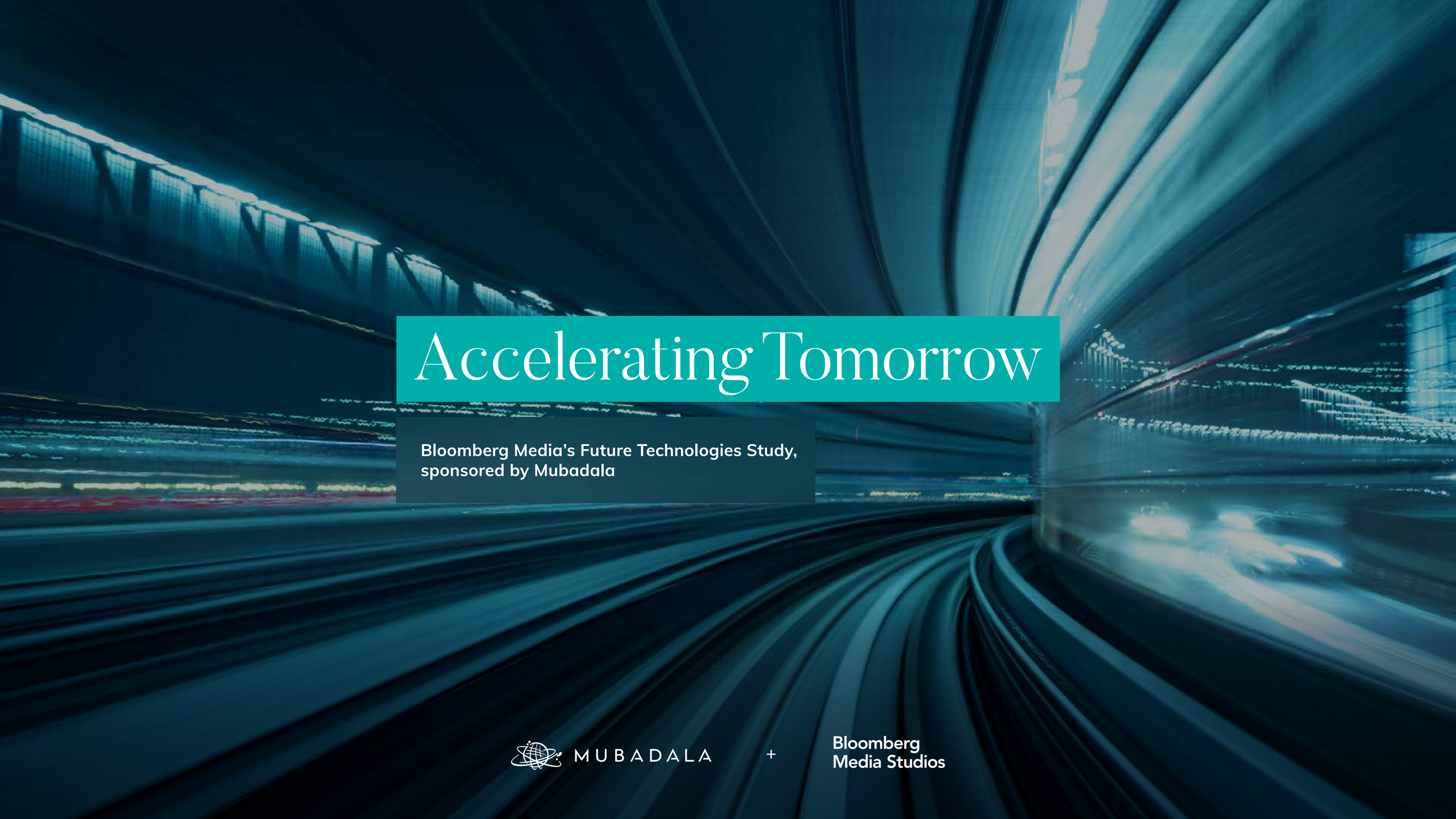


Accelerating Tomorrow

Bloomberg Media's Future Technologies Study, sponsored by Mubadala

MUBADALA + Bloomberg Media Studios

Contents

Executive Summary

Environmental, geopolitical, social, and economic risks are growing across the world.

There is uncertainty and unrest everywhere you turn.

At the same time, emerging technologies are creating opportunities to tackle these global challenges and contribute to a more sustainable world, and investors are taking the lead in driving positive change.

Bloomberg Media's Future Technologies Study, sponsored by Mubadala, explores how investing in emerging technologies contributes to the world's sustainability goals.

We surveyed global investors and venture capital leaders to reveal which emerging technologies are most important to achieving a sustainable future, and to understand the role of investment in accelerating the development of these technologies.

Summary of Findings

Role of Investment

Investors and venture capital leaders agree that private-sector investment is mission-critical to the advancement of emerging technologies. Investment in AI, for example, is viewed as key to accelerating digital transformation.

Investment Priorities

The emerging technologies that hold the most promise for supporting a sustainable future in developed and emerging markets are attracting the most investment.

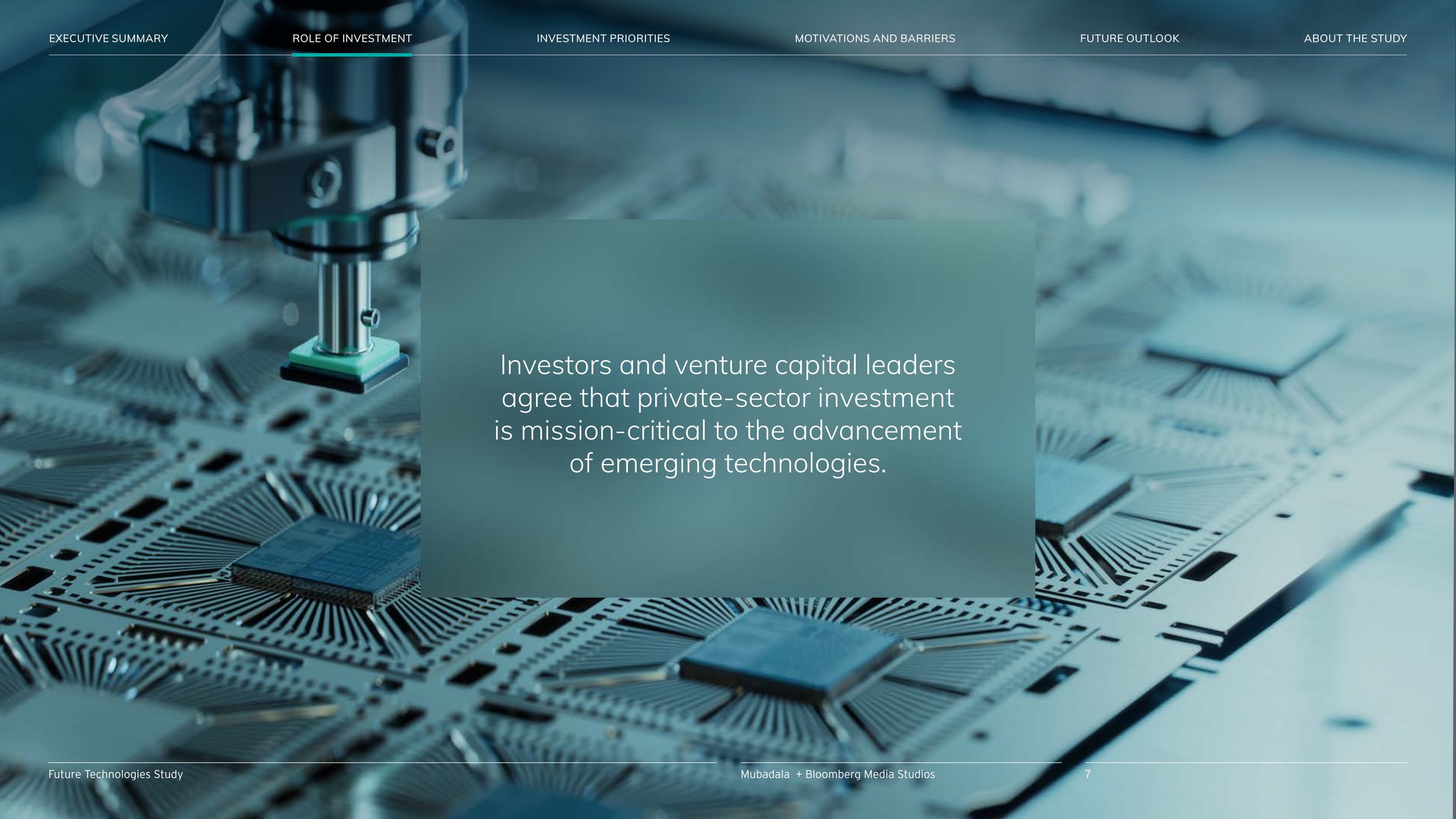
Motivations and Barriers

Industry innovation is the most potent driver of investment, but climate change is also an important motivator. This divergence shows that both investors and venture capitalists are split globally on the best path toward a sustainable future.

Future Outlook

There's strong consensus that a sustainable future is within our reach by 2030, and that technology will play a lead role in realizing this objective.

Role of Investment



Investors and venture capital leaders agree that private-sector investment is mission-critical to the advancement of emerging technologies.

Private-sector investment is mission-critical to the advancement of emerging technologies.

Investment in an emerging techonology...

