AWS INVESTMENT IN MALAYSIA

AWS Economic Impact Study

AWS Economic Development | 2024

Contents

Executive Summary

29.2 billion[1] MYR ($6.2 billion)

Total planned investment associated with the AWS Asia Pacific (Malaysia) Region, 2024–2038

57.3 billion MYR ($12.1 billion)

Estimated GDP contributed to Malaysia by the AWS Asia Pacific (Malaysia) Region, 2024–2038

More than 3,500 jobs

Estimated average FTE jobs at local businesses annually supported by the AWS Asia Pacific (Malaysia) Region, 2024–2038

As Amazon Web Services (AWS)[2] invests in communities around the globe, it creates measurable and demonstrable economic growth in those regions. This AWS Economic Impact Study (EIS) describes the impact generated by AWS's investment associated with the AWS Asia Pacific (Malaysia) Region. This study further outlines the ripple effects of that investment throughout Malaysia. AWS investments in Malaysia play a vital role in enabling job retention, cloud training, and education, harnessing advanced technologies such as artificial intelligence (AI), fostering community engagement, and ensuring our ability to fulfill our commitment to renewable energy.

The new **AWS Region in Malaysia**, with planned investment of 29.2 billion Malaysian ringgit **($6.2 billion)** throughout 15 years, **will give developers, startups, entrepreneurs, and enterprises, as well as government, education, and nonprofit organizations, greater choice** when running their applications and supporting their constituents and customers.

To support the Malaysian government's strategic Madani Economy Framework, which aims to improve the living standards of all Malaysians by 2030, the new AWS Region in Malaysia will be instrumental in advancing the country's digitization ambitions and meeting the growing demand for cloud services, while driving innovation in Malaysia and across Southeast Asia.

The launch of the AWS Asia Pacific (Malaysia) Region and the introduction of new infrastructure will **nurture a vibrant community** where startups, small and mid-sized businesses (SMBs), enterprises, and public sector organizations can collaborate, experiment, and thrive with access to the latest technologies such as generative artificial intelligence (AI), machine learning, Internet of Things (IoT), and more. Moreover, these investments will give startups, public sector organizations, and enterprises access to state-of-the-art cloud infrastructure.

[1] The local currency values in this report were obtained by using the June 20, 2024 spot exchange rate of 4.7128 Malaysian ringgit (MYR) per U.S. dollar. MYR to USD Exchange Rate (bloomberg.com).

[2] References to AWS may relate to various affiliate entities including, but not limited to, Amazon Web Services Malaysia Sdn Bhd and Amazon Data Services Malaysia Sdn Bhd LLC, and may also refer to AWS services, products, methods, and practices, and the AWS brand and trademark. For more information on AWS generally, see https://aws.amazon.com/what-is-aws/.

This investment will enhance the experience of existing AWS customers in Malaysia by providing advanced cloud services through local infrastructure. Further, AWS supports more than 1,300 local startups through programs like ACTIVATE and collaborates with accelerators such as MyStartups and Penjana Kapital to support the rapid growth of their portfolio companies.

AWS provides customers in Malaysia with the added efficiency, scale, and reach to keep innovating and making a meaningful impact in the communities in which they operate. Further, AWS infrastructure provides AWS partners and government agencies throughout Malaysia the ability to solve critical low-latency challenges through enhanced access to cutting-edge cloud technologies, including AI. These Malaysian companies are also using AWS to drive cost savings, accelerate innovation, and better serve the citizens of the region. Leading companies in Malaysia, such as Astro Malaysia Berhad, CelcomDigi, Johor Corporation, PayNet, PETRONAS, as well as large public sector organizations, including the Department of Statistics Malaysia (DOSM), Ministry of Higher Education (MoHE), Ministry of Education, the Jabatan Digital Negara (JDN), the Federal Agricultural Marketing Authority (FAMA), POS Malaysia, Radio Televisyen (RTM), Smart Selangor, and Tenaga Nasional Berhad (TNB), are running every imaginable workload on AWS.

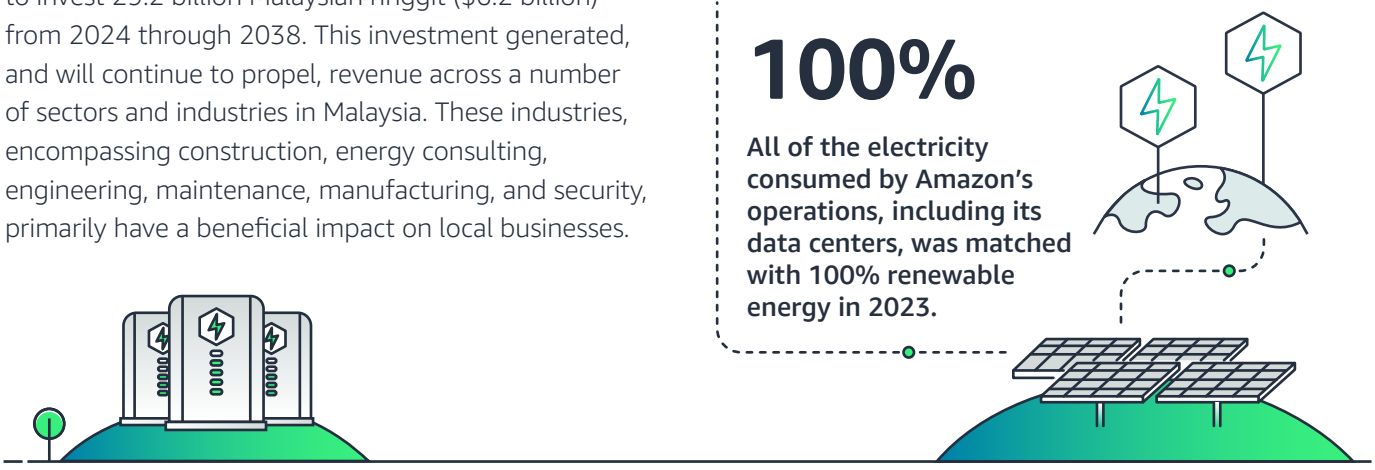
To construct, connect, operate, and maintain AWS data centers in the Asia Pacific (Malaysia) Region, AWS plans to invest 29.2 billion Malaysian ringgit ($6.2 billion) from 2024 through 2038. This investment generated, and will continue to propel, revenue across a number of sectors and industries in Malaysia. These industries, encompassing construction, energy consulting, engineering, maintenance, manufacturing, and security, primarily have a beneficial impact on local businesses.

