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ENERGY TRANSITION INSIGHTS REPORT 2024

Identifying and tracking the key investment and strategy trends driving the energy transition

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FOREWORD

Liam Stoker
Content Lead
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Welcome to the 2024 edition of the Reuters Events Energy Transition Insights Report.

This study has been produced following a qualitative research process and a survey of energy industry decision-makers which was conducted in Q4 2023. More details of the survey and our respondents can be found in the Methodology section of this report.

This report uncovers key trends, strategies and disruptions that energy organizations are encountering as their respective transition plans take hold. It explores the key decisions being taken with regards the energy transition, the development of investment roadmaps and which technologies are delivering favorable returns today.

Our research coincides with a number of external factors that are buffeting the energy sector, ranging from economic to geopolitical. These factors would appear to be reshaping energy transition strategies, even if only in the short-term.

The conclusions of our research, which are detailed over the coming pages, reveal how energy organizations are responding and adapting to these challenges. We hope the details in this report help educate and inform decisions being as those disruptions play out.

We would like to take this opportunity to thank the hundreds of industry professionals who completed our survey, alongside those who took time out of their schedules to help with our qualitative research. This report would now have been possible without their valuable contributions, and we look forward to continuing the discussion at Reuters Events' Energy Transition series of conferences, and our future research.

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EXECUTIVE SUMMARY

The energy transition continues to represent profound change, but also significant opportunity for energy sector participants. Opportunities for growth and the energy transition being imperative to the long-term direction of energy organizations continue to be the most prominent drivers for transition strategies today.

This year's edition of the Reuters Events Energy Transition Insights Report, however, details how there has been a softening of energy transition sentiment year-on-year. A greater share of respondents have indicated that their organization's energy transition will complete in 2050 than we recorded last year, with a similar-sized contraction in the share of respondents stating 2030 as their energy transition target date.

There are greener shoots, however, towards the end of this decade. We now see 30% of respondents indicating they expect renewables investments to grow by more than 40% over the next three years, an increase of 22 percentage points versus last year's survey, while renewables investments are making up larger shares of total investment within respondent organizations.

Those investments, we can see, are largely heading towards a cluster of technologies that are favored for investment sentiment and favorable returns. Solar PV, operational improvements, asset digitization and AI, and energy storage are our four leading technologies in this regard, with asset digitization climbing into that top four from last year's research.

Our research does indicate that inflation, high cost of capital and other economic headwinds are baring heavy on some technologies, with sentiment around offshore wind in particular having suffered year-on-year. There is also some evidence of geographical lean towards specific technologies – energy storage in Europe, or hydrogen production in the Middle East, for example – which can be attributed to more regional trends.

While our research has indicated that the key factors to maximizing asset ROI are internal, government support or subsidies was indicated by a greater share of respondents compared to last year, perhaps an indication of the success of the U.S. Inflation Reduction Act in driving investment sentiment.

This year's report also takes a deep dive look at the role of insurers in driving the energy transition, and our research has highlighted some interesting differences between how oil and gas and renewables organizations are behaving today, both in terms of where they perceive risk and at which stage of the asset lifecycle they are most likely to be engaging insurance organizations.

1. CHARTING ENERGY TRANSITION AMBITION AND DRIVERS

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In last year's study, we observed that while a significant majority of energy companies had tangible transition targets, progress against these was mixed and an acceleration would be required in the second half of this decade. This year's research further compounds this.

Of our respondents, a significant majority still indicate that an energy transition strategy was either in place at their organization, or it was in the process of developing one. Some 79% of respondents indicated as such, compared to 80% in 2023's survey.

ACTIONABLE INSIGHTS

- A greater share of respondents in this year's study indicate they expect to meet their energy transition goals by 2050, compared to last year. This, alongside other data, suggests there has been a softening in energy transition targets year-on-year.
- While energy transition drivers remain largely the same - long-term business strategy and opportunities for growth being our most common drivers – these were selected by smaller shares of respondents compared to last year. This could indicate there is less certainty surrounding the energy transition than in 2023.
- What has proven constant, however, is that investing in renewables and reducing carbon intensity of current operations are the primary strategies for the energy transition.

Further analysis of the data, however, indicates there to be some softening of energy transition strategies and/or ambition within certain company types. While 92% of respondents from downstream oil and gas organizations said their company had an energy transition strategy in last year's study, this share has fallen to 78% in our 2024 study. There is a similar decline witnessed in respondents from midstream oil and gas companies, the share falling from 91% in 2023 to 75% in 2024.

While the decline in both respects may be stark – around 15 percentage points – it does bring both respondent shares more in line with the energy sector average of 79%. Our research did also record some softening in the share of respondents from independent power producers (IPPs) and integrated energy companies (IECs) stating their organization had a transition strategy in place, however these declines were more marginal.

What these findings could indicate is a possible softening of energy transition sentiment, recorded within specific areas of the industry. This is also apparent in the energy transition ambition recorded in this year's survey, more specifically in the dates by which respondents expect their organization's targets to be met.

Figure 1 shows energy transition target dates recorded in both the 2023 and 2024 iterations of our Energy Transition Investment Survey. While there has been a marginal increase in the share of respondents indicating their organization has

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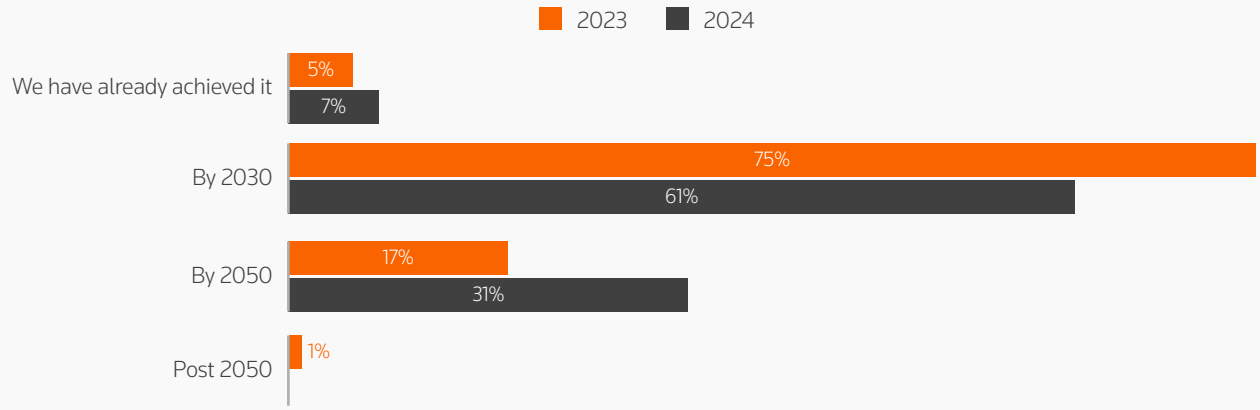
Figure 1

Energy transition timelines appear to be slipping, with a greater share of respondents expecting to complete their energy transitions by 2050 than last year

Share of respondents indicating by what date their energy transition strategies are expected to complete, showing 2023 vs 2024 respondents



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achieved its aims, we can see more a consequential slide towards achieving targets by 2050, compared to 2030.

While a majority of respondents (61%) expect their organization to realize its energy transition targets by 2030, this has slipped from 75% who suggested the same in last year's research.

This apparent slide in ambition also coincides with more of a distinct divergence in the share of revenues our respondents derived from renewable or non-fossil fuel sources. As *figure 2* highlights, last year's research indicated a 'flatter' point of difference between the share of respondents reporting different revenue shares. For 2024, however, a much larger share of respondents fell into either the smallest (0 – 10%) or largest (>60%) clean revenue brackets.

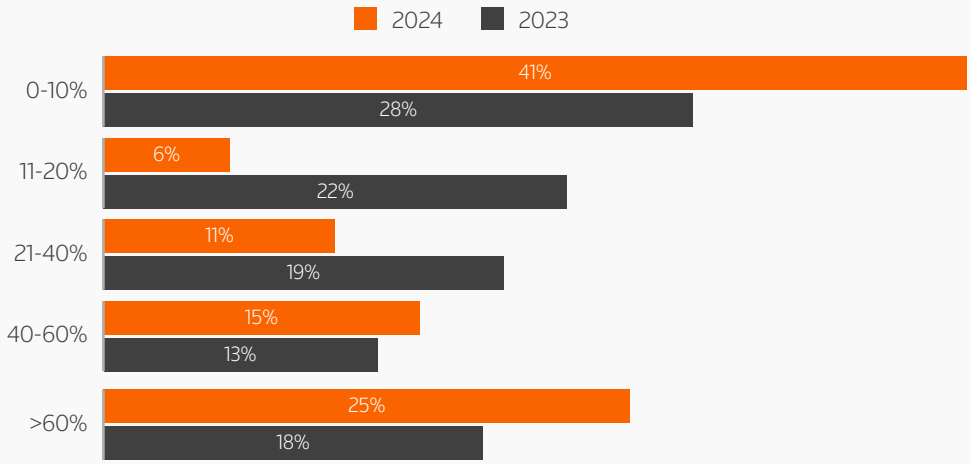
This could be seen to indicate that, in the past year, the split between clean and fossil fuel-related revenues has grown, with fewer respondents indicating that their organizations fall into the 'middle ground' of deriving 11 – 40% of revenues from clean sources.

This is further seen when comparing last year's and this year's data regarding investments attributed to non-fossil

Figure 2

Respondent revenue splits from renewable sources are more distinct in this year's survey

Share of respondents indicating approximate share of revenue their organizations derive from non-fossil fuel sources, showing 2023 vs 2024 respondents



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fuel technologies. As *figure 3* illustrates, there have been declines in the share of respondents indicating that between 11 and 100% of investments have gone to non-fossil fuel sources year-on-year. Meanwhile, the share of respondents indicating that just 6 – 10% and 5% or less of investments have gone to clean energy sources has increased.

The total share of investments heading towards clean energy sources would therefore appear to have diminished compared to last year's study, indicating a potential softening of energy transition ambition in the immediate term. This could be attributed to a number of reasons, not least inflationary and other economic impacts putting pressure on the viability of investments. As our next chapter will also detail, there are further indications investments into maximizing the efficiency of existing assets are growing in popularity.

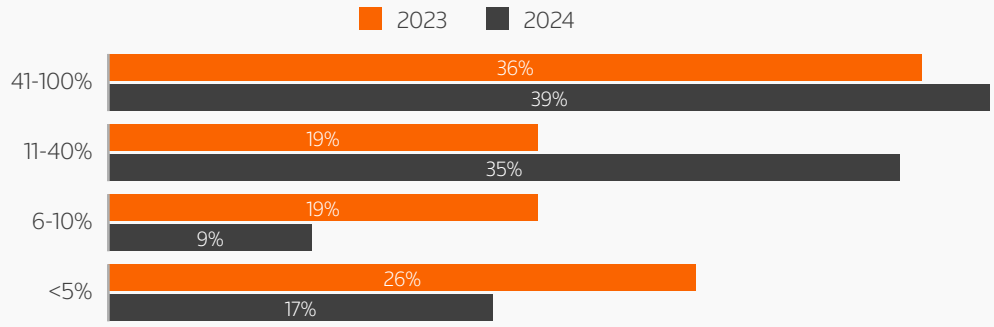
There is, however, better news on the horizon. In last year's report we revealed that just 8% of respondents expected their organization's investments into renewables to increase by more than 40% over the next three years, a finding which suggested energy organizations were leaving much of their clean transition to the latter half of this decade.

As *figure 4* shows, we now have evidence that this acceleration of clean energy investment is expected to commence over the coming three years. This year's survey reveals that now 30% of respondents expect their organization's clean energy investments to increase by more than 40%. While more than a quarter (27%) of respondents still indicated that clean investments would grow by 0 – 10%, there are signs the kind of growth in green investment appetite required to successfully transition the energy sector is expected to materialize prior to 2030.

