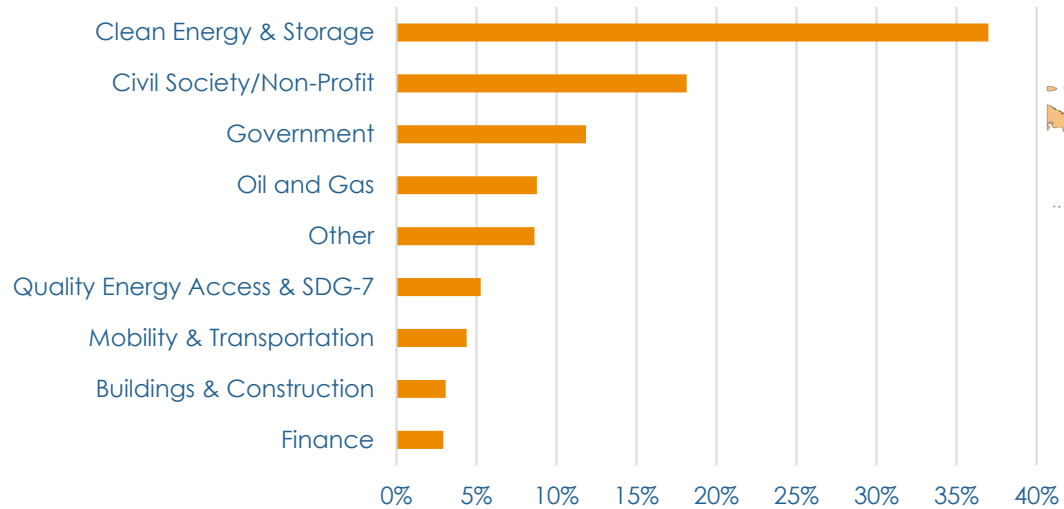


A CRITICAL TURNING POINT FOR ENERGY LEADERSHIP

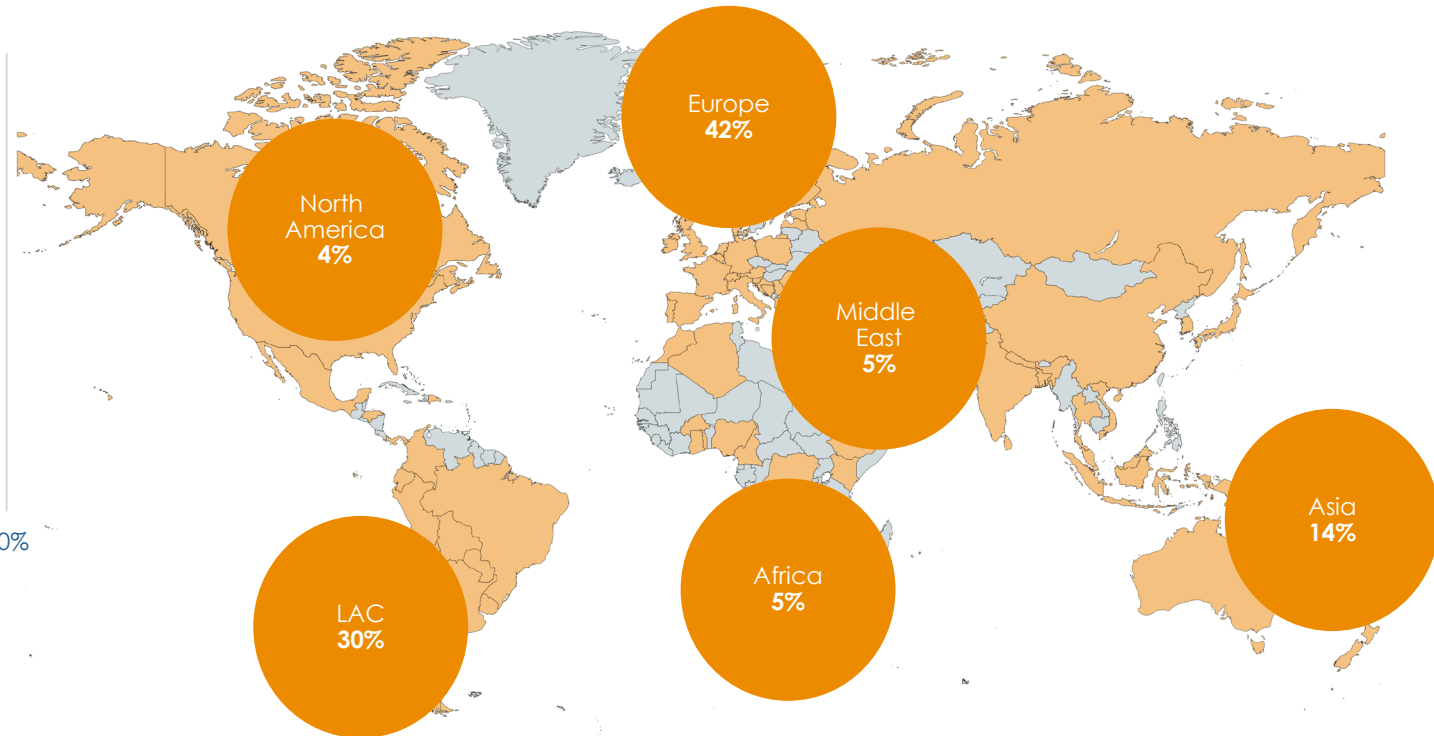
WORLD ENERGY PULSE 2023 | NOVEMBER

Pulse response overview

848 energy decision makers
Across **6** regions and **88** countries



15% of which are
Global Future Energy Leaders (FEL100) and
Start-up Energy Transition (SET100) entrepreneurs



EXECUTIVE SUMMARY

WORLD ENERGY PULSE | OCTOBER 2023

World Energy Leaders concerned about enabling more effective collaboration in the context of widening trust and affordability gaps.

We have been tracking world energy leadership perspectives through the annual World Energy Issue Monitor Survey for 15 years and using more frequent deep-dive Pulses to make sense of the faster and more fundamentally shifting context of global energy transitions.

In our most recent survey of over 800 leaders across six regions, discussions of the findings by our community of experts have produced the following insights:

COP28 MIGHT STRUGGLE TO KEEP REALISTIC HOPE ALIVE

While the majority (68%) agree COP28 is the last opportunity for a significant course correction in achieving net zero by 2050, only 11% believe participation levels have reached critical mass in their region. A worrying 24% think a passive majority is holding back energy transitions.

MORE DEMAND-DRIVEN ENGAGEMENT

Energy transition is nothing new, however, there is an increasing risk of disorderly energy transitions, and well-managed global energy transitions are historically unprecedented.

Half of the respondents (50%) stress the need for improved coordination and more effective collaboration, and 23% point to lack of trust and cooperation as a significant gap.

33% of respondents highlight the significant potential of new blended finance models and community-driven ownership structures in de-risking global public-private funding. These new approaches build trust, engage communities, and drive action.

THE EVOLVING TRILEMMA – DECARBONISATION WITH JUSTICE AND RESILIENCE

The majority (64%) agree that integrated policy frameworks are the best way to manage emerging trade-offs and synergies of energy security, affordability and sustainability challenges.

As companies are looking to play their part and invest in the future, they face the risk of assets becoming obsolete while striving to meet shareholder expectations. Many of them are grappling with investments larger than their scale. Some are waiting for a 'silver bullet' that may not materialise.

MOONSHOTS, EARTHSHOTS AND EMPATHY SHOTS?

The majority see an urgent need for broader innovation - in social, political and institutional domains. Insufficient investment in infrastructure and scaling up new technology is mentioned by 40%, whilst only 26% of respondents are relying on next-gen technology moonshots to expedite faster energy transitions.

HUMANSING ENERGY IS OUR CALL TO ACTION

The task at hand is to build on the many new initiatives which will be launched at the climate-centric COP28 and show real progress is being made with whole of society efforts.

