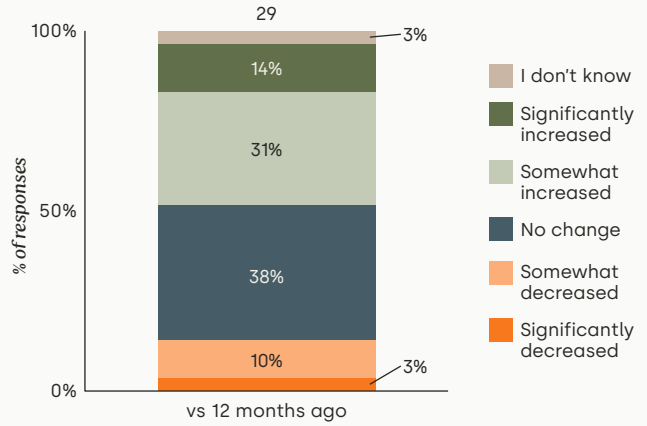
Commercial EV adoption is growing rapidly, though it still represents a small share of the overall fleet, with improving total cost of ownership (TCO) economics an important driver. In China, heavy-duty trucks are already crossing TCO parity, while in Germany, the Netherlands and the Nordics, lighter trucks are nearing parity. In the US, the commercial segment remains near-stalled under regulatory retreat.

Business leaders flag long-term regulatory certainty as a more urgent concern than last year. Pulled purchase incentives, shifting internal combustion engine (ICE) phaseout timelines and an unresolved EU–US tariff environment are forcing carmakers into prolonged dual-track investment in both ICE and battery electric vehicle (BEV) platforms, rather than full electrification.

Geopolitical tensions present both risks and opportunities for the transition. Trade barriers and supply chain concentration pose resilience risks, while oil price volatility and energy security concerns are strengthening the structural case for electrification.

Investment

Road transportation figure 1: How have your company's total investments contributing to climate mitigation, adaptation and resilience changed compared to the previous 12 months? *Survey results (N=29).*



Top 3 reasons for increasing investment (as stated by business)

- **Expected changes in customer demand:** In passenger segments, adoption is shifting from incentive-driven purchase to genuine customer preference in leading markets (e.g., China, Norway). In commercial segments, lighter trucks have already achieved TCO parity in select European markets, while heavy-duty trucks are crossing parity in China and approaching it in high-use segments in Europe, progressively reducing, though not yet eliminating, dependence on direct subsidies.
- **Clearer or stronger policy support:** In markets with sustained industrial policy commitments such as China, Mexico and India, long-horizon frameworks (five-year planning, Plan México, PM E-Drive) have demonstrably unlocked investment at scale. However, this reflects the experience of those who increased investment; overall, confidence in government support is lower than last year, with regulatory uncertainty being a key concern.
- **Improved access to affordable clean energy:** Falling clean-electricity costs are strengthening EV TCO economics and leaders increasingly see them as a structural prerequisite for closing the TCO gap. Business leaders describe renewables and EV adoption as mutually reinforcing transitions in key growth markets.

Note: Barometer '26 Survey (N=508); Road transportation industry leader interviews (N=12)

Business case progress



Where businesses saw progress

Infrastructure

Public charging stocks are expanding rapidly. China's network grew 45% p.a. (2020–2024) to 3.6 million public charging points; Europe's grew 41% p.a. (2020–2024) to 1.0 million. Battery storage is emerging as a peak-management tool for charge-point operators at high-use sites.

Technology

In the passenger segment, EVs are increasingly closing the gap with ICE on range and charging speed, removing the compromises that held mainstream buyers back. Additionally, plug-in hybrids (PHEVs) are playing a larger transitional role than previously expected in some markets (e.g., Brazil). In the commercial segment, battery electric is increasingly the lead pathway while fuel cell electric (FCEV) narrows to more select use cases.

Where progress has seen limited change or declined

Investment case

Progress is limited year-on-year. EV economics have improved due to lower battery cost, but the TCO gap compared to ICE remains open in several markets (e.g., Japan) and segments (e.g., heavy-duty). Original equipment manufacturers (OEMs) are seeing margin parity in parts of the EU and Southeast Asia; however, policy volatility is hindering order forecasts and intense domestic competition in China risks eroding margins for Chinese players.

Customer behavior

Mainstream demand growth is softening in Europe and the US as early adopters are largely captured and buyers now demand full cost-and-convenience parity rather than paying a premium for sustainability alone. At the same time, elevated oil price volatility stemming from ongoing political tensions is strengthening the case for electrification and improving EV TCO competitiveness.

Supply constraints

The issue has shifted from raw-material scarcity to supply chain resilience. Business leaders flag a concentrated dependency on Chinese battery minerals, cells and electronics, compounded by China's rare-earth export restrictions and rising tariffs.

Regulatory certainty

Policy instability remains a significant constraint in Europe and the US. China leads with clear and consistent policy, while other growth markets, such as India and Mexico, show a similar direction. More broadly, unresolved trade tensions and evolving tariff regimes are adding a further layer of uncertainty, as governments balance the acceleration of affordable EV supply with the protection of domestic manufacturing capacity.

Regional nuances

Investment case:

- **China:** Heavy-duty trucks crossed TCO parity in 2025

Customer behavior:

- **China:** EV penetration reached 54% in 2025; electric trucks exceeding 50% of heavy-duty sales in December 2025
- **Europe:** EV penetration reached 31% in 2025, growing but underperforming expectations; momentum is strong in Norway and the Netherlands, while Southern and Eastern Europe lag
- **US:** Passenger EV penetration is stalled at around 10%; commercial adoption is near-zero.
- **Emerging economies:** Affordable Chinese supply is driving rapid uptake — Singapore reached ~45% EV share in 2025, Vietnam ~38%, Uruguay ~28%, Thailand ~22%

Infrastructure:

- **US:** Long-haul charging build-out continues. (Mixed: build-out continues, but the NEVI pause, in the regulatory line, is a headwind)

Supply constraints:

- **Europe:** Chinese OEMs are expanding local manufacturing capacity to navigate import tariffs
- **Emerging economics:** Chinese OEMs hold more than a 70% share in Brazil, Mexico and Thailand

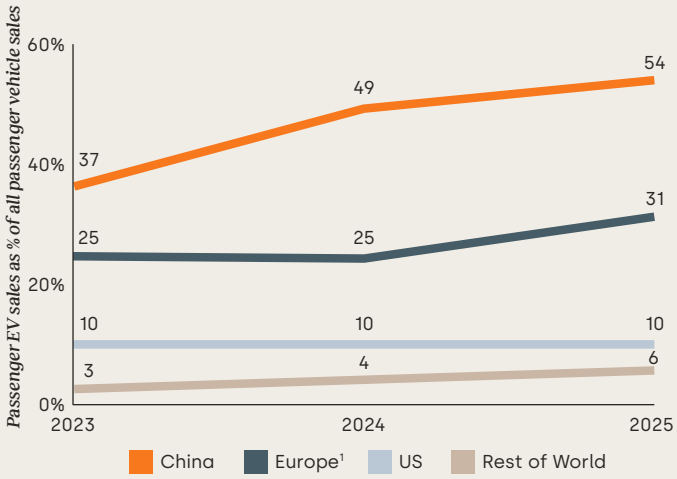
Note: Barometer '26 Survey (N=508); Road transportation industry leader interviews (N=12)

Passenger | Policy instability and remaining gaps for EVs compared to ICE are forcing exposed OEMs into prolonged dual-track investment.

Policy instability has become one of the clearest barriers to scaling. The EU softened its 2035 ICE phase-out from 100% to 90% zero-emissions.[S2] In the US, the Section 30D credit expired in September 2025 under the One Big Beautiful Bill Act (OBBBA),[S3] the Environmental Protection Agency (EPA) rescinded the 2009 Greenhouse Gas Endangerment Finding,[S4] and the NEVI charging program paused before resuming under revised guidance.[S5] At the same time, mainstream buyers now expect EVs to match ICE on all dimensions, with upfront price and charging experience the dominant global barriers. Some carmakers are setting internal scope 3 and net-zero targets to anchor decisions where policy no longer provides clarity.

The result is prolonged dual-track ICE and BEV investment, leaving non-Chinese OEMs exposed on two fronts. In the US, combined announced write-offs from scaling back EV strategies exceed USD $60 billion across Stellantis,[S6] Ford,[S7] Honda[S8] and GM,[S9] with Stellantis attributing its charge to "over-estimating the pace of the energy transition." In Europe, Chinese brands domestically provide affordable supply and are doubling down through local manufacturing. Several European OEMs are forming joint ventures with Chinese tech firms to access advanced EV software, batteries and autonomous systems.

Road transportation figure 2: Passenger sales as % of all passenger vehicle sales, by region 2023-2025. Note: (1) Europe includes the EU27, the UK, Iceland, Norway and Switzerland | *Source: BNEF*



[1] Europe includes the EU27, the UK, Iceland, Norway and Switzerland

Passenger | Multi-speed by geography: China has crossed a self-sustaining tipping point, while Europe and the US lose momentum.

Passenger EV penetration now varies sharply by region. As shown in figure 2, Chinese sales reached 54% of new registrations in 2025, up from 37% in 2023. Europe rose from 25% to 31%, the United States flatlined at around 10%, and the rest of the world grew from 3% to 6%. China has excluded EVs from its Five-Year Plan (2026–2031) for the first time in a decade, signaling the market is now self-sustaining. The policy focus is shifting to consolidation and an "anti-involution" campaign against price competition.

Europe and the US are losing ground for different reasons. In Europe, the transition continues, but unstable policy and overlapping rules between EU-level policies are slowing investment. In the US, the rollback of purchase incentives and weaker emissions standards have stalled momentum. Emerging markets across Asia (India, Thailand, Vietnam, Indonesia) and Latin America (Mexico) are accelerating on the back of affordable Chinese supply. Across regions, several governments are exploring technology transfer frameworks and joint ventures with Chinese manufacturers as a way to balance supply chain resilience with domestic industrial ambitions.

Passenger | Falling battery costs driven by Chinese scale and lithium-ion phosphate (LFP) innovation are deepening pressure on all non-Chinese car manufacturers.

LFP battery costs continue to fall. The volume-weighted global pack price fell from USD $170/kWh in 2022 to USD $108/kWh in 2025, a 14% p.a. decline in real terms.[S10] LFP chemistry drives most of this reduction, with sustained innovation expanding its relevance from low-end models into mid-market and commercial segments, and significant manufacturing overcapacity in China putting further downward pressure on prices.

While falling battery prices benefit all manufacturers as buyers, China's dominance in battery manufacturing and critical mineral supply is creating supply chain dependencies for non-Chinese manufacturers. LFP capacity additions in China through October 2025 were 30 percentage points higher than the rest of the world combined.[S11] China's restrictions on rare-earth exports compound this, making the exposure more structural than purely price-driven. Across the industry, manufacturers are increasingly turning to circularity to reduce raw-material dependency, with battery material recovery, including reclaiming secondary lithium, cobalt and nickel, an important avenue among broader efforts.

Note: Barometer '26 Survey (N=508); Road transportation industry leader interviews (N=12)

Passenger | China's cost advantage is now structural and Chinese OEMs are leveraging it to capture emerging markets.

Average EV prices in China are 34% (SUVs) and 55% (small and large vehicles) below ICE.[S12] A coordinated state policy system, deep domestic battery production capabilities and low-cost manufacturing, including competitive electricity prices, have driven the scale needed to lower costs. Intense domestic competition and fast product cycles reinforce this further, creating a self-reinforcing advantage that keeps pushing costs down as the market operates at mass-market scale.

Chinese OEMs are using their cost advantage to capture emerging markets. As shown in figure 3, they hold more than 70% share in Brazil, Mexico and Thailand, with a large share in Singapore and India. The average new Chinese EV in Mexico costs around USD $32,000, compared to USD $49,000 in the US. In Europe, Chinese brands are doubling down through local manufacturing.

Passenger | Emerging economies are electrifying rapidly on the back of affordable supply and targeted national policy.

EV adoption is accelerating across emerging markets. As shown in figure 4, Singapore reached 45% EV share of new passenger car sales in 2025, Vietnam 38%, Uruguay 28% and Thailand 22%. Colombia, Brazil and Mexico are accelerating from near zero.

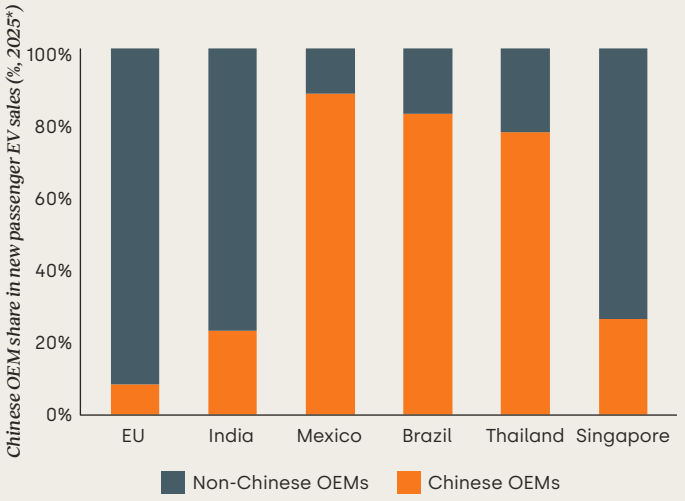
Growth-economy governments are combining three levers to sustain this momentum. First, they strengthen customer economics through consumer subsidies, tax exemptions and preferential electricity tariffs. Second, they create manufacturer confidence through stable multi-year frameworks and clear long-term targets. Third, they invest in local manufacturing and charging rollout. Examples include India's PM E-Drive Scheme (~USD $1.2 billion for two- and three-wheelers through 2028,[S13] Mexico's Plan México (~USD $1.5 billion through 2030 with accelerated depreciation of 35%–91% on EV-linked investments),[S14] and China's October 2025 action plan targeting 28 million charging facilities by end-2027.[S15]

Passenger | Public charging is expanding fast, but grid access, site delivery and urban density are now the binding constraints.

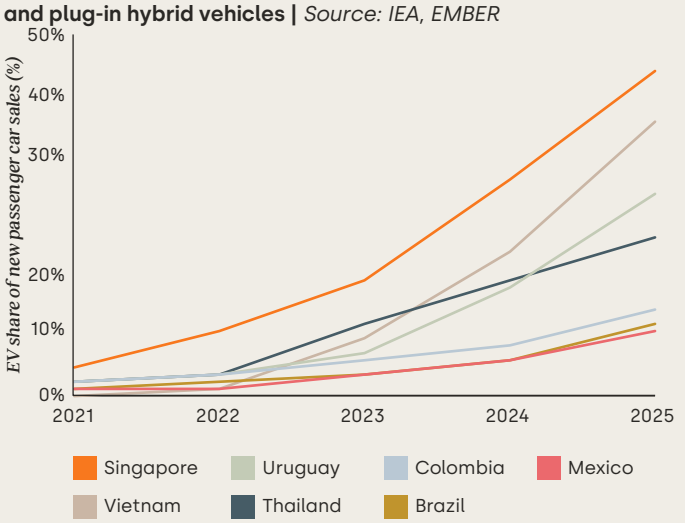
Public charging has grown rapidly but unevenly. As shown in figure 5, China reached 3.58 million points in 2024 (45% p.a. growth), Europe 1.03 million (41% p.a.), the rest of the world 0.63 million (51% p.a.), and the United States 0.20 million (19% p.a.). China now accounts for more than half (66%) of the global total. Charging speed is improving, particularly in China, and home charging adoption is reducing reliance on public networks.

Three bottlenecks now constrain further scale. Grid access is the most cited barrier, operating through limited connection capacity in Europe and reduced federal infrastructure investment in the US. Site energization – meaning land, permits and approvals – is the main execution barrier across regions. Fitting charging into apartment parking in dense urban markets such as Tokyo remains structurally complex. Competing load growth from data center build-out is intensifying grid pressure in several US markets. On-site battery storage is increasingly deployed at charging hubs to manage peak loads.

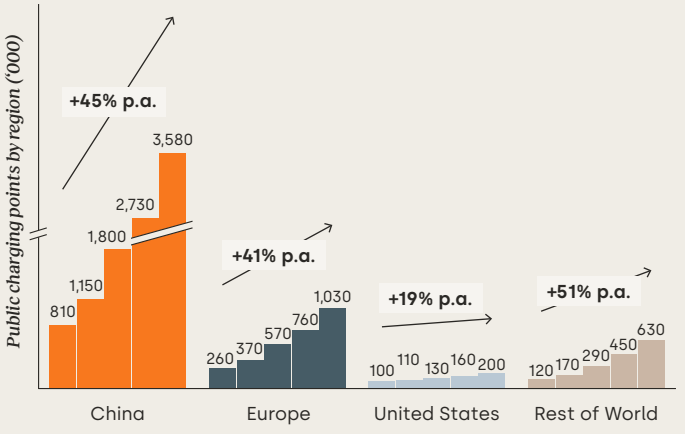
Road transportation figure 3: Chinese OEM share of new passenger EV sales in select regions, 2025 | *Source: IEA*



Road transportation figure 4: EV share of new passenger car sales (%) Note: Note: Passenger EVs include battery-electric and plug-in hybrid vehicles | *Source: IEA, EMBER*



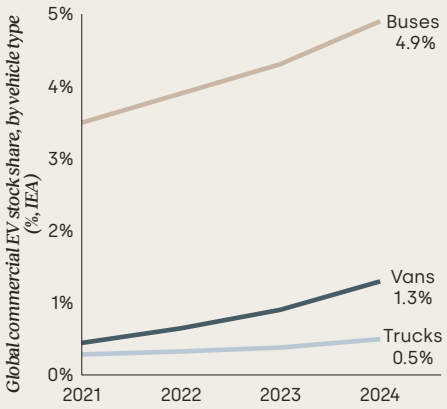
Road transportation figure 5: Growth of public charging points in China, Europe, US and the rest of the world. | *Source: IEA*



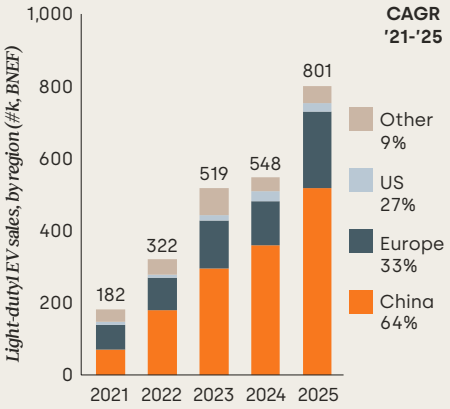
Note: Barometer '26 Survey (N=508); Road transportation industry leader interviews (N=12)

Road transportation figure 6: Commercial EV stock share by vehicle type (left), light-duty EV sales (center) and medium- and heavy-duty EV sales (right) by region, 2021–2025 | *Source: IEA, BNEF*

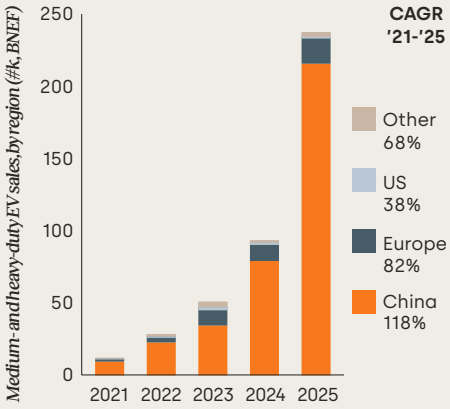
Commercial EV stock share increasing, yet remains limited (<5% in 2024)



Light-duty[1] EV sales growing in double-digits across key regions



Medium- and heavy-duty[2] EV sales remain concentrated in China



Notes: [1]Includes vans and small commercial vehicles; [2]Includes trucks and buses

Commercial | Adoption is growing fast but from a low base, with uptake varying sharply by segment and geography

As shown in figure 6, **commercial EV adoption remains below 5% of the global stock, but it is growing rapidly and with wide variation by segment.** Buses led at 4.9% of the global stock in 2024, with vans at 1.3% and trucks at 0.5%. Light-duty commercial EV sales grew from 182,000 in 2021 to 801,000 globally in 2025, a 45% compound annual growth rate (CAGR). Medium- and heavy-duty EV sales remain concentrated in China (118% CAGR 2021–2025 compared to 82% in Europe and 38% in the US). In December 2025, more than half of the heavy-duty trucks sold in China were battery-electric.

Lead segments differ sharply by region. In China, heavy-duty trucking and public transport are furthest ahead, backed by state energy-security priorities and subsidy support. In Europe, city buses and regional freight lead, supported by Norway's polluter-pays tax regime, Switzerland's performance-related heavy vehicle fee (LSVA) toll exemption for electric trucks, and the distance-based tolling reform in the Netherlands. In the US, commercial adoption is nearly stalled at the federal level, with California a bright spot and long-haul charging build-out continuing. In India, three-wheelers covering passenger transport and last-mile delivery are the clear lead segment, driven by high vehicle use and improving market readiness.

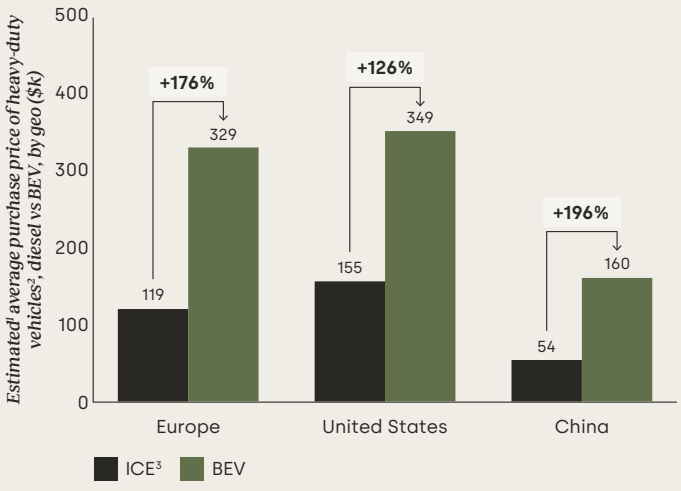
Commercial | The bottleneck has shifted from technology readiness to commercial economics and operational execution

Upfront cost remains the main commercial barrier. As shown in figure 7, heavy-duty battery-electric trucks carry a purchase premium of roughly 126%–196% over diesel: around USD $329,000 vs USD $119,000 in Europe, USD $349,000 vs USD $155,000 in the US, and USD $160,000 vs USD $54,000 in China. TCO parity is emerging in high-use segments where mileage, depot charging and low-cost power compress payback, including last-mile delivery, urban buses and regional freight in Germany, the Netherlands and Switzerland. Targeted policy support (toll exemptions, electricity tax relief) further narrows the gap.

Note: Barometer '26 Survey (N=508); Road transportation industry leader interviews (N=12)

Outside high-use segments, operational execution constrains scale. Site delivery, meaning land, permits and grid connection, is the main execution bottleneck. Weak charging-point economics limit the number of operators willing to invest; unreliable or occupied chargers have the potential to disrupt fleet use once networks exist.

Road transportation figure 7: Estimated[1] average purchase price of heavy-duty vehicles[2], diesel vs BEV, by geo ($k) | *Source: IEA*



Notes: [1]Estimated by IEA in the Global EV Outlook 2025; [2]Includes trucks and buses; [3]Internal Combustion Engine (diesel-powered)

Policy priorities

Businesses highlight three key policy priorities that require urgent progress over the next 1–3 years: long-term policy strategy and frameworks, demand creation and enabling infrastructure.

Long-term policy strategy & frameworks

Commit to stable 5- to 10-year regulatory frameworks to give both industry and fleets the multi-year certainty needed to invest in EV, avoiding sudden policy reversals and the withdrawal of incentives mid-cycle.

Revise electric truck weight and dimension rules to compensate for battery mass and restore payload parity with diesel, removing a regulatory penalty currently borne by electric fleet operators.

Accelerate regional EV supply chain build-out through industrial frameworks, strategic access to critical raw materials and lower barriers to local component sourcing while keeping EU and North American markets open to fair competition.

Complement existing tailpipe CO_2 regulations with additional measures that capture full life-cycle impact, rewarding CO_2 reductions across supply chain, production and use, with circularity positioned as a core lever.

> *"Regulatory uncertainty is now one of the biggest barriers to large investments. Companies still do not know how key rules such as CBAM and ETS will evolve or what cost path they should plan against."*
>
> – Executive, Road transport company

Demand creation

Anchor demand-side policy with a predictable carbon price for the sector, notably through Europe's Emissions Trading System (ETS), as the central driver of the investment case; complement this with targeted, time-bound demand support, such as toll relief and replacement incentives, until EV TCO is self-sustaining, with support removed gradually to avoid demand cliffs.

Enable leasing or service-based models that redistribute risk and reduce upfront costs, shifting capital expenditure to operating expenditure for fleets.

Leverage public procurement at scale, prioritizing vehicle classes where technology and infrastructure already support a viable transition (urban delivery, city buses, light commercial) to create bankable demand.

Accelerate vehicle-to-grid (V2G) and vehicle-to-home (V2H) development, integrating direct economic incentives for EV owners in applicable segments (primarily passenger and light-duty fleets) and removing barriers such as double grid fees that currently penalize bidirectional charging.

> *"Demand can be accelerated through clear, time-bound incentives such as toll relief for e-trucks."*
>
> – Executive, Road transport company

Enabling infrastructure

Coordinate charging rollout with vehicle uptake, ensuring the deployment of chargers where and when there is demand for EVs, particularly along heavy-duty corridors where megawatt-scale capacity is the rate-limiting variable. Promote data sharing across fleet operators, charge point operators, utilities and public authorities to improve demand forecasting and infrastructure planning.

Expand public cofinancing and blended finance to de-risk early charging investment, alongside anticipatory grid investments that unblock connection queues.

De-risk grid connection and permitting through digitalized procedures, harmonized at the country or regional level, to shorten deployment timelines and lower costs for charge point operators.

Ensure competitive electricity prices for charging through taxation adjustments and discounted grid tariffs for operators; enable smart charging through tariff design (e.g., off-peak incentives); and ensure tariff consistency across regions for predictable operating costs, recognizing that electricity cost is a structural component of EV TCO competitiveness.

Support technology-neutral policy frameworks that allow markets to determine their most appropriate decarbonization pathway, recognizing lower-carbon fuel alternatives as a legitimate transitional solution where local energy infrastructure continue to constrain EV rollout.

> *"A major infrastructure issue is not just build-out, but low network use, which weakens the business case for charging operators."*
>
> – Executive, Road transport company

Note: Barometer '26 Survey (N=508); Road transportation industry leader interviews (N=12)

Countries to watch

Coordinated policy and industrial action position China, Mexico and Germany as leading regions for EV growth, each combining demand-side support, infrastructure investment and manufacturing capability in a distinct configuration.

China

- **Dual-credit mandate (2026–2027):** with binding NEV credit ratios of 48% in 2026 rising to 58% in 2027 forcing manufacturers to scale EV production or acquire credits from EV-heavy OEMs.[S16]
- **Continues to leverage supportive industrial policy and domestic supply chain depth** (batteries, critical minerals, low-cost manufacturing) to keep EVs cost competitive
- **Deployed demand-side policies,** such as financial incentives, tighter vehicle emissions standards, and access restrictions for polluting trucks, that are supporting heavy-duty electrification
- **EVs excluded from the 2026–2031 Five-Year Plan for the first time,** signaling the market is now considered self-sustaining and no longer requires direct state support.
- **Heavy-duty electrification scaling faster than expected,** with Chinese carriers switching to battery electric trucks at pace, driven by pure economics rather than policy compliance.