Figure 3

A smaller share of respondents are reporting more significant renewables investments

Share of respondents indicating the share of overall investments committed to renewable or clean energies in the past three years, comparing 2023 vs 2024 respondents



**Note: The category ranges from the Reuters Events Energy Transition Survey 2023 have been regrouped to correspond with the category options used in the 2024 survey. This modification is to ensure that the relevance and comparisons between the two datasets*

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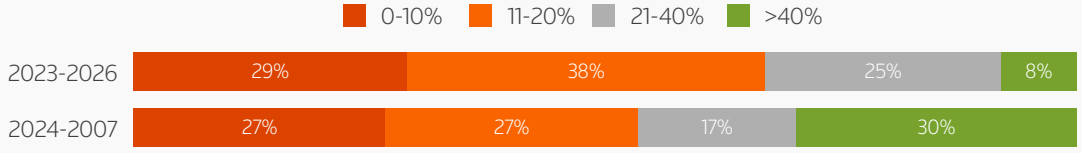
Figure 4

There is a marked acceleration of expected renewable energy investments over the next three years

Share of respondents indicating the expected increase in renewables investments over the next three years, comparing 2023 vs 2024 respondents



**Note: The category ranges from the Reuters Events Energy Transition Survey 2023 have been regrouped to correspond with the category options used in the 2024 survey. This modification is to ensure that the relevance and comparisons between the two datasets. Percentage may not add up to 100 per cent due to rounding*

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INSIDE ENERGY TRANSITION STRATEGIES AND KEY DRIVERS

While there may be some evidence that energy transition ambition, at least in the short term, may be faltering, assessing the key drivers for developing an energy transition strategy indicates that, year-on-year, these have become slightly more mixed.

While the most common driver for pursuing an energy transition strategy remained long-term business objectives, selected by 51% of respondents, the share of respondents identifying this has slipped from 68% in 2023. Likewise, regarding the energy transition as an opportunity for growth was identified by 36% of respondents in this year's research – still enough for it be ranked as our second most popular driver – but was identified by a much smaller share of respondents compared to our survey in 2023 (59%), as *figure 5* illustrates.

This is not limited to the more popular drivers, however. External pressures including regulatory, shareholder and market volatility were also selected by smaller shares of our respondents in this year's survey.

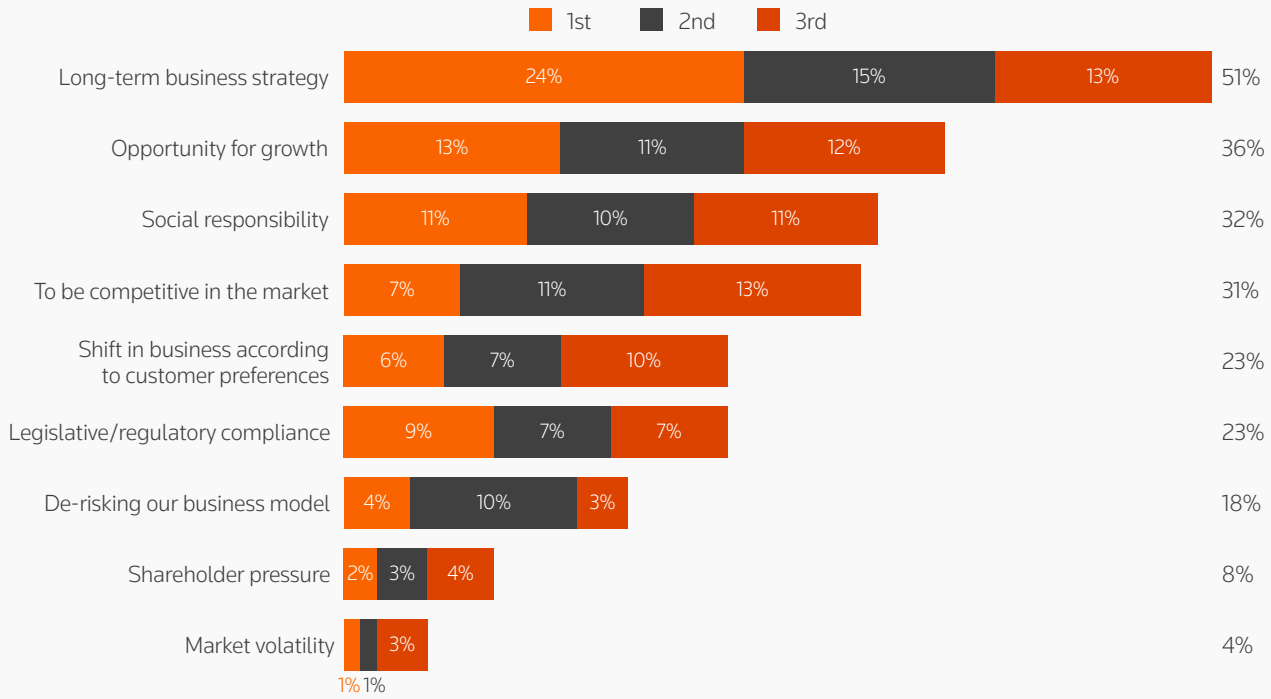
We also determine some shifts in drivers from specific company types. There has been a marked decline, for instance, in the share of respondents from both upstream and midstream oil and gas organizations citing market volatility as a key driver for their energy transition strategies, falling from 18 and 15% respectively to just 2% this year.

The timing of our survey in 2023 coincided largely as global gas markets continued to be volatile on the back of geopolitical crises. While these had not necessarily eased at the time of this year's survey, trading conditions had certainly become less volatile, allowing for a more stable operating environment for upstream and downstream oil and gas organizations. A similar decline was recorded in the share of respondents from IPPs citing market volatility (falling from 10% in 2023 to 2% in 2024), indicating that market volatility has also eased in power trading markets. These

Figure 5

External influences only account for a minority of respondents' reasons for developing energy transition strategies

Share of respondents indicating their organization's top three reasons – in order of priority – for developing an energy transition strategy



Note: Percentages might not add due to rounding error. This is a multiple choice question.

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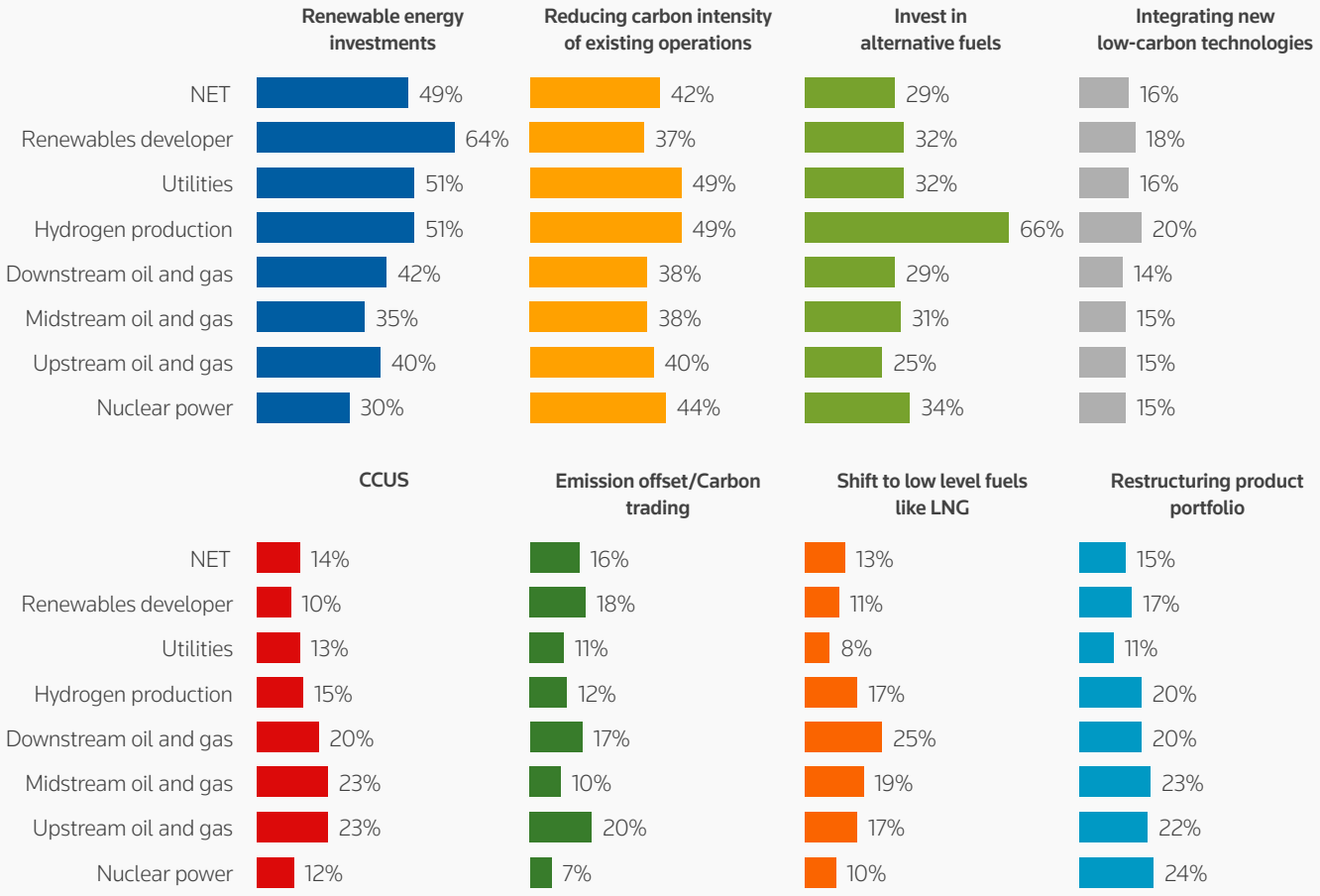
drivers – among other factors – can be seen as shaping the strategies pursued by energy organizations today. Figure 6 shows the leading energy transition strategies, segmented by the share of respondents per company type. It shows how investing in renewable energy investments and reducing the carbon intensity of existing operations are the most popular strategies today, selected by 49% and 42% of respondents respectively. There is a clear gap between those two strategies and our next most popular, with investments in alternative fuels selected by 29% of respondents. This can be seen as evidence of the importance placed on renewables investment and decarbonizing existing operations. This is equally supported by the level of support these strategies are receiving from across the energy ecosystem, with ~40% of respondents from organizations who identify as oil and gas also investing in renewables. By means of comparison, this is a greater share than those investing in alternative fuels, carbon capture, usage and storage (CCUS) and low-impact fuels such as LNG.

Our research therefore places renewables at the heart of energy transition strategies today, a conclusion which is endorsed by our analysis of energy transition investment sentiment.

Figure 6

Greater shares of O&G firms than average consider portfolio restructuring a leading strategy, while renewables energy investments are universally popular

Share of respondents, segmented by company type, indicating their leading strategies for the energy transition



**Note: This chart displays the top 7 strategic approaches selected for analysis, focusing on high-impact areas in the energy sector. It excludes strategies such as shifting to lower-impact fuels like LNG, accelerating the transition through aquisitions of clean energy companies, nuclear energy investments, organizational restructuring, among others. The strategies shown are abbreviated for clarity; their full descriptions are as follows: 1) Renewable Energy Investments (Solar, Wind, Geothermal, Hydropower), 2) Reducing Carbon Intensity of Existing Operations, 3) Investment in Alternative Fuels (e.g. Hydrogen, Biomass), 4) Integration of New Low-Carbon Technologies in Exploration and Production, 5) Carbon Capture, Utilization and Storage (CCUS)/ Energy Storage, 6) Emission Offset/Carbon Trading, 7) Product Portfolio Restructuring. Excluded categories not shown in the chart include Petrochemicals, Grid Ownership/Operation, Materials/Mining, and Energy Services*

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2. GLOBAL ENERGY TRANSITION INVESTMENT SENTIMENT IN 2024

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The last year has been one of change for the energy sector, buffeted by headwinds including inflation, high cost of capital, geopolitical disruption and supply chain constraints for specific technologies.

Such disruptions would appear to have affected the investment sentiment surrounding specific energy transition technologies, as our research reveals. *Figure 7* reveals the technologies respondents said their organization had invested in over the previous year.

ACTIONABLE INSIGHTS

- Improvements to operational efficiency is the leading energy transition investment of the past 12 months, selected by 40% of survey respondents, taking pole position from last year's top-ranked solar PV. The popularity of operational improvements could be related to broader economic factors, such as high inflation and high cost of capital.
- While there is little change in the popularity of our top-three investments – operational improvements, solar PV and energy storage – some technologies have experienced more marked declines in investment sentiment. Offshore wind in particular has seen investment sentiment fall sharply year-on-year, beset by well publicized cost spikes and other supply chain constraints. These issues may, however, be short-lived.
- Carbon capture, usage and storage has witnessed an improvement in investment sentiment, supported by further research which shows a significant majority (76%) of respondents expect the technology to be commercially viable within the next 10 years.

