energy institute | Energy Barometer 2025

Energy Barometer 2025:

Insights from ASEAN's Energy Workforce

Highlights

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The Energy Institute (EI) Energy Barometer, now in its 11th year, continues to present the perspectives of energy professionals around the world. Each year, with a focus on specific regions, it captures and analyses the views of experts across the entire energy spectrum, providing an informed sense check on policy, investment, and technology priorities that have and will shape the global energy transition.

The 2025 edition focuses on member states of the Association of Southeast Asian Nations (ASEAN), in a region of rapid growth, rising populations, and soaring energy demand. To date, much of this expansion has been underpinned by fossil fuels, around 90% of the region's energy mix, according to the latest EI Statistical Review of World Energy. Whilst supporting rapid development, such dependency also creates energy security risks. ASEAN's energy use is now 2.6 times higher than in 2000, growing at around 4% per year. The International Energy Agency expects the region to account for a quarter of global energy demand growth by 2035.

The ASEAN – comprising eleven member states – represents one of the world's most diverse regional blocs. Its economies range from advanced, service-driven but resource-poor markets like Singapore, to energy-producing Malaysia, and resource-rich Indonesia. The Philippines, a rapidly developing economy with growing clean energy ambitions yet high vulnerability to climate impacts, also grapples with the complex energy challenges. Meanwhile, emerging and fast-growing energy markets such as Vietnam and Cambodia, along with more developed markets like Thailand, continue to expand infrastructure and improve access to energy.

This diversity directly influences how each country sets its priorities across energy security, environmental sustainability, and affordability, reflecting differences in resources, geography, politics, regulation, and social development. It also shapes how energy professionals responded to the survey questions, with perspectives reflecting local context.

Despite the region's heavy reliance on fossil fuels, ASEAN's energy transition is already taking shape. Several Southeast Asian countries are making steady progress in scaling up renewables, reflecting growing regional commitment to clean-energy development. Malaysia is gradually diversifying its energy mix beyond fossil fuels, including hydrogen, biogas, CCUS and nuclear power as long-term options to strengthen energy security and reduce emissions, while also expanding solar energy and modernising its electricity grid. Singapore, though lacking natural resources, is emerging as a centre for clean energy innovation, testing new technologies such as hydrogen, carbon capture, and cross-border electricity connections, while also considering nuclear solutions.

This year's Barometer findings reinforce the view that deeper ASEAN integration is viewed by energy professionals as a decisive enabler of affordable, resilient, and sustainable energy. Cross-border infrastructure, harmonised regulation, and shared investment frameworks are seen as critical to achieving the next phase of growth, even as practical challenges around financing and governance remain.

The results also reflect optimism about clean energy growth, paired with realism about the enduring role of fossil fuels. Respondents see the energy transition not as an immediate replacement of hydrocarbons, but as a pragmatic rebalancing – where fossil fuels evolve through efficiency, cleaner technologies, and carbon capture, while clean energy, storage, and interregional trade scale up to meet rising demand.

The insights gathered through this year's Barometer – drawing on the survey results and in-depth interviews with energy professionals working in the region – highlight both the opportunities and realities of ASEAN's evolving energy landscape. While no single country stands as a universal model, tangible steps are being taken toward a more resilient, cleaner, and inclusive energy future.

Fossil Fuels in Transition

While over half of surveyed energy professionals expect the share of fossil fuels in the energy mix to decline moderately over the coming decade, the transition is expected to be gradual and uncoordinated across countries, reflecting different national priorities and resources. Most respondents view energy affordability and security concerns as the primary factors underpinning ASEAN's continued reliance on fossil fuels. The fossil fuel sector is expected to evolve, with strong support from respondents for diversifying into low-carbon fuels, improving efficiency and reducing carbon intensity, and investing in emissions-reduction technologies such as CCUS, methane abatement, and direct air capture.

