Sustainable Energy Association of Singapore

ENERGY TRANSITION REPORT – 2025

The State of the Energy Transition

In Singapore and ASEAN 2025

Table of Contents

Executive Director's Message

Kavita Gandhi,
Executive Director,
SEAS

This year's State of the Energy Transition Survey 2025 captures a region learning to translate ambition into resilience. Southeast Asia's clean-energy transformation continues to advance, but the story is no longer about targets alone. It is about how systems, policies, and partnerships withstand pressure and deliver results.

The findings reveal a more measured confidence. Optimism for renewables remains strong, but it is tempered by the realities of grid limitations, fragmented regulations, and financing hurdles that persist across ASEAN. At the same time, the results point to growing maturity. Stakeholders now place greater emphasis on supply-chain stability, regional coordination, and shared data frameworks, recognising that resilience is what sustains progress.

We are also seeing a more distributed leadership landscape. Singapore continues to play a vital role

> "Regional integration and the concept of ASEAN as a regional energy bloc remains central to this story."

as the region's financial and policy anchor, while Malaysia, Vietnam, Indonesia, and the Philippines are advancing their own capabilities through policy reform, industrial scaling, and community-level innovation.
Together, these developments signal an ASEAN that is more interconnected and collaborative than ever.

Regional integration and the concept of ASEAN as a regional energy bloc remains central to this story. The expansion of the ASEAN Power Grid and cross-border solar projects, from the ASEAN Power Grid to the Riau-Singapore solar corridor, illustrate how shared infrastructure and financing can turn regional vision into reality.

Diversification has also become essential for long-term security. New frontiers such as bioenergy, decentralised systems, and carbon markets are gaining momentum, broadening the region's energy mix and building long-term resilience.

At SEAS, we believe that resilience and cooperation are inseparable. This evolution reinforces the importance of collaboration and capacity-building. Our commitment to connecting governments, investors, and innovators - to turn frameworks into action and ambition into delivery - remains steadfast. Through initiatives such as the Asia Clean Energy Summit, industry partnerships, and cross-sector dialogues, we will continue to strengthen ASEAN's capacity to build an inclusive, credible, and future-ready energy ecosystem.

The next phase of ASEAN's clean-energy transition will test our collective resolve. But with collaboration, consistent policy, and shared purpose, we can turn resilience into our greatest renewable resource.

November, 2025

Diversification has become essential for long-term energy security, incorporating new frontiers such as bioenergy.

Introduction

The State of the Energy Transition in ASEAN 2025 survey, conducted by the Sustainable Energy Association of Singapore (SEAS), captures a decisive moment for Southeast Asia's clean energy journey. Optimism about renewables remains strong, but this year's findings show a clear pivot from ambition toward resilience. Stakeholders are now focused on building systems that can withstand global supply and policy disruptions while maintaining progress toward net zero.

ASEAN's operating environment has grown more complex. Meanwhile, geopolitical tensions, energy protectionism, and commodity price swings have made risk management and coordination central to transition strategies. The 2025 survey signals a region redefining success, less in terms of scale and speed, but more about stability and delivery.

About the survey

Conducted annually, in conjunction with the Asia Clean Energy Summit, (ACES), SEAS's flagship conference, the survey measures industry sentiment on the progress, challenges, and opportunities shaping the region's path to net zero.

The 2025 edition gathered responses from 105 targeted energy industry professionals based in Southeast Asia through an online study held in August 2025.

Executive Summary

The Energy Transition in ASEAN

Resilience, readiness, and regional leadership emerge as defining forces in ASEAN's path to net zero.

ASEAN's clean energy transition continues, though progress has become steadier and more grounded. The enthusiasm that defined earlier years now sits alongside a growing recognition of practical limits.

Key themes emerging

Three main themes define this year's results:

Resilience over ambition.
Stakeholders are prioritising supply chain stability, regional coordination, and risk management to safeguard long-term progress.

Regulatory uncertainty persists.
Fragmented policies remain the top barrier for the third consecutive year, signalling the need for consistent and transparent regulation.

Technology and finance as accelerators.
Investment in clean infrastructure (83.8%), regional power trade (75.2%), and technologies like storage and hydrogen are seen as pivotal for scaling up.