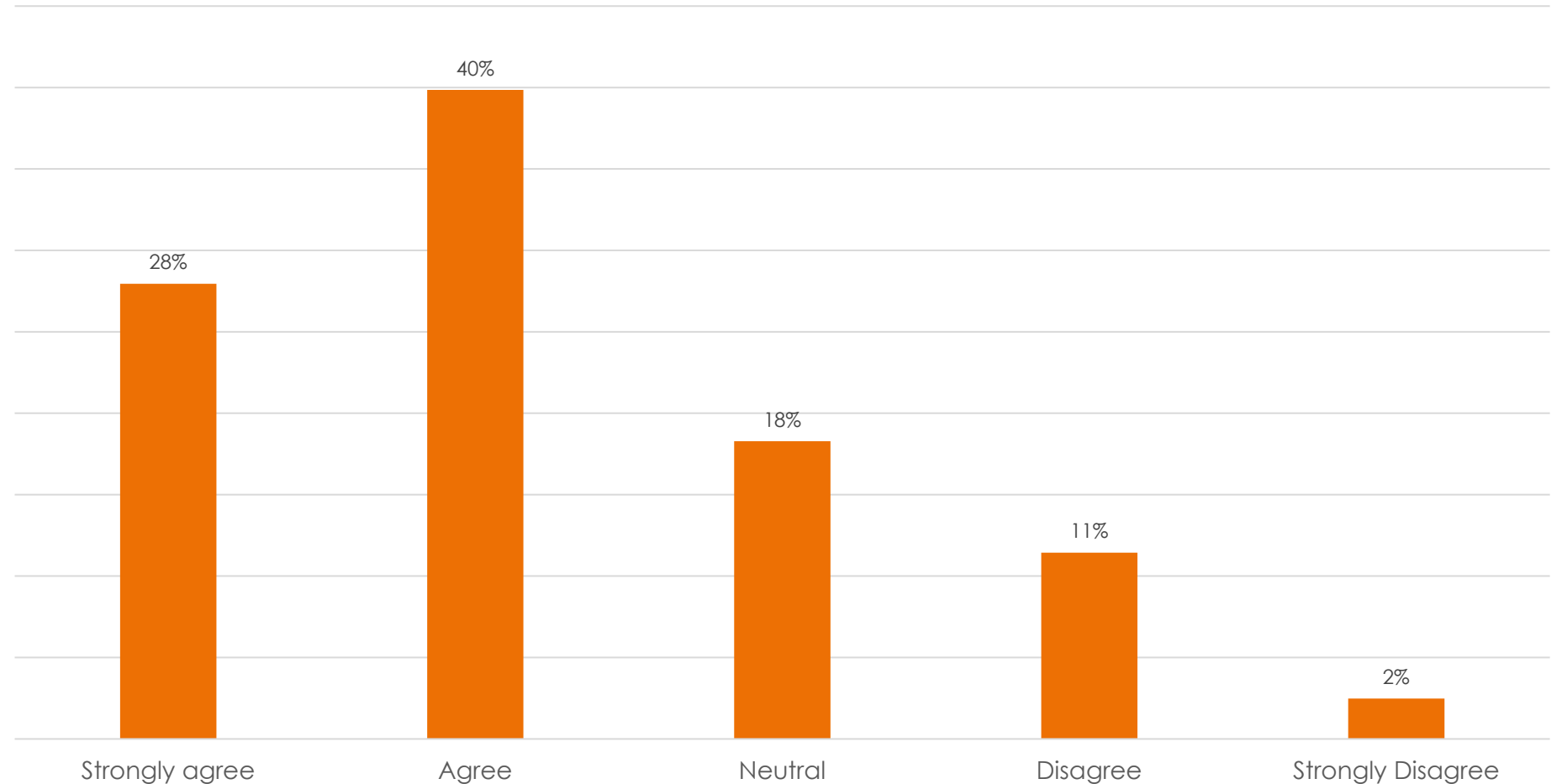
COP28

COP28 is regarded as the last opportunity for a significant course correction, considering the escalating urgency of the climate crisis, by 68% of the October 2023 World Energy Pulse respondents.

The urgency underscores the critical need to transition to sustainable energy sources, which has been slow and complex across all regions.

There is widespread consensus on the urgent need for action at COP28, given the escalating severity of the climate crisis

Q1: COP28 is the last chance for a course correction, to mobilise coordinated international action for energy transitions at a pace and scale required, to get the world on track to meet Paris goals.

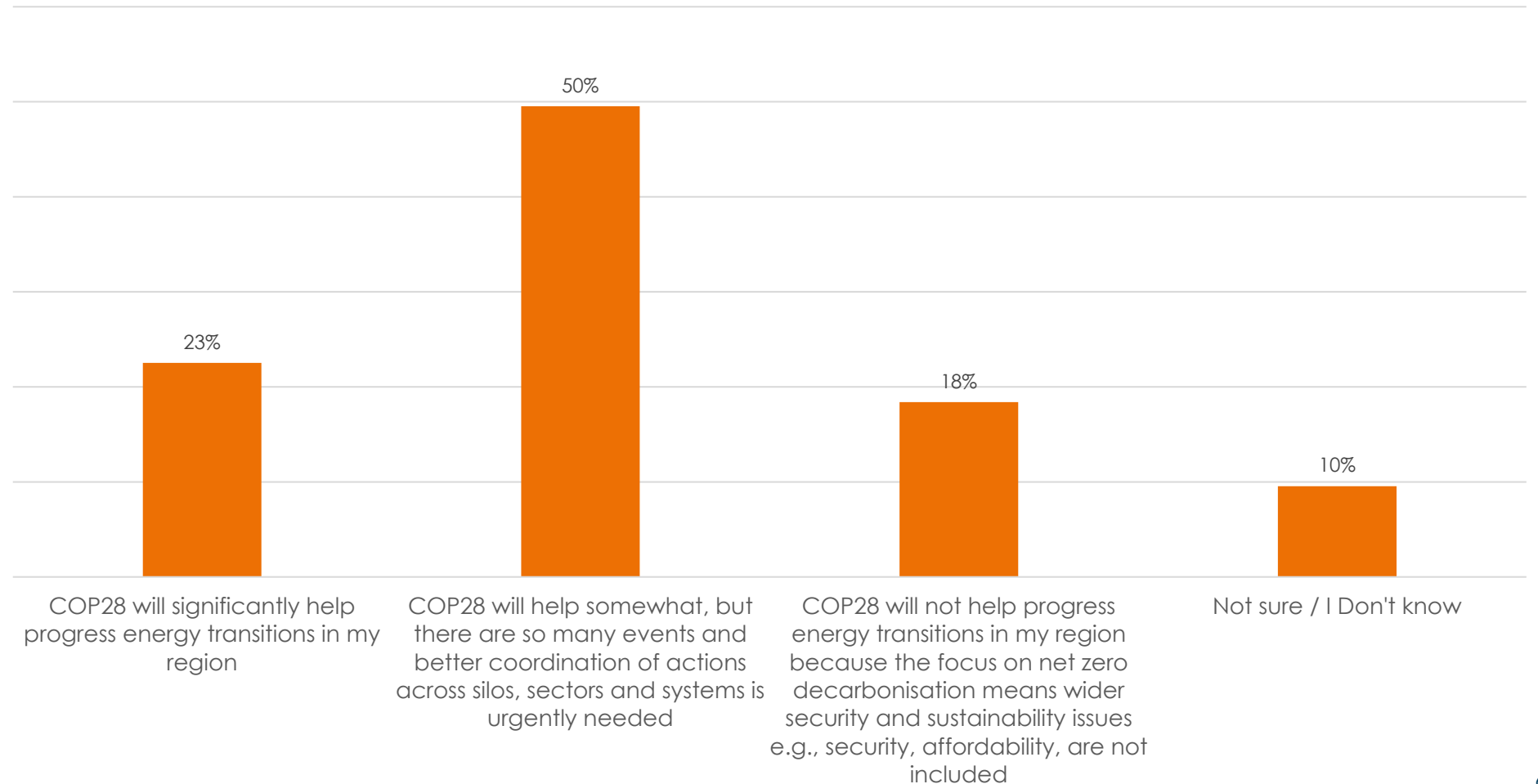


While COP28 is regarded as the last chance for a significant course correction towards Paris goals, a majority (50%) points to the urgency for enhanced cross-domain coordination beyond COP28 .

Only 23% of respondents view COP28 as a significant catalyst for regional energy transitions.

50% of respondents stress the necessity for improved cross-domain coordination and action beyond COP28

Q2: In your region, which option best describes the way in which COP28 will progress the energy transitions process?