In Malaysia, AWS collaborates with local communities on long-term, innovative programs that will have a lasting impact in the regions where people work, live, and raise their families. AWS focuses on developing the cloud workforce and providing education initiatives to learners of all ages. AWS aims to support Malaysia's growth by helping organizations across various sectors harness AI, elevating productivity, competitiveness, and customer engagement.

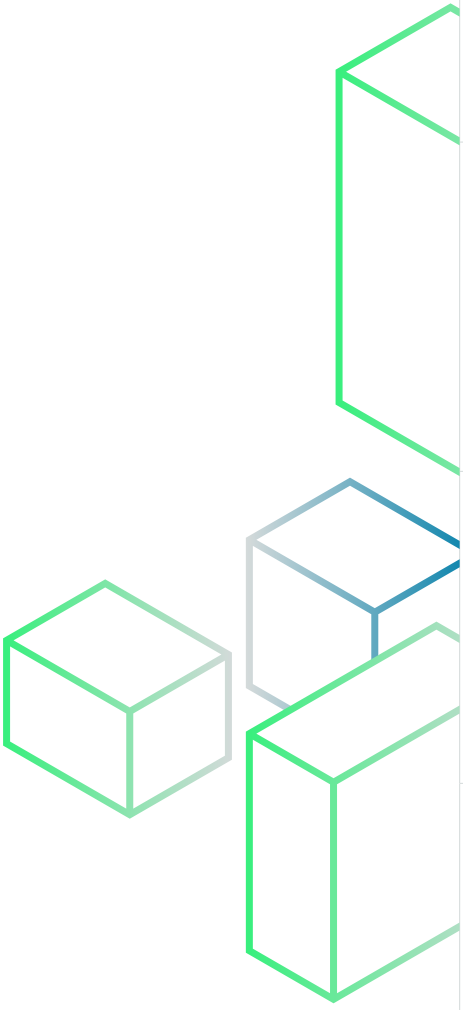
Amazon is committed to becoming a more sustainable business and reaching net-zero carbon across its operations by 2040, 10 years ahead of the Paris Agreement, as part of The Climate Pledge. Amazon co-founded The Climate Pledge and became its first signatory in 2019. In December 2023, PKT Logistics Group became the first Malaysian signatory to The Climate Pledge. As part of its Climate Pledge commitment, Amazon was on a path to power its operations with 100% renewable energy by 2025, five years ahead of the original 2030 target. This year, Amazon announced that it had met its 100% renewable energy goal seven years ahead of schedule. All of the electricity consumed by Amazon's operations, including its data centers, was matched with 100% renewable energy in 2023. Further illustrating this commitment, AWS plans to be water positive by 2030, returning more water to communities than the company uses in its data center operations.

100%

All of the electricity consumed by Amazon's operations, including its data centers, was matched with 100% renewable energy in 2023.



Economic impact of AWS investment in the Asia Pacific (Malaysia) Region



$29.2 billion

AWS plans to invest 29.2 billion Malaysian ringgit ($6.2 billion) **in the AWS Asia Pacific (Malaysia) Region from 2024 to 2038**, including the capital and operating expenditures associated with constructing, connecting, operating, and maintaining the AWS Region in Malaysia. All expenses are directly attributable to this initiative, such as the imports of highly specialized and proprietary equipment and software, and in-country spending on construction and data center operations.

$57.3 billion

The investment associated with the AWS Asia Pacific (Malaysia) Region will contribute an estimated **57.3 billion Malaysian ringgit ($12.1 billion) to Malaysia's total GDP from 2024 through 2038**. Malaysia's level of growth that is attributable to AWS's investment includes the value added by AWS to Malaysia's information technology (IT) sector and in-country spending on goods and services related to the construction and operation of AWS data centers.

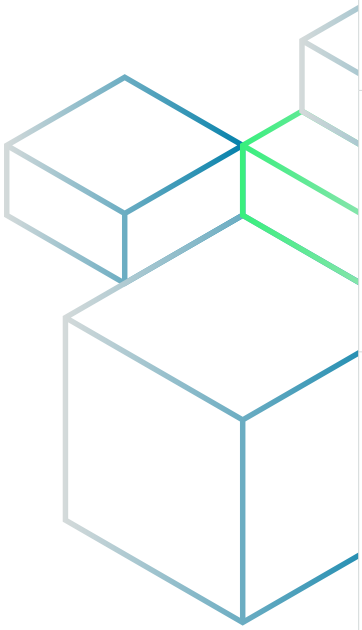
3,500 jobs

AWS investment **from 2024 through 2038** will support an estimated annual average of more than **3,500 full-time equivalent (FTE) jobs at local businesses** in the data center supply chain. This investment will sustain long-term financial stability for workers in industries such as telecommunications, non-residential construction, electricity generation, facilities maintenance, and data center operations.

Ripple effect

The economic growth created by **AWS investment in the AWS Asia Pacific (Malaysia) Region will lead to a ripple effect in the Malaysia cloud community**. This ripple effect will occur through accelerating productivity gains in the Malaysia economy, empowering the digital transformation of businesses, including startups and MSMEs that are part of the AWS Partner Network (APN), upskilling the cloud and digital workforce, developing renewable energy projects, and creating a positive impact in the communities where AWS operates.

Economic impact of cloud adoption in Malaysia



1% increase

According to the research study, "Cloud Computing Policies and Their Economic Impacts in Asia and the Pacific," published by the Asian Development Bank Institute (ADBI)[3], **an increase of 1% in cloud adoption in Malaysia would add 10.5 billion Malaysian ringgit ($2.23 billion) to GDP in Malaysia in 2023**.

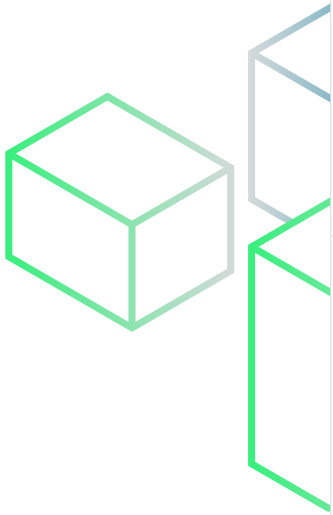
$110 billion

From 2024 through 2028, Malaysia has an opportunity to expand the use of cloud services and unlock up to 110 billion Malaysian ringgit ($23.25 billion) of additional economic value, which is relative to the extent of the Malaysia government's implementation of cloud demand–stimulating policies.

Up to 66%

The 2023 Enterprise Strategy Group (ESG) Economic Validation report found organizations reduced compute, networking, and storage **three-year total cost of ownership (TCO) by up to 66%** by migrating from on-premises systems to the AWS Cloud.[4] These organizations also experienced increased performance, improved operational efficiency, faster time to value, and improved business agility.