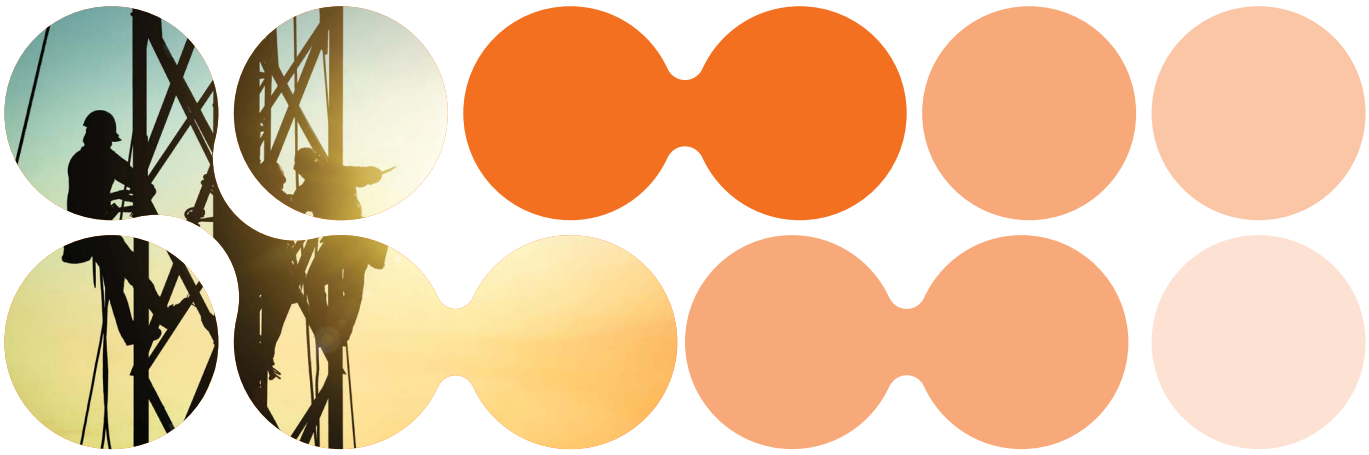
Q: What are the primary factors driving continued reliance on fossil fuels in your country?

21% Energy affordability

16% Energy security concerns

12% Infrastructure and technology limitations

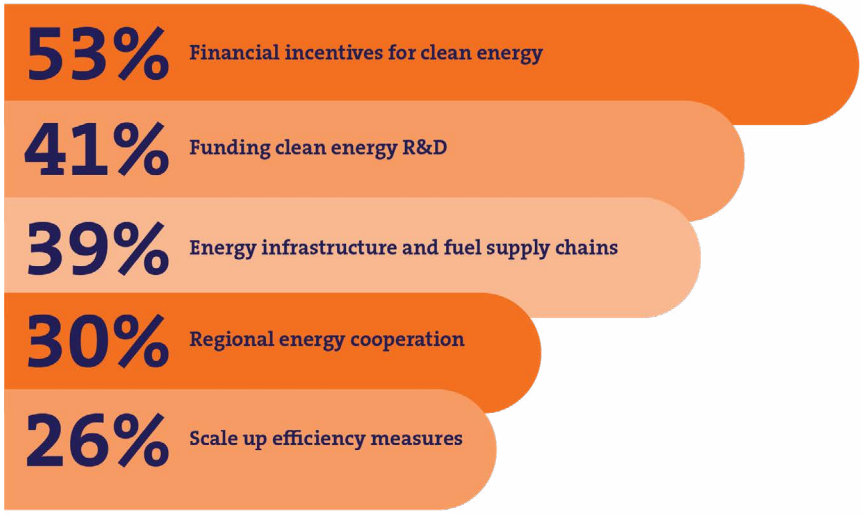
*Responses to this question were weighted by rank (first = 9 points, second = 8, etc.) and aggregated. Percentages show each factor's share of total points.



