



ashurst

Powering Change

ENERGY IN TRANSITION

Global insights into the current energy market, the pace of change and areas of future opportunity

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Foreword

We are at a tipping point. The 2020s are vital as investors, corporates and those in the financial system at large, help fund a global energy transition to tackle climate change.

This is also a time when governments and industry need to make some key decisions about which technologies and business models will be pivotal in ensuring the energy transition happens.

We are delighted to publish Powering Change: Energy in Transition, which is Ashurst's contribution to this important debate. This report explores the changing global energy market as organisations seek to meet rising energy demands while also achieving decarbonisation.

This topic is high on the social, regulatory, political and investor agenda. What is significant is that the steady trickle of investment in low-carbon technologies of the last decade or two, which has been mainly limited to the renewable generation sector, is expected to accelerate and expand to other sectors at an unprecedented rate.

In order to understand the impact on investment strategies in depth, we have polled 2,090 executives across the G20 who make energy investment decisions at their businesses. We will look at these findings in this report.

As a leading international law firm with specialist expertise in the energy industry, we see the various ways in which the energy transition is being tackled. We have seen that, while there are common themes, there are also a large number of different paths being taken by companies across the world to achieve carbon reduction goals.

This is echoed in our research. Respondents told us about the attitudes towards and investment behaviours in renewable power generation and decarbonisation technologies. This is in both the regions and countries where they are based, and in other jurisdictions where they currently invest or plan to do so in the future. It reveals a myriad of approaches and interpretations.

Our specialists provide an end-to-end advisory service covering the full energy value chain. We work on high-profile projects and transactions globally which will shape the energy mix for decades to come. This experience spans renewables and energy from waste, decarbonisation technologies (e.g. energy storage, hydrogen, smart meters), natural gas, conventional power and nuclear.

The breadth of our wider experience means we also see how the energy transition is affecting, and will continue to affect, non-energy sectors such as the electrification of transport, manufacturing and construction.

The energy transition undoubtedly brings both opportunities and challenges for all market participants, and we expect that addressing these will call for considerable focus in the coming years. Thank you for reading.

It would be remiss of us to not mention the ever-evolving Coronavirus (COVID-19) pandemic. While addressing the energy transition will remain a key agenda item in both the short and long-term, almost overnight the global landscape has changed. As governments implement measures to safeguard public health, there has been a direct impact on supply chains, energy demand and the financial markets at large.

We are clearly entering a volatile and uncertain period for all markets, especially energy. This data set was captured prior to the advent of COVID-19 crisis and the sharp reduction in oil prices. However, we believe the fundamentals of the market and prospects for the clean energy transition will remain largely unchanged longer-term.

The findings from this report will provide a useful benchmark for the industry to review and compare against when markets have stabilised. It gives insight into where executives are looking to invest in and commit to as part of the broader global energy transition, and will help us all understand how and where sentiment shifts in the months to come.



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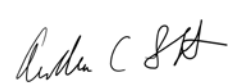
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Executive summary: Navigating the energy transition

There can be no doubt that the world is moving to cleaner energy sources.

According to the International Energy Agency, at least one quarter of global electricity use is now powered by renewables, including solar, wind and hydro, with more countries seeking to change their wider energy mix.

Accelerating this energy transition is set to come with some serious capital requirements. The International Renewable Energy Agency forecasts that US\$110 trillion must be invested in the energy system globally by 2050 to meet renewable energy targets.

This raises the question: how well-placed are market participants to navigate these shifts while delivering returns to their shareholders? It is clear the pressure is growing on companies to invest in climate-positive projects, and so it is crucial for them to understand the drivers behind the energy transition so they make the smartest investment decisions.

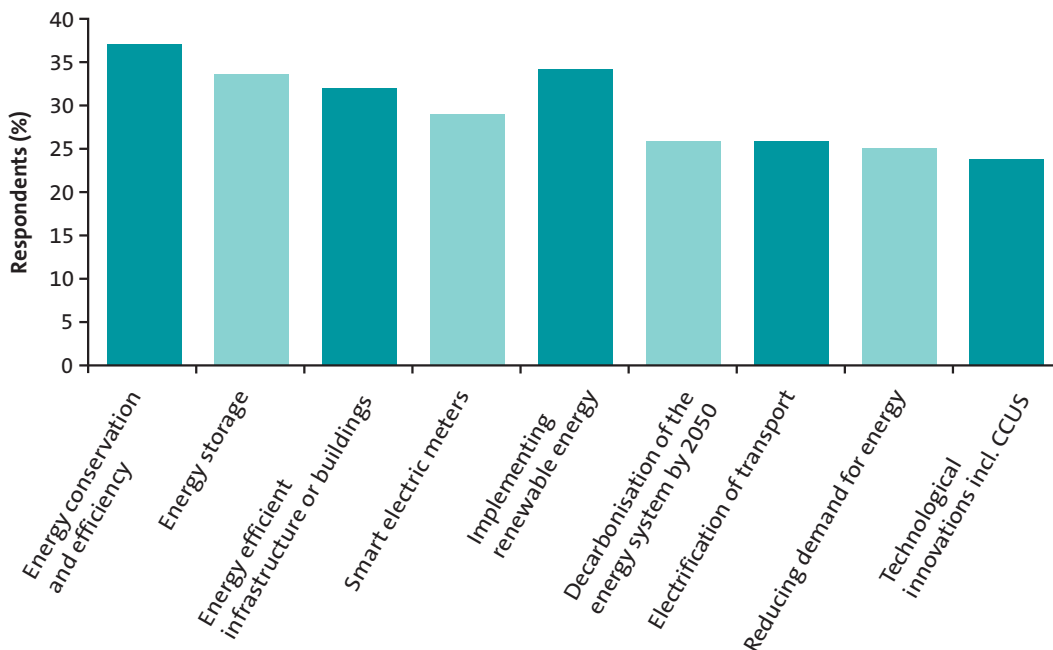
Our analysis looks at how companies in the G20 plan to invest in renewable power generation and other decarbonisation technologies, with a particular focus on investment strategies and regional trends. We found little resistance among investors about the need to respond to the climate crisis, but such changes do not come with a blank cheque.

It is apparent that, particularly in the context of nascent technologies and sectors, a clear policy direction from governments is required to make investments in the energy transition economically viable, and this must be associated with valid business models and/or regulatory drivers.

BACKGROUND

There were 110 respondents from each of the G20 countries. The average global turnover of respondents' companies was US\$15 billion, an aggregate sum turnover of approximately US\$30 trillion.

Graph 1 | Interpretation of energy transition



INVESTING IN THE ENERGY TRANSITION

One trend we see in our research is the lack of consensus about what the “energy transition” means. The top three descriptions (see graph 1) were that the energy transition means improving energy conservation and efficiency, installing renewable energy technology and energy storage.

In addition, on average, respondents chose at least three of our 12 proposed meanings for the energy transition. This can be seen as encouraging as it reflects a level of understanding that the energy transition requires a holistic approach. However, any confusion among industry participants about what the energy transition means could be a barrier at a macro level to a coordinated and concerted global response, and at a micro level, to the development of effective energy transition strategies of individual businesses.

It is important for the business community to be aligned on what is meant by the energy transition as it gives clarity on what needs to be done, even though different companies will invest in their own ways depending on their strategies, industry and the countries in which they operate.

For the purposes of our report, we have defined the energy transition as:

*The transition to a lower carbon energy system, in particular, achieving net zero CO₂ emissions from energy and industrial systems through **improvements in energy efficiency, combined with the decarbonisation of power production and the gradual electrification of the economy.***



Companies are under a wide range of pressures to invest in the energy transition, which comes from a diverse group of stakeholders including investors, shareholders and activists. This means companies need to look at their investments in both renewable power generation, which are largely established, and other decarbonisation technologies (see graph 2). We look at these trends in more detail between pages 12 and 19.



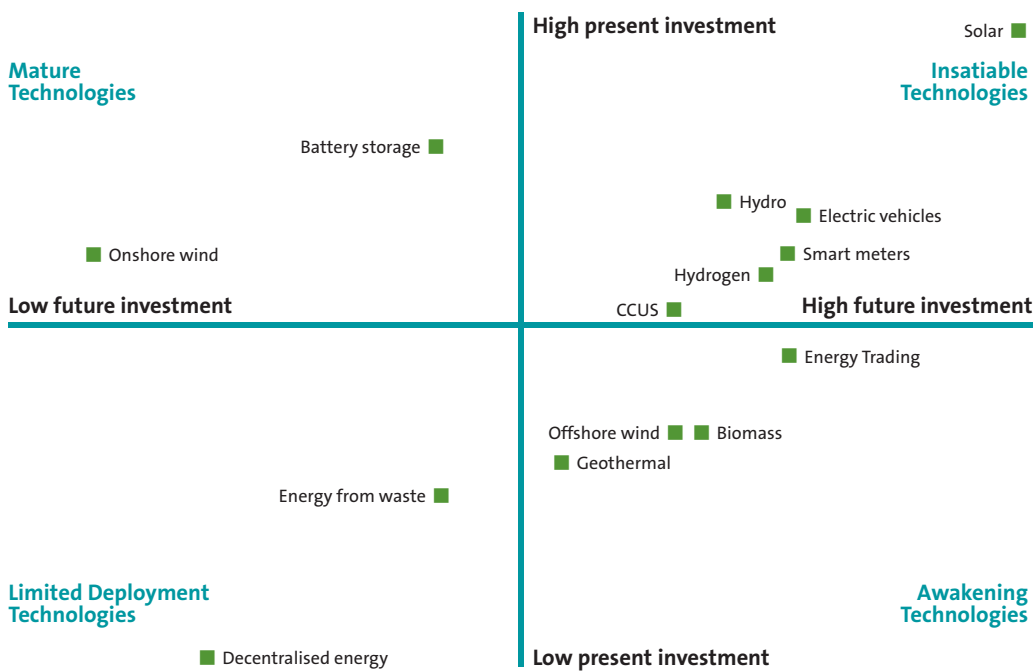
Companies are under a wide range of pressures to invest in the energy transition

Graph 2 plots the present and future investment levels by technology, as reflected by our respondents' committed or anticipated spend. It highlights what we are categorising as insatiable technologies, that is, those which are receiving high levels of investment, and will continue to do so over the next five years. We have categorised other technologies as either mature, awakening or limited deployment technologies, again reflective of their present and future investment levels.

Interestingly, across this G20 group, onshore wind and energy from waste received lower levels of focus than what we had anticipated. We expect that on a global basis there will be a material increase or at least a sustained investment in these areas in coming years, so it is likely that markets outside the G20 will also play a significant role in this.

Our respondents said the biggest pressure to act is coming from government (see graph 3).

Graph 2 | G20 energy transition technology maturity matrix



In total, 87% of respondents said their government is applying significant or extreme pressure on them to act on climate change. This is named as the top pressure in every country we surveyed except Brazil, which is to be expected given the current Brazilian Government's rejection of climate change as an issue to be addressed.

Even so, Latin America is a regional hotspot for companies investing in the energy transition. We look more at regional insights between pages 20 and 37.

Executives in most regions are feeling the pressure. The energy transition is seen as key to strategic growth by most executives across the G20. Only in Saudi Arabia did most respondents not see investing in the energy transition as key to their strategic growth, with Turkey and South Africa being the next lowest.

Across the G20, 94% of respondents expect their organisation's investment in the energy transition to increase over the next five years, with the average increase expected to be a massive 43% in dollar terms.

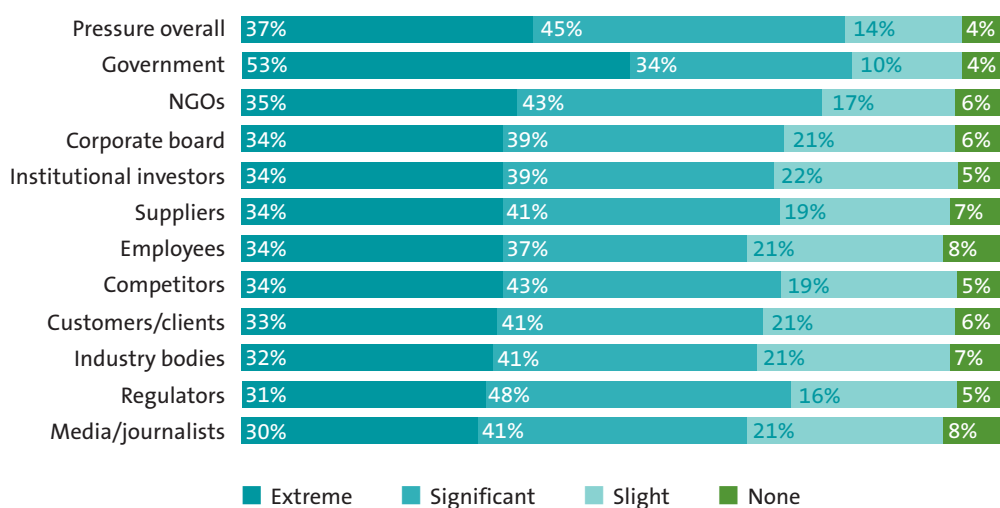
However, there are wider issues driving change, including concerns about security of energy supply, expectations of the public, and the desire by corporates to diversify and future-proof their investment portfolios.