- **raises its profile**
- **makes it more credible**
- **increases adoption**
- **accelerates its advancement**
- **influences megatrends like climate change**

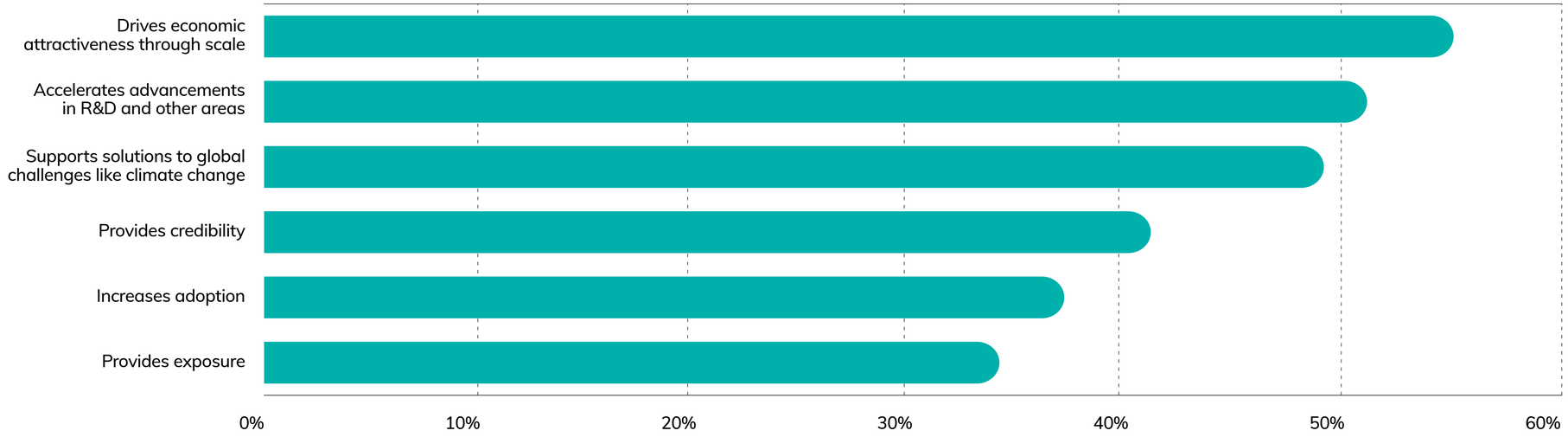
Q22
How much do you agree with the following statements?

Investment increases the value of an emerging technology.

Over half of all respondents agree that investment drives the economic attractiveness of emerging technologies through scale.

Most investors and venture capital leaders also strongly believe that investment helps to accelerate advancements in R&D and other areas, and supports solutions to global challenges like climate change.

Role investment plays in relation to emerging technologies today



Q9

What role does investment play in relation to these emerging technologies today?

As 2030 approaches, investment in emerging technologies will drive economic and social benefits.

Investors

"Investment is essential to widespread adoption and use of innovative and exciting technologies. Investment in these technologies will encourage their ***expansion and promote economic growth and innovation."***

"Investment can play a role in advancing the development of the digitalization process, ***allowing more AI devices to be used in everyday life,*** *relieving the burden of people's daily work and bringing greater economic benefits."*

Venture Capital Leaders

"Investment will be crucial in ***driving the innovation, research, and development of emerging technologies,*** *paving the way for their successful adoption and integration by 2030."*

"Investment is needed to ***fill the gaps*** *between advanced and developing countries."*

"Directing capital flows *toward sustainable industries is critical."*

Q10

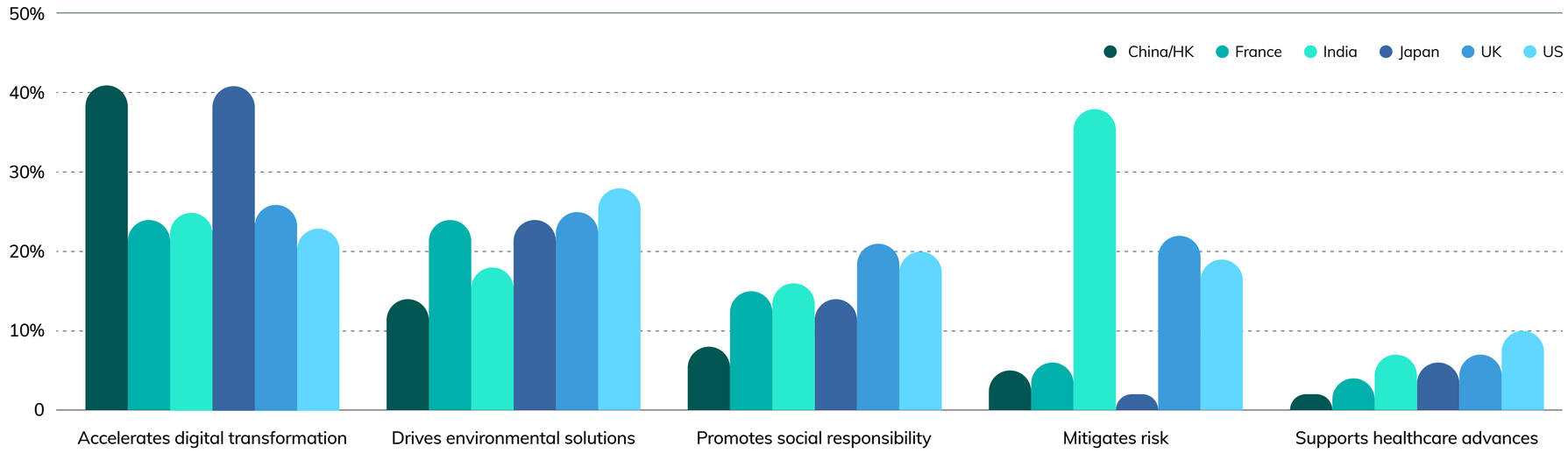
What role will investment play in relation to these emerging technologies as we get closer to 2030?

Specifically, investment in emerging technologies will accelerate digital transformation and benefit the environment.

Across markets, investors and venture capital leaders see investment playing a strong role in supporting digital transformation and environmental solutions.

China/HK and Japan are particularly bullish on the role investment in emerging technologies will play in digital transformation, while India sees it as a way to manage risk, for example, through supporting rigorous vetting, etc.

Role investment will play in relation to emerging technologies as we get closer to 2030



Q10

What role will investment play in relation to these emerging technologies as we get closer to 2030?

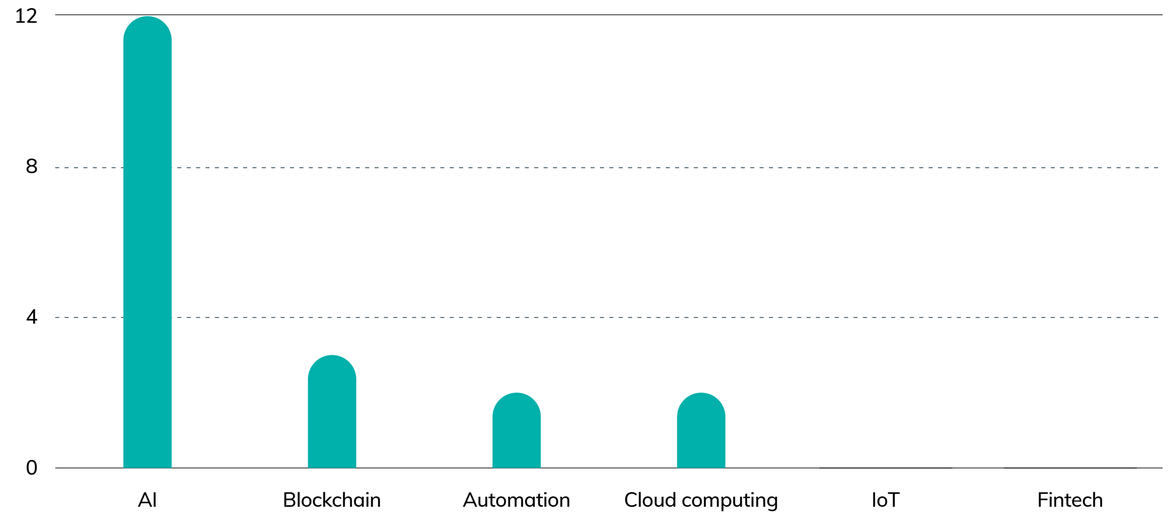
AI is far and away the most important technology for accelerating digital transformation.

Of the respondents who agree that investment accelerates digital transformation, nearly half see AI as the focal point. Other technologies, such as blockchain, automation, cloud computing, IoT, and fintech, score significantly lower in comparison.

"AI and machine learning will play significant roles in numerous fields such as medical care and finance, and will be crucial to future development trends."

— *Investor*

Technologies seen as key to accelerating digital transformation



Q10

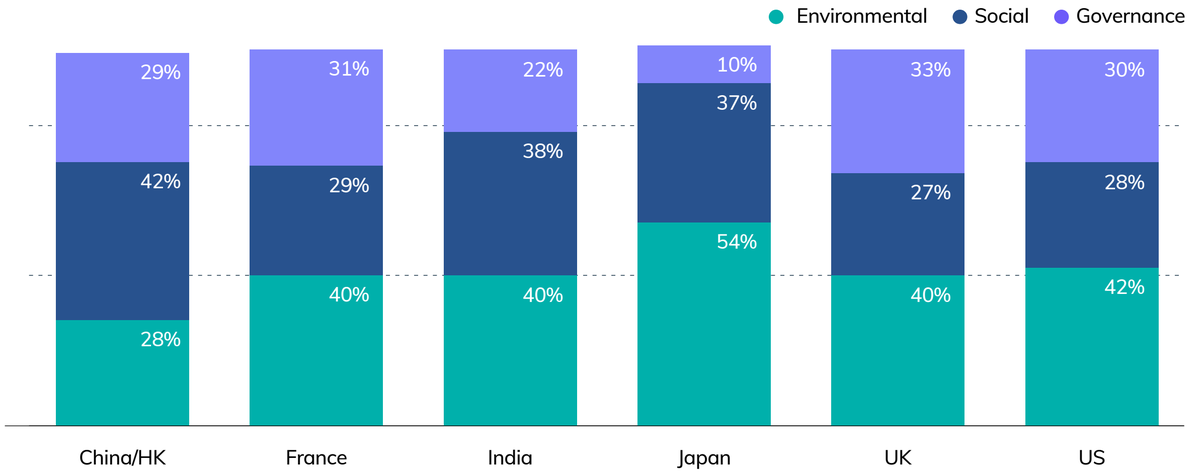
What role will investment play in relation to these emerging technologies as we get closer to 2030?

Investing in emerging technologies has an outsized impact on the “E” in ESG.