As *figure 7* shows, the most popular investment destination of the past year has been in operational or efficiency improvements, selected by 40% of respondents in total and by 20% of respondents as their highest priority investment. This was followed closely by Solar PV – which topped last year's investment rankings – which was identified by 39% of respondents in total. Energy storage and asset digitization/AI are jointly ranked in third position within our rankings, selected by 27% of respondents respectively.

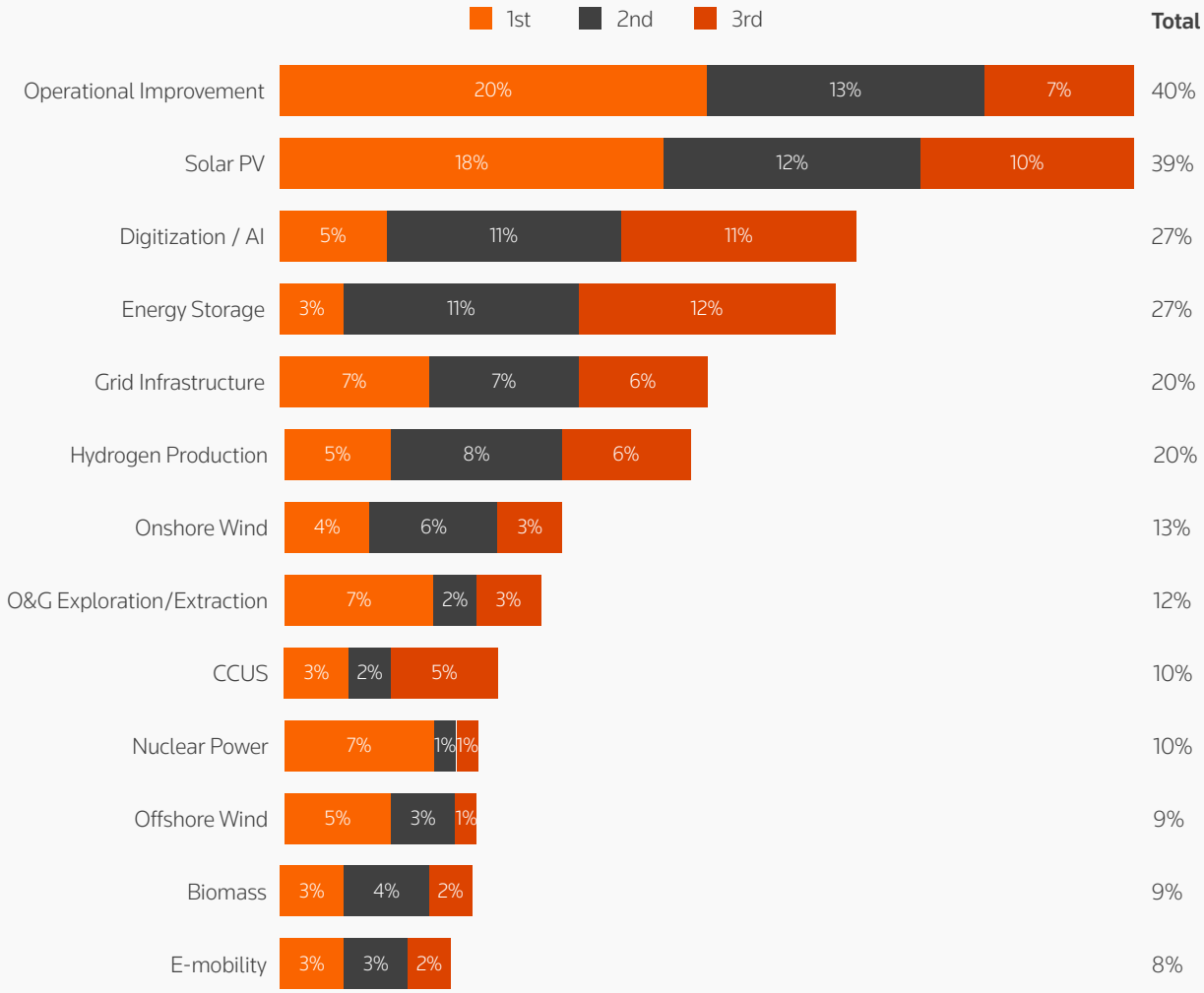
Some of the more immediate conclusions to draw here is the growth of investment sentiment around operational efficiency improvements. The overall share of respondents stating that they have invested in Solar PV has actually grown year-on-year, rising from 35% of respondents in 2023 to 39% of respondents in 2024, but this has not been enough to maintain the pace of growth in investment sentiment surrounding operational improvements.

This comes despite a significant drop in the prices for Solar PV panels over the past year, which in itself has been driven by overcapacity in the supply chain, particularly in polysilicon.

Figure 7

Operational improvements and solar PV are the runaway leading destinations for energy transition investments this year

Percentage share of respondents indicating investments in specific technologies - in order of investment priority - in the last 12 months



**Note: The chart does not include data on certain technologies with a low base size, such as hydropower, eLNG, geotherm, and others. Percentages might not add due to rounding error.*

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Prices for Solar PV modules have fallen to as low as €0.115c/W in Europe, with only protective import restrictions preventing similar cost reductions being witnessed in the United States.

The case for investing in operational improvements may, however, be more nuanced, and pull in evidence seen in other investment areas. Improving operational efficiencies would, typically, require less capital expenditure than investing in new generation capacity. With both inflation and interest rates increasing in most markets over the past year, boosting the efficiency of existing assets would likely be seen as more ideal, particularly in the short term while economic stability is sought.

This may also explain why other generation assets and/or more costly investments recorded declines in investment sentiment over the past year. Offshore wind – which has experienced numerous supply chain constraints in the past year, translating into a number of prominent organizations writing off investments – in particular has seen investment sentiment decline.

'CLASSIC' BATTERY STORAGE TECHNOLOGIES LEAD THE WAY

To gain more granularity over energy storage investments, we also asked respondents to have indicated that their organization had invested in the technology to state which types of energy storage were the subject(s) of their investment. The most popular type of energy storage selected was 'classic' battery storage, including lithium-ion and lead acid batteries, which was identified by nearly two-thirds (67%) of our respondents. The second most popular energy storage technology selected by our respondents was chemical energy storage technologies, including ammonia or hydrogen production, selected by 24% of respondents, a finding which largely coincides with the popularity of hydrogen production within our broader survey. Other technologies recorded included mechanical energy storage (18% of respondents), flow batteries (17%) and thermal energy storage (14%).

How short or long-term the effects of the economic climate of recent years will be on energy transition investment remains to be seen, however there are indications that sentiment will remain strong in certain key technologies and rebound in others over the next three years. *Figure 8* shows the share of respondents to state their organization intends to invest in specific technologies over the next three years.

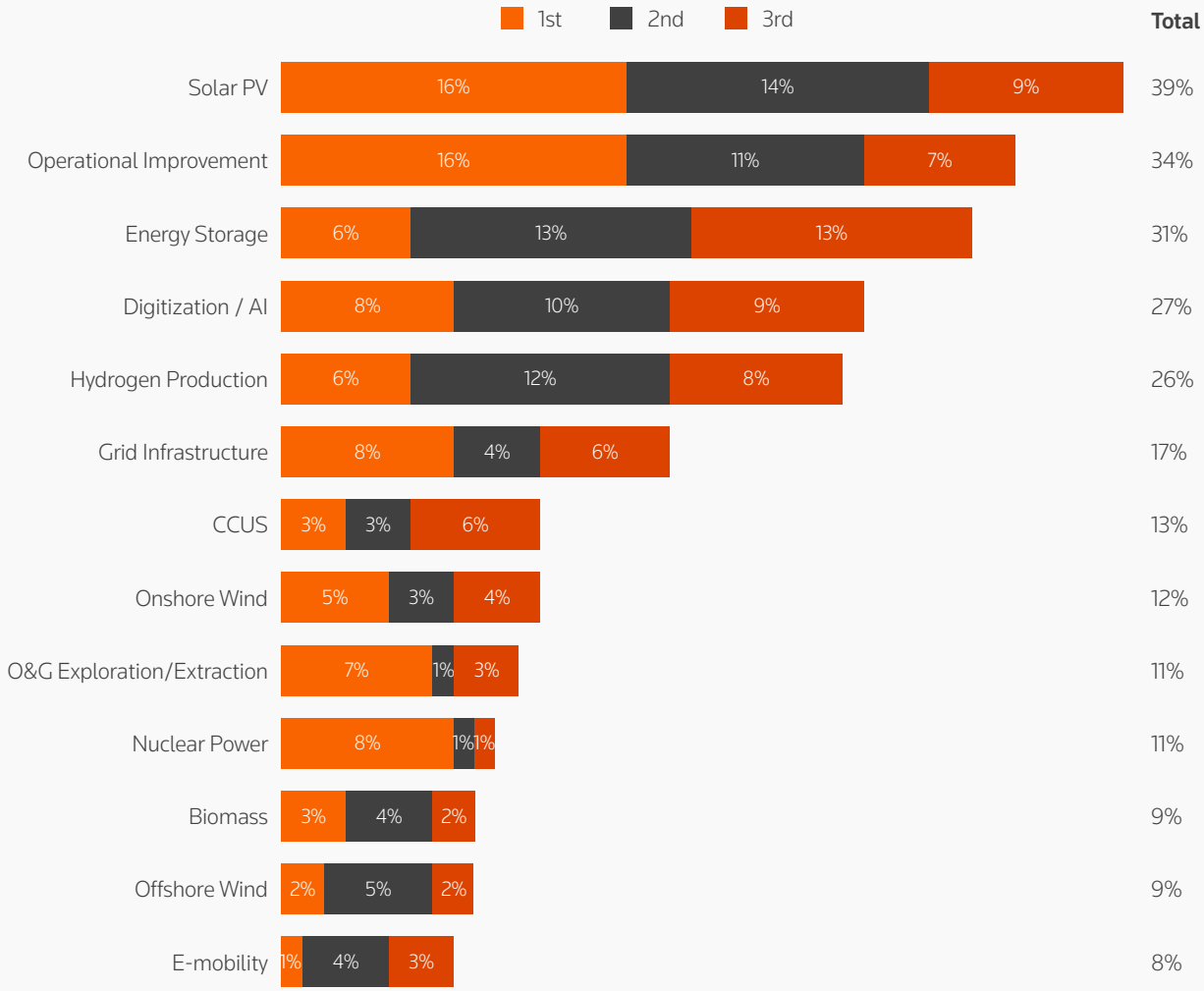
As *figure 8* indicates, solar PV is expected to regain its crown as the most popular energy transition investment destination over the next three years, selected by 39% of respondents. Operational improvement, energy storage and asset digitization/AI make up the other technologies in our top four, identified by 34%, 31% and 27% of respondents respectively. Hydrogen production, selected by 26% of respondents as an investment destination of interest, adds to what is an established leadership group of technologies which present the five most popular destinations of investment for the next three years.

There is then a somewhat clustered group of technologies, ranging from grid infrastructure to e-mobility at the bottom

Figure 8

Solar PV is expected to be the leading investment destination over the next three years, surpassing operational improvements

Percentage share of respondents indicating expected investment in specific technologies - in order of investment priority - over the next three years



**Note: The chart does not include data on certain technologies with a low base size, such as hydropower, eLNG, geotherm, and others. Percentages might not add up due to rounding error*

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of our future investment rankings, all of which were identified as investment destinations for the next three years by between 17% and 8% of our respondents.

Comparing *figures 7 and 8* together, we can see there is perhaps more clustering of technologies into specific groups based on their popularity in the last 12 months. In *figure 7*, we see operational improvements and solar PV dominate the investment ranking, followed by asset digitization and energy storage which polled in joint-third position. These are in turn followed by grid infrastructure and hydrogen production which, again, polled together in joint-fifth position. This clustering could be perceived to suggest there has been greater certainty over how energy transition investments are to be prioritized, based on drivers including company objectives, energy transition targets and broader economic conditions.