Mexico

- **This strategic EV manufacturing and adoption hub** leverages nearshoring momentum, United States-Mexico-Canada Agreement market access and the Plan México to anchor battery and vehicle investment.
- **Plan México Fiscal Stimulus Decree (2025)** of 30 billion Mexican pesos (approx. USD $1.5 billion) allocated through 2030, with accelerated depreciation of 35–91% on new fixed-asset investments linked to EV supply chains, targeting 3,000 fast-charging stations along strategic corridors.[S14]
- **State-level incentives and affordability,** given that the average price of a new Chinese EV in Mexico is around USD $32,000 vs. USD $49,000 in the US, with Chinese OEMs now holding majority market share.
- **Regulatory formalization** of commercial real estate administrative guidelines on EV charging stations, permitting and grid interconnection have improved infrastructure visibility for investors.
- **Revision of the National Electromobility Strategy (ENME),** which is ongoing, is expected to reinforce coordination between transport, energy and industrial policy priorities, while supporting EV infrastructure deployment and domestic supply chain development.
- **Commercial-EV coordination** through the Playground de Electromovilidad platform is accelerating coordinated adoption of medium- and heavy-duty EVs across fleet operators.

Germany

- **EV purchase support reintroduced 2026** for a EUR €3 billion fund supporting about 800,000 EVs at EUR €1,500–6,000 per vehicle from January 2026, restoring demand visibility for OEMs after the prior subsidy withdrawal; no country-of-origin restrictions (S18).
- **Electric truck toll exemption extended** for motorways to 2031, improving TCO for zero-emissions freight and anchoring long-term fleet investment signals.
- **Industrial capacity and expertise** covering dense battery manufacturing investment, established OEM base and proximity to European charging corridors create a durable competitive position despite Chinese OEM incursion.

Note: Barometer '26 Survey (N=508); Road transportation industry leader interviews (N=12)

Policy landscape

Business leaders highlight the following **key policy developments** shaping the road transportation sector across regions.

Legend N – New | C – Continuation | R – Reform | B – Rollback

Region	*Key developments*
European Union	N: **Germany:** EV purchase subsidy relaunched for 2026 – EUR €1,500–6,000 per vehicle from January 2026, with a total fund of EUR €3 billion; electric truck toll exemption extended to 2031.[S17] R: **France:** Malus CO_2 tightened from 2026; vehicles emitting more than 108 gCO_2/km face escalating tax, rising to EUR €80,000 for vehicles above 191 gCO_2/km, reinforcing the polluter-pays principle[S19] R: **Across the EU:** The Alternative Fuels Infrastructure Regulation (AFIR) is under revision in 2026, with the direction and market implications uncertain in the current policy climate B: **Across the EU:** The EU softened the 2035 ICE phase-out, reducing the zero-emission new-vehicle requirement from 100% to 90% of new vehicle sales, allowing limited hybrid and ICE vehicles beyond 2035 and creating a visible wedge in the long-term electrification trajectory[S18]
United States	B: The Section 30D New Clean Vehicle Credit expired; under the OBBBA, the government accelerated the credit expiry from 2032 to September 2025, removing the main federal consumer incentive and triggering multi-billion-dollar OEM write-offs B: 2009 Greenhouse Gas Endangerment Finding under rescission as the EPA moved in 2026 to remove the legal basis for regulating vehicle GHG emissions under the Clean Air Act; if finalized, future standards would be materially weakened B: The government paused the USD $5 billion National Electric Vehicle Infrastructure program for six months in 2025 and resumed under revised guidance, shifting execution risk to states[S20]
China	N: Mandatory dual credit policy 2026–2027 instructs passenger car manufacturers to achieve a 48% NEVI credit ratio in 2026, rising to 58% in 2027, either producing enough credits from EV and plug-in vehicle sales or buying credits from EV-heavy manufacturers to close the gap[S16] R: Tightened passenger-car fuel consumption standards effective as of 1 January 2026; mandatory fleet-average fuel consumption limits strengthen compliance costs for ICE-heavy manufacturers and structurally favor electrification B: EVs excluded from the 2026–2031 Five-Year Plan for the first time in a decade, signaling that the domestic market is considered self-sustaining and no longer requires direct state support
India	N: National EV charging infrastructure guidelines issued in 2025 covering battery swapping, charging stations and grid interconnection provide a harmonized framework for nationwide rollout C: Electric two- and three-wheeler subsidies active since September 2024, with two-wheeler support through July 2026 and three-wheeler support through March 2028; four-wheeler passenger cars remain excluded R: PM E-DRIVE scheme active from October 2024 to March 2026 and extended to 2028 for selected segments (buses, trucks, charging infrastructure); approximately USD $1.2 billion allocated to support EV adoption, charging infrastructure and the domestic manufacturing ecosystem[S13]
Mexico	N: Plan México Fiscal Stimulus Decree 2025 allocated 30 billion Mexican pesos (approx. USD $1.5 billion) through 2030, offering accelerated depreciation of 35%–91% on new fixed-asset investments, including machinery and equipment linked to EV supply chains, targeting 3,000 fast-charging stations along strategic corridors[S14] N: Administrative guidelines for EV charging, issued by the Energy Regulatory Commission, cover permitting, grid access and charging business models, formalizing the regulatory framework R: Vehicle industrial tax reform 2026 incorporates environmental and efficiency criteria, adjusting taxation based on sustainability performance

Note: Barometer '26 Survey (N=508); Road transportation industry leader interviews (N=12)

Policy landscape

Region	*Key developments*
Brazil	**N:** Programa MOVER regulation imposes new mandatory criteria for all new vehicles, including minimum recyclability rates, energy efficiency and vehicle labeling, and from 2027 the presentation of full life-cycle carbon footprints **R:** PROCONVE L8 phase tightens light-vehicle emissions and efficiency requirements, with compliance obligations phased in from 2025 through 2031
Ethiopia	**R:** ICE vehicle import ban extended for imports of petrol and diesel passenger cars in January 2024 and extended the ban to fuel-powered trucks in October 2025, making Ethiopia the first country to mandate a full transition to electric mobility through import policy



Note: Barometer '26 Survey (N=508); Road transportation industry leader interviews (N=12)

Road transportation | External sources

Section	*Note*	*Data point*	*Source*
Business case progress	S1	EVs omitted from China's 2026-2031 Five-Year Plan for first time in a decade	The Diplomat
Business intelligence	S2	EU softened 2035 ICE phase-out from 100% to 90% zero-emission	European Commission
Business intelligence	S3	Section 30D credit expired in September 2025 under OBBBA	IRS OBBBA (Public Law 119-21)
Business intelligence	S4	EPA rescinded the 2009 Greenhouse Gas Endangerment Finding	US EPA
Business intelligence	S5	NEVI charging program was paused before resuming under revised guidance	FHWA / US DOT Federal Register (FHWA)
Business intelligence	S6	Stellantis write-off	Stellantis press release The Guardian
Business intelligence	S7	Ford write-off	Fast Company Ford SEC 8-K filing
Business intelligence	S8	Honda write-off	Honda SEC Form 6-K Reuters (via US News)
Business intelligence	S9	GM write-off	Reuters (via KFGO) InsideEVs / GM SEC 8-K
Business intelligence	S10	The volume-weighted global pack price fell from USD 170/kWh in 2022 to USD 108/kWh in 2025	BloombergNEF
Business intelligence	S11	LFP capacity additions in China through October 2025 were 30 percentage points higher than the rest of the world combined	BloombergNEF
Business intelligence	S12	Average EV prices in China are 34% (SUVs) and 55% (small and large vehicles) below ICE	BloombergNEF
Business intelligence	S13	India's PM E-Drive Scheme	Electrive
Business intelligence	S14	Mexico's Plan México	CLAUGTO LATAM Mobility
Business intelligence	S15	China's October 2025 action plan	State Council of China
Countries to watch	S16	Mandatory Dual Credit Policy 2026-2027. 48% NEV credit ratio in 2026, 58% in 2027	Dieselnet (referencing MIIT)
Countries to watch	S17	EV purchase support reintroduced 2026: approximately EUR €3 billion fund supporting about 800,000 EVs at EUR €1,500–6,000 per vehicle from January 2026, restoring demand visibility for OEMs after the prior subsidy withdrawal; no country-of-origin restrictions.	European Alternative Fuels Observatory (EC)
Policy landscape	S18	2035 ICE phase-out softened: The EU reduced the zero-emissions new-vehicle requirement from 100% to 90% of new vehicle sales, allowing limited hybrid and ICE vehicles beyond 2035 and creating a visible wedge in the long-term electrification trajectory.	European Commission
Policy landscape	S19	France: Malus CO_2 tightened from 2026. Vehicles emitting more than 108 gCO_2/km face escalating tax, rising to EUR €80,000 for vehicles above 191 gCO_2/km, reinforcing the polluter-pays principle.	Ministère de l'Économie (France)
Policy landscape	S20	NEVI program paused and restarted: The USD $5 billion National Electric Vehicle Infrastructure program was paused for six months in 2025 and resumed under revised guidance, shifting execution risk to states.	Federal Register (FHWA)

Note: Barometer '26 Survey (N=508); Road transportation industry leader interviews (N=12)

Global Climate Action Agenda Goal

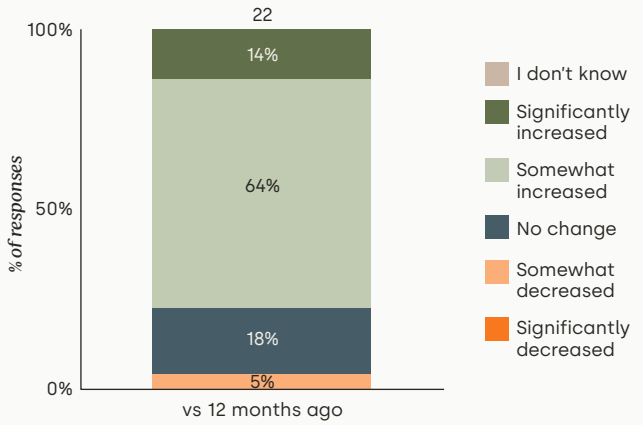
Near-zero emissions steel is the preferred choice in global markets, with efficient use and near-zero emissions steel production established and growing in every region by 2030.

Business confidence

Business confidence in steel decarbonization has improved year over year, driven by clearer EU trade policy, accelerating electric arc furnace (EAF) investment, and tightening carbon frameworks; but conviction in near-term hydrogen-based ironmaking has weakened. Near-term investment is concentrating on EAF conversion, thermal substitution, and scrap use, with some producers pivoting to natural gas-based direct reduced iron (DRI) as a bridge where hydrogen economics do not yet close the gap. These pathways improve emissions intensity without relying on green premiums, which remain regionally uneven (emerging in parts of Europe, but limited in Asia and absent in the US). The next wave of investment depends on durable policy, affordable clean power, stronger demand-side pull, and harmonized greenhouse gas (GHG) accounting and monitoring, reporting and verification (MRV) frameworks. The EU Carbon Border Adjustment Mechanism (CBAM) (definitive phase from Jan. 2026) is supportive but adds compliance complexity, while emerging bilateral partnerships (e.g., EU-Mercosur, EU-Canada) are opening new cross-border pathways for green iron supply.

Investment

Steel figure 1: How have your company's total investments contributing to climate mitigation, adaptation and resilience changed compared to the previous 12 months? *Survey results (N=22).*



Top 3 reasons for increasing investment (as stated by business)

- **Expected changes in customer demand:** Demand signals are strengthening across segments, with auto original equipment manufacturers (OEMs) actively engaging suppliers on decarbonization, long-term offtake contracts emerging in India, and US buyers beginning to set carbon thresholds on procurement.
- **Cost reductions in low-carbon technologies:** Renewables are now cheaper than thermal power in India, green hydrogen production costs have fallen to USD $3–4/kg versus a USD $5–6 global average, and post-Ukraine electricity price normalization is strengthening the European EAF business cases.
- **Clearer or stronger policy support:** The CBAM definitive phase and Emissions Trading System (ETS) free allocation phase-out are improving European economics, India's Green Hydrogen Mission and draft procurement mandate expected in April 2028 are accelerating action, and US tariffs, alongside melt-and-pour rules, are stabilizing domestic prices.

> *"Compared to last year, the investment case looks stronger. We made our investment decisions in 2024 and are moving ahead with nearly EUR €5.5 billion in EAF-based transformation. Despite market volatility, we remain committed."*
>
> – Executive, Steel company

Note: Barometer '26 Survey (N=508); Steel sector leader interviews (N=7)

Business case progress



Where businesses saw progress

Regulatory certainty

The implementation of CBAM and stronger trade safeguards in Europe are improving regulatory visibility and strengthening investment confidence. Fragmented MRV standards remain a critical gap, with the EU scrap-variable scale emerging as a convergence signal. India's taxonomy is directionally positive but remains a starting point, isolated from global frameworks and in need of alignment. Carbon pricing is expanding in Brazil, Mexico and through CBAM, but risks inconsistent compliance burdens across jurisdictions.

Where progress has seen limited change or declined

Investment case

The investment case has seen limited change year over year, reflecting long cycles and unchanged project economics. In Europe and the US, investments depend on policy stability and trade protections, with policies such as the EU Steel Action Plan and the Industrial Accelerator Act yet to produce tangible effects. Additionally, some major projects are being scaled back from their original scope. In India and the Nordics, strong demand supports capacity expansion, but a large share of announced green steel investments globally remain stuck at the planning stage.

Customer behavior

Demand for low-carbon steel continues to grow but remains concentrated in early-mover sectors, with volumes still small relative to multi-million metric ton capacity. Green premiums remain case by case: in India, customers want lower-carbon steel at cost parity, with no willingness to pay a premium. Customers increasingly ask for emissions data, but cannot reference a common standard, limiting offtake commitments.

Infrastructure

Hydrogen infrastructure and renewable power remain insufficient for large-scale hydrogen-based DRI, the binding constraint on decarbonizing ironmaking. Regional limitations differ: Europe faces energy cost barriers, India and Southeast Asia face grid access and reliability challenges, and Brazil faces grid expansion requirements for green iron and hydrogen at scale

Supply constraints

High-quality scrap constrains EAF substitution for premium grades – scrap is abundant but quality-limited in the US, increasingly competed for in Europe, and scarce in India. Low-carbon hydrogen supplies remain limited and expensive, delaying hydrogen-based steel and ironmaking deployment. Alternative fuel and green iron supply chains are developing unevenly across regions, with scrap covering only roughly 25% of global production and the need for multiple enablers in parallel.

Technology

Core technologies, including EAF, hydrogen-based DRI, and carbon capture, utilization and storage (CCUS) remain viable but face significant cost and scaling challenges. Many steelmakers are prioritizing the electrification of steelmaking first, while delaying large-scale ironmaking transformation until energy and hydrogen costs fall. Pilot projects in hydrogen, CCUS and alternative fuels continue, but with limited progress versus last year – hydrogen availability lags expectations and CCUS remains stuck at the pilot scale.

Regional nuances

Investment case:

Latin America: Brazil's emerging ETS and the advancing EU-Mercosur trade agreement are strengthening the investment case for low-carbon steel production by creating both a domestic carbon price signal and a preferential pathway into the European market for differentiated green products.

Customer behavior

Europe: Automotive OEMs continue to drive the bulk of binding offtake agreements for low-carbon steel; leading European producers (especially Nordic countries) are sustaining a green premium of EUR €200 to EUR €300 per metric ton,[S1] though every deal requires hard negotiation.

US: State-level environmental product declaration requirements in California, New York, Denver and Minnesota are generating growing demand for sustainability data and carbon thresholds, but this has not translated into any willingness to pay a premium.

Note: Barometer '26 Survey (N=508); Steel sector leader interviews (N=7)

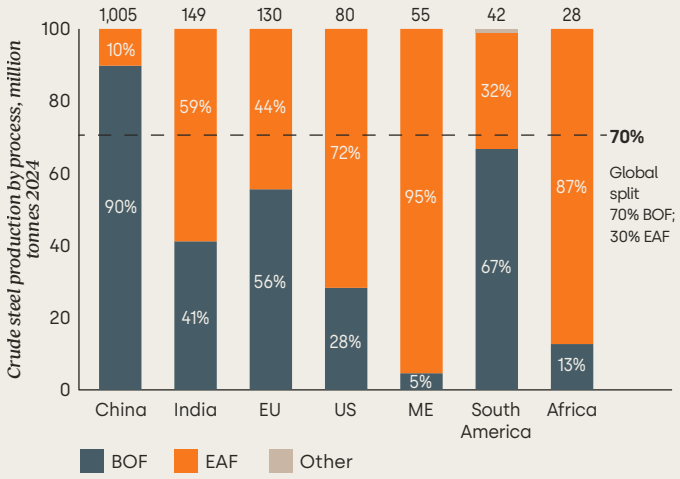
Steel decarbonization is advancing through EAF expansion, but green premiums remain insufficient and no project has reached commercial scale.

EAF steelmaking now accounts for approximately 30% of global steel capacity (figure 2) and represents the most executable near-term decarbonization pathway. It cuts CO_2 emissions by roughly 70% compared to blast furnace production while avoiding dependence on large-scale hydrogen infrastructure. EAF penetration is high across the EU, US, Middle East and North Africa (MENA) and India, though profiles diverge (figure 2): the US and EU are predominantly scrap-based, while India and MENA are more DRI-reliant. In the US, EAF already accounts for roughly 70% of domestic production – a structural advantage that places the country's steel sector substantially ahead of most global peers on emissions intensity.

The replacement of ageing blast furnace assets is primarily driving expansion, as global overcapacity limits incremental additions (India is a key exception). In Sweden, the EUR €4.5 billion electrification program converting blast furnace sites at Luleå and Oxelösund[S2] to EAF-based production exemplifies this approach; business leaders frame the transformation explicitly as converting existing assets, not adding capacity. In France, a specific combination enabled the ~EUR €1.3 billion Dunkirk EAF investment (~2 million metric ton capacity, operational 2029):[S3] EU trade safeguards reducing import pressure, a long-term nuclear power purchase agreement stabilizing electricity costs, and accelerated permitting through France's "strategic industrial project" pathway are facilitating parallel approvals. These conversions typically pair scrap-based EAF feed with hot metal from a residual blast furnace, illustrating how decarbonization advances site by site within existing operations rather than as a clean-sheet build. India is the exception: structural demand growth of 6–7% of gross domestic product (GDP)[S4] requires steel consumption to expand at double-digit rates, supporting new capacity additions alongside conversion.

Where these investments have proceeded, cost competitiveness and supportive trade policy were the decisive triggers; green premium demand alone has not been sufficient to drive investments at scale. Producers in Europe are maintaining premiums of EUR €200–300/t[S1] for fossil-free products, with demand expanding beyond early automotive frontrunners into certain construction segments. But this remains an exception. In the US, businesses launched carbon-offset steel products such as RebarZero and Merchant Zero, which combine renewable energy certificates with carbon credits, four years ago but they have not gained meaningful traction. Uptake is so far limited to sporadic municipal and state projects seeking to meet carbon targets. Businesses in India report that no customer segment is willing to pay above cost parity and that demand mandates, not voluntary premiums, are necessary to shift the system.

Steel figure 2: Crude steel production by route, 2024 | *Source: Market participant interviews (N=7), World Steel Association, Global Iron and Steel Tracker, Global Energy Monitor, OECD for crude steelmaking capacity and World Steel Association for crude steel production*



Notes: [1]Capacity data reflect information up to 2024; [2]All production data are from the World Steel Association

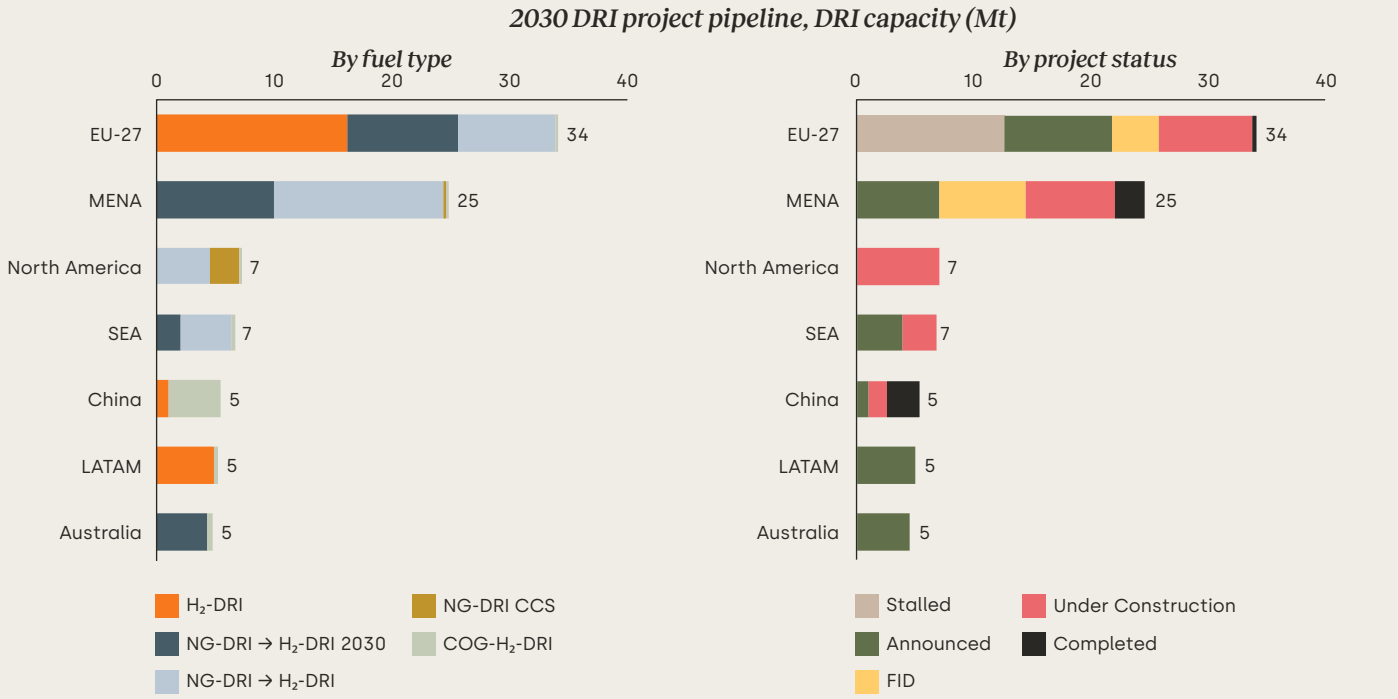
Ironmaking remains the structural bottleneck as hydrogen-based DRI and CCUS are validated but power cost, infrastructure and capital constrain them.

H_2 DRI requires renewable electricity priced at roughly USD $30 to USD $40 per MWh to reach cost parity with conventional ironmaking, a threshold out of reach in most regions today. In Europe, where energy costs remain persistently high, this is the single greatest barrier. Across the EU 27, 38% of announced DRI projects have stalled, with elevated power prices, grid connection delays, and hydrogen infrastructure gaps cited as the principal causes (Figure 3). One major investment in northern France captures this well: steelmaking capacity moved forward at the site, but the business deferred the DRI component because it judged the economic conditions for hydrogen-based ironmaking to be insufficient. In Sweden, businesses have validated the HYBRIT hydrogen DRI pathway at pilot scale, with intellectual property secured, though the next milestone, a large-scale demonstration plant on the iron ore side, faces permitting delays.

The MENA region is advancing a pipeline of roughly 25 million metric tons of DRI capacity, though mostly on natural gas, with the transition to green hydrogen contingent on falling costs and stronger carbon price signals (figure 3). In Brazil, green hot briquetted iron (HBI) projects are under development, leveraging abundant renewables and iron ore to capture more value locally rather than exporting raw ore. A similar logic is emerging in Australia, where the ambition is to process iron ore into green iron using cheap renewable energy and to then export the upgraded product. China, with the world's largest installed base of electrolysers, has the industrial capability to pivot rapidly to green ironmaking once conditions align. Yet no structural shift in global trade flows has materialized.

Note: Barometer '26 Survey (N=508); Steel sector leader interviews (N=7)

Steel figure 3: 2030 DRI project pipeline by fuel type (left) and project status (right), DRI capacity in million metric tons | *Source: Agora Industry*



CCUS remains at the pilot stage in the steel sector. The most prominent example is a facility in Ghent, Belgium, producing ethanol from carbon captured at an industrial scale footprint, yet still formally classified as a pilot. The project has demonstrated technical feasibility but highlights harder questions that remain unresolved: scaling capture rates to full plant output, building CO_2 transport and storage infrastructure, and resolving carbon accounting challenges.

Not all producers see CCUS as part of their long-term answer. The view from business leaders is that CCUS treats the symptom rather than the cause; the better path is to remove fossil carbon from the process entirely.

Trade safeguards, carbon pricing and domestic certification frameworks are key investment enablers, with EU protective measures and India's green steel taxonomy strengthening conditions for low-carbon production.

Trade protection and carbon pricing frameworks are emerging as key investment enablers, operating through three reinforcing channels. First, tariffs, quotas and safeguard measures stabilize domestic pricing by shielding producers from underpriced imports and global overcapacity pressures. Across the Nordics, business leaders confirm that trade protections help stabilize domestic steel prices and demand, which in turn increases confidence to invest in low-carbon production. Second, by reducing import pressure, these measures improve plant use and margin visibility, strengthening balance sheets and freeing capital for near-zero pathway upgrades. In a sector where global overcapacity will likely reach roughly 700 million metric tons by 2027,[S5] the link between trade defense and investable margins is direct. Third, mechanisms such as CBAM are beginning to prevent a worsening of the cost gap between conventional and low-carbon steel as free allowances phase out: CBAM ensures that imported steel faces equivalent carbon obligations to domestically produced material, avoiding a scenario where European producers bear carbon costs while imports do not.

Policy ambition, however, continues to outpace delivery. In Europe, the Steel and Metals Action Plan and the Industrial Accelerator Act are directionally positive, but tangible effects have yet to materialize. Industry sentiment in much of Europe remains subdued, with German capacity use at roughly 80%[S6] and arc furnace use across the rest of Europe running below that level. In the United States, the regulatory environment has shifted markedly. Businesses report that environmental, social and governance (ESG)-focused investor engagement has dropped sharply, with sustainability leads noting a decline from four or five dedicated investor calls per year to just one in 2026. US-based producers, as founding members of the Global Steel Climate Council, have set 2034 targets backed by concrete action plans. Yet they describe the 2050 carbon neutrality goal as aspirational and suggest it may eventually shift to 2055 or 2060.