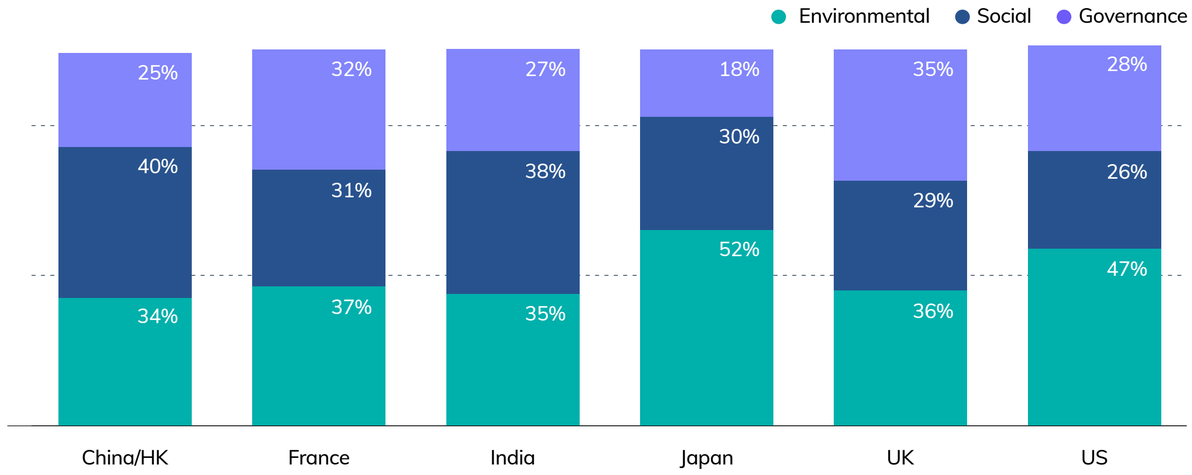
Most investors and venture capital leaders see investment in emerging technologies impacting the “E” in ESG the most, both today and in 2030.

China/HK, however, sees a much greater impact on the “S.” This difference could be linked to China/HK’s focus on the benefits of emerging technologies to society versus the planet.

Today



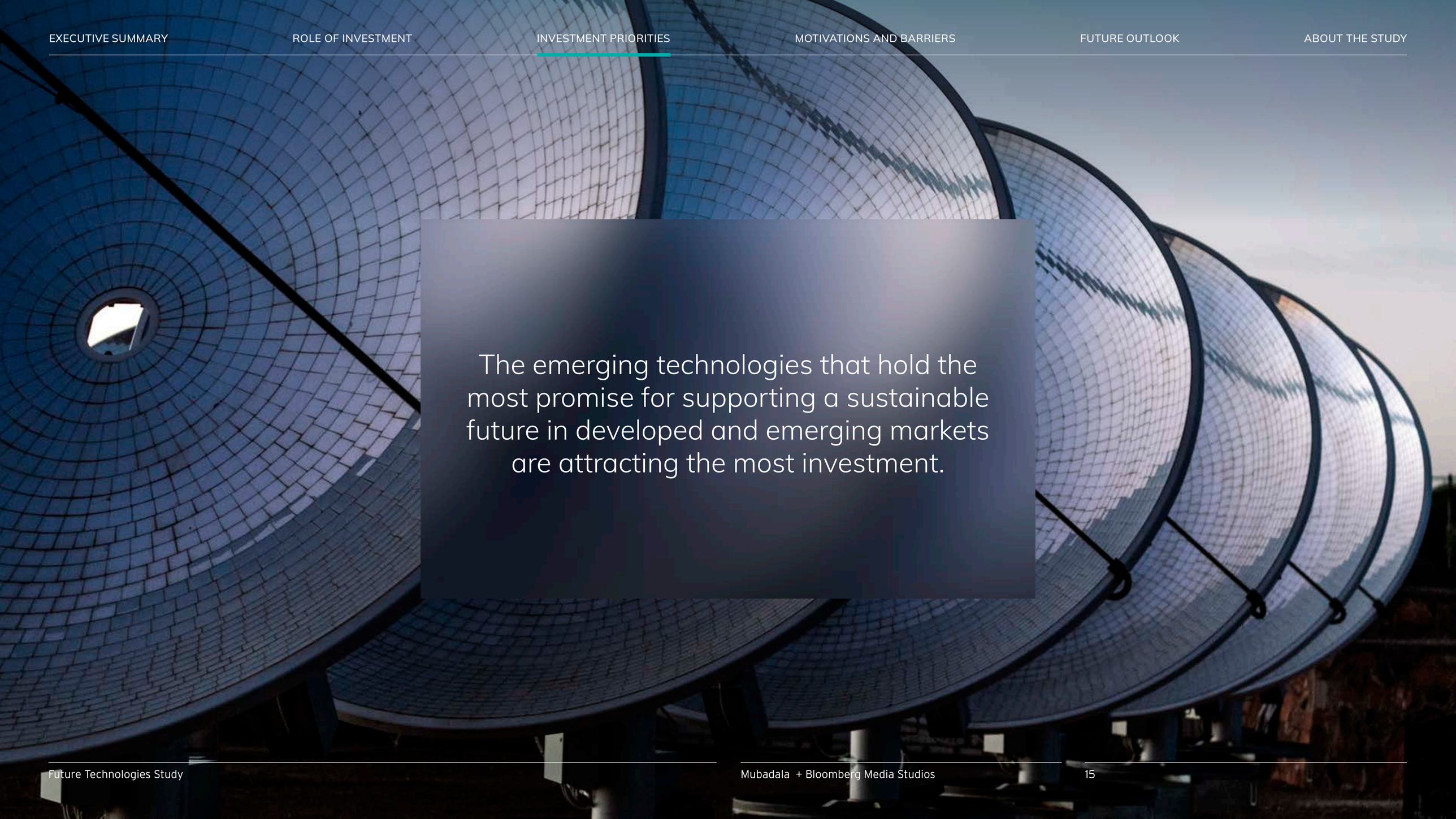
2030



Q16 & Q17

Q16. What aspect of ESG does investment in emerging technologies impact the most?
Q17. What aspect of ESG will investment in emerging technologies impact the most by 2030?

Investment Priorities



The emerging technologies that hold the most promise for supporting a sustainable future in developed and emerging markets are attracting the most investment.

Investors and venture capital leaders assessed a range of emerging technologies in this study.

All of these emerging technologies have the potential to impact our ability to achieve a sustainable future.

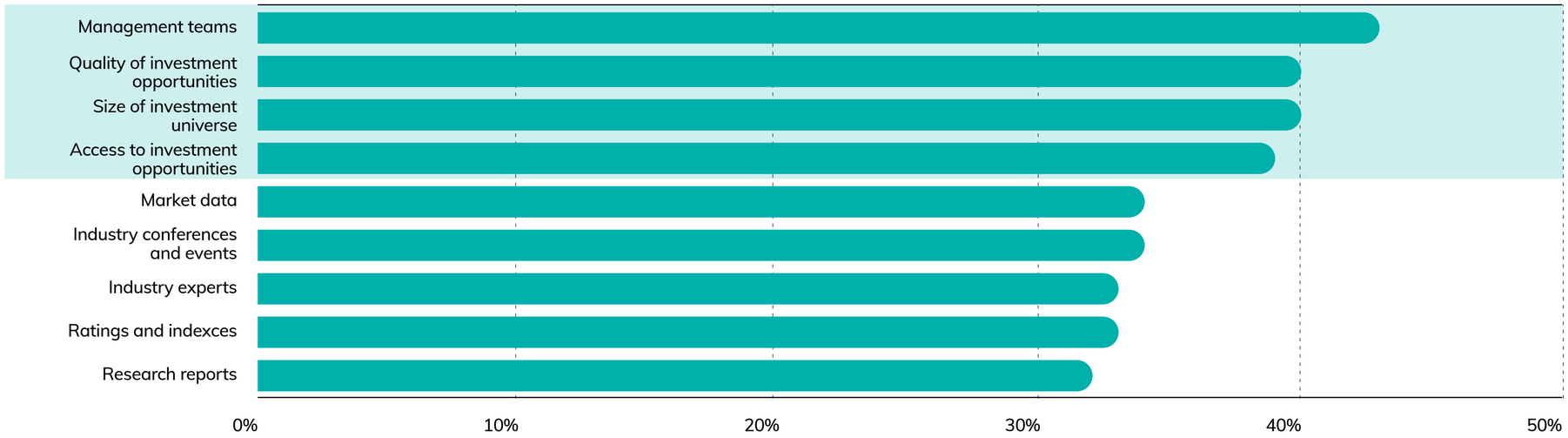
1. Connectivity
   (e.g., AI, cloud, Big Data)
2. Carbon capture, usage and storage
3. Digital collaboration tools
   (e.g., video conferencing)
4. Energy efficiency
   (e.g., building energy modeling)
5. EVs and charging infrastructure
   (e.g., smart grid technologies)
6. Health / medical technologies
7. Heating and cooling
   (e.g., IoT integration)
8. Recycling
9. Renewable energy and energy storage
   (e.g., hydrogen, nuclear fission)
10. Sustainable infrastructure
    (e.g., green materials development)
11. Wastewater management

The human factor remains paramount, even when investing in emerging technologies.

Despite an abundance of market data, investors and venture capital leaders rely first and foremost on company management teams when making decisions about investing in emerging technologies.

The quality of the investment opportunities, the ability to access those opportunities, and the size of the investment universe also play a prominent role in decision-making.

What tools and/or information do you use to make decisions about investing in emerging technologies?



Q11

What tools and/or information do you use to make decisions about investing in emerging technologies?

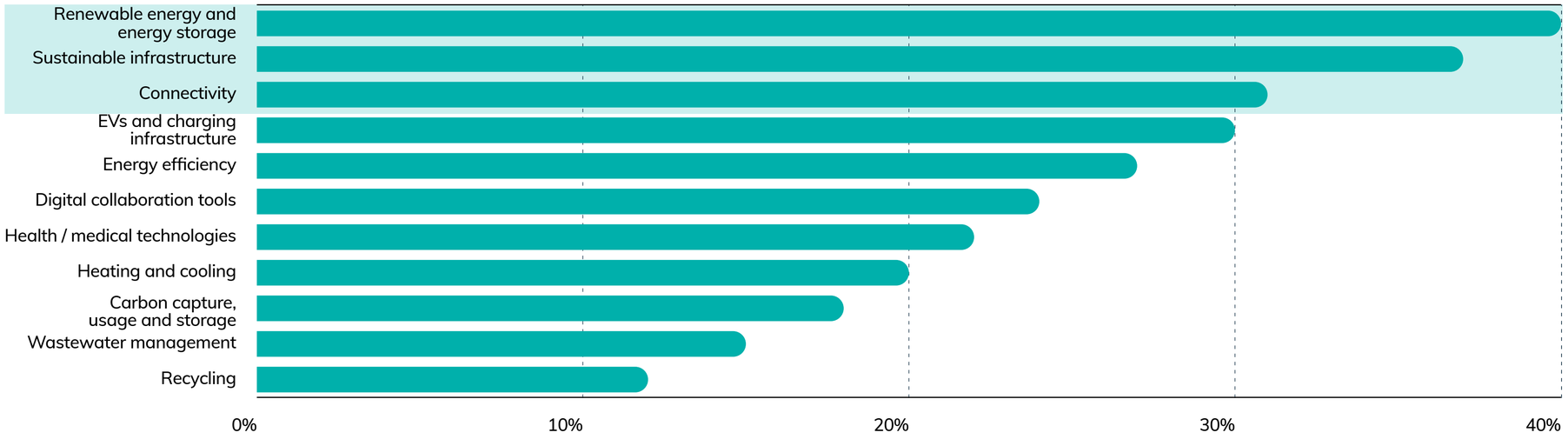
Technologies that help manage resources more efficiently are the most important to achieving a sustainable future.