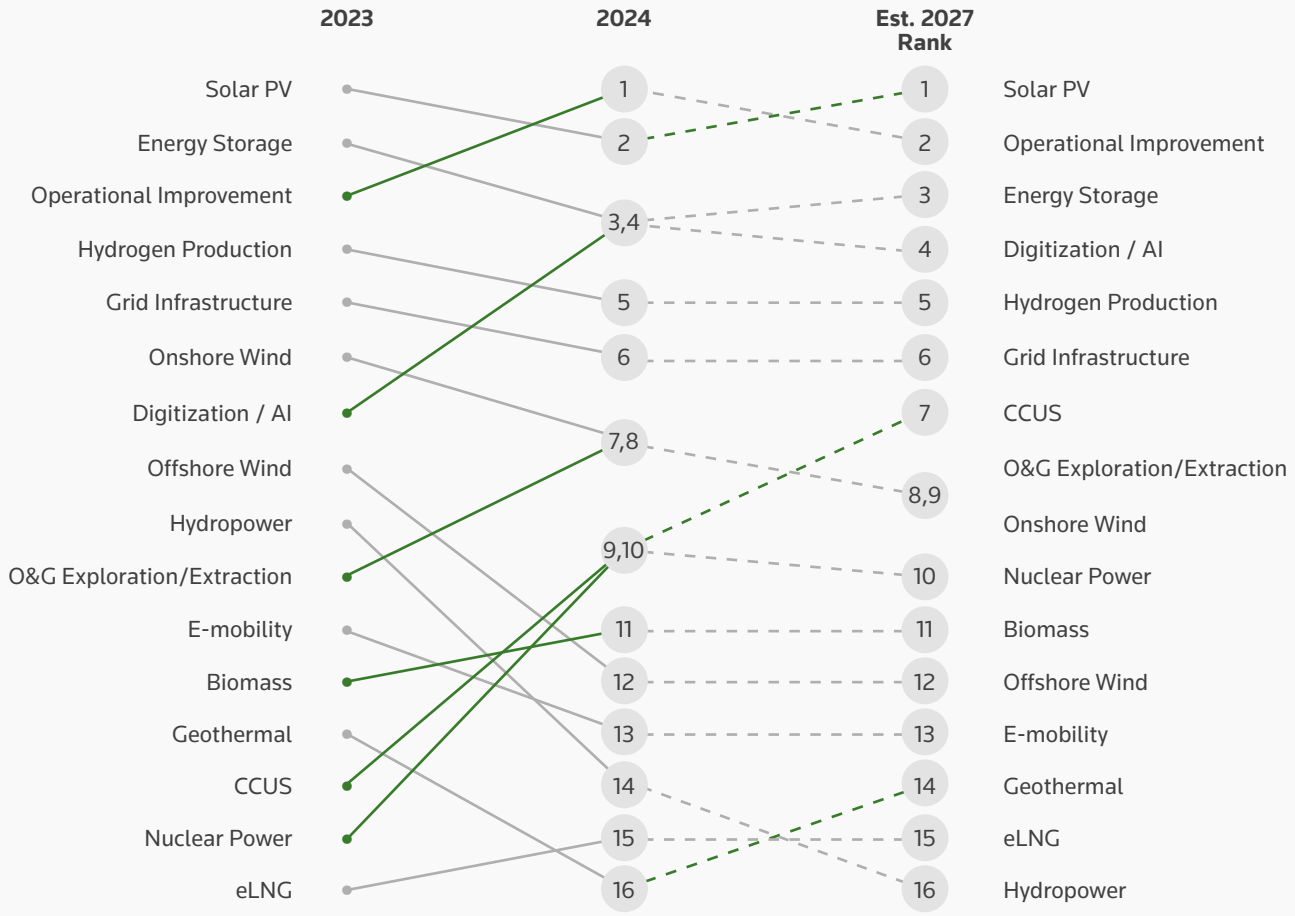
That there is less clustering when we look at figure 8, which details expected investments over the next three years, perhaps indicates how investment certainty has dipped given recent trends such as economic headwinds and increasing geopolitical uncertainty. The latter could equally become more prominent given the number of national elections held this year, perhaps most notably in the US.

Figure 9 shows the trajectory of energy transition technologies within our investment sentiment rankings,

Figure 9

Digitization/AI and CCUS experience the greatest growth in investment sentiment amongst our respondents from 2023 to 2024

Comparative rankings of technologies invested in by survey respondents, showing 2023 and 2024 actual versus 2027 expected investments



**Note: The rank estimations for 2027 are derived from the percentage of investment mentions by respondents projected for that year*

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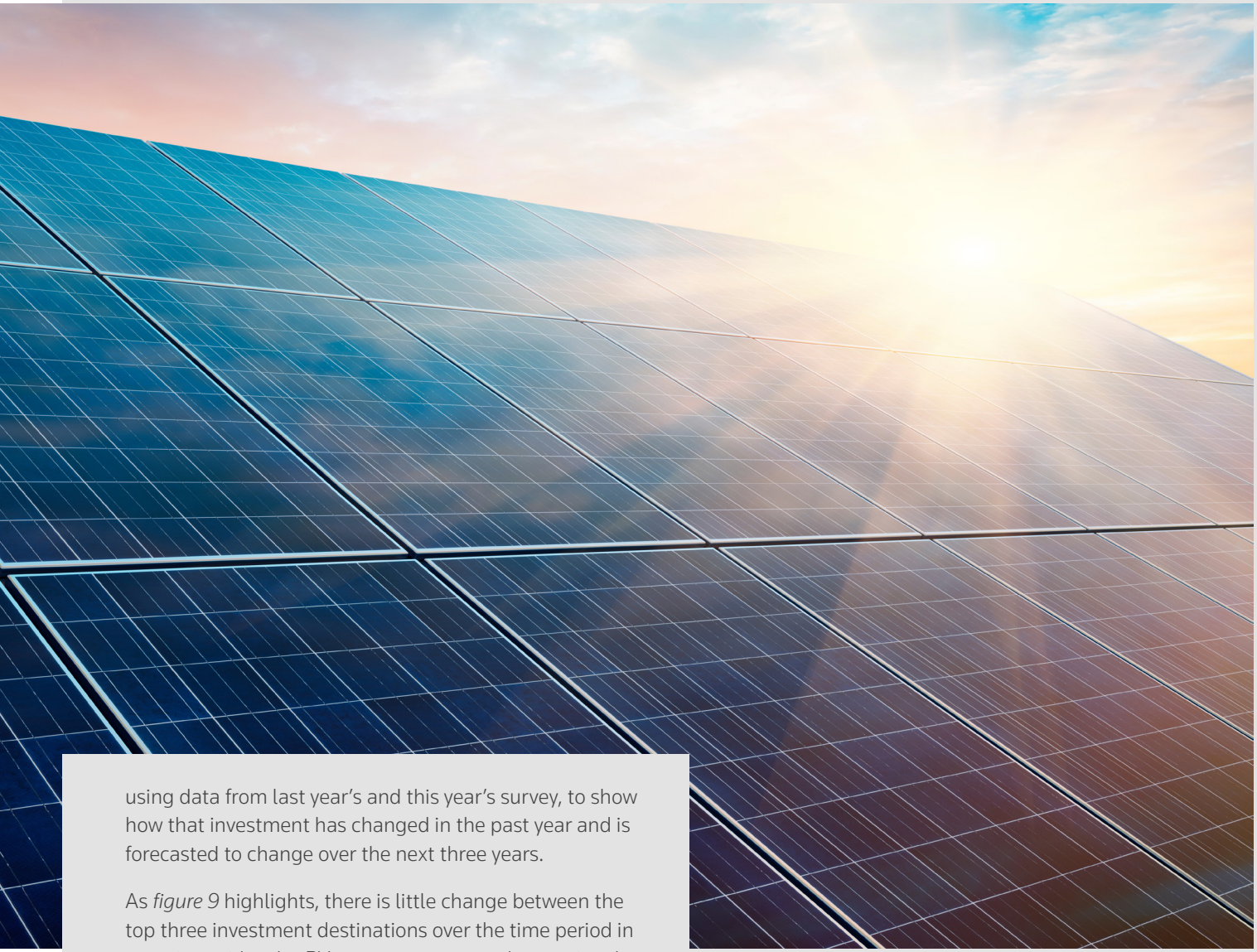


PETERSCHREIBER.MEDIA/ADOBE STOCK

using data from last year's and this year's survey, to show how that investment has changed in the past year and is forecasted to change over the next three years.

As *figure 9* highlights, there is little change between the top three investment destinations over the time period in question, with solar PV, energy storage and operational improvements largely vying for those leading three positions. This continual positioning at the top of our ranking highlights both the strategic importance placed on these technologies, and the comparative certainty surrounding the returns on investment they offer, as detailed in our next chapter.

The chart also indicates – in solid green lines – the technologies which have experienced growth in investment sentiment in the past year. Asset digitization/AI is one such technology, perhaps driven by the significant growth in AI capabilities – and the level of anticipation surrounding them. Equally oil and gas extraction and exploration has grown marginally, with price volatility having ceded and average prices up over the time period in question.

Carbon capture, usage and storage investment sentiment has not only grown in the past 12 months, but is expected to

INDUSTRY SPLIT OVER TIMELINE FOR CCUS COMMERCIAL VIABILITY

The commercial viability of CCUS is a subject of considerable importance to energy organizations and the energy transition in general. The energy sector would appear split, however, as to the timeline for that commercial viability, with no clear indication other than it will likely happen over the next 10 years. While a majority (76%) said CCUS would be commercially viable within the next 10 years, just 15% said they expected it to happen within the next 1 – 3 years. A further 29% said commercial viability would be achievable within 2 – 5 years time, while just under one-third (32%) said it would be achieved within 5 – 10 years' time.

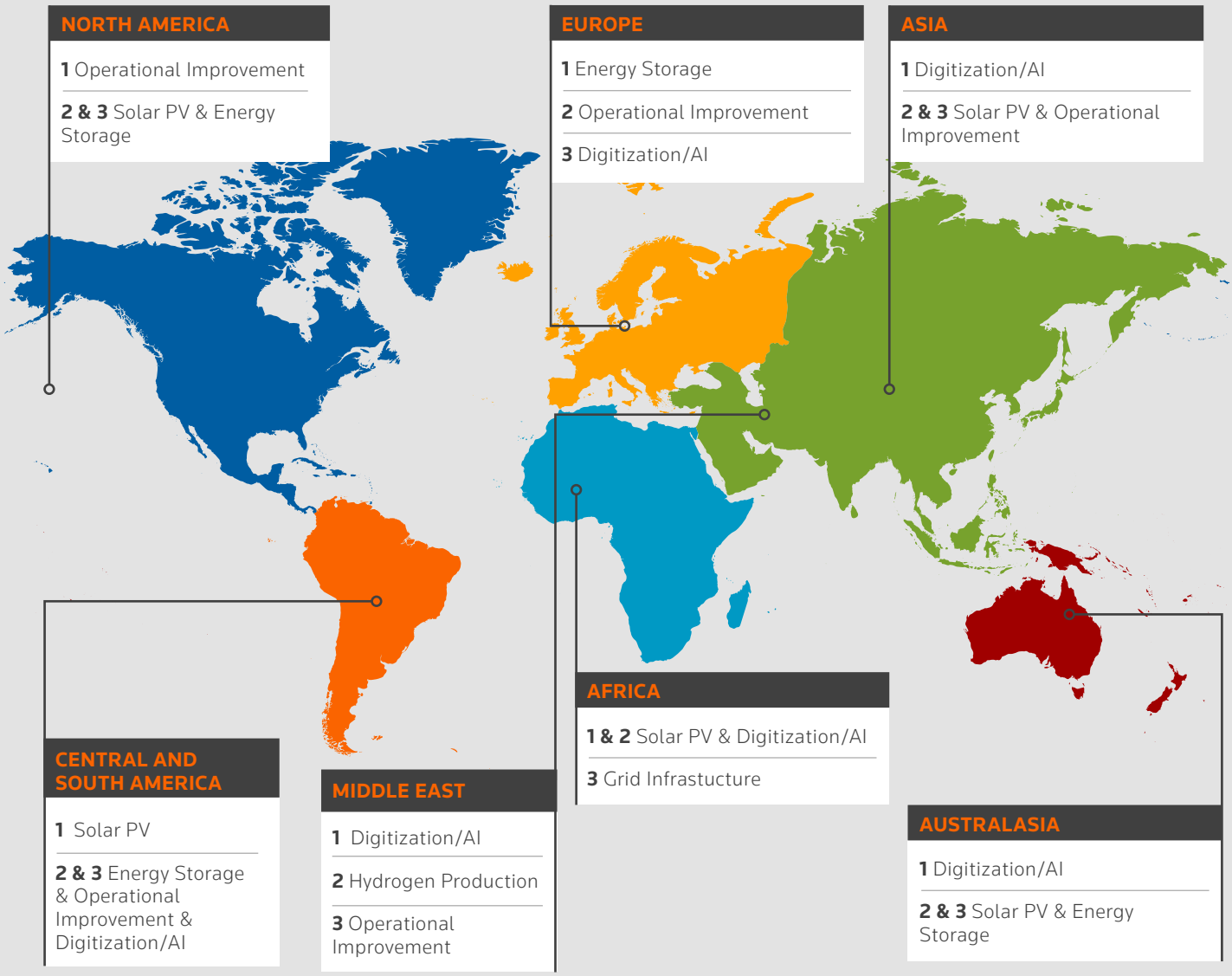
continue to grow over the coming three years. Despite high costs and ongoing uncertainty over just when the technology will be commercially viable (see boxout), that sentiment continues to grow cements just how integral CCUS is expected to be for the energy transition in the mid- to long-term.