Singapore remains ASEAN's clean energy anchor, but its leadership perception has softened from 95% in 2024 to 51.4% in 2025 as neighbouring economies mature. The country remains the regional reference point for carbon pricing and market development, even as Malaysia and Vietnam make notable advances.

Across three years of survey data, the narrative has evolved from governance (2023) to investment (2024) and now to resilience (2025). This shift reflects a region learning to balance ambition with operational and systemic readiness, signalling a maturing transition.

The ASEAN Outlook

ASEAN's clean energy transition remains on course but under growing strain from external shocks and domestic limitations. Confidence in renewables is high, yet implementation challenges continue to slow momentum.

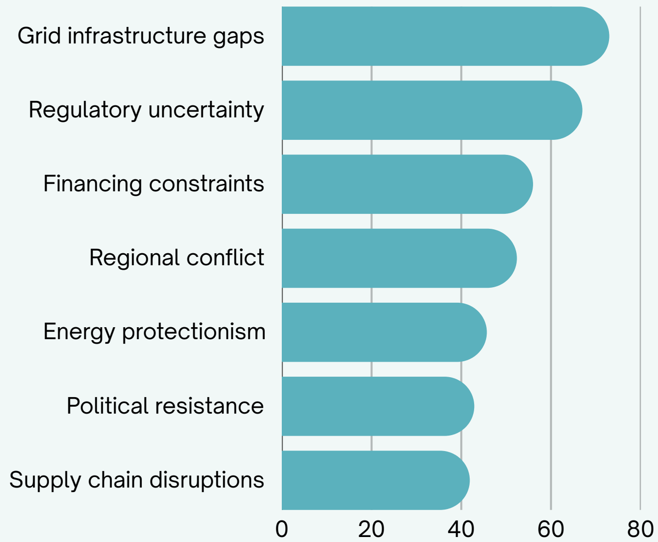
Respondents identified the top barriers to progress:

- Grid infrastructure gaps (73%)
- Regulatory uncertainty (67%)
- Financing constraints (56%)
- Political resistance (42.9%)

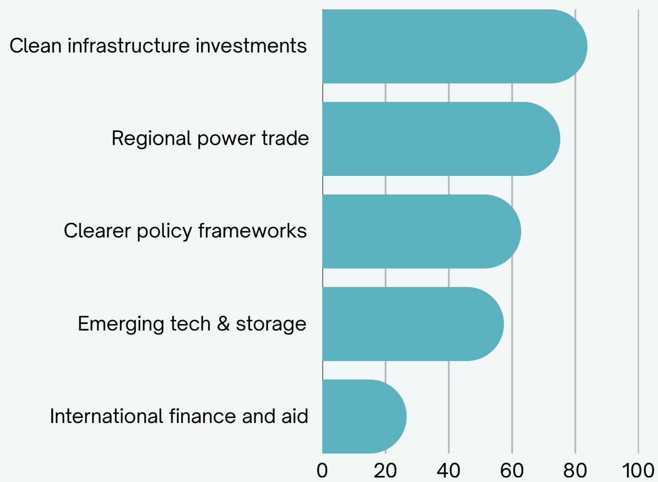
External risks are an increasing concern. More than half of participants (52.4%) cite regional conflict and political tensions as the main threats to energy progress. Energy protectionism (45.7%) and supply chain disruptions (41.9%) follow closely.

To strengthen resilience, 66.7% of respondents call for better cross-border coordination, reinforced by local and regional manufacturing capacity and shared data frameworks. These measures signal the need for building security and self-sufficiency into ASEAN's energy supply chain.

WHAT ARE THE TOP 3 BARRIERS TO THE ENERGY TRANSITION IN ASEAN?



WHAT ARE THE MOST IMPACTFUL ENABLERS FOR ASEAN'S CLEAN ENERGY FUTURE?



"As ASEAN's clean energy transition evolves from ambition to resilience, the Philippines holds a unique advantage through its reliable, indigenous renewable energy resources — led by geothermal, our baseload backbone.

Yet our vision goes beyond borders and beyond technologies. To truly accelerate the transition, we need regional cooperation not just in grids, but in carbon markets, financing, and nature-based solutions.