Investment giants BlackRock, State Street and Japan's Government Pension Investment Fund have called on companies to put the climate crisis at the heart of their strategies. The message from these investors is that there are huge opportunities to invest in emerging regions and markets, and this will be key to companies' long-term financial performance.

But it is clear that pressure to change in the absence of clear policy direction may not yield positive outcomes. It can force companies to take short-term decisions which erode long-term value for shareholders and other stakeholders. Managing these risks will be key to a successful energy transition.

In short, every organisation must be responsible for their part in reaching net zero. The energy transition presents valuable opportunities, and those which capitalise on it will be well placed for growth in the 2020s and beyond.

Graph 3 | Sources of pressure





Investment strategies:
How are companies
investing in the
energy transition?

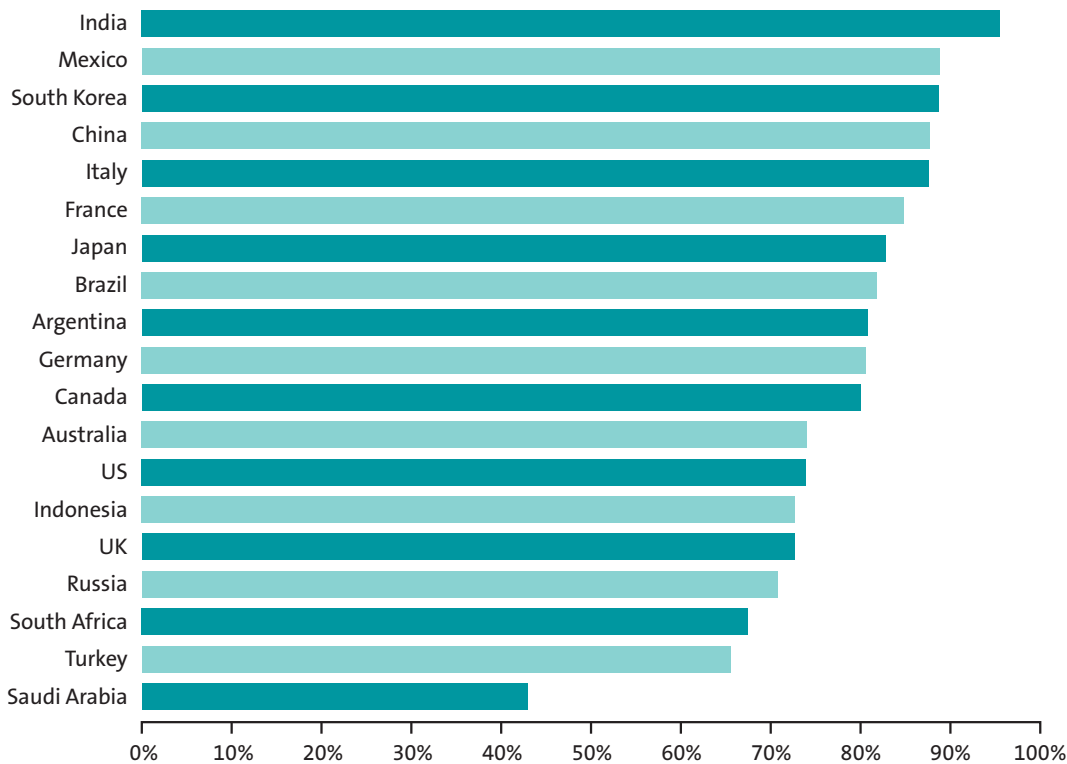
The pressure is growing on management teams in all industries to put the energy transition at the heart of their strategies in the 2020s.

Our research shows there is a wide range of companies investing in the energy transition, and 86% of respondents from large businesses – those with at least US\$50 million turnover and 250 employees – believe investing in the energy transition will be essential to their strategic growth. The response was 71% for smaller companies.

The majority of respondents in the health and social care sector said investing in the energy transition is essential to their strategic growth, compared with lower engagement in the education, water and waste sectors. However, given the need to decarbonise energy globally, it is positive that 78% of all respondents said the energy transition is essential to growth and just 1% said it is not important.

This means there is broad agreement in the importance of the energy transition. However, the question about who is funding these changes is less straightforward.

Graph 5 | Perception of the energy transition as essential to growth, by G20 country



Our research shows banks, government and corporates are seen as investing the most, although there are significant regional variations (see graph 6). The lowest-ranked group is transport and mobility companies, although we expect this to rise rapidly in the coming years as the electrification of the transport sector gains momentum.

Funding the capital requirements of the energy transition is evidently a crucial element in achieving net zero. We will watch with interest to see whether there is material change in the activity levels of these funder groups. It may be that government plays a more significant role if progress towards targets is not on track, for example through increased pressure on banks and other regulated financial intermediaries.

DOMINANT FUNDERS: A REGIONAL VIEW

While none of our six main investor groups gained widespread recognition in our research globally, this masked some interesting trends on a country-by-country basis. For example, in a handful of G20 countries there is a perception that one group dominates the investment into the energy transition.

Banks are seen as the dominant investor group in the energy transition in India, Brazil and Argentina; funds in Saudi Arabia, which is likely due to the influence of government-backed wealth funds; corporates in Mexico; and oil companies in Turkey and South Africa.

In addition, some countries have two dominant investor groups, with governments and banks the most common combination, including in China and Germany.

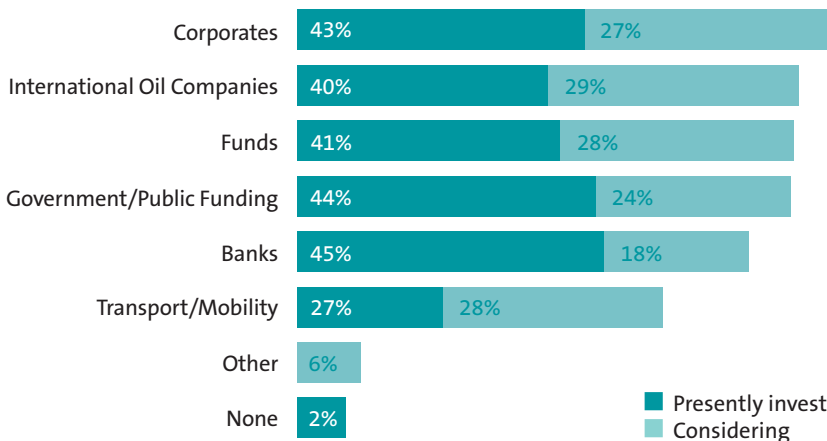
But it was rare for our respondents to recognise the contribution of corporates. To us, this suggests private companies have a long way to go to convince the public and others that they are investing in the energy transition.

Investment strategies will be affected by a wide range of factors, including the following.

- The falling costs of wind and solar power generation, which have made these sources cheaper than fossil fuels in some parts of the world. This may make such deals attractive, but slimmer margins affect appeal as an asset class.
- Growing demand for electric vehicles making it a hot sector in the 2020s. This growth will support more wind and solar on electricity grids. Significant investment will also be required globally to implement supporting charging infrastructure and smarter grids to spread the demand load
- The rising pressure for companies to act on the climate crisis will mean they will have to take meaningful action and communicate their stories. Companies will come under greater scrutiny for perceived greenwashing. For example, hedge fund short sellers are showing interest in shorting companies they perceive as not living up to their green promises.
- An increase in concerns about energy security and rising electricity prices, as well as regional political shifts. The renewable energy industry remains reliant on political support, even if it is not in the form of financial incentives and subsidies such as feed-in tariffs.

These challenges will need to be navigated with care.

Graph 6 | The investors



BARRIERS TO INVESTING IN THE ENERGY TRANSITION

Our respondents also gave views on the barriers to be unlocked if further investment is to flow into the energy transition. Transaction costs, lack of government support and technical risk were most commonly identified as the greatest concerns, with lack of infrastructure ranking just behind them (see graph 7).

However, the statistics also include interesting regional variations.

For example, respondents from the BRIC countries (Brazil, Russia, India and China) cited the most barriers to investment in each, while those in Indonesia, South Africa and South Korea cited the fewest. This is likely due to the infrastructure challenges in larger nations and the fact that the energy transition is slipping down the political agenda in key BRIC markets.

Technical risks are seen as the most significant barrier by investors in the BRICs, followed by Asia-Pacific and Latin America. By contrast, technical risks ranked at the bottom of the list in North America and Western Europe, likely reflecting the relative maturity of renewable power generation and decarbonisation technologies in these regions.

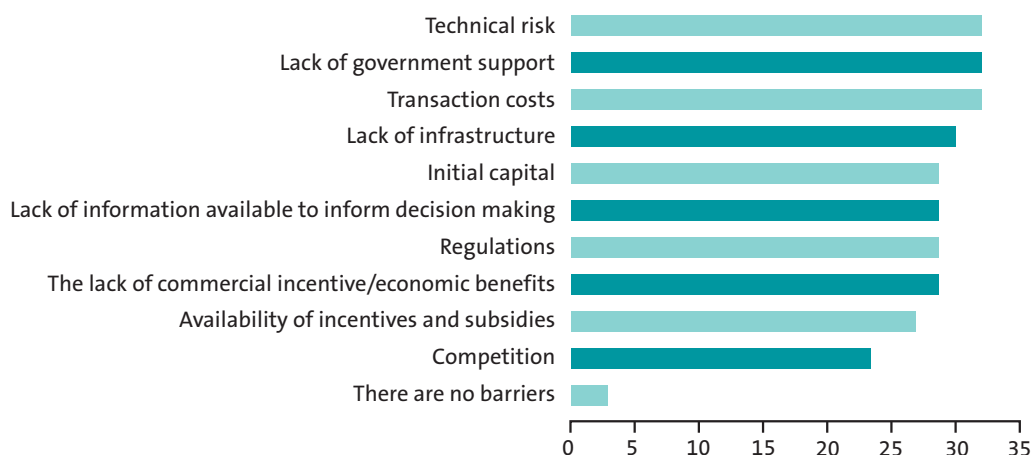
In addition, the lack of commercial incentives or economic benefits rank high on the list of investor barriers in Germany, Japan and the United Kingdom, with lack of government support seen as a significant barrier by investors in Germany, Italy and Australia.

Germany is particularly interesting as the country’s onshore wind industry, after significant growth over recent years, is currently in the grips of a high-profile crisis. Despite a generally positive attitude towards renewables and though reasons for the current crisis are certainly manifold, significant public opposition against new permits for onshore wind assets and a lengthy permitting regime is currently considered to be one of the main reasons for the slowed expansion.

Another reason is a change in regulatory policy that came into effect in Germany in 2017, aimed at bringing renewable power generation closer to the market by reducing fiscal support and replacing former statutory tariffs with competitive auctions for tariffs. This situation opens up a conversation about the role of fiscal and regulatory support from the government to facilitate continued growth in the energy transition, even in the context of established technologies, in that country and others.

We have seen in the United Kingdom the positive impact long-term stable government support can have on the market. For example, the use of Contracts for Difference to provide revenue stabilisation for offshore wind farms, which were underpinned by competitive auctions, shows the crucial role that government fiscal support can play in driving down costs and supporting capacity growth. The strike price for offshore wind dropped from around £120/MWh in the first auction in 2014, to around £40/MWh in the 2019 auction. This helps support strong private investment.

Graph 7 | Perceived barriers to investment



A black and white photograph of three wind turbines in a field. The sky is filled with clouds, and a bright sunburst effect is visible in the lower right quadrant. A teal rectangular box is overlaid on the upper part of the image, containing the text 'Market trends'.