Energy Systems Resilience and Stability

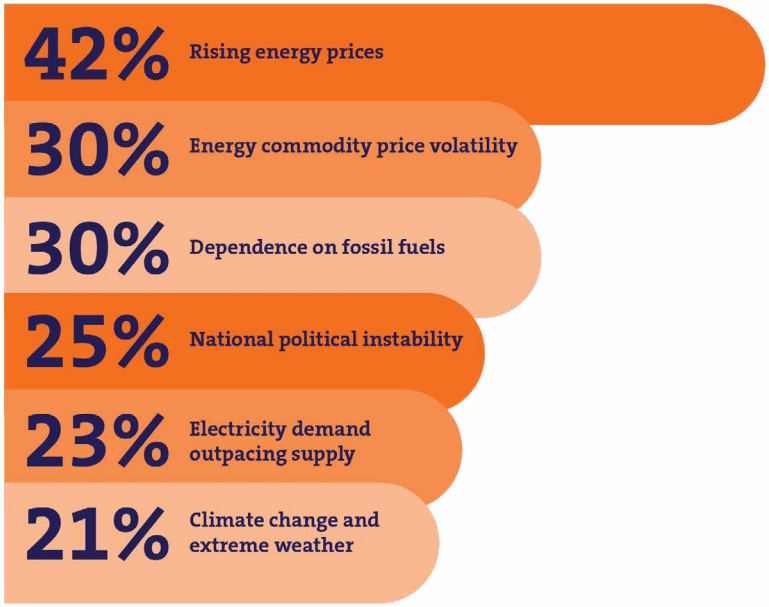
Security, affordability, and sustainability are increasingly seen as mutually reinforcing priorities shaping ASEAN's energy future. Financial incentives for clean energy, funding for innovation, and infrastructure upgrades are viewed as key energy policy measures, with more than half of respondents ranking subsidies and tax breaks for clean energy as their top policy priority. Yet affordability remains pressing concerns: rising energy prices are cited as the biggest near-term risk, with exposure to commodity price volatility and dependence on fossil fuels also ranking high among priorities. Looking ahead, opinion is divided on meeting emissions targets, with more than half believing that given current policies, the targets will fall short. To protect consumers, respondents emphasize a combination of structural and social measures: promoting energy efficiency, diversifying energy sources, and providing targeted financial support for vulnerable households.

Q: Which of the following energy policy actions do you believe should be a top priority for your country?



*Responses reflect the percentage of respondents. Respondents were allowed to choose more than one option.

Q: What do you see as the biggest risks to your country's energy system over the next 5 years?



Q: What government measures are needed to protect consumers from energy price shocks?

57% Promotion of energy efficiency programmes

52% Diversification of energy sources

45% Targeted financial support for vulnerable households

ASEAN Regional Energy Cooperation

Survey results underscore strong support for joint initiatives such as the ASEAN Power Grid, with most respondents recognizing cross-border coordination as a central pillar of their energy security policy and a way for more affordable energy. At the same time, they are concerned that sovereignty concerns, financial barriers, and differing regulatory frameworks are slowing progress. Despite these challenges, the findings point to a clear appetite for deeper collaboration, particularly in developing cross-border infrastructure and promoting regulatory alignment, while maintaining a pragmatic awareness that successful integration depends on aligning regional efforts with national development priorities and institutional capacities.

Q: Which of the following do you see as the main barrier to regional (cross-border) grid interconnection in ASEAN?