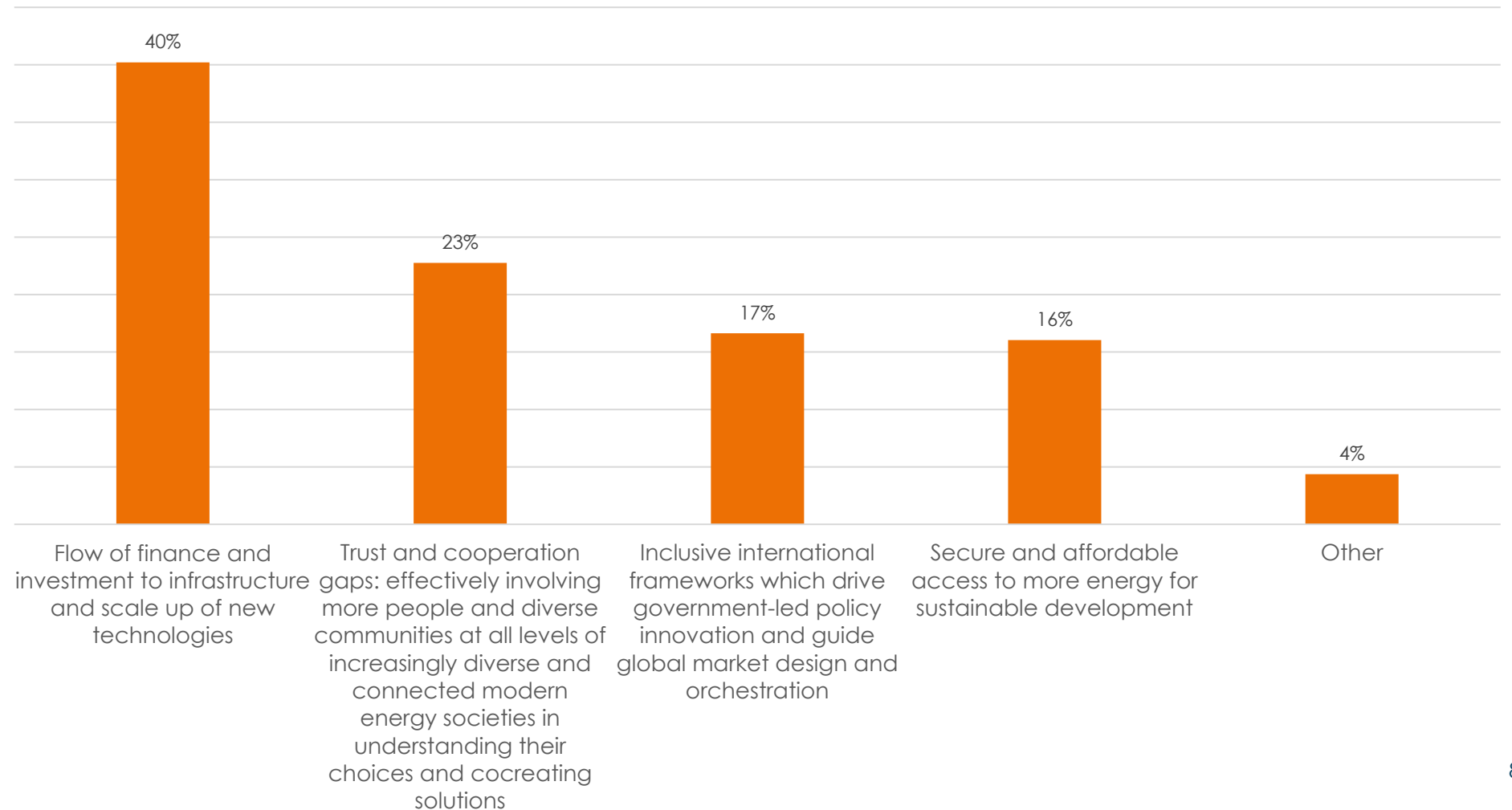
GAPS – RISKS – PIVOTAL ACTIONS

Sustainable energy transitions are occurring within increasingly diverse and interconnected modern energy societies, necessitating collective action for the greater public good. This is why cooperation and collaboration are now critical.

Responses illuminate tensions between current energy leadership models and trust (23%) and finance gaps (40%) hindering sustainable transitions.

There is consensus on the necessity for more funding in technology and infrastructure, alongside a strong emphasis on cultivating trust to effectively engage communities in advancing energy transitions.

Q5: In your view, which of the following GAPS is the biggest challenges in progressing energy transitions in your region:



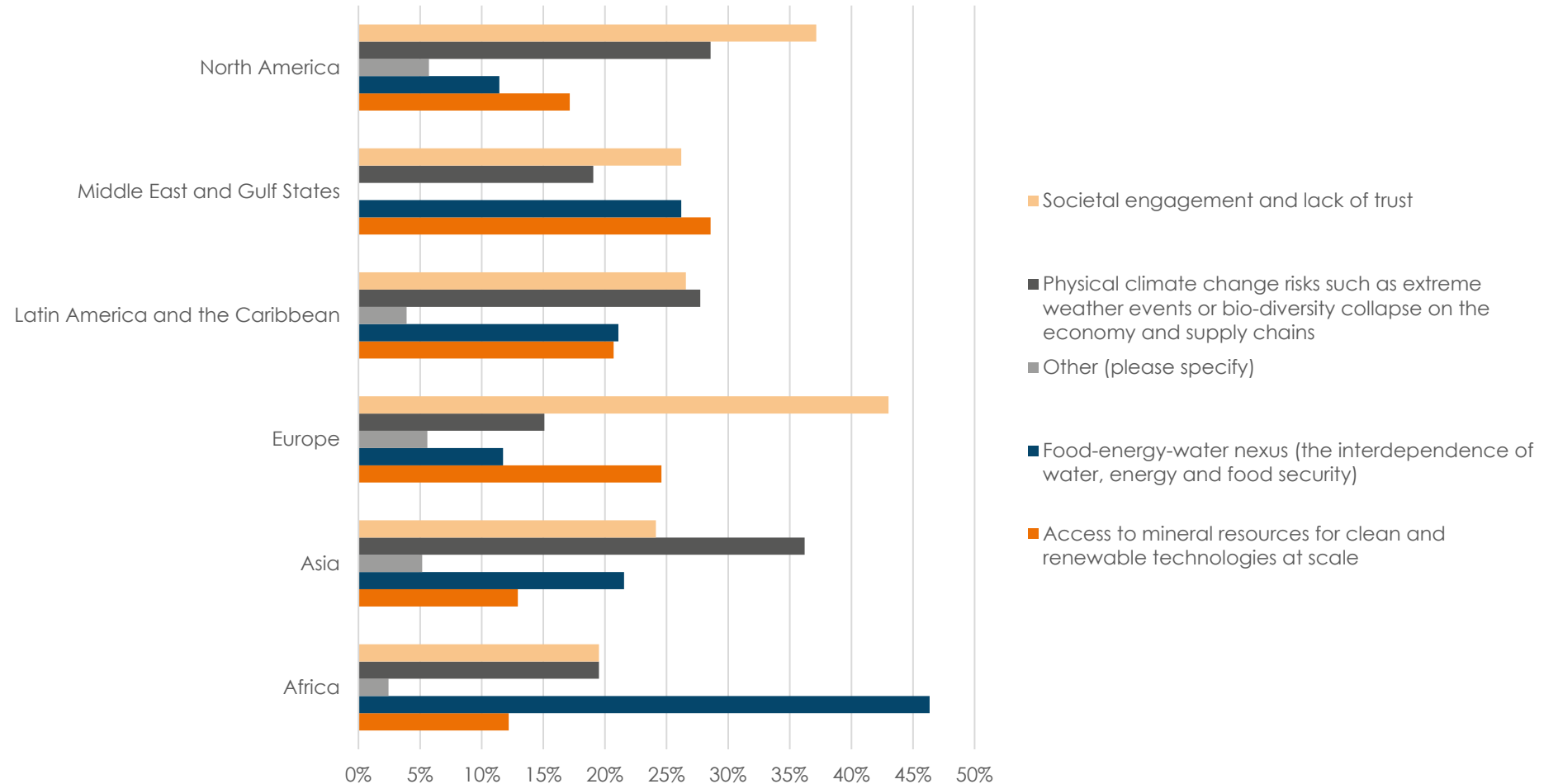
In Europe, societal engagement and trust deficiencies emerged as critical vulnerabilities, mirroring similar concerns in North America.

Meanwhile, the Energy-Water-Food nexus stood out as the most pressing risk in Africa and of concern in the Middle East. In Latin America and Asia, physical climate change risks took precedence, a challenge also resonating in North America.

Access to critical minerals emerged as a significant risk in Europe and the Middle East.

Survey respondents underscored diverse concerns surrounding energy transition risks, revealing discernible differences between regions at varying stages of development.

Q7: Which of the following do you perceive as the most relevant EMERGING RISK in progressing energy transitions in your region?