Through our geothermal portfolio, First Gen generates substantial renewable energy certificates that can enable cross-border decarbonization, while our BINHI forest restoration program shows how natural climate solutions can help Southeast Asia achieve a regenerative, net-zero future together."

JAY JOEL SORIANO, Head of Planning and Strategy, First Gen

The Singapore Story

Continuing to lead through partnership

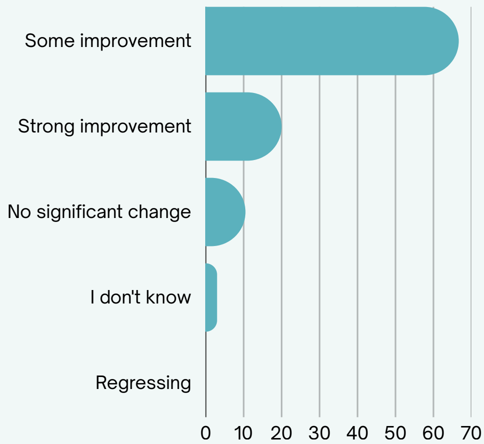
Singapore remains ASEAN's most trusted energy hub, but its leadership is now more shared. In 2025, 51.4% of respondents still view Singapore as the regional leader, though this is a significant decline from 95% in 2024. Malaysia (14.3%) and Vietnam (13.3%) are gaining recognition for their growing renewable capacity and supportive policy moves.

Domestically, 66.7% see Singapore's transition as progressing, but constraints persist: limited land, high project costs, and continued reliance on natural gas.

However, Singapore continues to be regarded as the regional centre for carbon pricing and market integration (29.5%), as well as a key hub for green finance (12.4%). Its influence now lies in enabling regional cooperation, setting clear regulatory models, and promoting carbon market development.

WHICH ASEAN COUNTRY DO YOU CURRENTLY PERCEIVE AS THE REGIONAL LEADER IN THE ENERGY TRANSITION?

HOW WOULD YOU RATE SINGAPORE'S PROGRESS ON ITS ENERGY TRANSITION GOALS COMPARED TO LAST YEAR?

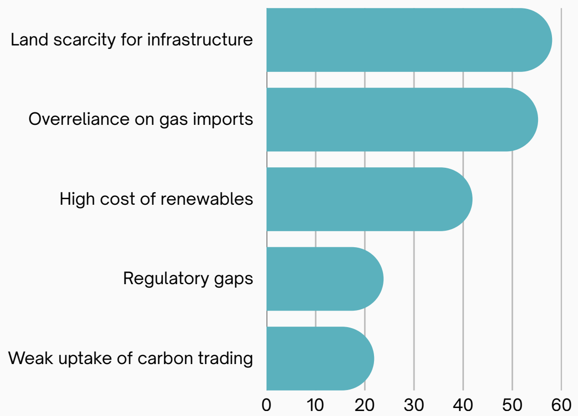


"This year's survey tells a story of a transition under strain, but not in retreat. The optimism for technology is now tempered by a sober recognition that systemic readiness for geopolitical and supply chain shocks will make or break ASEAN's net-zero ambitions.

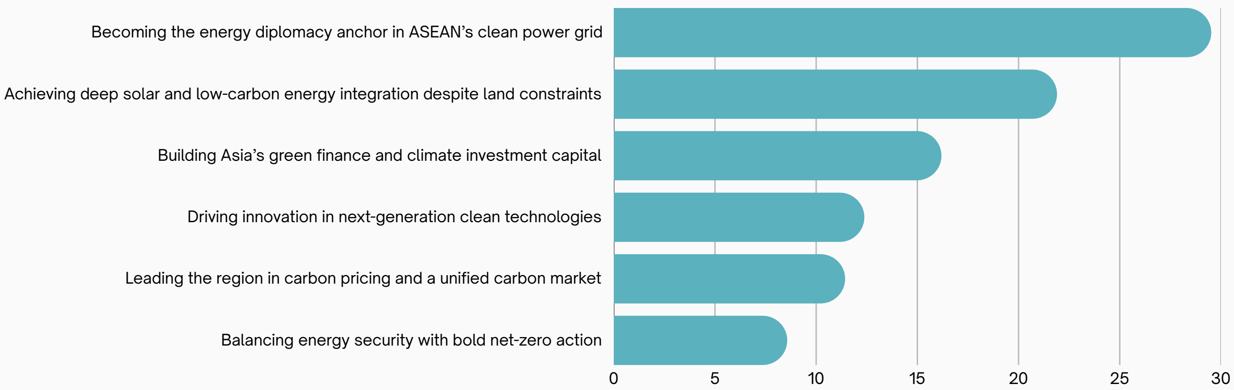
Singapore's role is evolving, and our focus must be on leveraging our strengths in finance, policy, and diplomacy to build a more resilient and interconnected regional energy architecture, with carbon markets as a critical pillar."