59% National sovereignty concerns

53% Regulatory differences

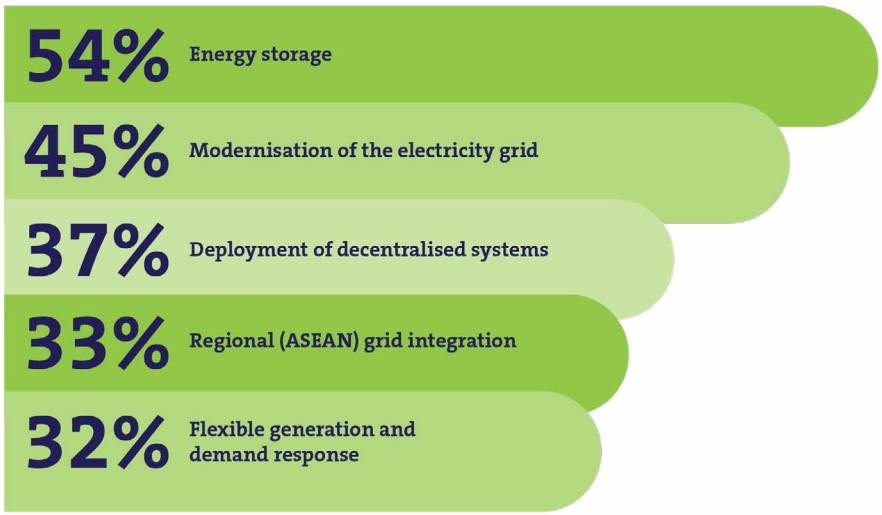
51% Limited grid infrastructure

46% Financing challenges

Redesigning Energy Systems with Technologies

Outlooks on ASEAN's 2030 renewable electricity target are mixed, with roughly half expecting it to be met or exceeded, while nearly as many anticipate it will fall short. Respondents highlight energy storage, electricity grid modernisation, decentralised systems, and greater regional interconnectivity as key technical measures for renewable energy integration. As several countries in the region explore nuclear power, around half of survey participants see it as viable if strong safety regulations are in place and public acceptance is ensured. Digital solutions are also considered critical, with many respondents pointing to grid operations and real-time monitoring, smart metering, and renewable forecasting as areas where digital technologies can most effectively support the energy system. In response to surging data-centre electricity demand, respondents strongly favour powering these centres with renewable energy, implementing stricter efficiency standards, and co-locating them near renewable generation.

Q: What are the most important technical improvements needed to enable more renewable energy integration in your country?



Q: What measures do you think are the most important to manage the energy consumption of data centres in Southeast Asia?

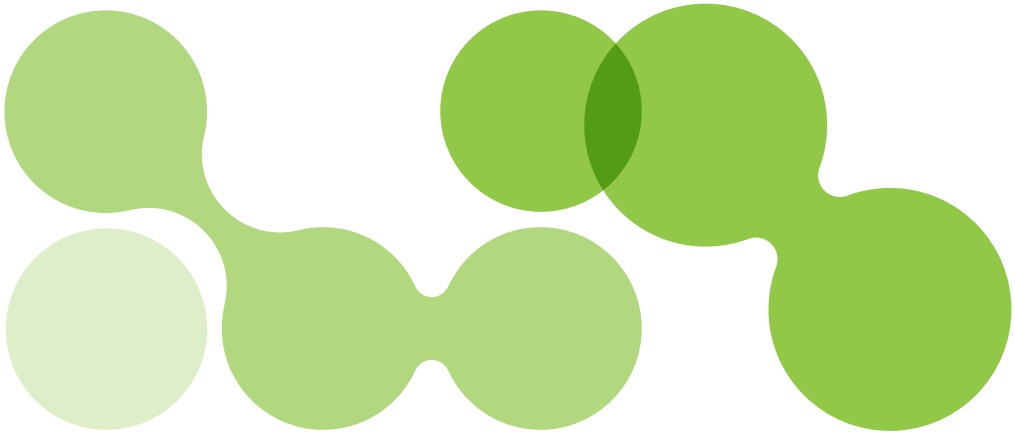
73% Power data centres with renewable energy sources

54% Stricter energy efficiency standards

47% Co-locating data centres closer to renewable energy sources

Investing in the Future of Energy

Survey respondents support investments across a range of technologies, including energy efficiency, solar, energy storage, CCUS, modernisation of fossil fuel power plants, and low-carbon transport, prioritising initiatives that balance near-term practicality with long-term sustainability objectives. Despite strong support for these investments, high upfront costs, regulatory uncertainty, and limited access to affordable long-term financing are widely seen as obstacles that must be addressed to turn ambitions into action. Overcoming these barriers will require a dual approach: reducing the cost and risk of capital through innovative financing mechanisms and ensuring policy stability and clarity to build investor confidence and accelerate the energy transition.



Q: Which technologies or innovations should be prioritised for investment to support your country's energy transition?