Advancing sustainability in Malaysia



500 globally

Amazon is the largest corporate purchaser of renewable energy in the world, according to Bloomberg New Energy Finance, and has invested billions of dollars in more than 500 solar and wind projects globally. Moving forward, Amazon will continue to invest in renewable energy, including in Malaysia, to meet its goal of net-zero carbon across its business by 2040.

4.1x

AWS can help lower carbon footprints in Asia-Pacific. AWS is constantly working on ways to increase the energy efficiency of its data centers—optimizing data center design, investing in purpose-built chips, and innovating with new cooling technologies. According to a new study by Accenture, commissioned by AWS, "Moving onto The AWS Cloud Reduces Carbon Emissions," estimates AWS infrastructure is up to 4.1 times more energy-efficient than on-premises infrastructure, and when workloads are optimized on AWS, the associated carbon footprint can be reduced by up to 99%.

[3] Asian Development Bank Institute. 2024. "Cloud Computing Policies and Their Economic Impacts in Asia and the Pacific."
[4] Enterprise Strategy Group. 2023. "Maximizing Economic Advantages by Migrating to AWS Cloud Infrastructure."

Economic Impact of Cloud Adoption

What is cloud computing?

Cloud computing is the on-demand delivery of IT resources over the internet with pay-as-you-go pricing. Instead of buying, owning, and maintaining physical data centers and servers, customers can access technology services, such as computing power, storage, and databases, on an as-needed basis from AWS.

What are the advantages of cloud computing?

Agility: AWS lets customers quickly spin up resources as they need them, deploying hundreds or even thousands of servers in minutes, leading to faster innovation.

Cost savings: AWS's pay-as-you-go pricing means that the customer only pays for the resources used instead of the traditional IT model, in which expenses come as a fixed cost.

Elasticity: Customers do not have to overprovision resources upfront. Instead, they provision only the resources they need to scale up or down with the needs of their businesses, which reduces costs and improves the ability to meet their users' demands.

Innovation: Customers can innovate faster because they can focus IT resources on developing applications to transform customer experiences instead of managing infrastructure.

Scalability: AWS has the most extensive, reliable, and secure global cloud infrastructure, providing customers with the ability to deploy globally in minutes.

Security: AWS is architected to be the most flexible and secure cloud computing environment available today. Customers can build on the most secure global infrastructure, knowing they always control their data, including the ability to encrypt it, move it, and manage retention at any time.

Enhanced scalability, agility, and resilience coupled with cost savings for startups

Cloud computing is a key enabler of digital transformation, especially for startups. One of the most significant obstacles startups experience during the initial stages of business is financial constraints. These constraints are particularly challenging for organizations when facing the high upfront capital expenditure for data storage and processing, which can create hurdles to investing in on-premises computing resources.

The elasticity of cloud computing, underscored by "pay-as-you-go" and "pay-as-you-grow" operational strategies, improves a startup's ability to meet its growth demands. Further, reliable cloud infrastructure allows founders and startups to concentrate their efforts on areas of priority and focus less on the operations and maintenance of information and communications technology (ICT) infrastructures. This scalable nature of cloud computing provides a foundation for startups to grow and expand into new business areas and regions globally.

Additionally, the ability of cloud infrastructure to provide backup systems in the case of unexpected disruptions, such as disasters triggered by natural hazards, significantly bolsters the resilience of startups.

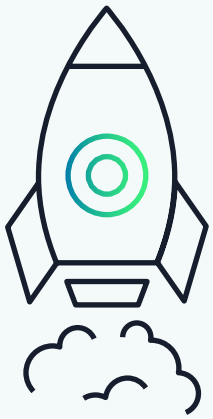
Economic impact of cloud adoption in Malaysia

Cloud adoption, by enhancing agility, innovation, scalability, and security, as well as reducing costs, will create ripple effects throughout the entire Malaysia economy. A recent study, "Cloud Computing Policies and Their Economic Impacts in Asia and the Pacific," published by the Asian Development Bank Institute (ADBI), measures the economic impact of cloud adoption in Asia-Pacific, including Malaysia, encompassing AWS and other cloud service providers.

The aggregated economic contribution of cloud to GDP comprises the domestic value added generated by cloud users, and the spillover effects of cloud services on the total economy. The spending includes the purchase of cloud services by public and private organizations, while spillover effects include benefits generated by cloud computing in terms of IT cost efficiencies, new product development, and support for the incubation of startups.

1%
increase

According to the ADBI's study, an increase of 1% in cloud adoption in Malaysia would contribute 10.5 billion Malaysian ringgit ($2.23 billion) to Malaysia's GDP in 2023.



Notwithstanding Malaysia's cloud adoption, the report stated that the spillover effects of cloud adoption are expected to continue growing as the public and private sectors transition from low maturity levels of cloud usage (such as email and collaborative tools) to more sophisticated usage levels (AI/ML). The ADBI research suggests the existence of "return to scale" effects, where the marginal economic impact of cloud adoption is greater for countries with higher cloud adoption, and the productivity effect of firms achieving more advanced use of cloud applications is higher than those in lower maturity use cases.

Pro-cloud policies and estimated economic impact of cloud adoption in Malaysia, 2024–2028

Cloud adoption has enabled positive efficiencies in the private and public sector to drive enhanced productivity, and at an aggregate level, it has also yielded economic growth, as measured in terms of GDP. Particularly, policies supporting cloud adoption are playing a pivotal role in increasing the economic contribution of cloud computing over time.

For the period from 2024 through 2028, the ADBI report estimated economic impact based on two scenarios. The results indicate significant potential for GDP gains linked to the increase in cloud policy maturity.

- The **pessimistic scenario** assumes cloud spending in Malaysia will evolve at the lowest growth rate from 2024 through 2028, due to a reluctance by the government to proceed with implementing the proactive incentives.
- The **optimistic scenario** assumes that cloud spending will evolve at the highest growth rates forecasted by industry analysts, as a result of policy interventions by the government to stimulate demand.

The total cumulative economic contribution **in the pessimistic scenario throughout the period from 2024 through 2028 will reach 0.52% of the forecasted cumulative GDP, which amounts to 68.6 billion ringgit ($14.56 billion). Under the optimistic scenario**, the total cumulative economic contribution over the same period has the potential to reach 0.83% of the forecasted cumulative GDP, amounting to **110 billion ringgit ($23.25 billion)**.