Market trends

Renewable power generation

The move away from fossil fuels and towards renewable power generation is central to the energy transition. In this section, we look at some of the key findings from our research into renewable power generation.

SOLAR SPARKS MOST INTEREST ACROSS THE G20

There are three dominant renewable power generation sources that respondents are either investing in or have planned to do so: the most favoured of these is solar, followed by hydro and onshore wind.

At present, hydro is the largest segment by installed capacity at 1,300GW globally, which is roughly equal to the combined figure for wind and solar. However, solar is often an easier investment as it can be installed on buildings, can be installed relatively quickly and does not have the same geographical restrictions as hydro plants.

The top ranking of solar for current or committed investments was seen in 12 nations including China, India and Mexico, and it is in the top two in four more countries. Onshore wind is top or joint top in four (Argentina, Brazil, France and Germany), and hydro in four as well (Germany, Indonesia, South Africa and Turkey).

The low costs and predictable output from solar farms both enhance its appeal, although trade tensions between the United States and China (which have resulted in higher prices for solar panels and supply shortages) have stifled the industry during the last two years.

In addition, solar and hydro performed strongest when we included respondents who said they would consider investing in the areas in the next five years. In total, 74% of respondents were actively considering investing in solar, and 67% in hydro. All of the renewable power generation sources polled higher than 55%, reinforcing their prevalence in the energy system globally.

POCKETS OF VALUE EMERGE IN ONSHORE WIND

Onshore wind is now a global industry, but it is also clear that even the largest markets rely on supportive politicians and policies. Germany and India have both been hit hard by the introduction of competitive auctions in the last three years, while the United States can expect a strong 2020 after a vital tax credit was extended.

The onshore wind industry in the United Kingdom has also suffered due to a lack of subsidies and a lack of government support. However, positively, the UK Government has proposed amendments which may see onshore wind once again eligible to take part in the next Contracts for Difference allocation round, which is scheduled for 2021.

This shows that markets can rise and fall quickly, and there are still pockets of value for investors who take a global view and are not fazed by emerging market risks.

Our research showed high levels of committed onshore wind investment by the G20’s Latin American nations – Argentina, Brazil and Mexico. For respondents from Argentina, 90% of this investment related to greenfield projects, however it was a more balanced mix of greenfield and brownfield for those from Brazil and Mexico.

Onshore wind also polled strongly across investors in key Asian countries (China, India and Japan) as well as France and Germany. Despite current challenges in some onshore wind markets, investors remain optimistic. This reflects the status of onshore wind as a well-established and proven renewable power generation source.

EMERGING MARKETS FOR OFFSHORE WIND INVESTMENT

In the last two years, major European utilities and investors have been driving the expansion of offshore wind into China, Taiwan, the United States and new regions in Europe, such as the Baltic Sea.

The commercialisation of floating foundations will likely further drive growth in offshore wind. It is little surprise therefore that it has attracted the interest of respondents.

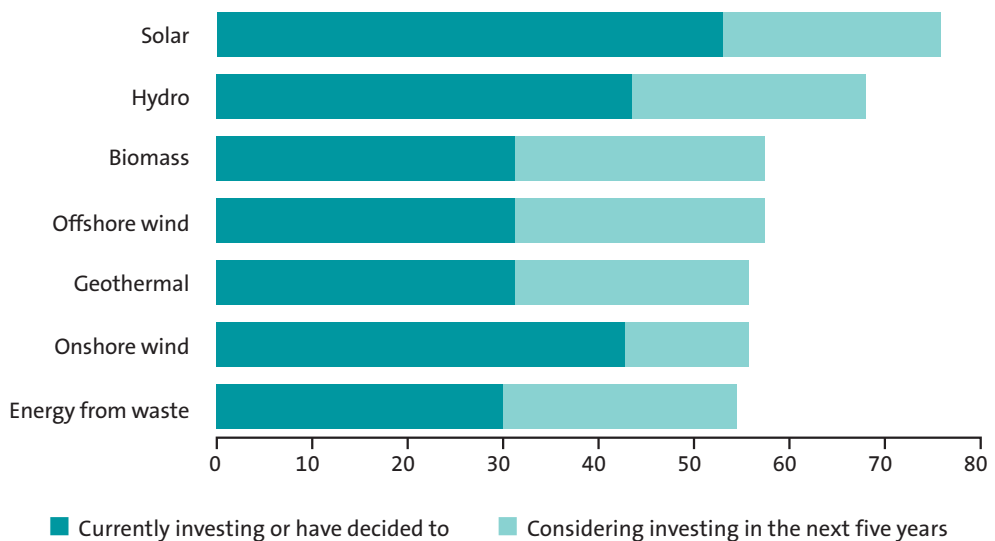
Executives in Latin American countries polled the highest globally on their current plans to invest in offshore wind at 36%. Reinforcing this, in Argentina and Brazil, respondents said offshore wind is the most attractive power generation source to utilise or invest in over the next five years, at 40% and 34% respectively. Respondents from India and China are also strongly considering utilising or investing in offshore wind in the same period, at 44% and 33% respectively.

The next most favoured region for respondents seeking to invest in offshore wind is Asia, which is being led by companies in China, Indonesia and Japan.

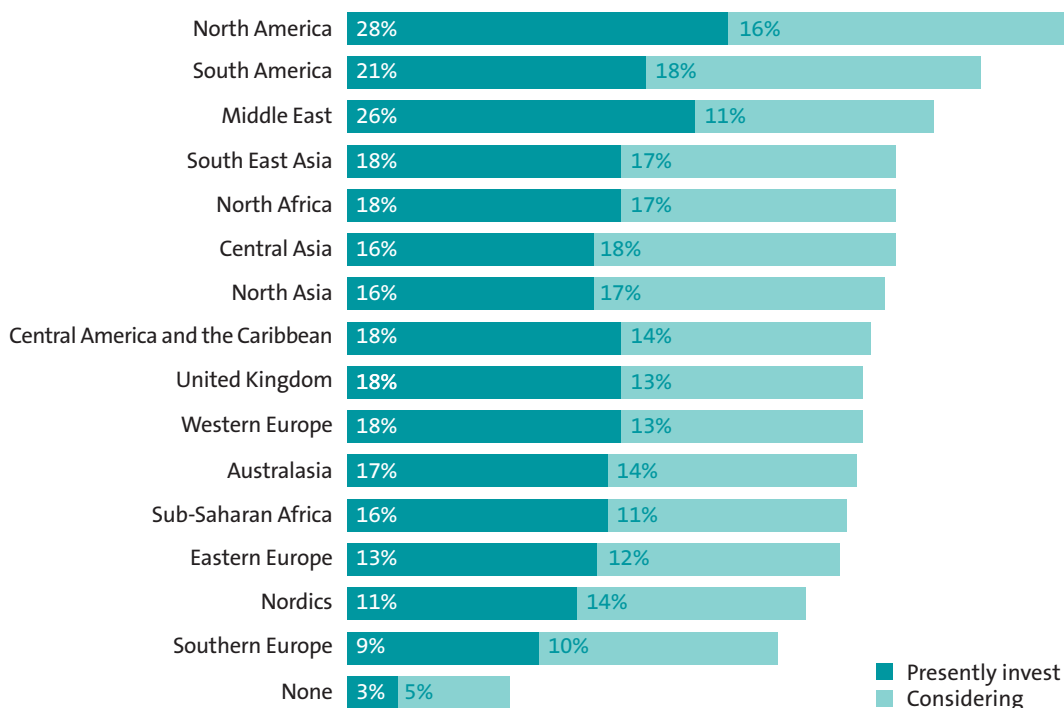
The companies who are most interested in investing in offshore wind in North America are from Mexico, Canada and Brazil, with the United States itself coming in fourth. North America is also of interest to Western Europeans, but most of the companies in Europe are mainly focused on their own continent or the United Kingdom specifically.

This shows that investor interest in offshore wind is increasing, with a preference for markets close to their respective homes.

Graph 8 | Favoured renewable power generation sources



Graph 9 | Current and future hotspots for energy transition investment



GENERATING ENERGY FROM WASTE

Our research shows the growing attraction of energy from waste technologies. This is a broad category that includes technologies that generate electricity heat and/or synthesis gas directly from the combustion of waste (e.g. waste incineration, gasification and pyrolysis) and technologies that produce electricity and/or heat from waste by-products (primarily landfill gas).

The deployment of energy from waste technologies has a positive impact on the climate crisis in two ways. One is that it diverts waste from landfill, where its biodegradation would otherwise lead to the potential release of harmful gases and liquids into the environment, in addition to the negative visual and odour impacts of landfill sites.

The other is that – as a “baseload” energy generation technology – it potentially replaces fossil fuel electricity and heat generation which produce comparatively higher emissions (when the relevant emissions are not abated, for example through the use of carbon capture and storage), compared to the emissions of most modern energy from waste facilities which employ sophisticated flue gas treatment systems.

Energy from waste is of particular interest to executives we polled in India, China and Russia, which reflects the importance of the landfill issue in these countries. For example, in Russia, the government has faced protests about the ecological impacts of open-air landfills, and China’s biggest landfill – the Jiangcungou site in Shaanxi province – reached capacity in November 2019, nearly 25 years earlier than planned.

We also see strong interest from executives in more mature renewable power markets who have decided to invest in or use the technology, including the United Kingdom (41%) and the United States (40%).

However, energy from waste is best classified as an awakening technology (despite its maturity in certain countries including the United Kingdom and the United States) as only 30% of respondents are investing in it or are planning to do so. This could grow quickly as an additional 25% are looking at investing in the next five years, although in our experience, for less mature renewable power markets, this will first require the right environmental, financial and legal drivers to be in place.

Decarbonisation technologies

The transition to a lower carbon energy system is not limited to the use of renewable power generation sources. Decarbonisation technologies, such as battery storage, smart metering and electric vehicles, will play a key role in the energy transition.

BATTERY STORAGE THE MOST FAVOURED DECARBONISATION TECHNOLOGY

Batteries and other energy storage technologies have long been seen as the missing link to help smooth the intermittent power production from wind and solar farms, and to improve grid stability. Over the last year we have seen growing numbers of large institutional investors adding storage to their low-carbon portfolios.

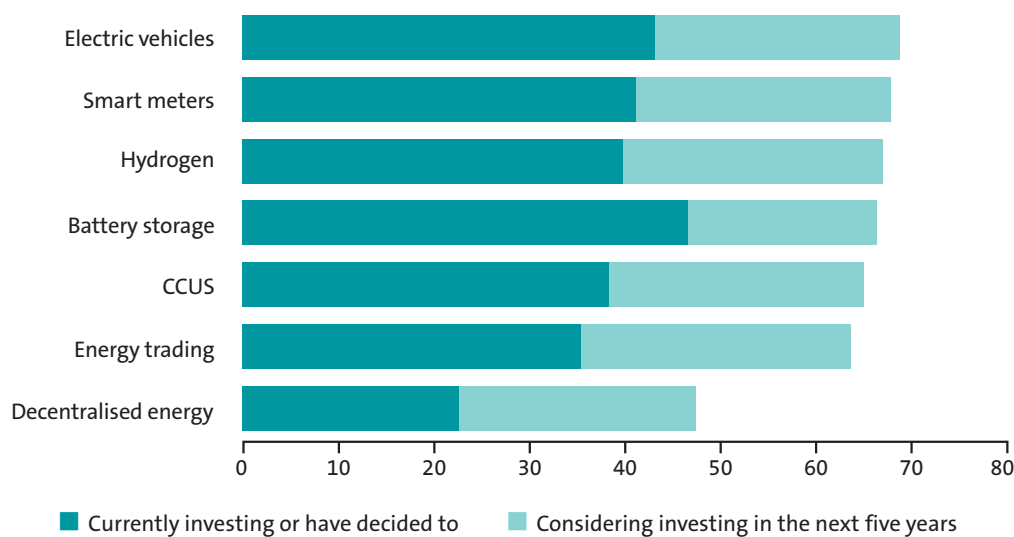
Nearly half of our respondents said they were currently investing or were committed to investing in battery storage, which is the highest level of support out of all the decarbonisation technologies researched (see graph 10). This likely reflects that the role of battery storage in current energy systems is well understood, compared to other decarbonisation technologies, the role of which, in many cases, is still being developed.