The critical gap underpinning all of this is the absence of a common global standard for steel carbon intensity. India's green steel taxonomy, which uses a star rating system and has certified over 60 companies, is a meaningful first step, but it is currently isolated from international frameworks such as ResponsibleSteel, SteelZero, and the EU's scrap-variable scale. In the US, industry leaders are contesting the Global Steel Climate Council (GSCC) sliding-scale methodology, viewing the distinction between scrap-based and iron-ore-based metrics

Note: Barometer '26 Survey (N=508); Steel sector leader interviews (N=7)

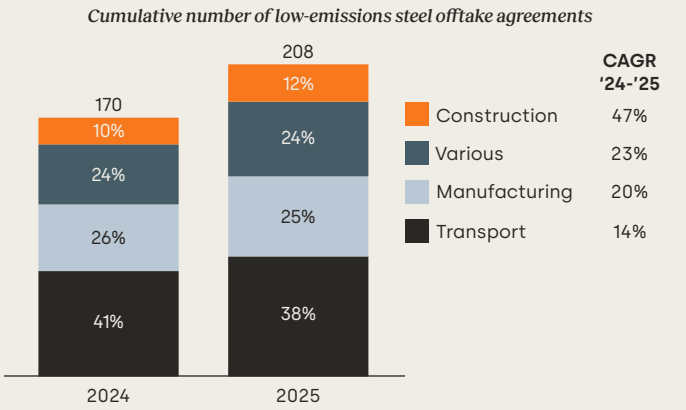
as a critical unresolved issue. Without convergence across these frameworks, CBAM cannot function effectively and buyers cannot make credible offtake commitments anchored in verifiable carbon intensity. The EU Industrial Accelerator Act's reference to the scrap-variable scale is emerging as a convergence signal, but significant gaps remain before the industry has an interoperable system that can underpin trade in low-carbon steel.

Demand remains the binding constraint – narrow in breadth, lacking verifiable standards and buyers largely unwilling to pay a premium – while clean power costs and grid bottlenecks further constrain supply-side scale-up.

Cost competitiveness and trade policy are unlocking the first wave of EAF investments, but scaling beyond frontrunner projects requires demand pull that does not yet exist at the scale needed. Cumulative low-emissions offtake agreements grew 22% year over year, reaching 208 in 2025, yet the market remains concentrated: transport and manufacturing together account for nearly two thirds of all deals (figure 4), with automotive OEMs the strongest source of pull and some construction and select tech companies following. Where interest is rising, buyers still cannot verify what they are buying and customers are requesting environmental product declarations and emissions data with growing frequency. Yet many do not know which standard to reference or how to act on the information they receive. Therefore, information requests rise but binding offtake commitments remain rare, denying producers the contractual certainty needed to underwrite capital-intensive investments. Willingness to pay a green premium remains the exception, not the norm: in India and the US, no customer segment is paying above cost parity; in Europe, premiums are hard-won, transaction by transaction and confined to a narrow set of buyers, which is insufficient to anchor the investment case for system-wide capacity transformation. In India, where a large share of steel demand flows through government projects, industry leaders argue that mandating low-carbon steel in public procurement would create the binding demand signal the market currently lacks. Without such mandates, the economics do not close the gap and producers cannot justify the capital expenditure needed to decarbonize when customers treat low-carbon steel as a preference rather than a requirement.

On the supply side, low-cost power availability and legacy plant configurations not designed for electrification further constrain steel decarbonization pathways. Many legacy plants sit in areas with weak grid connections and the shift to electricity-driven production requires major transmission build-out that grid operators have been slow to deliver.

Steel figure 4: Cumulative low-emissions steel offtake agreements by sector, 2024–2025 | *Source: BloombergNEF 2026*



Note: Barometer '26 Survey (N=508); Steel sector leader interviews (N=7)

Policy priorities

Businesses highlight three key policy priorities that require urgent progress over the next 1–3 years: demand creation, standards and definitions, and enabling infrastructure.

Demand creation policies

Introduce public procurement mandates and sectoral standards (e.g., EU Green Public Procurement (GPP), India taxonomy, Japan government procurement) to create binding demand for low-carbon steel.

Encourage downstream commitments (e.g., ReFuelEU Aviation Regulation) to enable scale and cost reductions.

Strengthen carbon pricing and trade measures (CBAM, Brazil/Mexico ETS, safeguards, ETS free allocation phase-out) to close the green premium gap and prevent leakage.

Standards & definitions

Harmonize emissions accounting as current frameworks (India, GSCC, Cradle to Finished (C2F), ResponsibleSteel, China, Germany) are not interoperable, allowing cherry-picking of methodologies.

Converge on the scrap-variable scale, which the EU Industrial Accelerator Act already references as the emerging common methodology.

Establish chain-of-custody frameworks for credible cross-border trade; without this, mandates and CBAM cannot function.

Enabling infrastructure

Accelerate grid build-out, which is the single biggest physical bottleneck; connection timelines are determining EAF conversion pace in Europe, grid access is constraining India and Southeast Asia.

Invest in low-carbon hydrogen infrastructure and competitive clean energy (e.g., India H_2 Mission, EU Hydrogen Bank, Brazil grid expansion).

Use public funding tools (EU Innovation Fund, carbon contracts for difference), India National Green H_2 Mission) and attract private funding to de-risk early investments.

> *"Make low-carbon products a requirement, not a good-to-have thing."*
>
> – Executive, Steel company

> *"There is no uniform standard to arrive at the emissions intensity of steel - every industry is using it to their own benefit."*
>
> – Executive, Certification body

> *"The biggest constraint that will decide our pace is the pace of grid build-out - we are fully dependent on grid providers."*
>
> – Executive, Steel company



Note: Barometer '26 Survey (N=508); Steel sector leader interviews (N=7)

Countries to watch

Green steel progress diverges across growth markets, execution leaders and cost-advantaged systems.

Sweden

- **Green steel investment is advancing toward commercial scale as large-scale production shifts and EAF conversions progress;** but it is not yet at full commercial production. The Northvolt bankruptcy has dampened investor confidence in European green industrial projects; however, the EUR €4.5 billion electrification program is proceeding.[S2]
- **Grid connections and infrastructure readiness remain the key enabler,** with high-voltage connection timelines determining the pace of transition.

India

- **India is the only major market where steel consumption is actively growing:** 6–7% GDP growth is translating into high-single-digit to double-digit steel demand growth.[S4] Over 60 producers have applied for the new green steel taxonomy, with ~25 mills certified so far, and EAF and H_2-DRI pilots advancing.[S7] Yet most of the announced capacity additions by major producers remains blast furnace-based.
- **There is strong policy momentum with the green steel taxonomy,** National Green Hydrogen Mission, and CCUS budget commitments. The taxonomy will need to evolve toward interoperability with global frameworks over time.

Brazil

- **The country has a structural advantage** due to abundant renewables, domestic iron ore, and an established biomass pathway (charcoal-based ironmaking).
- **The 2027 presidential election is creating policy continuity risk** (the current pro-decarbonization agenda could shift materially); grid infrastructure is not yet in place for green iron/hydrogen at scale and rising Chinese steel import pressure from trade diversion.



Note: Barometer '26 Survey (N=508); Steel sector leader interviews (N=7)

Policy landscape

Business leaders highlight the following **key policy developments** shaping the steel sector across regions.

Legend **N** – New | **C** – Continuation | **R** – Reform | **B** – Rollback

Region	*Key developments*
EU	**N:** In October 2025, the EU Council proposed to replace the steel safeguard (expiring in June 2026), including new provisions to lower tariff volumes and raise out-of-quota tariffs for blast furnaces-basic oxygen furnaces (BF-BOF) (CBAM, Reg. (EU) 2023/956) **C:** ETS (Phase IV) tightening and declining free allocation strengthening carbon price signals and increase cost for BF-BOF steelmaking route
India	**N:** Carbon Credit Trading Scheme launched in 2026 across 9 sectors, including steel **C:** National Institute of Secondary Steel Technology (India) (NISST) will issue certificates and star ratings under the Green Steel Certification framework published in 2024, promoting transparency and adoption of low-carbon steel
Sweden	**C:** In 2025, government awarded ~USD $41 million to Stegra and ~USD $30 million to SSAB to scale hydrogen-based and electrified fossil-free steel production[S9] **R:** Sweden's 2025 Spring Amending Budget increased Industriklivet (Industrial Leap) funding by SEK 2.2 billion (~USD $210 million), strengthening grant support for green steel projects[S8]
Brazil & Chile	**N:** The GHG Emissions Trading System launched in 2025 marks the country's commitment to advancing carbon market mechanisms (SBCE – Law 15.042/2024) **N:** Chile's Chamber of Deputies approved a green hydrogen promotion bill in December 2025, currently under Senate consideration; while focused on green hydrogen tax credits, it could indirectly support green steel production through projects like CAP's Huachipato hydrogen initiative (National Green Hydrogen Strategy)
US	**C:** 48C (Inflation Reduction Act (IRA) §48C of the US Internal Revenue Code) advanced energy credit for plants that reduce their emissions by >20% remains active; Round 2 tax credit announced (USD $6 billion)[S10] **C:** No federal carbon pricing mechanism; however, some states have carbon programs (e.g., California cap-and-invest) **B:** Ongoing regulatory volatility – including challenges to the Environmental Protection Agency (EPA) endangerment finding and broader climate policy rollbacks – increases uncertainty and investment risk for steel projects
China	**N:** People's Bank of China (PBoC) Green Finance Catalogue (2025) creates unified taxonomy to channel capital into low-carbon and renewable projects **R:** National ETS expanded to steel, but carbon price remains low and has limited impact on production economics
MENA	**N:** United Arab Emirates: Demonstration project by Masdar and EMSTEEL in Abu Dhabi to produce green steel from green hydrogen **N:** Oman: National green hydrogen project auctions (Duqm hub) to supply green iron/steel export projects **N:** Morocco: Launched Off. Maroc, a USD $35 billion investment program to produce green hydrogen and support green steel production[S11]
Australia	**N:** Hydrogen Production Tax Incentive (USD $2/kg) from mid-2027 expected to lower operating cost for green hydrogen-linked iron/steel projects[S12] **N:** Guarantee of Origin scheme, implemented in 2025, created certification framework for green hydrogen and metals

Note: Barometer '26 Survey (N=508); Steel sector leader interviews (N=7)

Steel | External sources

Section	*Note*	*Data point*	*Source*
Investment	S1	In Europe, automotive OEMs continue to drive the bulk of binding offtake agreements for low-carbon steel; leading European producers (especially the Nordics) are sustaining a green premium of EUR €200 to EUR €300 per metric ton, though every deal requires hard negotiation.	Fastmarkets
Business intelligence	S2	In Sweden, the EUR €4.5 billion electrification program converting blast furnace sites at Luleå and Oxelösund to EAF-based production exemplifies this approach.	SSAB Luleå; SSAB Oxelösund Link 1; Link 2
Business intelligence	S3	In France, a specific combination enabled the ~EUR €1.3 billion Dunkirk EAF investment (~2 million metric ton capacity, operational 2029): EU trade safeguards reducing import pressure, a long-term nuclear power purchase agreement stabilizing electricity costs, and accelerated permitting through France's "strategic industrial project" pathway allowing parallel approvals.	ArcelorMittal
Business intelligence	S4	Structural demand growth in India of 6–7% GDP requires steel consumption to expand at double-digit rates, supporting new capacity additions alongside conversion.	GMK Center / JPC India
Business intelligence	S5	In a sector where global overcapacity is projected to reach roughly 700 million metric tons by 2027, the link between trade defense and investable margins is direct.	OECD Steel Outlook 2025
Business intelligence	S6	Industry sentiment in much of Europe remains subdued, with German capacity use at roughly 80% and arc furnace use across the rest of Europe running below that level.	ifo Institute
Countries to watch	S7	Over 60 producers have applied for the new green steel certificate, with ~25 mills certified so far; EAF and H_2-DRI pilots are advancing.	NISST / Green Steel Certification
Policy landscape	S8	Sweden's 2025 Spring Amending Budget increased Industriklivet (Industrial Leap) funding by SEK 2.2 billion (~USD $210 million), strengthening grant support for green-steel projects.	Riksdag
Policy landscape	S9	In 2025, Sweden awarded ~USD $41 million to Stegra and ~USD $30 million to SSAB to scale hydrogen-based and electrified fossil-free steel production.	Reuters
Policy landscape	S10	The 48C (Inflation Reduction Act (IRA) §48C of the US Internal Revenue Code) advanced energy credit for plants that reduce their emissions by >20% remains active; Round 2 tax credit announced (USD $6 billion).	U.S. DOE
Policy landscape	S11	Morocco launched Off. Maroc, a USD $35 billion investment program to produce green hydrogen and support green steel production.	Green Hydrogen Organisation
Policy landscape	S12	Australia's Hydrogen Production Tax Incentive (USD $2/kg) from mid-2027 aims to lower operating cost for green hydrogen-linked iron/steel projects.	Australian Government DCCEEW

Note: Barometer '26 Survey (N=508); Steel sector leader interviews (N=7)

Global Climate Action Agenda Goal

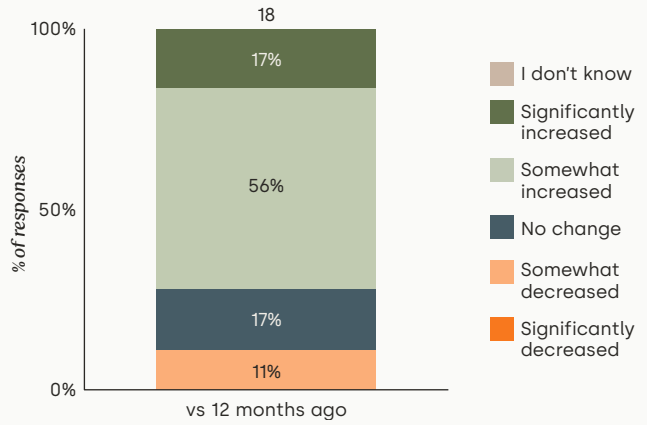
Make near-zero and low-emissions cement/concrete the preferred choice in global markets by 2030

Business confidence

Leaders remain optimistic, driven by near-term decarbonization efforts and new carbon capture, utilization and storage (CCUS) pilots, but do not yet see a transformational change. Investor confidence is highest where policy support is clear, such as India and the UK. It is cautious where regulation is volatile, as in the EU and US. And it is still emerging in Africa, where policy frameworks remain less mature. The absence of market-driven demand remains a core barrier to management buy-in for low-carbon investment. Near-term investment is concentrating on commercially viable levers – supplementary cementitious materials (fly ash, slag, limestone), alternative fuels, waste heat recovery, and renewable energy – which deliver emissions reductions at or below cost parity. CCUS has advanced past proof-of-concept, with the first plants operational and new final investment decisions, but commercial viability remains contingent on sustained public co-funding, demand-side measures, and credible carbon claim mechanisms. The next wave of investment depends on durable carbon pricing, affordable clean energy, stronger demand-side pull through public procurement mandates, and policy-enabled book-and-claim mechanisms that can decouple carbon value from physical cement flows.

Investment

Cement figure 1: How have your company's total investments contributing to climate mitigation, adaptation and resilience changed compared to the previous 12 months? *Survey results (N=18).*



Top 3 reasons for increasing investment (as stated by business)

- **Cost reductions in low-carbon technologies:** The use of supplementary cementitious materials such as fly ash and slag enables decarbonization without raising product costs, making low-carbon cement commercially viable. For example, in India, blended cements with 20–50% lower carbon content are already price-competitive with ordinary Portland cement.[S1]
- **Clearer or stronger policy support:** The inclusion of cement in national emissions trading schemes (China's emissions trading scheme/system (ETS) expansion, India's Carbon Credit Trading Scheme launching in 2026) and green procurement mandates (New York's 2027 low-carbon concrete mandate, the EU Construction Products Regulation from 2026) is creating regulatory pull for low-carbon investments.
- **Expected changes in customer demand:** Large technology companies with public climate commitments, particularly those investing in data center construction, are creating concentrated but meaningful demand for low-carbon concrete in North America and Europe. While this demand remains narrow, it provides near-term revenue visibility for producers.

> *"The fight for capital expenditure (CAPEX) allocation within our internal project pipeline needs to fuel the business case - but with rising uncertainty where North America is heading, it just gets more complicated."*
>
> – Executive, Cement company

Note: Barometer '26 Survey (N=508); Cement sector leader interviews (N=9)

Business case progress



Where businesses saw progress

Technology

There is meaningful progress in low-carbon cement technologies compared to last year, with incremental decarbonization solutions continuing to scale, particularly in energy-efficiency measures like waste heat recovery, alternative fuels such as refuse-derived fuel, and ongoing clinker substitution. Pilots and early deployments in carbon capture and novel binders mark tangible advances, though leaders cautioned that established technologies have not fundamentally changed and that novel binders remain a partial solution at roughly 5–10% of the mix.

Where progress has seen limited change or declined

Investment case

Competitive near-term decarbonization levers remain investable, with companies scaling clinker substitution, waste heat recovery, alternative fuels and renewables. These approaches are strongest in markets with abundant supplementary cementitious materials and lower-cost power such as India, while progress in Europe and North America has been more gradual. CCUS, by contrast, remains unprofitable without policy support, with investments delayed due to high capital expenditure and uncertain returns despite early momentum in Europe and emerging support in India and parts of Africa.

Customer behavior

Demand for low-carbon concrete is concentrated in a few segments, particularly hyperscalers and high-end real estate in North America and Europe. Most markets, especially India and other emerging economies, remain highly price-driven, with limited willingness to pay green premiums.

Infrastructure

Regulatory frameworks and carbon markets are emerging, such as the India Carbon Market, but remain immature and insufficient to support CCUS economics. Chain-of-custody and book-and-claim mechanisms to decouple carbon benefits from physical cement flows are absent, limiting demand aggregation for low-carbon cement overall and constraining CCUS scale in particular. However, credibility and robustness concerns remain, with risks of greenwashing. Without integration into GHG Protocol and Science Based Targets initiative (SBTi), these mechanisms may not translate into investable demand signals.

Supply constraints

Near-term legacy supply pressure is easing through ash harvesting, international sourcing, and slower-than-expected steel decarbonization, which means more basic oxygen furnace slag for Supplementary cementitious materials (SCMs). But this is delaying rather than accelerating the development of next-generation alternative materials. Meanwhile, CO_2 transport and storage infrastructure for carbon capture remains limited outside a few clusters such as Northern Europe, constraining large-scale deployment. Energy availability is emerging as an additional bottleneck.

Regulatory certainty

Emerging markets lead, with India's CCTS launching mid-2026, a formal CCUS roadmap and cement intensity targets creating the most coherent regulatory push of any major developing economy. Europe is advancing but disorderly – regulatory uncertainty is actively undermining investment decisions. The lack of alignment between carbon claim mechanisms and established accounting frameworks is creating a credibility gap that deters buyers and investors alike. In the US, the picture is bifurcated – the federal government has withdrawn support and state-level initiatives and hyperscaler demand remain too fragmented to anchor investment decisions.

Regional nuances

Investment case:

India: Near-term levers – clinker substitution with abundant fly ash and slag, waste heat recovery, renewables, and refuse-derived fuel (RDF) – are investable at or below cost parity, making India the strongest market for cost-aligned decarbonization.

Supply constraints

India: Abundant fly ash and slag supply supports rapid supplementary cementitious material (SCM) scaling, with no near-term constraint; significant headroom to increase fly ash use nationally.

Europe: Short-term SCM supply pressure easing as steel decarbonization slows – delaying, not accelerating, the development of next-generation alternative SCMs.

Regulatory certainty

India: The Carbon Credit Trading Scheme (CCTS) launching mid-2026, a formal CCUS roadmap, and cement intensity targets create the most coherent regulatory push of any major developing economy.

North America: The government has withdrawn federal support; state-level initiatives and hyperscaler demand are too fragmented to anchor investment decisions.

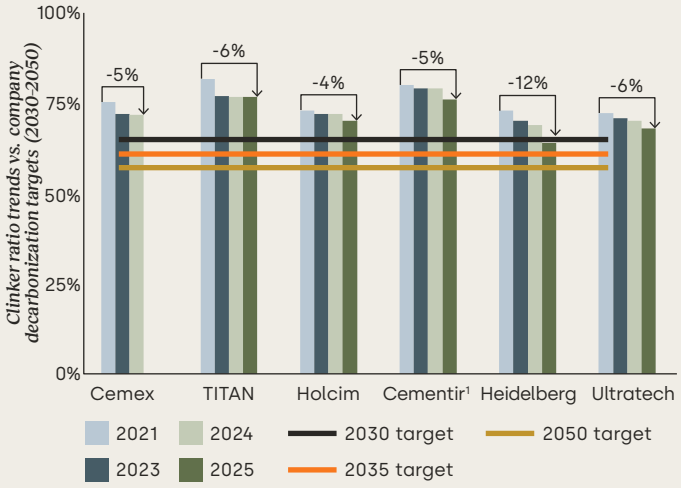
Note: Barometer '26 Survey (N=508); Cement sector leader interviews (N=9)

Cement decarbonization is scaling through clinker substitution, with cost-aligned uptake strongest in India, incremental in Europe, and nascent in Africa.

Clinker substitution remains the dominant near-term decarbonization lever in cement, delivering emissions reductions at or below cost parity by replacing energy-intensive clinker with supplementary cementitious materials. The approach scales because it is commercially driven. Producers reduce the clinker share wherever SCM supply is available and standards permit. In India, blended cements with 20–50% lower carbon content are already price-competitive with ordinary Portland cement,[S1] with major producers reporting clinker factors at or below 50%. As shown in Cement fig. 2, across Europe, leading producers are tracking toward 2030 targets of 60–65%, although progress remains incremental. In North America, selective demand pockets are driving gradual adoption. Africa is at an earlier stage but increasingly active.

However, the clinker substitution pathway alone cannot deliver full decarbonization. Process emissions from calcination (roughly 60% of total cement CO_2) remain untouched even at the most aggressive SCM use rates, underscoring the sector's dependence on CCUS and novel binders for residual emissions.

Cement and concrete figure 2: Clinker ratio trends vs company decarbonization targets (2030–2050) | *Source: Company annual reports, International Energy Agency*



Note: [1]Clinker ratios shown for gray cement; clinker ratio defined as the share of clinker in cement, with lower ratios indicating lower CO_2 intensity and therefore better decarbonization performance

SCM supply is tightening as coal and steel plant closures constrain traditional sources, but innovation – from limestone calcined clay cement (LC3) and alternative binders to recovered ponded fly ash – is emerging to offset the squeeze.

Decarbonization-driven plant closures are eroding the supply base for fly ash and blast furnace slag, the two principal supplementary cementitious materials. Coal production is declining sharply in Germany (compound annual growth rate of negative 3.6% through 2025, accelerating to negative 13.9% to 2030)[S2] and flat to declining in the US, while China's output is projected to plateau and India's growth is decelerating. The share of steel production via blast furnace is also declining across all major markets, reducing slag availability. That said, supply shortfalls are local rather than global, with international cementitious trading potentially closing the regional gaps.

A new wave of SCM sources is emerging to fill the gap. Legacy ash harvesting is extending fly ash availability; limestone calcined clay cement uses locally available clay resources and manufactured SCMs. Steel's slower-than-expected transition to electric arc furnaces means blast furnace slag remains available well beyond 2030, buying time to scale these alternatives.

Thermal substitution remains a major decarbonization lever, with high use in Europe and increasing momentum in India, while the US remains at an early stage with minimal biomass usage.

Replacing fossil fuels in cement kilns with waste- and biomass-derived fuels is scaling at markedly different rates. Europe leads at roughly 50% alternative fuel consumption but is nearing practical limits from biomass competition and kiln constraints. India is accelerating through municipal refuse-derived fuel linked to waste management policy. The US remains at an early stage, with minimal biomass use. China's substitution is low due to cheap coal (Cement fig. 3). Thermal substitution reduces but does not eliminate kiln emissions, meaning full thermal decarbonization requires either pure biomass or CCUS.

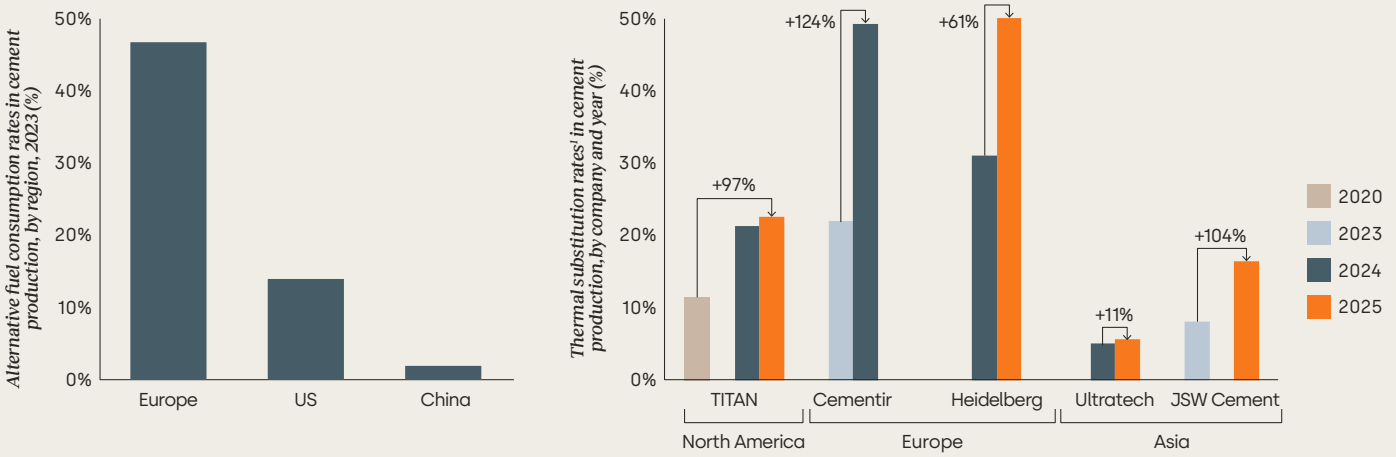
CCUS has moved beyond proof-of-concept, with strong industry momentum and recent final investment decisions (e.g., Brevik, Padeswood and Protos) reinforcing confidence in the technology as a key long-term decarbonization lever. This is the case even as scalability and economics continue to be dependent on regulatory support.

Carbon capture is now the only pathway that can address the cement emissions arising from calcination at existing cement plants. The Brevik facility in Norway has demonstrated technical viability as the world's first full-scale cement CCUS plant, and eight EU Innovation Fund co-financed projects are advancing. In India, a ~USD $2.2 billion CCUS budget allocation and the Department of Science and Technology (DST) roadmap targeting 750 Mt CO_2 capture by 2050 signal clear policy direction, although commercial scale is contingent on carbon market maturation and a legal storage framework. As shown in Cement fig. 4, Europe is expected to account for 73% of planned capacity by 2032.

However, economics, geography, infrastructure, and policy are constraining the scalability of CCUS, each independently blocking the path. CCUS adds permanent capital and operating expenditure on top of existing plant costs, meaning the investment case depends on sustained subsidies, mandates or green premiums. According to business leaders, successful CCUS deployments in Europe have depended on government subsidies covering a portion of project costs, without which

Note: Barometer '26 Survey (N=508); Cement sector leader interviews (N=9)

Cement and concrete figure 3: Alternative fuel consumption rates by region and thermal substitution rates by company (2020–2025) | *Source: Rocky Mountain Institute, Barclays Research, company annual reports*



Note: [1]Thermal substitution, often called TSR, is the replacement of fossil fuels used to heat cement kilns with alternative fuels

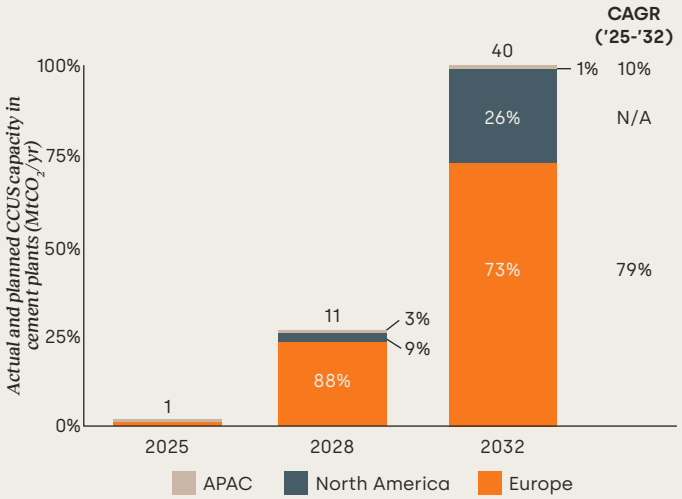
companies typically deprioritize CCUS in favor of faster payback investments. Full-chain deployment is impossible without CO_2 transport and storage infrastructure, yet planning alone adds years to already lengthy project timelines. At the same time, the EU lacks an infrastructure plan to match its carbon price and India has pilots but no legal storage framework. The entire CCUS pipeline clusters in 2030–2032. Any slippage in policy, planning or financing risks pushing projects past the point of no return, with companies already shifting capital to alternatives with faster payback as regulatory confidence erodes.