41 billion

In conclusion, the Malaysia government's strategic implementation of cloud demand–stimulation policies is expected to yield a cumulative effect of 41 billion ringgit ($8.7 billion) over the five-year period, offering a substantial opportunity for economic growth.

Economic Impact of AWS Investment in Malaysia

About Amazon Web Services

Since 2006, Amazon Web Services has been the world's most comprehensive and broadly adopted cloud. AWS has been continually expanding its services to support virtually any workload, and it now has more than 240 fully featured services for compute, storage, databases, networking, analytics, machine learning and artificial intelligence (AI), Internet of Things (IoT), mobile, security, hybrid, media, and application development, deployment, and management from 108 Availability Zones within 34 geographic regions, with announced plans for 18 more Availability Zones and six more AWS Regions in Mexico, New Zealand, the Kingdom of Saudi Arabia, Taiwan, Thailand, and the AWS European Sovereign Cloud. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—trust AWS to power their infrastructure, become more agile, and lower costs. To learn more about AWS, visit aws.amazon.com.

AWS in Malaysia

AWS has a longstanding history of investing in Malaysia, starting with the establishment of the first AWS office in Malaysia in 2016 to bring AWS closer to customers and partners. Since then, AWS has continued to invest in Malaysia through local infrastructure including the first AWS Edge and Direct Connect points of presence in 2017 and availability of AWS Outposts in 2020. Today, there are four CloudFront locations in Malaysia. To better support Malaysia's digitization efforts, AWS opened its newest office in the heart of Kuala Lumpur in July 2023. Spanning more than 32,000 square feet, this new facility is thoughtfully designed to foster agile work, lifelong learning, and collaboration as AWS continues to grow its business, operations, and investments in Malaysia.

AWS launched its first Direct Connect location, at Menara AIMS, and edge network in Kuala Lumpur in 2017. To meet high customer demand, the new Asia Pacific (Malaysia) Region will comprise three Availability Zones. Currently, AWS's advanced capabilities are used by thousands of active customers in Malaysia each month, accelerating their innovation, increasing their agility, and facilitating their cost savings. Numerous Malaysia public sector organizations rely on AWS to enable their digital transformation, scale their impact, and help residents in adapting to major global events.

The AWS Asia Pacific Region in Malaysia

AWS's investment in establishing three Availability Zones in the Asia Pacific (Malaysia) Region marks a significant advancement for customers in Malaysia, providing enhanced access to AWS technology.[5] Each Availability Zone within an AWS Region is a distinct physical location equipped with independent power, cooling, and physical security, all connected by redundant, ultra-low latency networks. These zones are strategically separated to ensure resilience during potential disruptions that can affect data centers, such as power outages, lightning strikes, and extreme weather conditions.

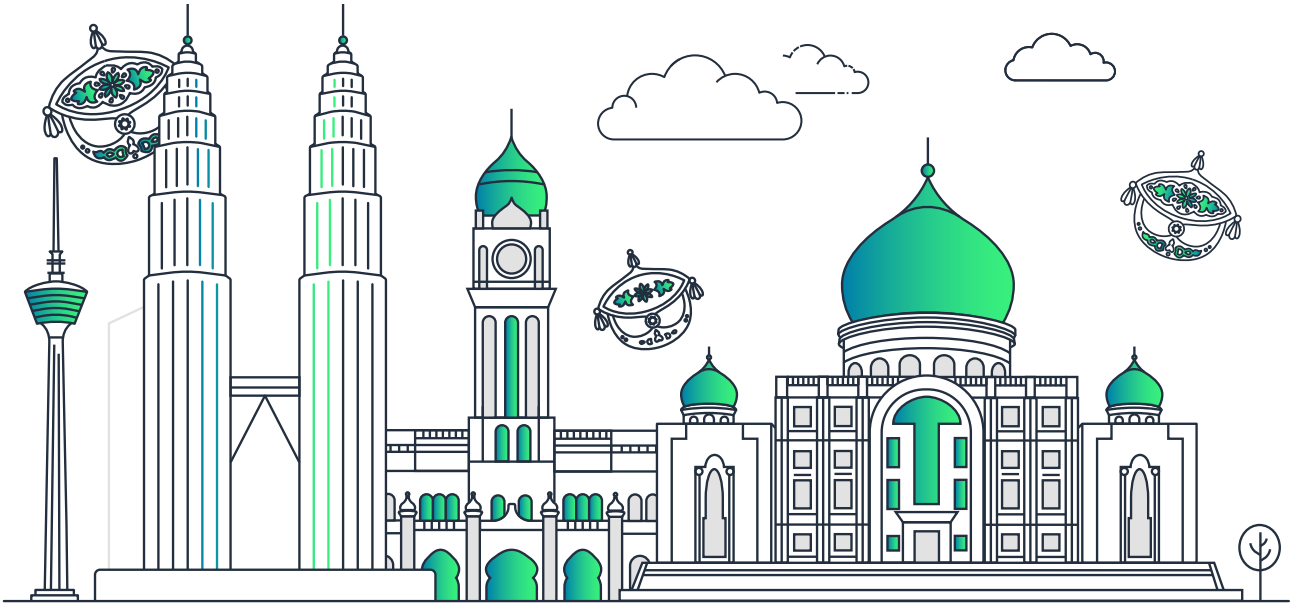
This enhanced infrastructure empowers customers in Malaysia to securely operate their production applications and databases, securely store their data locally, and solve critical low-latency challenges. By leveraging AWS's reliable and scalable design, businesses in Malaysia can innovate more rapidly, accelerate growth, and contribute to the country's burgeoning tech sector.

AWS's corporate office in Kuala Lumpur is home to developers, engineers, sales representatives, marketing teams, and business development professionals who support our local customers and channel partners.

The AWS Region in Malaysia offers various services that are used by large enterprises, government agencies, academic institutions, government agencies, academic institutions, SMEs, and startups, reaffirming AWS's commitment to supporting all industries across Malaysia.

AWS locations in Malaysia

AWS offices: Amazon Web Services (AWS-KUL15) Malaysia, The Gardens North Tower
AWS Region: Asia Pacific (Malaysia)
AWS Direct Connect: View locations
AWS Edge Location: View locations
Regional edge caches: View locations
Renewable energy projects: View locations



[5] https://aws.amazon.com/about-aws/global-infrastructure/regions_az/

Economic impact of AWS investment in Malaysia, 2024–2038

AWS investments have a measurable economic impact in Malaysia through the construction, connection, operation, and maintenance of AWS data centers. In Malaysia, AWS **plans to invest 29.2 billion Malaysian ringgit ($6.2 billion) in the AWS Asia Pacific (Malaysia) Region from 2024 through 2038**. The investment includes all expenses directly attributable to the AWS Asia Pacific (Malaysia) Region, including imports of highly specialized and proprietary equipment and software, as well as in-country spending.

