



Ashurst

Powering Change

A New Era for the Energy Transition

Our five-year exploration of historical trends and predictions

2025

Outpacing change

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Welcome

Welcome to the fifth edition of our *Powering Change* report, bringing you fresh insights and analysis about the energy transition and how to make the most of your energy investments.

Powering Change surveys 1,900 senior energy-sector decision-makers across G20 markets, offering insights about trends shaping the sector.

This year, in spite of a number of geopolitical challenges and ever-evolving regulation, we uncover the key trend that most respondents from companies and other organisations are committed to driving forward lower-carbon-intensity business operations, while being prudent and selective about where and how to allocate their capital.

And while there have been mostly modest drops in investment in some markets, other important markets like the US, the UK, Japan, Indonesia and South Africa have seen increases.

Notably, a total of 77% of all respondents view renewable energy investment as essential to their strategic growth.

Respondents this year viewed the Middle East and South America as some of the most-promising regions for investment.

Organisations are committed to driving forward lower-carbon-intensity business operations, while being prudent and selective about where and how to allocate their capital

The clean-energy sector continues to innovate and mature as both new and old technologies are in vogue.

The cost of a number of renewable-energy technologies – and in particular solar panels – continues to decline, cementing solar as the number one technology across most markets.

Companies, investors, financiers and governments/regulators that understand the deep trends shaping the evolving industry are likely to outperform those that don't.

If you have any questions or would like to have a conversation about how prepared you or your organisation are to take advantage of the opportunities offered by the energy transition and its latest trends, then please speak to your local Ashurst contacts or Michael Burns (EMEA/US) or Dan Brown (APAC).

We hope you will enjoy this report and that it provides valuable insights for your organisation's own energy transition strategy.



Michael Burns

**Partner and Global Co-Chair
of Energy Industry, London**



Dan Brown

**Partner and Global Co-Chair
of Energy Industry, Brisbane**

Report highlights

Organisations are taking a prudent approach to energy transition investment decisions

87%

of respondents stated their **energy transition investment strategy** has changed in the last 12 months.

Corporates are also evaluating a wider range of criteria than in the past to justify their investments.

Pressure to drive the energy transition forward is being led by corporate boards

80%

said in 2024 that the **greatest pressure to cut emissions is coming from corporate boards and competitors.**

This is a common theme over the past five years of Ashurst research, with the perceived pressure from corporate boards never falling below 71%.

Solar power remains the leading renewable energy technology over the past five years

59%

Solar power has increased from 52% to 59%.

The next two most-popular technologies are energy from waste (38%, up from 30% five years ago) and biomass (37%, up 6% from 31%). In contrast, hydro has fallen from second place five years ago, (from 43% to 33%), and onshore wind has fallen from 42% to only 30%.

Report highlights

P2X technologies are generating interest

80%

of respondents **plan to increase investment in P2X technologies** over the next five years.

- 91% of organisations believe their market is ready for P2X over the next five years.
- Across the G20 countries, 76% of respondents agree that achieving net zero will require investment in P2X technology.

Legal disputes remain a key concern for corporates

87%

of respondents in 2024 believed their organisation's approach to the energy transition is **likely to lead to disputes**.

The potential for legal disputes was most likely to emerge around new or untested technology (64%), infrastructure limitations (63%), environmental issues (62%), and regulatory delays (62%).

Sustained investment sentiment regarding renewables

77%

of senior business leaders in 2024 **viewed renewable energy investment as essential** to their strategic growth.

Over the five years of our survey, this figure has not dropped below 75%.



The Net-Zero Blueprint: Navigating ambition and feasibility

As our reports have consistently demonstrated over the past five years, businesses overwhelmingly believe in the importance of the transition and are keen to play their role in ensuring it progresses as quickly and effectively as possible.

However, the long-term realities and scale of the transition to net zero is driving ever-more-stringent appraisal of the practicalities – as well as the likely financial outcomes – of the investment decisions they make.

A note of caution is not unexpected after several years of strong investment and organisations have been taking stock of their efforts to date. But progress towards reducing carbon-intensity is unlikely to decline significantly in most markets, given pressures from boards, employees, competitors, regulators and society at large. Companies we speak to are working harder to carefully evaluate where their investment in renewable power will be most effective, both when it comes to the technologies under consideration and also which jurisdictions are most welcoming of investment in the energy transition. This could present an opportunity for countries to compete for such investment.

This year, 67% of respondents say their organisation has committed to a net-zero target—a four-point decline from last year. However, this overall figure masks significant national variations.

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The key finding that corporates are becoming increasingly selective in how they deploy their capital in energy transition-related businesses and projects aligns with the experiences we are having with our clients. **Clients still see quality opportunities in the market, both from an economic perspective and more broadly, but they are laser-focussed on economics and macro-political resiliency in deciding where to spend money.**"



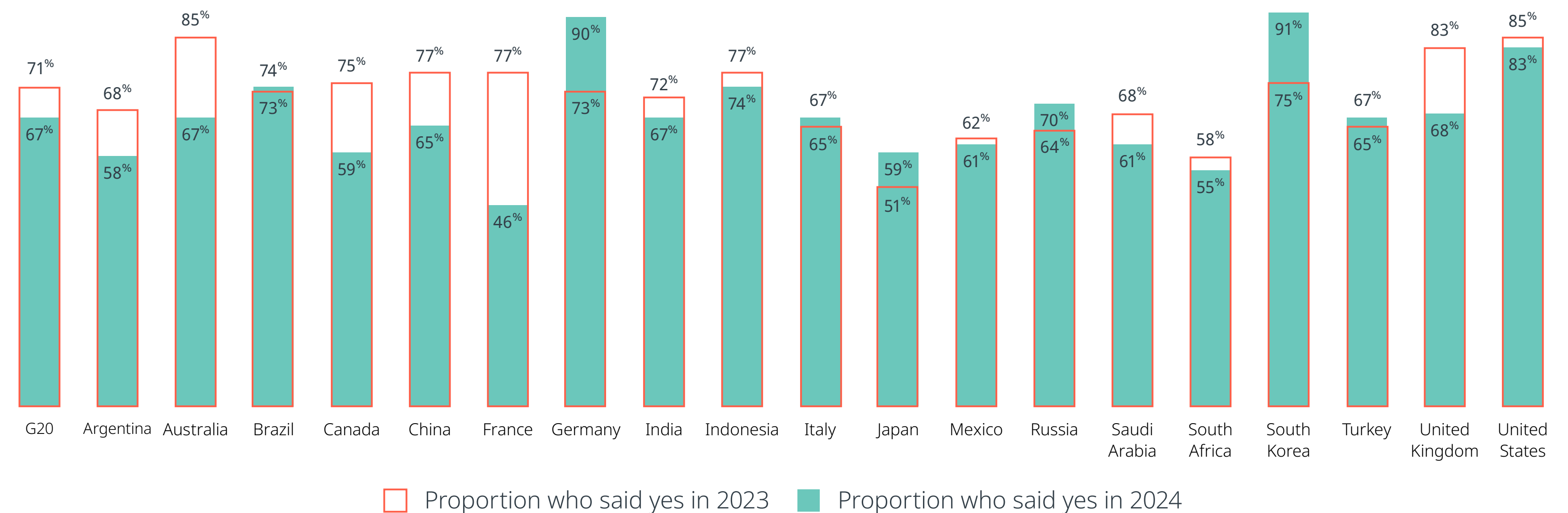
Michael Burns

Partner and Global Co-Chair of Energy Industry, London

Some countries have seen steep rises. For example, South Korea has seen a significant upward trend, with 91% now committed, up from 75% last year. Germany also reports strong engagement, with 90% of corporates committed to net-zero goals. Meanwhile, despite a slight drop in the US (from 85% to 83%), commitment levels remain well above the G20 average of 67%.

Our survey found that reducing an organisation's own emissions (for example, by electrifying production processes, introducing energy efficiency measures, and generating renewable energy onsite) remains the most-popular way of meeting carbon-reduction goals.

Organisations committed to a net-zero target



Strategies that result in a real and immediate reduction in emissions remain generally more popular with respondents than other – arguably less direct – methods (eg acquiring carbon offsets or removals).

Other data uncovered in our survey (for example, on whether renewable energy is critical to corporate strategies) paints a similar picture over a five-year time frame. The overall figures remain high: indeed, in every survey we have conducted, more than three-quarters of respondents told us they considered such investment essential to their organisation.

In all five of our surveys over the years, more than 75% of respondents considered investment in renewable energy to be essential to their organisation's strategic growth.

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Although energy businesses tend to be ahead of the curve in energy investment and innovation, many still face challenges in implementing their climate strategies. Collaboration, creative thinking, and a willingness to evaluate and adopt new technologies are all vital to success in the energy transition. This is also true in relation to carbon offsets, which is an area that is increasingly competitive and subject to scrutiny. **Senior leaders need to set the tone, carefully evaluating the potential benefits and risks of alternatives in light of their strategy, and cementing their organisation's commitment to making necessary up-front investments and maintaining that support to ultimately reap the benefits that the energy transition offers.**



Maria-Laure Knapp

Director, Risk Advisory, London

This year, across the G20,
77% of respondents say they believe
that investing in renewable energy,
the energy transition and decarbonisation
technologies is essential for their
strategic growth.

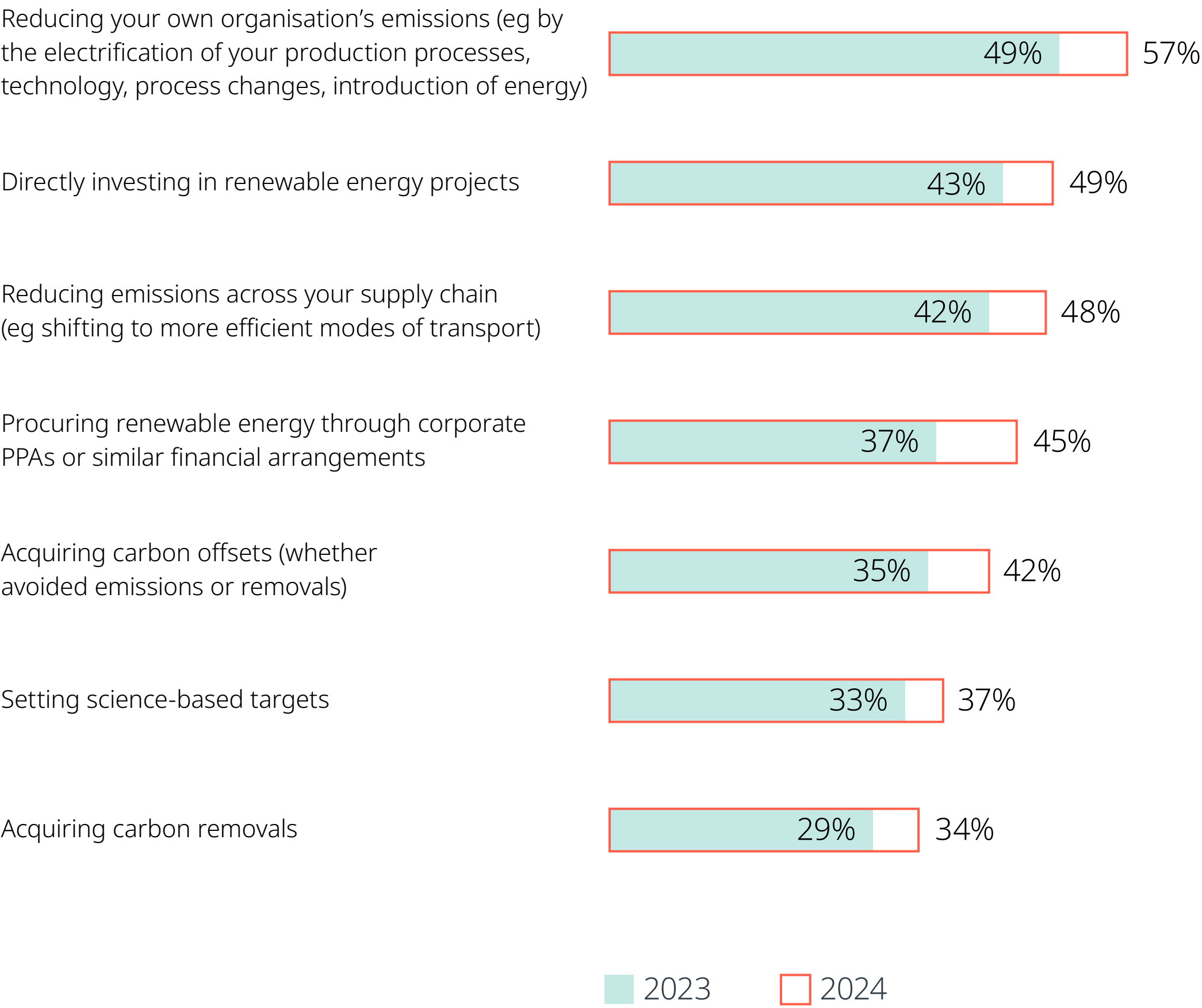
Five-year trends in renewable energy spend

The average % spent on renewable energy across G20 countries in 2019 was 22%.
In 2024 it was 18%.