Given the local nature of cement markets, scaling low-carbon cement will require policy-backed book-and-claim mechanisms to decouple carbon benefits from physical flows and enable demand aggregation.

Premium demand for low-carbon cement is narrow, while the local nature of cement markets creates a structural barrier to scaling. Demand is emerging from hyperscalers and select private projects in North America and Europe, but most construction remains price-driven. Carbon accounting is jurisdiction-specific: reductions at one plant cannot be monetized elsewhere. Without book-and-claim mechanisms analogous to renewable energy certificates, willing buyers cannot support CCUS production in other regions.

Public procurement mandates represent the most powerful demand lever. Government projects account for roughly 50% of cement demand in the US;[S3] mandating low-carbon specifications would create the binding signal the market lacks. In the US, New York is the first state to mandate environmental product declarations (EPDs) and global warming potential (GWP) limits specifically for concrete, from January 2025. It builds on Buy Clean policies already in force in California, Oregon, Washington, Colorado and Minnesota that cover steel, concrete, asphalt, glass and other materials. Canada's Federal Embodied Carbon Standard requires a 30% reduction for projects above USD $5 million.[S4] These signals are positive but remain too fragmented to anchor large-scale investment.

Cement and concrete figure 4: Actual and planned CCUS capacity in cement plants (Mt CO_2/yr), 2025–2032 | *Source: International Energy Agency*



The credibility of carbon claim mechanisms remains unresolved but is advancing. In May 2025, Carbon Direct and Microsoft published the first criteria for high-quality environmental attribute certificates in concrete and steel. In January 2026, the Rocky Mountain Institute and the Center for Green Market Activation released a sector-specific book-and-claim framework developed with over 30 value chain stakeholders. The Sustainable Concrete Buyers Alliance is now operationalizing these frameworks. In April 2026, it issued its first request for proposals targeting up to 250,000 metric tons of low-carbon cement annually.[S5] However, regulators have not yet defined standards for low-carbon cement. Without integration into the GHG Protocol and SBTi, these mechanisms may not yet translate into investable demand signals at scale.

Note: Barometer '26 Survey (N=508); Cement sector leader interviews (N=9)

Policy priorities

Businesses highlight three key policy priorities that require urgent progress over the next 1–3 years: carbon pricing and market mechanisms, supply-side incentives and financing, and the harmonization of standards and definitions.

Carbon pricing & market mechanisms

Ensure carbon price signals are robust enough to unlock investment in CCUS at scale. India's nascent carbon market is expected to open at roughly USD $10 per metric ton of CO_2, orders of magnitude below the levels industry leaders consider necessary for commercial viability.[S6] In Europe, recent ETS price drops are further weakening already fragile business cases.

Recognize that policy predictability is as important as price level, with 7–8-year CCUS investment horizons requiring stable rules, including clarity on EU ETS reform and free allowance phase-out timelines.

Shore up confidence in Carbon Border Adjustment Mechanism (CBAM) credibility for producers investing in decarbonization, with recent sector opt-out signals eroding confidence in the mechanism's durability.

> *"The drop in the CO_2 price in Europe has a very, very direct impact on our CAPEX decisions."*
>
> – Executive, Cement company

Supply-side incentives & financing

Create public co-funding and grants to de-risk early CCUS deployment via the EU Innovation Fund, India's USD $2.2 billion CCUS allocation,[S7] and direct government risk-sharing as demonstrated in Norway and the United Kingdom.

Use tax incentives to close the cost gap for high capital expenditure pathways; the US 45Q (Section 45Q tax credit (for carbon oxide sequestration)) remains active but demand-side uncertainty limits uptake.

Ensure energy cost support and permitting acceleration to reduce barriers, with grid competition from data centers and slow permitting constraining investment in CCUS and new SCM capacity.

> *"The PM gave five projects supported by the Government of India for carbon capture and utilization. They will be pumping in 75% of the CAPEX for the pilot."*
>
> – Executive, Cement company

Harmonization of standards & definitions

Accelerate the adoption of and align existing standards as part of national building codes and public procurement frameworks.

Ensure greater permitting clarity for CCUS, including planning approvals, CO_2 transport/storage permitting, and industrial cluster access. Most cement plants currently lack proximity to viable pipeline or storage networks, also locking them out of funding.

> *"There is still a lack of clear standards and definitions for low-carbon cement, which makes it harder to drive consistent adoption."*
>
> – Executive, Cement company

Note: Barometer '26 Survey (N=508); Cement sector leader interviews (N=9)

Countries to watch

The global cement transition is accelerating as demand growth, policy signals and project economics strengthen momentum for low-carbon investment – with divergent pathways across high-growth markets, execution leaders, and technology frontrunners.

India

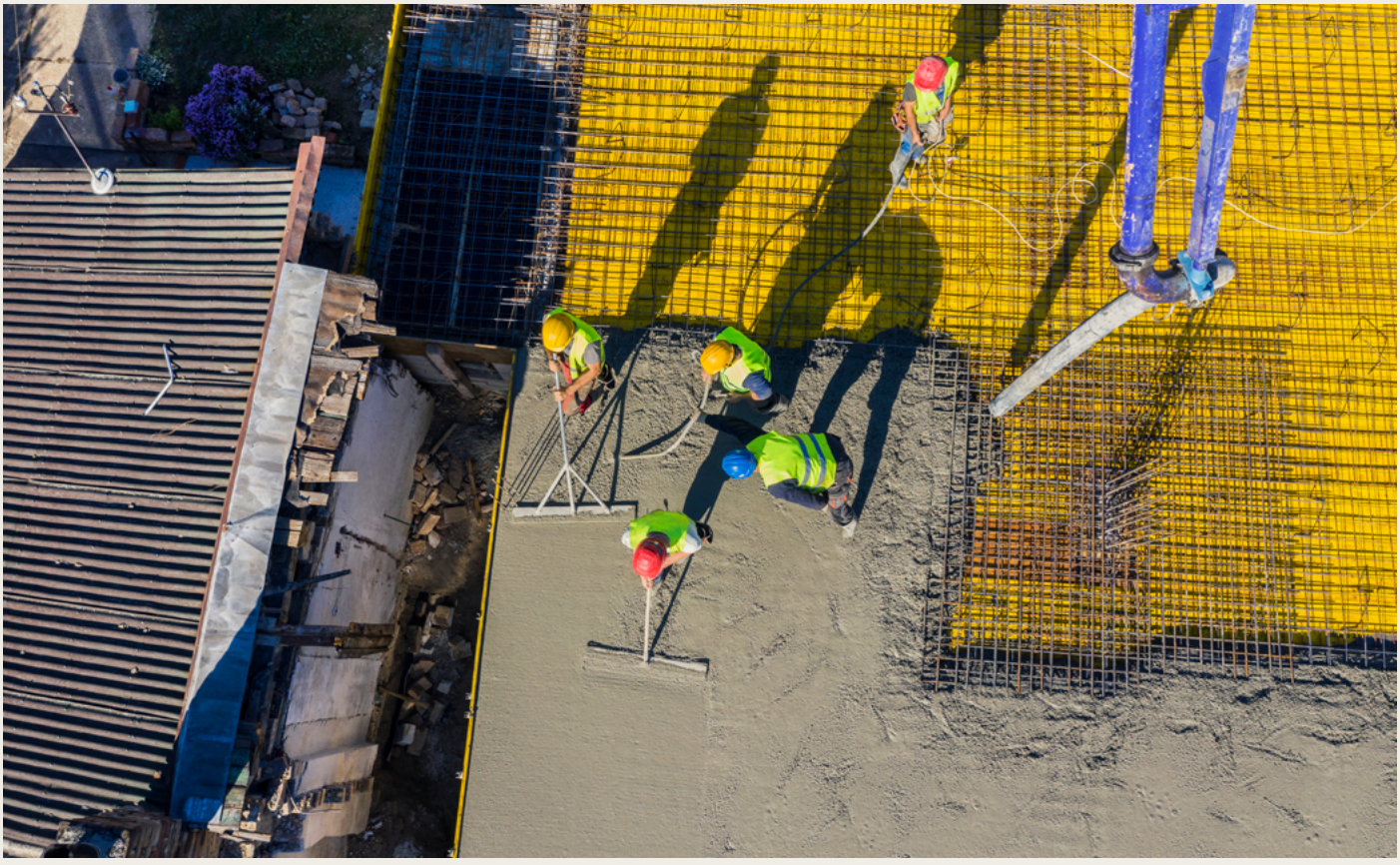
- **Greenhouse Gas (GHG) Emission Intensity Target Rules notified (Oct. 2025),** with cement required to cut emission intensity by 4.7–7.6% across 282 plants,[S8] penalizing underperforming plants; Indian CCUS Carbon Credit Trading Scheme is launching in mid-2026.
- **~USD $2.2 billion CCUS budget allocated (budget 2026-27)**[S7] across cement, steel, power and refineries over five years – explicitly bridging the gap between pilot and commercial scale.
- **Department of Science and Technology (DST) CCUS Research & Development Roadmap** (launched in Dec. 2025) targets 750 Mt CO_2 per annum capture by 2050,[S9] with cement-specific test beds and a legal storage framework under development in parallel.

Germany

- **EUR €5 billion Carbon Contracts for Difference scheme expanded to include CCUS (Mar. 2025),**[S10] with 15-year contracts awarded via competitive reverse auctions to hard-to-abate industries, including cement; first CCUS auction opening mid-2026.
- **EU CO_2 transport infrastructure legislation due in Q3 2026,** directly addressing the infrastructure gap holding back full-chain CCUS deployment across Europe.
- **EU ETS reform uncertainty is hitting CCUS CAPEX decisions;** with carbon price signals unreliable, industry increasingly sees direct government co-financing (e.g., EU Innovation Fund, EU ETS revenue recycling) as essential to de-risk investment.

Canada

- **Federal Embodied Carbon Standard (amended March 2025)** has a mandatory 30% embodied carbon reduction for federal construction above USD $5 million;[S11] it has been expanded to cover steel alongside concrete, with whole-building life-cycle assessments now required.
- **Buy Clean Strategy and CCUS Investment Tax Credit are both active,** with ~30% of Canada's public construction spending going to cement and concrete, making procurement policy a direct demand lever.[S12]
- **Cement and Concrete Breakthrough initiative (launched at the 28th United Nations Climate Change Conference (COP28) with the United Arab Emirates)** commits Canada as a global co-leader on standards, certification and demand creation for low-carbon cement.



Note: Barometer '26 Survey (N=508); Cement sector leader interviews (N=9)

Policy landscape

Business leaders highlight the following **key policy developments** shaping the cement sector across regions.

Legend **N** – New | **C** – Continuation | **R** – Reform | **B** – Rollback

Region	*Key developments*
EU	**N:** Carbon Border Adjustment Mechanism (CBAM) definitive period started January 2026 – importers of cement face financial obligations via Carbon Border Adjustment Mechanism (CBAM) certificates tied to embedded emissions[S13] **N:** Germany: EUR €5 billion state aid scheme to help industries decarbonize production processes, approved March 2025[S10] **N:** France: 15-year support scheme for EU ETS sites announced in February 2026 – ~EUR €1.6 billion to seven industrial projects deploying clinker substitution (e.g., calcined clays) and CCUS[S15] **C:** Innovation Fund allocates EUR €2.9 billion for large industrial decarbonization projects, including cement CCUS and process innovation[S14] **R:** France: Tightened embodied-carbon requirements for new buildings from January 2025 onwards, pushing developers to specify lower-carbon concrete and cement[S16]
India	**N:** Carbon-intensity targets established (~4.7–7.6% reduction) for 282 cement production units for 2025–26 and 2026–27 versus 2023–24 baseline[S8] **N:** Regulatory framework created for carbon credit trading, with formalization of markets expected in 2026 **N:** ~USD $2 billion budget allocated for CCUS in February 2026 to help decarbonize hard-to-abate sectors[S7]
US	**N:** State-level support advancing: New York becomes the first state to mandate EPDs and GWP limits specifically for concrete from January 2025; it builds on Buy Clean policies already in force in California, Oregon, Washington, Colorado and Minnesota that cover steel, concrete, asphalt, glass, and other materials **B:** Rescinded federal program aimed at low-CO_2 building materials, including cement, in January 2025 **B:** Environmental Protection Agency (EPA) proposed removing GHG reporting obligations for most source categories, including cement, after reporting year 2024
China	**N:** Mandates ultra-low emissions standards for clinker producers and grinding stations, with phased retrofit targets (50% of clinker capacity in key regions by end-2025; ~80% nationally by end-2028)[S17] **R:** Expanded national ETS to cement, with compliance expected from end of 2025
Canada	**N:** Federal Buy Clean/whole-building LCA disclosure required for all major federal buildings in 2025 **N:** Target to reduce embodied carbon in federal construction by ~30% since 2025 (Greening Government Strategy)[S11] **C:** Low Carbon Economy Fund and Greening Government Fund support low-carbon cement and concrete development
Brazil	**N:** Greenhouse gas (GHG) emissions trading system (SBCE) regulatory framework established in October 2025 **N:** Interim governance body set up to build carbon market infrastructure and monitoring, reporting and verification (MRV) system
UAE	**N:** Mandates nationwide GHG reporting, including for cement, starting in May 2025, enabling authorities to set annual emissions reduction targets
Vietnam	**N:** Updated rules mandate pilot ETS launch in August 2025 and development of a fully functional carbon market by 2029

Note: Barometer '26 Survey (N=508); Cement sector leader interviews (N=9)

Cement and concrete | External sources

Section	*Note*	*Data point*	*Source*
Investment	S1	In India, blended cements with 20–50% lower carbon content are already price-competitive with ordinary Portland cement.	Chemistry World
Business intelligence	S2	Coal production in Germany is declining at a compound annual growth rate (CAGR) of -3.6% through 2025, accelerating to -13.9% to 2030.	GDM Commodity Data by Country
Business intelligence	S3	Government projects account for roughly 50% of cement demand in the US.	ACEEE (Shi et al.)
Business intelligence	S4	Canada's Federal Embodied Carbon Standard requires a 30% reduction for projects above USD $5 million.	Treasury Board of Canada (Mar 2025)
Business intelligence	S5	The Sustainable Concrete Buyers Alliance issued its first request for proposal (RfP) in April 2026, targeting up to 250,000 metric tons of low-carbon cement annually.	RMI (Apr 2026)
Policy priorities	S6	India's nascent carbon market is expected to open at roughly USD $10 per metric ton of CO_2.	Costmos (India)
Policy priorities	S7	India allocated ~USD $2.2 billion for CCUS in budget 2026-27 across cement, steel, power and refineries over five years.	Business Standard (Feb 2026)
Countries to watch	S8	India's GHG Emission Intensity Target Rules (Oct. 2025) require cement to cut emissions intensity by 4.7–7.6% across 282 plants.	ICAP (Nov 2025)
Countries to watch	S9	India's DST CCUS R&D Roadmap (Dec. 2025) targets 750 Mt CO_2 per annum capture by 2050.	Down to Earth
Countries to watch	S10	Germany's EUR €5 billion Carbon Contracts for Difference scheme expanded to include CCUS in March 2025, with 15-year contracts via reverse auctions.	European Commission (Mar 2025)
Countries to watch	S11	Canada's Federal Embodied Carbon Standard (amended March 2025) mandates a 30% embodied carbon reduction for federal construction above USD $5 million.	Treasury Board of Canada (Mar 2025)
Countries to watch	S12	~30% of Canada's public construction spending goes to cement and concrete.	Pembina
Policy landscape	S13	EU CBAM definitive period started January 2026 – cement importers face financial obligations via CBAM certificates tied to embedded emissions.	EU Taxation & Customs
Policy landscape	S14	EU Innovation Fund allocates EUR €2.9 billion for large industrial decarbonization projects, including cement CCUS and process innovation.	Insight EU (Nov 2025)
Policy landscape	S15	France: 15-year support scheme for ETS sites announced February 2026 – ~EUR €1.6 billion to seven industrial projects deploying clinker substitution and CCUS.	Carbon Herald (Feb 2026)
Policy landscape	S16	France tightened embodied-carbon requirements for new buildings from January 2025, pushing developers to specify lower-carbon concrete and cement.	EPD Guide (Dec 2025)
Policy landscape	S17	China mandates ultra-low emissions standards for clinker producers with phased retrofit targets: 50% of clinker capacity in key regions by end 2025; ~80% nationally by end-2028.	Global Cement (Jan 2024)

Note: Barometer '26 Survey (N=508); Cement sector leader interviews (N=9)

Global Climate Action Agenda Goal

Achieve a global reduction in GHG emissions from production of fertilizers and optimize global nutrient use efficiency (NUE) by 2035

Business confidence

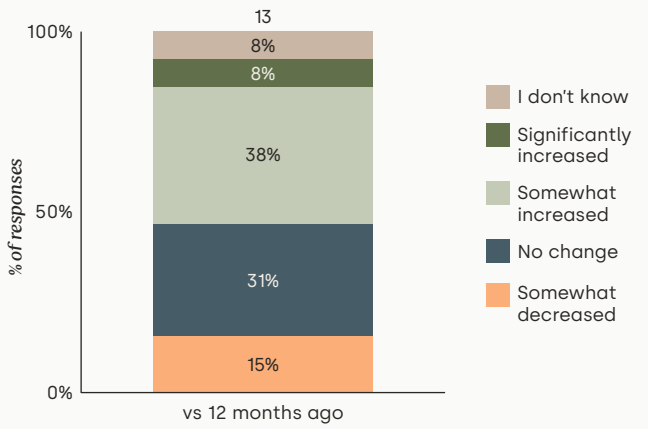
Business leaders see that the value chain and the maturity of supply-side solutions are constraining the decarbonization of fertilizer production. While nitrogen producers can already make low-carbon products at scale, downstream buyers show little willingness to absorb the premium, leaving farmers to cover the cost. For phosphate, a critical mineral for global food security where cutting production is not an option, several process emissions abatement pathways remain under technical and commercial assessment. This leaves decarbonization to advance in parallel with maintained output. Pioneering companies are setting the scene with cross-value chain partnerships, including the Yara-PepsiCo offtake agreement and Heineken's equity stake in Fertighy. Scaling beyond these pioneers will require broader industry-wide collaboration and a supportive policy environment.

Geopolitical shocks are hitting fertilizer disproportionately along three distinct channels: first, volatile gas prices are squeezing production economics, particularly in Europe where conventional ammonia margins have compressed; second, highly concentrated trade routes for urea, ammonia and sulfur are constraining supply availability, leaving importing regions vulnerable to single points of failure. Third, key chokepoints are disrupting logistics, with recent Middle East and Red Sea tensions stressing the routes that connect Gulf and North African producers to Asian and European buyers. Additionally, sulfur prices are increasing to unprecedented levels, which is largely decreasing margins and increasing pressure on buyers. The combined effect is to raise input costs and put planting seasons and food production at risk, while at the same time making localized, renewable-powered fertilizer production increasingly rational.

The most effective near-term lever for decarbonization is market infrastructure. Trusted certifications, harmonized monitoring, reporting and verification (MRV) and book-and-claim mechanisms would allow buyers to claim scope 3 reductions, justify the premium and, in turn, secure bankable offtake for suppliers. The longer-term solution leaders are asking for is policy durability, so that abrupt reversals tomorrow do not undermine investment decisions made today.

Investment

Fertilizer figure 1: Question: How have your company's total investments contributing to climate mitigation, adaptation and resilience changed compared to the previous 12 months? *Survey results (N=13).*



Note: Barometer '26 Survey (N=508); Fertilizer industry leader interviews (N=7)

Top 3 reasons for increasing investment (as stated by business)

- **Expected changes in customer demand:** Consumer packaged goods (CPG) scope 3 commitments are generating demand signals largely absent a year ago, with select buyers moving toward contracted offtake and giving producers confidence to invest. Rising conventional fertilizer landed costs are also narrowing the cost gap in import-dependent markets, making countries with large domestic demand and low-cost inputs, such as India, more attractive.
- **Rising physical climate risks or costs:** Fertilizer is uniquely exposed to supply disruption because farmers must apply it during precise windows, so trade route shocks can directly lead to missed planting and food production losses. Recent geopolitical shocks (rise in raw material prices and supply chain disruption) might lead to the acceleration of investment in localized low-carbon production as a structural resilience hedge (e.g., domestic producers in Morocco).
- **Improved access to affordable clean energy:** Electricity costs are the dominant variable in electrolytic ammonia economics, so affordable renewables are the primary lever to close the gap with conventional fertilizer. Regions with cheap, scalable renewables, such as Brazil, India and Morocco, are attracting electrolytic investment, while markets with high energy costs, including the UK, are lagging. Parts of the EU with abundant renewables, such as the Nordics and Iberia, remain more competitive. The US sits in a similar in-between position on electrolytic economics.

Business case progress



Where businesses saw progress

Technology

Modular small-scale Haber-Bosch systems are enabling distributed supply chains, with food companies now anchoring early offtake (e.g., PepsiCo's low-carbon ammonia attribute agreement with TalusAg). Innovation in business models and new equity partnerships are emerging (e.g., Yara-PepsiCo offtake, Heineken's equity in Fertighy).

Where progress has been limited or has declined

Regulatory certainty

The situation has worsened materially, with trade tariffs the most disruptive near-term development and uncertainty over carbon border adjustment mechanism (CBAM) implementation and the fertilizer exemption debate eroding confidence in long-term investment decisions.

Supply constraints

Concentrated fertilizer trade routes (urea, sulfur) are exposed to geopolitical disruption; cost-effective availability of low-carbon inputs – hydrogen, ammonia, electrolysers, renewable power – remains limited, with grid waiting times lengthening.

Investment case

Willingness to pay the green premium remains constrained, with pathway economics varying sharply by geography – carbon capture and storage (CCS)-enabled ammonia is advancing in the US Gulf Coast, with electrolytic progress depending on capital expenditures (CAPEX) for low-cost renewables and electrolysers.

Customer behavior

CPG engagement momentum has slowed as economic pressures compress margins, leaving fertilizer producers to absorb the premium cost and no clear mechanism to fund farm-level adoption.

Infrastructure

Core fertilizer infrastructure is in place; the bottleneck sits upstream in low-carbon ammonia and hydrogen infrastructure – renewable power connections, electrolytic plants, ammonia transport – which leaders report is taking longer than expected.

Regional nuances

Investment case:

- **US Gulf Coast:** CCS-enabled ammonia final investment decisions (FIDs) advancing – a 1.4 million metric ton per annum (Mtpa) project sanctioned in Louisiana in 2025 citing 45Q, low-cost gas and existing CO_2 infrastructure as key enablers.[S2]
- **India:** Electrolytic levelized cost of ammonia (LCOA) approaching parity – Solar Energy Corporation of India (SECI) auctions at ~USD $580–650/t compared to gray at ~USD $515/t.[S2]

Regulatory certainty

- **US:** Section 45V excludes electrolytic hydrogen facilities starting construction after 2027, widening the cost gap for electrolytic ammonia.
- **EU:** France and Italy pushing for CBAM suspension or exemption for fertilizers, creating a wait-and-see dynamic on offtake decisions.

Supply constraints

- **Middle East and North Africa (MENA) and South Asia:** The conflict in the Middle East has stressed LNG, sulfur, ammonia and urea trade routes, reinforcing the case for localized low-carbon production in Morocco, Qatar and Oman.

Note: Barometer '26 Survey (N=508); Fertilizer industry leader interviews (N=7)

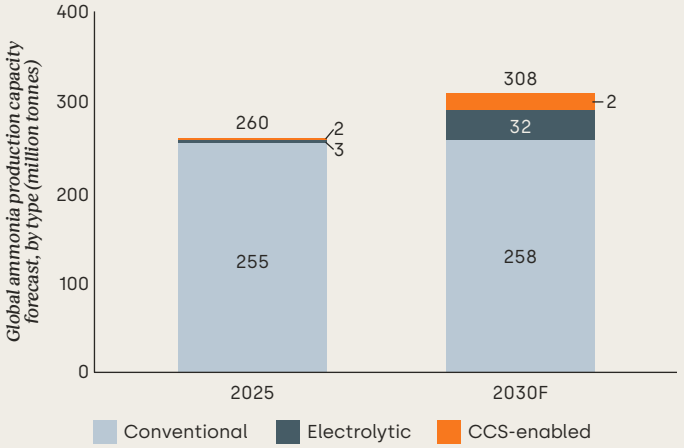
Inorganic fertilizers production has three main forms – nitrogen (~60% of global output), phosphate (~20%) and potash (~20%). Each one draws on a distinct raw-material base: natural gas for nitrogen, phosphate rock for phosphate, and mined potash salts for potassium. The Business Barometer's focus is mostly on the production and application of nitrogenous fertilizers as it is important in terms of international policy coordination. It also briefly addresses phosphate fertilizers.

Low-carbon fertilizer uptake remains at an early stage as cost premiums persist; CCS-enabled ammonia in the US and electrolytic ammonia in India, China and MENA are approaching parity, while the EU lags on both cost and policy clarity.

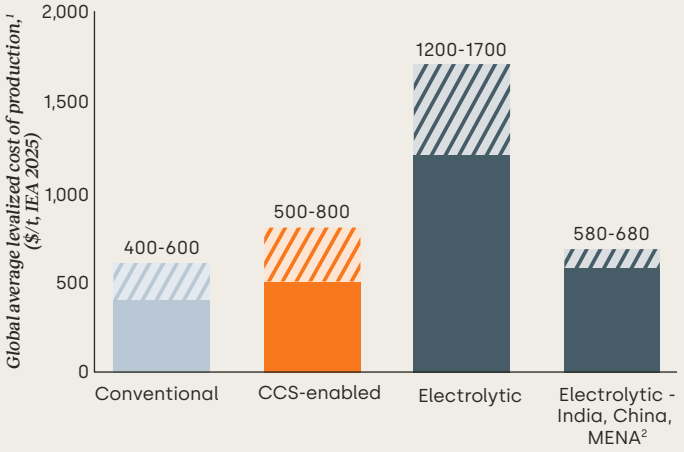
Low-carbon ammonia is about ~2% of global production capacity today and will reach ~16% by 2030. Against a 2025 installed base of roughly 260 million metric tons (Mt) of conventional ammonia capacity, the pipeline adds about 32 Mt of electrolytic and 18 Mt of CCS-enabled capacity by 2030 (figure 2). Only nine electrolytic fertilizer plants were operational in 2025 according to Agora Industry, a Berlin-based think tank focused on climate-neutral industry. They account for ~0.3% of global ammonia used for nitrogen fertilizer production.