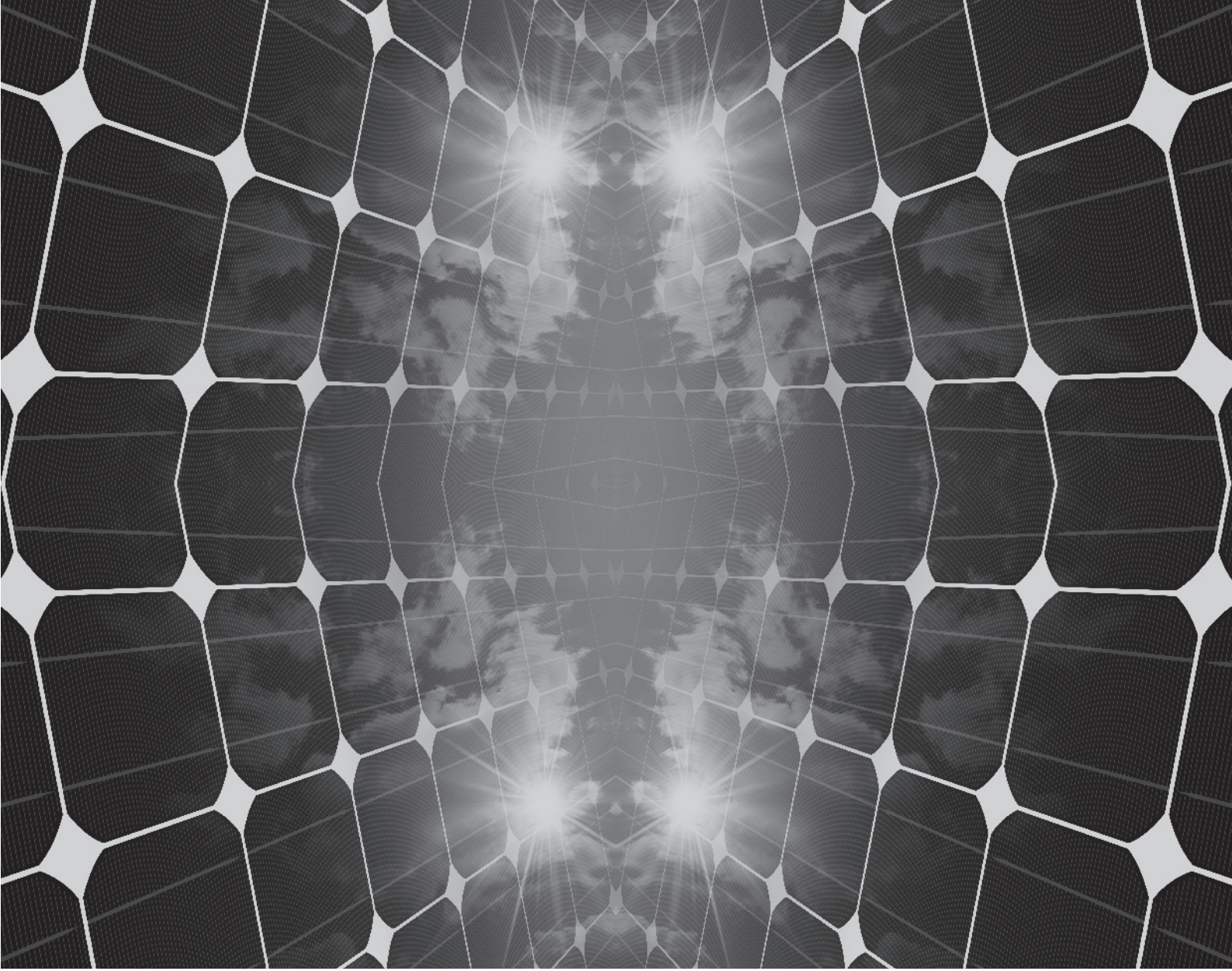
Executives in India were the most likely to have already invested or decided to do so, followed by those from Argentina and China, likely due to the instability of the grid in India and Argentina. In contrast, respondents from Saudi Arabia and Turkey ranked lowest for their current commitments to battery storage investments.

Showing additional interest in the longer term, a further 19% are considering such investment over the next five years. Executives in Saudi Arabia, South Africa and Turkey ranked highest for those considering investing in battery storage over this period.

Overall, executives in India, Indonesia and Argentina were the most confident about their country being fully prepared to adopt battery storage, with executives in the United Kingdom, Saudi Arabia and France showing the least confidence.

Graph 10 | Favoured decarbonisation technologies





LOW-CARBON TRANSPORT REVOLUTION IS ON THE WAY

The second most favoured decarbonisation technology in our analysis is electric vehicles, where 43% of respondents have invested or decided to invest, and a further 25% are considering doing so. This is a relatively high figure given the current low penetration of electric vehicles and can most likely be explained by the fact that across the world, transport, following in the footsteps of electricity generation, is set to undergo a rapid decarbonisation revolution. This is set to increase demand for electricity, while batteries in the vehicles can also help grid stability by providing a source of energy storage to the grid when they are connected and charging.

It is generally accepted that global growth in electric vehicles will follow an upward curve, accelerating over the coming decade. However, government policy will play an important role in what can be described as a chicken and egg situation – the fact that drivers are unwilling to make the switch unless charge point infrastructure is readily available, while the private sector is unlikely to invest in charge point infrastructure (in the absence of government backing) until there is a critical mass of electric vehicle ownership.

Therefore, governments must lead by formulating incentives to accelerate the switch to electric vehicles while at the same time playing an active role in the roll-out of charge point infrastructure.

Our research also shows high proportions of executives believe their countries are fully prepared for the transition to electric vehicles, with confidence highest among the respondents in G20 countries in Asia-Pacific, Latin America and North America. Some 64% of executives in India consider their country to be fully prepared for the electric vehicle revolution, followed by Mexico (54%) and Indonesia (47%) – although this may be due in part to the fact that their countries have less ambitious targets than some developed nations.

BUSINESSES WANT SIMPLICITY AND CREDENTIALS

A massive 84% of our respondents in G20 countries in each of Asia-Pacific and Latin America said that investing in the energy transition is essential to their strategic growth, as well as 82% in Western Europe. This shows they see energy transition investments as key, so it is worth looking at where this money will go.

The three decarbonisation technologies that ranked strongly among respondents in these regions were battery storage, electric vehicles and smart meters. Hydrogen and energy trading also performed well, but they polled lower than the three technologies identified above – likely because they are still maturing and have not yet captured executives' attention. In both decarbonisation and renewable technologies, respondents are understandably favouring proven technology.

WIDESPREAD INTEREST IN MOST TECHNOLOGIES, EXCEPT DECENTRALISED ENERGY

There is solid interest in most of the decarbonisation technologies we surveyed, with between 63% and 67% of executives polled having either invested, planned to invest, or would consider investing in the following technologies: battery storage; carbon capture, utilisation and storage ("CCUS"); energy trading systems; hydrogen; electric vehicles; and smart meters. This gives us confidence that there is market interest in a range of technologies which will help drive the energy transition.

The only outlier here is decentralised energy systems (48%), which we do not see as a surprise given such systems are traditionally installed at community level. As the name suggests, decentralised energy systems encompass a range of energy solutions which are deployed at a more local level, and include onsite combined heat and power; and low-carbon heat, in the form of hot water or steam, from the point of generation (usually an energy centre) to the end user through a local pipeline system.

As such, they are of comparatively marginal interest to individual businesses surveyed, as they do not necessarily appear to present large-scale opportunities. However, they may be of greater interest outside of the G20 where grid stability and availability is more of an issue, or by different investor groups (i.e. those which manage smaller investments).

Moreover, the requisite scale of opportunity may present itself in the future in jurisdictions such as the United Kingdom, where heat networks currently play a marginal role (particularly when compared to countries such as Germany) but may be adopted on a large-scale as part of the UK Government's strategy to decarbonise heat.

HYDROGEN GAINING MOMENTUM

It is also worth honing in on hydrogen as, until recently, it was a relatively ignored technology in comparison to others. While still a nascent technology, interest in it is gaining momentum. Hydrogen has the potential to replace natural gas in a number of sectors where decarbonisation would otherwise be challenging. However, to produce "clean" hydrogen, using electrolyzers, fuel cells and hydrogen production with CCUS, an economy of scale is required to reduce costs.

To use the United Kingdom as an example, clean hydrogen could replace natural gas for heating and other domestic and commercial/industrial applications, but as this would require some changes to the current gas distribution and transmission network, as well as gas appliances, industry has been calling on the government to provide a clear policy direction, to facilitate the scale of investment that will be required to implement the roll-out of clean hydrogen.



In both decarbonisation and renewable technologies, respondents are understandably favouring proven technology





Regional insights

We have seen so far that there are a variety of ways for companies to invest in the energy transition. These strategies will depend on the political, economic and social background of the countries and regions in which these businesses operate, which we explore in this section. To start, we look at three overarching trends that unite the regions.



COMPANIES FOCUS ON THE AREAS THEY INFLUENCE

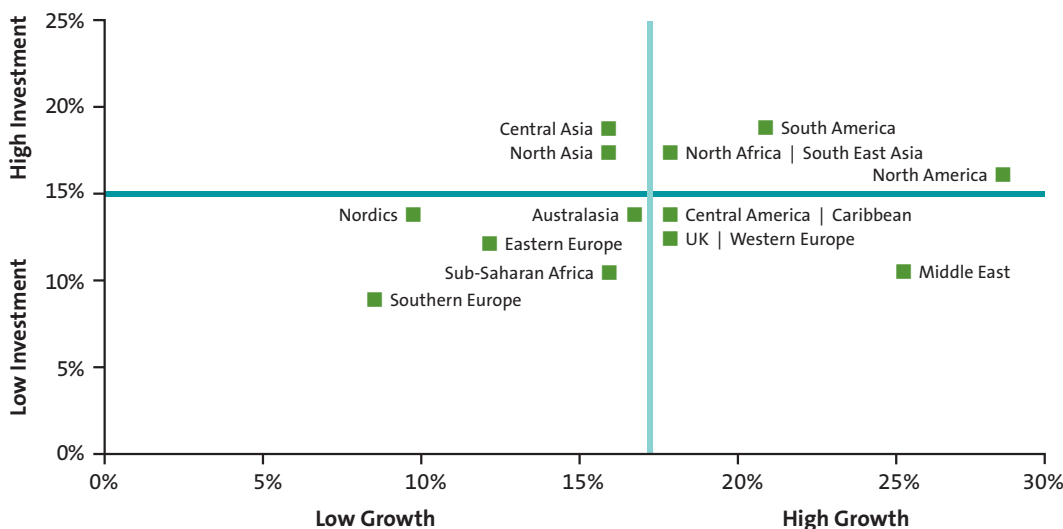
There are many different interpretations about what the energy transition means. But what we see globally is respondents focused on aspects of the energy transition they can materially influence.

As well as energy conservation and efficiency, this means implementing renewable power technology, energy storage, and energy efficient buildings and infrastructure.

Globally, they focused less on the practical engineering challenges of making this transition, with decentralising the grid, CCUS, hydrogen development and changing consumer habits ranked with lower priority in the energy transition. This is understandable given they can do little to influence these solutions directly, but it might also breed complacency that solutions to the energy transition sit with others.

Finally, 83% of executives recognise the need to keep adapting their strategies for investing in the energy transition. It is reassuring that this is a business priority, and 62% worldwide expect the pace of investment to increase over the next 12 months.

Graph 11 | Regional investment hotspots



LEADERSHIP FROM GLOBAL CORPORATE POWERHOUSES

We noted earlier that 86% of respondents from large businesses believe investing in the energy transition will be essential to their growth, compared with 71% at smaller companies. The differences between these groups extend further and were evidenced worldwide.

81% of executives from large companies said their business had changed their investment strategy in the last 12 months to prepare for the energy transition and would continue to do so, while only 63% from smaller companies could say the same.

This is likely to reflect the fact that large corporate players are currently attracting more pressure from stakeholders, but we see in our research that many smaller businesses are looking to catch up: 16% of executives from smaller businesses said they hadn't yet adapted their strategy but planned to do so in the next 12 months or longer-term, compared to 7% at larger businesses.

In total, that means that 88% of executives from larger companies are looking to change their strategy, whether or not they have done so before now, compared with 79% of executives at smaller players.