There are also conclusions to draw from examining technologies to have fallen within our investment rankings, perhaps most specifically wind. While onshore wind has slipped marginally, offshore wind's fall is further illustrated, beset by aforementioned supply chain constraints.

While the above figures detail the energy transition investment sentiment globally, we also asked respondents to indicate specific regions in which these technologies are being invested in. This was asked irrespective of where organizations are based in order to capture organizations investing in specific technologies in multiple or selected regions.

The map below charts the top three energy transition investments over the next three years per region, highlighting where there may be more region-specific steers.

Leading technologies for investment by 2027, split by geography



**Note: In instances where technologies have the same mentions within a specific region, such as solar PV and digitization/AI in Africa, both are ranked jointly as 1st and 2nd.*

YALCINSONAT/ADOBE STOCK

Perhaps the most notable observation is the absence of solar PV from Europe's top three. The technology was the fourth most popular future investment within Europe – just short of asset digitization and AI. The absence of solar PV from the top three in Europe, which comes despite Europe realizing some of the cheapest sale prices for solar PV equipment globally, could be seen as a potential symptom of investment flight seen since the introduction of the Inflation Reduction Act in the U.S.

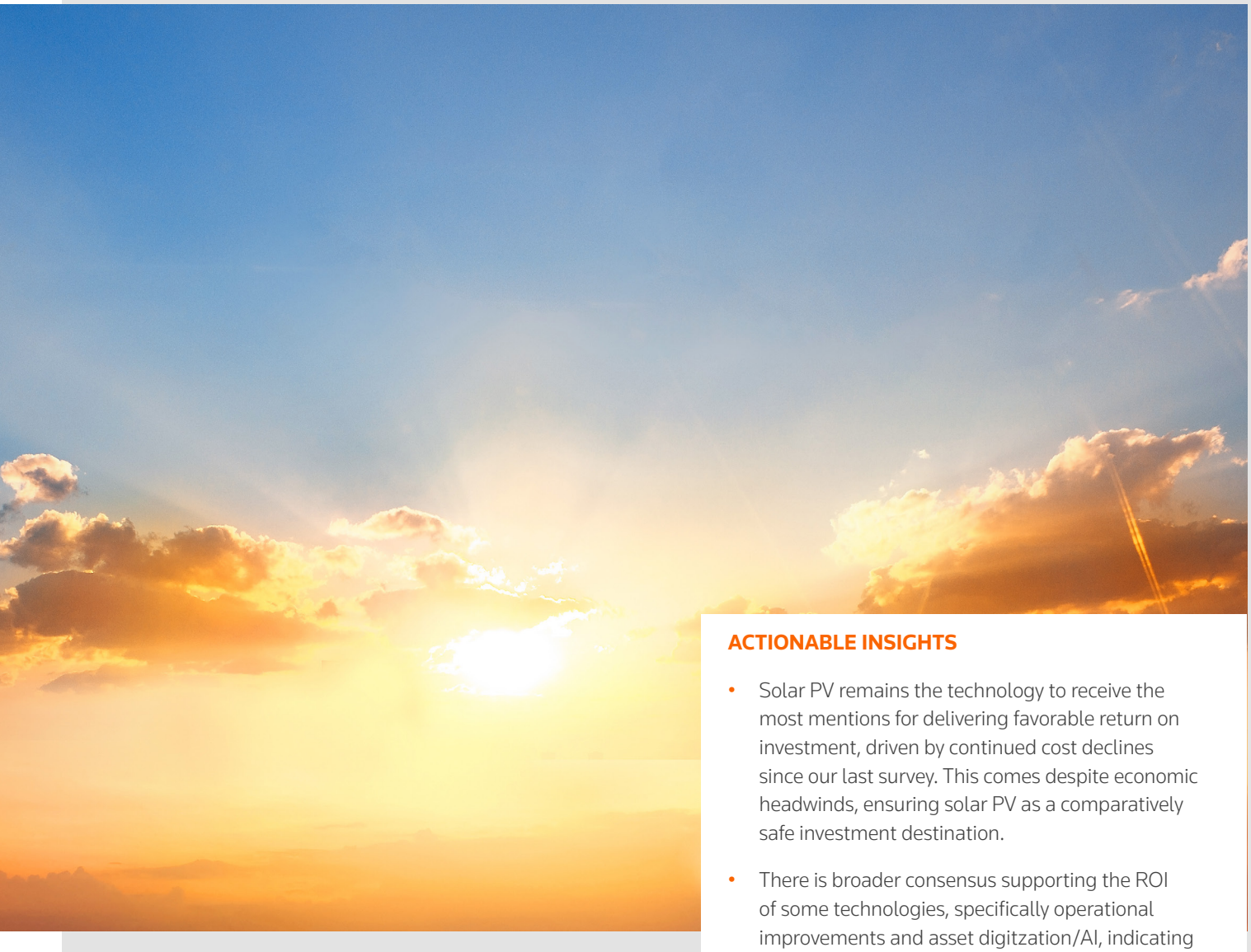
The inclusion of hydrogen production in the Middle East and grid infrastructure in Africa are also interesting given their positions outside of the leading positions globally, and perhaps reflect more strategic imperatives for investment. The need for grid infrastructure improvements are perhaps more acute in Africa, especially with regards to boosting energy access across the continent, while energy organizations in the Middle East have leaned further into hydrogen production, the most notable of which is perhaps NEOM's Green Hydrogen complex planned for Saudi Arabia.

MAJORITY OF RESPONDENTS INDICATE HYDROGEN INVESTMENTS ARE GREEN

Hydrogen continues to be backed as a major contributor to the energy transition, with specific use cases in decarbonizing heavy industry and some transport applications. To better understand how the energy sector is approaching hydrogen production, we asked respondents to identify which 'color' on the hydrogen spectrum they would be investing in, ranging from grey to green. Green hydrogen was the most common, selected by 76% of respondents across our sample, followed by blue hydrogen, which was identified by 34% of respondents.

N.B. This question was multiple choice, with respondents able to select more than one 'color' of hydrogen being produced.

3. HOW ROI IS DRIVING ENERGY TRANSITION INVESTMENT SENTIMENT



PAUL/ADOBE STOCK

With the two primary drivers for developing an energy transition plan being long-term business strategy and growth opportunities, it stands to reason that the return on investment delivered by specific technologies continues to shape the direction of energy organizations today.

Alongside our line of questioning on investment, we also sought to understand which energy transition technologies are delivering the best ROI, both of the last 12 months and expectations for the next three years.

ACTIONABLE INSIGHTS

- Solar PV remains the technology to receive the most mentions for delivering favorable return on investment, driven by continued cost declines since our last survey. This comes despite economic headwinds, ensuring solar PV as a comparatively safe investment destination.
- There is broader consensus supporting the ROI of some technologies, specifically operational improvements and asset digitzation/AI, indicating that the ROI delivered by these technologies is more universal.
- The keys to maximizing ROI remain largely internal, with areas such as strict management of costs, improving operational efficiency and minimizing the cost of capital on new investments deemed critical by our respondents. Government support, however, was the most popular external factor.

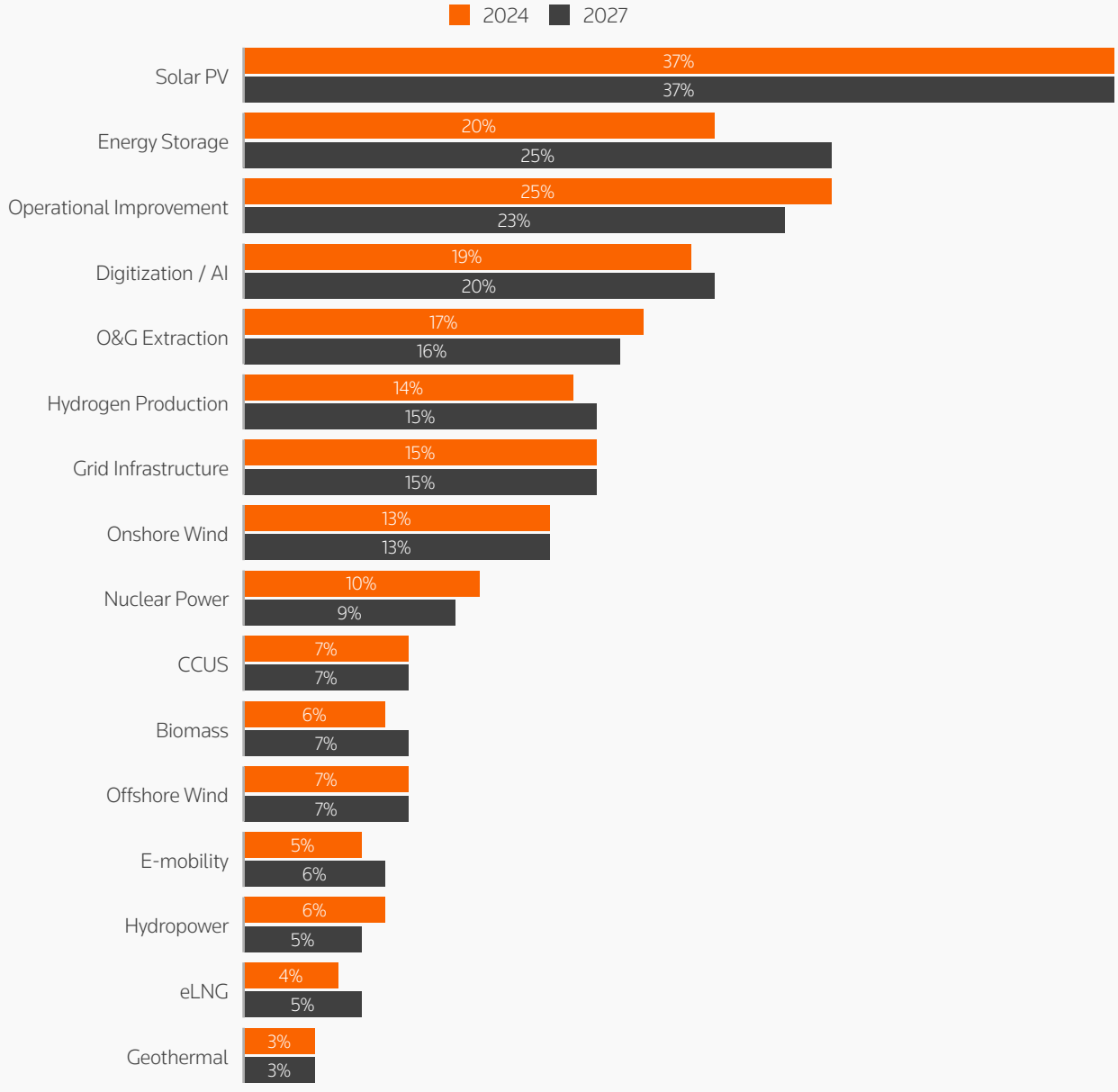
Having topped our poll in 2023, solar PV continue to be the leading technology for ROI for energy organizations, both of the last 12 months and over the next three years. In both instances the technology was selected by 37% of respondents, more than 12 percentage points above the second-most selected technology in both instances.

Similarly to our research into investment sentiment, our top three technologies remain the same – with solar PV challenged most closely by energy storage and operational improvements. That energy storage is more commonly selected as delivering favorable ROI in the next three years than of the last 12 months perhaps reflects short-term increases in line with inflation and supply chain constraints.