Across respondents, the three emerging technologies most important to achieving a sustainable future are:

- Renewable energy and energy storage
- Sustainable infrastructure
- Connectivity

These three technologies all promote the efficient use of resources, and are seen as foundational in addressing sustainability challenges.

Emerging technologies most important to achieving a sustainable future



Q7

From the list below, please select the three emerging technologies you see as being most important to achieving a sustainable future.

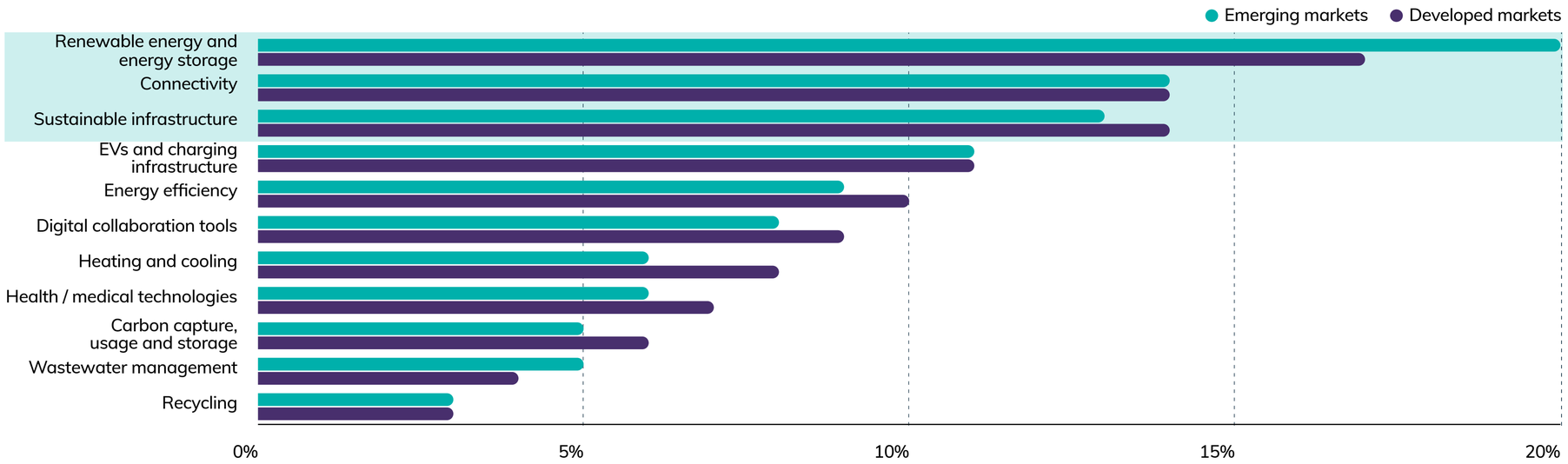
The same technologies serve the needs of both emerging and developed markets.

Emerging and developed markets have vastly different attributes, including growth rates, liquidity, infrastructure, etc.

Despite this, when asked which emerging technologies will most benefit both types of markets, respondents named the same three technologies as those most important to a sustainable future:

- Renewable energy and energy storage
- Sustainable infrastructure
- Connectivity

Emerging technologies that will most benefit emerging and developed markets



Q19 & Q20

Q19. From the list below, please select the emerging technology that will most benefit emerging markets.

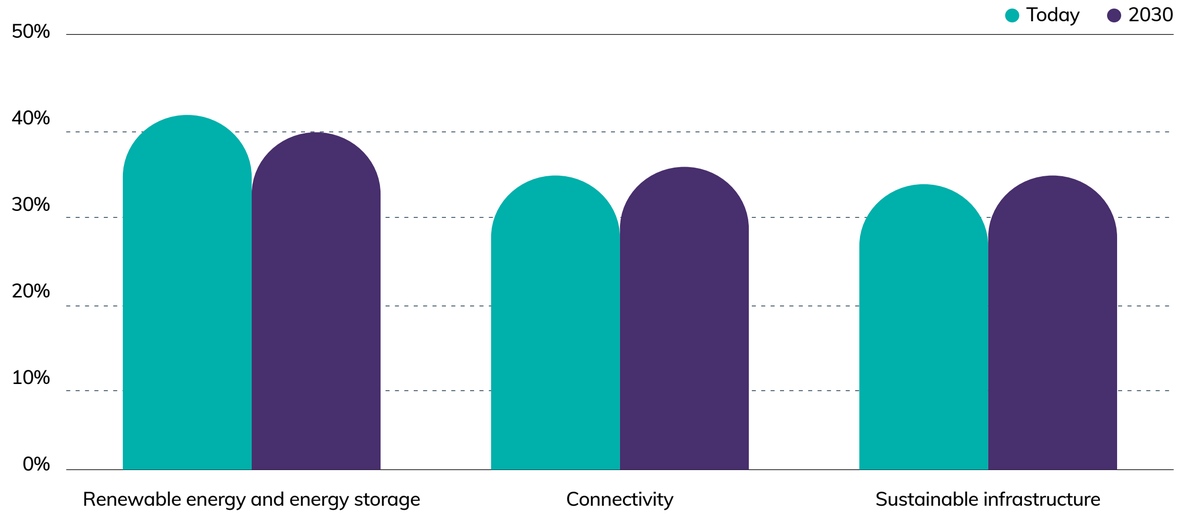
Q20. From the list below, please select the emerging technology that will most benefit developed markets.

These sustainable technologies will attract the most investment activity, both today and over the next decade.

Investors and venture capital leaders see these three emerging technologies—renewable energy and storage, connectivity, and sustainable infrastructure—as their highest investment priorities.

The fact that these technologies are seen as critical to achieving a sustainable future in emerging and developed markets suggests that most respondents are investing in the emerging technologies that will most move the needle in the future.

Emerging technologies where you expect to see the most investment happening



Q3 & Q5

Q3. From the list below, please select the three emerging technologies where you see the most investment happening today.

Q5. From the list below, please select the three emerging technologies where you expect to see the most investment happening by 2030.

Market by market perspectives on which investments contribute most to sustainability goals are more nuanced.

Japan's biggest bet is on renewable energy and energy storage, while the US prefers sustainable infrastructure.

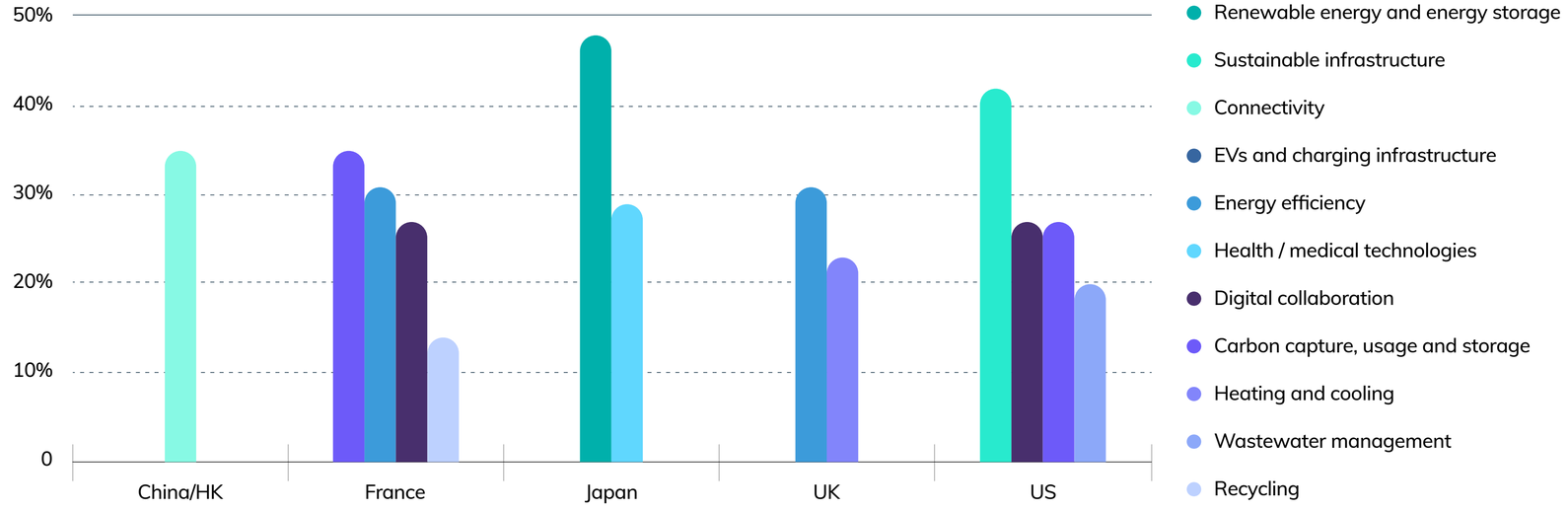
The US, the UK, and France see climate-mitigation technologies as critical, including carbon capture, usage and storage, heating and cooling, wastewater, and recycling technologies.

China/HK, however, sees the most opportunity in connectivity technologies like AI, and France and the UK lean toward digital collaboration.

Q7

From the list below, please select the three emerging technologies you see as being most important to achieving a sustainable future.

Emerging technologies that are most important to achieving a sustainable future



Note: India did not rate any technology higher in impact on sustainability than any other market.