However, a notable minority of our respondents from smaller companies said they do not plan to adapt further for the energy transition: 20% of them said they had adapted but would not adapt further. Larger companies are clearly facing more pressure to take action and to justify their "licence to operate" – both in terms of their shareholders but also the public at large, as well as regulators.



81% of executives from large companies said their business had changed their investment strategy in the last 12 months to prepare for the energy transition



CONSERVATIVE THINKING PREVAILS WORLDWIDE

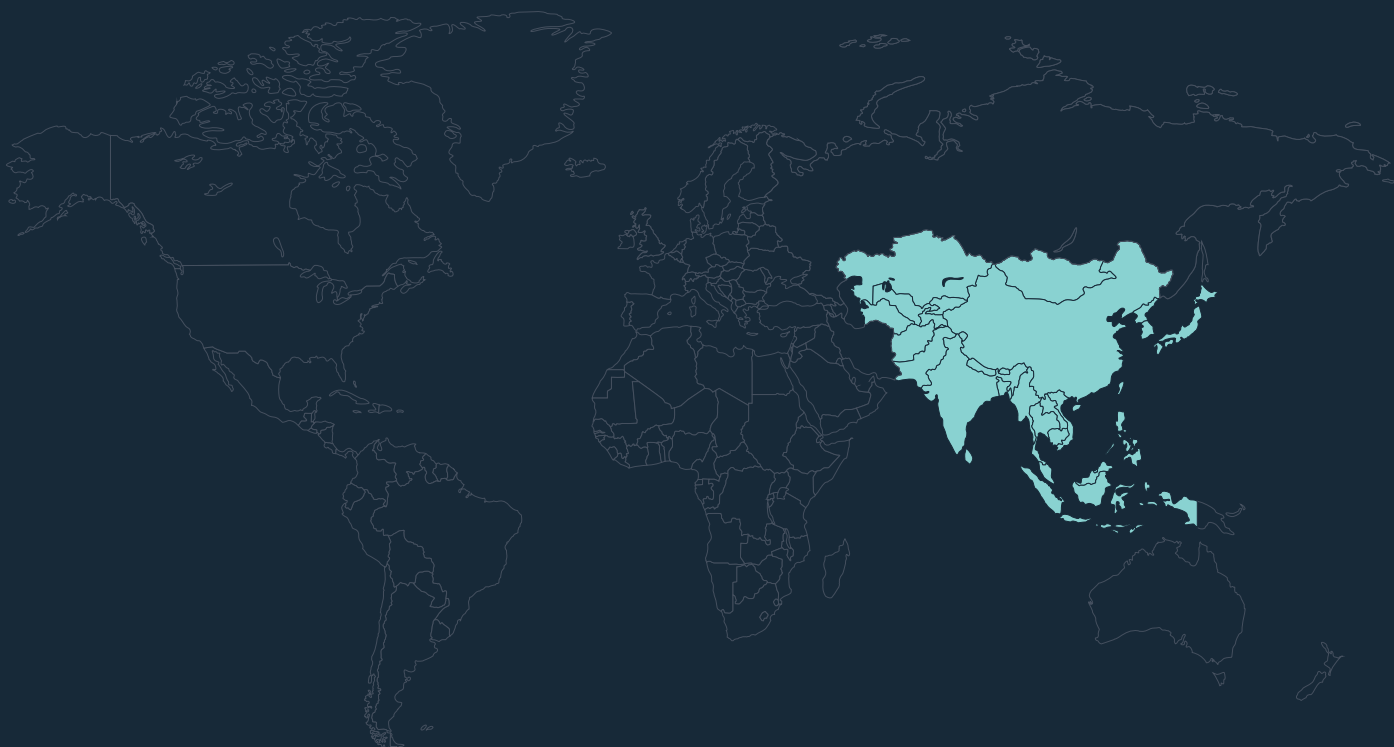
Proven technology is seen as the main driver of the adoption of the energy transition for companies across the world. This ranked higher for companies than having the corporate opportunities, in terms of M&A and equity capital markets, or the presence of incentives or subsidies. We see this as revealing.

First, it shows that while companies are aware of the importance of adapting their investment strategies for the energy transition, they are also looking to play it safe. The lack of willingness to invest in unproven technologies is sensible from a risk management perspective, but it may mean the energy transition is slower than needed.

It also shows that the companies investing in developing these technologies will need to convince others that may not be energy experts about the efficiency of renewable power generation and other decarbonisation technologies. This will unlock both early-stage venture capital investment and later-stage institutional investment which is needed to make new technology commercially viable.



Asia



The picture across Asia is a mixed one. On the positive side, China is the largest country in the world for installed wind and solar farms, with a combined capacity of more than 400GW, together with some 360GW of hydro. Asia also hosts two more of the top five countries for installed wind and solar capacity, being India (62.5GW) and Japan (59GW).

But this does not tell the whole story. Despite China's high levels of renewable generation capacity, as the top consumer of fossil fuels globally, the country has a long way to go in terms of decarbonising its energy system. A similar comparison can be made for India. This contrast highlights the need to contextualise each country's progress to ensure the effectiveness of the energy transition, both within Asia and globally.

Additionally, there are signs in some markets of a slowdown in renewables growth, in part due to changes in the levels of support. The introduction of competitive auctions for wind and solar in India have slimmed profit margins, slowed development, and mean the country is

likely to miss Prime Minister Narendra Modi's goal to reach 175GW of installed wind and solar capacity by 2022. It is expected to come in closer to 100GW.

There is a chance this may also happen in China, which has brought in auctions for solar and is also considering them for wind from 2021. The government's renewable power investment plan also appears to be taking a back seat as it seeks to stabilise a slowing economy and continues to fight trade tensions with the United States.

And earlier this year, partially in response to the capacity deficit caused by a reluctance to restart nuclear reactors following the Fukushima disaster, the Japanese government set out plans to invest in building 22 coal-fired power stations over the next five years. Many countries in Asia will continue to have a strong reliance on coal for baseload power generation.

Japanese respondents identified a number of barriers to investment in the energy transition, with the top four barriers being: lack of infrastructure (42%); technical risk (35%); lack of commercial incentives (35%); and lack of information available to inform decision-making (33%).

However, there are still bright spots in Asia for investors in the energy transition.

ASIA POISED FOR OFFSHORE WIND BOOM

All our respondents in Asia said solar and onshore wind were in their top four investments in the energy transition now, with hydro also featuring highly, but in the next five years they expected this focus to shift towards offshore wind, biomass and energy from waste. Many sponsors, contractors and funders are looking to export their European experience to the Asian market.

China has already developed significant offshore wind capacity and is expected to overtake the United Kingdom as the largest offshore wind market globally by installed capacity in 2022, while Taiwan is one of the most exciting emerging markets in offshore wind for investors from around the world and a number of large offshore wind farms now under construction have successfully reached financial close. The re-election of Taiwan's president Tsai Ing-Wen in January means it is now targeting 15.5GW offshore wind by 2035.

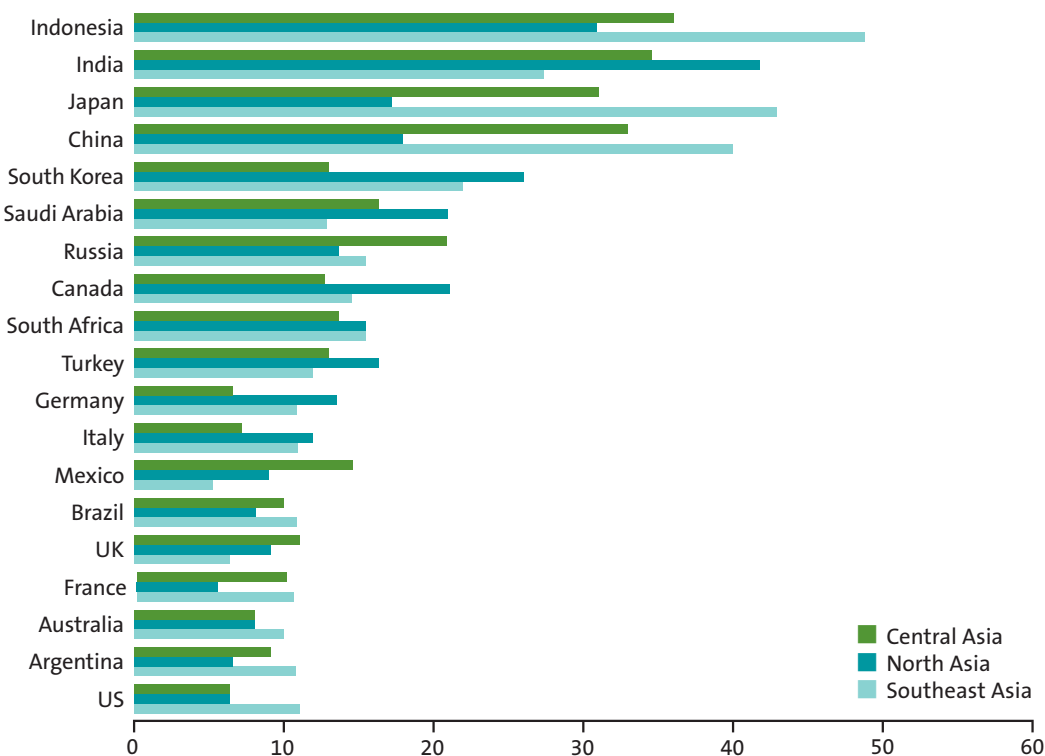
Our research shows 37% of executives polled in China are currently investing in offshore wind and an additional 33% are considering investing in the next five years. We also saw 35% of executives in India are currently investing in offshore wind, and 44% are looking to do so in the next five years, showing a potential uptick in this market.

There is also Japan, where the offshore wind investment market is set to open up as the country puts in place a regulatory framework and auction process to facilitate development in the open sea beyond ports and harbours. Additionally the increasing maturity of floating technology offers interesting possibilities in Japan given the characteristics of the surrounding seabed.

Our respondents also identified the emergence of Southeast Asia as an investment market. This is the main target for investment in Asia-Pacific now and in the next five years, with 53% of respondents in the region naming it as a target. This will include Indonesia, where 82% of our respondents in the country said there is extreme political pressure to invest in green technologies, as well as the fast-growing Vietnam.

There is also a real sense of overall optimism by respondents in the region. Across Asia-Pacific, two-thirds of respondents expected a rise in the pace of investment in the energy transition at their organisations. This is more positive than other regions surveyed.

Graph 12 | Current investors in Asia



Australia



Discussion around investment in the energy transition in Australia is far from easy. Renewable power generation has been a polarising political issue in the country for most of the last decade and has been a key factor behind several changes in the federal government.

Australia has experienced a significant increase in the number of renewable energy projects connecting into the National Electricity Market (“NEM”) since 2015 (in addition to high levels of rooftop solar penetration). Despite this, the federal government is considering supporting the development of a new coal-fired power station in northern Queensland. Gas has largely been underutilised as a transitional fuel source due to sustained periods of high gas prices (caused by tight supply conditions partly due to moratoriums on new onshore exploration in some states).

The influx of renewable power generation has led to technical challenges for maintaining power system security as traditional synchronous generation is replaced by asynchronous renewable generation. As more projects seek to connect to the fringes of the grid, there has been a decline in marginal loss factors which directly impacts the financial viability of existing and future projects.

Additionally, system strength issues are affecting the development, commissioning and operation of renewables projects around the NEM, but in particular, in north-west Victoria and south-west New South Wales. These issues remain a key concern of developers, investors and financiers.

Energy storage has been proposed as a key part of resolving these technical challenges, but the technology remains in the early stages of deployment across the NEM. Most battery projects to date have required some level of government support to proceed, and there is no settled commercial model for battery projects yet (e.g. spot price arbitrage or participation in ancillary services markets, or a combination). It will be important for contracts to remain sufficiently flexible to enable full use of the services that can be provided by batteries.

A number of significant regulatory reforms have been developed to assist the transition of the NEM, from the introduction of new system strength requirements and a retailer reliability obligation, to a proposal to better coordinate generation and transmission investment and a review of the design of the NEM after 2025. Many of these reforms are a key concern of developers, investors and financiers. An important feature of the offtake agreements for projects that have been banked and developed has been the inclusion of robust change in law mechanics and the ability to extend key dates if technical issues are experienced during commissioning.

POLITICAL DIVISIONS AFFECTING INVESTMENT

Australia has the lowest proportion of companies that have updated their strategy in the last 12 months for the energy transition – 71% compared to a global average of 88% – and 43% expect their investment in the energy transition to stay at the same level or slow, compared to 38% globally.