AWS is committed to a progressive expansion of the local infrastructure and development of corporate operations to meet the projected demand for AWS technology in Malaysia and across the Asia-Pacific region. Local spending in Malaysia encompasses capital expenditures on construction labor, materials, and services, as well as recurring operating expenditures, such as compensation for employees and contractors, utility fees, and facilities and rental costs.

This study projects that the planned investment in the AWS Asia Pacific (Malaysia) Region **will contribute 57.3 billion Malaysian ringgit ($12.1 billion) to Malaysia's total GDP from 2024 through 2038**. These estimates are derived from internal data, the input-output (I-O) model,[6] and statistical data provided by the Organisation for Economic Co-operation and Development (OECD). The GDP contribution by the AWS Asia Pacific (Malaysia) Region reflects the value added by AWS to the IT sector in Malaysia, as well as the direct, indirect, and induced effects of AWS purchases from the Malaysia data center supply chain.

[6] Please refer to the Appendix for an overview of EIS methodology.

The following illustration presents a conceptual breakdown of the supply chain impacts segmented into direct, indirect, and induced effects.

Direct effects

Investments in construction and expenditures for operations

Indirect effects

Inter-industry and supply chain spending

Induced effects

Household income spending within the local economy

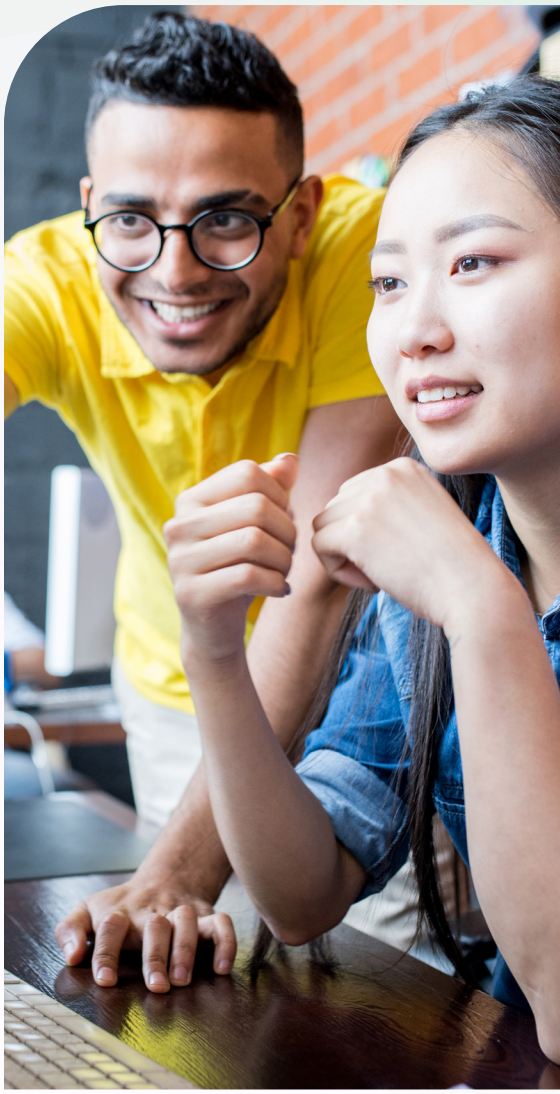
Additionally, the study estimates the in-country portion of AWS investment will support an annual average of more than 3,500 FTE jobs at local businesses in Malaysia throughout this period, including:

More than 1,400 jobs annually	**Supported by the direct effects**—These jobs exist within AWS suppliers, which tend to be local businesses that are directly supported by AWS investment. These jobs are generally in industries such as non-residential construction, facilities maintenance, electricity generation, and telecommunications.
More than 1,200 jobs annually	**Supported by the indirect effects**—These jobs reside in the AWS supply chain that are indirectly supported by business-to-business transactions resulting from AWS investment. This includes jobs in industries that supply the skilled labor and services needed to fulfill work for AWS, which means they are likely to be local to Malaysia, as well.
More than 900 jobs annually	**Supported by the induced effects**—These are jobs in the broader Malaysia economy supported by the household consumption of workers receiving compensation from AWS and the AWS supply chain. This includes jobs in industries that supply consumer goods and services to households in Malaysia.

Empowering Public and Private Sector Digital Transformation

Supporting AWS customers with AWS technology

Each month, tens of thousands of active customers in Malaysia use AWS services, accelerating their digital transformation through the ripple effect created by AWS investment. In Malaysia, customers have been reducing IT operation–related costs and scaling their businesses globally to become more agile, increase security, and advance innovation through AWS. Amazon is especially proud to observe organizations in Malaysia—including the fastest-growing startups, largest enterprises, and leading government agencies—use AWS to power their digital transformation and scale their impact to support citizens and customers.



AWS is committed to supporting Malaysia's digital transformation. This year, AWS launched an AWS Region in Malaysia, with a planned estimated investment of more than 29.2 billion Malaysian ringgit ($6.2 billion) throughout 15 years. This represents AWS's largest investment in Malaysia to date, unleashing further innovation and driving productivity for individuals, governments, and businesses alike. Moreover, this planned investment will **give developers, startups, entrepreneurs, and enterprises, as well as government, education, and nonprofit organizations greater choice** when running their applications and supporting their customers and constituents from data centers located in Malaysia.

Enhancing public sector capabilities with AWS technology

Government, education, nonprofit, and health care organizations in Malaysia and around the world face unique challenges to accomplish complex initiatives with limited resources. Public sector leaders turn to the power and speed of AWS when they want to serve citizens more effectively, accelerate innovation and digital transformation, and put more of their time and resources into their core mission.

According to the 2023 Enterprise Strategy Group (ESG) Economic Validation report, organizations reduced compute, networking, and storage three-year TCO by up to 66% by migrating from on-premises systems to the AWS Cloud. These organizations also experienced increased performance, improved operational efficiency, faster time to value, and improved business agility. On a broader economic scale, countries including Canada, Spain, United Arab Emirates, and the United States have adopted cloud computing for their digital transformation goals, and they are experiencing the economic benefits of such investments.