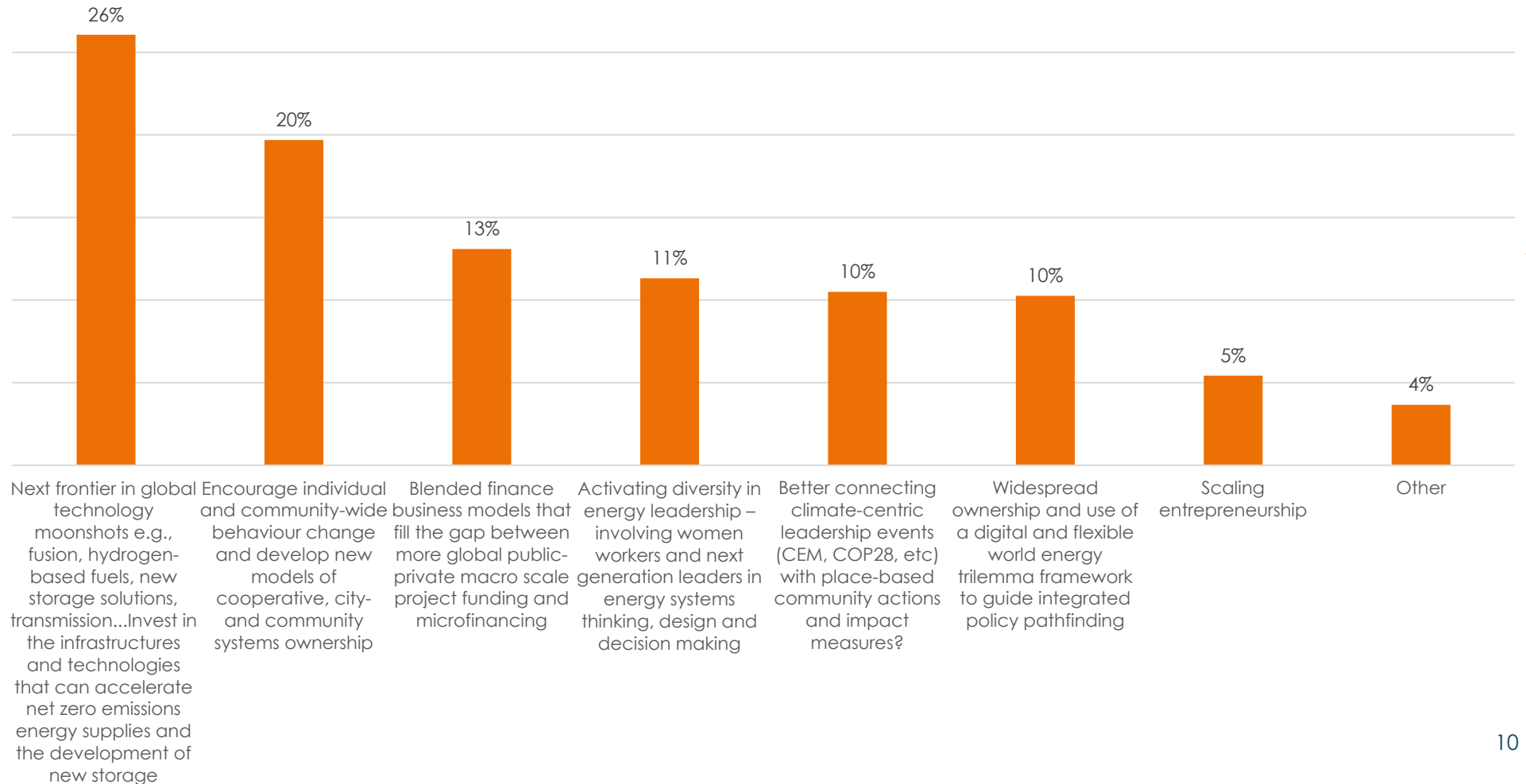


While 26% of respondents count on next-gen technology moonshots to expedite faster, fairer, and more far-reaching energy transitions, the majority acknowledges that innovation is required well beyond technology – in social and institutional domains.

33% of respondents highlight the significance of blended finance models and community-driven ownership structures to enable global public-private funding, aiding community-level project financing and fostering trust and cooperation.

Respondents prioritize a human-centred approach, advocating for active community involvement and inclusive financing to bridge trust and cooperation gaps for effective energy transition solutions beyond technology.

Q6: What of the following is the most PIVOTAL ACTION in progressing "faster, fairer and more far-reaching energy transitions" to happen in your region?



GLOBAL OVERVIEW

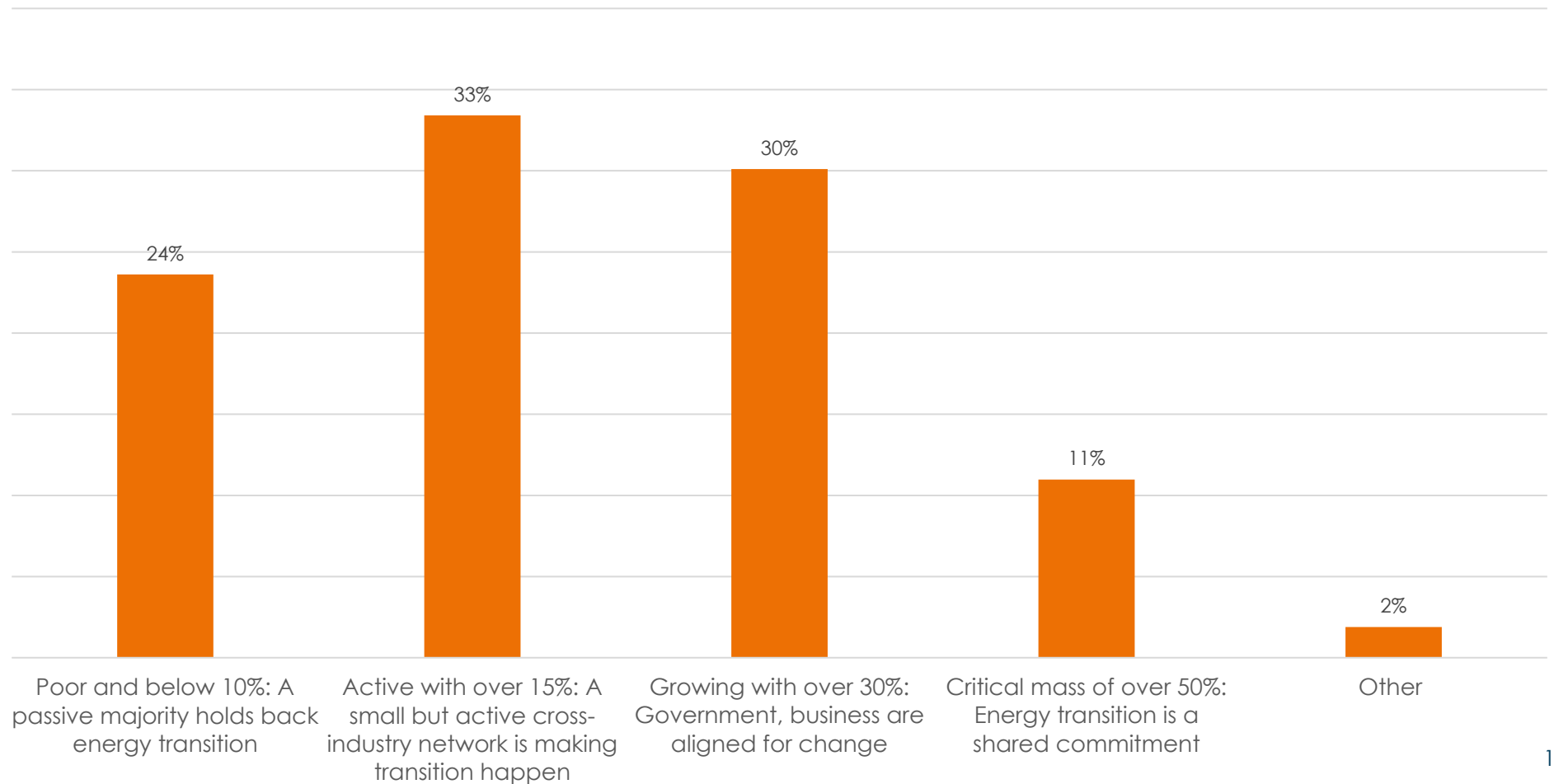
Approximately one-third of respondents describe a proactive but limited vanguard leading the transition, noting active participation levels exceeding 15% in their region.

Over 40% observe an encouraging trend of expanding active participation to encompass a more diverse set of actors.

24% of respondents see critical mass participation in the energy innovation ecosystem and community as "Poor and below 10%."

Respondents observe an encouraging trend of expanding transition efforts beyond a limited vanguard to encompass a more diverse set of actors.

Q10: A critical mass of global participation is needed in the energy innovation ecosystem and community, to reach transitions at scale. Which best describes participation levels in your region?