 **Hover on the locations below or on the map to see details**



Strategies organisations are pursuing to meet net-zero commitments



Again, however, the overall findings mask significant regional and national differences, presenting a complex mosaic of investment landscapes for corporates. In a number of more-developed countries, the number of those who see investing in renewables as essential to strategic growth has fallen significantly since our first *Powering Change* report. In France, for instance, the figure has dropped from 85% five years ago to 55% today, while in Germany it has slipped from 81% to 68% over the same period. Of course, the economic picture may help explain this change: Europe's growth has been generally poor in recent years, while energy prices have been pushed higher due to the war in Ukraine, which has forced the region to spend significant time and effort sourcing replacement natural gas.

“Corporates are becoming more selective about their projects. **Businesses are moving away from an ideological approach to a more economically rational one.** People still want to invest in the transition, but there is a greater focus on the economics of each project, based on use cases and available subsidies. Corporates are rarely making a conscious effort to pull back, but they understand that although renewables are very competitive, they can put a strain on grid transmission, so care is needed, and investments need to be sustainable. There is still a path towards the transition, but it has to happen at a pace that can be implemented effectively.”

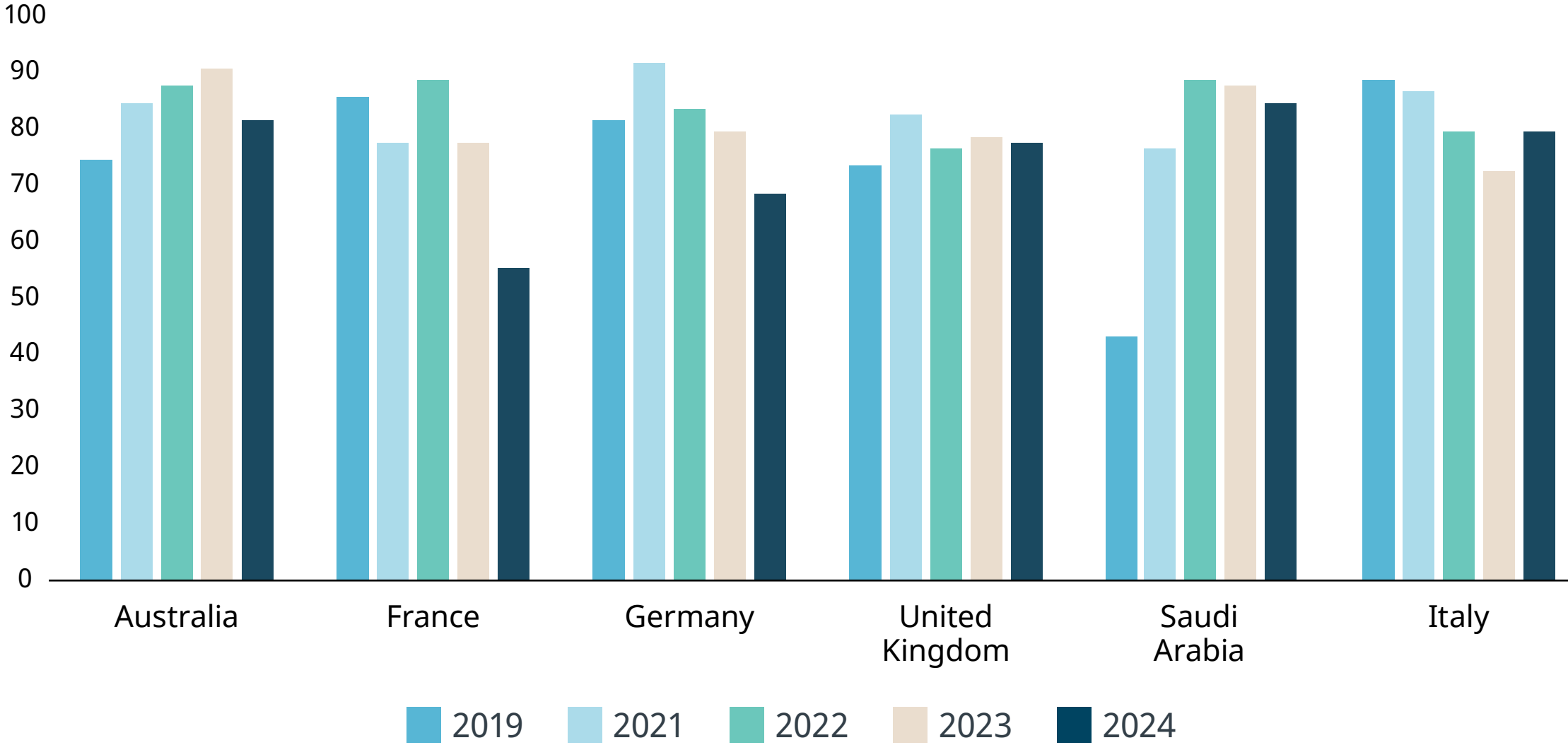


David Wadham
Partner, Tokyo



Jean-Louis Neves Mandelli
Partner, Singapore

Percentage of organisations that believe investment in renewable energy, energy transition and decarbonisation technologies is essential to strategic growth



As shown in the chart above, the overall findings mask significant regional and national differences, presenting a complex mosaic of investment landscapes for corporates.

In addition, until recently, there was a moratorium on onshore wind development in the UK (now lifted). In France, more than 80% of the electricity is already carbon-free – due mainly to nuclear power generation – so, perhaps unsurprisingly, the imperative to focus on renewable power may be less compelling.

By contrast, countries whose economies have been based to a large extent on fossil fuels or mineral extraction have seen an increase in those viewing investment in renewables as essential to strategic growth. In oil-rich Saudi Arabia, the number of corporates seeing investment in renewables as vital has surged dramatically from 43% to 84%, nearly doubling since our surveys began. Meanwhile, in South Africa – again, a country with a significant fossil fuel base – the number has also risen significantly over the same period, from 68% to 76%. In Australia, it has risen from 74% to 81%. This shows just how far clean energy has moved up the corporate, regulatory and public agendas in economies that historically have been more reliant on fossil fuels.

“Post Covid-19, we have seen a broad buy-in to the transition from all the key stakeholders in the Middle East, with the realisation that it is important to the future of the region’s economies. This region was built on energy, and the large state players believe they need to maximise their old energy assets and position themselves for what comes next. So, they are looking at diversifying their energy investments into the lower-carbon technologies like blue and green hydrogen. Even in these areas, which have so far failed to live up to the hopes placed in them, governments are prepared to put their money where their mouths are to make sure they are getting first-mover advantages.”

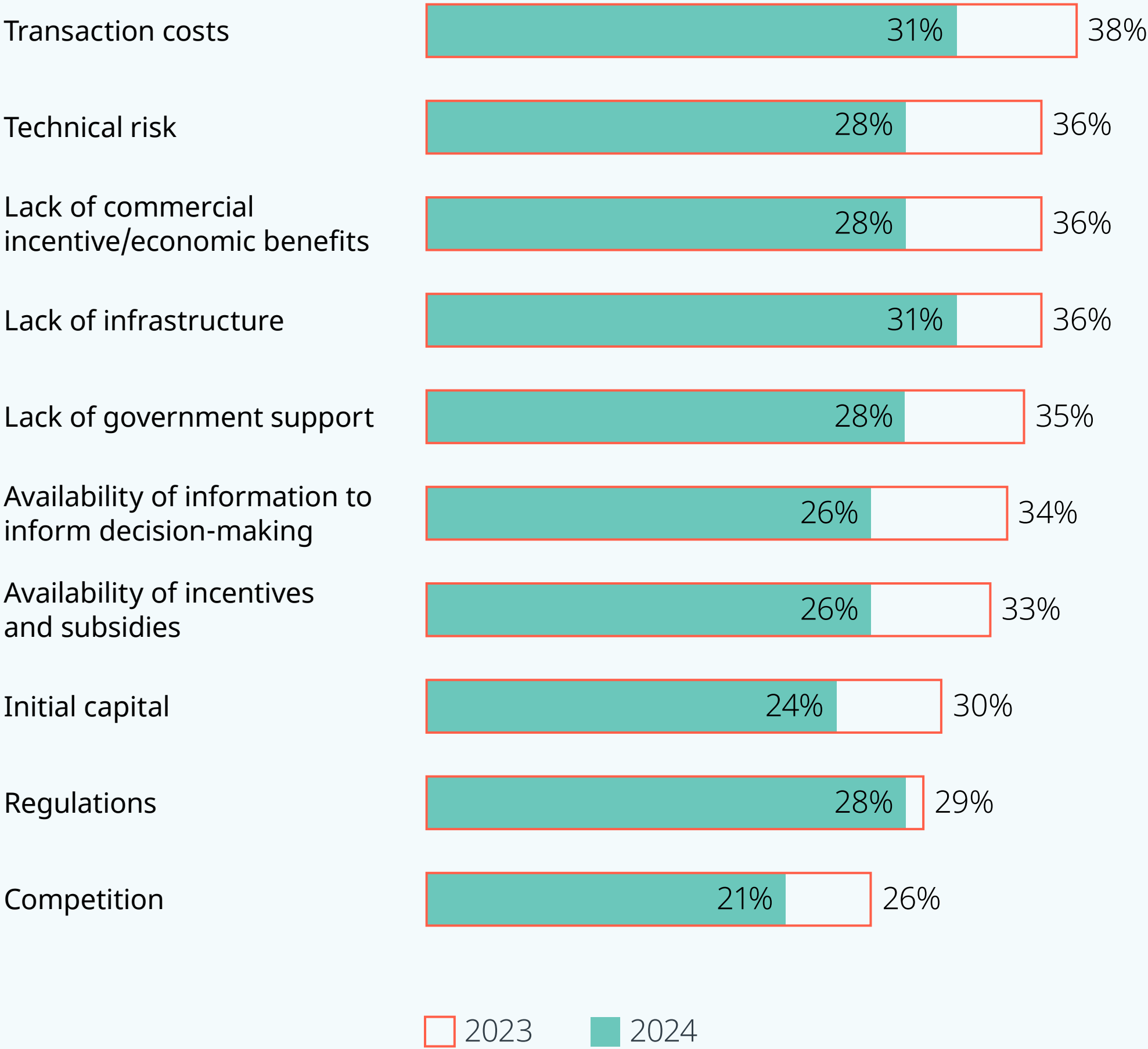


Luke Robottom
Partner, Abu Dhabi

One reason for the changing attitudes to the transition at a global level might be the minimal progress in overcoming obstacles to investment in the sector since our surveys began. Globally, a lack of infrastructure (31%) and increasing transaction costs (31%) are now considered the main barriers to investment in the industry. The number of corporates citing these two factors as potential impediments has barely shifted over the last five years. Other potential roadblocks include a lack of government support, unavailability of commercial incentives or economic benefits, the burden of regulation, and technical risk.



Barriers to investment



Corporates should consider:

Organisations can and should prepare to navigate any potential challenges resulting from potential geopolitical tensions, economic headwinds, policy uncertainty, or technological hurdles.

1. Increased regulatory and investor scrutiny

- **Challenge:** Regulators (eg EU CSRD, SEC climate disclosure rules) and institutional investors (eg Climate Action 100+) are likely to still demand transparency on climate risks and decarbonisation progress.
- **Implication:** Companies perceived as backtracking on commitments risk penalties, litigation, or exclusion from ESG-focused funds. Greenwashing accusations could escalate.

2. Stranded assets and market disruption

- **Challenge:** Delaying decarbonisation investments (eg retaining fossil-fuel-dependent infrastructure) may lead to stranded assets as markets shift toward low-carbon alternatives.
- **Implication:** Competitors investing in distributed energy, efficiency, or circular models could capture market share, leaving laggards with obsolete operations and declining valuations.

3. Supply chain and partner pressures

- **Challenge:** Suppliers, customers, and B2B partners may continue pushing for Scope 3 emissions reductions, even amid broader scepticism.

- **Implication:** Companies failing to meet sustainability criteria could lose contracts, face price premiums for carbon-intensive materials, or struggle to access green supply chains (eg EV batteries, green steel).

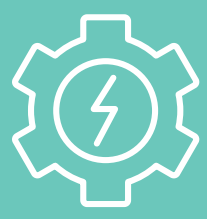
4. Reputational and consumer risks

- **Challenge:** Public sentiment is polarised – some stakeholders may criticise slow progress, while others resist the costs of transitioning.
- **Implication:** Brands risk alienating climate-conscious consumers (especially younger demographics) or facing activist campaigns. Conversely, abrupt transitions may spark backlash over costs/job losses.