The global average levelized cost of production (LCOP) shows narrower gaps than headline figures suggest, with US Gulf CCS-enabled ammonia close to conventional and Chinese, Indian and MENA electrolytic ammonia approaching parity. Conventional ammonia is produced at USD $400–600/t, whereas CCS-enabled ammonia sits at USD $500–800/t and electrolytic ammonia at USD $1,200–1,700/t on a global average basis (figure 3). Within the CCS-enabled range, US Gulf Coast projects sit at the lower end on the back of the 45Q tax credit, low-cost gas and existing CO_2 infrastructure, while EU equivalents sit at the upper end and without comparable production-side support. The exceptions on the electrolytic side are India, China and MENA, where costs now range from USD $580 to USD $680/t. Prices are low there for two main reasons. First, there are abundant low-cost renewables, since electricity is the majority of electrolytic and electrolyser production costs. Second, direct state support (e.g., subsidized offtake auctions in India, government backing of projects in China, and direct state funding of producers in MENA) drives costs down further.

Fertilizer figure 2: Global ammonia production forecast 2025-2030F, by type | *Source: S&P Global Ammonia Outlook 2024 Data file*



Fertilizer figure 3: Global ammonia production capacity forecast and levelized cost of production by pathway | *Source: S&P Global Commodity Insights 2024, IEA Breakthrough Agenda Report 2025, Agora fertilizer tracker*

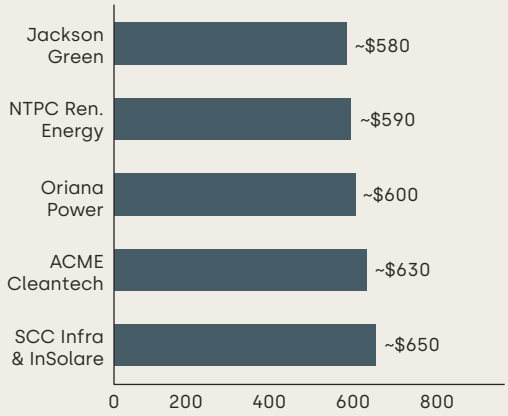


Notes: [1]Estimated levelized costs of production are based on regional averages, accounting for variation in energy inputs and costs by region; they do not include explicit policy support (e.g., carbon pricing). [2]Best-in-class observed in these regions – India: SECI auctions; China: project averages; MENA: NEOM Saudi, DUQM Oman

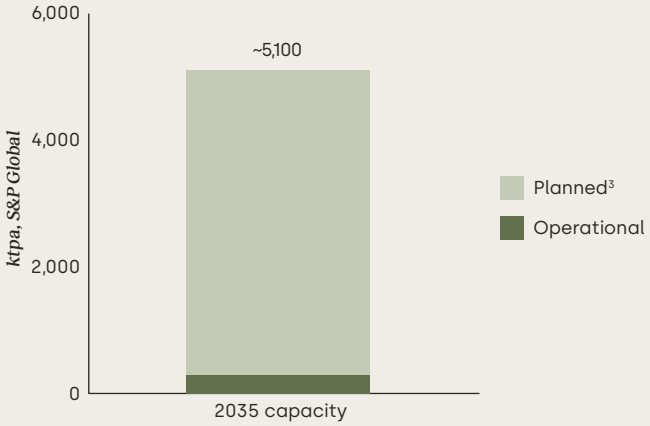
Note: Barometer '26 Survey (N=508); Fertilizer industry leader interviews (N=7)

Fertilizer figure 4: Approximate domestic electrolytic ammonia auction-clearing prices (USD $/metric ton) and announced 2035 capacity by project stage (ktpa) | *Sources: literature research (left); S&P Global Ammonia Outlook 2024 Data file (right)*

Approximate1 domestic electrolytic ammonia LCOA[2] observed in India ($/tonne)



India 2035 announced electrolytic ammonia production capacity, by project stage (ktpa, S&P Global)



Notes: [1]Values shown are SECI/SIGHT domestic auction-clearing prices of supply for 10-year contracts, used as a proxy for LCOA; [2]LCOA; [3]Includes plants that are not yet operational but set to commence operations before 2030, "Project" phase in source data

Low-carbon ammonia projects are advancing where production incentives, domestic food security concerns and pathway-specific structural advantages align.

In India, auction-based offtake is de-risking electrolytic ammonia at a scale absent elsewhere. SECI's Strategic Interventions for Green Hydrogen Transition (SIGHT) Mode-2A is a demand-side auction sub-program for low-carbon ammonia offtake under India's National Green Hydrogen Mission. It has contracted ~724 metric kilotons per annum (ktpa) of electrolytic ammonia on 10-year purchase agreements, with SECI acting as the demand aggregator on behalf of 13 Indian fertilizer producers. These are mostly public sector undertakings (PSUs) backed by a government guarantee against payment default.[S3] This provides the bankable demand that producers require to reach FID. Auction-clearing prices cluster tightly in the USD $580–650/t range (figure 4, left). Announced 2035 capacity totals roughly 5,100 ktpa, the majority still in the project phase (figure 4, right).

Export demand for Indian electrolytic ammonia is also emerging across use-cases and geographies, which strengthens the broader investment case feeding into fertilizer. AM Green has agreed to supply 500 ktpa from 2028 to Uniper in Europe as a hydrogen carrier and industrial feedstock.[S4] The ACME Odisha project will deliver 400 ktpa to IHI in Japan from 2028 for power generation and industrial demand.[S5] L&T Energy GreenTech has contracted 300 ktpa from Kandla to Itochu for ammonia bunkering in Singapore.[S6]

In the US Gulf Coast, CCS-enabled ammonia is progressing, driven by three reinforcing structural advantages. First, existing CO_2 transport and storage infrastructure reduces the need for new capital investment, with producers connecting into the established system rather than building greenfield pipelines. Second, Gulf Coast production is co-located with the US's largest ammonia demand base, reducing delivered cost and strengthening the domestic supply chain resilience case. Third, the Section 45Q tax credit of up to USD $85/tCO_2$ materially improves project economics.[S7]

Policy has become the key market maker for low-carbon fertilizer, with targeted incentives unlocking FIDs in a handful of geographies, while regulatory uncertainty is actively delaying investments elsewhere.

Three geographies illustrate how tailwind policies can unlock investments. In the US, Section 45Q remains active and provides up to USD $85/tCO_2$ for secure carbon storage, narrowing the cost gap for CCS-enabled pathways.[S7] Japan's Ministry of Economy, Trade and Industry (METI) hydrogen and ammonia Contract for Difference program provides up to USD $20 billion in 15-year price-gap support, creating bankable demand for clean ammonia imports.[S8] In India, the National Green Hydrogen Mission's SIGHT Mode-2A program has contracted 724 ktpa of green ammonia across 13 fertilizer plants on 10-year offtake agreements,[S9] helping projects advance toward financing and scale.

Headwind policies are undermining the investment case in the EU and for US electrolytic projects. Ongoing debate over CBAM implementation and the fertilizer exemption is creating a wait-and-see dynamic in Europe, with buyers and producers deferring offtake decisions until the scope of the mechanism is settled. In the US, Section 45V has been narrowed to exclude electrolytic hydrogen facilities that begin construction after 2027, materially reducing the support window for electrolytic ammonia pathways and widening the cost gap compared to conventional production. Business leaders describe the effect as "muted investment interest" in US electrolytic projects.

Note: Barometer '26 Survey (N=508); Fertilizer industry leader interviews (N=7)

Downstream demand and traceability are the weakest links in the value chain: low willingness to pay sends a weak upstream signal and producers cannot yet monetize low-carbon attributes.

The premium has no natural home in the value chain. Fertilizer suppliers set the price of low-carbon ammonia, but can only invest against bankable offtakes; and low volumes keep unit costs high. Farmers face the higher input cost first, but cannot absorb it without a yield increase or crop premium, neither of which low-carbon fertilizer reliably delivers. Traders and distributors pass the premium through with no intrinsic willingness to fund it. Food companies and retailers are the end-buyers with potential motivation, driven by reputational or regulatory pressure, but they struggle to monetize at the shelf because consumer willingness to pay for input-level sustainability remains weak.

Traceability gaps compound the demand problem. Embedded emissions are hard to specify and verify across fragmented supply chains, so producers cannot substantiate low-carbon claims for end-users. Without clear guidance from accounting standards setters, CPG buyers cannot make scope 3 claims, which in turn means they cannot justify paying the premium upstream. CPGs also pursue scope 3 category 1 reductions through complementary on-farm pathways – improved nitrogen-use efficiency that lowers field N_2O emissions, as well as soil carbon sequestration via cover crops, reduced tillage and agroforestry. These are typically credited through dedicated methodologies (e.g., Verra VM0042, Climate Action Reserve Soil Enrichment) rather than the production-side book-and-claim systems above. These pathways are complementary to low-carbon fertilizer, not substitutes. Production-side decarbonization cuts embed emissions per metric ton, while on-farm practices reduce application emissions and sequester carbon. This will change upon the finalization of the GHG Protocol's emerging Action and Market Instruments (AMI) guidance as it will provide a framework for market-based mechanisms that can accommodate the low traceability inherent in agri-food value chains. In the meantime, business leaders highlight the importance of collaboration across the value chain to align demand, incentives and traceability.

Strong value chain collaboration is needed to align actors, drawing on three actions proven in other industries.

Finance mobilization is the first lever. Concessional and blended finance reduce the cost of capital for low-carbon fertilizer producers until scale brings costs down, as illustrated by the International Finance Corporation (IFC) and Green Climate Fund deployment to unlock a USD $630 million electrolytic fertilizer plant in Paraguay.[S10] Access to these instruments is uneven by region: multilateral concessional finance is most relevant for emerging markets, while Organisation for Economic Co-operation and Development (OECD) producers rely on national green bank facilities, EU Innovation Fund grants or export credit agencies. This leaves high-cost markets without comparable mechanisms, such as the UK, at a material disadvantage. At the farm level, the premium can be covered through offtaker pre-financing, where agricultural commodity traders or food companies fund low-carbon inputs in exchange for guaranteed yield, quality or volume.

Demand aggregation and direct downstream engagement are the second lever. Pooling offtake commitments across governments and food companies creates credible demand signals that give producers confidence to invest. Policy demand levers can underwrite this further, for example through public procurement programs that grant preferred access to products made with low-carbon fertilizer. Direct partnerships between fertilizer producers and CPGs can translate scope 3 targets into contracted offtake, analogous to renewable power purchase agreements (PPAs). Yara's partnership with PepsiCo is one example. This mechanism is most viable in higher-income markets where end-consumer willingness to pay for sustainability claims provides shelf-level economic backing for the premium; in price-sensitive markets, public procurement and farm-level fiscal support are likely to do more of the work than pull from CPG-led demand.

Traceability and certification are the third lever. Systems that track, verify and attribute low-carbon value across supply chains allow CPGs to make credible scope 3 claims. Book-and-claim accounting, for example modeled on sustainable aviation fuel (SAF) systems, would let CPGs purchase low-carbon attributes independently of physical supply. The SAF analogy carries useful lessons as well as caveats: SAF's credibility rests on clear rules about which precursors qualify, though leaders underline how companies account for emissions reductions attributed to each metric ton. They also emphasize the need for a financing mechanism (typically blending mandates, levies or compliance markets) that funds the price gap rather than relying on voluntary willingness to pay. An equivalent regime for low-carbon fertilizer would need the same three pillars – eligible-feedstock definitions, transparent emissions-reduction accounting and a funded premium – alongside the robust tracking leaders already highlight to avoid becoming an uncapped offset mechanism. Nutrien's use of third-party carbon-intensity certification to build credibility for low-carbon ammonia attributes downstream is an example. End-to-end product traceability remains the long-term goal; in parallel, leaders see harmonized product carbon footprint methodologies and book-and-claim as the pragmatic bridge while product-level traceability matures.

Note: Barometer '26 Survey (N=508); Fertilizer industry leader interviews (N=7)

Specific opportunities and challenges for phosphate fertilizers

Building on last year's positioning, phosphate producers have moved beyond a sustainability-led narrative and are actively working to build economically viable decarbonization pathways. However, a compelling sector-wide business case has yet to materialize and progress remains contingent on full value chain collaboration. Progress is most visible on the production side: scaling renewable electricity (e.g., co-generation from sulfuric acid production, solar and wind PPAs), substituting gray inputs with green ones (e.g., green ammonia from green hydrogen) and optimizing logistics (e.g., slurry pipelines replacing rail freight).

Beyond production, decarbonization at scale also depends on the use side, where precision fertilizer management through the 4R Nutrient Stewardship remains the core lever to optimize phosphate application, boost yields, sequester carbon and prevent soil degradation. However, progress on the demand and value chain side remains limited and geopolitical disruptions are now compounding it:

- → Structural demand-side constraints leave little room for premium pricing as farmers operate on thin margins and cannot absorb the cost of low-carbon fertilizers. At the same time, CPGs typically lack visibility into where their agricultural feedstock is grown (commodity sourcing), limiting cost pass-through across the value chain and undermining adoption.
- → Current carbon accounting rules attribute carbon removals to CPGs alone in their scope 3, not the input providers that enable them, leaving upstream investment unrewarded and weakening the case for scale.
- → Middle East volatility is disrupting sulfur supply and global fertilizer logistics (e.g., Strait of Hormuz), threatening food security and risking a repeat of the 2020–2022 fertilizer crisis.

Business leaders are calling for the explicit recognition of phosphate fertilizers as a hard-to-abate sub-sector. Nitrogen pathways increasingly rely on low-carbon ammonia substitution as a maturing decarbonization route. Phosphate production, however, faces structurally difficult process emissions linked to phosphoric acid production, for which commercially mature, large-scale abatement solutions remain limited and costly:

- → Phosphate rock drying requires high-temperature heat beyond current solar capabilities – leading producers are piloting concentrated solar process heat as a substitute for fossil-based heat, but solutions remain pre-commercial;
- → Phosphoric acid production emits diluted CO_2 that is technically and economically hard to capture; CCUS is not yet industrially scaled and missing transport/storage infrastructure and policies excluding non-biogenic CO_2 from key markets (e.g., EU) is further constraining it.

Recognition has advanced since last year's Barometer, but no dedicated decarbonization pathway for phosphate fertilizers exists yet. Policymakers and standard-setters must move from standardized fertilizer policies to sector- and geography-specific frameworks that provide incentives where technology is not yet mature.

> *"It's no longer only about sustainability for the sake of going into sustainability. It's also about building a business case. If there is no business case behind, you will not find the right incentives, the right finance, the right stakeholders to follow you."*
>
> – Executive, Fertilizer company

Note: 4R Nutrient Stewardship is an international framework that refers to applying the right source of nutrients, at the right rate, at the right time and in the right place to optimize fertilizer use for productivity, environmental protection and sustainability



Note: Barometer '26 Survey (N=508); Fertilizer industry leader interviews (N=7)

Fertilizer | Policy priorities and countries to watch

Policy priorities

Businesses highlight three key policy priorities that require urgent progress over the next 1–3 years: demand creation policies, supply-side incentives, and the harmonization of standards and definitions. Supply-side incentives in particular play a decisive role in project economics, as illustrated by the geographic cost split in low-carbon ammonia (e.g., US Gulf Coast CCS-enabled and Indian electrolytic projects approaching parity, versus EU and UK projects well off parity).

Demand creation policies

Strengthen carbon mechanisms by establishing clarity on CBAM-type measures and increasing emissions trading system (ETS) prices to close the price gap between low-carbon and conventional fertilizer production.

Enable market-based demand aggregation by supporting pooled offtake mechanisms, such as India's SIGHT auctions, that allow buyers to collectively signal demand and give producers confidence to invest.

Activate downstream scope 3 demand by incentivizing food and CPG buyers to source a share of inputs from low-carbon fertilizer, pulling premium demand through the value chain.

Create lead markets for low-carbon ammonia and fertilizer, following the precedent set in steel and cement.

Extend demand-side pressure to farmers and end-consumers by complementing CPG-facing mandates with on-pack labeling and public-procurement preferences on the consumer side, and farm-level fiscal support (subsidies, tax relief or preferential credit) to share the input cost – calibrated to regional affordability.

Supply-side incentives

Provide production incentives linked to emissions intensity, such as offering tax credits and subsidies for low-carbon ammonia and fertilizer production, tied to verified emissions reductions rather than specific technology pathways.

Ensure policy stability to protect investor confidence and avoid abrupt reversals of production incentives, which undermine long-term investment decisions, such as the early sunsetting of the US Section 45V hydrogen production tax credit.

Address energy cost disadvantages by investing in affordable renewable energy access for producers, particularly in markets with high energy costs where electrolytic fertilizer economics remain uncompetitive.

Harmonization of standards & definitions

Converge on trusted certifications through the establishing of International Organization for Standardization (ISO)-aligned life-cycle assessment (LCA) methodologies and product carbon footprint standards covering both ammonia at the production stage and the final fertilizer product, alongside auditable book-and-claim mechanisms that allow CPG buyers to credibly claim scope 3 reductions.

Formalize a low-carbon fertilizer taxonomy within a broader low-carbon agriculture framework by establishing a common definition of what qualifies as low-carbon, near-zero, blue, green or clean fertilizer. This would provide a consistent benchmark for production incentives, procurement mandates and CPG sourcing commitments. Recognize that fertilizer is one input in a wider agricultural value chain in which soil carbon sequestration and on-farm practices also play a decarbonization role.

Recognize distinct decarbonization pathways across nutrients, starting with phosphate and potash fertilizer. Over time, add secondary nutrients (e.g., sulfur) and micronutrients, as distinct from nitrogen-based approaches, reflecting their differing emissions profiles and abatement routes (e.g., Science Based Targets initiative (SBTi) and International Energy Agency (IEA) recognition of phosphate-specific abatement routes).

> *"If policies required CPGs to source a share of their products from low-carbon inputs, they would pull decarbonization through their entire upstream value chain - and they would be willing to pay."*
>
> – Executive, Fertilizer company

> *"The early sunset of the 45V production tax credit has certainly muted investment interest in the US."*
>
> – Executive, Consumer goods company

> *"Clear, credible standards unlock scale - the single biggest accelerator will be the convergence on robust, trusted certifications and registries."*
>
> – Executive, Food & beverages company

Note: Barometer '26 Survey (N=508); Fertilizer industry leader interviews (N=7)

Countries to watch

MENA, India and Brazil each pursue distinct paths to low-carbon fertilizer growth: export capacity, demand aggregation and import substitution.

India

- **Rapidly declining electrolytic ammonia costs are bringing India close to price parity with gray ammonia,** driven by SECI auctions, low-cost renewables and power banking arrangements.
- Auction clearing prices of ~USD $600/t compared to gray ammonia at ~USD $515/t reflect the cost compression (S11); **SECI auctions** act as a demand aggregation mechanism, providing bankable offtake for producers.
- However, business leaders stress that **power banking arrangements** do not meet EU Renewable Fuels of Non-Biological Origin (RFNBO) temporal correlation requirements, limiting European market access without regulatory alignment.

Brazil

- **Brazil's dependence on imported fertilizer, combined with abundant renewable power, is making locally produced electrolytic fertilizer increasingly competitive,** particularly when conventional ammonia prices spike on geopolitical shocks.
- **Private sector investment is accelerating, with feedstock localization as the key driver:** for example, Atlas Agro's USD $1 billion plant in Uberaba produces green ammonia on-site from Brazilian renewable power, displacing imported nitrogen feedstock rather than relying on imported gray ammonia.[S12]

MENA (Morocco, Qatar, Oman)

- **MENA is emerging as a strategic hub for export-oriented low-carbon fertilizer,** anchored by large-scale CCS and electrolytic projects linked to deep-water ports and long-term offtake agreements.
- **Qatar:** QatarEnergy's Ammonia-7 (1.2 Mtpa) deploys ~1.5 Mt CO_2/year of CCS from 2026 to supply low-carbon ammonia for fertilizer production, one of the largest CCS-enabled facilities globally.[S13]
- **Oman:** Government-structured **Hydrom auctions** have attracted large-scale green hydrogen projects, including SalalaH2 1+ Mtpa green ammonia project led by OQ, Marubeni, Dutco and Samsung C&T – targeting FID in 2026.[S14]
- **Morocco:** Domestic producers investing heavily to replace gray ammonia imports, reducing fossil-based feedstock dependence (e.g., OCP's USD $7 billion Tarfaya project targeting 3 Mtpa of electrolytic ammonia by 2032).[S15]



Note: Barometer '26 Survey (N=508); Fertilizer industry leader interviews (N=7)

Policy landscape

Business leaders highlight the following **key policy developments** across regions.

Legend **N** – New | **C** – Continuation | **R** – Reform | **B** – Rollback

Region	*Key developments*
India	**C:** National Green Hydrogen Mission (SIGHT Mode-2A), launched in 2023, contracts ~724 ktpa of domestic electrolytic ammonia supply across 13 fertilizer plants through 10-year offtake agreements, providing revenue visibility for producers[S16]
European Union	**N:** Industrial Accelerator Act (IAA), proposed in March 2026, would include fertilizers as an energy-intensive industry eligible for accelerated permitting on decarbonization projects, with potential later extension of lead market measures via delegated acts **B:** CBAM and ETS debate as fertilizers entered the CBAM definitive phase in January 2026, but with sector-specific concessions in response to member-state pressure on cost grounds; ongoing political pressure on the stringency and trajectory of both CBAM and the ETS adds further uncertainty to the EU carbon cost signal
USA	**C:** Section 45Q CCS tax credit offers up to USD \$85/tCO_2 for secure carbon storage, driving CCS-enabled ammonia to FID **B:** Section 45V hydrogen production tax credit narrowed to exclude electrolytic hydrogen facilities that begin construction after 2027, reducing the support window and weakening the case for electrolytic ammonia
Morocco	**C:** OCP Group Green Investment Program and investing to launch the production of 1 Mt of green ammonia in a phased approach 1 Mtpa[S17]
Oman	**N:** Hydrom government-structured 2025 land auctions allocated land parcels on 47-year leases (7-year construction plus 40-year operation) to developers for electrolytic ammonia[S18]
Qatar	**R:** QatarEnergy expanding urea produced from CCS-enabled ammonia capacity from ~6 Mtpa to ~12.4 Mtpa by 2030, constructing 3 new CCS-based ammonia production sites and 4 new urea production lines at Mesaieed Industrial City[S19]
Brazil	**N:** Belém Declaration on Fertilizers (United Nations Climate Change Conference (COP30), Nov. 2025) is a ministerial call to action co-launched by Brazil and the UK, with Japan endorsement, committing signatories to sustainable fertilizer production and more efficient nutrient use **C:** National Fertilizer Plan (PNF, Plano Nacional de Fertilizantes) introduces targets reducing import dependency for fertilizers from 86% to 50% by 2050 through incentives for industrial expansion, R&D investment and sustainable technologies, including biologicals, organo-mineral fertilizers and green ammonia[S20]
Australia	**N:** Hydrogen Headstart program used to launch the government's Hunter Valley Renewable Hydrogen Project with ~USD \$280 million in funding to synthesize electrolytic ammonia for domestic and export use[S21]

Note: Barometer '26 Survey (N=508); Fertilizer industry leader interviews (N=7)

Fertilizer | External sources

Section	*Note*	*Data point*	*Source*
Business intelligence	S1	Low-carbon ammonia is estimated to be ~2% of global production capacity today and is projected to reach ~16% by 2030.	S&P Global – Ammonia Outlook 2024 (data file)
Business case progress	S2	US Gulf Coast: CCS-enabled ammonia final investment decisions (FIDs) are advancing – a 1.4 Mtpa project was sanctioned in Louisiana in 2025, citing 45Q, low-cost gas and existing CO_2 infrastructure as key enablers. India: Electrolytic levelized cost of ammonia (LCOA) is approaching parity – Solar Energy Corporation of India (SECI) auctions at ~USD $580–650/t compared to gray at ~USD $515/t.	CF Industries (corporate press release)
Business intelligence	S3	SECI's SIGHT Mode-2A program has contracted ~724 ktpa of electrolytic ammonia on 10-year purchase agreements, with SECI acting as the demand aggregator on behalf of 13 Indian fertilizer producers (mostly PSUs), backed by a government guarantee against payment default.	Business Standard (trade press)
Business intelligence	S4	AM Green has agreed to supply 500 ktpa from 2028 to Uniper in Europe as a hydrogen carrier and industrial feedstock.	Uniper (corporate press release)
Business intelligence	S5	The ACME Odisha project will deliver 400 ktpa to IHI in Japan from 2028 for power generation and industrial demand.	IHI Corporation (corporate press release)
Business intelligence	S6	L&T Energy GreenTech has contracted 300 ktpa from Kandla to Itochu for ammonia bunkering in Singapore.	Larsen & Toubro (corporate press release)
Business intelligence	S7	The US Section 45Q tax credit of up to USD $85/tCO$_2$ materially improves project economics.	Global CCS Institute
Business intelligence	S8	Japan's METI hydrogen and ammonia Contract for Difference program provides up to USD $20 billion in 15-year price-gap support, creating bankable demand for clean ammonia imports.	S&P Global Commodity Insights (news)
Business intelligence	S9	India's National Green Hydrogen Mission SIGHT Mode-2A program has contracted 724 ktpa of green ammonia across 13 fertilizer plants on 10-year offtake agreements.	Business Standard (trade press)
Business intelligence	S10	IFC and Green Climate Fund deployment aims to unlock a USD $630 million electrolytic fertilizer plant in Paraguay.	International Finance Corporation (corporate press release)
Countries to watch	S11	In India, auction clearing prices at ~USD $600/t, compared to gray ammonia at ~USD $515/t reflect the cost compression.	PV Magazine India (trade press)
Countries to watch	S12	Atlas Agro's USD $1 billion low-carbon fertilizer plant in Uberaba, Brazil produces green ammonia on-site from Brazilian renewable power.	Atlas Agro (corporate)
Countries to watch	S13	QatarEnergy's Ammonia-7 (1.2 Mtpa) deploys ~1.5 MtCO$_2$/year of CCS from 2026 to supply low-carbon ammonia for fertilizer production, one of the largest CCS-enabled facilities globally.	QNA (Qatar News Agency)
Countries to watch	S14	Government-structured Hydrom auctions in Oman have attracted multiple 1+ Mtpa projects targeting FID in 2026, including SalalaH2 by OQ, Marubeni, Dutco, and Samsung.	Hydrom (Oman government hydrogen orchestrator)
Countries to watch	S15	OCP's USD $7 billion Tarfaya project in Morocco targets 3 Mtpa of electrolytic ammonia by 2032.	Ammonia Energy Association (industry body)
Policy landscape	S16	The National Green Hydrogen Mission (SIGHT Mode-2A), launched in 2023, contracts ~724 ktpa of electrolytic ammonia across 13 fertilizer plants through 10-year offtake agreements, providing revenue visibility for producers.	Business Standard (trade press)

Note: Barometer '26 Survey (N=508); Fertilizer industry leader interviews (N=7)

Section	*Note*	*Data point*	*Source*
Policy landscape	S17	OCP Group Green Investment Program: State-owned and investing to ramp up electrolytic ammonia production from 1 Mtpa (2027) to 3 Mtpa (2032).	OCP Group (corporate)
Policy landscape	S18	Hydrom land auctions: Government-structured 2025 Hydrom land auctions allocated land parcels on 47-year leases (7-year construction plus 40-year operation) to developers for electrolytic ammonia.	Marubeni Corporation (consortium member press release)
Policy landscape	S19	QatarEnergy is expanding low-emissions urea capacity from ~6 Mtpa to ~12.4 Mtpa by 2030, constructing 3 new CCS-based ammonia production sites and 4 new urea production lines at Mesaieed Industrial City.	Doha News (trade press)
Policy landscape	S20	Brazil's National Fertilizer Plan (PNF, Plano Nacional de Fertilizantes) targets reducing import dependency for fertilizers from 86% to 50% by 2050 through incentives for industrial expansion, R&D investment and sustainable technologies, including biologicals, organo-mineral fertilizers and green ammonia.	Agência Gov (Brazilian government media)
Policy landscape	S21	The Australian government launched the Hunter Valley Renewable Hydrogen Project with ~USD $280 million in funding to synthesize electrolytic ammonia for domestic and export use through the Hydrogen Headstart program.	Australian Renewable Energy Agency (ARENA)



Note: Barometer '26 Survey (N=508); Fertilizer industry leader interviews (N=7)

COP Action Agenda Axis 3: Transforming Agriculture and Food Systems

The Global Stocktake underscored that achieving the Paris Agreement requires safeguarding food security and ending hunger, and notes the particular vulnerabilities of food production systems to the adverse impacts of climate change.[22] It urges governments and other actors to increase focus on climate-resilient food and agricultural production and supply and distribution of food, as well as increasing sustainable and regenerative production and equitable access to adequate food and nutrition for all.