Figure 10

Solar PV is expected to increase its lead over other technologies for investment sentiment over the next three years

Share of respondents to indicate technologies delivering favorable ROI, showing both mentions for the previous year (2024) and the next three years (2027)



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Inflationary pressures and supply chain constraints may also be pivotal in the ROI expectations of other technologies, perhaps most notably offshore wind. Last year's study saw offshore wind selected by 17% of respondents for delivering favorable ROI in the past 12 months, but this has fallen to just 7% in this year's study. A similar decline is witnessed in ROI expectations for the next three years, compounding the more immediate impact on ROI from inflationary pressures.

There are, however, some differences in the expectations of ROI for certain investments when we examine the answers by respondent type, i.e. those working for a renewables developer versus those at an oil and gas company. *Figure 11* shows ROI rankings for specific technologies, split by the fewest and most number of mentions per respondent company type. For this specific chart, the larger the bar between the two opposing points, the greater the difference in opinion on ROI – in short, there is greater consensus around the ROI for technologies with smaller bars.

As figure 11 shows, while asset digitization/AI was selected for favorable ROI by 19% of our entire sample, its smaller range of answers – and in the chart, the smaller bar – indicates there is broad industry consensus regarding its ROI. This is similarly the cases for operational improvements.

There is much less census around generational technologies, specifically solar PV, energy storage and oil and gas extraction/exploration. This lack of consensus could serve as evidence that generation technologies are still the subject of some bias with regards the expectation of ROI.

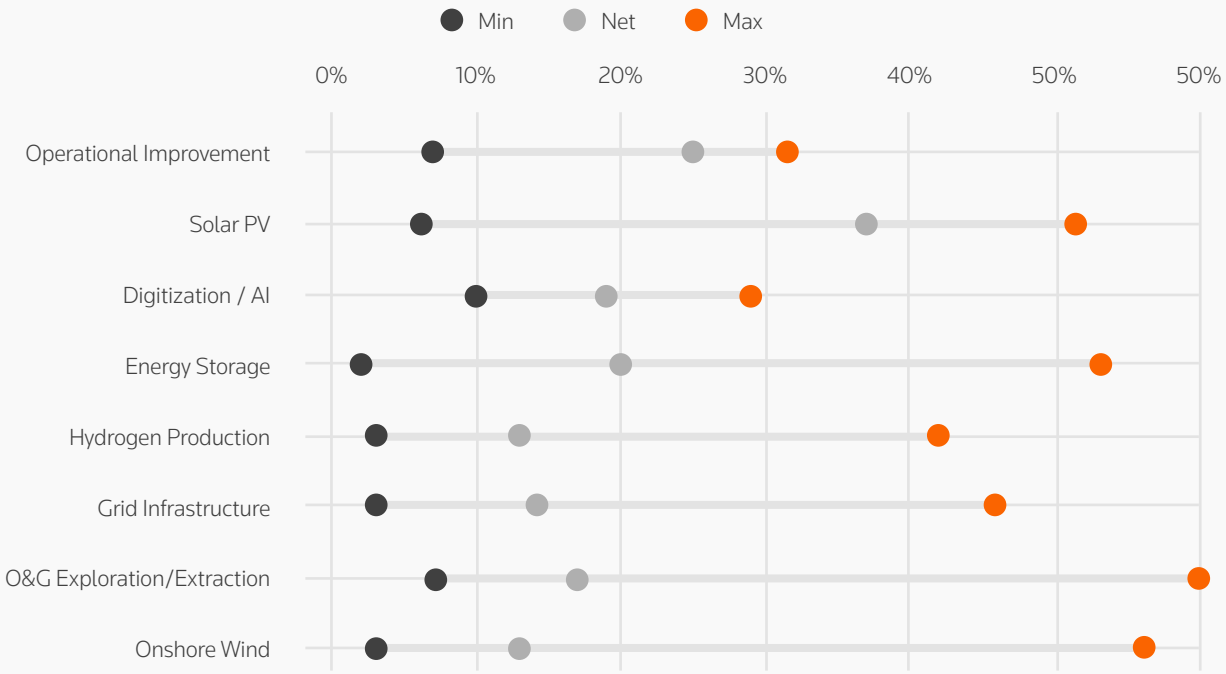
ESTABLISHED LEADERS FOR ROI AND ENERGY TRANSITION INVESTMENT

Combining our research around favorable ROI and investment sentiment of specific technologies, we can identify technologies that are currently leading the field and how the industry's perception of technologies has changed over the last year.

Figure 11

While solar PV tops our rankings for favorable ROI, there is less divergence around investments such as operational improvement and digitization

Energy transition technologies ranked in terms of mentions for ROI for the past 12 months, highlighting the fewest and most number of mentions per respondent company type



**Note: The chart does not display certain technologies due to a low base size. The excluded technologies are: nuclear power, biomass, offshore wind, CCUS, hydropower, e-mobility, eLNG, geothermal, and others.*

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Figure 12 combines these data points on a single matrix, with the X axis detailing share of respondents indicating their organization has invested in a technology over the past 12 months, and the Y axis indicating the share to have selected the technology as delivering favorable ROI. Median lines for mentions across both allow us to segment these technologies into four quadrants, the upper right quadrant being our 'leading' technologies.

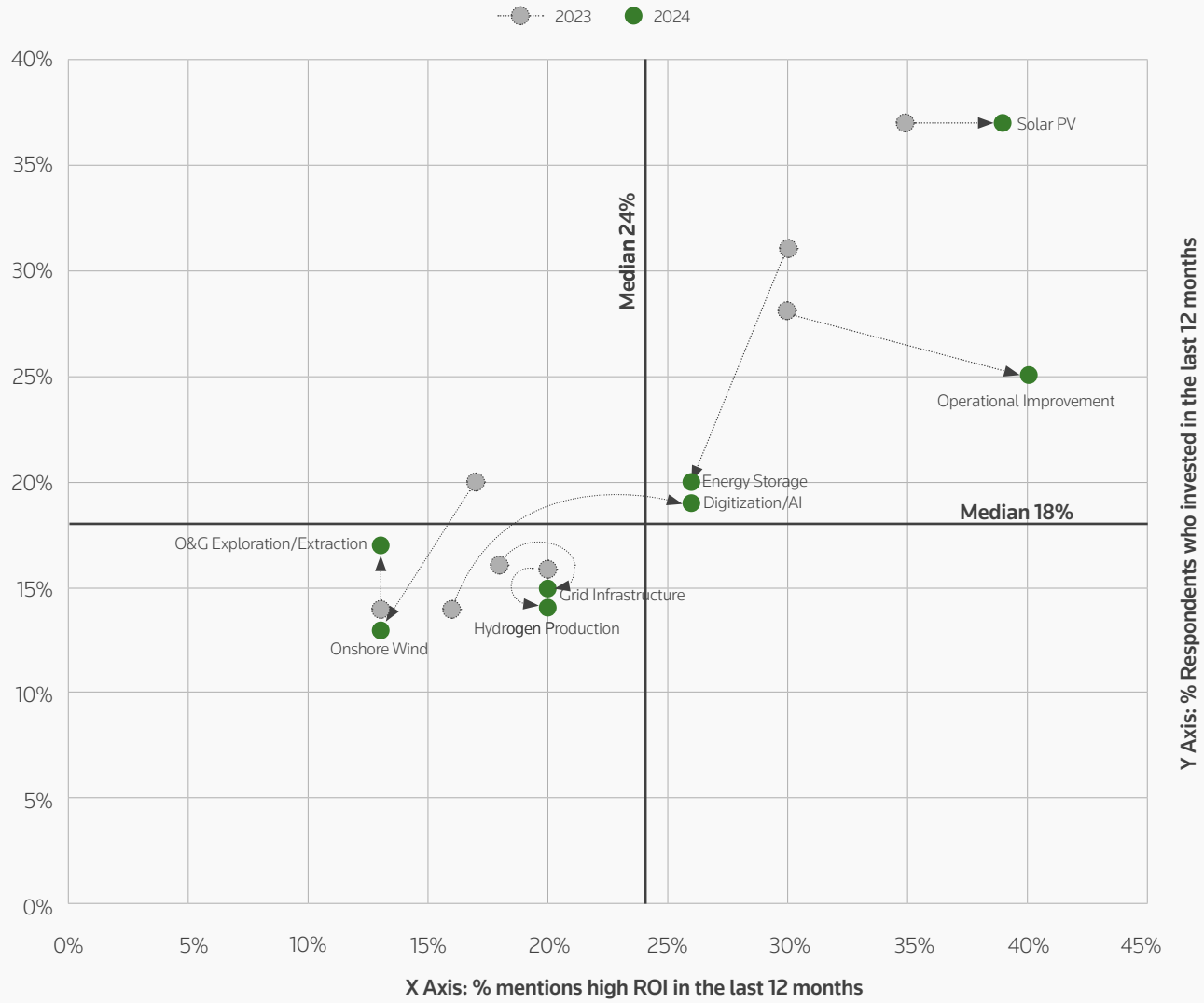
As *figure 12* shows, solar PV leads a field of 'leading' technologies that also includes operational improvements, energy storage and digitization/AI. Digitization/AI is particularly interesting as it has effectively jumped into our 'leading' quadrant for 2024, compared to last year's results.

While showing the direction of travel, the arrows also show the scale of the movement year-on-year with regards

Figure 12

While solar PV's position at the top of our investment vs ROI matrix is largely unchanged, energy storage's drift is more pronounced

Matrix comparing share of respondents mentioning technologies for investment and favorable ROI, comparing data from 2023 and 2024



**Note: The chart excludes data on specific technologies such as offshore wind, e-mobility, biomass, geothermal, CCUS, eLNG) and nuclear power due to a low sample base in the 2024 survey.*

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investment sentiment and ROI expectation, which could be interpreted as an indication of the level of volatility. For example, solar PV's movement is considerably more marginal on the chart than energy storage or onshore wind, indicative of a technology whose fundamentals has not markedly changed year-on-year.

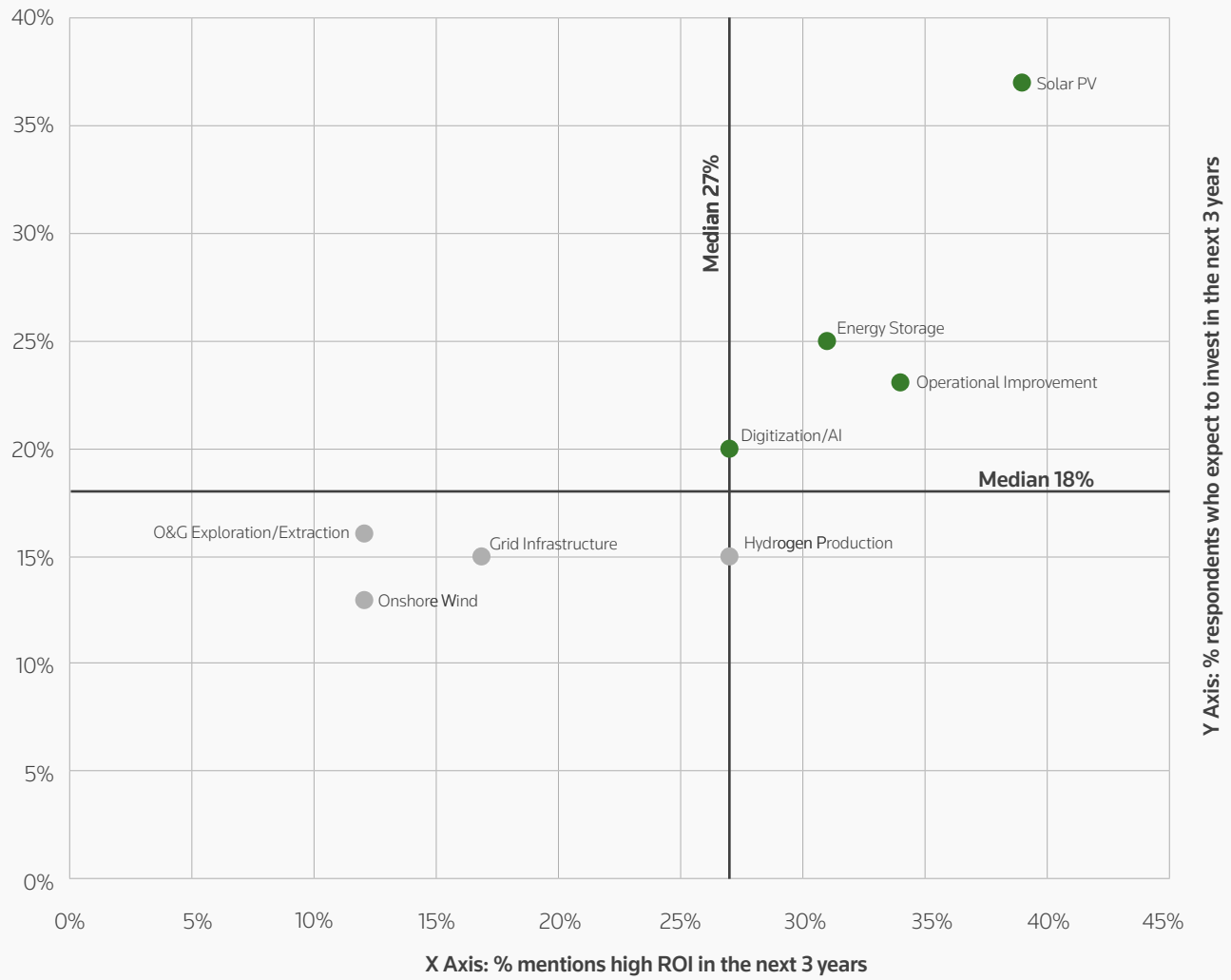
Figure 13 shows the same comparison for investment mentions and favorable ROI expectation, but this time reviewing data for over the next three years. This chart can therefore be understood as a projection of leading energy transition technologies in the immediate future, specifically those in the upper-right quadrant.