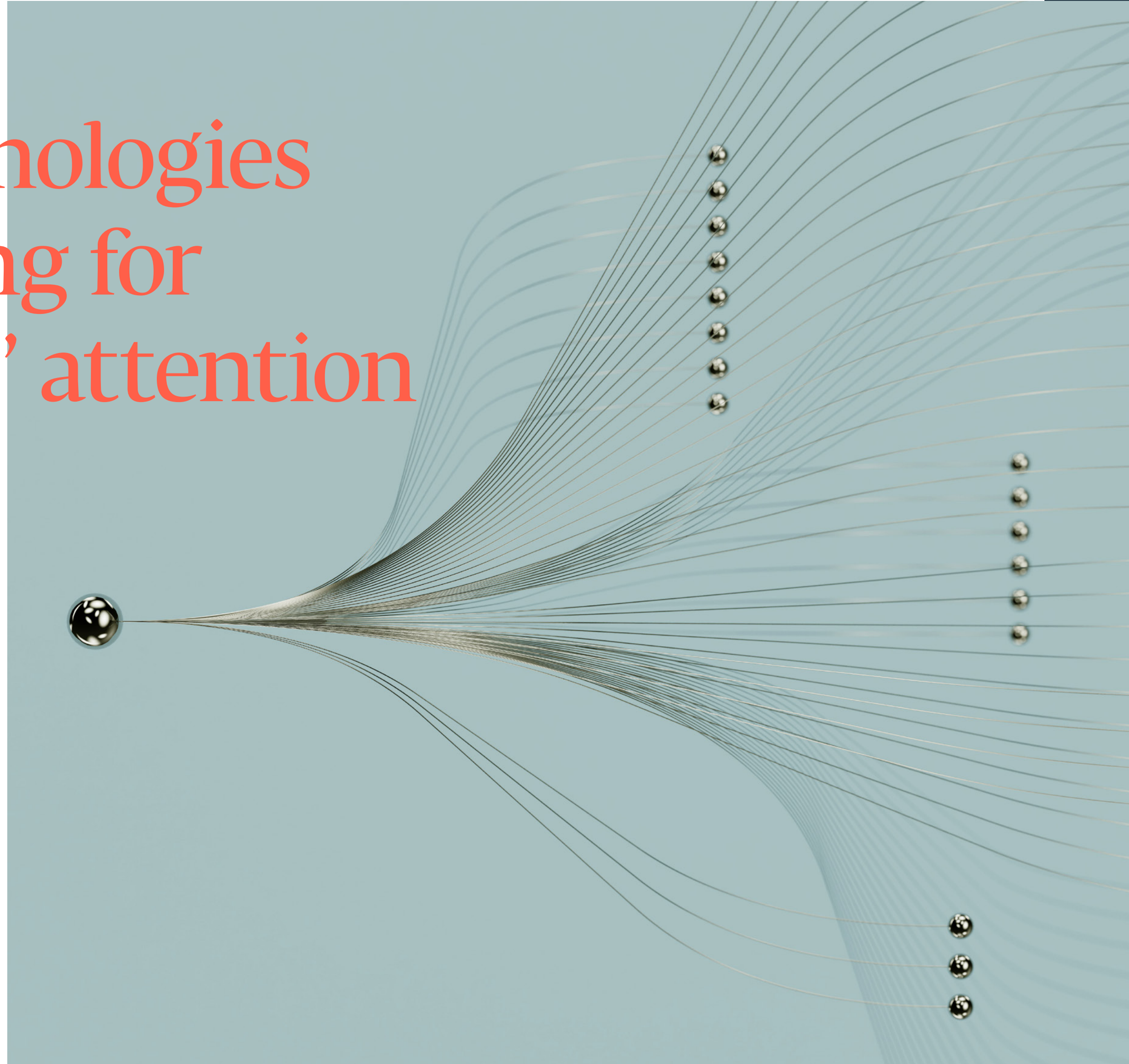
5. Higher long-term costs of inaction

- **Challenge:** Delaying adaptation (eg energy efficiency, resilience to climate shocks) increases exposure to future carbon taxes, volatile energy prices, and physical climate risks (eg floods, droughts).
- **Implication:** Companies could face unplanned CAPEX to retrofit operations later, while insurers may raise premiums for high-carbon sectors.

The net-zero transition remains uneven, but proactive stakeholders can turn scepticism into opportunity by aligning decarbonisation with cost savings (eg renewables' falling prices) and innovation.



The technologies competing for investors' attention

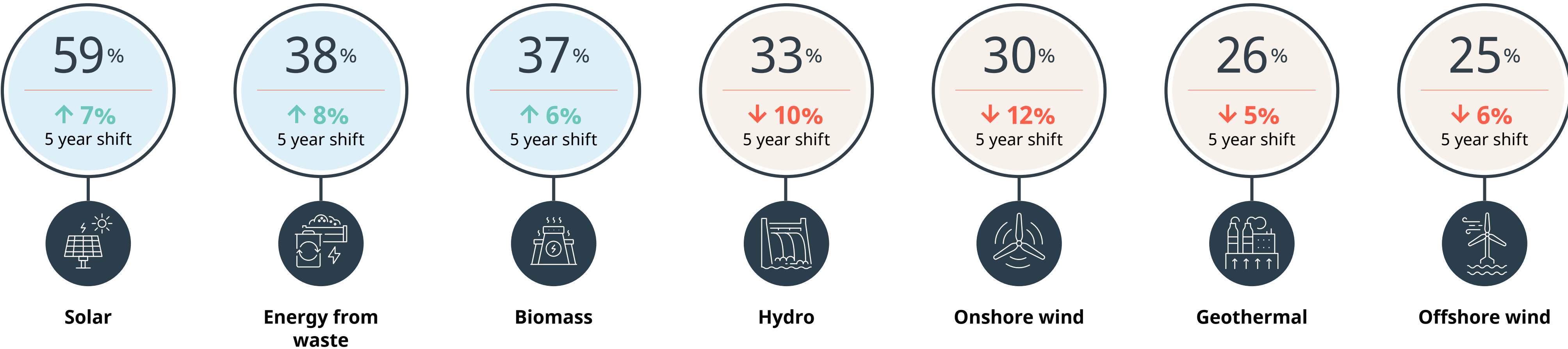


The technologies that are now finding favour with investors are a good indicator of shifting priorities.

While many of them continue to show growth, others have experienced a loss of investor appetite among corporates in recent years.

Looking first at renewable energy, the findings point to a continuing appetite for the development and financing of solar power, which remains the dominant form of renewable power. As the price of solar power continues to fall, 59% say they are currently investing in the technology, a rise of seven percentage points in the past five years. Indeed, across all our surveys, solar power has consistently been the number one renewable power in which to invest.

Current investment in renewable power generation



According to our respondents, another significant technology winner when it comes to renewable power is energy from waste (38%), which is up by 8% over the period and now ranks second.

Meanwhile, biomass – which uses organic matter to generate electricity – currently ranks third at 37%, having risen by six percentage points over the past five years. Of note, biomass is now the number one power generation source being utilised or invested in within the US (47%), according to our survey.

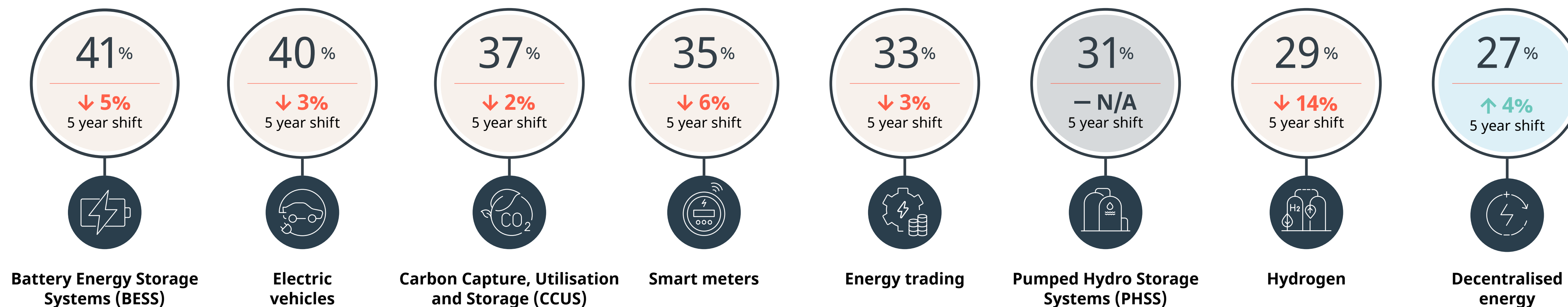
However, while investment in these three technologies has increased significantly, results for others are less favourable. For example, the report data suggests that the proportion of G20 organisations investing in wind, geothermal and hydro has decreased over the past five years.

In spite of this mixed picture, recent surveys suggest that renewable power generation will maintain its momentum. An [IEA report](#) at the beginning of October 2024 predicts that the world is set to add more than 5,500 GW of renewable power capacity by 2030. The report notes that this is roughly the same as the current combined power capacity of China, the European Union, India and the US.

Turning our attention to those technologies outside of power generation, respondents appear split on which of the existing technologies is likely to prove most appealing.

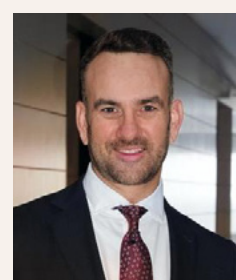
None stood out from the others as the new technology to utilise or invest in over the next five years. This finding underscores the complexity and diversity of technologies outside of generation that are needed to drive the transition in the years ahead.

Current investment in renewable non-power generation



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A few years ago, there was great momentum around the climate journey. However, as time goes on, people are realising it's a lot harder than they thought. This feeling has been exacerbated by the recent rise in the cost of living: people are now more concerned about the extra costs for net-zero energy and technologies. Social licence to operate is a key consideration. **There is still a tremendous amount of capital looking to support the energy transition, but increasingly the impediments to it are becoming more pronounced, which is slowing implementation.**



Dan Brown

**Partner and Global Co-Chair of Energy Industry,
Brisbane**

Strategic considerations

Corporates/governments should consider:

The evolving focus on which renewable technologies to prioritise for investment – driven by rapid innovation, shifting policy incentives, and market dynamics – creates both opportunities and risks for corporates. Below are five implications and strategic considerations for businesses navigating this transition:

1. Strategic portfolio risk and opportunity

- **Implication:** Corporates face trade-offs between investing in mature technologies (eg solar, onshore wind) with predictable returns and emerging innovations (eg green hydrogen, floating offshore wind, advanced nuclear) that promise long-term disruption but carry higher uncertainty.
- **Risk:** Overcommitting to a single technology could lead to stranded assets if market demand shifts or breakthroughs outpace adoption (eg lithium-ion batteries vs. solid-state alternatives).
- **Opportunity:** Early bets on scalable innovations (eg perovskite solar cells, geothermal) could secure first-mover advantages in niche markets.
- **Action:** Build a diversified portfolio, balancing low-risk, near-term projects with strategic stakes in high-potential emerging tech.

2. Policy-driven market uncertainty

- **Implication:** Government incentives (eg tax credits, grants) increasingly target specific technologies (eg the US Inflation Reduction Act's focus on hydrogen and carbon capture). Regional policy divergence (eg EU backing offshore wind, Asia prioritising solar) complicates global strategies.

- **Risk:** Sudden policy shifts (eg retroactive subsidy cuts or repeal of legislation) can derail ROI for technologies reliant on state support.
- **Opportunity:** Aligning investments with national decarbonisation agendas (eg India's green hydrogen mission) unlocks funding and regulatory goodwill.
- **Action:** Map investments to jurisdictions with stable, long-term policy frameworks and lobby for aligned incentives. Also structure transactions to avail of relevant investment treaty arbitration mechanisms should sovereign issues arise.

3. Supply chain vulnerability and innovation

- **Implication:** Emerging technologies often depend on scarce or geopolitically sensitive materials (eg cobalt for batteries, rare earths for turbines). Supply chain bottlenecks (eg China's dominance in solar panel production) can delay projects.
- **Risk:** Overreliance on single suppliers or regions exposes corporates to price volatility and trade disputes. Shift toward reciprocal tariff arrangements can distort CAPEX and project returns, too.
- **Opportunity:** Investing in circular economy solutions (eg battery recycling) or alternative materials (eg sodium-ion batteries) mitigates resource risks.
- **Action:** Secure partnerships for critical minerals, diversify suppliers, and co-invest in recycling infrastructure.