In response to questioning about whether the country is fully prepared for the energy transition, Australian respondents were mainly negative. Even in battery storage, where Australia is a world leader, only 47% consider the country to be fully prepared to develop and adopt the technology. Energy storage is also the top descriptor of what the energy transition means to our respondents in Australia, followed by efficient buildings and energy conservation.

Overall, lack of government support is seen as the largest barrier to investing in the energy transition among Australian respondents. A lack of information to inform decision-making and initial capital were also key barriers.

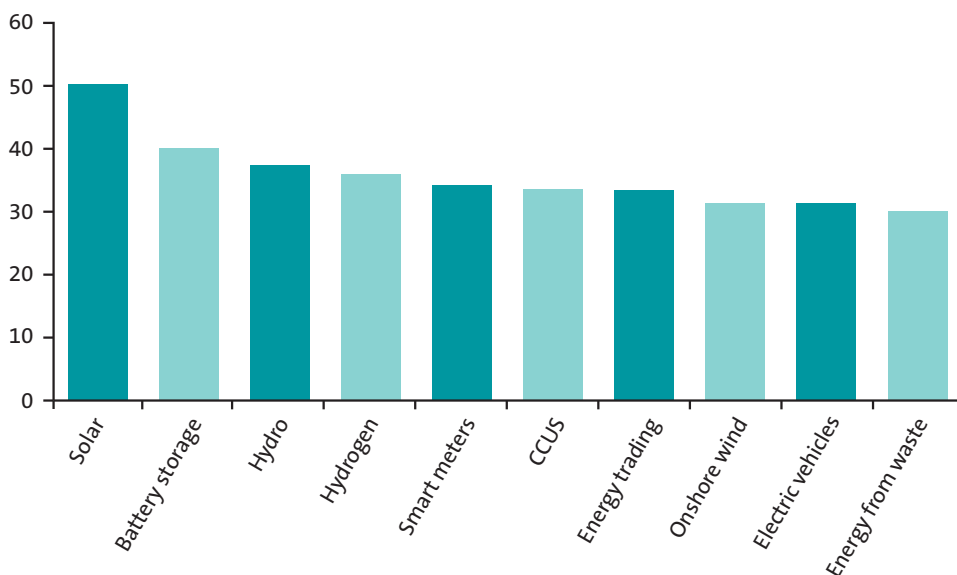
This, however, does not tell the full story. Political support for investment in the energy transition is seen as the second-highest driver for investment, after proven technology. The message from Australia appears to be that you are either strongly in favour of the government or strongly against it.

Despite these challenges, investment in renewable power projects has picked up in recent years. More than 2.3GW of renewable power capacity was completed in 2018 followed by 6.3GW in 2019. This is a significant increase from the Abbott years.

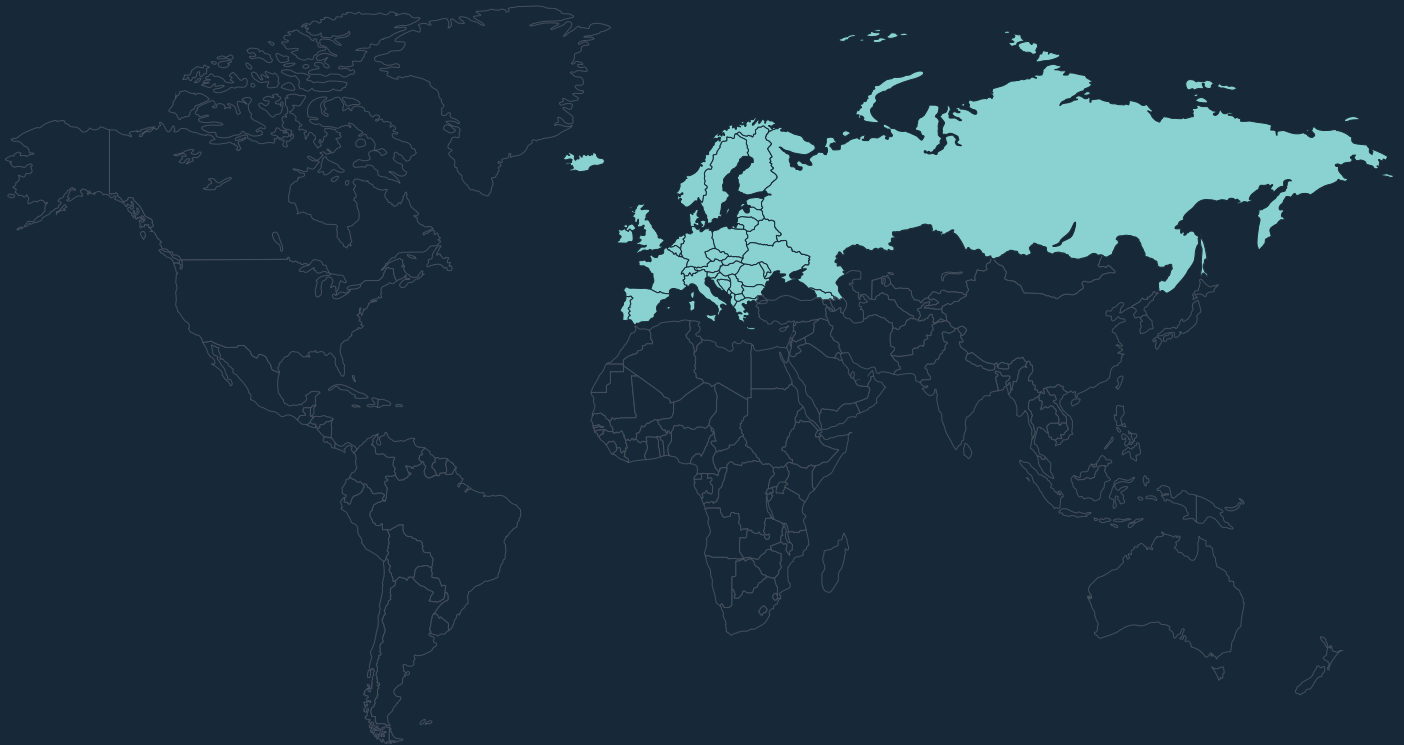
This has proven attractive to our respondents in the country, with 53% of executives saying they were currently investing in their home region. This is more than double the rate of their next most favoured region, the Middle East, and three times higher than North America.

However, in terms of inbound investment to Australia, including the wider Australasia region, only 17% of respondents across the G20 said they were investing, led by India, Saudi Arabia and Turkey. This reinforces that activity in the region is likely to be predominantly driven by domestic players.

Graph 13 | Most favoured energy transition investments in Australia



Europe *including United Kingdom*



“This is Europe’s man on the moon moment.”

It was with this phrase that European Commission president Ursula von der Leyen revealed plans for a European Green Deal to make the continent carbon neutral by 2050, which will require the mobilisation of investments worth €1 trillion by 2030. This is an extra €260 billion per year on top of existing plans to fund the energy transition.

This makes it interesting to look at investment flow as we enter the 2020s, and as negotiations continue between the European Union and United Kingdom over a free trade deal.

The United Kingdom is the second lowest region for new market investment by European companies in the next five years, with just 10% of executives who do not currently invest in the region planning to do so. Ongoing uncertainty over the political and economic situation in the United Kingdom has hit the attractiveness of the country as an investment location. For example, only 12% of respondents in Germany said they are currently investing in the energy transition in the United Kingdom, with figures also low in France and Italy.

By contrast, 64% of United Kingdom respondents said they were investing in their home market.

Our research identifies some interesting trends among European executives about the importance of the energy transition and the role of governments in driving it.

A large majority of respondents in Continental Europe see investing in the energy transition as key to their strategic growth, for instance by respondents in Italy (88%), France (85%) and Germany (81%); somewhat higher than in the United Kingdom (73%). Respondents across Europe say there is extreme or significant pressure to change, with 77% in the region saying so, including Russia.

However, this importance is not reflected in the investment plans of companies in the region. Overall, only 46% of respondents from Western Europe expect to grow investments in the energy transition over the next five years, with France, Germany, Italy and the United Kingdom each polling between 42% and 50%. There is pressure but many companies are resisting it.

GOVERNMENTS SEEN AS THE BIGGEST DRIVER

While utilities and manufacturers in Europe have made strides to make renewable power generation commercially competitive with fossil fuels, our respondents said there is still a big role for governments to drive the energy transition. Some 73% of executives polled in Western Europe recognised governments as the biggest investors in the energy transition, which is just ahead of corporates at 72%.

This indicates there is tension about the role that governments should play.

While countries including Germany and the United Kingdom have been cutting back on centrally-determined government subsidies for sectors including wind and solar, other energy transition industries also rely on governments to set ambitious renewable power policies and remove bureaucratic barriers. It is not an easy balance to achieve.

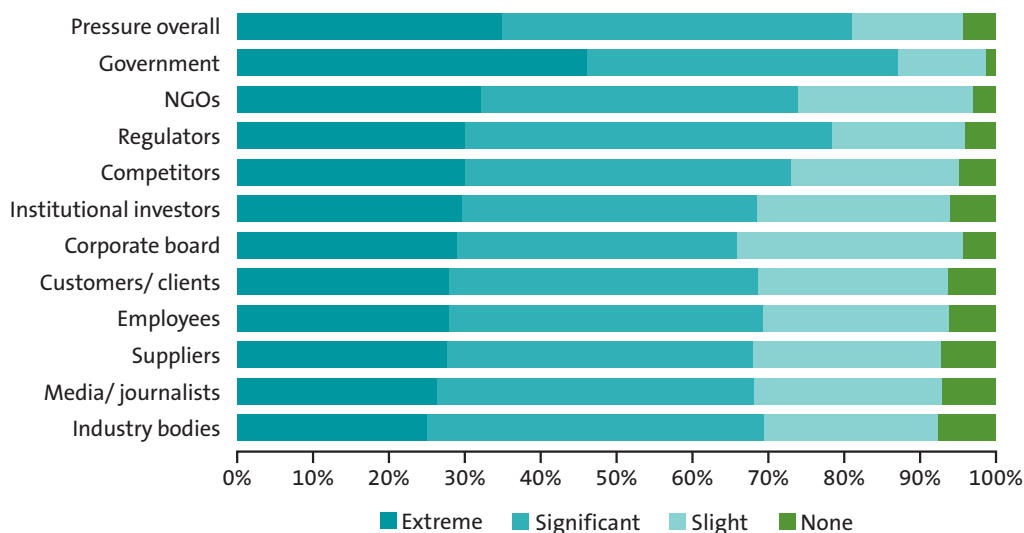
In addition, the barriers to investment vary by market. Lack of commercial incentives is a key barrier in Germany and the United Kingdom, as is the access to capital.

The costs of transactions are significant barriers for executives in France and the United Kingdom; the lack of government support matters most in Italy; and lack of information for decision-makers is a big challenge in France. This highlights the different drivers for investors in each of these countries, but overall the dominant theme appears to be that across Europe there is consensus that clear and strategic government policy is required to back the technologies that are to be taken forward by the private sector.

In terms of investment sectors, offshore wind will remain important as developers and utilities increasingly move beyond the North Sea into other regions such as the Baltic Sea, the Irish Sea, the Mediterranean, and some parts of the Atlantic.

Furthermore, we expect to see European renewables giants expanding in other technologies too.

Graph 14 | Biggest pressures for the energy transition in Western Europe



Latin America



Increased levels of deforestation in the Amazon have drawn further attention to the climate policies of Brazilian President Jair Bolsonaro. But this does not appear to be dampening appetite for renewables, as the Brazilian government awarded support to 1GW of wind, 530MW of solar, 445MW of hydro and 229MW of biomass in a 3GW energy auction in October 2019.

Brazil is the third largest in the world by installed renewable energy capacity, which is largely due to the hydro plants which make up 65% of its energy mix.

Meanwhile, the momentum behind the renewable power revolutions in Argentina and Mexico is at risk of slowing. Mexican President Andres Manuel Lopez Obrador upended a renewable energy support scheme in late 2019, while solar and wind developers in Argentina have been putting developments on hold due to problems securing capital.

Yet compared with other countries in the G20, our respondents in Latin American countries still believe that implementing renewable power projects is a key part of the energy transition: 44% in Mexico and 42% in Brazil, which put both in our top five. Energy storage and energy efficiency are also the main areas of focus.