In today's digital age, public sector organizations are leveraging cloud technology to drive innovation and scale their services regionally. The adoption of cloud solutions like those provided by AWS has enabled these organizations to enhance operational efficiency, reduce costs, and deliver superior services to their constituents. This report highlights several groundbreaking use cases where public sector entities in Malaysia have utilized AWS to achieve significant milestones. From RTMKlik's seamless streaming capabilities and Pos Malaysia's digital transformation, to Tenaga Nasional Berhad's smart energy solutions, the Department of Polytechnic and Community College Education's comprehensive online learning system, and the Department of Statistics Malaysia's efficient census operations, these case studies underscore the transformative impact of cloud technology on public service delivery.

RTMKlik is the first national free-to-air (FTA) over-the-top (OTT) platform for all Malaysians, broadcasting Radio Televisyen Malaysia's (RTM) live TV, radio, podcasts, and on-demand programs to more than 20 million Malaysians both in the country and abroad. RTMKlik is built on AWS and specifically designed to handle traffic spikes seamlessly to ensure uninterrupted streaming without any lag or buffering. Implementation of this solution on AWS has also resulted in substantial cost savings and enhanced the platform's efficiency. AWS played a crucial role in enabling RTM to excel in delivering high-traffic content through RTMKlik with a remarkable 34 million views for the FIFA Qatar World Cup 2022. RTM and AWS are currently working closely to improve users' experiences and higher viewership of RTMKlik by adding more features such as personalized content recommendation, educational video on demand, and personalized advertising.

> **"The launch of the AWS Region in Malaysia means being able to leverage AWS generative AI services like Bedrock to bring transformative innovation to RTMKlik and tailor our content to align with the viewing preferences of each RTMKlik user. AWS technology has helped us enhance the inclusivity of RTMKlik, providing value-added services such as live captions to ensure our hearing-impaired audience can better understand and follow live broadcasts. Advancements like these elevate the user experience and help us engage with a broad audience. AWS has been pivotal in making RTMKlik a more dynamic, accessible, and user-centric platform."**
>
> **—Datuk Suhaimi Sulaiman**
> Director general of the Department of Broadcasting Malaysia, RTM

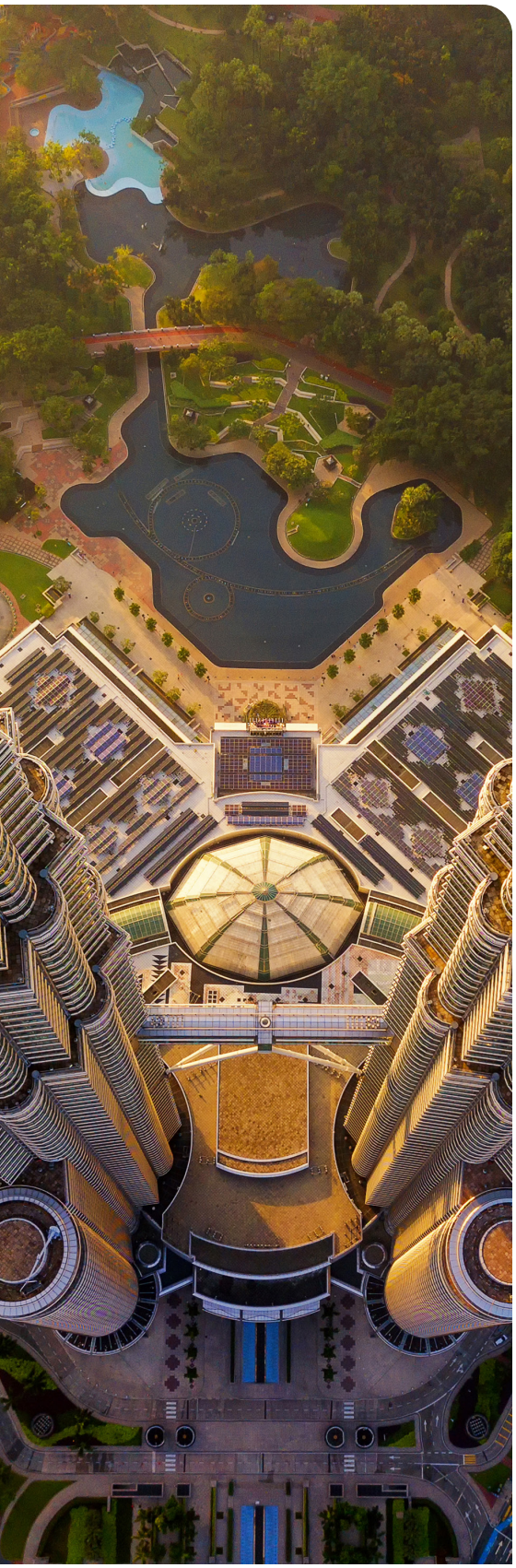
Tenaga Nasional Berhad (TNB) is the largest electricity utility provider in Malaysia and services more than 9.5 million commercial, industrial, and residential customers nationally. TNB has collaborated with AWS to accelerate its digital transformation, improve customer experience, and develop smart energy solutions.

> **As part of our 10-year Reimagining TNB Plan, we are collaborating with AWS to build digital capabilities and infrastructure that support decarbonization efforts across our business entities. Digital solutions are key to modernizing the grid and expanding renewable energy capacity, while also empowering our customers through advanced digital platforms. Through collaborations like this, TNB is driving the future of sustainable and efficient energy, ensuring we meet growing energy demands and lead the way in the energy transition."**
>
> **—Azlan Ahmad**
> Chief Information Officer, Tenaga Nasional Berhad

Pos Malaysia Berhad (Pos Malaysia), the country's national postal and courier service provider, is fully committed to AWS to drive the company's ambitious transformation plan to diversify its products and services. As part of this business transformation, Pos Malaysia closed its on-premises data centers and migrated the vast majority of its information technology (IT) infrastructure to AWS in 2023. With AWS, Pos Malaysia has made transactions smoother with new digital, customer-centric solutions while reducing IT costs by 50%. These solutions also help the 200-year-old organization better serve customers with seamless deliveries.

The Department of Polytechnic and Community College Education (DPCCE) in Malaysia's Ministry of Higher Education adopted AWS to reduce downtime in delivering education services on its cloud-based learning management system, Curriculum Information Document Online System (CIDOS). Their CIDOS is now the largest integrated cloud-based education platform in Malaysia's public sector, delivering a full year of academic curriculum online for **more than 110,000 students and 7,000 lecturers across 36 polytechnics**. Additionally, the Selangor State Government adopted AWS Cloud technology to build and run its Citizens Electronic Payments Platform (CEPat), which enables citizens to access paid government services on their mobile or through the web. The DPCCE is now planning to pilot online academic courses via the cloud, for five community colleges as a use case for the potential full rollout across **104 community colleges, engaging approximately 15,000 individuals**.