4. Accelerated R&D and collaboration demands

- **Implication:** Staying competitive requires continuous R&D to adopt breakthroughs (eg AI-driven grid optimisation, fusion energy prototypes). However, in-house innovation is costly and slow.

- **Risk:** Falling behind technologically may erode market share (eg legacy automakers vs. Tesla in EVs).
- **Opportunity:** Collaborating with startups, academia, or consortia (eg Breakthrough Energy Ventures) pools risks and accelerates scaling.
- **Action:** Allocate dedicated R&D budgets, acquire niche innovators, and join cross-industry alliances.

5. Reputational and competitive positioning

- **Implication:** Technology choices signal corporate climate ambition. Investors and consumers reward leaders in cutting-edge solutions (eg Microsoft's nuclear fusion partnerships) but seem to penalise laggards or perceived "greenwashing."
- **Risk:** Backing controversial technologies (eg biofuels linked to deforestation and, in certain jurisdictions, nuclear) can spark backlash.
- **Opportunity:** Aligning with high-impact, scalable tech (eg offshore wind for energy giants) may enhance ESG ratings and attract talent/capital.
- **Action:** Transparently link investments to science-based targets (SBTi) and communicate progress through frameworks like the TCFD.

By proactively addressing these implications, corporates can turn the renewable technology pivot into a catalyst for resilience, growth, and leadership in the net-zero economy.

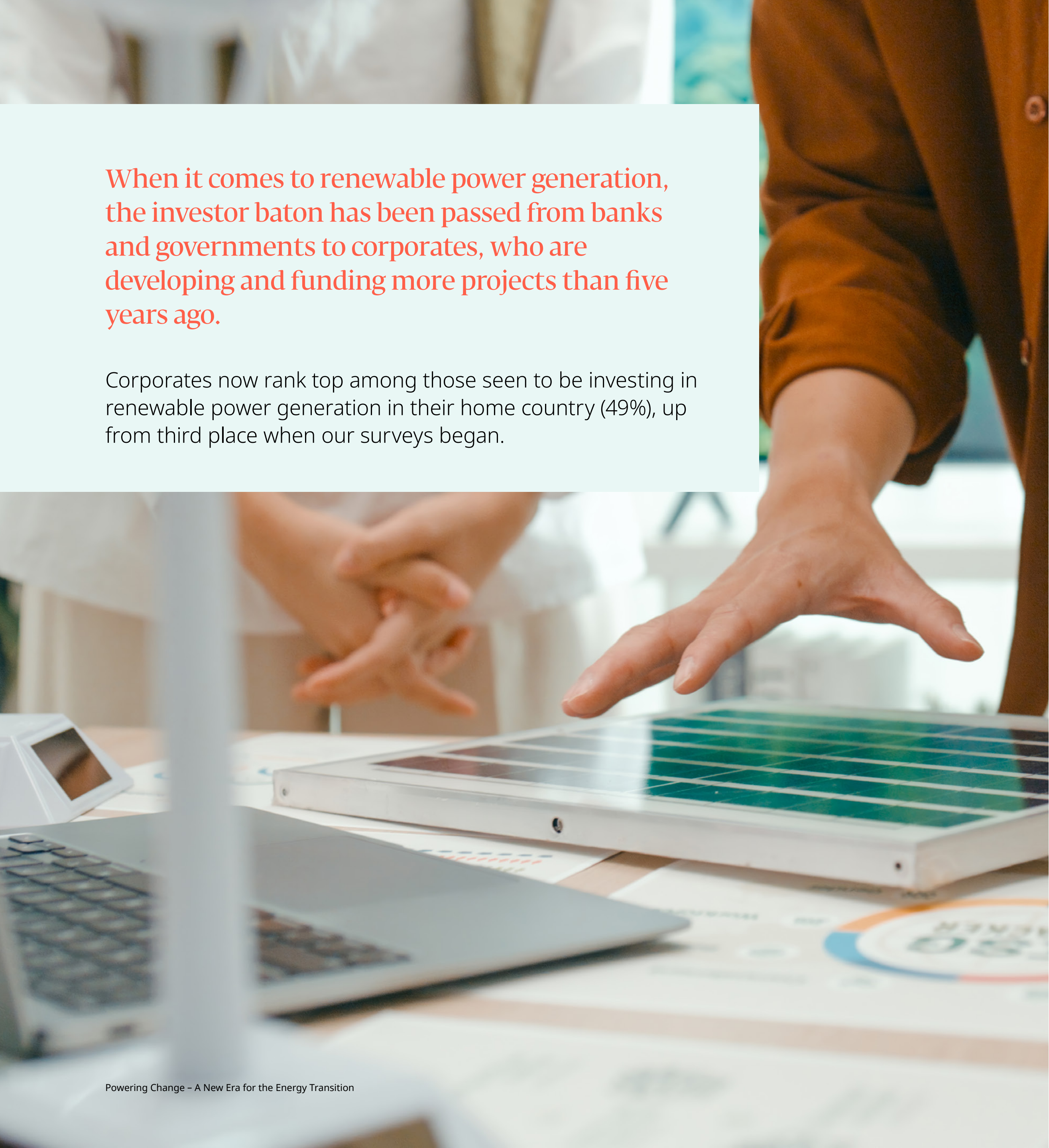


The players and places shaping energy investment



When we look at who is financing the transition, we see that many of the trends we have observed over five years are becoming the ‘new normal’.

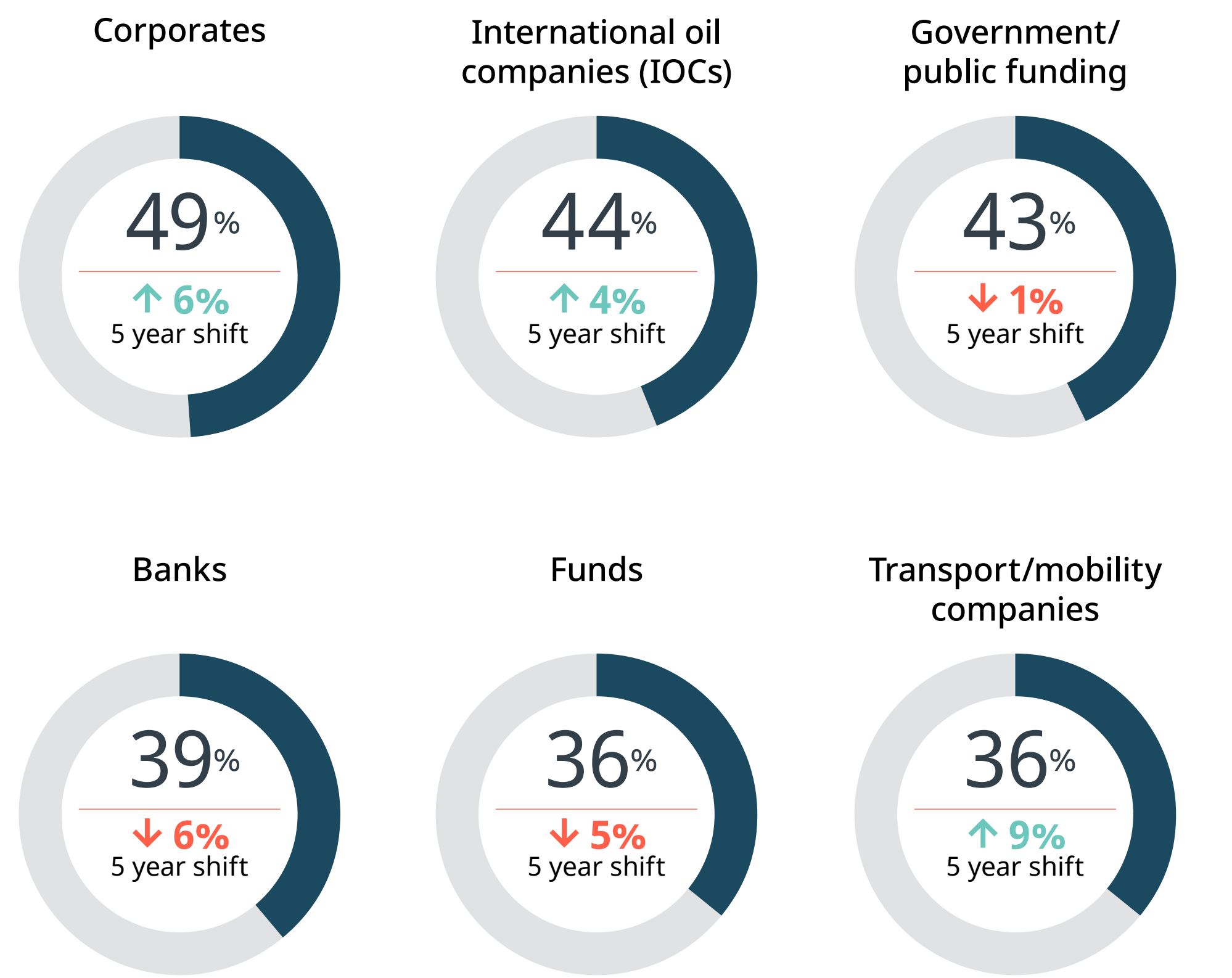
In spite of the obstacles, the industry as a whole continues to mature, and the existing players – particularly corporates (a 6% increase across five years) – are taking on a more-central role. The survey suggests that, in spite of some challenges, many of them still feel comfortable about investing in renewables and are looking to diversify their strategies by increasing their exposure to clean energy.



When it comes to renewable power generation, the investor baton has been passed from banks and governments to corporates, who are developing and funding more projects than five years ago.

Corporates now rank top among those seen to be investing in renewable power generation in their home country (49%), up from third place when our surveys began.

Corporates leading investment in renewable power generation over 5 years, with interest from transport/mobility companies increasing strongly





Renewable developers and traditional utilities showing biggest increase in interest in investment in non-power generation over 5 years

Similarly, signs of a maturing industry are also clear when we turn from renewable power generation itself to look at who is investing in non-power generation technologies. The data suggests that corporates are becoming more comfortable with investing in the sector. These businesses face significant carbon penalties if they do nothing to reduce their emissions, bolstering the business case for decarbonisation projects and intra-industry collaboration and innovation. We explore the role of Power-to-X technologies as a potential solution in this report.

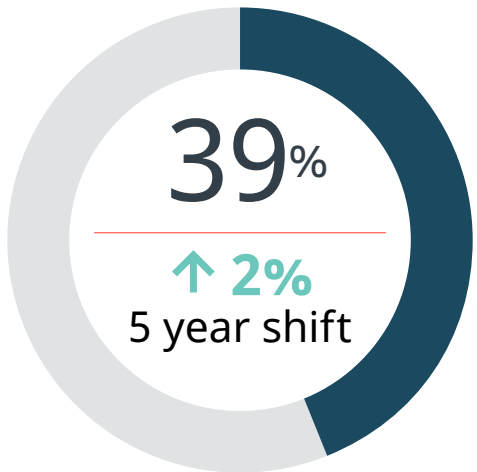
In this year’s survey, renewable developers and private equity firms jointly occupy the top spot (each at 39%) as the leading developers and funders of non-generation technology, with both having shown an increase in investment in the technology – as have traditional utilities – over the last five years. By contrast, governments – which ranked top after the Covid-19 pandemic disrupted many projects – appear to be taking a less-significant role, showing the sharpest decline (a 5% fall) of any single group over the period.

Existing players’ increasing dominance of the industry perhaps reflects the fact that far fewer new entrants are entering the market compared with when our surveys began. Their number has slipped by ten percentage points over the last five years.