47% Energy efficiency and demand management

37% Solar

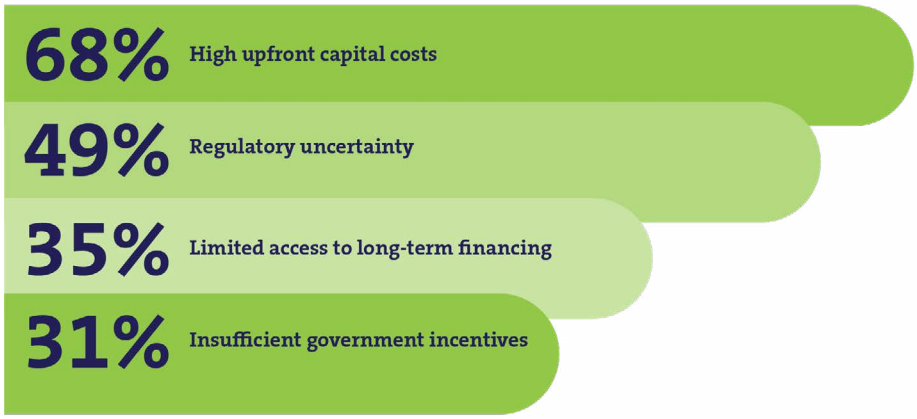
35% Energy storage

33% Carbon capture, utilisation, and storage

29% Efficiency improvements of fossil fuel power plants

27% Low-carbon transport

Q: What are the biggest obstacles preventing greater investment in energy transition projects in your country?



Powering a Just Energy Transition

A successful energy transition depends on equipping all communities to participate. Energy professionals stress that groups most at risk of being left behind are low-income households, remote communities without reliable access to energy, and elderly populations and those with limited digital literacy. Respondents highlighted the importance of developing multidisciplinary capabilities, prioritising engineering and technical expertise, policy and strategic planning skills, and knowledge of environmental and social impact assessment alongside renewable energy technologies. The findings underscore that strengthening technical, policy, and environmental-social skills will be critical to building an energy system that is resilient, equitable, and capable of delivering both innovation and inclusion.

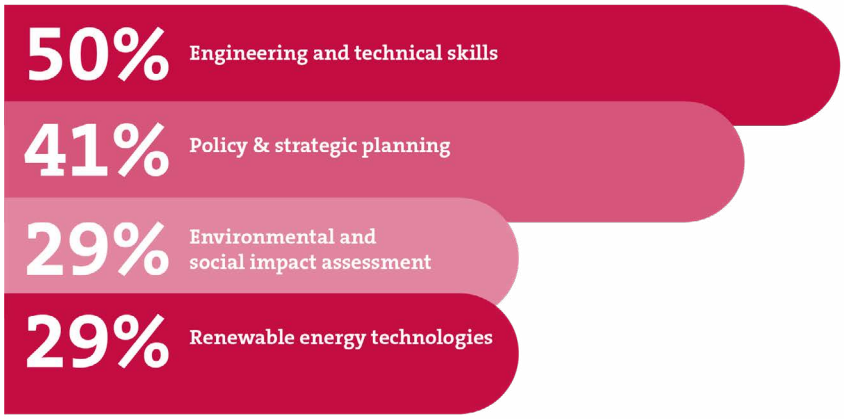
Q: Which groups in your country are most at risk of being left behind by the energy transition?

75% Low-income and marginalised households

68% Remote communities without reliable access to energy

39% Elderly populations and those with limited digital literacy

Q: Which of the following skills and capabilities will need to be improved within the energy workforce in your country to support the energy transition?



Methodology

The 2025 Energy Barometer is the eleventh annual survey of energy professionals, including both EI members and non-member participants.

The online survey, conducted from August to October 2025, received responses from over 200 energy professionals. The findings were further validated through in-depth qualitative interviews with some of the respondents.

This survey and report were developed and delivered by the Energy Institute working in partnership with Universiti Teknologi PETRONAS (UTP), Malaysia, and the ASEAN Centre for Energy (ACE), Indonesia, with support from the Malaysian Ministry of Economy and S&P Global Energy. The Energy Institute is grateful for their collaboration, expertise, and commitment throughout the process.

Perspectives and opinions of professionals were captured across all areas of energy, including oil and gas, renewables, energy and carbon management, hydrogen, biofuels and waste, energy storage, and carbon capture, utilisation and storage (CCUS).

Unless stated otherwise, responses to all types of questions are presented as percentages of the number of respondents.

Consequently, this may lead to percentages adding up to more than 100%, particularly in the instance of multiple-choice questions where respondents were allowed to choose more than one option.