Another example is when the Department of Statistics Malaysia (DOSM), which collects national economic and social statistics, became the first Malaysian federal government agency to migrate to AWS. The agency was conducting Malaysia's national census for the year 2020, a process that is customarily completed throughout a period of 3 months; however, it needed to maintain its costly on-premises infrastructure year-round. By transitioning to cloud services, DOSM is able to use cloud resources only as needed, achieving cost savings for the government and improving scalability. On the cloud, the agency also gains access to a broad range of AWS solutions to manage user traffic and strengthen security. With AWS Cloud, the DOSM has the flexibility and scalability to manage access needs and traffic spikes before, during, and after census periods.



Advancing public sector innovation: AWS's Cloud Framework Agreement with Malaysia

In 2022, AWS signed the Cloud Framework Agreement with Malaysia to power public sector innovation. In the public sector, government agencies can leverage the Cloud Framework Agreement (CFA) with the Jabatan Digital Negara (JDN), which grants Malaysia's government agencies and departments access to advance IT modernization and improve citizen services.

The CFA is part of AWS's ongoing commitment to support the Malaysian government's Digital Economy Blueprint, the country's roadmap toward becoming a regional leader in the digital economy. AWS's customers in Malaysia include notable public sector organizations, such as the Ministry of Higher Education and the Smart Selangor Delivery Unit within the Selangor State Government, as well as leading companies like PETRONAS and innovative startups like Storehub.

To support the Malaysian government's strategic Madani Economy Framework, which aims to improve the living standards of all Malaysians by 2030, the new AWS Region in Malaysia will play a pivotal role in advancing the country's digitization ambitions and meet the high demand for cloud services while supporting innovation in Malaysia and across Southeast Asia. This new infrastructure will **nurture a vibrant community** where startups, small and mid-sized businesses (SMBs), enterprises, and public sector organizations can collaborate, experiment, and thrive with access to the latest technologies such as generative artificial intelligence (AI), machine learning, Internet of Things (IoT), and more.

AWS also supports more than 1,300 local startups through programs like ACTIVATE and collaborates with accelerators like MyStartups and Penjana Kapita.

This investment will benefit existing AWS customers in Malaysia, including Al Rajhi Bank, the Department of Statistics Malaysia, and PETRONAS, by offering advanced cloud services from local infrastructure. AWS also supports more than 1,300 local startups through programs like ACTIVATE and collaborates with accelerators like MyStartups and Penjana Kapital, fostering the rapid growth of their portfolio companies.

Driving innovation for enterprises and financial institutions

In 2023, PETRONAS, Gentari Sdn Bhd (Gentari), Amazon, and AWS announced a collaborative effort aimed at enhancing their sustainability and decarbonization initiatives in the accelerated global energy transition.

This partnership aligns with PETRONAS's commitment to providing affordable, low-carbon energy solutions while concurrently reducing the emissions across its operations. Furthermore, it supports Amazon's commitment to achieving net-zero carbon emissions by 2040 by leveraging Gentari's expertise in renewable energy solutions.

PETRONAS and AWS will design and construct a state-of-the-art plant that incorporates cutting-edge technology, robotics, and automation solutions similar to those used in Amazon warehouses and facilities. PETRONAS will also continue using AWS's broad and deep set of technologies to improve and expand existing and new solutions, including SETEL, Malaysia's first e-wallet for purchasing fuel at PETRONAS stations, and STEAR, a cloud-based logistics solution and services platform built on AWS for the offshore industry. Moreover, Gentari will drive the decarbonization of Amazon's India transportation network by working with third-party delivery service partners to electrify transport vehicles, which will fulfill Amazon's commitment to deploying 10,000 electric vehicles in its India delivery fleet by 2025.

AWS will continue to upskill technical and non-technical employees at PETRONAS and strengthen their digital literacy through AWS Training and Certification programs. This is in line with AWS's broader commitment to help develop a digitally trained workforce to advance Malaysia's digital economy.

Malaysia's stock exchange, Bursa Malaysia, is currently building an innovative Centralized Sustainability Intelligence platform on AWS to support Malaysia's transition to a lower carbon economy. "Bursa Malaysia sees the launch of an AWS Region in Malaysia as a positive step forward for the digital economy, Bursa's own digitalization journey, and in helping to spur continued innovation to drive Malaysia's capital markets growth. Built in collaboration with AWS, Bursa Malaysia's Centralized Sustainability Intelligence (CSI) platform will help Malaysian companies and their suppliers standardize ESG reporting to improve the investment credentials of listed companies and increase access to sustainable financing. We believe cloud computing will continue to contribute to improved sustainability outcomes for Malaysia's publicly listed companies, and the delivery of this infrastructure at scale will benefit the broader ecosystem," said Datuk Umar Swift, chief executive officer at Bursa Malaysia.

> **"Digital technologies play an important role in all our businesses. Cloud services enable our work in artificial intelligence, IoT, advanced analytics, robotics, and data governance. AWS's investment in Malaysia will facilitate our data residency needs, improve performance, and elevate the country's digital capabilities. I am excited by the possibilities this investment can create for Malaysia to become a regional leader in the digital economy."**
>
> **—Ir. Mohd Yusri Mohamed Yusof**
> Senior Vice President, Project Delivery & Technology, PETRONAS

AWS is a pioneer at the intersection of financial services and technology, enabling our customers to optimize operations and accelerate innovation through the broadest set of services and partner solutions—all while adapting to ever-changing regulations. Thousands of financial services firms, from the fastest-growing fintechs to systemically important financial institutions, are redefining their future on AWS.

Principal Malaysia, a joint venture between Principal Financial Group and CIMB Group Holdings Berhad, has made significant strides in its digital transformation journey, becoming a pioneer in full-scale data center migration to the AWS Cloud in Malaysia and ASEAN. Through its robust migration program, Principal aims to revolutionize customer experiences with unparalleled scalability and agility in the cloud, ensuring the capability to adapt swiftly to evolving client needs. This development aligns with the burgeoning investing population in Malaysia, enabling Principal to create sophisticated and engaging investing services tailored to the growing customer base.