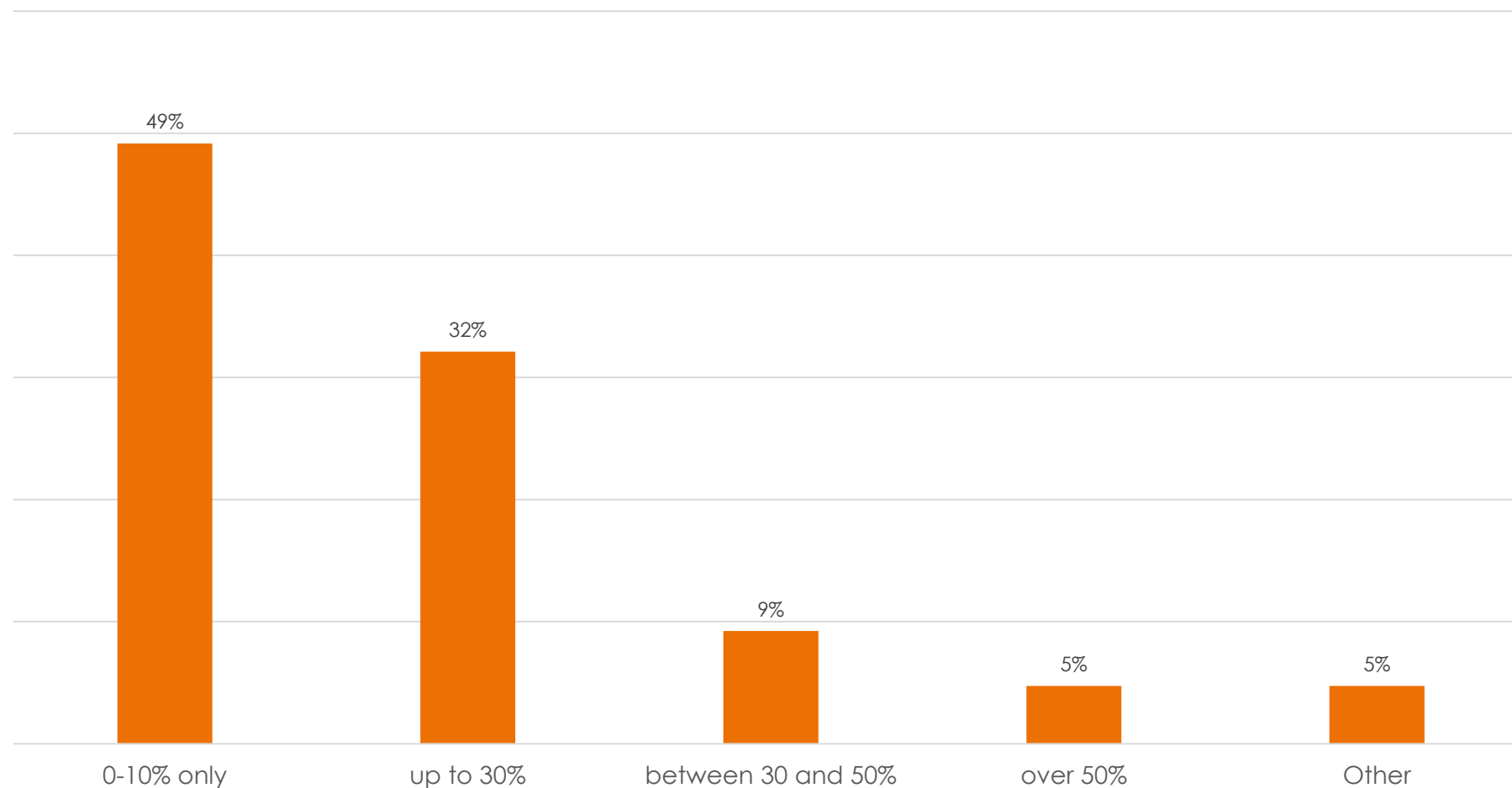


49% of respondents estimate that their regions have reallocated 10% or less of investment to transition, indicating a pressing need for increased investment to meet global energy transition goals.

Notably, those perceiving a higher (+30%) involvement in energy transitions(Q10) see a more significant reallocation of capital – with less than 30% of them estimating only 0-10% of investment being re-allocated to transition in their region. This underscores the call for cohesive action underlines the urgency of aligning efforts.

Energy leaders express concern that market and policy signals are not incentivising the major reallocation of capital to low-carbon power and efficiency that would align with a sustainable energy future.

Q9: An estimated \$4 trillion in capital investment is required annually for global energy transitions. But current levels are at a mere \$1 trillion. What percentage of capital investment do you estimate has been reallocated to transition in your region?



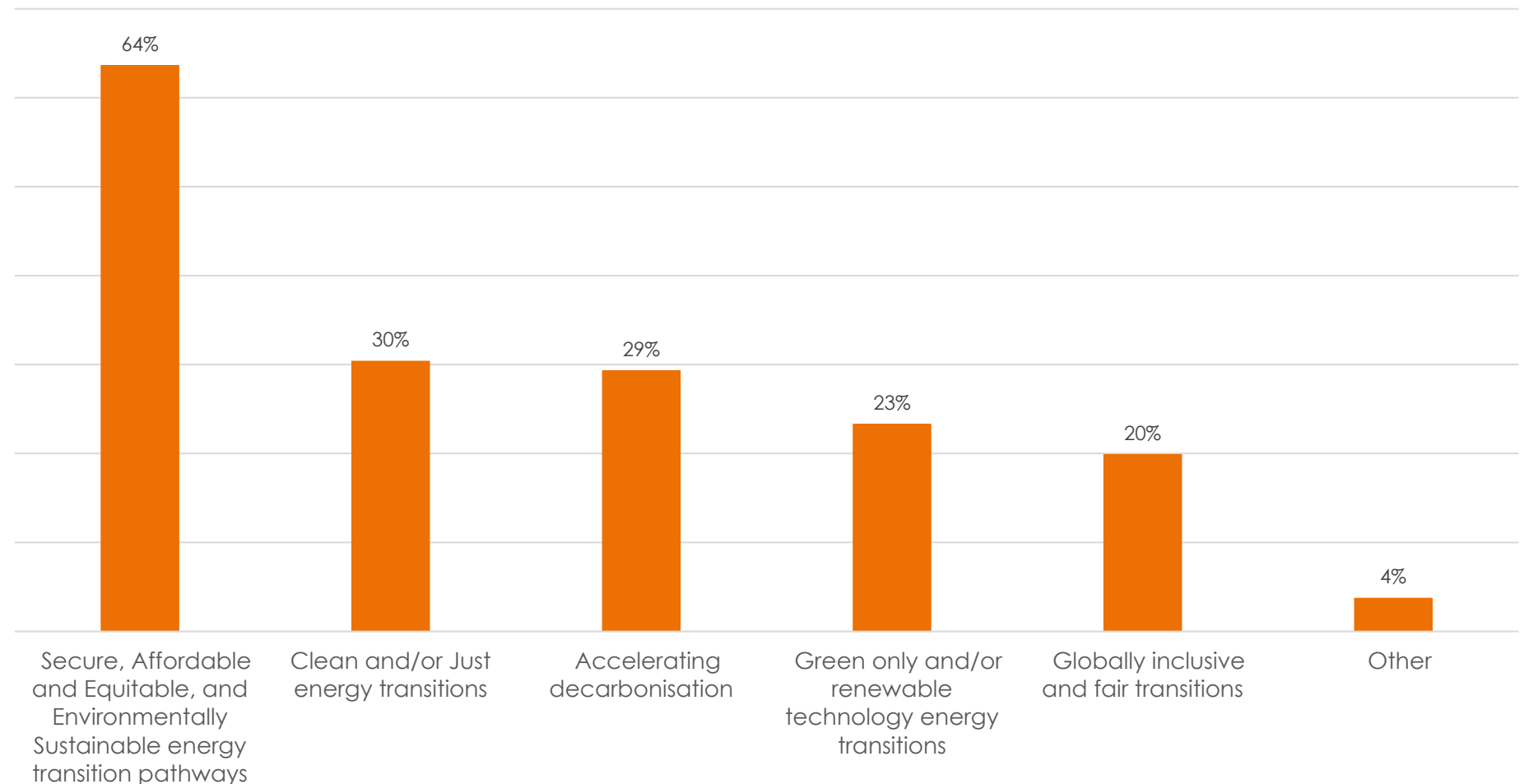
The Trilemma framework features strongly for 64% of respondents when describing energy transition pathways and processes.

This aligns with the majority emphasizing the urgent need for improved cross-domain coordination and more cohesive action, considering broader concerns such as security and affordability.

Meanwhile, terms like "Clean and/or Just" and "Globally inclusive and fair" indicate a call to expand trilemma definitions to incorporate justice-related elements.

There is a clear emphasis on addressing issues of security, equity, and sustainability as fundamental starting points for energy transitions.

Q3a. Which of the following terms do you prefer to use to describe energy transition in terms of **means/pathways and processes** (multiple answers possible)?