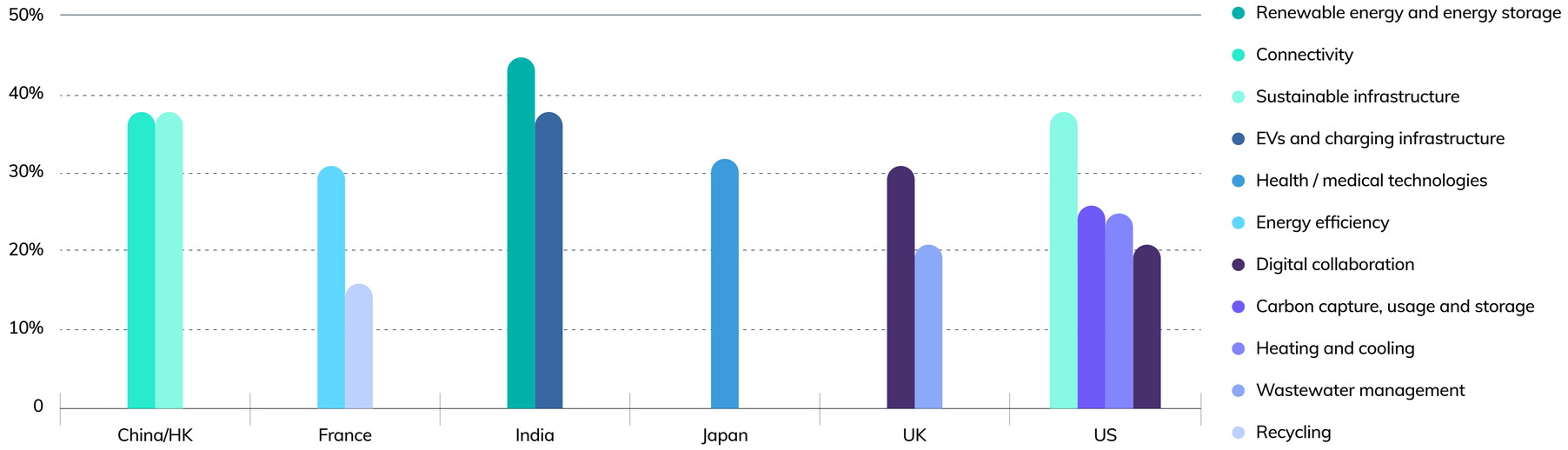
This market by market view also reveals where each market sees the greatest investment opportunities.

When it comes to the world's top economies, China/HK and the US favor sustainable infrastructure, and India gravitates toward renewables and EVs.

The US, the UK, and France also prioritize climate-oriented technologies, e.g., wastewater management, etc. Japan, however, sees opportunity in health/ medical technologies.

On a separate front, connectivity and digital collaboration spike for China/HK and the UK respectively.

Emerging technologies where you expect to see the most investment happening in 2030



Q5

From the list below, please select the three emerging technologies where you expect to see the most investment happening by 2030.

The technologies that will attract the least investment, however, center on tackling environmental challenges.

Across respondents, these emerging technologies are viewed as low investment priorities:

- Wastewater management
- Heating and cooling
- Carbon capture, usage and storage
- Recycling

Some are also seen as less critical to achieving a sustainable future, indicating that respondents are less attracted to investment opportunities focused on tackling environmental challenges.

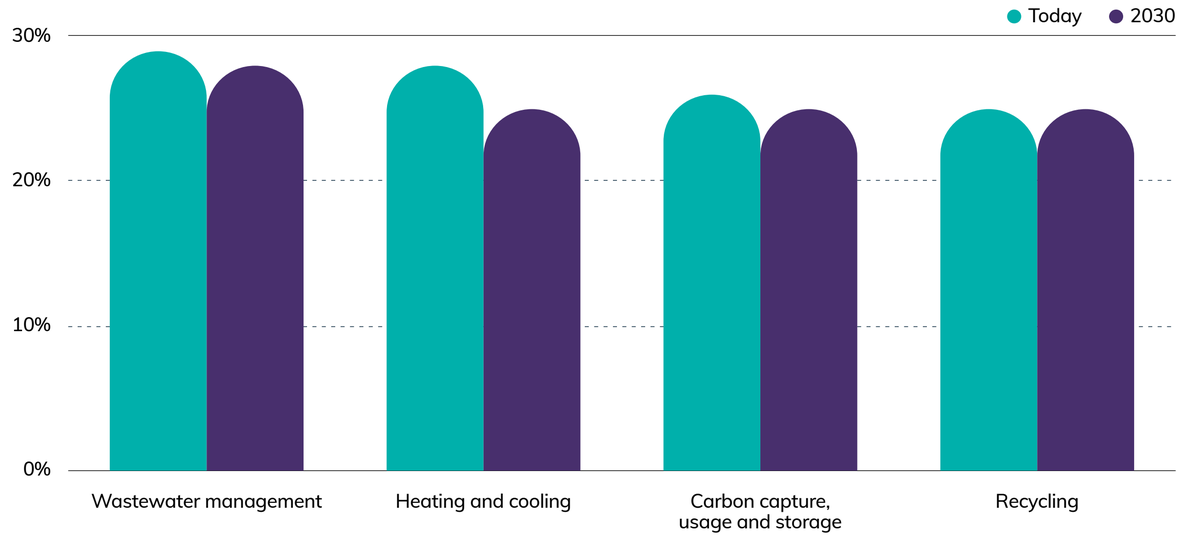
Q4, Q6 & Q8

Q4. From the list below, please select the three emerging technologies where you see the least investment happening today.

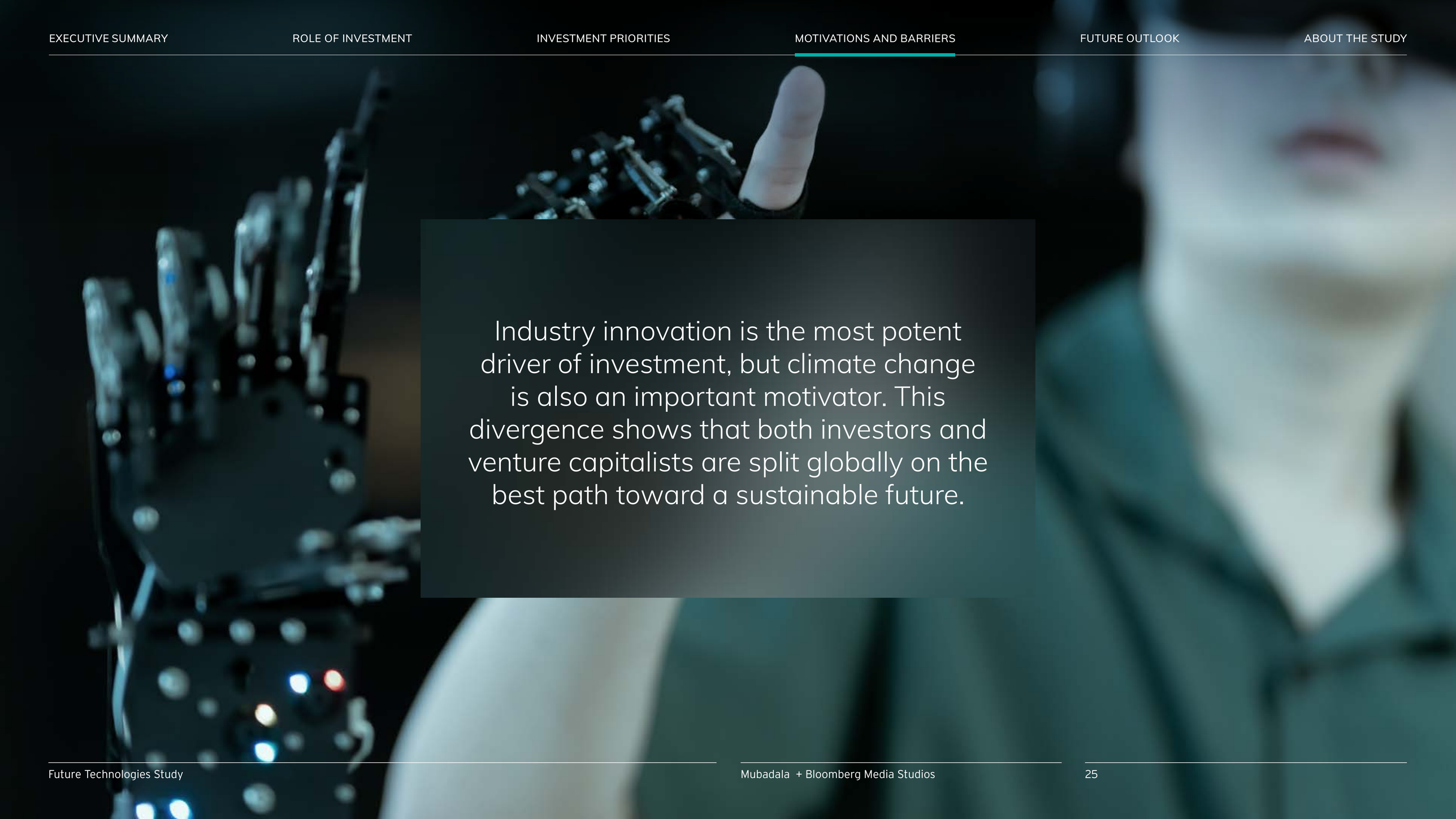
Q6. From the list below, please select the three emerging technologies where you expect to see the least investment happening by 2030.

Q8. From the list below, please select the three emerging technologies you see as being least important to achieving a sustainable future.

Emerging technologies where you expect to see the least investment happening



Motivations and Barriers



Industry innovation is the most potent driver of investment, but climate change is also an important motivator. This divergence shows that both investors and venture capitalists are split globally on the best path toward a sustainable future.