EDWIN KHEW, Chairman, SEAS

WHAT ARE THE MOST URGENT CHALLENGES SINGAPORE MUST ADDRESS TO ACCELERATE ITS TRANSITION?



AS SINGAPORE MARKS ITS 60TH YEAR, WHICH ENERGY TRANSITION AMBITION SHOULD WE STRIVE TO BE REMEMBERED FOR?



Opportunities in the Energy Transition

Investment, Innovation, and Integration

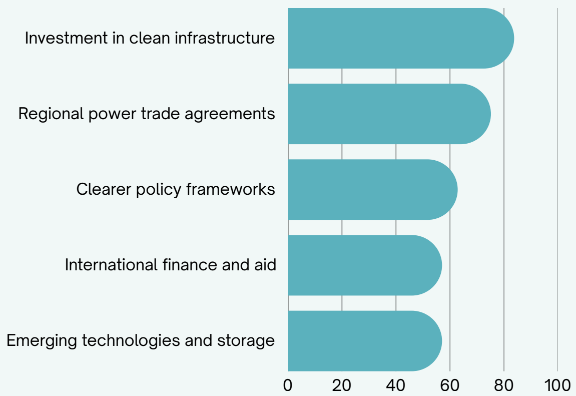
Despite global headwinds, capital is still flowing toward infrastructure and technology. Respondents overwhelmingly identify clean infrastructure investment (83.8%) and regional power trade (75.2%) as critical enablers, underscoring a pragmatic approach to accelerating impact.

Top enablers identified in the 2025 survey:

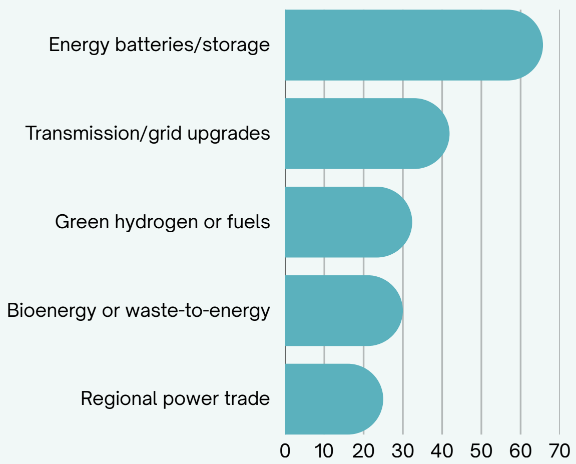
- 83.8%: Investment in clean infrastructure
- 75.2%: Regional power trade agreements
- 62.9%: Clearer policy frameworks
- 57.1%: International finance and aid
- 57.1%: Emerging technologies and storage

Investment priorities are shifting toward risk mitigation and reliability. Over the next year, 65.7% will prioritise energy storage and 41.9% transmission upgrades. These findings point to a maturing market that values resilience and reliability as much as growth potential.

WHAT ARE THE MOST IMPACTFUL ENABLERS FOR ASEAN'S CLEAN ENERGY FUTURE?



WHICH AREA OF CLEAN ENERGY IS LIKELY TO SEE THE HIGHEST INVESTOR INTEREST IN THE NEXT 12 MONTHS?