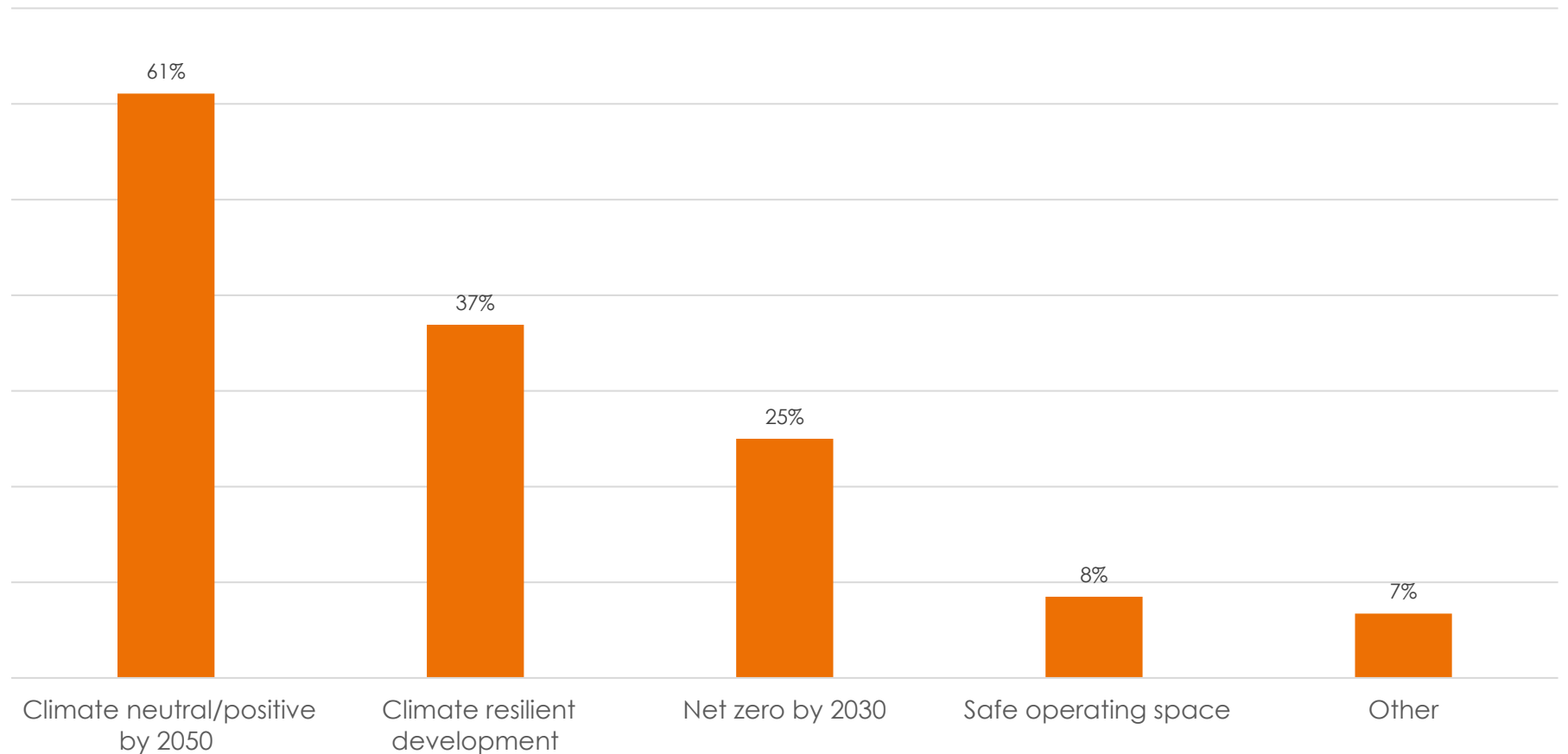


There is a clear preference for the term "Climate neutral/positive by 2050," indicating a shared focus on achieving a balanced state where carbon emissions are either eliminated or offset by 2050 yet appreciating the longer-term nature of energy transitions.

Following closely is the term "Climate resilient development," highlighting the significance placed on developing systems and strategies that can withstand and adapt to the impacts of climate change.

The aim of achieving Net-Zero (or beyond) by 2050 is deeply embedded as a shared goal.

Q3b. Which of the following terms do you prefer to use to describe energy transition in terms of **goals/ends** (multiple answers possible)?



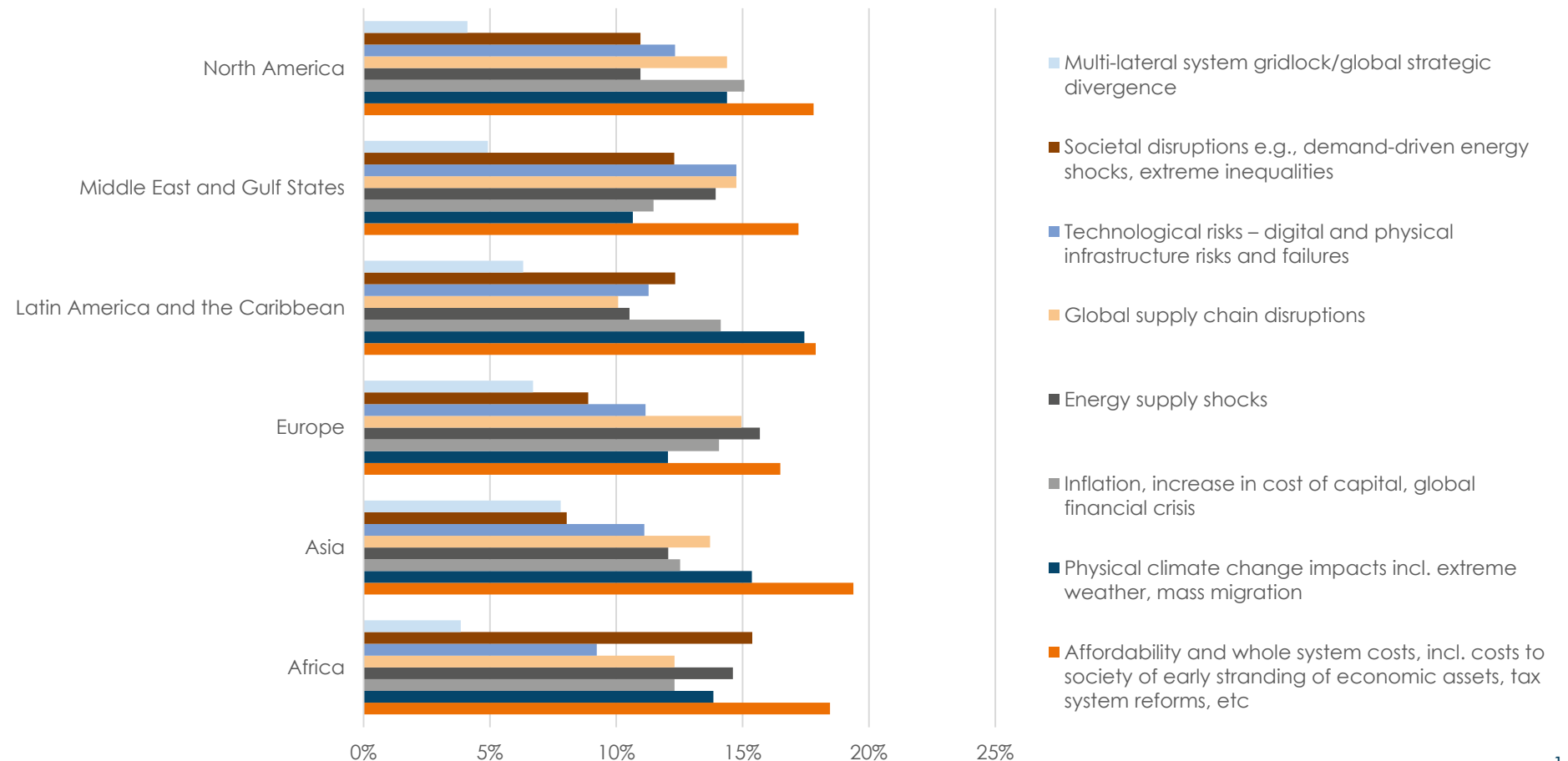
In addition, in Latin America, Asia, and North America, preparations are geared towards potential disruptions caused by the physical impacts of climate change and the challenges arising from extreme weather events and their effects on energy systems.

Conversely, Europe, the Middle East, and Africa prioritize readiness for potential energy supply shocks, ensuring resilience against potential disruptions.

Europe, North America, Asia, and the Middle East are bracing for potential global supply chain disruptions.

Regional preparedness for energy disruptions reveals distinct focus areas across different parts of the world, with disruptions due to affordability and whole system costs at the top of the agenda for all.

Q4: Climate and energy security agendas involve transformational change agendas. Which of the following DISRUPTIONS are you preparing for in your region (multiple answers possible)?