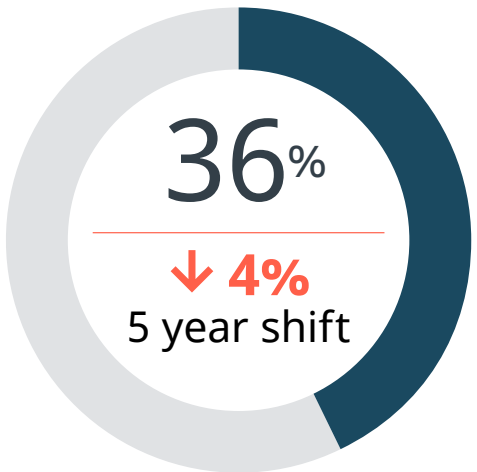
Renewable developers



Private equity



Renewable funds



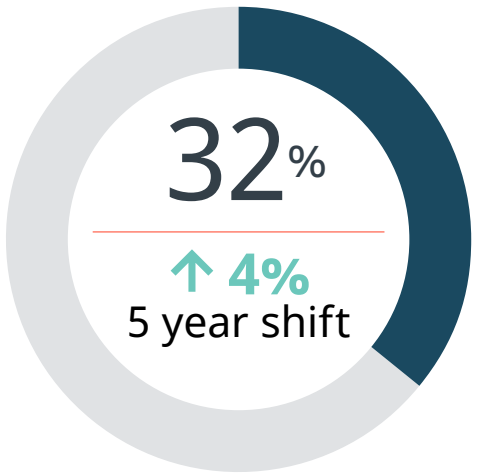
International oil companies (IOCs)



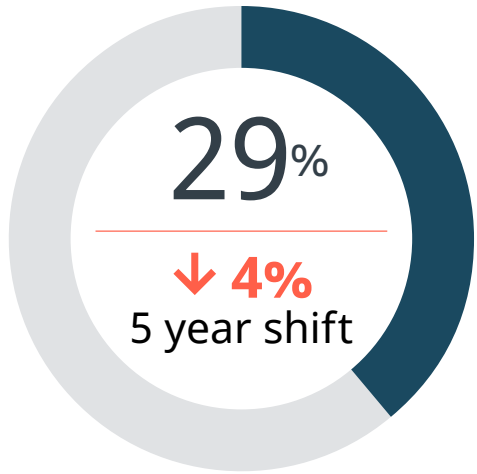
Governments



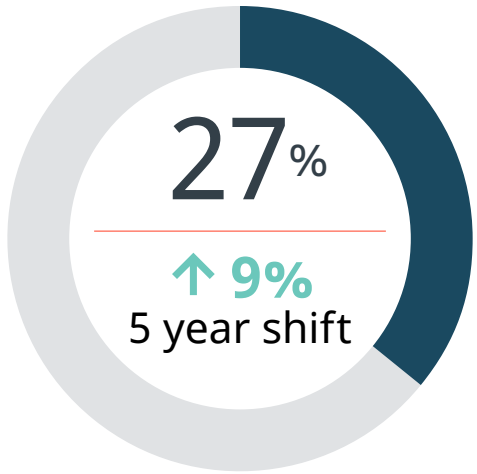
Infrastructure funds



Venture capital



Traditional utilities



New entrants

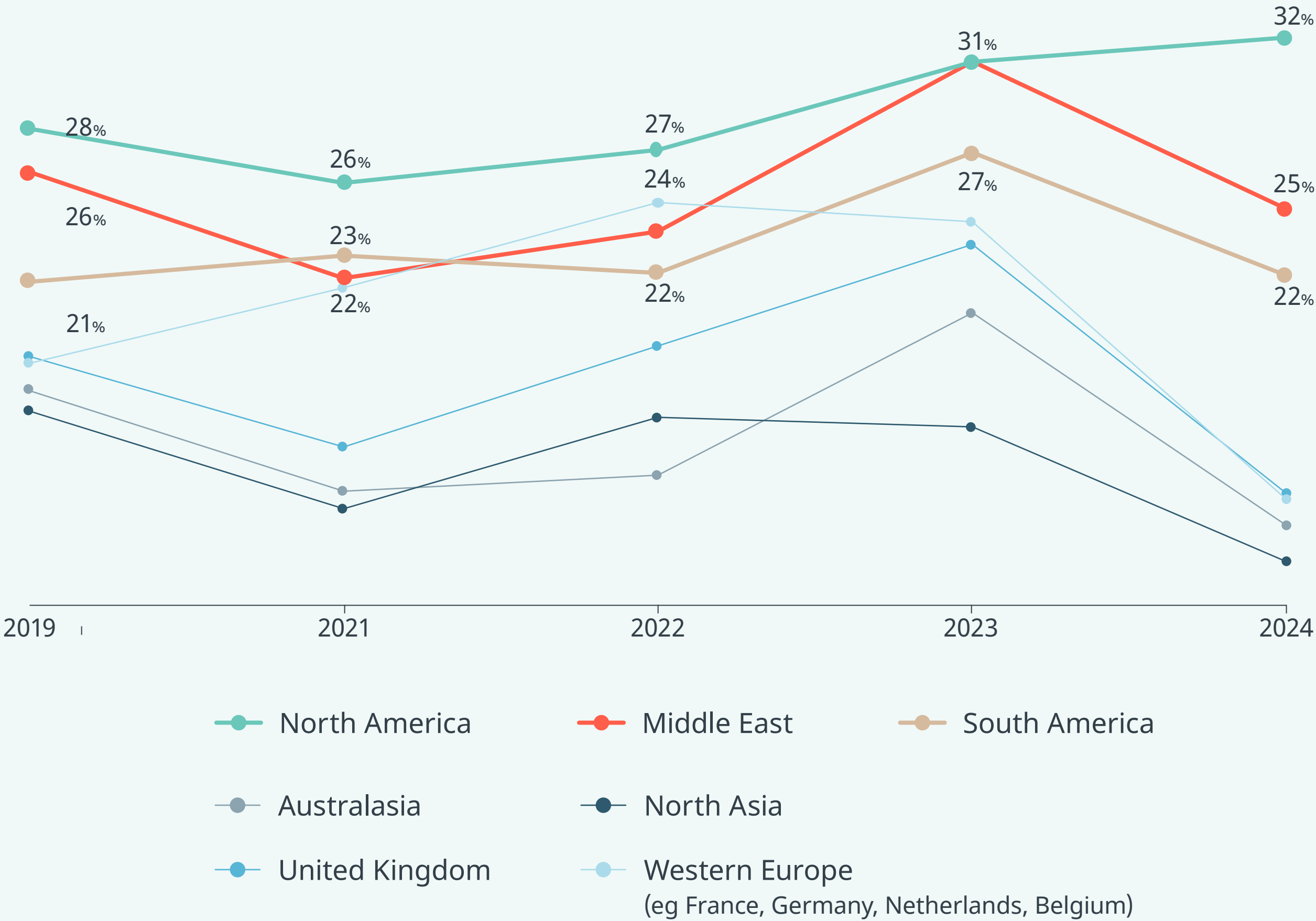


When it comes to target markets for investment, again the trends we have witnessed in the past appear to have been reinforced. North America, the Middle East and South America remain the most popular markets for investing in renewable energy, the energy transition and decarbonisation technologies, as they were five years ago. All three regions have either increased in popularity or been broadly flat compared to 2020.

Looking ahead to the next five years, the Asia Pacific region is expected to be a significant focus. Both North (18%) and South East Asia (17%) are set to join South America (20%) as the top destinations for investment during this period.



North America has been the most-popular investment destination over the past 5 years for renewable energy



Energy sovereignty and the interplay between renewables and nuclear energy in Europe

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What's changed most in Europe over the last five years is a growing realisation following the Ukraine invasion that easy access to cheap and abundant energy is not guaranteed. France recently appointed a commission to examine its energy sovereignty since electricity supply is highly strategic. France relies on nuclear power for about 70% of its electricity (expected to increase with new nuclear plants), and with hydro and solar added that means up to 80% or 90% of the country is already running on carbon-free electricity. Despite this, we are about to see a large investment in renewables (eg offshore wind power is expected to increase 10-fold to 20GW by 2030 and as much 45GW by 2050).”



Mark Barges

Partner, Paris

“

In Spain, a national energy plan for 2023-30 has increased almost all of its objectives for various renewable technologies with a view to strengthening energy security, which has been shown to be urgent following the pandemic and the invasion of Ukraine. Spain is now relying more on renewables and less on nuclear and natural gas, with renewables accounting for more than 50% of national power production. **Energy storage is key to the flexibility and stability of the power grid,** resulting in an ambitious objective to build 22.5 GW of energy storage installed capacity by 2030, which represents a doubling of current installed capacity.”



Andrés Alfonso

Partner, Madrid

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In Italy, there is a growing focus on the stability of the grid and, in particular, batteries. Indeed, the Government here has just come up with an incentive scheme aimed at 50 GW of batteries by 2030, and it is now one of the most active sectors of Italy's energy transition market. If we look ahead to the next five years, however, another key theme could be the extent to which nuclear energy is feasible. We currently have no nuclear power in Italy, because it was banned in a referendum decades ago. **People here now realise, however, that an energy transition based only on renewables may not be realistic or sufficient.**”



Carloandrea Meacci

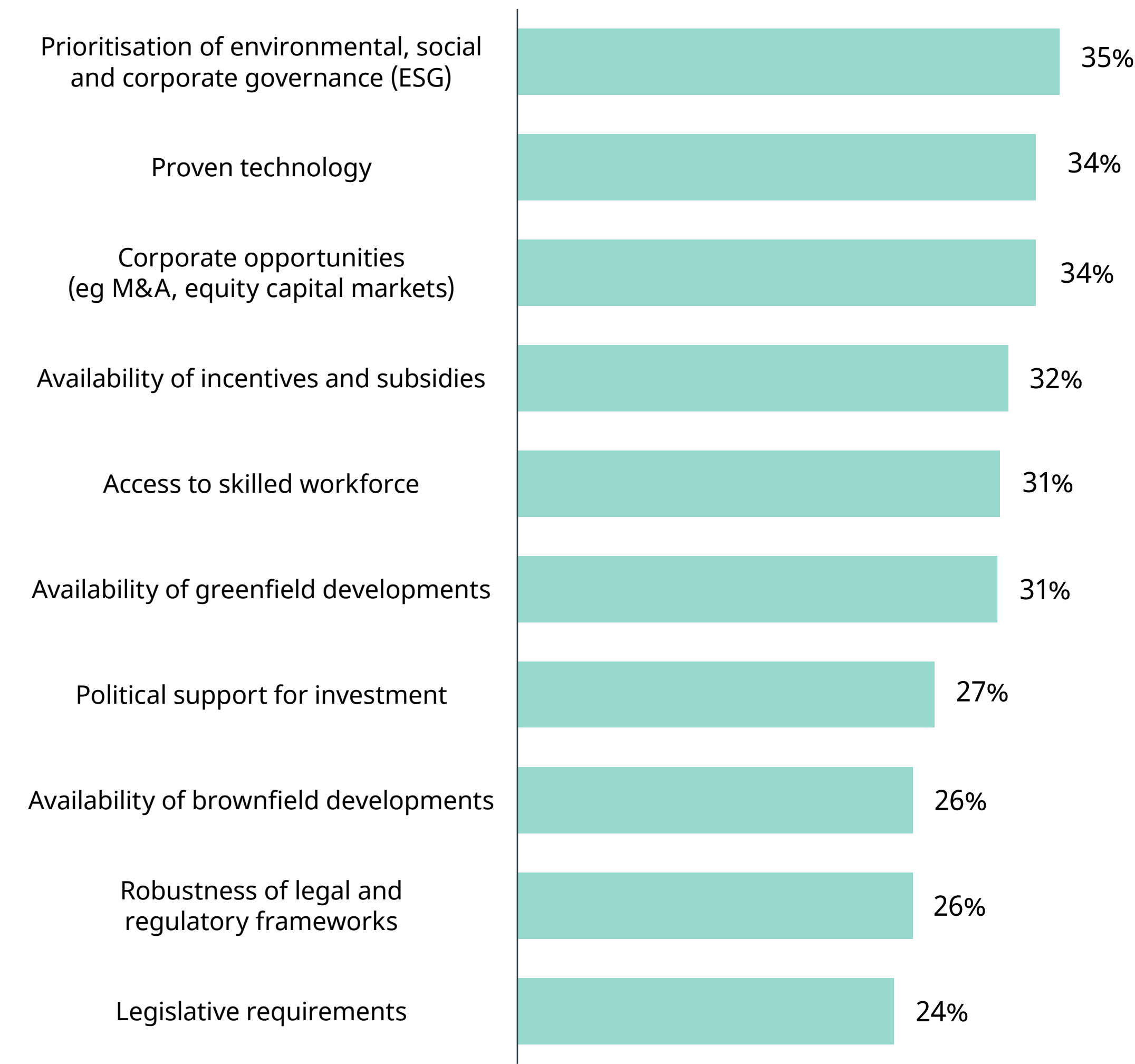
Partner, Milan



When assessing what is behind an organisation's approach to investing in renewable energy, we see that ESG has become a priority and has surpassed existing proven technology as the most-significant driver of growth in the sector (35%). However, this year M&A and capital raisings, along with proven technology, rank as joint second drivers of investment (both at 34%). This is as parties are looking to source investors to help fund project development. The markets in which M&A and capital-raising opportunities score relatively highly as a driver of activity include Japan (40%) and Saudi Arabia (49%). Organisations in the United States said they believed the availability of greenfield developments had been the main driver of investment, with 41% citing it as a factor.

When assessing what is behind an organisation's approach to investing in renewable energy, we see that ESG has become a priority and has surpassed existing proven technology as the most significant driver of growth in the sector (35%).