Though outside the G20, Colombia, Chile and Peru are important countries to note in the context of the energy transition in Latin America.

Late in 2019, the Colombian government set a goal of achieving a total renewable energy output of 2.2GW by 2022 (up from 1.5GW, the previously set goal), and has launched an ambitious programme to develop solar and wind plants in the country.

Chile is still one of the most attractive emerging countries in the world for investing in renewable power generation, and it remains committed to gradually getting rid of carbon-emitting energy sources. It also has laws and policies in place providing substantive incentives to investors in solar and wind power.

Peru is also working on improving the regulatory framework in order to incentivise foreign investment in the development of renewable power generation in the country, although this process has been slowed down due to political instability.

Given the political upheaval we have seen, it is perhaps no surprise that 83% of the executives we spoke to in Latin America said they had changed their investment strategy for the energy transition in the last 12 months, and would continue to do so. 74% of respondents in the region expect investment in the energy transition to speed up in the next 12 months.

Overall, the pressure to engage in the energy transition in Latin America is high. A huge 93% of respondents in Argentina said the pressure is either extreme or significant, followed by 85% in Brazil and Mexico.

There are currently high levels of investment in established renewable power generation sources, with 66% of respondents in Brazil saying they are investing in onshore wind, solar or both; 64% in Argentina investing in onshore wind; and 64% in Mexico investing in solar. These established technologies are expected to be some of the main drivers of the energy transition (48%), as well as the availability of incentives and subsidies (37%).

We saw great interest in future offshore wind investments too. Some 81% of respondents in Argentina said they are investing in offshore wind, are committed to, or would consider doing so over the next five years. The figure in Brazil is 70%. In addition, 75% of respondents in Latin America are investing in, have committed to invest in or would consider investing in battery storage over the next five years.

INWARD INVESTMENT FROM NEW ENTRANTS

The main investor types our Latin American respondents see as investing in the energy transition are new entrants, oil companies and renewables funds. The interest from the so-called new entrants is particularly striking, and is likely to reflect the growing interest in renewables in the region on the world stage. For example, new entrants are the main investor in Argentina, reflecting the huge support for renewables under the previous government.

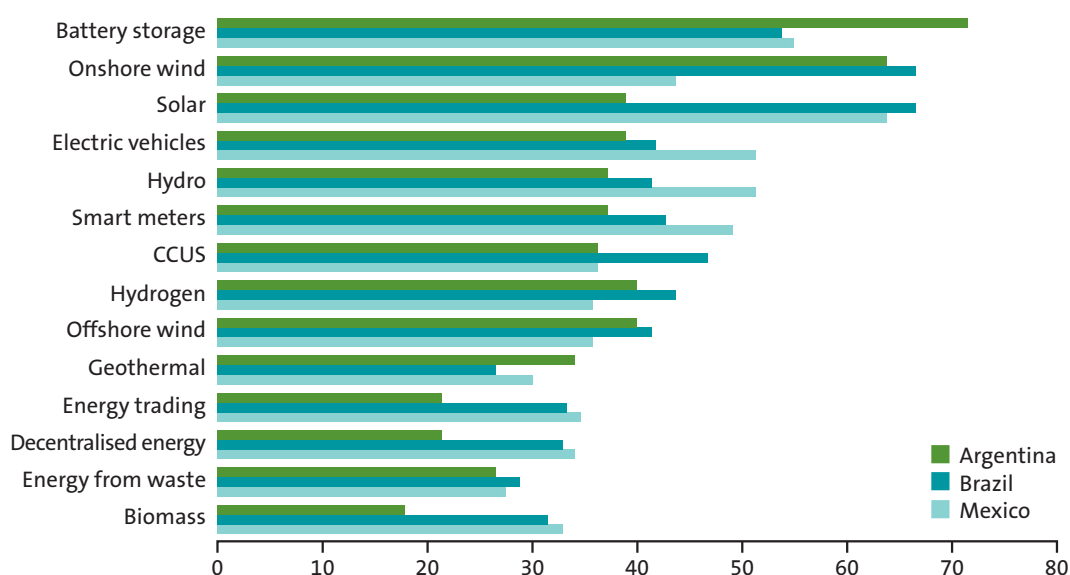
New entrants and renewables funds are the most active in Brazil, while the government and private equity are major players in Mexico.

The main barrier to investment in Latin America is transaction costs, with 37% of respondents in the region picking this as the top obstacle. Other important barriers are regulations, lack of government support, and technical risk. Mexico stands out, with competition and access to initial capital two further notable challenges.

While we expect investors in Argentina, Brazil and Mexico to face political challenges in the coming years, we see reasons to be positive about them all.

As a broader destination investment region, South America is expected to be a leading growth region for new renewables investment from across the G20 nations with nearly a fifth of respondents saying they expect to invest there within the next five years.

Graph 15 | Most favoured energy transition investments in Argentina, Brazil and Mexico



Middle East and North Africa



The Middle East has long been a global oil and gas powerhouse. This means a worldwide shift towards the use of low-carbon energy sources in homes, industry and vehicles, posing a unique challenge for the region, and the wider Middle East and North Africa (MENA) region.

It is also important to note that there is a huge dependence on desalination to meet water demand in the region, which drives up energy consumption. The demand for both power and water continues to rise, however there has been little focus on energy efficiency to date.

Nowhere was this risk better demonstrated than in the statement from Mohammed Barkindo, secretary general of the Organisation of Petroleum Exporting Countries, who called climate activists “perhaps the greatest threat to our industry” in 2019.

The MENA region’s strong connection to its oil and gas resources is reflected in our research, which suggests the energy transition is less of a focus in the Middle East, despite pockets of activity in countries including Egypt, Jordan and Morocco; and increasingly ambitious statements on renewable power from the Saudi Arabian government, which is targeting 58.7GW of renewables by 2030.

Only 18% of executives in the Middle East currently invest, have committed to invest or are considering investing in the energy transition in the Middle East in the next five years. A larger proportion of these executives (37%) are looking at North Africa, which is a reflection of the more advanced wind and solar markets in Egypt and Morocco.

Respondents in the region reported a lower number of drivers to invest in the energy transition compared with other parts of the world. Availability of developments and corporate opportunities were the biggest drivers, although there was a very even spread across all of the drivers we considered.

Finally, only 40% expect to see opportunities to invest in the energy transition grow in the next 12 months, which is the lowest globally. This is compared to 50% that expect investment to remain unchanged, and 10% who expect it to slow. We believe this is the result of a combination of the region’s reliance on oil and gas, which still dominates its energy policy, and a lack of government policies on renewables.

MAINTAINING A WATCHING BRIEF

Our results show that 57% of respondents in Saudi Arabia are keeping a close eye on developments, but are not looking to invest yet. The same view is only held by 33% of respondents from Turkey, with a larger 66% of that group seeing investment in the energy transition as essential to strategic growth.

One reason for this in Saudi Arabia might be the government’s history of setting and then backing away from ambitious renewable energy policies. It is risky for investors to pile into investing in the energy transition if those goals may be changed at a later date. Other reasons may include the fact that Saudi Arabia is only a relatively recent adopter of renewable technologies and also has ongoing availability of subsidised or low cost energy from fossil fuels.

The importance of fossil fuel players is borne out in this region. Around half of our respondents in the region said they thought oil companies were investing in renewable power generation.

Of the executives we polled in the Middle East whose companies are investing in the energy transition, solar is their preferred avenue, which is to be expected given the climate in the region.

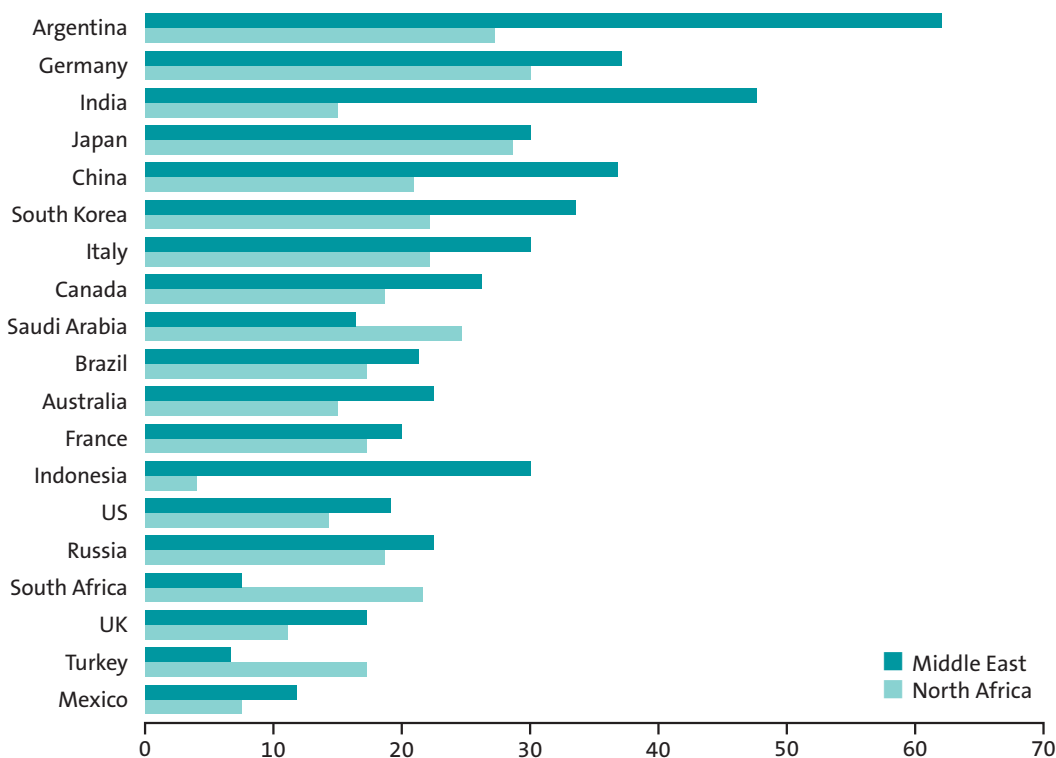
Both the Middle East and North Africa are attractive to inbound investors.

Companies based in Asia-Pacific and Latin America are the biggest investors in the energy transition in the Middle East, with 33% and 32% respectively doing so, according to their executives. A strong showing of European companies (37%) are also currently investing in the Middle East or are considering doing so in the next five years.

Meanwhile, respondents from Asia-Pacific and Latin America also see North Africa as attractive with 35% and 38% respectively currently invested, committed to invest or considering the region in the next five years. This is ahead of those from Europe (32%) and North America (30%).

However, we also know that the Middle East is a strategically important power hub, and so we may see quick shifts in energy transition policies which could significantly alter its current investment course. Moreover, there are some sound economic reasons driving a shift towards renewables in the Gulf oil producing states. As the cost of renewables continues to go down, it makes sense for those regions, which are ideally placed to generate electricity from renewable energy sources, to make the switch from inefficient oil-fired generation. Doing so will allow these oil producing countries to earn more revenue from oil export.

Graph 16 | G20 countries currently investing in MENA



North America



There can be no doubt over President Trump's support for the coal industry since he assumed power in January 2017, but even he cannot hold back the momentum for the energy transition. The improving economics of wind and solar, as well as state and corporate support, are some of the key factors which are driving this.

This has helped to take installed wind capacity to more than 100GW in late 2019; solar capacity to 71GW; and opened up investment in the offshore wind sector in the United States. The country is second only to China in terms of installed renewable power capacity.

In Canada, Prime Minister Trudeau is leading a government which has ended subsidies for fossil fuel companies and is reinvesting in renewable energy. But it has also backed a huge tar sands project in Alberta and other fossil fuel projects. While Canada has 100GW of installed renewables, including 81GW of hydro, its current activity is mixed.

Even so, our respondents in both countries have said they are taking the energy transition seriously – 81% of United States respondents and 71% of Canadian respondents said they have changed their corporate strategy in the last 12 months in response to the need for the energy transition and would continue to change.

MOST NORTH AMERICANS INVESTING INWARDS

Almost half of our respondents in North America (48%) said their company is investing in the energy transition in the region, which is far higher than the investments they are making in the second-ranked Middle East (22%). Their primary drivers for investment are proven technology (37%) and corporate opportunities (31%). Acquisitions of independent developers have been a big factor behind the growth of renewables-focused utilities in the United States since 2018.