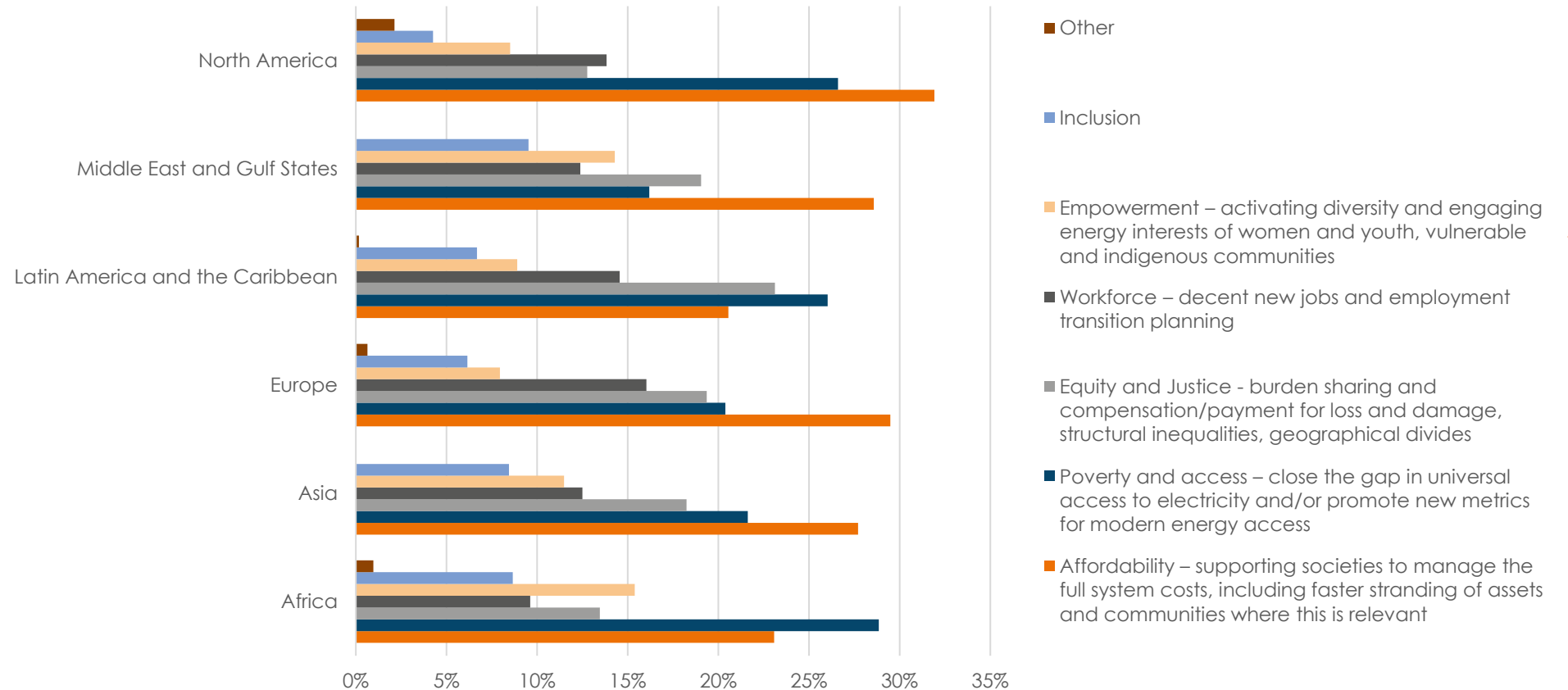
Europe, Asia, North America, and the Middle East prioritize grappling with affordability challenges and managing the overall costs of system changes, recognizing the socio-economic repercussions.

Africa and Latin America focus on the fairness of transitions, aiming to mitigate poverty and ensure equitable energy access without widening societal gaps.

This divergence highlights the complexity of the energy transition challenge, urging tailored approaches that encompass technical, economic, social, and ethical dimensions unique to each region.

The global landscape of concerns surrounding fairness in energy transitions reflects a diverse array of priorities across different regions, underscoring the multifaceted nature of the energy transition challenge.

Q8: Which aspects of fairness are you most concerned about in progressing energy transitions?

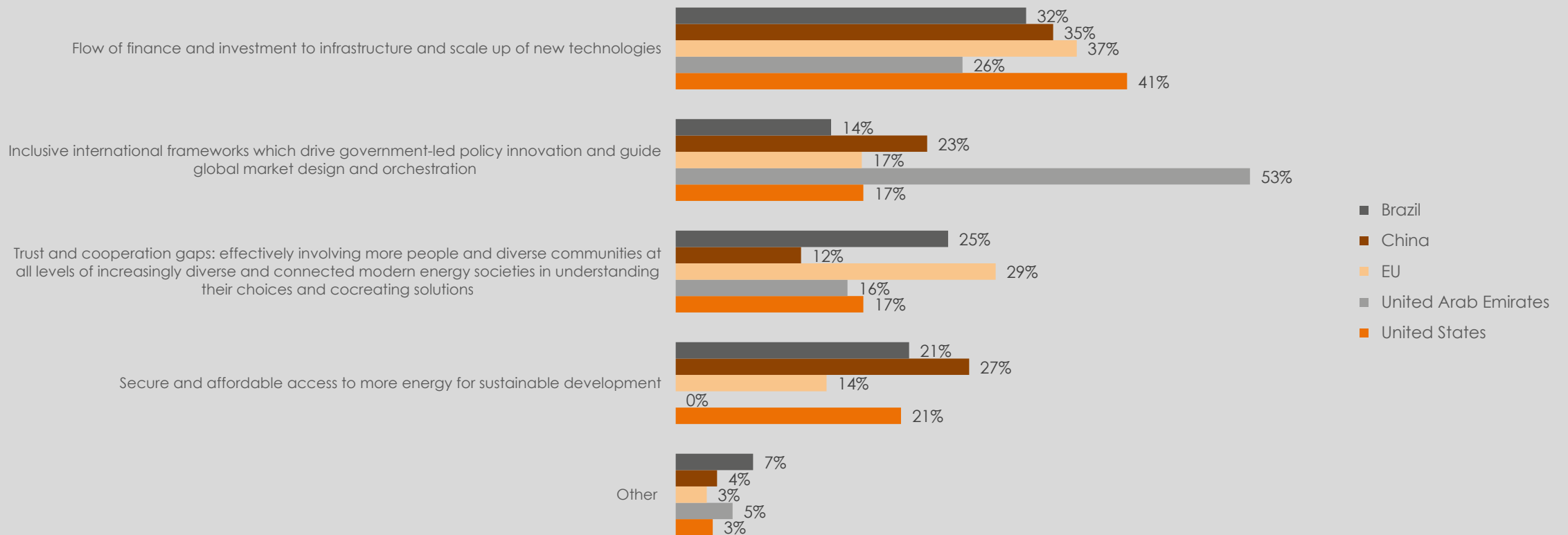


COUNTRY COMPARISON

While countries recognize the significance of "Flow of finance and investment" in propelling energy transitions, priorities vary across other domains.

Major emphasis on finance and investment gaps exists worldwide. Beyond finance, respondents from Brazil and the EU acknowledge trust and cooperation as gaps, whereas Brazil adds concerns about energy access. Chinese respondents emphasize secure energy access to meet demand. UAE respondents, with the country hosting COP28, signal a strong backing and relevance of global frameworks in progressing energy transitions. US respondents recognize gaps across all domains - energy access, trust, and global frameworks.

Q5: In your view, which of the following GAPS is the biggest challenges in progressing energy transitions in your region:



In nearly all surveyed countries, respondents value next-gen technology for fairer, faster, and more far-reaching energy transitions, yet they recognize innovation goes beyond technology.