Regional Integration and Power Trade

ASEAN as a sovereign energy bloc

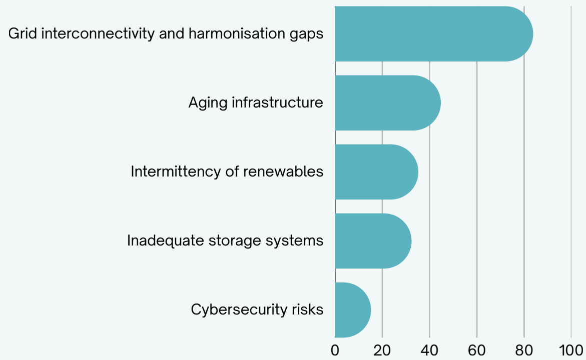
Regional integration remains the cornerstone of ASEAN's energy ambitions. Nearly three-quarters (75.2%) of respondents view cross-border power trade as one of the most important tools to accelerate the transition. However, the technical and policy challenges remain considerable.

Grid interconnectivity and harmonisation (83.8%) are identified as the most significant technical obstacles. Respondents point to the need for consistent regulations, multilateral coordination, and long-term investment to make the ASEAN Power Grid viable.

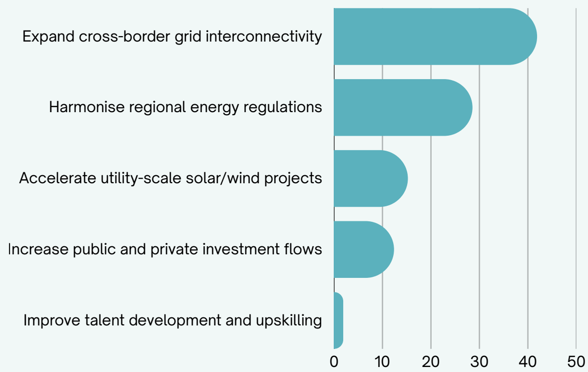
When asked which action matters most, 41.9% prioritise expanding grid links, followed by 28.6% advocating regulatory harmonisation and 15.2% calling for accelerated large-scale solar and wind projects.

Integration is now viewed as both an economic and political project: a pathway to energy security and cost parity across member states.

WHAT ARE THE BIGGEST TECHNICAL BARRIERS TO ASEAN'S ENERGY RESILIENCE?



WHAT IS THE MOST IMPORTANT ACTION ASEAN MUST TAKE TO MEET ITS RENEWABLE ENERGY TARGETS?



"The investor focus on grid and storage infrastructure reveals a market maturing towards practical solutions. However, capital requires certainty. The persistent citation of regulatory uncertainty as a top barrier for three years running is a clear call to action for harmonised policies and bankable project structures. Building trust through verified carbon accounting and uniform standards is not just an environmental imperative but a financial one to unlock the massive investment needed."

SHARAD SOMANI, **Partner and Head of Infrastructure, KPMG Asia Pacific**

Technology Outlook: Solar, Storage, and Hydrogen

Diversification to meet rising demand

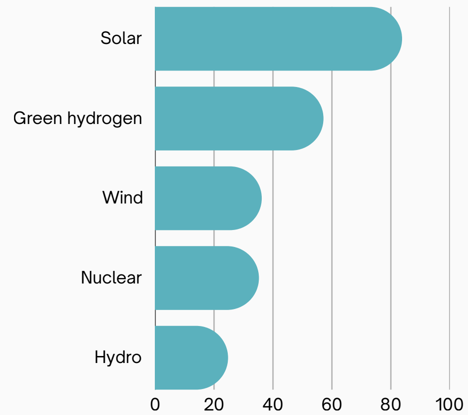
Technology sentiment remains strong but measured.

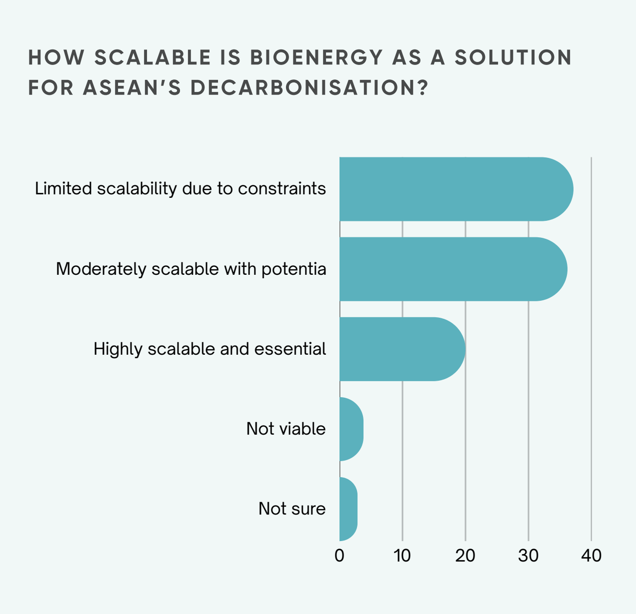
Solar (83.8%) remains the dominant growth technology due to falling costs and scalability. Respondents may be seeing Hydrogen entering an early commercialisation phase with 57.1% of votes, while Storage (65.7%) emerges as a bridge technology enabling reliability.