In response, the Global Climate Action Agenda made Agriculture & Food Systems a priority theme for coordinated, delivery-focused action—bringing together governments, businesses, financial institutions, and farmers around a shared set of outcomes:[23]

i. Landscape restoration and regenerative agriculture;

ii. More resilient, adaptive and sustainable food systems;

iii. Equitable access to adequate food and nutrition for all.

Together, the aim is to shift the sector from fragmented pilot activity to system-wide transformation, with clear signals, incentives, and accountability across the value chain.

The Solutions Deep-Dives in this chapter focus on two solutions relevant to business that contribute to these Action Agenda outcomes:

1. **Regenerative agriculture** refers to on-farm approaches aimed at improving outcomes for health, water stewardship, biodiversity, climate resilience, and livelihoods.[24]
2. **Protein diversification** refers to the intentional shift toward a broader, balanced mix of protein sources, including plant- and fungi-based options (such as legumes, nuts and whole grains), underused animal and aquatic sources (including insects), blended products, and alternatives derived from fermentation or cell cultivation.[25]

Regenerative agriculture can protect yields and supply from geopolitical shocks and accelerating climate and nature impacts, while improving soil health, water regulation, and farm economics.[26] However, improvements in the way we farm land also need to be complemented by efforts to conserve, restore and use land in a more sustainable way and increase efficiency gains across the value chain, by reducing food loss and waste and driving more sustainable consumption patterns. The EAT-Lancet report on healthy, sustainable, and just food systems enhanced the scientific evidence for dietary shifts that support people, planet, and food security.[27]

Progress on these solutions are important for businesses, governments and consumers, as farmer productivity declines, and geopolitical shocks are straining supply and trade - ultimately affecting food prices and consumer affordability. Businesses play a pivotal role in accelerating these transitions.

These two solution deep-dives provide a business-led view on the state of investment, implementation and priorities for accelerated progress through sustained farmer, business, government and finance cooperation.

Global Climate Action Agenda Goal

Climate-resilient, sustainable agriculture is the most attractive and widely adopted option for farmers everywhere by 2030.

Business confidence

Businesses are optimistic overall, seeing increasing benefits of regenerative agriculture such as more resilient supplies, stable yields and strengthened climate resilience.

Some businesses report positive capital market signals, including sustainability-linked loans with preferential conditions. As a result, investment commitments are increasing with the Action Agenda on Regenerative Landscapes reporting a surge of committed investments from USD $2.2 billion in 2023 to USD $9 billion in 2025.[S1] A World Bank report estimate shows that the benefits in health, economic and environmental terms can create a 16-to-1 return on investment costs.[S2]

Long-term investments are often required before regenerative agriculture begins to generate financial returns. Progress is accelerating fastest where governments support the transition at farm and supply chain levels with technical assistance and access to finance. For instance, Brazil combines an extensive agricultural market with aligned public-private frameworks. In India, climate exposure and farmer demand are driving scale. The EU is advancing supportive policies and the US is advancing regenerative agriculture to address increasingly depleted soils.

Effective regenerative agriculture business strategies focus on protecting and enhancing farm economics and tackling the impacts of climate change and soil degradation on yields.

Investment

Top 3 reasons for increasing investment (as stated by business)

- **Climate, biodiversity and geopolitical risk volatility and supply chain resilience:** For some businesses, the main driver to invest in regenerative agriculture is to meet their climate targets. As physical risks and geopolitical volatility compound, businesses increasingly invest in regenerative agriculture to support supply chain resilience.
- **Making farming attractive for future generations:** Companies recognize that the long-term viability of their supply chains depends on farming remaining economically attractive and appealing for future generations. Businesses and Farmers recognize that investing in regenerative practices that improve soil health, reduce input costs and stabilize yields is essential to retaining and attracting the next generation of farmers.
- **Demand for innovation and efficiency to increase productivity:** Companies are investing in more efficient inputs and digital or artificial intelligence (AI) tools to deliver higher yield, lower impact outcomes at scale.



Note: Barometer '26 Survey

Business case progress



Where businesses saw progress

Locally adapted technical and knowledge support

Progress on the business case is strongest where businesses tailor technical assistance and agronomy support, and product and technological innovation to local conditions and deliver them through trusted field networks, helping farmers build confidence and see early proof points.

Growing evidence on yields and productivity

Across multiple programs, businesses report increasing evidence that regenerative approaches can keep yields stable, improve productivity while reducing emissions, improve removals and strengthen resilience, and support a stronger farm-level case beyond environmental outcomes. Restoring the world's 30 most valuable landscapes could unlock a USD $310 billion asset class, with a projected internal rate of return of 15–30% over 10 years for commercial investors.[S3]

Increasing alignment on metrics and definitions

40 companies have committed to the SAI Regenerating Together framework,[S4] marking a significant step towards industry alignment on regenerative agriculture.

Where progress has been limited or has declined

Financing upfront transition costs

The central bottleneck is financing the upfront transition and sharing risks and benefits. The cost of transitioning 50% of the world's food production to regenerative approaches is estimated at USD $250 to USD $430 billion in finance per year through 2040. Currently, businesses are only deploying around USD $44 billion per year.[S5]

Policy certainty

Despite progress in some jurisdictions, policies worldwide are typically disjointed and often focus only on particular practices instead of on the outcomes that have to be achieved (e.g., improved soil health). Companies highlight that slow approval cycles are holding back technological innovations and subsidies disincentivize regenerative agriculture.

Regional nuances

Policy support and financial incentives

Brazil is an important market for scaling regenerative agriculture and has introduced several policy frameworks to do so. For example, restoring degraded lands and improving sustainable management on some 50 million hectares (an area nearly the size of France) could add up to USD $28 billion annually to Brazil's GDP while benefiting over 600,000 growers and ranchers.[S6]

Enabling environment and mounting physical risks

India: The country is a relative bright spot for regenerative adoption because of enabling policies and climate exposure driving farmer demand. Pressure on access to water is accelerating that need. Identifying and scaling investable climate-smart agriculture and regenerative agriculture landscapes in priority states is needed because moving from pilots to landscape scale impact requires more than technical solutions: it requires finance mechanisms that work for farmers, the private sector, and public institutions alike.[S7]

Regenerative agriculture – a bipartisan issue

United States: Trusted intermediaries and locally resonant narratives can accelerate adoption. Businesses see regenerative agriculture as a bipartisan issue. However, incentives for public goods remain weak overall without subsidies or policy-driven demand.

Businesses demand more outcome-based policies

EU: While the region is leading on standards and promotion of regenerative agriculture, businesses are calling for a shift toward outcome-based regulation and enabling innovation. Engagement is more effective when farmer associations are explicitly at the table.

Note: Barometer '26 Survey

Businesses are investing in regenerative agriculture to improve resilience to volatility, physical risks and deteriorating farm economics.

Businesses are acutely aware that farm profitability is under significant pressure[S8] following multiple years of below cost production in some regions, with climate volatility destabilizing yields and increasing production risk. Global commodity production could decline up to 35% across 15 key crops by 2050 – crops that account for 70% of caloric intake.[S9]

In response, businesses see regenerative agriculture as a risk mitigation strategy that reduces dependence on volatile inputs, builds supply chain resilience, and strengthens national food security, particularly in import-dependent regions. This has resulted in a positive overall business sentiment towards regenerative agriculture, with the market projected to grow by 18.8% annually by 2034, up to USD $72 billion.[S10]

Further, regenerative agriculture can significantly reduce greenhouse gases emissions. If implemented EU wide, the approach could mitigate an estimated 513 Mt CO_2e per year.[S11]

Businesses highlight that, alongside financial support to cover the upfront costs and risks, locally adapted agronomy and technical assistance are essential. This is because applying regenerative practices effectively and avoiding production losses requires technical knowledge and experience. Furthermore, these investments build the trust needed to sustain that shift: keeping farming economically attractive and ensuring agriculture remains a livelihood the next generation will choose.

> *"Regenerative agriculture ticks all the boxes: there are benefits for the planet, for the farmer, and ultimately for a stable supply for us."*
>
> – Executive, Food & beverages company

Businesses and farmers are already investing in regenerative agriculture, but the availability of de-risking capital and suitable co-financing structures is constraining scaling.

Businesses are already investing in regenerative agriculture, but businesses see access to de-risking capital as a key barrier to moving from pilots to implementation at scale. Where solid opportunities and conditions exist, businesses often cover direct investments from their own balance sheets. However, businesses also emphasize that their own investments are not enough to finance a systemic transition. They recommend flexible, grant-based support from governments and philanthropic organizations.

Businesses require co-investment to cover farmer transition costs, provide technical assistance and affordable credit, and support practical monitoring, reporting and verification systems that create transparency for investors and other stakeholders, without adding excessive reporting burdens for farmers. The next wave of progress will depend on a coordinated public-private financing architecture that absorbs upfront transition risks for farmers. Formal financing channels fail to meet financing needs in emerging markets – covering only 16% of financing demand in sub-Saharan Africa and 55% in South Asia.[S12] Therefore, businesses see defining a suitable capital stack with patient and flexible financing solutions as critical.

Businesses also do not widely see alternative financing mechanisms such as carbon trading as viable solutions to finance regenerative agriculture due to the associated accounting burden and uncertainty over how value is distributed across the value chain.

> *"We very much welcome more co-funding. By putting resources together, we can address a much wider scope than if you would do it alone."*
>
> – Executive, Food & beverages company

Farmer-centric program, built on trust and coordination, are essential to the transition to regenerative agriculture.

Businesses highlight that adoption accelerates when input providers, producers, processors, brands, buyers, retailers, finance and the public sector align on a small set of consistent expectations (what practices and outcomes matter, how progress is measured, and how farmers are supported) and then reinforce those signals through procurement, advisory services and financing. Furthermore, joint projects and partnerships with, for example, local NGOs, research institutes, academia and farming cooperatives reduce transaction costs: aggregating farms and programs can make initiatives large enough for investment.

Especially, where companies have a long-standing field presence, it becomes much easier to layer sustainability requirements onto existing sourcing partnerships. This dynamic is particularly visible for commodities such as coffee and cocoa, where pre-existing trust and advisory relationships enable faster uptake of practices such as agroforestry, soil cover and crop rotation. Leaders also stress that programs grounded in local science and delivered in alignment with local research institutes, extension services and farmer associations reinforce trust. Such programs also ensure that practices are farmer-led, locally relevant and economically viable.

> *"If farmers are not at the center, regenerative agriculture will not scale. The transition has to start with what helps them build resilient, viable farms, backed by training, local support and long-term buying commitments."*
>
> – Executive, Food & beverages company

Policy, reporting and data frameworks remain fragmented - but leading businesses are charging forward.

Businesses report that industry alignment on regenerative agriculture outcomes is underway.[S13] However, fragmented policy frameworks remain a challenge. Top-down policies that impose high reporting burdens, without being shaped by input from businesses and farmers, are slowing progress. Instead, businesses recommend outcome-based and decision-useful metrics and frameworks that allow for adjustment and alignment on what "good looks like", with the caveat that regenerative agriculture is highly context- and commodity-specific. Therefore, businesses see transparency and reporting as important, with innovative technologies (such as soil health measurement kits) playing a supporting role.

Note: Barometer '26 Survey

Policy priorities

Businesses highlight three key policy priorities that require urgent progress over the next 1–3 years: credible and harmonized sustainability data to inform investment decisions; sharing costs and risks across public and private actors; advancing stable and coherent policies.

Credible and harmonized sustainability information to inform investment decisions

Align the measurement and accountability frameworks and data systems that companies, investors and policymakers use for decision-making. This will enable increased investment in regenerative agriculture by shaping both internal business and capital market decisions.

Sharing costs and risks across public and private actors

Redirect finance towards farmers who bear the majority of the transition risks and strengthen systems to share costs and risks fairly between public and private actors and across value chains. This will strengthen the economic business case for investments, ensuring commercial capital can be directed where sustainable land management is most needed.

Advancing stable and coherent policies

Build coherence across policy, finance and data systems, across markets and jurisdictions, and between policy areas and thematic domains, from regenerative agriculture to conservation and restoration. This will reduce compliance costs and complexity for business, enabling them to respond quicker and implement strategies more effectively.

> *"We want to see more enabling policies that focus on achieving better soil health and lower-emissions crops rather than use of a particular practice."*
>
> – Executive, Agriculture company

> *"Unless there is an external intervention or subsidy, it's not going to work. Farmers don't like to be told how to farm. You need to find ways to attract farmers' interest."*
>
> – Executive, Agriculture company

Countries to watch

Brazil

Brazil continues to lead on regenerative agriculture[S7] – The country accounts for around one-fifth of global agricultural exports, while land-use change and agriculture make up nearly three-quarters of national emissions. There is a 50-million-hectare opportunity across the Cerrado and Amazon, with benefits for more than 600,000 producers without further land conversion. Enabling public frameworks, including the Forest Code, Plano ABC+ are creating favorable conditions to scale regenerative agriculture.

India

India is a key country in scaling regenerative agriculture, given its large and diverse farm systems and its position as a major global crop producer, ranking first for rice, second for wheat, sugarcane and cotton, and among the top five for maize.

Climate exposure, pressure on water resources and rising input costs are strengthening the case for approaches that improve water efficiency, rebuild soil health and reduce dependence on external inputs. Policy support, growing farmer interest and the need to protect smallholder livelihoods are helping accelerate uptake, making India one of the more important markets to watch.

USA

Businesses report that most farmers they work with across the US are willing to transition to regenerative agriculture because they see clear benefits, particularly for soil health. Scale is happening where subsidies are paired with agricultural extension. Businesses in the US also view regenerative agriculture as a bipartisan issue. They see stronger adoption where incentives are paired with trusted intermediaries, practical technical support and locally resonant narratives. The US combines strong private sector momentum with significant room for scale.

Note: Barometer '26 Survey

Policy landscape

Business leaders highlight the following **key policy developments** shaping regenerative agriculture across regions.

Legend **N** – New | **C** – Continuation | **R** – Reform | **B** – Rollback

Region	*Key developments*
Europe	**N:** EU: The Soil Monitoring Law, passed in 2025,[S14] aims to address key soil threats and provide a legal framework to achieve healthy soils by 2050. It does so by requiring member states to monitor and assess soil health, supporting farmers and soil managers, and improving knowledge about soil health. The EU Agri Sustainability Compass.[S15] is a voluntary benchmarking scheme building on existing initiatives and harmonizing how farm sustainability is measured across environmental, economic and social dimensions. **N:** Netherlands: The Dutch government is investing EUR €129 million in the Re-Ge-NL innovation program designed to bring about the transition to a regenerative, socially supported agricultural sector. It has a practical goal for 1,000 Dutch farms to make the transition to regenerative agriculture by 2030.[S16]
India	**N:** As of 2025, the government has distributed over 250 million Soil Health Cards to farmers to promote better soil management across the country. These cards offer recommendations on how to improve soil fertility and guide farmers to adopt sustainable practices. The Soil and Land Use Survey complements this with soil mapping at a larger scale.[S17]
USA	**C:** The Regional Conservation Partnership Program (RCPP), administered by the Natural Resources Conservation Service at the US Department of Agriculture (USDA), funds partner-led projects that direct conservation payments and technical assistance to farmers adopting improved land management practices on agricultural land. **N:** The USDA Regenerative Pilot Program is a USD $700 million initiative supporting whole-farm regenerative agriculture practices to improve soil health, water quality and long-term productivity by providing outcome-based support.[S18]
Brazil	**C:** The low-carbon agriculture plan (ABC+ Plan) uses targeted credit lines to promote sustainable farming to reduce greenhouse gas emissions.[S19] Meanwhile, the National Policy of Payment for Environmental Services law promotes direct financial incentives for environmental conservation and restoration. **C:** Green Way (Caminho Verde Brasil) is a national program that aims to restore 40 million hectares of degraded land for sustainable agriculture over 10 years.[S20] **N:** Eco Invest, one of its delivery mechanisms, auctions public concessional capital (1% annually) to banks, which gain 4 to 6 times greater leverage in private investment for restoration and the bioeconomy.[S21] Additional financing mechanisms will support further scaling.
Kenya	**C:** Launched in 2024, the National Agroecology Strategy for Food System Transformation provides a comprehensive framework to transition Kenya's food systems.[S22] The strategy promotes practices that regenerate ecosystems and empower communities by providing a national framework, promoting traditional knowledge, and strengthening research and innovation in these practices.

Note: Barometer '26 Survey

Regenerative agriculture | External sources

Section	*Note*	*Data point*	*Source*
Business confidence	S1	Committed investments increased from USD $2.2 billion in 2023 to USD $9 billion in 2025.	WBCSD: COP28 Action Agenda on Regenerative Landscapes launched in Dubai (2023); Climate High-Level Champions, Top of the COP (2025)
Business confidence	S2	Benefits in health, economic and environmental terms could create a 16-to-1 return on investment costs.	World Bank: Recipe for a Livable Planet (2024)
Business case progress	S3	Restoring the world's 30 most valuable landscapes could unlock a USD $310 billion asset class, with a projected internal rate of return of 15–30% over 10 years.	Boston Consulting Group: The Overlooked Investment Opportunity in Regenerative Landscapes (2025)
Business case progress	S4	40 companies have committed to the SAI Regenerating Together framework.	SAI
Business case progress	S5	The cost of transitioning 50% of the world's food production to regenerative approaches is estimated at USD $250–430 billion in finance per year through 2040. Currently, businesses are only deploying around USD $44 billion per year.	Global Alliance for the Future of Food: Cultivating Change: Accelerating and Scaling Agroecology and Regenerative Approaches (2023)
Business case progress	S6	Restoring degraded lands and improving sustainable management on some 50 million hectares (an area nearly the size of France) could add up to USD $28 billion annually to Brazil's GDP while benefiting over 600,000 growers and ranchers.	WBCSD: Landscape Accelerator Brazil Action Plan (2025)
Business Intelligence	S7	WBCSD's Landscape Accelerator in India	WBCSD: India Landscape Accelerator Kickoff: From Pilots to Landscape-Scale Impact (2026)
Business intelligence	S8	Businesses are acutely aware that farm profitability is under significant pressure.	WBCSD: An enhanced assessment of risks impacting the Food & Agriculture sector (2020)
Business intelligence	S9	Global commodity production could decline up to 35% across 15 key crops by 2050.	Boston Consulting Group: The Overlooked Investment Opportunity in Regenerative Landscapes (2025)
Business Intelligence	S10	The regenerative agriculture market is projected to grow by 18.8% annually by 2034, up to USD $72 billion.	Towards Check & Materials: Regenerative Agriculture Market Size, Growth, Report 2026 to 2035 (2025)
Business intelligence	S11	Further, regenerative agriculture can significantly reduce greenhouse gases emissions. If implemented EU wide, the approach could mitigate an estimated 513 Mt CO_2e per year	European Alliance for Regenerative Agriculture: Farmer-led Research on Europe's Full Productivity (June 2025)
Business intelligence	S12	Formal financing channels fail to meet financing needs in emerging markets, covering only 16% of financing demand in sub-Saharan Africa and 55% in South Asia.	ISF Advisors: State of the Sector: Agri-SME Finance (2022)
Policy landscape	S13	Industry alignment on regenerative agriculture outcomes is underway.	WBCSD: Driving Convergence and Action on Regenerative Agriculture Outcomes (2025)

Note: Barometer '26 Survey

Section	*Note*	*Data point*	*Source*
Policy landscape	S14	EU Soil Monitoring Law	European Commission: **Soil Monitoring Law**
Policy landscape	S15	EU Agri Sustainability Compass	European Commission: **Agri Sustainability Compass**
Policy landscape	S16	The Netherlands is investing EUR €129 million in Re-Ge-NL, with a goal of 1,000 farms by 2030.	**Re-Ge-NL (2023)**
Policy landscape	S17	The government as distributed over 250 million Soil Health Cards in India	Government of India: **Soil Health Card portal**
Policy landscape	S18	Regional Conservation Partnership Program (RCPP) and United States Department of Agriculture (USDA) Regenerative Pilot Program	USDA NRCS: **Regenerative Pilot Program; USDA / NRCS, Regional Conservation Partnership Program**
Policy landscape	S19	The low-carbon agriculture plan (ABC+ Plan) promotes sustainable farming to reduce greenhouse gas emissions supported by targeted credit lines.	Government of Brazil: **Plano ABC e ABC+**
Policy landscape	S20	The Green Way (Caminho Verde Brasil) national program aims to restore 40 million hectares of degraded land for sustainable agriculture over ten years.	Government of Brazil: **Caminho Verde Brazil**
Policy landscape	S21	Eco Invest auctions public concessional capital (1% annually) to banks, which gain 4 to 6 times greater leverage in private investment for restoration and the bioeconomy.	Government of Brazil: **Eco Invest Brazil**
Policy landscape	S22	The National Agroecology Strategy for Food System Transformation provides a comprehensive framework to transition Kenya's food systems.	Ministry of Agriculture and Livestock Development, Kenya: **National Agroecology Strategy for Food System Transformation 2024–2033**



Note: Barometer '26 Survey

Global Climate Action Agenda Goal

Climate-resilient, sustainable agriculture is the most attractive and widely adopted option for farmers everywhere by 2030.

Business confidence

Businesses are increasingly optimistic about protein diversification, as consumers prioritize health and well-being and show a greater openness to a wider range of affordable protein sources. According to businesses, the sector is maturing. After a steep rise a decade ago and slowing interest in the early 2020s as the novelty of meat analogues wore off, sales have picked up again in the past year. There is a clear trend towards whole foods and minimally processed foods, such as plant-based proteins (e.g., tofu, tempeh) or hybrid products (e.g., spreads).

These shifts are unfolding against a backdrop of heightened geopolitical and physical risk volatility, driving businesses toward more diverse and resilient supply chains and governments toward a stronger focus on long-term food and nutrition security. Government investments are responding to those pressures – public investments in alternative proteins have increased from USD $700 million in 2021 to USD $2.5 billion as of 2025.[S1] China stands out globally with the largest new investments in protein diversification, setting a new industry standard for the pace and coordination across innovation, incentives, processing capacity and agricultural production.[S2]

Leading businesses, especially manufacturers and retailers, play a key role in shaping product portfolios, markets and demand by investing in new crops and processing technologies. Retailers and food services are also implementing product and procurement strategies that are critical in driving further demand and investments. For instance, retail pricing incentives for plant-based alternatives have led to significant sales uptake. These strategies show that food environments – the physical and digital spaces that shape choices – are decisive for protein diversification.

Silicon Valley is an innovation hub for biotechnology for alternative proteins. The European Union is leading on growing diverse crops, with Denmark's action plan for plant-based foods and retailers in Germany and the Netherlands implementing leading protein diversification strategies. In regions where dietary traditions already incorporate a diverse range of protein sources, diversification strategies and product adoption pathways may look fundamentally different than in markets with more narrow protein consumption patterns. Looking ahead, businesses expect the next phase of scale to come from affordability gains and demand growth in emerging markets.

However, businesses see high regulatory barriers and a lack of coherent policies and targeted financial incentives as a constraint in scaling the transition towards more diversified proteins.

Investment

Top 3 reasons for increasing investment (as stated by business)

- **Changes in consumer demand and behavior:** Businesses expect continued shifts in consumer demand, driven by stronger interest in health and well-being, rising flexitarian and hybrid eating patterns, and greater openness to a broader range of protein sources – with taste and affordability as decisive factors.
- **Shaping markets and creating demand:** Leading businesses are positioning themselves early in diversified ingredients and protein markets – both geographically and across product categories. By investing early in R&D production (such as for fava beans), product development, processing capacity (such as the fermentation of proteins), partnerships and consumer nudging, companies can help build demand, lower costs over time, and establish ingredient- and protein-diverse products.
- **Risk and resilience in a more volatile food system:** Businesses are investing in protein diversification to maintain future competitiveness and reduce exposure to climate, biodiversity and supply chain risks by varying their crops and protein sources, lowering import dependence, and increasing their ability to withstand geopolitical shocks and price volatility.

Note: Barometer '26 Survey

Business case progress



Where businesses saw progress

Innovation

Improved taste, texture and functionality are supporting repeat purchases. As a top success, businesses mention plant-based milks. Governments are directing funding toward crop diversification (e.g., legumes) and circularity to strengthen more resilient domestic food systems and support long-term food security.

Consumer behavior

The focus on health, well-being and openness to a flexitarian diet is increasing. There are many reasons for this, including the growing use of GLP-1 medications (which promote weight loss).

Where progress has been limited or has declined

Pricing incentives

Despite growing consumer interest in healthier diets, affordability remains a priority across food choices. There are additional barriers where plant-based alternatives do not benefit from the same subsidies or VAT treatment as meat and dairy. Lowering this price gap and repurposing subsidies can quickly unlock demand.[S3]

Regulatory certainty and policy frameworks

While production incentives for legumes are increasing in several geographies, novel food approval pathways remain slow and costly in some jurisdictions, pushing commercialization towards more permissive markets.

Regional nuances

Policy coherence and incentives

China: The country has a fast pace and coordination across innovation, industrial capacity and policy direction; it is also a major market for soy-based categories and a potential accelerator for new protein supply chains.

Consumer demand

USA: A strong trend in high-protein foods is driving uptake for protein-diverse ready meals and snacks. Affordability, protein fortification, health and taste are shaping demand; businesses see the strong innovation and financing ecosystem as favorable, with relatively fast commercialization for novel products.

Mixed policy signals

European Union: The EU is seen as favorable on crop diversification, but slower novel foods approvals and policy fragmentation reduce investment confidence. The EU's Common Agricultural Policy is mainly subsidizing the production of animal products.[S4]

Note: Barometer '26 Survey

Protein diversification is advancing in different ways, with a resurgence of whole foods and minimally processed plant-based and hybrid products - with regional variation.

Consumers are turning to a wider range of protein sources and moving towards more flexible and diverse diets. Due to consumer and policy trends, the recent resurgence has a stronger focus on natural plant-based proteins, like legumes, and protein-rich vegetables than the 2016-2020 boom in meat-analogue products.