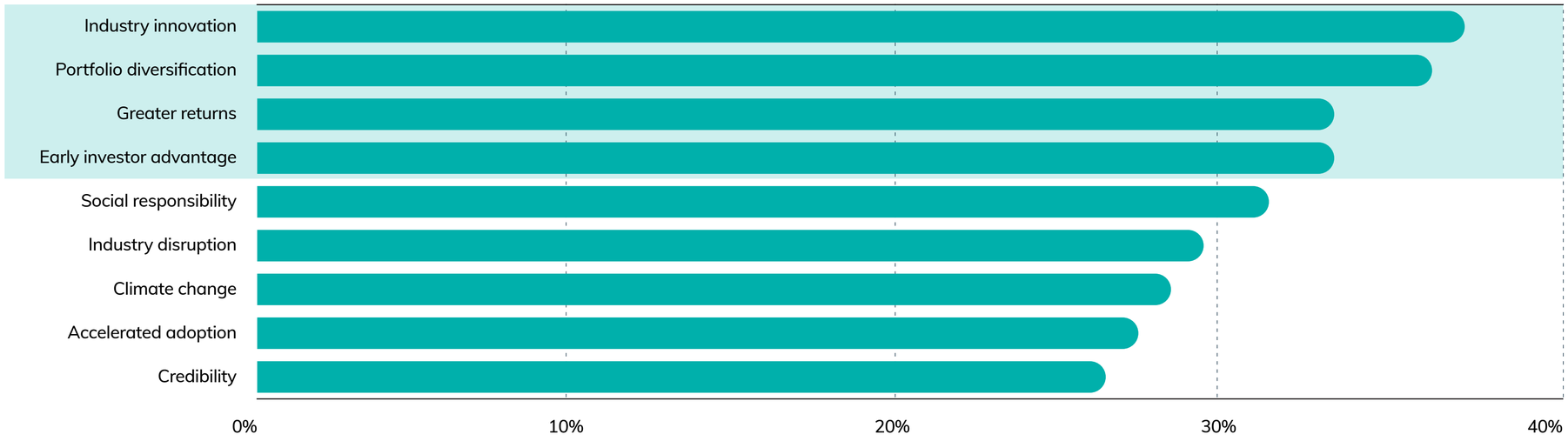
Spurring innovation is the top motivation for investing in emerging technologies.

Across investors and venture capital leaders, the biggest motivations for investing in emerging technologies fall into two categories.

Above all, respondents believe their investments will fund new ideas and advancements.

In addition, they see investing in emerging technologies as a way to diversify their portfolios, garner greater returns, and position themselves as first movers in the space.

Top motivations for investing in emerging technologies



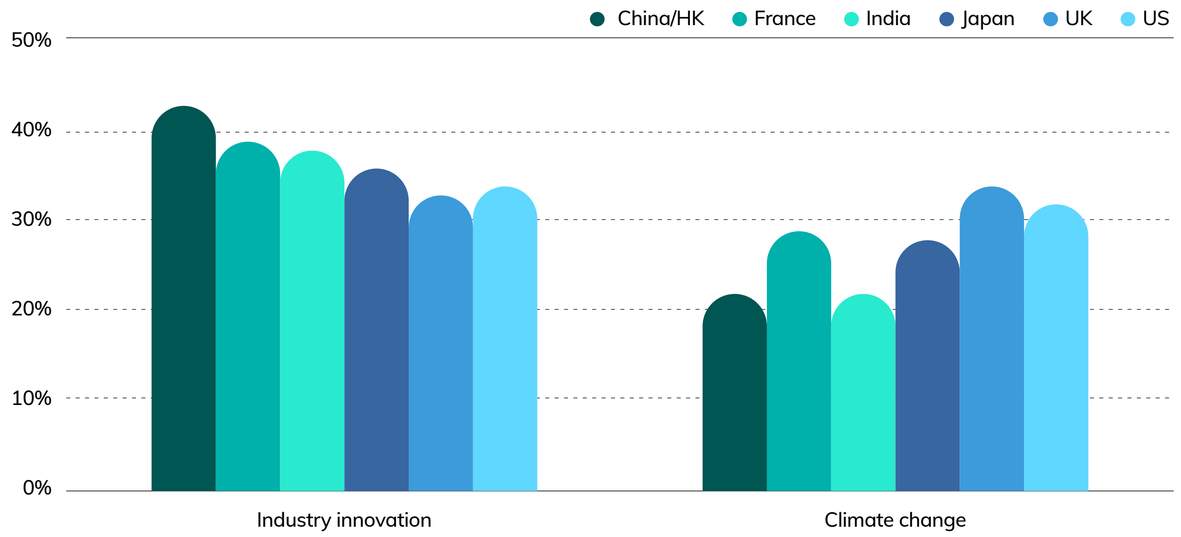
Q12

What are your top three motivations for investing in these emerging technologies?

The UK and the US are equally motivated by industry innovation and climate change—a key differentiator from other markets.

While investors and venture capital leaders in most markets ranked climate change much lower than other investment motivations, UK and US respondents ranked climate change as one of their top three motivations for investing in emerging technologies.

Top motivations for investing in emerging technologies



Q12

What are your top three motivations for investing in these emerging technologies?

Investors are more motivated by climate change than venture capital leaders.

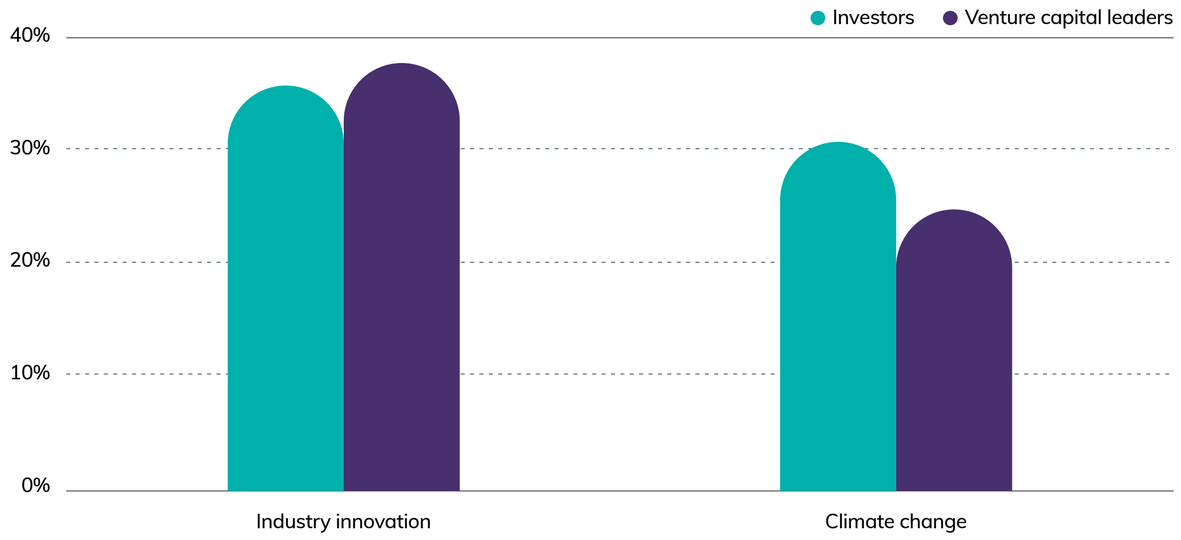
Both investors and venture capital leaders see industry innovation as their top motivation for investing in emerging technologies, but there's one major area where they diverge.

Investors are more likely to see climate change as a top motivator, suggesting they place greater value on the potential positive impact of emerging technologies on the planet.

Q12

What are your top three motivations for investing in these emerging technologies?

Top motivations for investing in emerging technologies

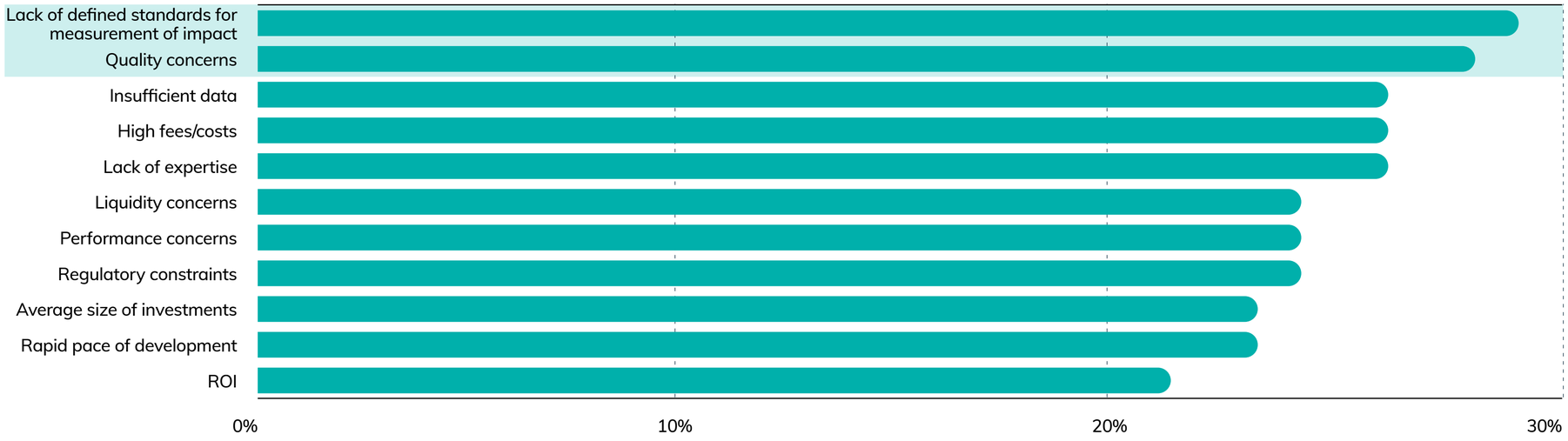


Lack of defined standards for measuring impact and quality concerns are the biggest barriers to investing in emerging technologies.

Both investors and venture capital leaders agree that the lack of defined standards to measure impact and quality concerns are the biggest barriers to investment.

It's significant that these barriers rank above the more traditional barriers of high fees/costs and performance concerns, suggesting unease around the number of unknowns involved in investing in emerging technologies.

Top barriers to investing in emerging technologies



Q13

What are your top three barriers to investing in these emerging technologies?