Bioenergy is viewed as moderately scalable (36.2%), with potential to expand through regional feedstock integration. Nuclear is a long-term option for 24.8% of respondents, but remains peripheral for now.

The message: With rising demand for power amid geopolitical uncertainty, ASEAN is looking at diversifying its energy sources, prioritising modular, bankable technologies that improve energy stability rather than speculative breakthroughs.

WHICH ENERGY SOURCES ARE MOST LIKELY TO SCALE SIGNIFICANTLY IN ASEAN OVER THE NEXT 5 YEARS?





Carbon Markets: Progress and Gaps

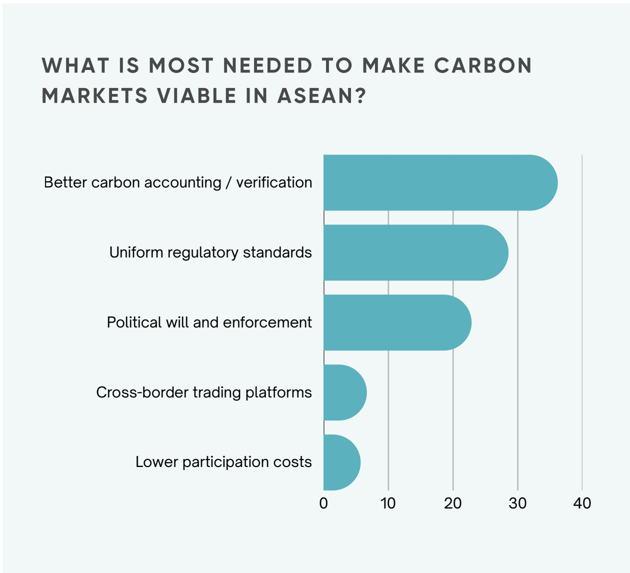
Carbon markets are evolving quickly across ASEAN, but many barriers remain.

Respondents identify several key priorities for success:

- Better carbon accounting and verification (36.2%)
- Uniform regulatory standards (28.6%)
- Greater political will and enforcement (22.9%)

Singapore's leadership in carbon pricing remains strong, given the existence of initiatives such as the Climate Impact X marketplace and bilateral trading frameworks under Article 6. However, inconsistent verification and regulatory systems across ASEAN could limit cross-border trade and investor participation.

The results indicate that harmonising standards and improving transparency are now top priorities for building trust and attracting capital into regional carbon markets.



Supply Chains and External Risks

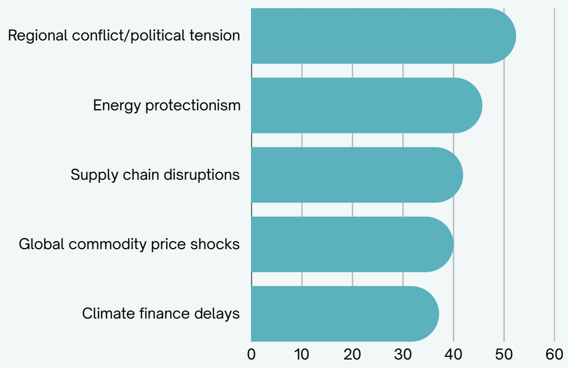
Global volatility continues to influence ASEAN's energy strategies. While only 16.2% of respondents report significant disruptions, most acknowledge the need to adapt to moderate (31.4%) or minimal (30.5%) impacts from trade tensions and shifting geopolitical alliances.

External risks continue to weigh heavily on ASEAN's energy transition. Over half of respondents (52.4%) identify regional conflict and political tension as the most immediate threats to progress, while energy protectionism (45.7%) and supply chain disruption (41.9%) are close behind. These concerns highlight how external dynamics such as trade restrictions, resource nationalism, and shifting geopolitical alliances can quickly reshape investment confidence and project timelines.