There are also regional differences. In the Middle East and the Mediterranean, where the balance of meat, legumes and vegetables in diets already compares to the Planetary Health Targets, businesses see less appetite for novel protein products.[S5]

In the Northern Hemisphere, fitness and protein-enrichment trends are driving an increased focus on protein-diverse products. However, businesses flag that intake in some regions already exceeds recommended ranges for health and sustainability. In other regions of the world, entire populations do not have access to a minimum intake of protein.

> *"The most exciting signal in food today is that plant based proteins have moved beyond all or nothing thinking. With hybrids, next generation dairy alternatives, and global consumer relevance, we have the tools to deliver positive nutrition at scale - and that gives me real optimism about where food is headed."*
>
> – Executive, Agriculture company

Health and well-being are going mainstream.

Businesses highlight that health and well-being have gone mainstream, which recent analysis that sees health awareness reflected in sales confirms.[S6]

The increased use of digital applications such as Yuka reflects the sensitivity around health by giving consumers access to detailed nutrition profiles. As part of wider health trends, businesses observe that GLP-1 medication is turning families' food consumption towards healthier foods and more home-cooked meals. In this context, natural protein-diverse frozen meals or pantry products, such as enriched chickpea pasta, are seeing greater uptake.

Affordability is a key driver of scale and needs the right incentives.

Affordability is a main concern for consumers, as the cost of living increases. Businesses share that consumers are moving towards plant-based protein where meat products have become more expensive.[S7] Retail price incentives have shown steep sales uptakes for protein diverse products: Lidl reported a 30% sales increase after introducing price parity for plant-based products.[S8]

Businesses note that retailers are often more powerful than brands in shaping demand, including through private-label, protein-diverse products that can reach consumers at scale, and efforts to build protein-diverse categories, such as Oatly's partnership with retailers to help build the oat-milk category.

Despite the progress in recent years, businesses stress that supportive policy frameworks, including aligning subsidies, VAT treatment and tax incentives, remain important to unlocking affordability.

Investments focusing on innovation aim to improve taste, texture and quality.

Businesses are especially optimistic about the potential for ingredient innovation towards cleaner label categories and enriching plant-based products with protein across food product portfolios, including chickpea pasta, snacks and frozen meals. Alternative milks still dominating markets worldwide and demand is growing in emerging markets. Businesses expect that these innovation breakthroughs could change the growth trajectory for plant-based proteins.

Taste and texture remain determining factors in consumers' food choices, prompting businesses to invest in internal capabilities, including culinary expertise. At the same time, innovation is helping create better products, improve circularity, functionality, nutrition and the use of a wider range of crops.

Fermentation-derived protein technologies continue to attract venture capital investments, especially from Silicon Valley and China.

Coordination across the supply chain is critical.

Businesses consistently identify collaboration throughout the value chain as essential to efforts to scale. Concrete examples include: farm-level incentives from retailers or buyers to support farmers transitioning to protein-rich crops; open innovation platforms linking industry with research institutions; and co-investment in pilot facilities and infrastructure for crops, biomass and precision fermentation.

Food processing companies and manufacturers also play a critical role, offering market intelligence, developing new products and sharing insights. The goal is to improve efficiency that can inform investment decisions for companies considering entry into protein diversification. Collaboration also matters for resilience, as supply disruptions and commodity rerouting raise costs and increase the need to share risks, including with insurers.

In addition to value chain collaborations, businesses stress the need for coalitions across industry, government, research and finance. China stands out in this respect, replicating an industrial coordination model that brings together innovation, incentives, processing capacity and agricultural production. The aim is to accelerate the shift towards more protein-diverse diets, backed by its 15th Five-Year Plan and public-private research centers such as the USD $11 million New Protein Food Science and Technology Innovation Base in Beijing.[S9] Businesses report that full production facilities are ready in China, while European counterparts remain at the pilot stage.

Note: Barometer '26 Survey

Policy priorities

Businesses highlight three key policy priorities that require urgent progress over the next 1–3 years: supply chain and production incentives, public procurement and institutional demand, and policy coherence and accountability.[S13]

Supply chain and production incentives

Direct financial incentives aimed at diverse protein supply chains by providing transition finance, repurposing subsidies to support farmers and producers, and investing in infrastructure and R&D to scale diverse, sustainable protein production

> *"Real change only happens when there is policy, regulation and financial incentives behind it."*
>
> – Executive, Food & beverages company

Public procurement and institutional demand

Update dietary guidance and shape food environments to drive protein diversification based on the latest scientific evidence. Work with business to create food environments that make diverse protein options the easy, affordable, accessible and appealing choice.

> *"When plant proteins are positioned right next to animal proteins, consumers don't have to go to a separate section of the store - the choice becomes much easier"*
>
> – Executive, Food & beverages company

Policy coherence and accountability

Advance policy coherence and accountability by integrating protein diversification into national strategies, aligning policies across ministries and promoting the use of science-based metrics and transparent data systems to track progress and align business action with public goals.

> *"The growing trend towards food security being taken more seriously means that governments are more likely to promote more resilient food systems."*
>
> – Executive, Food & beverages company

Countries to watch

Denmark, China and the United States stand out as transformative protein diversification markets due to favorable regulatory pathways, coordinated national strategies and strong investment in innovation and infrastructure.

Denmark

- → Denmark is a leader in protein diversification and supports this transition through financial incentives.
- → It launched the world's first national Action Plan for Plant-Based Foods,[S10] backed by DKK 1 billion (~USD $200 million), with strong farmer and political buy-in.
- → Through this Denmark aims to capture 1%–3% of the global plant-based market and is projected to generate USD $750 million to USD $2.1 billion, 27,000 jobs and USD $1.9 billion in annual healthcare savings.
- → The plan paves the way for more plant-rich foods by finding common ground between politicians, farmers, businesses and NGOs, and by constructively promoting plant-rich foods.

China

- → China is one of the biggest investors globally in the context of protein diversification.[S1]
- → Food security is a core strategic priority in China, treating it as inseparable from economic stability and national security.[S2] Recent signals suggest Beijing is deploying the same industrial playbook that delivered global dominance in solar and electric vehicles – coordinating policy, capital and technology to reshape its food system. For example, soya bean import demand is projected to drop 25% by 2030 as overall import reliance on meat and feed peaks and recedes.

USA

- → Consumer demand for protein-diverse products is rising strongly in the United States,[S11] supported by health, affordability and product innovation.
- → The country offers a relatively favorable environment for novel food innovation and commercialization.
- → It is also promoting innovation through favorable investment ecosystems: products developed in the US can scale into markets with similar regulation, such as Singapore.
- → However, the country drew back from public biotechnology investments, with only USD $6 million in new research funding for alternative proteins in 2025.[S1]
- → Businesses see updated US dietary guidelines as less supportive of protein-diverse diets due to the focus on animal protein. Yet companies pointed to the 2025 Whole Milk for Healthy Kids Act, which allows schools to offer nutritionally equivalent plant-based milk options, as opening up opportunities for plant-based alternatives.[S12]

Note: Barometer '26 Survey

Policy landscape

Business leaders highlight the following **key policy developments** shaping protein diversification in the food and agriculture sector across regions.

Legend **N** – New | **C** – Continuation | **R** – Reform | **B** – Rollback

Region	*Key developments*
Europe	**N: EU:** As a leading global investor for biomanufacturing capacity (S1), the European Union is among the leading global investors in plant-based and fermentation companies. The creation of sandboxes in the EU creates new opportunities for cross-sector innovation. **B:** Nevertheless, the EU has restricted plant-based labeling for plant-based meat analogues, with changes to take effect over the next three years, creating new compliance considerations for manufacturers. Initiatives are expanding fava bean production as part of broader crop diversification, but high regulatory barriers (notably European Food Safety Authority (EFSA) novel food approval) continue to slow scale and the introduction of novel products.[S14] **N: Netherlands:** The National 50:50 Protein Transition Target for retailers aims for a 50% plant-based and 50% animal-derived protein consumption split by 2030.[S15] The Re-Ge-NL innovation program (EUR €129 million) supports the transition;[S16] the updated 2026 dietary guidelines recommend reduced red meat and increased legume and nut consumption, focusing on improving health whilst staying within planetary boundaries.[S15] **N: France:** Jointly drafted by the ministries of health, agriculture and the environment, the country's national dietary guidelines (updated in 2026) advise citizens to limit meat consumption and increase the share of plant-based proteins.[S17] France is also using school meal programs to support the transition to more sustainable agriculture and food systems, while creating wider social, economic and environmental value.[S18]
Singapore	**C:** The Singapore Food Agency became the first regulatory body globally to approve cultivated meat (2020). The 2024 Food Safety and Security Bill consolidates existing laws into a single framework, reducing complexity and encouraging business investments.[S19]
Brazil	**N:** The country strengthened its National School Feeding Program (PNAE) to mandate the sourcing of 45% of meals from family farms (up from 30%), encouraging fresh and plant-rich produce. The program serves approximately 40 million meals daily.[S20]



Note: Barometer '26 Survey

Protein diversification | External sources

Section	*Note*	*Data point*	*Source*
Business confidence	S1	Public investments in alternative proteins increased from approximately USD $700 million in 2021 to at least USD $2.5 billion as of 2025.	The Good Food Institute
Business confidence	S2	China stands out globally with the largest new investments in protein diversification, setting a new industry standard for the pace and coordination across innovation, incentives, processing capacity and agricultural production.	Systemiq: China's food future (2026)
Business case progress	S3	Lowering this price gap and repurposing subsidies can quickly unlock demand.	WBCSD: Repurposing subsidies for equitable and regenerative agriculture (2024)
Business case progress	S4	The EU's Common Agricultural Policy is mainly subsidizing the production of animal products.	Foodrise: Reforming EU CAP subsidies to support healthy sustainable diets (2026)
Business case progress	S5	In the Middle East and the Mediterranean, where the balance of meat, legumes and vegetables in diets already compare to the Planetary Health Targets.	EAT-Lancet: The EAT-Lancet Commission on Healthy Sustainable and Just food systems (2025)
Business case progress	S6	Health and well-being have become gone mainstream, which recent analysis that sees health awareness reflected in sales confirms.	BCG: CPG Companies Need a New Recipe as Consumers Seek Healthier Choices (2025)
Business case progress	S7	Affordability is a main concern for consumers, as the cost of living increases.	Euronews: Meat prices are surging across Europe — and these countries are feeling it most (2026)
Business case progress	S8	Retail price incentives have shown steep sales uptakes for protein diverse products: Lidl reported a 30% sales increase after introducing price parity for plant-based products.	Vegconomist: Lidl Hosts Protein Transition Event, Reports Vegan Sales Increase of Over 30% (2024)
Countries to watch	S9	China opened the New Protein Food Science and Technology Innovation Base in Beijing with an investment of about USD $11 million.	Feed Magazine: China's futuristic protein pathway (2026)
Countries to watch	S10	Denmark launched the world's first national Action Plan for Plant-Based Foods, backed by substantial public funding and designed to strengthen the plant-based value chain.	Ministry of Food, Agriculture and Fisheries of Denmark: Danish Action Plan for Plant-based Foods (2025)
Countries to watch	S11	Consumer demand for protein-diverse products is rising strongly in the United States.	Towards FnB: Plant-Based Protein Market Size, Growth, and Trends 2025 to 2035 (2025)
Countries to watch	S12	The 2025 Whole Milk for Healthy Kids Act allows schools to offer nutritionally equivalent plant-based milk options	US Congress: S.222 - Whole Milk for Healthy Kids Act of (2025)
Policy priorities	S13	Policy priorities	WBCSD: Policies for Protein-Diverse Food Systems: A Business Perspective (2025)
Policy landscape	S14	The EU has restricted plant-based labeling for plant-based meat analogues, with changes to take effect over the next three years, creating new compliance considerations for manufacturers.	BBC: No more veggie burgers? EU parliament votes to ban meat names for plant-based foods (2025)

Note: Barometer '26 Survey

Section	*Note*	*Data point*	*Source*
Policy landscape	S15	The Netherlands has a national ambition to reach a 50:50 animal-to-plant protein consumption ratio by 2030, while major supermarkets are targeting 60:40 plant-to-animal protein sales by 2030.	Wageningen University: **Accelerating the protein transition (2025)**
Policy landscape	S16	The Re-Ge-NL innovation program (EUR €129 million) supports the transition.	Utrecht University: **Regenerative agriculture gets boost from national growth fund**
Policy landscape	S17	Jointly drafted by the French ministries of health, agriculture and the environment, the national dietary guidelines (updated in 2026) advise citizens to limit meat consumption and increase the share of plant-based proteins.	Fern: **France's new food strategy targets ready-made meals and increased plant-based consumption (2026)**
Countries to watch	S18	France is using school meal programs to support the transition to more sustainable agriculture and food systems while creating wider social, economic and environmental value.	National Library of Medicine: **Beyond their nutritional value, school meal programs support agricultural and food transition toward sustainability by creating multi-sectoral values in France (2025)**
Policy landscape	S19	The 2024 Food Safety and Security Bill consolidates existing laws into a single framework, reducing complexity and encouraging business investment.	Singapore Statutes Online: **Food Safety and Security Bill (2024)**
Policy landscape	S20	Brazil's government strengthened the National School Feeding Program (PNAE) to mandate sourcing of 45% of meals from family farms (up from 30%). The program serves approximately 40 million meals daily.	Global Health Advocacy Incubator: **40 million Students to Benefit from Increased Budget for Brazil's National School Feeding Program (2026)**

Note: Barometer '26 Survey

COP Action Agenda Axis 4: Building Resilience for Cities, Infrastructure and Water

Buildings are a critical pillar of the Global Climate Action Agenda, as they account for a significant share of global emissions and material demand.

The COP Action Agenda Axis 4 prioritizes objectives of improving:[28]

i. Multi-level governance

ii. Sustainable and resilient constructions and buildings

iii. Resilient urban development, mobility and infrastructure

iv. Water management

v. Solid waste management

The Buildings Breakthrough launched at COP28 supports these goals by aligning public and private actors to make "Near-Zero (low greenhouse gas emission) and Resilient Buildings the new normal by 2030", through coordinated international actions and collaboration.[29] The Buildings Plan to Accelerate Solutions (PAS) at COP30 translates this into priorities over the next three years — including strengthening codes and standards, scaling finance, driving demand creation and capacity and skills.

The *Barometer Buildings Solution Deep Dive* contributes by providing a business-led view of where implementation is gaining traction and priorities for where stronger policy, finance, and market action are needed to move from incremental progress to system-wide delivery.



Global Climate Action Agenda Goal

Near-zero emissions and resilient buildings are the new normal by 2030

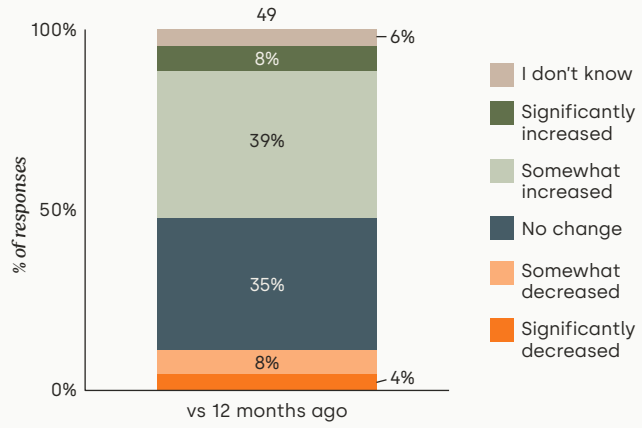
Business confidence

Business leaders report cautiously higher confidence in the building sector transition compared to last year, driven by improving economics and technology. This is particularly true for the continued scaling of low-carbon energy performance solutions demonstrating a clear return on investment (ROI). Yet stable long-term policy frameworks remain a key challenge in most regions. In the EU, regulatory intent remains the most ambitious globally through the Energy Performance of Buildings Directive (EPBD), although leaders flag (uneven) implementation across member states as the key risk to achieving impact. In the US, economics are leading progress, with efficiency upgrades and lower operating costs driving investment in the most advanced states, even as federal direction retreats. In Greater China, Japan and Singapore, stable long-term policy signals provide the investment certainty largely absent elsewhere in Asia-Pacific.

Building owners and investors in mature urban markets are increasingly pursuing green and sustainable credentials. Voluntary certifications such as Leadership in Energy and Environmental Design (LEED) and Building Research Establishment Environmental Assessment Method (BREEAM) have become the primary instrument for this, bundling energy performance, climate resilience, circular profile and carbon footprint, among others, into a single asset quality signal. Demand for these certified buildings is concentrated in high-end commercial and high-end residential segments, where certification commands a premium, protects long-term asset competitiveness and reduces the risk of stranded assets. Compelling energy economics are driving the independent advancement of data centers and industries such as manufacturing and logistics. Across these segments, climate resilience and adaptation have similarly moved from a peripheral consideration to a core investment criterion. Insurability assessments and energy security are now shaping capital allocation alongside protection against physical climate risks and tightening regulation. Beyond these segments, however, momentum has yet to reach mass market residential and other commercial buildings. Progress across the transition as a whole continues to depend on long-term policy frameworks, value chain coordination and the harmonization of standards and definitions.

Investment

Buildings figure 1: How have your company's total investments contributing to climate mitigation, adaptation and resilience changed compared to the previous 12 months? *Survey results (N=49).*



> *"There is already a clear premium for buildings with green and sustainability certifications and that value is recognized by investors*
>
> – Executive, Construction company

Top 3 reasons for increasing investment (as stated by business)

- → **Expected changes in tenant demand:** Building owners in high-end commercial real estate are investing in green credentials to future-proof portfolios, avoid brown discounts and maintain long-term asset competitiveness in mature urban markets. In data centers and the industrial sector (e.g., logistics), the compelling economics of on-site energy generation and microgrids are primarily driving the investment case. Energy performance credentials directly reduce operating costs and improve energy security, creating a financially self-reinforcing case for decarbonization.
- → **Cost reductions through low-carbon technologies:** Building owners and investors are concentrating investments in efficiency solutions (e.g., insulation, smart building management systems) because they deliver direct cost reductions through energy performance improvements, with clear ROI and short payback periods. The investment case is self-reinforcing as energy costs rise and artificial intelligence (AI) further accelerates returns in this space.
- → **Corporate sustainability commitments:** Corporate tenants are increasingly tying leasing and fit-out decisions to internal climate targets and environmental, social and governance (ESG) reporting requirements, creating a consistent pull for certified space in high-end commercial buildings.

Note: Barometer '26 Survey (N=508); Buildings sector leader interviews (N=12)

Business case progress



Where businesses saw progress

Investment case

The business case for sustainable and green buildings has strengthened. Certified buildings across high-end commercial, high-end residential, data centers and industry command premiums of 5–25% in rent and asset value relative to comparable uncertified stock. Energy performance solutions with proven ROI are primarily driving this premium, as willingness to pay for low-carbon materials remains fragile. Companies are increasingly pursuing electrification as a hedge against fossil fuel dependency. Climate resilience is shaping investment decisions through insurance pricing and risk metrics. Retrofitting remains hard to unlock at scale.

Technology

Business leaders highlight progress in the deployment, integration and scaling of proven technologies to reduce the carbon footprint of buildings related to operational emissions, with economics and availability described as stronger than ever, though progress on low-carbon building materials (cement, steel) and circular profile solutions (recycled materials, modular design, disassembly) remains less mature.

Where progress has been limited or has declined

Customer behavior

Limited year-over-year (YoY) change. Demand for sustainable and green buildings remains concentrated in high-end commercial and residential buildings, data centers and logistics while it is fragmented and price-led in other segments. Energy security is emerging as a new demand driver. Private owner finances are constraining the mass residential retrofit gap.

Infrastructure

Perception of standards and measurement frameworks as lacking progress are acting as a gating function where, without consistency, the shift from pilots to scaled procurement remains limited.

Supply constraints

Low-carbon materials are increasingly available but not cost-competitive and inconsistent offtake signals constrain production.

Regulatory certainty

Regulatory signals are increasingly fragmented across most geographies, with short-term certainty undercut by longer-term ambiguity, causing value chain players to hesitate on longer-term commitments.

Regional nuances

Customer behavior:

- Asia-Pacific: Hong Kong, Singapore and Japan drive demand, with green and sustainable buildings as a baseline competitive requirement and brown discounts priced in.

Infrastructure

- EU: Perception of standards and measurement frameworks as lacking progress, linked to fragmentation across member states.
- US & EU: Grid infrastructure is not keeping pace with electricity demand in parts of the US and EU, creating access delays.

Supply constraints

- Hong Kong: 20+ building owners and steel manufacturers are coordinating through a low-carbon steel charter, sending a clear joint demand signal to low-carbon building material suppliers.

Regulatory certainty

- Greater China: Stable and consistent policy signals from the 15th Five-Year Plan provide the long-term investment certainty largely absent elsewhere.
- EU: Even where policy is firm (e.g., EPBD roll-out), there are concerns about variance marring execution.

Note: Barometer '26 Survey (N=508); Buildings sector leader interviews (N=12)

Sustainable and green building certifications are accelerating. While building owners, tenants and investors value them for quality assurance and green premiums, they often remain a proxy rather than a reliable measure of climate performance.

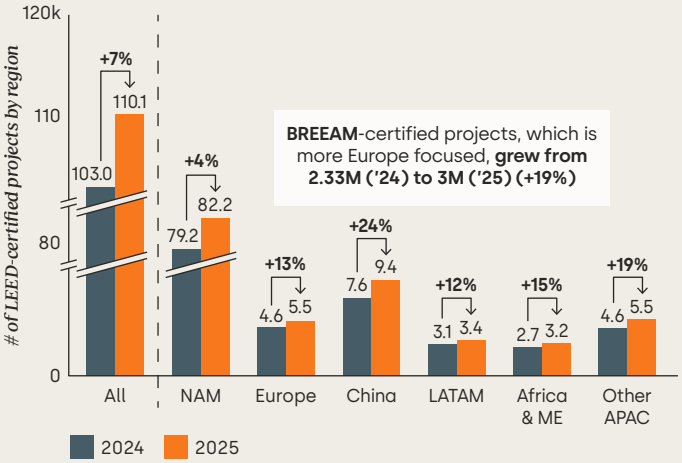
Building owners, tenants and investors value certifications as trusted proof of building quality across energy performance, carbon footprint, water efficiency, people-friendly and climate resilience dimensions, among others. As shown in Buildings fig. 2, green building certifications are accelerating, with LEED-certified projects growing 7% globally in 2024–25. Certification continues to drive asset value and financing logic. In EU urban markets, certified buildings command measurable rent and valuation premiums. In Hong Kong, the dynamic has inverted: the primary motivation is avoiding brown discounts rather than capturing a green premium. Demand remains concentrated in high-end commercial and high-end residential segments, where building owners use certification to future-proof portfolios and reduce stranded asset risk. This is also true for data centers and logistics, where energy performance credentials align with underlying energy economics. Other commercial and mass market residential buildings remain largely outside the certified market.

One limitation of certifications is that most assess design choices rather than operational performance, curbing their value as a reliable measure of climate impact measurement. While operational schemes such as BREEAM In-Use exist, market adoption remains clustered at the design stage. Business leaders in the finance sector note that certifications remain a proxy and do not always reflect what a building actually emits.

The policy environment for buildings operates at multiple levels, where (supra)national frameworks set the direction while countries, states and cities layer additional requirements on top, front runners are, for example, C40[S1] cities in the EU, California in the US, and Greater China in Asia-Pacific.

Europe leads on policy but the gap between ambition and implementation is widening. Carbon and energy performance are the dominant regulatory focus, anchored by the EPBD. Business leaders broadly support the directive's intent, but are increasingly concerned that execution variance across member states will undermine its impact. Denmark, Sweden, the Netherlands, the United Kingdom and France are establishing low-carbon performance as a market baseline rather than a differentiable premium, embedding whole-life carbon requirements and tightening energy performance thresholds progressively. Cities are reinforcing national frameworks from below. C40 cities, including London, Stockholm and Oslo, alongside cities such as Prague, are using public procurement and local planning requirements to drive additional demand, including refurbishment-first approaches that national regulation alone does not mandate.

Buildings figure 2: Number of LEED certified projects by region (2024, 2025) | *Source: Leadership in Energy and Environmental Design (LEED) Project Directory*



In the US, the decarbonization of buildings is progressing through economics rather than federal policy. A small number of states and cities are leading the evolution. California, New York State and Boston are driving decarbonization through local regulation and carbon pricing mechanisms. Fossil fuel price volatility and lower operating costs from energy-efficiency upgrades are the primary investment drivers for building owners across the broader market.

In Asia-Pacific, policy quality varies sharply across markets and embodied carbon remains an almost universal gap. Singapore, Greater China, including Hong Kong, and Japan stand out for stable long-term policy signals and clear government direction. In these markets, sustainability has become a standard competitive requirement for building owners and investors rather than a premium, providing the investment certainty largely absent elsewhere in the region. Across the region, however, mandatory embodied carbon reporting or benchmarking remains absent in most markets, leaving the carbon footprint from construction materials largely unregulated.

Similar to policy, green building certification operates at multiple levels. The World Green Building Council sets global principles while national green building councils define locally enforceable schemes, such as US Green Building Council (USGBC)/LEED in the US and Hong Kong Green Building Council's BEAM Plus.

Note: Barometer '26 Survey (N=508); Buildings sector leader interviews (N=12)

Certified sustainable and green buildings command a premium in high-end commercial, high-end residential, data centers and industrial segments. Cost savings across energy performance, water efficiency and carbon footprint metrics are the drivers, yet willingness to pay for embodied carbon solutions remains limited.

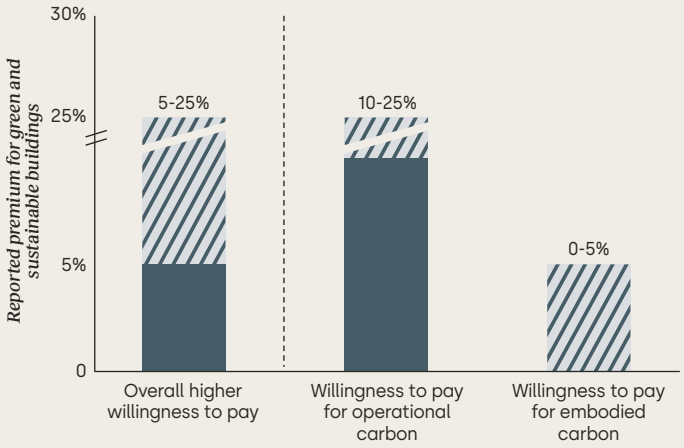
Certified green buildings command a clear premium, driven by operational performance, but willingness to pay for embodied carbon remains structurally limited. Across prime commercial locations, certified buildings have overall premiums of 5–25% in rent and asset value relative to comparable uncertified stock. Building owners and investors translate this into willingness to pay a premium of 10–25% where the company has proven the business case and established market recognition for solutions that deliver measurable energy performance, water efficiency and carbon footprint improvements . In markets where there is ample supply of green buildings for high-end commercial real estate, such as Hong Kong, the dynamic shifts from green premium to brown discount.

Willingness to pay for lower embodied carbon in building materials remains negligible across most of the market. Building owners report limited to no appetite to pay a premium for low-carbon concrete or steel, with the effective ceiling sitting at 0–5% in most cases. The core constraint is that embodied carbon reductions are difficult to monetize: they do not reduce operating costs, certification outcomes rarely reflect them in a financially legible way, and they lack the clear payback logic that drives investment in operational efficiency. The exceptions are narrow. Building owners in high-end commercial, data centers and logistics with strong internal sustainability commitments are absorbing higher material costs in select projects, but this remains purpose-driven rather than market-driven. Where retrofit programs do deliver a pathway to lower embodied carbon, it tends to emerge as a co-benefit of decisions made on other grounds, including energy savings, asset life extension and material reuse, rather than as a primary investment rationale.