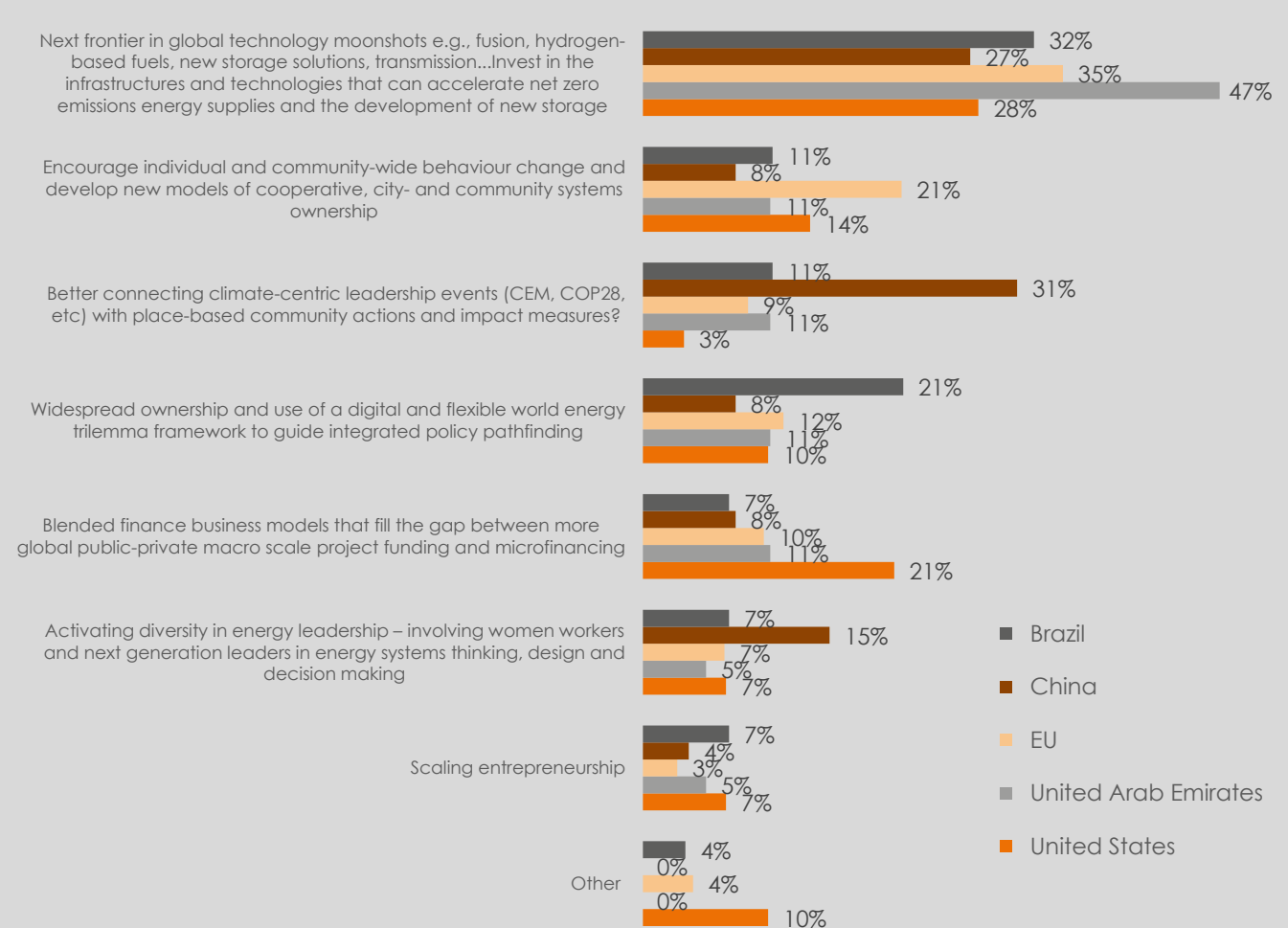
While majority of respondents in almost all countries count on next-gen technology moonshots to expedite faster, fairer, and more far-reaching energy transitions, the majority acknowledges that innovation surpasses technological realm.

China stands out with respondents calling for better connecting global leadership with place-based community action and impact measures.

Similar to global results, respondents see opportunity to progress energy transitions through a mix of blended finance models and community-driven ownership structures to enable global public-private funding.

These views underscore that bridging the ambition-impact gap requires humanizing energy, prioritizing people in transitions. And that the active involvement, understanding roles, choices, and costs will empower contributions and accountability while fostering greater engagement and acceptance and enabling action.

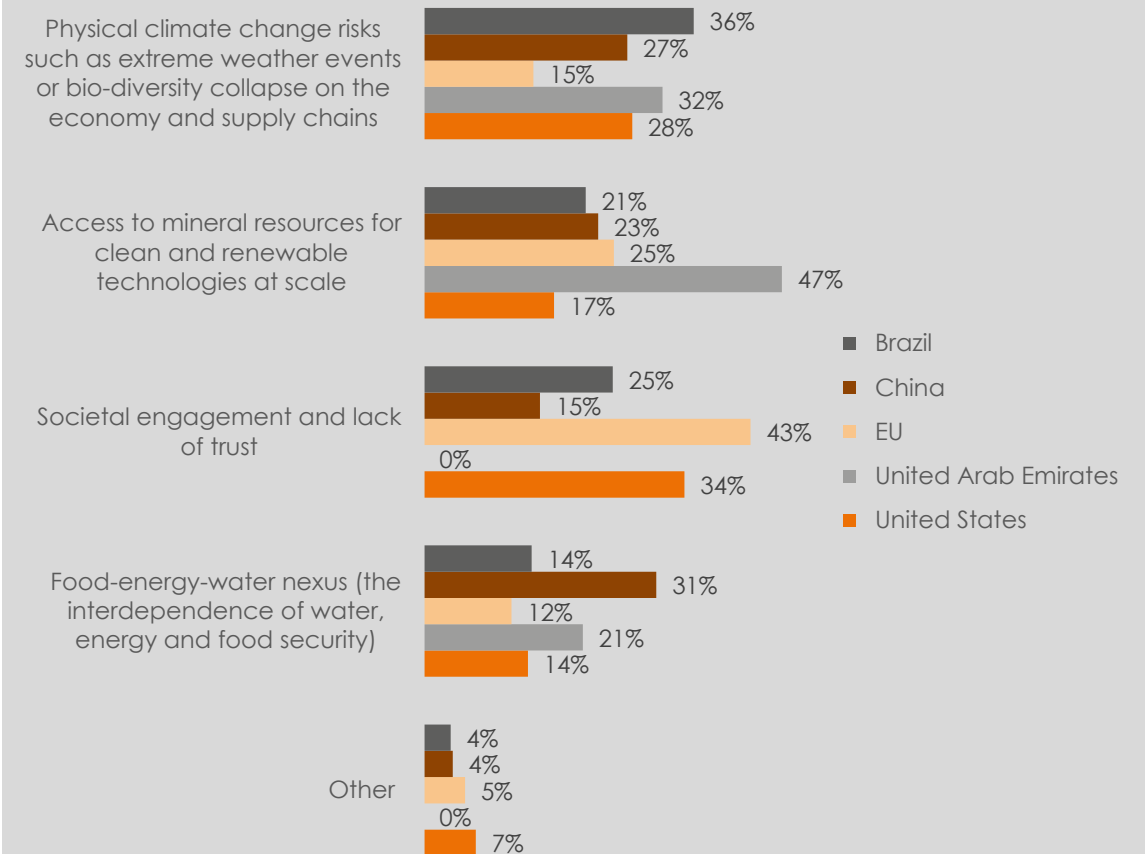
Q6: What of the following is the most PIVOTAL ACTION in progressing "faster, fairer and more far-reaching energy transitions" to happen in your region?



Survey respondents have underscored diverse concerns surrounding energy transition risks, revealing discernible differences between regional realities.

- **Brazil** flags significant concerns (50%) regarding the impacts of 'Physical climate change risks' and the 'Food-energy-water nexus' on the energy system and economy. Following closely at almost equal levels are concerns related to 'Societal engagement and lack of trust' and 'Access to mineral resources', underscoring the importance of community engagement and resource accessibility."
- **China** expresses even greater concerns (58%) regarding the impacts of 'Physical climate change risks' and the 'Food-energy-water nexus' on the energy system and economy. 'Access to mineral resources' follows, underscoring the continued commitment to scaling clean and renewable technologies to progress energy transitions.
- In the **EU** and the **United States**, respondents prioritize 'Societal engagement and lack of trust' as the most pressing emerging risk, with 43% and 34% respectively, highlighting the necessity to move beyond techno-economic issues and actively engage citizens, consumers, and diverse community roles in achieving faster, fairer, and more far-reaching energy transitions.
- In the **United States**, respondents express significant concerns (28%) regarding 'Physical climate change risks,' reflecting the impact of increasingly severe weather events on energy systems, the economy, and communities.
- In the **EU**, views shared emphasize concerns (25%) about 'Access to mineral resources,' highlighting a commitment to maintaining global leadership in advancing clean and renewable technologies for energy transition progress.
- The **United Arab Emirates** express severe concerns over "Access to mineral resources" (47%) to ensure continued advancement in their energy transition. Simultaneously, respondents express concerns (52%) about the effects of 'Physical climate change risks' and the 'Food-energy-water nexus' on their energy system and economy.

Q7: Which of the following do you perceive as the most relevant EMERGING RISK in progressing energy transitions in your region?



ABOUT THE WORLD ENERGY COUNCIL

The World Energy Council is the world's oldest independent and impartial community of energy leaders and practitioners.

Through our Humanising Energy vision, we involve more people and communities in accelerating clean and inclusive energy transitions in all world regions.

Formed in 1923, the Council is an UN-accredited global energy body that has convened diverse interests from across the full energy ecosystem for a century, and today has over 3,000 member organisations and a presence in nearly 100 countries.

Our global network draws from governments, private and state corporations, academia and civil society, as well as current and future energy leaders.

We collaborate on impact programmes and inform local, regional and global energy agendas in support of our enduring mission: to promote the sustainable use and supply of energy for the benefit of all people.

The Council convenes leadership dialogues including the World Energy Congress to enable new collaborations and drive impact; and provides a range of practical tools including the World Energy Trilemma Framework to define, support and better manage energy transitions.



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