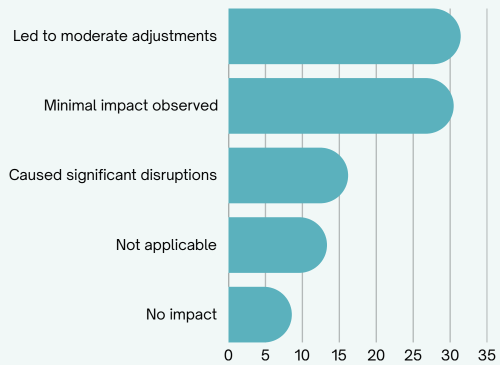
The data also suggest a growing recognition that resilience is now as much about diplomacy and diversification as it is about technology.

For ASEAN, stakeholders are emphasising local production, diversification of suppliers, and better data-sharing among markets to mitigate exposure to global shocks, calling for member states to respond collectively when disruptions arise. This trend signals a collective effort to strengthen autonomy and resilience within the regional clean energy ecosystem.

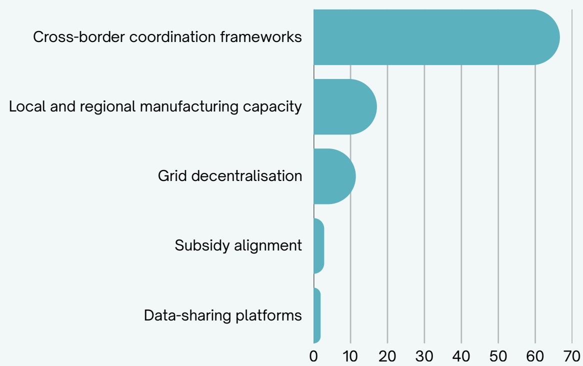
WHAT ARE THE TOP EXTERNAL RISKS THREATENING ASEAN'S ENERGY TRANSITION?



HOW HAVE US-CHINA TRADE TENSIONS IMPACTED YOUR ORGANISATION'S RENEWABLE ENERGY SUPPLY CHAINS?



WHAT WOULD MOST STRENGTHEN ASEAN'S ENERGY SUPPLY CHAIN RESILIENCE?



Three-Year Comparison: 2023–2025

How the narrative has shifted

ASEAN's transition has matured from building frameworks to ensuring execution and resilience. The narrative is now about durability and delivery rather than declarations and targets.

	2023	2024	2025
Focus	Governance & frameworks	Investment & policy	Resilience & readiness
Leading Barriers	Weak strategies, cross-border issues	Regulatory uncertainty, financing constraints	Grid gaps, regulatory uncertainty, supply chains
Key Enablers	Governance standards	Clean energy investment	Infrastructure investment, power trade
Singapore Leadership	92%	94.9%	51.4%

Looking ahead

The 2025 SEAS survey shows ASEAN moving forward, adapting to new realities. The region has learned that resilience underpins ambition.

Singapore's role as coordinator and carbon market pioneer remains critical, even as leadership becomes more distributed. For ASEAN, the test ahead is synchronisation: aligning regulation, upgrading grids, and scaling proven technologies.

The next phase will be defined not by ambition alone, but by the ability to sustain progress when conditions turn uncertain.

The SEAS Mission

As ASEAN enters a new phase of its clean energy journey, SEAS remains committed to building an ecosystem defined by resilience and readiness.

Our mission continues to centre on advancing sustainable energy practices, technologies, and policies that strengthen both national and regional capacity for change. By fostering collaboration between industry, government, and the public, we aim to create systems that not only reduce emissions but also withstand future shocks.

Looking ahead, SEAS will intensify efforts in policy advocacy, capacity building, and cross-border cooperation to ensure the region's energy transition remains inclusive, credible, and future-ready.

Through partnerships that encourage innovation, education, and investment, we will continue driving Singapore's leadership in sustainable energy while deepening regional collaboration to secure a more resilient and net-zero ASEAN.

SEAS
Sustainable Energy Association of Singapore

Connect with us for questions, to discuss our findings further, for access to data from the survey or potential collaborations.

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