Value chain cooperation is a key challenge. Business leaders want more coordination across stakeholders to share an aligned view and drive progress.

Value chain fragmentation is the structural barrier preventing coordinated action on greener and more sustainable buildings. Building owners and investors, corporate and private tenants, builders, EPCs and specifiers, facility managers, and building materials suppliers and distributors each operate with their own standards, incentive structures and measurement frameworks. This fragmentation creates inconsistency that erodes trust and prevents the coordinated procurement decisions that would allow lower-carbon solutions to scale. No single actor controls enough of the value chain to shift the system unilaterally. Without a shared reference point, each party defaults to optimizing according to its own cost and timeline rather than the collective sustainability outcome.

Buildings figure 3: Reported premium for green and sustainable buildings | *Source: Building sector interviews (N=12), Bain analysis*



A shared understanding of what whole-life carbon means and how to measure it is the critical prerequisite for low-carbon material adoption. Without agreed measurement rules, building material suppliers and distributors cannot credibly demonstrate the value of greener options, builders and prescribers cannot specify them consistently, and building owners and investors cannot formally credit them in procurement decisions. The same coordination gap applies across energy performance, climate resilience and circular profiles, each requiring its own shared standard. Examples of regulatory efforts to establish consistency across the value chain include the EU's whole-life carbon framework for buildings through the revised EPBD, though rollout still depends on national implementation. France's RE2020 regulation illustrates what consistent signaling can achieve, driving low-carbon materials into requests for proposals and giving building material suppliers greater confidence to invest in innovation.

Coordination creates a mechanism to prove the business case that no single actor can establish alone. It helps building material suppliers and distributors demonstrate the value of greener options, giving building owners, investors, facility managers, builders, EPCs, and the wider ecosystem of prescribers greater confidence to include these options in procurement briefs and absorb the associated cost premium. It also gives suppliers and distributors more confidence to invest in and scale greener alternatives. Buyer coordination through collective charters can break the chicken-and-egg dynamic: more than 20 stakeholders, comprising building owners in Hong Kong and steel manufacturers in China, coordinated through a low-carbon emissions steel charter, sending a clear joint demand signal to low-carbon building material suppliers. Data centers and logistics are ahead on coordination, while mass-market residential and non-high-end commercial lag the most.

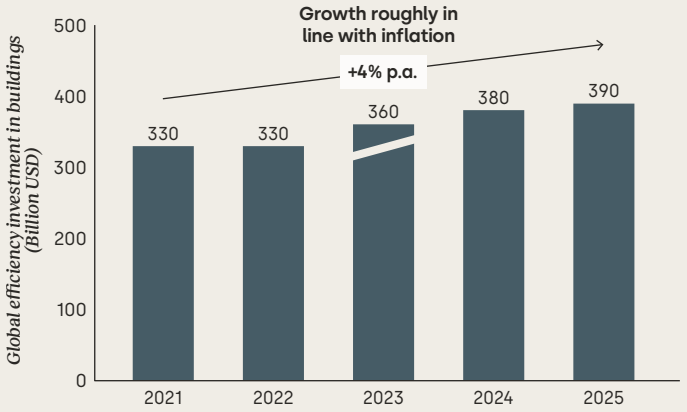
Note: Barometer '26 Survey (N=508); Buildings sector leader interviews (N=12)

Private capital backs the building transition through proven efficiency solutions, where operating cost savings de-risk investments. But fragmented standards, capital-heavy scale-up risks and geopolitical volatility are holding back broader deployment.

Private capital is backing proven efficiency solutions, with private wealth and private equity perceived as the most progressive sources of capital in real estate and increasingly treating the transition to green and sustainable buildings as a value generation and risk management opportunity rather than a compliance cost. Investment focuses on technologies with a well-established business model and where the task is to scale deployment and manufacturing rather than prove the concept. Categories attracting capital include window systems, cooling equipment and building energy management solutions, where lower operating costs provide a financially legible return on investment. Investors are also placing growing weight on climate resilience metrics, including cumulative value in risk assessments and insurability evaluations, as standard components of real estate investment due diligence.

Several structural barriers are preventing private capital from flowing more broadly into green and sustainable buildings. As shown in Buildings fig. 4, global efficiency investments in buildings have stalled at roughly USD $390 billion, growing only in line with inflation at +4% per annum between 2021 and 2025. Falling technology costs mean investment is going further than the headline figures suggest, with each dollar funding the greater deployment of efficiency solutions than in prior years. The absence of harmonized standards is the most pervasive constraint: building material suppliers and distributors, builders and prescribers, and building owners and investors cannot consistently claim or verify green choices across markets. This fragments the demand signal that would otherwise justify cross-market scaling. Scale-up risks compound this, as it is necessary to provide capital-heavy manufacturing build-out before volume is proven, with meaningful failure rates at series B and C investment stages. Complex and fragmented value chains extend roll-out timelines, as the number of actors required to align on a single building asset slows execution. Geopolitical volatility is adding a further brake, with limited partners deferring fund commitments until market conditions stabilize. Together, these constraints explain why efficiency investment in buildings has not accelerated despite strong investor intent and a deepening pipeline of technically viable solutions.

Buildings figure 4: Global efficiency investment in buildings (billion USD $) | *Source: IEA World Energy Investment Report 2025*



Standard gaps and fragmented demand signals are holding back new sustainable and green buildings, while stakeholder misalignment (across residential and commercial) and household financial health (in mass-market residential) are constraining retrofits. At the same time, data centers and industrial buildings are largely exempt from these dynamics, driven primarily by energy economics.

Two reinforcing barriers are holding back new green and sustainable buildings: fragmented standards and absent demand signals. Without agreed and shared definitions and measurement frameworks, building owners and investors, facility managers, builders, EPCs and prescribers cannot consistently claim or verify lower-carbon choices, eliminating willingness to pay a premium and preventing lower-carbon innovations from scaling. Fragmented value chains compound this: each actor optimizes according to its own cost and timeline rather than the collective sustainability outcome, leaving building material suppliers and distributors without the consistent demand required to scale production. Demand remains concentrated among purpose-driven building owners and investors in high-end commercial segments. Data centers and logistics are the exception, driven by compelling energy economics that operate independently of these barriers.

Retrofitting existing buildings to green and sustainable standards faces two structurally distinct challenges. The first is misaligned incentives between building owners and investors on one side and corporate tenants on the other. Corporate tenants have no financial incentive to fund upgrades that increase their landlord's asset value, while building owners and investors see limited return on investments that primarily benefit occupants through lower operating costs. Many corporate tenants reinforce this through deliberate no-capital expenditure rules, transferring the full burden of green investment onto building owners and investors. The second challenge is the financial health of private house and apartment owners. Even where energy performance and electrification upgrades offer clear returns, upfront costs remain out of reach for a large share of these owners.

Note: Barometer '26 Survey (N=508); Buildings sector leader interviews (N=12)

Policy priorities

Businesses highlight three key policy priorities that require urgent progress over the next 1–3 years: long-term policy strategy and frameworks, demand creation policies, and the harmonization of standards and definitions.

Long-term policy strategy & frameworks

Set stable standards and provide the visibility and predictability of coming standards, for long-term horizons of 10–20 years, for the industry to be able to mobilize accordingly.

Maintain the direction of travel on decarbonization policy even as short-term priorities shift, as energy security and fossil fuel volatility justify the same solutions regardless of climate framing.

Commit to implementation, not just ambition, as uncertainty over whether the policies announced will materialize is as damaging to investment planning as reversal.

Demand creation policies

Position building energy performance as a broader economic and energy security lever (compared to climate only).

Introduce carbon pricing, creating a level playing field across all actors to drive real-economy transition investments.

Shift green building standards progressively toward measured performance in use (compared to designed/installed only).

Strengthen carbon-related policies to structurally support predictable demand for green buildings through mandatory whole-life carbon disclosure in planning approvals, measurement requirements for new buildings, and sustainability specifications in public procurement tenders.

Incentivize the reuse and retrofitting of existing buildings through embodied-carbon rules, circular profile frameworks, resolution of landlord-tenant split incentives, minimum energy performance standards with clear timelines, and end-to-end retrofit support for households covering subsidies, guidance and financing.

Require investor/lender assessment of buildings to include whole-life carbon performance beyond green certifications and energy-use proxies.

Harmonization of standards & definitions

Harmonize whole-life carbon measurement rules and energy-intensity metrics (energy per square meter) **across countries** for the consistent assessment, claiming and comparing of projects regardless of geography.

Align environmental product declaration (EPD) and carbon-reporting rules across countries for the consistent use of product declarations in carbon accounting.

Establish product classifications and certification standards for low-carbon building materials, including circular and bio-based alternatives, so that carbon accounting can formally credit all low-carbon structural solutions.

Create fast-track approval pathways for technologies already certified under equivalent international standards (e.g., EU, ASTM), removing the need for full jurisdiction-specific re-testing and enabling proven solutions to scale across borders.

> *"Above all else, we would ask policy-makers to hold course as consistency of direction matters more than the pace of progress."*
>
> – Executive, Buildings technology company

> *"Without incentives tied to operational performance, most building owners have no reason to sustain building performance after handover, leaving the gap between designed and actual performance unaddressed."*
>
> – Executive, Investment company

> *"Without agreed measurement rules, the sector cannot move from ambition to accountability, as every actor calculates differently, making comparison and procurement claims impossible."*
>
> – Executive, Engineering & advisory

Note: Barometer '26 Survey (N=508); Buildings sector leader interviews (N=12)

Countries to watch

In many jurisdictions, several layers of policy-making establish requirements on top of each other, progressively raising the floor for building sustainability performance.

Greater China

- **Hong Kong** is strengthening market pull through green finance and disclosure policy, with tighter sustainability reporting expectations and a push to position itself as an international green finance hub.
- **China's** 15th Five-Year Plan (2026–2030) shifts policy focus from energy-use targets to carbon-emissions targets, with specific implementation plans for buildings expected in 2027, while public support for renewables and grid integration is improving access to green electricity and reducing the operational emissions of buildings.
- **Across both markets,** embodied carbon remains largely unaddressed, with no mandatory reporting.

United States

- **New York State** is setting a structured decarbonization pathway for buildings (Carbon Neutral Buildings Roadmap), with both short-term, technologically ready, economically viable actions and a longer-term transition vision for 2050.
- **San Francisco** is tightening electrification rules for buildings, requiring most new buildings to use electric systems instead of natural gas, with major renovations also moving toward full electrification (from July 2026).
- **Boston** is pairing stricter local building emissions rules (BERDO – Building Emissions Reduction and Disclosure Ordinance) with a free advisory program linking building owners to decarbonization experts (BDAP – Building Decarbonization Advisor Program).

Europe

- **Select EU cities,** including London, Oslo, Stockholm, Prague and Warsaw, alongside a broader network of C40 cities,[S1] are driving a refurbishment-first approach
- **Select countries** are establishing low-carbon performance as the baseline: Denmark and Sweden require compulsory whole-life-cycle assessments (LCA) covering operational and embodied carbon, while the Netherlands prohibits new construction from connecting to the gas grid.
- **France's RE2020** makes whole-life LCA mandatory for large new buildings, changing design decisions even before emissions benchmarks are set and creating product-level carbon data that raises supplier standards across Europe.



Note: Barometer '26 Survey (N=508); Buildings sector leader interviews (N=12)

Policy landscape

Business leaders highlight the following key policy developments shaping the buildings sector across regions.

Legend **N** – New | **C** – Continuation | **R** – Reform | **B** – Rollback

Region	*Key developments*
Europe	**N:** United Kingdom: Homes built from 2025 must produce ~75% less CO2 compared to previous standards under the 2025 Future Homes Standard (FHS)[S5] **N:** Finland: Mandatory life-cycle carbon limits on new buildings from 2025[S3] **C:** EU-wide: Leaders are positive on Energy Performance of Buildings Directive (EPBD) intent, but concerned about possible delayed implementation amid affordability pressures **R:** Denmark: Leading mandatory whole-life carbon (WLC) limit, extended LCA to almost all new buildings, from July 2025[S2] **R:** France: Stricter embodied CO2 and energy thresholds (RE2020) for new buildings started in Jan 2025[S4] **R:** Netherlands: Embodied carbon requirements tightening from July 2026; office buildings face 15% stricter limits, while schools, retail, healthcare and industrial buildings fall under mandatory embodied carbon standards for the first time[S6]
Greater China[S7]	*New policy under development, currently focused on shifting measurement metrics away from energy to carbon* **N:** 15th Five-Year Plan (2026–2030) marks overall shift from reducing total energy consumption to reducing total carbon emissions **N:** Targeting about 100 zero-carbon industrial parks by 2030 **N:** Sector-level plans for buildings expected in 2027
Asia excl. China	**R:** Indonesia (new policy limited to reporting requirements): Requires mandatory energy and water efficiency reporting and targets for commercial and government buildings in Jakarta from 2026 onwards, in addition to previous green building standards[S8] **R:** Japan (new policy building on existing standards): All new residential and non-residential buildings from 2025 must comply with upgraded energy performance and conservation standards[S9]
US[S10]	**B:** Federal environment unfavorable, with the House voting to eliminate USD $5.7 billion in home energy performance rebates in Feb. 2026, pending Senate approval.[S10] However, support exists at the state-level, with states like California mandating solar photovoltaics (PV) for newly constructed non-residential buildings from 2025 onwards[S11]
Australia[S12]	**N:** On-site solar PV required for new commercial buildings via new building codes, state adoption expected May 2026 **N:** From 2026, all new office buildings built by or for the Australian government must achieve and maintain a 6-star NABERS (National Australian Built Environment Rating System) Energy rating and must be all-electric

Published in April 2026, WBCSD's From Assessment to Action: A Spotlight on Whole Life Carbon Processes in Cities demonstrates through findings from six global cities implementing whole-life carbon policies that city-level action is increasingly translating whole-life carbon ambitions into results, often ahead of national frameworks.

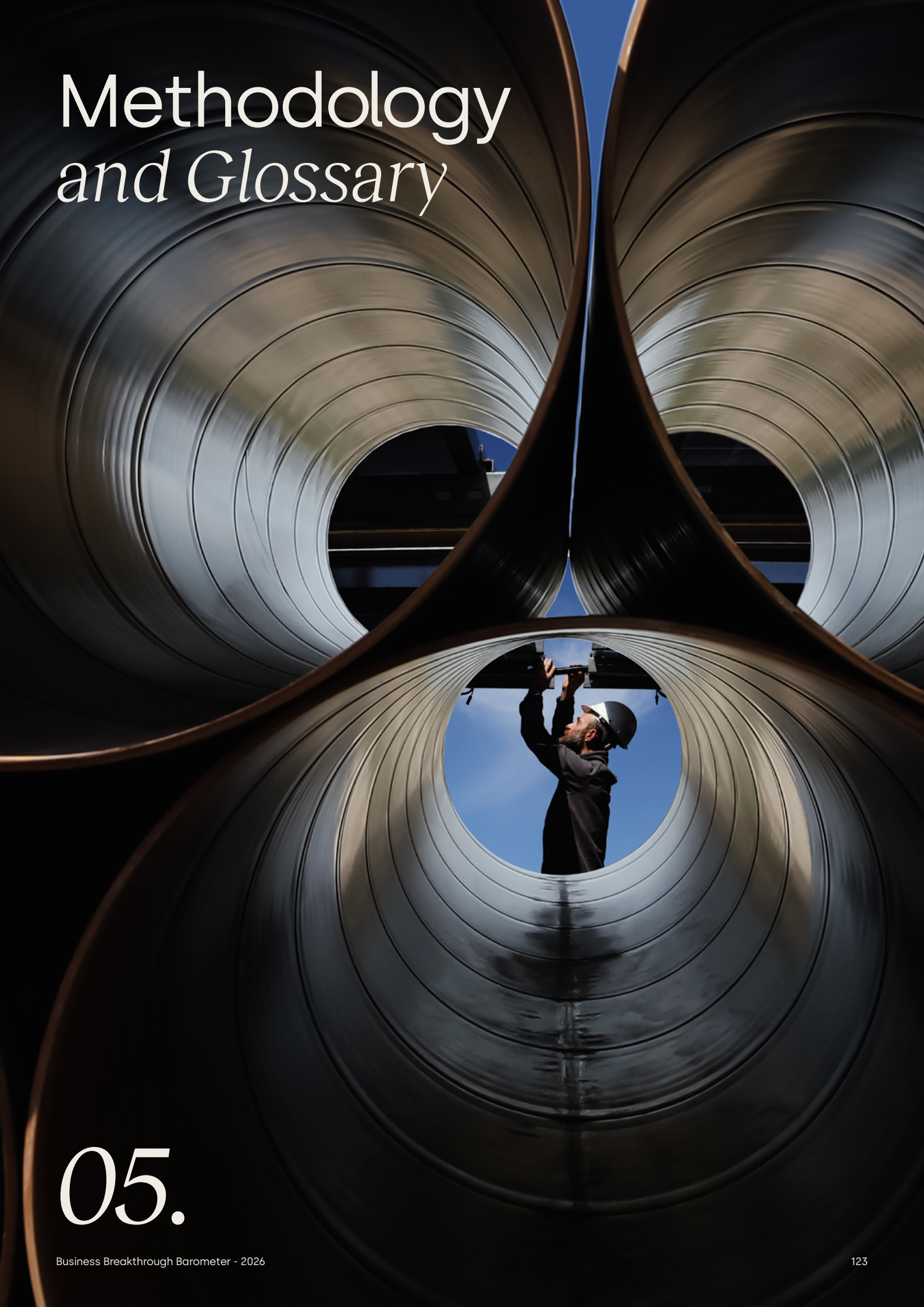
Note: Barometer '26 Survey (N=508); Buildings sector leader interviews (N=12)

Buildings | External sources

Section	*Note*	*Data point*	*Source*
Business intelligence, countries to watch	S1	C40 cities	C40
Policy landscape	S2	Policy changes in Denmark	Buro Happold: a global practice of engineers, designers and advisors committed to delivering sustainable solutions
		Policy changes in Denmark	KHR: Architecture, building consultancy and sustainability
Policy landscape	S3	Policy changes in Finland	Finnish government
Policy landscape	S4	Policy changes in France	Agora Energy Transition
Policy landscape	S5	Policy changes in UK	Kensa: leading manufacturer and installer of ground source heat pumps
Policy landscape	S6	Policy changes in Netherlands	Dutch government
Policy landscape	S7	Policy changes in Greater China	Climate Cooperation China
Policy landscape	S8	Policy changes in Indonesia	Indonesian government
Policy landscape	S9	Policy changes in Japan	Climate policy database
Policy landscape	S10	Policy changes in US	American Council for an Energy-Efficient Economy (ACEEE)
Policy landscape	S11	Policy changes in US	California Energy Commission
Policy landscape	S12	Policy changes in Australia	Standards Australia: nation's peak standards development body

Note: Barometer '26 Survey (N=508); Buildings sector leader interviews (N=12)

Methodology *and Glossary*



05.

05. Methodology and Glossary

Methodology

This third edition of the report examines the pace of the transition, based on the experiences of businesses at the forefront of the transition. The *Barometer* offers up-to-date insights and leading indicators of progress over the past year. It leverages the same research framework and methodology as the 2024 and 2025 reports.

Research framework

The approach integrates three sources of information for a comprehensive view of the business experience from those invested in the transition: **business insights, quantitative data collection and literature review.**

Business insights

We used qualitative research methods to understand how businesses see the subjective and experiential dimensions of the transition across the value chain of key sectors.

- **Survey of senior executives:** We conducted a survey with senior management and executives of 508 businesses at the forefront of the transition. This gauged overall business sentiment across sectors, as well as solution-specific insights for the 9 sectors in focus.
- **In-depth interviews:** We conducted 73 one-on-one semi-structured interviews with senior leaders from businesses. These were selected to provide perspectives from different geographies, sectors and company size, including and going beyond the WBCSD membership. These interviews provided further insights into business sentiment, investment trends, barriers and policy priorities to accelerate the transition.
- **Business group dialogues:** We tested consolidated insights from the survey and interviews with a group of businesses and at least one business organization per solution deep-dive. These business groups represent a diverse set of companies in terms of geographic locations and value chain positions.

Quantitative data collection

Quantitative data provided the basis for analyzing measurable trends and validating business sentiment. This included industry reports, market studies and macroeconomic data offering insights into development, deployment and investment trends. We leveraged BloombergNEF data extensively, with inputs shaped through consultations with the BloombergNEF team.

Literature review

The literature review (of select industry reports and academic studies) provided additional context to the findings. We consulted sector-specific and overarching publications to understand the latest trends, technological advancements and policy developments.

Data validation and peer review

We used cross-sector workshops with businesses and business organizations to further validate the trends and conclusions. Finally, we invited business and industry organization experts to peer review the *Barometer* headlines and solution deep dives.

Glossary

Battery energy storage system (BESS)	Energy storage using batteries
Blast furnace–basic oxygen furnace (BF-BOF)	The traditional high-emissions steelmaking process
Business sentiment	Overarching view from leading businesses on the pace of the transition in the sector and the commitment to overcome barriers in the near-term
Capital expenditure (CAPEX)/ operating expenditure (OPEX)	CAPEX is money spent on acquiring or improving long-term assets like buildings and equipment. OPEX is the ongoing costs necessary for day-to-day operations, such as rent and utilities.
Carbon Border Adjustment Mechanism (CBAM)	Often used in EU climate policy to prevent carbon leakage from imports
Clarity on transition pathway	Common understanding across the sector on the steps, strategies and technology pathways required to reach net-zero emissions, with clearly defined goals, timelines and technologies
Customer behavior	Actions, preferences, willingness to pay and decision-making processes of individuals or groups when purchasing goods or services (e.g., awareness of low-carbon alternatives, mentality on upfront costs vs long-term savings, perceived risk, preference for status quo, preference for sustainable, low-carbon products)
Direct reduced iron (DRI)	An iron production route using hydrogen or natural gas instead of coal
Emissions trading scheme/ system (ETS)	Often used in EU climate policy, especially the EU's Emissions Trading System
Final investment decision (FID)	A formal commitment to capital expenditure on a project
Greenfield/brownfield	Greenfield – new development from scratch; brownfield – redevelopment of existing assets
Infrastructure	Fundamental physical and organizational structures (e.g., power grids, storage capacity, charging infrastructure, standards, codes, permitting processes, regulatory environment)
Investment case	Business case for operating, or transitioning to, low-carbon technology (e.g., returns from low-carbon technology compared to traditional options, capital and operational expenditure, cost of capital, availability of financing, revenue model, customer demand)
Leading business	Businesses with one or more characteristics: 1) investing at scale in net-zero transition, 2) leading innovation in net-zero transition, 3) acting as demand-side market catalysts, 4) leading policy and advocacy for the sector
Power purchase agreement (PPA)	A contract to buy electricity from a power generator
Regulatory certainty	Clear, stable rules and policies that provide long-term overview and predictability for businesses, investors and other stakeholders regarding priority-setting and decision-making processes
Supply constraint	Availability of goods or resources in the market for the transition pathway (e.g., key raw input materials, skilled labor, equipment, energy)
Technology	State of technology required for low-carbon operations (e.g., technological maturity, efficiency, scalability)

Acknowledgements

Disclaimer

This publication is the result of input and consultation with a wide range of companies and business organizations that contributed to and reviewed the content. However, this does not mean each company and organization that participated in the consultative process agrees with every word in the Business Breakthrough Barometer or that this constitutes an endorsement.

The report has been prepared for general informational purposes only and is not intended to be relied upon as accounting, tax, legal or other professional advice.

Acknowledgements

The Barometer has been made possible through a joint effort involving many individuals and organizations. We would like to thank the Breakthrough Agenda, the Marrakech Partnership and the Climate High-Level Champions, in particular, for the partnerships that have enabled the meetings and consultative discussions for the Business Breakthrough Barometer.

We would like to thank Bain & Company for their pro-bono technical support to WBCSD in the development of the Business Breakthrough Barometer.

We would also like to thank the businesses and industry organizations that contributed, whether through participation in stakeholder consultations, interviews or reviewing the contents of the Barometer.

About the Breakthrough Agenda

The Breakthrough Agenda, launched at the United Nations Climate Change Conference (COP26), aims to help the world close the "collaboration gap" and accelerate international action on climate change to meet the Paris Agreement's global net-zero targets.

It convenes countries and initiatives to strengthen international collaboration to make clean technologies and sustainable solutions the most affordable, accessible and attractive option in key sectors and in all regions by 2030. It enhances global cooperation in six major emitting sectors (power, road transport, steel, hydrogen, buildings and cement and concrete), with fertilizers as an emerging sector of interest. These sectors cover over 50% of global emissions. At COP28, governments welcomed a new partnership with the World Business Council for Sustainable Development to strengthen private sector engagement to deliver the Breakthrough Agenda goals. The Business Breakthrough Barometer supports this partnership, and the COP-to-COP process, by providing annual insights to countries on the pace and challenges for sector transitions and identifying the business priorities for international collaboration.

About the Marrakech Partnership

Under the leadership of the Climate High-Level Champions, the Marrakech Partnership for Global Climate Action supports the implementation of the Paris Agreement by fostering collaboration between governments and non-state actors, including businesses, cities, regions and civil society, to accelerate climate action. The five-year vision for Global Climate Action Agenda for 2026–2030 is focused on scaling solutions and accelerating implementation of agreed outcomes from the UNFCCC process across six thematic axis. WBCSD serves on the Axis Coordination Groups within the Partnership, working with many organizations and initiatives that have provided extensive input and contributions to the development of the Business Breakthrough Barometer.

About Bain and Company

Bain & Company works with leaders worldwide to solve their toughest challenges and deliver enduring results. Since 1973, we've partnered with clients, including private equity and portfolio companies, to build the capabilities they need to stay ahead of change and help them redefine their industries. We measure our success by our clients' success, and we proudly hold the highest levels of client advocacy in our field.

Bain is consistently recognized globally as one of the best places to work. We operate as one global team, uniting strategists, industry and functional experts, technologists, and advisors with a vibrant ecosystem of technology partners.

Bain & Company was founded in 1973 and today has 19,000 employees across 67 cities in 40 countries. We have worked with more than two-thirds of the Global 500 and more than 9,000 companies worldwide. The firm is consistently recognized as a Leader in major analyst rankings across multiple areas, including digital business, innovation, strategy, experience design, customer experience, and carbon-zero transformation.

Bain's support to WBCSD is part of the firm's 10-year commitment to invest more than $2 billion in pro bono services to bring its talent, expertise, and insight to organizations tackling today's urgent challenges in climate & energy transition, food systems & nature, education, racial equity & social justice, and economic development.

About WBCSD

The World Business Council for Sustainable Development (WBCSD) is the leading community of around 230 global businesses making sustainability performance a key driver for competitiveness. Established in 1995, WBCSD is a non-profit member-led organization that connects business leaders through all sectors and major economies, and creates the tools and frameworks to scale collective impact, drive cross-sector innovation, and shape an ambitious, enabling policy agenda. We operate from seven offices worldwide — in Geneva, New York, Chicago, Amsterdam, London, Singapore and Wuhan — enabling collaboration across value chains and geographies. Together with our members, we are rewiring economic and financial systems to support the transition to a net-zero, nature-positive, and inclusive future that creates business value.

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