Drivers of growth



Corporates remain alert to the potential for disputes

Nearly nine in ten (87% of those surveyed) believe their organisation's approach to the energy transition is likely to lead to disputes as they carry out their activities, which is broadly similar to last year's figure. More than half (54%) believe their approach will lead to disputes with individuals or special interest groups, or with governments or other authorities. Just over a third (37%) say disputes will likely take place with other companies. Those in the mining and quarrying industry are the most concerned, with more than two-thirds fearing disputes will occur with individuals/special interest groups (69%) or governments (68%). Significant levels of concern exist in the manufacturing and electricity supply sectors.

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We are currently advising on various projects aimed at enhancing existing renewables infrastructure or reducing the carbon emissions from fossil fuel-fired power plants, including by the addition of carbon capture technology and battery storage. **This layering of new technology onto existing technology and infrastructure will be a huge driver of disputes, as will the 're-powering' of ageing renewables infrastructure.** The additional interfaces involved will bring a further degree of complexity to disputes and muddy the waters regarding blame when things go wrong. Players are also committing to complicated developments within tighter timescales and, when that happens, disputes often follow.”



Emma Johnson

Partner, London

“ Anything new involves pushing boundaries and uncharted risk profiles. So disputes are likely to increase. There will always be a baseline of cases concerning contractual issues but, in addition, disputes arise from innovative technology and industry transformation issues. Examples include the construction of large data centres, infrastructure for the energy transition, such as transmission networks and battery storage, and the decommissioning of old infrastructure. You also have the increasing implementation of artificial intelligence. Another aggravating factor is the current unprecedented geopolitical disruption and rising inflation, not to mention worldwide shortages of, and competition for, resources to implement such projects. **So, corporates need to be prepared or they will find themselves a few years from now with insufficient mechanisms to enforce contractual obligations to avoid negative impacts and/or recover damages. It is important to think about the uncomfortable topics early on.**”



Georgia Quick
Partner, Sydney



Arne Fuchs
Partner, Frankfurt

“ Five or six years ago people were optimistic about the opportunities presented by clean energy and the broader energy transition, and the idea of disputes in these areas was relatively novel. This optimism created a wave of investment, which brought several practical barriers in its wake, such as construction challenges, volatility in the energy market, the reliability of the grid and interconnection issues. These led to a range of new disputes. **Now we are into the next wave of greenwashing litigation. Corporates in a wide range of industries are making climate-related disclosures either because they are required to do so by law or because of broader market or social forces.** These disclosures are being routinely tested by regulators, investors and activists who are determined to know whether they are accurate or have a reasonable basis.”



James Clarke
Partner, Melbourne

Strategic considerations

Corporates/governments should consider:

The shifting investor profile in the energy transition – marked by the rise of ESG-focused funds, activist shareholders, and institutional investors prioritising climate alignment – creates new challenges and opportunities for corporates. Below are five implications and strategic responses:

1. Heightened demand for credible transition plans

- **Implication:** Investors increasingly scrutinise the substance of decarbonisation strategies, not just pledges. They demand science-based targets (SBTi), granular roadmaps, and progress on Scope 3 emissions.
- **Risk:** Companies lacking actionable plans face exclusion from ESG indices, divestment, or higher capital costs. Greenwashing accusations can damage reputations.
- **Opportunity:** Robust plans attract “transition-aligned” capital (eg green bonds, sustainability-linked loans) and partnerships.
- **Action:** Adopt frameworks like TCFD/ISSB for disclosures, tie executive compensation to climate goals, and engage investors proactively.

2. Divergence between short-term and long-term investors

- **Implication:** Institutional investors (eg pension funds) with long horizons may tolerate upfront costs for renewables, while hedge funds demand quicker returns. Balancing these pressures is critical.
- **Risk:** Misalignment with investor timelines can trigger shareholder activism or stock volatility.

- **Opportunity:** Structure phased investments (eg pilot projects – scaling) to satisfy both cohorts. Highlight long-term savings (eg energy cost reductions) alongside near-term milestones.
- **Action:** Tailor communications – emphasise risk mitigation for short-term investors and transformational impact for long-term holders.

3. Rise of climate-focused activist shareholders

- **Implication:** Investors like Engine No. 1 or Climate Action 100+ use stakes to push for board changes, fossil fuel divestment, or faster renewables adoption.
- **Risk:** Public battles over strategy disrupt operations and erode stakeholder trust.
- **Opportunity:** Proactive engagement with activists can align agendas, unlocking support for ambitious projects (eg Microsoft's climate innovation fund).
- **Action:** Establish investor advisory panels, disclose voting policies, and integrate climate expertise into board governance.

4. Geopolitical and regulatory alignment pressures

- **Implication:** Investors prioritise regions with stable policy incentives (eg EU taxonomy, US IRA subsidies). Companies face pressure to localise supply chains or pivot from high-risk markets.
- **Risk:** Overexposure to regions with retroactive policy shifts (eg fossil fuel subsidies) can alienate ESG-focused capital.
- **Opportunity:** Align portfolios with 'safe haven' markets (eg EU offshore wind, US hydrogen hubs) to attract funding.
- **Action:** Diversify investments across policy-supportive jurisdictions and lobby for regulatory clarity.

5. Competition for 'green premiums' and talent

- **Implication:** Investors reward sector leaders with valuation premiums (eg NextEra Energy vs. traditional utilities). Similarly, top talent flocks to firms perceived as sustainability pioneers.
- **Risk:** Laggards face higher capital costs, talent drain, and customer attrition.
- **Opportunity:** Position as a transition leader through flagship projects (eg Amazon's renewable PPAs) to attract both capital and skilled workers.
- **Action:** Benchmark against peers, leverage certifications (eg RE100), and showcase innovation in investor materials.

By addressing these implications, corporates can turn evolving investor expectations into a strategic advantage, securing capital and credibility in the energy transition era.





Power to X: Tackling investment gaps in the energy transition



Central to achieving net zero is reducing emissions from difficult-to-abate sectors, such as transport and heavy industry (eg steel production). ‘Power to X’ has a key role to play here. P2X technologies are a potential solution.

These technologies involve converting surplus renewable power into valuable fuels, chemicals and other products. These include turning renewable energy into clean hydrogen, ammonia or other gases or liquids, using relatively simple existing chemical technologies like electrolysis or gas separation. The resulting product can be used to provide clean power to energy-intensive industries, or stored and then shipped around the world before being converted back into fuel to generate lower-carbon power where it is needed.

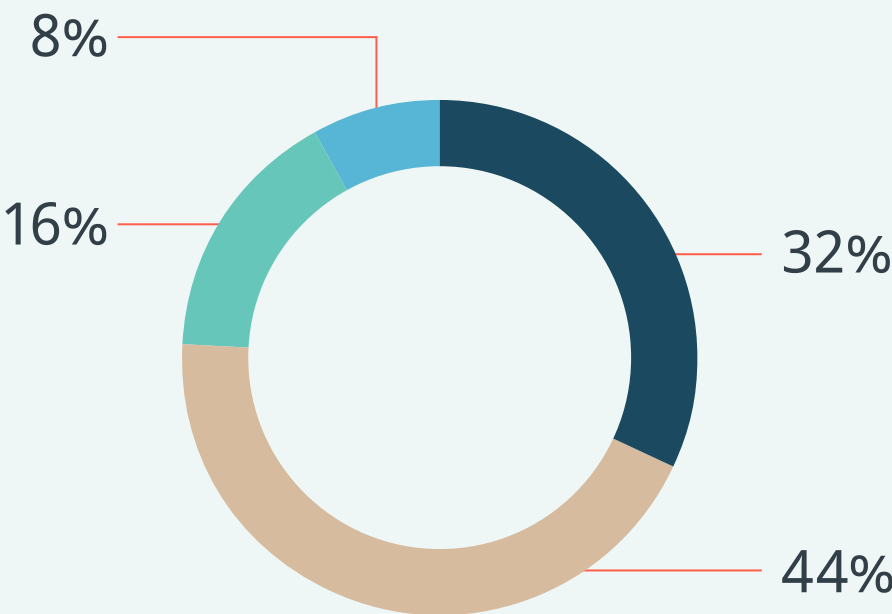
There is nervousness among some investors (56%) about P2X's cost, its effectiveness and whether there is sufficient end-user demand for the product. However, the findings suggest that the technology is seen as critical to the success of the energy transition.

Across the G20 as a whole, our survey finds corporates have a positive view of P2X technologies: eight in ten (80%) say they are planning to increase investment in P2X over the next five years.

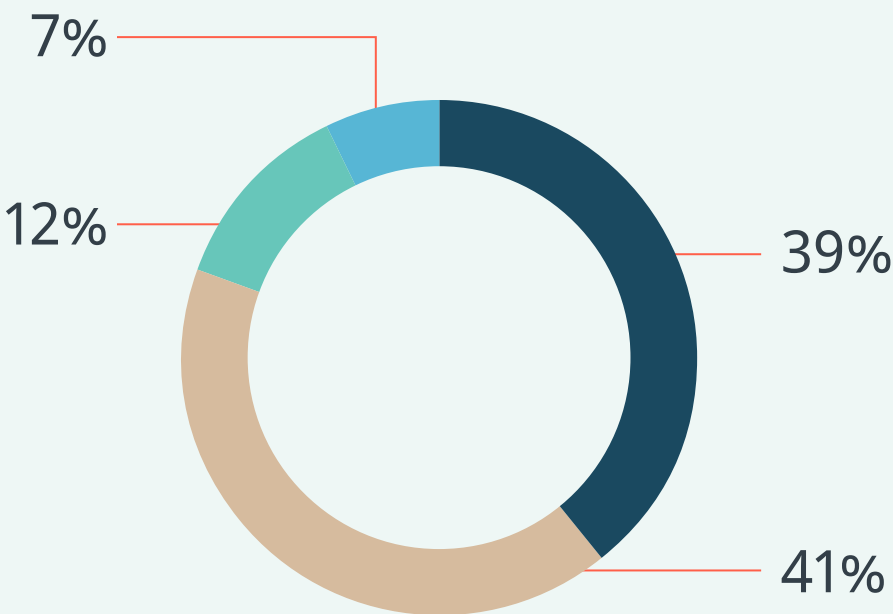


Positive sentiment towards investment in P2X technologies

Without substantial investment in P2X technologies or products in the next 5 years, it is unlikely that national net-zero targets will be met



We are planning to increase our investment in P2X technologies or products over the next 5 years



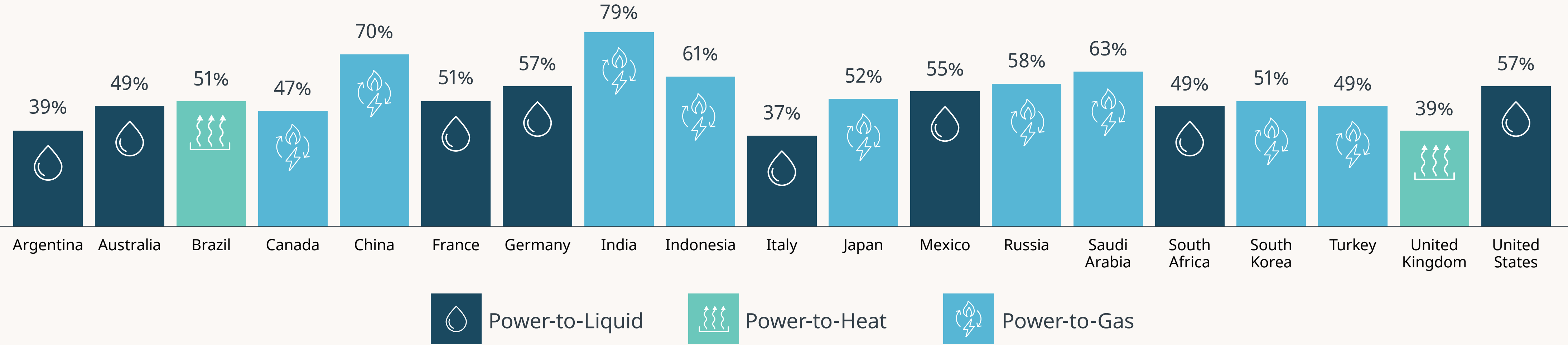
Strongly agree Slightly agree Slightly disagree Strongly disagree

In terms of which 'X' is attracting the most attention, opinions were mixed. Half of the G20 organisations say they are exploring or investing in Power-to-Liquid technologies (such as synthetic gasoline or diesel), with slightly fewer (49%) exploring Power-to-Gas solutions, including green hydrogen or green methane. Forty-four per cent are exploring Power-to-Heat technology, with the smallest number (41%) examining Power-to-Chemicals solutions, such as fertilisers. That being said, Power-to-Gas was the leading technology in nine countries, with Power-to-Liquid in eight, and Power-to-Heat in only two.