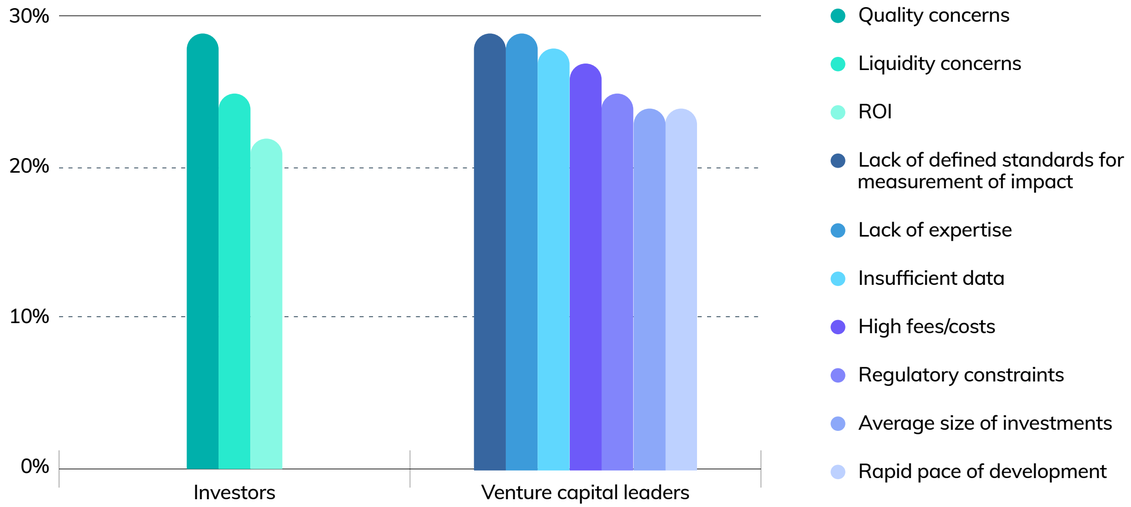
These results also demonstrate the differences between the solutions needed for investors versus venture capitalists.

When it comes to overcoming barriers to investment, investors and venture capitalists require different solutions.

For investors, there's a need to guarantee quality, liquidity, and ROI.

For venture capitalists, there's a need for not only more information and expertise, but also a need to ease fees and costs as well as regulatory constraints.

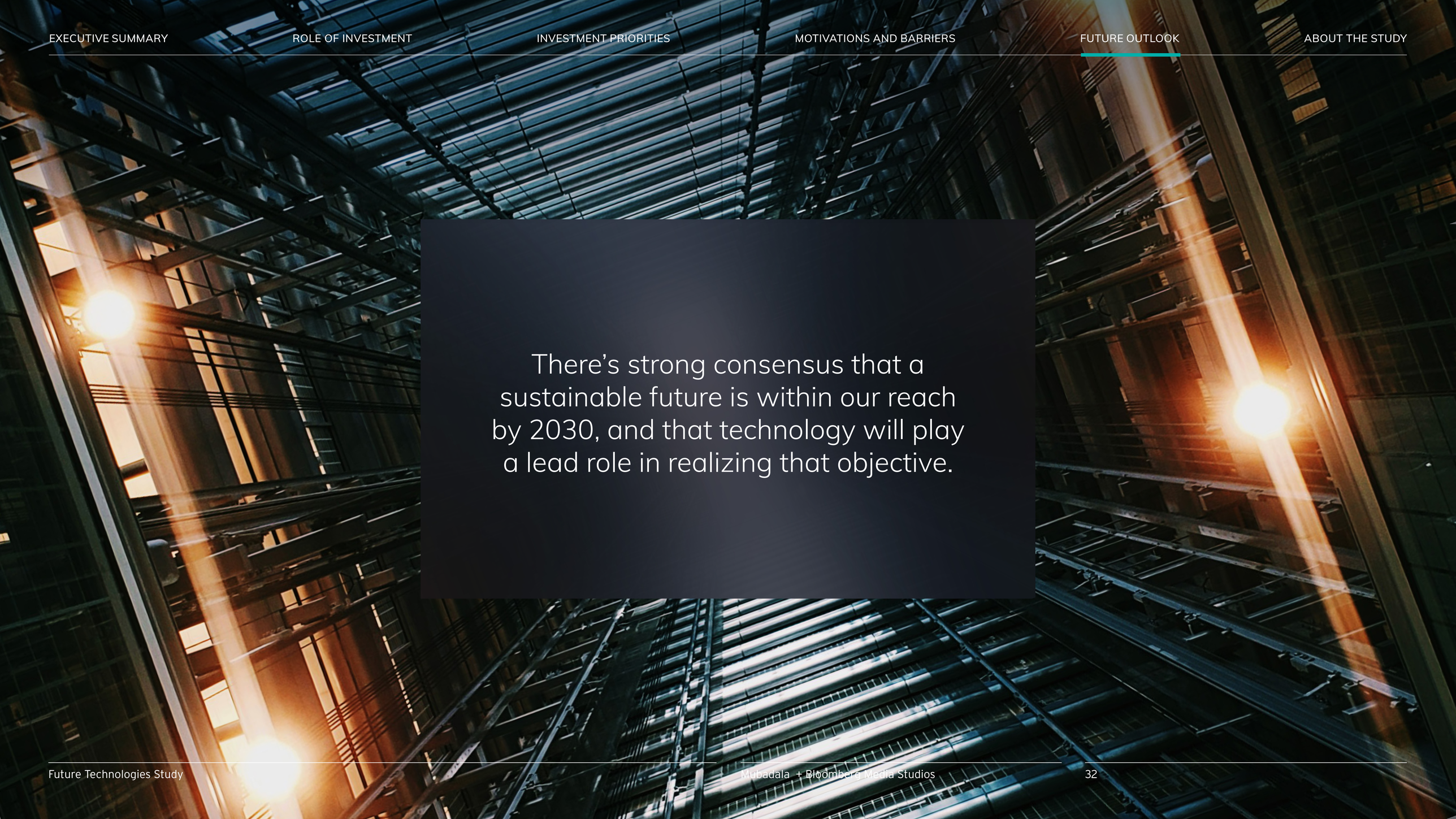
Top barriers to investing in emerging technologies



Q13

What are your top three barriers to investing in these emerging technologies?

Future Outlook



There’s strong consensus that a sustainable future is within our reach by 2030, and that technology will play a lead role in realizing that objective.

The world's top five megatrends are all driving investment in emerging technologies.

Emerging technologies have the potential to make a positive impact on the world's biggest sustainability challenges.

Digital Technologies

The widespread use of technologies involving the representation, storage, and processing of information in bits.

Climate Change

The human-induced warming of the atmosphere resulting in environmental degradation.

Inequalities

The differences between the levels of health, wealth, and opportunity across groups of people.

Demographic Shifts

The overall slowing of population growth and an aging population, e.g., declining fertility and increasing life expectancy.

Urbanization

The increasing concentration of the world's population in cities.

Respondents identified the emerging technologies that will make the most positive impact on the top five megatrends.

% of respondents	**21%**	**20%**	**18%**	**21%**	**16%**
Emerging technologies	**Connectivity and digital collaboration tools**	**Renewable energy and energy storage**	**Health / medical technologies**	**Health / medical technologies**	**Sustainable infrastructure**
Megatrends	**Digital Technologies** The widespread use of technologies involving the representation, storage, and processing of information in bits.	**Climate Change** The human-induced warming of the atmosphere resulting in environmental degradation.	**Inequalities** The differences between the levels of health, wealth, and opportunity across groups of people.	**Demographic Shifts** The overall slowing of population growth resulting in population aging, e.g., declining fertility and increasing life expectancy.	**Urbanization** The increasing concentration of the world's population in cities.

Q21

From the list below, please select the emerging technology you see as having the most positive impact on each of the top five megatrends.

A lack of focus on long-term sustainable goals is the biggest gap in the current investment landscape.

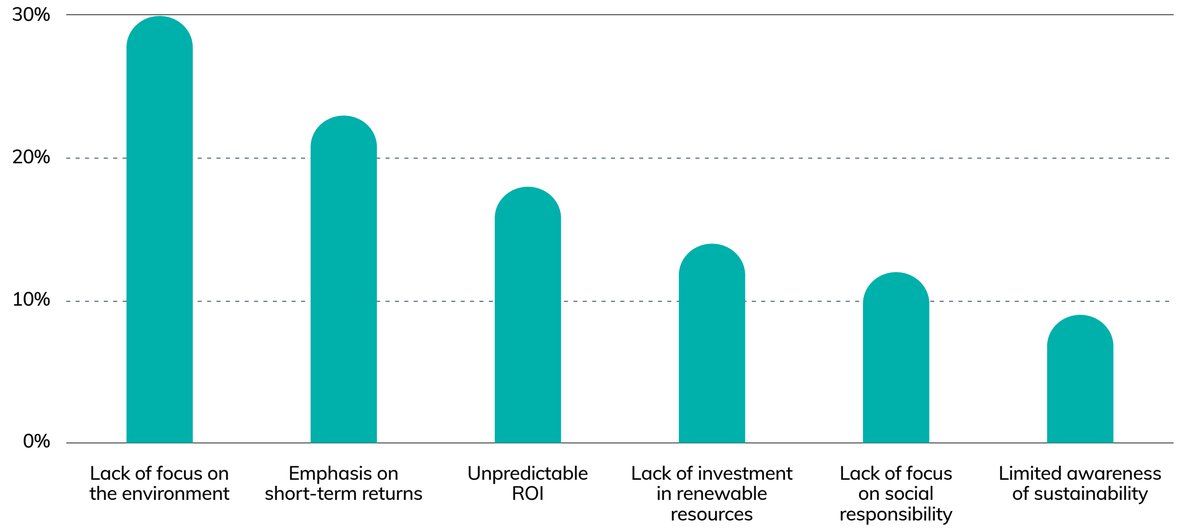
Investors and venture capital leaders see the overall market's lack of focus on the environment coupled with an emphasis on short-term returns as serious obstacles to achieving a sustainable future.

> *"The current investment landscape needs balance-bridging gaps between short-term returns and diverse sustainable technologies for a holistic future."*
>
> **— *Investor***

Q14

When it comes to achieving a sustainable future, what are the gaps in the current investment landscape, e.g., is there too much investment in one type of technology over another or is there too much of an emphasis on short-term returns?