As *figure 13* shows, there is minimal movement between the last 12 months and next three years. Indeed, the same four technologies are included within our 'future leaders' quadrant, with solar PV again some distance ahead of all others.

Figure 13

Minimal movement is expected within our investment vs ROI matrix for the next three years, suggesting economic factors could be present for some time yet

Matrix comparing share of respondents mentioning technologies for investment and favorable ROI, comparing expectations for the next three years



**Note: The chart excludes data on specific technologies such as offshore wind, e-mobility, biomass, geothermal, CCUS, eLNG) and nuclear power due to a low sample base in the 2024 survey.*

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There are a number of possible conclusions to take from this. Most notably, in the short-term respondents may not be expecting economic fundamentals of energy transition technologies to change much. Inflationary pressures and supply chain constraints may be expected to persist for some time, especially as additional manufacturing capacity ramps up in technologies including energy storage and wind.

There is also a heavy lean towards managing financial pressures, compounding a clear theme throughout this report. Managing project costs was identified by 12% of respondents, while minimizing the cost of capital was selected by 9%. Furthermore, the most common external factor was ensuring government support (i.e. subsidies or incentives), identified by 11% of respondents.

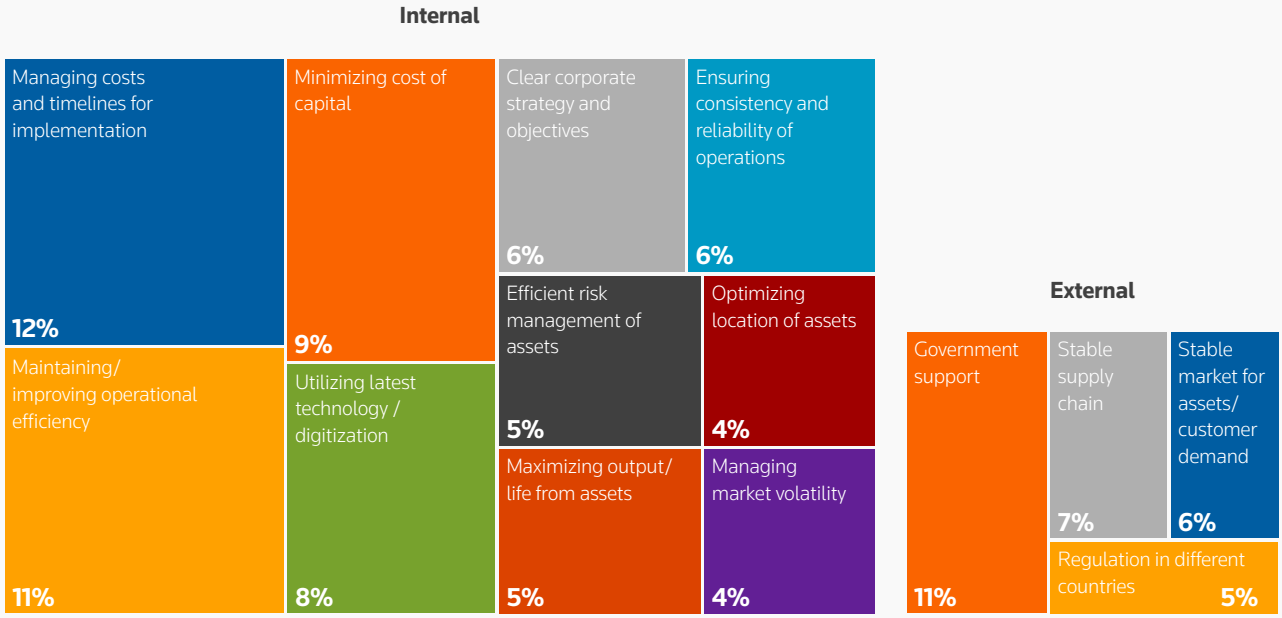
THE KEYS TO MAXIMIZING ENERGY TRANSITION INVESTMENT ROI

We asked respondents to identify the key factors in relation to maximizing ROI for energy transition investments, before separating these into two distinct pots; internal and external. Our research indicates that internal initiatives remain pivotal to maximizing ROI, as illustrated by *figure 14* – internal factors were mentioned more than twice as frequently than external factors.

Figure 14

Key factors to maximizing investment ROI are largely internal, driven by tight cost control and operational efficiency

Share of respondents to have indicated specific factors as key to maximizing investment ROI



**Note: The percentages do not add-up as it is a multiple choice question.*

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4. THE ROLE OF INSURANCE IN THE ENERGY TRANSITION

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As has been documented throughout this report, the energy transition is set to see the mobilization of trillions of dollars in investment, and energy organizations are expecting to see investments ramp up significantly over the coming years.

Such investment brings with it heightened scrutiny. Investors in energy transition assets expect certain levels of return, with the number of risks to those returns often stacking up. Operational, financial, regulatory and, increasingly, climate-related risks all hold the potential to derail asset performance and put those returns at jeopardy.

ACTIONABLE INSIGHTS

- A majority of respondents said insurance played an important role in helping their organization's energy transition strategy. Insurers should therefore remain engaged as transition strategies accelerate.
- When internal and external insurance and risk teams are engaged appears to differ, it is therefore crucial to consider at what stage of asset development is most appropriate to bring such teams into discussions.
- The nature of risks felt may also differ. Our research also shows a greater share of renewables developers highlighted financial and regulatory risks compared to respondents from oil and gas companies. A greater share of respondents from oil and gas organizations did, however, highlight operational risks.

Insurance, therefore, plays a particularly prominent role in providing safety and security for those assets.

A majority of respondents – some 66% - said that insurance played either a 'very important' or 'extremely important' role in helping their organization's energy transition journey. Indeed, just 3% said that insurance was not at all important, indicating the role insurance is likely to play as the energy transition scales up.

To better understand the nature of respondents' attitude to insurance, we asked them what kind of transition risks they are facing today, prompting them to select their top three. As *figure 15* shows, the three most prevalent transition risks being faced today are financial, regulatory and operational, selected by 49%, 47% and 43% of respondents respectively.

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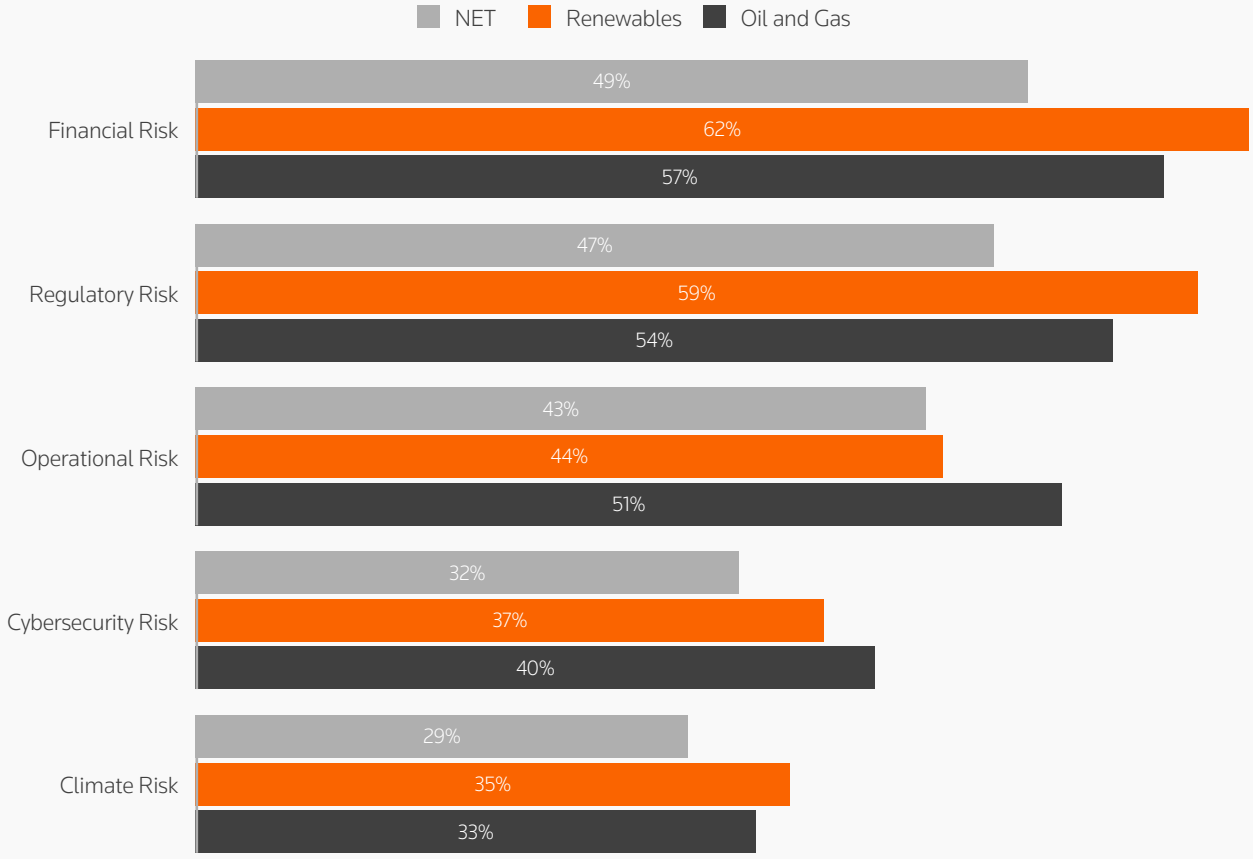
Figure 15

While more respondents from renewables organizations are facing financial or regulatory risks, oil and gas organizations are more likely to identify operational risks

Share of respondents to identify which transition risks their organization is facing today, segmented by company type



**Note: The categories geopolitical risk, technology risk, and others are excluded from the data display due to a low base size.*

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This is perhaps of little surprise given those three risks would encompass the significant majority of a traditional asset lifecycle, which resonates regardless of whether it's a utility-scale solar farm, battery energy storage facility or CCGT being constructed.

Comparing the results of different audiences within our respondent group also indicate some subtle differences in response. Slightly greater shares of respondents from renewables developers selected financial or regulatory risk than their oil and gas counterparts, perhaps an indication of the changing nature of the regulatory envelope for renewables globally and its impact on business models for renewables projects.

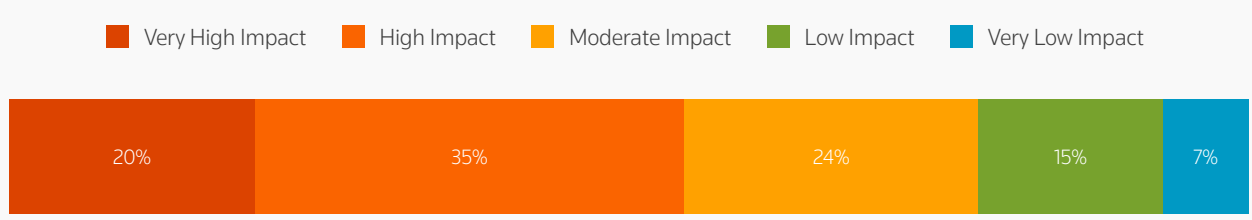
Meanwhile, just over half of respondents (51%) from oil and gas organizations identified operational risk, compared to around 44% of respondents from renewables organizations.