Despite the optimism about the technology, corporates recognise that significant investment is required. More than three-quarters (76%) agree that without substantial investment in P2X technologies, national clean energy targets will probably not be achieved. This sentiment was expressed most strongly in several developing countries. Corporates in Indonesia (91%), India (90%) and Argentina (84%) are the most concerned, followed by China (83%), Mexico (82%), Saudi Arabia (81%) and South Africa (81%).

Number 1 choice of P2X technology by country

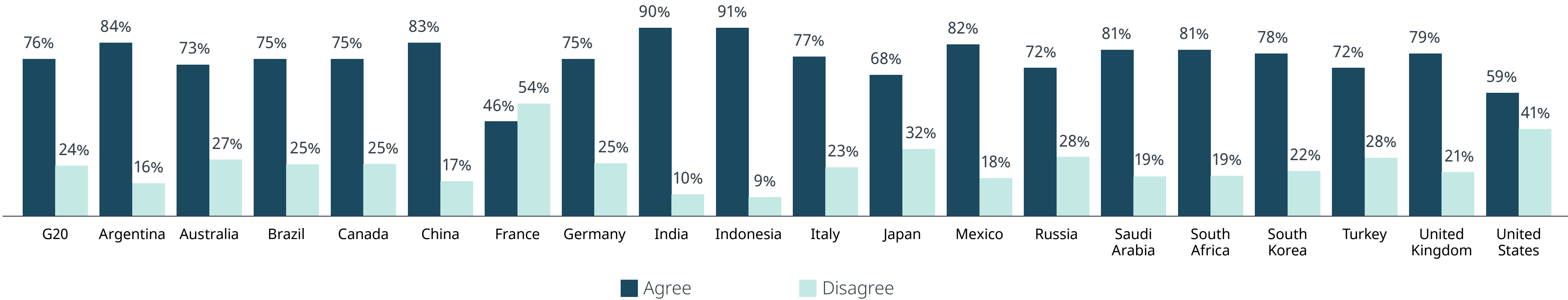
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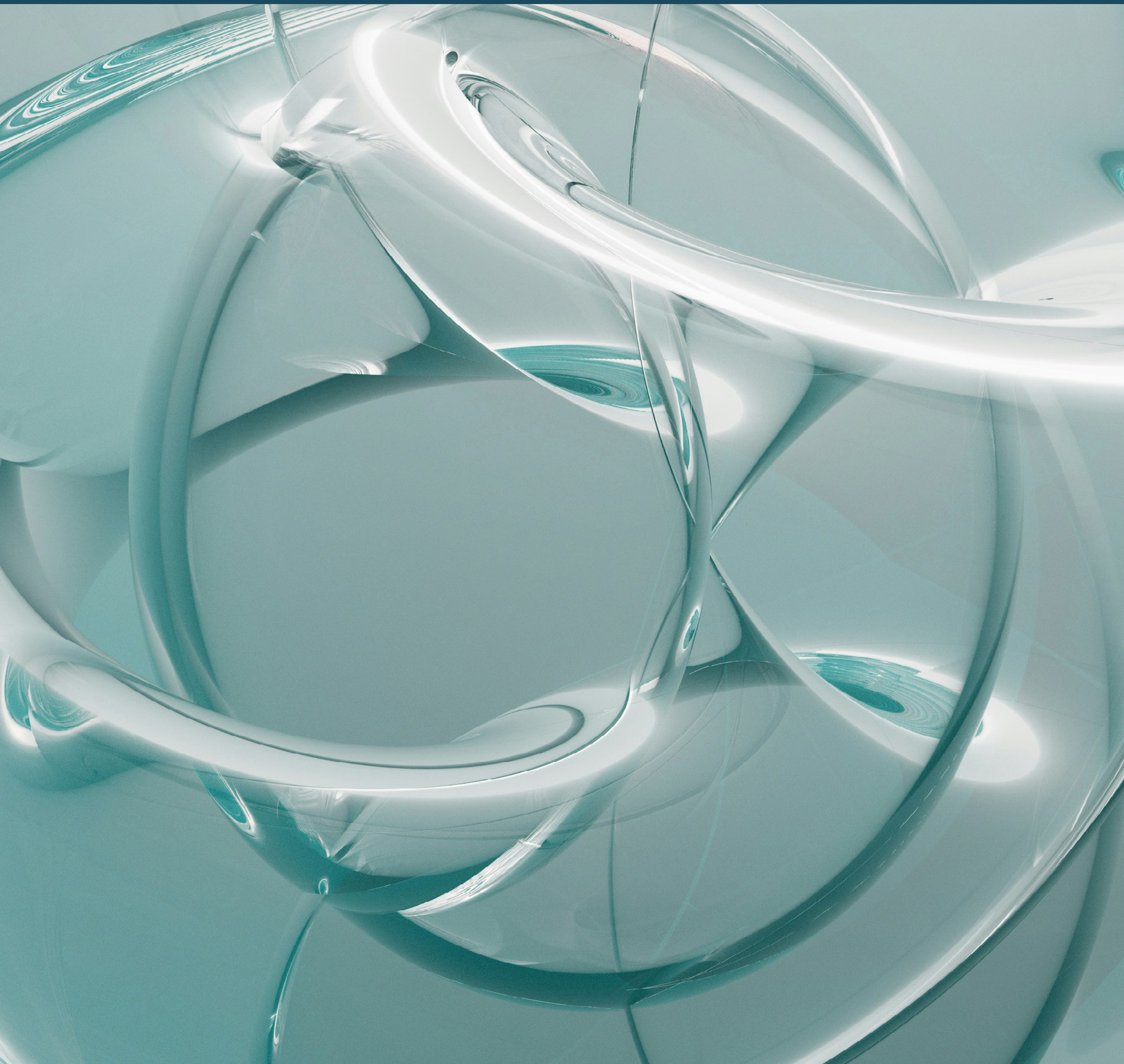




More than three-quarters (76%) agree that without substantial investment in P2X technologies, national clean energy targets will probably not be achieved.

Without substantial investment in P2X technologies or products in the next five years, it is unlikely that national net-zero targets will be met.





Green hydrogen as a potential solution?

It is clear that considerable faith is already being placed in P2X. Green hydrogen is one fuel source that could benefit from this optimism; however, green hydrogen has recently come under scrutiny amid concerns about costs, a lack of infrastructure and insufficient demand. Despite the initial excitement about the development of the fuel, concerns about its viability and cost remain.

Projects have yet to materialise at the speed and volume originally expected. The investor field has narrowed, leaving the mature energy players, creditworthy offtakers and those projects with proven end-user demand as viable projects while others with less-certain prospects are often not moving forward.

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South Korea remains committed to increasing its renewable energy mix, but various challenges remain – such as grid infrastructure constraints, a complex environmental permitting regime and historical reliance on fossil fuels – which will need to be addressed in order to expedite Korea’s progress to carbon neutrality. Hydrogen was one area that generated a lot of excitement in the market. Some of that energy has abated, though, as people realise that hydrogen is more expensive and the supply chain more complex than they had first anticipated. **However, Korea will need hydrogen in the future, and people understand it will be a constituent of long-term supply chains and part of the country’s energy mix. But they are being more measured and selective in what they pursue.”**

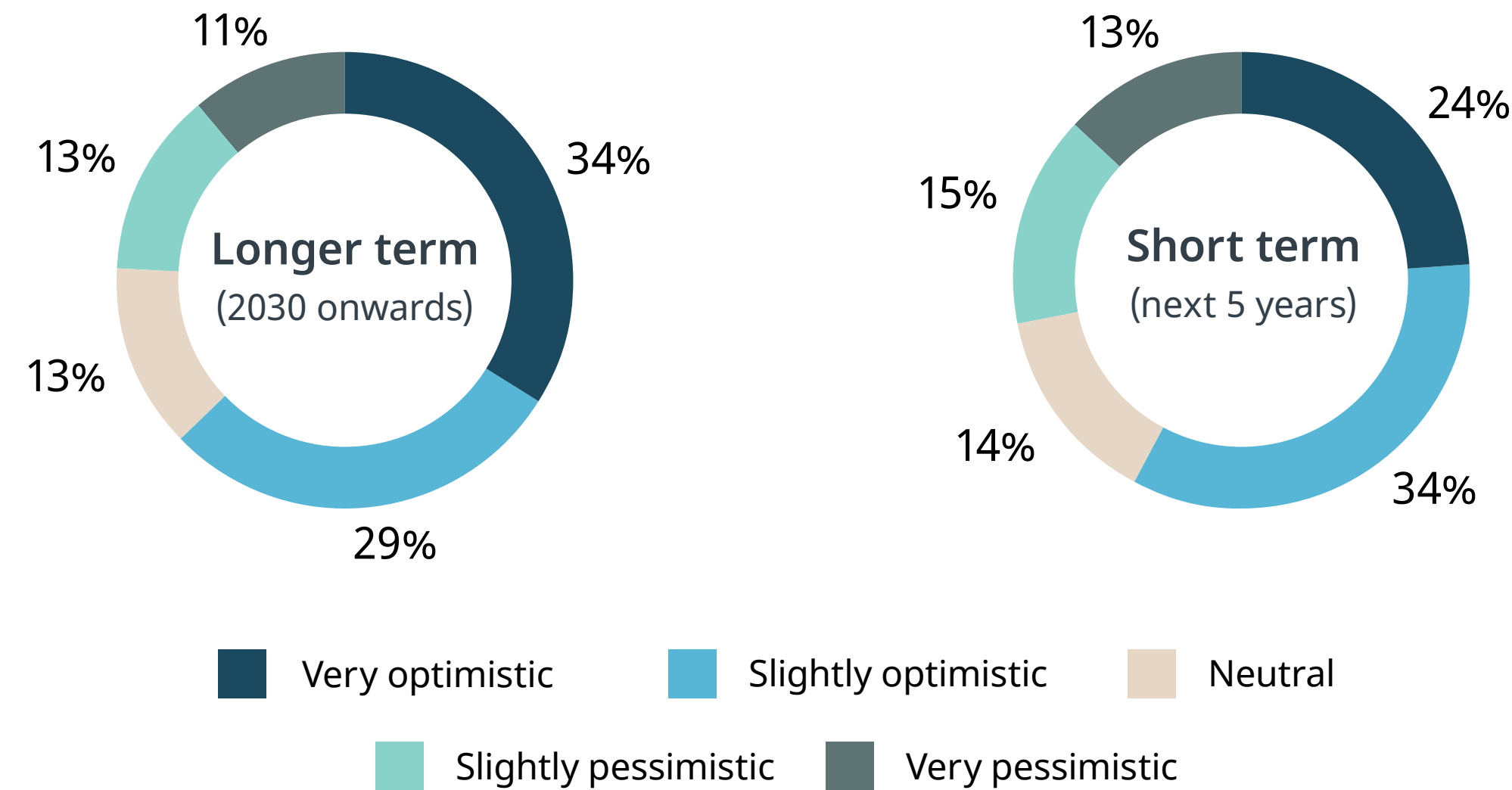


Anna Chung

Partner, Seoul

However, survey respondents seem generally positive, at least about the technology’s long-term prospects. Across the G20, just under two-thirds (64%) of organisations say they are optimistic about the outlook for green hydrogen in the long term, outnumbering the pessimists by more than two to one. Nevertheless, corporates recognise that the technology is still some years away from achieving sufficient scale. While 64% are optimistic about its outlook in the longer term, fewer (58%) feel the same about its short-term potential.

The outlook for green hydrogen in the energy transition, particularly in hard-to-abate sectors



Levels of optimism about green hydrogen seem to be higher in the faster-growing regions of the world than in developed nations. Organisations located in Latin America (82%), the Middle East and Africa (75%), as well as the BRICS nations (71%), are the most optimistic about its long-term prospects. By contrast, those in North America (44%) and Europe (50%) are far less optimistic.

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P2X here in the Middle East is really about hydrogen in all its forms. **Governments in the region have made a commitment to pursue it and, as these countries have shown before, if they want to do something, they do it.** There is excitement about P2X, with the various stakeholders taking their cue from what they see is coming down from on high.”



Luke Robottom
Partner, Abu Dhabi

“

Costs for things like hydrogen and carbon capture and storage are still quite high, which means there will be really significant barriers to entry – unless there is government support. With hydrogen, the expectation was always that the use case would need to be determined, and that is what is happening. **Businesses are asking what the best use of the molecules is going to be, given the cost and the need to make money.** There was an initial assumption – particularly in Asia – that ammonia would be used for power, but that isn’t happening. It’s too expensive, so people are looking at other ways of using it; they’re monetising it in different ways.”



Jean-Louis Neves Mandelli
Partner, Singapore

A number of impediments remain when it comes to P2X's wider adoption. Cost (56%), integration with renewable energy sources (49%), as well as transportation and storage (48%), are primary concerns for respondents. Also, the potential for legal disputes is seen as a key challenge facing organisations. Such disputes are most likely expected to involve new or untested technology (64%), infrastructure limitations (63%), environmental issues (62%) and regulatory delays (62%). Supply chain disruptions (60%) are also considered a likely source of contention. Robust offtake agreements are going to be key to protect against volatility in P2X projects.