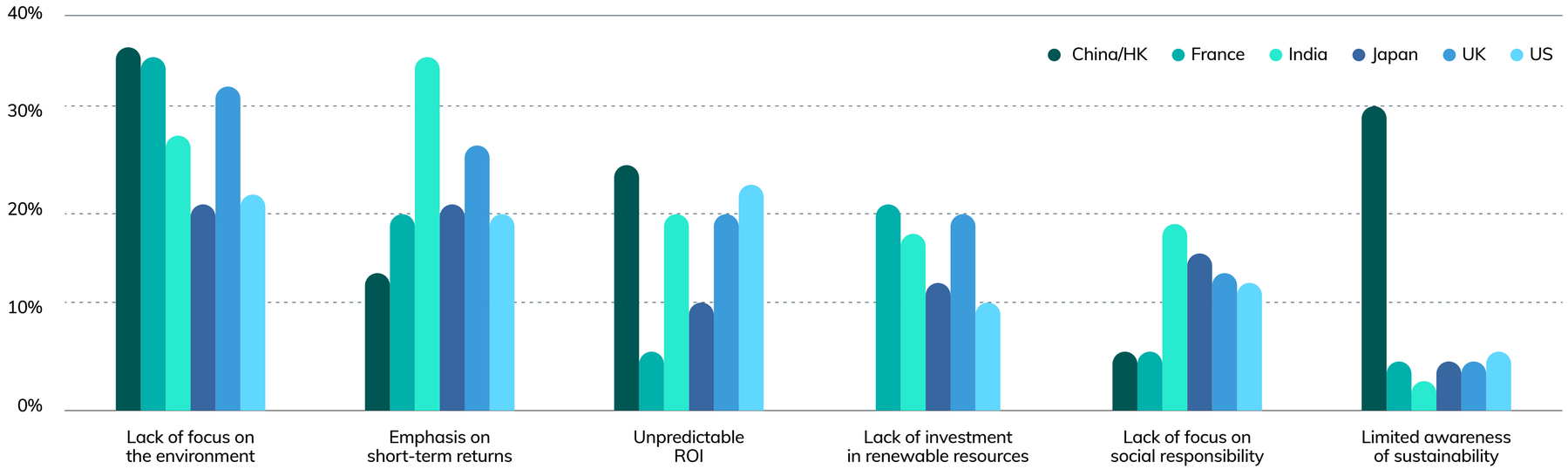
Gaps in the current investment landscape that could prevent the achievement of a sustainable future



China/HK is the only market that sees both a lack of focus on the environment and limited awareness of sustainability as gaps in the investment landscape.

While all investors and venture capital leaders agree that there's a lack of focus on the environment, only China/HK sees limited awareness of sustainability as an issue. That said, it's worth noting that even markets with high sustainability awareness don't think enough is being done to focus on the environment.

Gaps in the current investment landscape that could prevent the achievement of a sustainable future



Q14

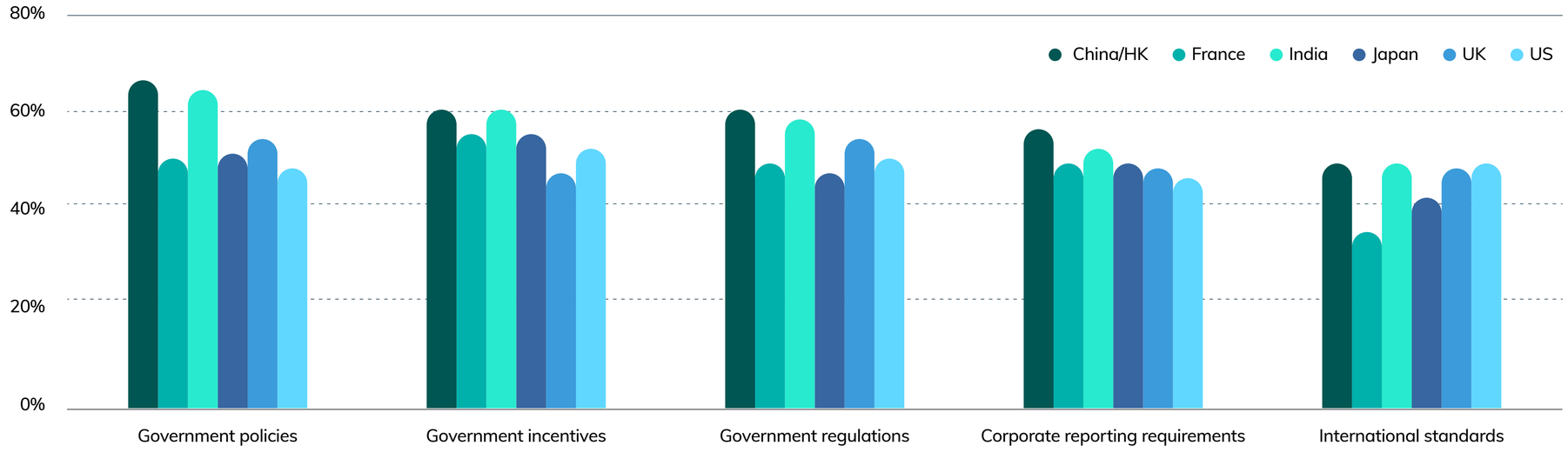
When it comes to achieving a sustainable future, what are the gaps in the current investment landscape, e.g., is there too much investment in one type of technology over another or is there too much of an emphasis on short-term returns?

Investors and venture capital leaders see government as the best way to address gaps in the investment landscape.

Without exception, respondents see government policies, incentives, and regulations as the best way to address gaps preventing the achievement of a sustainable future.

Specifically, China (67%), India (65%), and the UK (55%) prefer government policies, while France (56%), Japan (56%), and the US (53%) favor government incentives.

Best way to address the gaps in the investment landscape to achieve a sustainable future

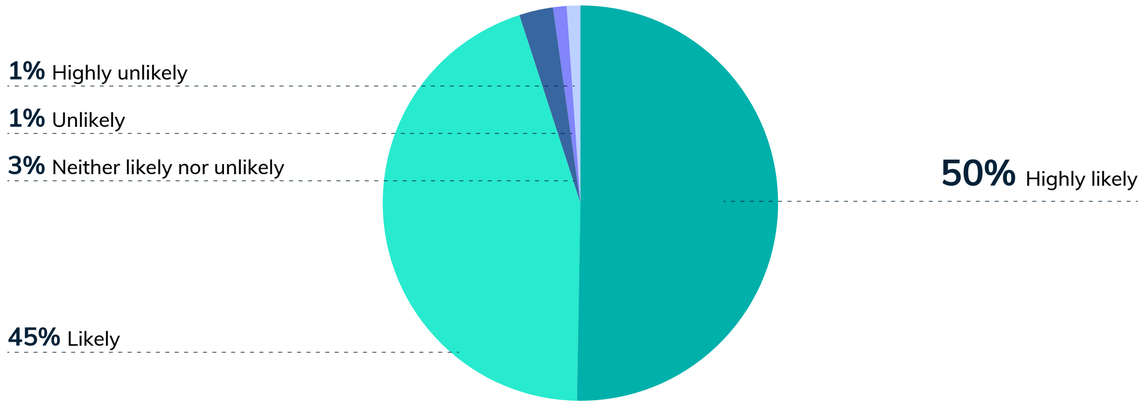


Q15

When it comes to achieving a sustainable future, what is the best way to address the gaps in the current investment landscape?

Overall, investors and venture capitalists strongly agree that a sustainable future is within our reach, and that technology will play the lead role in achieving that future.

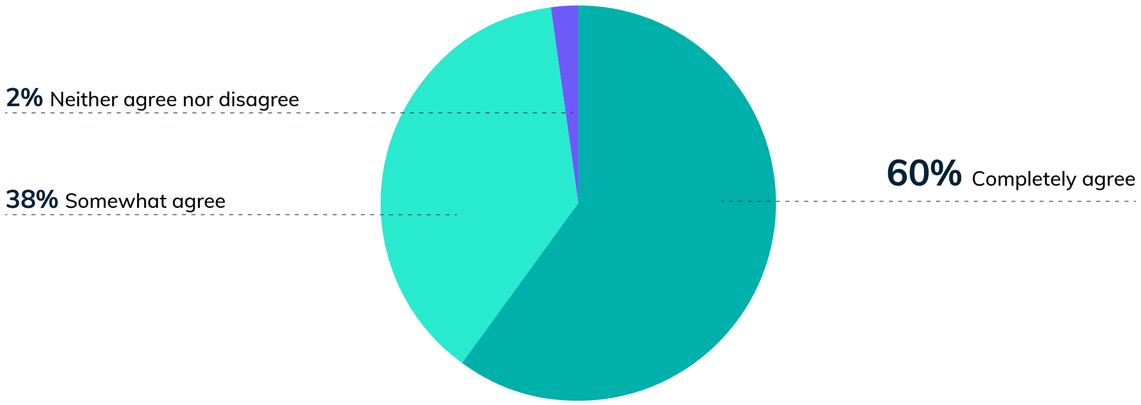
Likelihood that the world will achieve a sustainable future by 2030



Q1

How much do you agree or disagree with the following statement: “Technology will play the lead role in the world achieving a sustainable future”?

Agreement that “Technology will play the lead role in the world achieving a sustainable future”



About the Study

Methodology

What
A 15-minute survey designed by Bloomberg Media and Mubadala and fielded by Market Probe International Inc.

Who
Global investors and venture capital leaders with a focus on sustainable investing and 10+ years of experience.

When
The study was fielded August 30 to September 9, 2023.

Respondent role breakout
N=1,261
N=631 Investor community
N=630 Venture capital leaders

Respondent market breakout
Expected ~200 per market
N=212 China including Hong Kong
N=208 France
N=211 India
N=209 Japan
N=211 UK
N=210 US

Emerging technologies explored in this study

1. Connectivity
   (e.g., AI, cloud, Big Data)
2. Carbon capture, usage and storage
3. Digital collaboration tools
   (e.g., video conferencing)
4. Energy efficiency
   (e.g., building energy modeling)
5. EVs and charging infrastructure
   (e.g., smart grid technologies)
6. Health / medical technologies
7. Heating and cooling
   (e.g., IoT integration)
8. Recycling
9. Renewable energy and energy storage
   (e.g., hydrogen, nuclear fission)
10. Sustainable infrastructure
    (e.g., green materials development)
11. Wastewater management

Megatrends explored in this study

Digital Technologies

The widespread use of technologies involving the representation, storage, and processing of information in bits.

Climate Change

The human-induced warming of the atmosphere resulting in environmental degradation.

Inequalities

The differences between the levels of health, wealth, and opportunity across groups of people.

Demographic Shifts

The overall slowing of population growth and an aging population, e.g., declining fertility and increasing life expectancy.

Urbanization

The increasing concentration of the world's population in cities.

Respondent demographics: Audiences

	Investors	VC Leaders
Male	91%	86%
Female	9%	14%
Age (average)	45	45
AUM (average, million $)	543	541
Tenure (average, years)	15	15

Respondent demographics: Markets

	China	France	India	Japan	UK	US
Male	93%	88%	84%	89%	90%	87%
Female	7%	13%	16%	11%	10%	13%
Age (average)	46	45	44	44	45	47
AUM (average, million $)	636	519	439	596	632	432
Tenure (average, years)	17	15	16	15	16	14

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