Climate risk was identified as a top-three transition risk by just under one-third of respondents (29%), however when asked the scale of impact climate change and extreme weather events could pose to their organization, more than half (55%) of respondents said the impact would be either 'high' or 'very high', as figure 16 shows.

Figure 16

More than half of respondents said climate change and extreme weather events are expected to have a high impact on their organization

Share of respondents to identify the expected impact of climate change and extreme weather events on their organization



**Note: Percentage may not add up to 100 per cent due to the rounding*

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Indeed, just 22% of respondents indicated the impact would be 'low' or 'very low'. When read in conjunction with the share of respondents identifying climate risk as a top-three risk to their respective organizations, this could be seen as an indication as to just how significant and impactful financial, regulatory and operational risks are to the energy transition.

This also corresponds with our findings as to when, specifically, energy organizations are first engaging insurance and risk teams – both internally and externally – in asset development timelines.

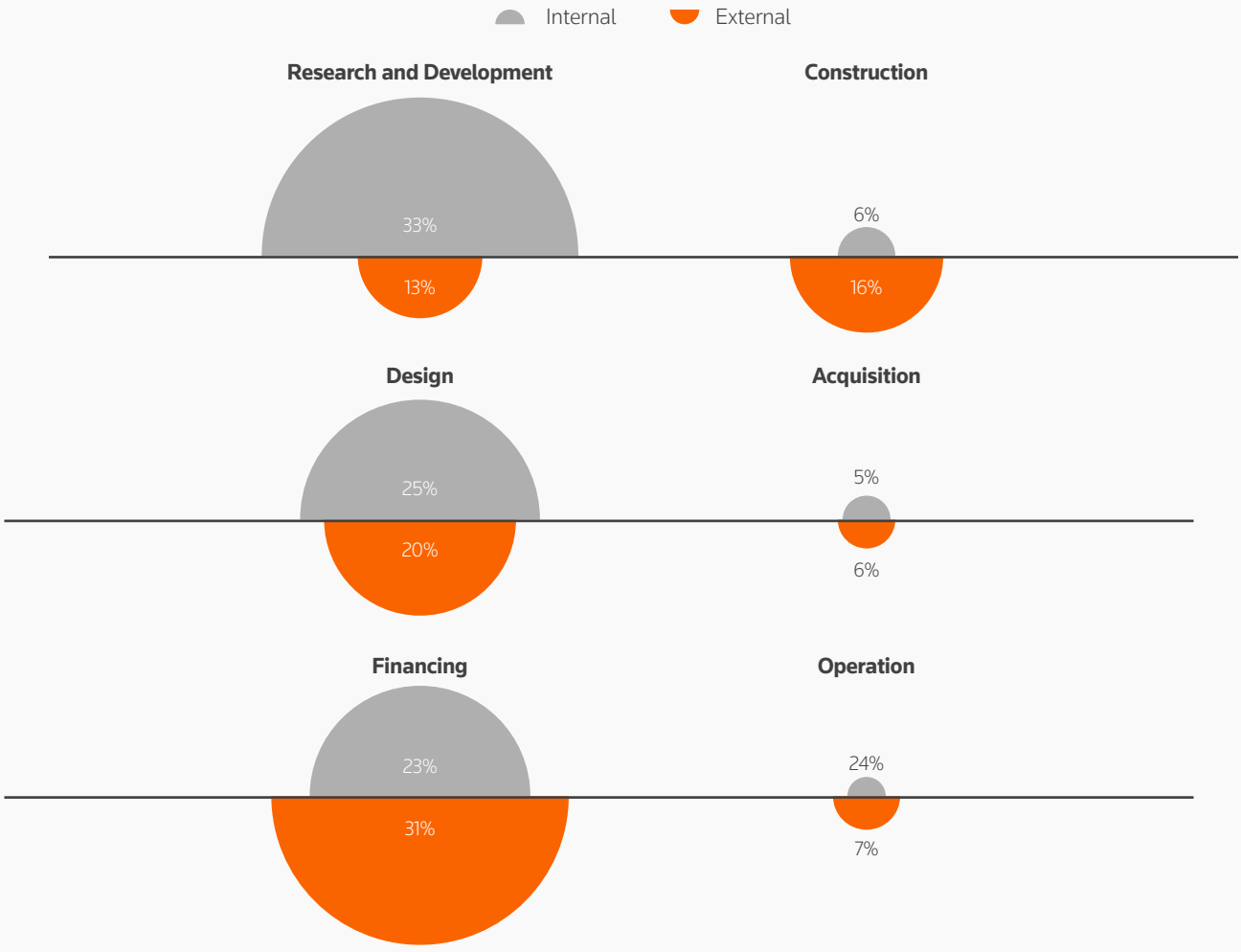
As *figure 17* shows, internal insurance and risk teams are largely being engaged at the research and development, financing and design stages, selected by 33%, 23% and 25% of respondents respectively. Combined, we can conclude that a significant majority – 81% - of respondents engage their internal insurance risk teams at the pre-construction stage, highlighting the importance afforded to this stage of the asset lifecycle.

The figures are distinctly similar for when external insurance providers are engaged. The research and development,

Figure 17

Energy organizations are largely involving internal and external risk and insurance teams at different stages of the asset lifecycle

Share of respondents indicating when they involve internal and external risk and/or insurance teams in the asset lifecycle



**Note: The stage of decommissioning is excluded from analysis due to there being only one case in response to the external question and no case in response to the internal question*

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financing and design stages were identified by 13%, 31% and 20% of respondents respectively, making a combined total of 64%.

There is, however, a relatively distinct difference between the share of respondents indicating when internal and external risk and insurance teams are engaged, specifically at the research and development stage. While one-third of respondents said internal teams are engaged right at the start of the asset development process, just 13% said this was also true of external insurance providers. Providers could be seen as more likely to be engaged at the financing stage, a conclusion which could, therefore, be seen as creating a link between the critical financing of a project and the insurance.

There is also an interesting point of difference when comparing how respondents from renewables and oil and gas organizations have responded, as illustrated in figure Z.2.

While around 19% of respondents from oil and gas organizations said they engaged internal insurance and risk teams at the financing stage, nearly one-third (31%) of respondents from renewables organizations did so. Respondents from renewables organizations are statistically more likely to be engaging internal insurance and risk teams at the financing stage, perhaps highlighting the significance of insuring against returns for renewable projects.

This is supported by responses to our line of questioning around the nature of how organizations work with insurers today, with 40% of respondents indicating they brought in partners or advisers at the financing and/or design stage.

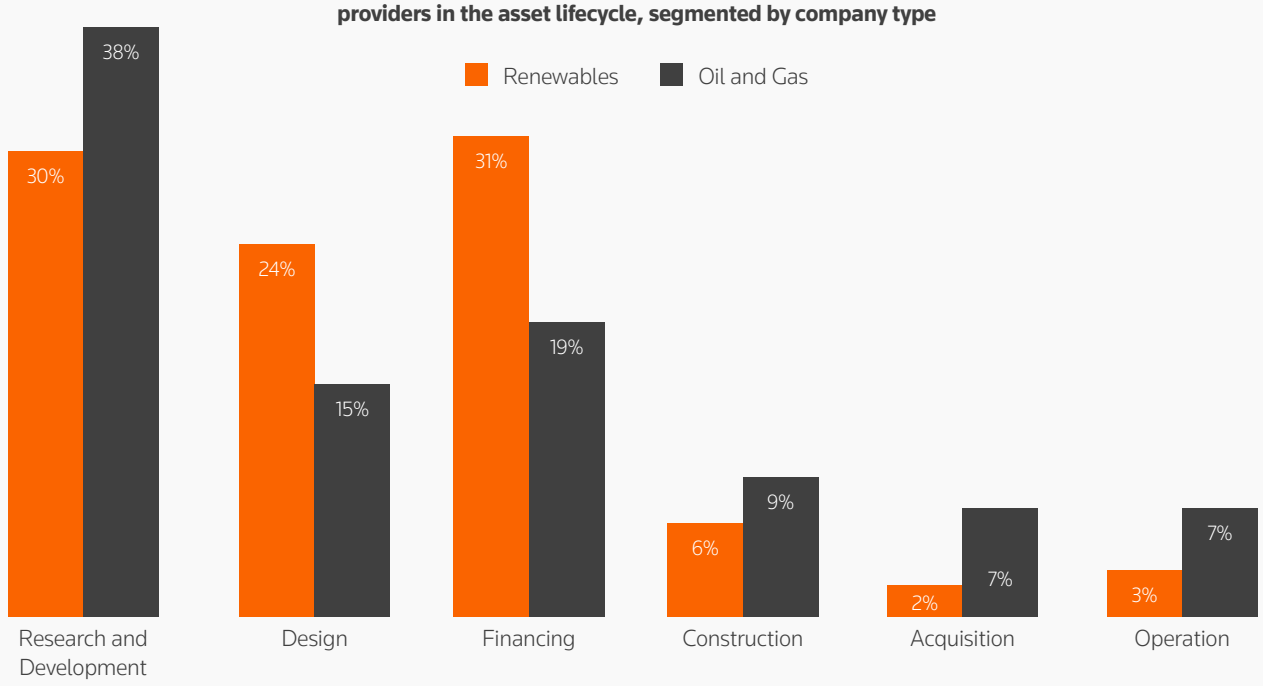
Just 15% of respondents said insurance partners or advisers were approached during the construction or operation phases. A further 38% indicated that they did not use partners or advisers, and simply worked with insurance providers only.

The role of insurers in offering expertise and advice throughout the entire project development cycle is, however, decidedly mixed within the energy sector. Exactly 50% of respondents said their insurer does offer such involvement.

Figure 18

Renewables organizations are more likely to engage insurance providers at the project financing stage

Share of respondents indicating when they involve external insurance providers in the asset lifecycle, segmented by company type



**Note: The stage of decommissioning is excluded from analysis due to there being no case in response to the question*

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METHODOLOGY

This report is based on the findings from three surveys conducted by Reuters Events. These include the **Reuters Events' Energy Transition Survey 2024** and the **Reuters Events' Insurance in Energy Transition Survey**, both carried out in the second quarter of 2024. Additionally, data from the Reuters Events' Energy Transition Survey 2023, which was conducted in the first quarter of 2023, is used to facilitate a year-to-year comparison analysis.

These three surveys engage energy transition professionals and practitioners across the energy value chain including renewables developers, utilities, oil and gas (upstream, midstream, downstream), integrated energy companies, independent power producers (IPP), petrochemicals, mining, and grid owner/operators, among others.

A total of 865 respondents from regions across the globe participated in the **Reuters Events' Energy Transition Survey 2024**; a total of 426 respondents participated in the Reuters Events' Insurance in Energy Transition survey, and a total of 586 respondents participated in the Reuters Events' Energy Transition Survey 2023.

Of our respondents of the **Reuters Events' Energy Transition Survey 2024**, 62% are in senior leadership, board, or senior management roles, with responsibilities across multiple functions, while 22% are in mid-management roles. There is diversity in the types of organizations that participated in the survey. Fifty-eight per cent of the respondents are in private companies, 26% are in public companies, 9% are in state-owned corporations, and 7% among other organizations. Participant organizations are operating across multiple regions: 56% in North America,

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48% in Europe, 37% in Asia, 30% in Central and South American, 26% in the Middle East, 25% in Africa, and 19% in Australasia.

Forty-eight per cent of companies surveyed in **Reuters Events' Energy Transition Survey 2024** have revenues of less than $250 million, 33% of companies have revenue between $251 million and $5 billion and 19% of companies have revenues over $5 billion. Over one-third (38%) of the respondents reported their employee headcount to be under 250. Thirty-two per cent are lower mid-sized at 250-5,000 employees, 8% are upper mid-sized at 5,000-10,000 employees, and 22% per cent reported over 10,000 employees.

The data was gathered through web surveys which were designed and implemented following strict market research guidelines and principles. However, there might be limitations where the survey cannot represent an overview of the current state of the energy transition industry. Furthermore, the current data does not capture the entire energy value chain; the representativeness might be limited in certain regions.