The majority of respondents in the United States (60%) are confident their company will increase the pace of investment in the energy transition in the next 12 months. The figure for those we surveyed in Canada came in lower than this, at 49%, and both are below the global average of 62%.

Of renewable power generation sources across North America, solar is the most attractive, with 54% of respondents stating their company had currently invested in it or had committed to do so. This is ahead of hydro (43%), onshore wind (42%) and energy from waste (35%).

It is also worth noting that 33% of those questioned in North America said they had either invested in or had committed to invest in offshore wind. The offshore wind industry in North America is still at a very early stage, with just one 30MW offshore wind farm currently operational, yet there is a strong level of support at this stage in the industry life cycle. The industry is predominantly focused on the east coast, where wind farms can be built with fixed foundations, but floating technology will unlock the west coast.

There is a great appetite from North American executives for decarbonisation technologies too. Half of respondents in the region said they had invested or committed to invest in battery storage (50%), which came in ahead of CCUS (40%), hydrogen and electric vehicles (both 39%). This focus on storage is interesting as it likely reflects the challenges of building a transmission system which takes the renewable power from where it is generated to the large cities that need it. Storage can alleviate that.

TRADE TENSIONS WITH CHINA

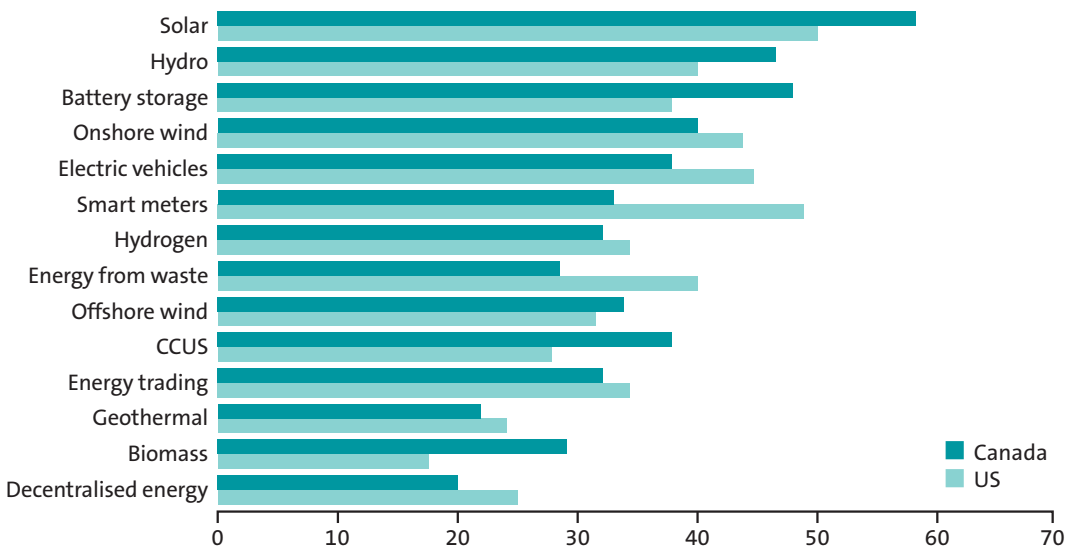
Our research has shown that 34% of Chinese respondents currently invest in the energy transition in North America, but only 12% of those considering new markets expect to invest in the region over the next five years.

More broadly, 28% of respondents from across the G20 said that they were presently investing in North America, making it the most attractive region for current investment in the sector globally. However, that number is also set to slow, with only 16% of participants suggesting that they are considering investments over the next five years.

Any potential reluctance to invest in the energy transition in North America is framed by the ongoing trade tensions between the United States and China, as well as any diplomatic fallout from the COVID-19 pandemic. United States-imposed tariffs on goods such as imported solar modules have to-date pushed production costs higher and discouraged foreign investment in state-level renewables initiatives in California, Texas and other states.

‘Phase One’ of the US-China trade deal may rectify this in part, but these negotiations are ongoing, and uncertainty remains. As nearly half of the world’s investment in renewables is Chinese-backed, continued Chinese support is necessary to accelerate the global energy transition.

Graph 17 | Most favoured energy transition investments in North America



Sub-Saharan Africa



The dominance of state utility Eskom in the South African electricity mix has long been a barrier to the growth of renewable power in the country. Eskom generates around 90% of the country's electricity use, mostly from coal-fired power stations, and tried to stifle the growth of renewables between 2016 and 2018 by refusing to sign power purchase agreements for 2.4GW of renewable power projects.

But there is evidence this is changing. The South African government published its Integrated Resource Plan in October 2019, in which it committed to add 19.4GW of renewable power generation by 2030 – up from 3.9GW – and bring the proportion of coal in the electricity mix down to around 43%. This is an ambitious goal.

We are also seeing wind and solar take off in other countries in Sub-Saharan Africa, including Kenya, where the 310MW Lake Turkana wind farm was commissioned in 2019. Ethiopia, Ghana, Senegal and Tanzania are seeing developments too.

ENERGY TRANSITION AND ENERGY EXPANSION

Our respondents in South Africa have helped shed light on what the energy transition means in this part of the world. In much of Sub-Saharan Africa, the transition is not so much about changing energy sources but in taking electricity to some of the 43% of Africans who do not have access to it. The shortage of existing infrastructure in Sub-Saharan Africa therefore presents some unique opportunities as well as challenges. As identified by the International Energy Agency, a key pre-requisite in Sub-Saharan Africa to the large-scale roll-out of renewables is investment in distribution and transmission grids.

Executives in South Africa predominantly see the energy transition as the electrification of transport (33%), energy storage (31%) and energy conservation and efficiency (29%). In contrast, implementing renewable energy technology polls further down the list, which likely reflects the dominant role that Eskom holds in terms of both power generation and the associated transmission infrastructure.

Only 16% of executives across the G20 said they were currently investing in Sub-Saharan Africa or had decided to invest there, and only an additional 11% are considering investing there in the next five years.

This is likely a reflection of the limited opportunities to invest in projects because of low current demand. For example, Lake Turkana wind farm represents around 18% of the current electricity generating capacity in Kenya, which shows how big a role one project can have on the market. This acts as a barrier to entry for investors.

Respondents in South Africa saw other barriers too, including lack of information to inform decision-making, lack of initial capital, transaction costs and technical risk. This likely reflects emerging legal and regulatory systems in large regions of Sub-Saharan Africa, which increases the risks faced by investors. The successful investors will be those who partner with local infrastructure experts.

This may explain why only 48% of executives expect their investments in the energy transition to grow at a faster rate in the next 12 months. Of those in South Africa that are investing, hydro (43%) and solar (38%) are the most favoured renewable power technologies. In addition, 46% have invested or decided to invest in hydrogen.

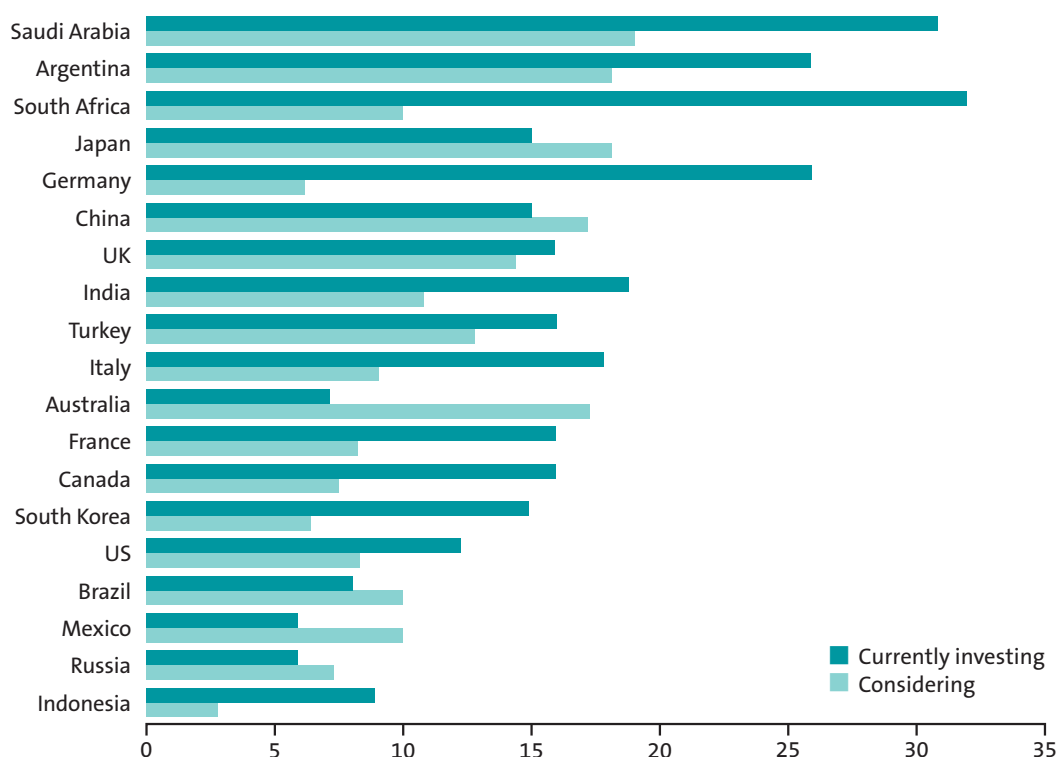
In general, corporates and funds are the most cited as investing in the energy transition in South Africa, well ahead of government. 44% of executives in the G20 see government as a key investor in renewable power generation in their country, but the figure is just 26% in South Africa. This is the lowest in our study; it may change as the Integrated Resource Plan comes into effect, but it is a long way short of the global average.

The South African government is seen as less prepared than the global average for implementing all decarbonisation technologies, except for decentralised energy. This may well be a legacy of problems with Eskom. But our respondents in South Africa do not see themselves as well-prepared for the energy transition either.

Interestingly, several years ago South Africa was somewhat leading the way in renewables procurement, with various rounds of bids successfully financed, though this unfortunately stalled around 2015.

There is still reason to be hopeful. A healthy 68% of South African companies see investment in the energy transition as essential to their strategic growth, and 32% are keeping a watching brief on developments before investing – which, despite the political situation, appears to be optimistic.

Graph 18 | G20 countries currently investing in Sub-Saharan Africa



A low-angle, black and white photograph of several modern skyscrapers with glass facades, reaching towards the sky. The sun is visible in the center, creating a bright lens flare. A teal rectangular box is overlaid on the right side of the image, containing the word "Conclusion" in white text. A thin green horizontal line is positioned below the teal box.

Conclusion

Climate change has become an issue that businesses cannot ignore. It is central to a considered approach to investment and risk management.

The risks to companies of failing to engage meaningfully with climate change grow each year. It will be one of the defining global issues for the business community in the 2020s, and our research gives plenty of reasons to be optimistic.

This research, which is expansive in nature, has shown categorically that the energy transition is not a fad or a piece of political jargon. It is the centrepiece of many companies' global investment strategies and its prominence will keep growing. It is not a green gloss which can be applied to business-as-usual investment decisions.

There are variations in approach, largely driven by differences in geography, industry and technology, which will have a knock-on effect on investment decisions. Nevertheless, businesses are aware they play a key role in helping the world to achieve the energy transition, and their actions are catching up with their words.

At 82%, a majority of respondents said they were under extreme or significant pressure to invest in the energy transition, with 87% stating pressure from governments. This is a structural shift which will not change any time soon.

The latter figure is intriguingly high to us. Globally, we have seen heads of government publicly question the science of climate change and lead parties that are actually doing more damage than good in promoting investment in the energy transition. Therefore the 87% must reflect the fact that there is pressure on businesses from government at every level: from cities, from states, and from opposition parties; echoing the pulse of public sentiment.

In short, the pressures to act are both bottom up as well as top down. And they are having an impact. Respondents told us their investment strategies had changed because of the energy transition and would continue to do so. This gives us the confidence that this resonates with corporate leaders too.

At present, we have concerns there is a lack of a joined-up approach from many governments. This can mean that companies take a scattergun approach but with little long-term direction. More clarity would help investors to make smarter commercial decisions which can unleash the energy transition worldwide.

Our research has shown that companies are ready to invest as long as the conditions are right. They are either actively investing in the energy transition or are considering doing so, and it is rising up their list of priorities. The energy transition will not be easy, but the desire to make it happen is clear. Investing in tackling climate change is going to be a key differentiator for businesses in the 2020s.

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