Strategic considerations

Corporates/governments should consider:

The rise of P2X technologies – which convert renewable electricity into hydrogen, synthetic fuels, or chemicals – offers transformative potential for corporates pursuing net-zero goals. However, it also introduces strategic, financial, and operational complexities. Below are five implications for businesses engaging with P2X opportunities:

1. Decarbonisation of hard-to-abate sectors

- **Implication:** P2X enables industries like aviation, shipping, steel, and chemicals to replace fossil fuels with green hydrogen, e-ammonia, or e-fuels, addressing emissions that electrification alone cannot.
- **Opportunity:** Position as a leader in sectors with limited decarbonisation options (eg Maersk's green methanol ships, Thyssenkrupp's hydrogen-based steel).

- **Risk:** High upfront costs for electrolyzers, carbon capture, and infrastructure; scalability depends on falling technology costs.
- **Action:** Pilot P2X projects in partnership with industry consortia (eg offtakers) and leverage subsidies (eg EU Innovation Fund, US IRA tax credits).

2. New revenue streams and market creation

- **Implication:** Corporates can diversify into green hydrogen, synthetic kerosene, or industrial feedstocks, tapping nascent markets projected to grow exponentially (eg green hydrogen demand could reach 530 Mt/year by 2050, per IEA).
- **Opportunity:** First-mover advantage in supplying sectors like aviation (eg Airbus's hydrogen planes) or heavy transport.
- **Risk:** Uncertain demand signals and price premiums; competition from fossil fuel-based alternatives if carbon pricing lags.
- **Action:** Secure long-term offtake agreements with buyers (eg airlines, chemical firms) and advocate for carbon border adjustments.

3. Energy system integration and grid challenges

- **Implication:** P2X can stabilise grids by absorbing excess renewable energy, but requires massive renewable capacity (eg 4x current global solar/wind output for green hydrogen alone).
- **Opportunity:** Partner with utilities to co-locate P2X facilities with wind/solar farms, optimising energy use and storage.
- **Risk:** Grid congestion and competition for renewable resources could delay projects or raise costs.
- **Action:** Invest in hybrid projects (renewables + storage + electrolyzers) and lobby for grid modernisation incentives.

4. Supply chain and geopolitical shifts

- **Implication:** P2X reshapes the global energy trade, favouring regions with cheap renewables (eg Australia for hydrogen, Chile for e-fuels). Corporates must secure access to critical minerals (eg iridium for electrolyzers) and navigate trade barriers.
- **Opportunity:** Establish 'hydrogen hubs' in resource-rich regions (eg Saudi Arabia's NEOM) or secure partnerships for green ammonia imports.
- **Risk:** Geopolitical tensions over critical minerals (eg China's rare earth dominance) and green protectionism (eg EU's carbon border tax).
- **Action:** Diversify suppliers, invest in mineral recycling, and align with geopolitical alliances (eg Japan's hydrogen partnerships with ASEAN).

5. Regulatory and policy dependency

- **Implication:** P2X viability hinges on supportive policies – carbon pricing, renewable mandates, and P2X-specific incentives (eg Germany's H2Global subsidies, Australia's Hydrogen Production Tax Input Credit). Policy shifts or delays could derail business cases.
- **Opportunity:** Shape regulations through industry coalitions (eg H2Zero) and capitalise on emerging standards (eg 'green' hydrogen certifications).
- **Risk:** Retroactive subsidy cuts (eg Spain's hydrogen tax changes) or inconsistent definitions (eg 'low-carbon' vs. 'green' hydrogen).
- **Action:** Lobby for stable, technology-neutral frameworks and stress-test projects against policy scenarios.

By navigating these implications thoughtfully, corporates can turn P2X into a cornerstone of their net-zero strategies while capturing growth in the post-fossil-fuel economy.



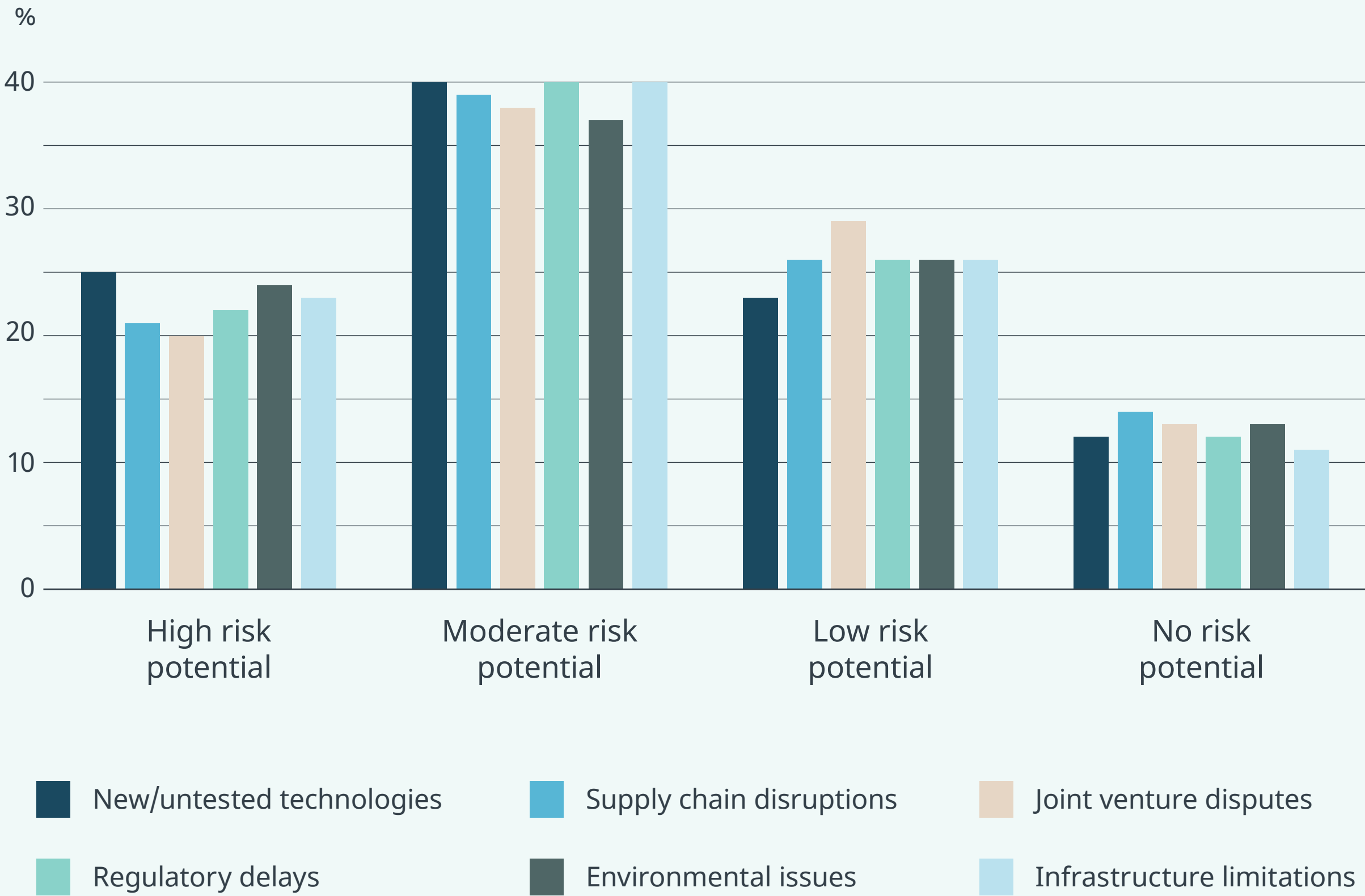
See Ashurst's Investing in hydrogen guide

The risk of disputes between joint venture partners was also highlighted. This could prove particularly significant, since the survey also found that partnerships are considered key to the technology's success. Only 3% of respondents believe partnerships will not be crucial to advancing the technology's projects or strategies. Respondents do, however, believe that partnerships – if not handled properly – could lead to potential litigation: 58% see the risk of joint ventures leading to disputes as moderate or high.

58% see the risk of joint ventures leading to disputes as moderate or high.



How would you rate the potential risk of legal disputes each factor below poses to P2X projects?



Nevertheless, if the technology can be progressed sufficiently speedily, it could prove a significant development for the drive to net zero. Ninety-one per cent of organisations believe their market is ready – to some degree – for P2X projects over the next five years. Indian corporates were particularly bullish in this regard, with 98% feeling their market is prepared. In addition, at the G20 level, more than three-quarters (76%) are confident that the regulatory environment for P2X projects is sufficiently developed and understood in their home country for the technology to succeed. That is nearly seven times more than the number of those expressing concerns. Meanwhile, governments and regulators are seen as being generally supportive. Looking at the prospects for the next five years, 72% feel that the impact of current policy steps and economic stimulus packages has been positive for the development of P2X projects, which is more than six times the number of those taking a negative view.

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For the most part, the technology which sits at the core of P2X is already available. **So the main issue now is not really technology risk, it's the price differential risk when compared with the next-best alternative. A number of steps need to be taken to bridge the gap.** The market needs to start applying a higher green premium, which is problematic in the current economic climate. In other words, offtake pricing needs to be higher for green products, and offtake strategies require careful consideration. Subsidy regimes are needed to help bridge the gap. Technology input costs need to come down. And, in some of the use cases, consumer technology needs to evolve, such as for ammonia engines and hydrogen plants.”



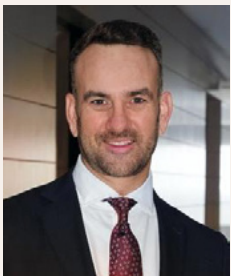
Paul Lingard
Partner, Perth



Annamaria Pinzuti
Partner, Milan

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There will be increasing pressure on states to accelerate the journey, by moderating impediments like social licence issues. People want solar and wind farms, and battery energy storage systems, but they don't want them near where they live. There is money to fund projects, and the market has the appetite to procure, deliver and own assets, but balancing social licence elements means putting the handbrake on. Similarly, states are going to have to streamline regulation in relation to P2X. The technology is incredibly important for the transition because it removes carbon from the 'last mile' (ie sectors like transport, heavy industry and agriculture). **So, governments' moves to force change to appropriately address impediments will include supporting the commercialisation of elements of P2X. It's difficult, it's expensive, but it's imperative. The energy transition can't happen without it.**”



Dan Brown
Partner and Global Co-Chair of Energy Industry, Brisbane

Ninety-one per cent of organisations believe their market is ready – to some degree – for P2X projects over the next five years.

37



Conclusion

Storing clean energy at scale and reducing emissions from difficult-to-abate sectors such as transport and heavy industry are among the most intractable problems to be solved if the transition is to succeed.

P2X has the potential to mitigate these problems. However, the technology is still expensive; therefore, regulatory certainty, a more-developed subsidy regime and significant investment are needed if results are to match net-zero ambitions.

More broadly, the evolving geopolitical and economic climate means there are now multiple potential routes when navigating the way to greater adoption of clean energy. Uncertainty from governments about committing to the transition, as well as disputes between wealthier and developing nations about who should pay, means corporates must be alert to the way changing sentiments could impact their strategies.

Careful navigation of issues such as regulatory frameworks, understanding the social licence, and capital investment are essential for increasing the adoption of clean energy.

Respondents remain committed to clean energy. At this juncture in the global energy transition, and in the more-complex geopolitical environment of 2025, it is more important than ever before that they work with regulators, governments, investors and partners to develop economically viable solutions. If they can do that, the potential for them to seize the opportunities afforded by the transition remains as exciting as ever.

Endnotes

A note on methodology:

From 30 September to 7 October 2024, we surveyed a total of 1,989 senior business decision-makers involved in energy investment decision-making in G20 countries. The average annual global turnover of companies whose executives we surveyed was US\$16.5 billion. Of these executives, 43% were C-Suite executives and 53% senior management, while 66% were from private companies, 27% from publicly listed companies and 8% from state-owned enterprises (numbers do not add up to 100 due to rounding).

What we mean by the energy transition:

For the purposes of this research, we have defined the energy transition as the transition of the global energy sector away from fossil-based fuels to achieve net-zero carbon emissions from energy and industrial systems. This involves improvements in energy efficiency and digitalisation of electricity grids (eg smart grids and meters), decarbonising the energy mix through use of lower-carbon fuels (including gas and hydrogen) and higher levels of renewable energy sources, integration of batteries and other storage technologies, as well as the electrification of other economic sectors (eg transport, heavy industry, manufacturing, agriculture and buildings).

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