> **"At Principal, we are committed to empowering our customers on their financial journey. The collaboration with AWS demonstrates our commitment to accommodate our customers' evolving needs and help improve their access to financial solutions. By leveraging AWS cloud technology, we strive to continue supporting our customers in building, protecting, and advancing their financial well-being."**

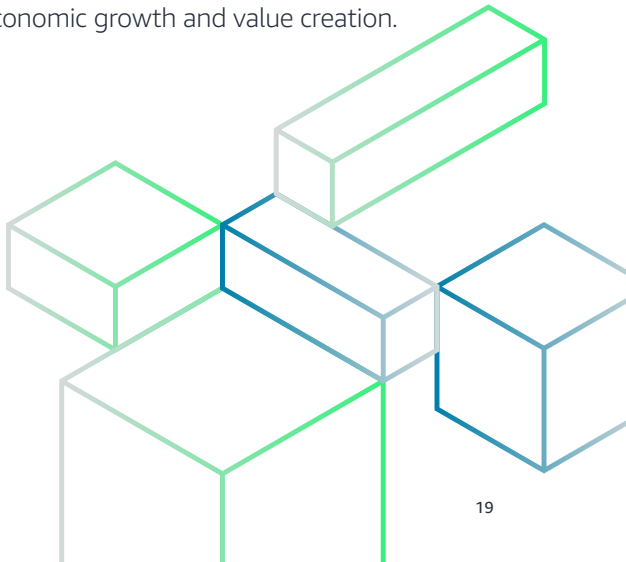
Accelerating growth for digitally native businesses and startups with innovative cloud solutions

Digitally native businesses, including startups, online businesses, and software-as-a-service (SaaS) providers, are launching and scaling their businesses from inception to maturity on AWS. Home-grown unicorns and fast-growing startups across every industry are leveraging AWS's comprehensive solutions to offer new products, technologies, and services.

Government-led initiatives: Supporting startup growth in Malaysia

Malaysia is an ideal location for startup incubation, offering a low cost of living paired with a high quality of life, access to skilled talent, fast-tracked visa processes, and comprehensive government support. The government, through various agencies such as Cradle Fund, Malaysian Technology Development Corporation (MTDC), Malaysia Debt Ventures Bhd (MDV), Malaysia Venture Capital Management (MAVCAP), Kumpulan Model Perdana (KMP), Malaysia Digital Economy Corporation (MDEC) and Malaysian Research Accelerator for Technology and Innovation (MRANTI), offer direct financial support to local startups. The total amount of government funds approved into the five technology-based funds equaled 1.31 billion ringgit ($280 million), which has been allocated between the 9th Malaysia Plan and the 11th Malaysia Plan.

In 2023, as part of the Malaysia Madani Economic Framework introduced by the government of Prime Minister Dato' Seri Anwar Ibrahim, a government-led funding initiative was envisioned to accelerate enterprise digitalization and automation. This initiative includes 1 billion ringgit ($217 million) in funding by the Bank Negara Malaysia to assist micro, small, and medium enterprises (MSMEs) in automation and digitalization, as well as a 20 billion ringgit ($4.3 billion) loan for SMEs in the technology, agriculture, and manufacturing industries to stimulate economic growth and value creation.



In the dynamic world of startups, cloud technology plays a pivotal role in driving innovation and enabling rapid expansion. This report highlights how startups in Malaysia and across Southeast Asia are leveraging AWS cloud solutions to transform their operations and scale regionally. From Carsome's revolution in the pre-owned car industry to Aerodyne's advancements in drone technology, these success stories illustrate the transformative potential of cloud technology in enabling startups to innovate, scale, and deliver cutting-edge solutions to their markets.

Carsome

Carsome, a Southeast Asian car e-commerce platform, exemplifies the advantages of AWS cloud solutions, enabling cost-effectiveness and regional expansion. Being on the cloud has also enabled Carsome to expand across Southeast Asia, with a presence in Indonesia, Thailand and Singapore. The startup aims to digitize the region's pre-owned car industry by reshaping and elevating the car buying and selling experience, with approximately 100,000 cars being transacted via its platform annually.

"By working with AWS to utilize the breadth and depth of its services, we have scaled operations rapidly to meet the exponential growth in customer demand," said Piyush Palkar, chief digital officer at Carsome. "AWS's cutting-edge technologies have also helped us reduce the time it takes to do car inspections while driving efficiencies in our day-to-day operations. We are excited about the launch of the AWS Region in Malaysia, which will help the next generation of Malaysian unicorns innovate."

Aerodyne

Aerodyne is revolutionizing drone operations to solve complex industrial issues worldwide through running its DRONOS software as a service (SaaS) platform on AWS to help drone operators in the telecommunications, agriculture, and energy industries grow their businesses globally.

Fully committed to AWS, the Malaysia-based startup operates drone solutions for telecommunications, agriculture, surveillance, logistics, and energy industries in 45 countries. DRONOS is an innovative, end-to-end drone service platform that allows drone users to onboard, analyze, and make sense of drone data to optimize operations, drive efficiencies, and conduct aerial inspections to keep workers safely on the ground. To better maintain their infrastructure, power companies, mobile network operators, and farmers are increasingly using drones to collect operational data from towers, grids, and fields. Aerodyne created a data lake on AWS using Amazon Simple Storage Service (Amazon S3) to store and turn drone data, including images, satellite, agriculture, and weather data, into actionable insights. Using Amazon SageMaker, a fully managed service to build, train, and deploy machine learning (ML) models, the company automates infrastructure analysis on mobile phone towers and farm fields.

Malaysia's startup environment: AWS-led initiatives and success stories

AWS has a longstanding involvement and presence among the startup business environment in Malaysia. The aim is to provide startups with low-cost, easy-to-use infrastructure that supports the scaling and growth of businesses of any size, yet also meaningful access to experts, markets, and vertically aligned solutions to enable startups to solve specific business challenges quickly and cost-effectively.

This year, AWS Malaysia, in partnership with global startup ecosystem partner Endeavor Malaysia, launched ASEAN's first **Startup Day** at the Asia School of Business in Kuala Lumpur. The event aimed to support Malaysia's burgeoning startup community, coinciding with the Region launch. The event drew significant attention, with 532 attendees from the startup and venture capital communities, including notable startups such as Aerodyne, CapBay, CoinGecko, Decube, FirstMove, Indelible Ventures, NexMind, Pandas, PolicyStreet, respond.io with the managing partner of Gobi, RHL Ventures, SafeTruck, and 500 Global.

Thought Leadership Forum with Endeavor Malaysia

Endeavor is a global organization with focus on supporting entrepreneurs with potential for economic and social impact in their regions. Endeavor has supported more than 50,000 candidates and selected more than 2,000 entrepreneurs from 1,200 companies. Supported and mentored by a network of more than 3,500 local and global business leaders, these entrepreneurs have created more than 650,000 jobs and generated more than $10 billion in revenues. Endeavor Malaysia has supported more than 800 candidates and selected 36 Endeavor Entrepreneurs from 24 companies.

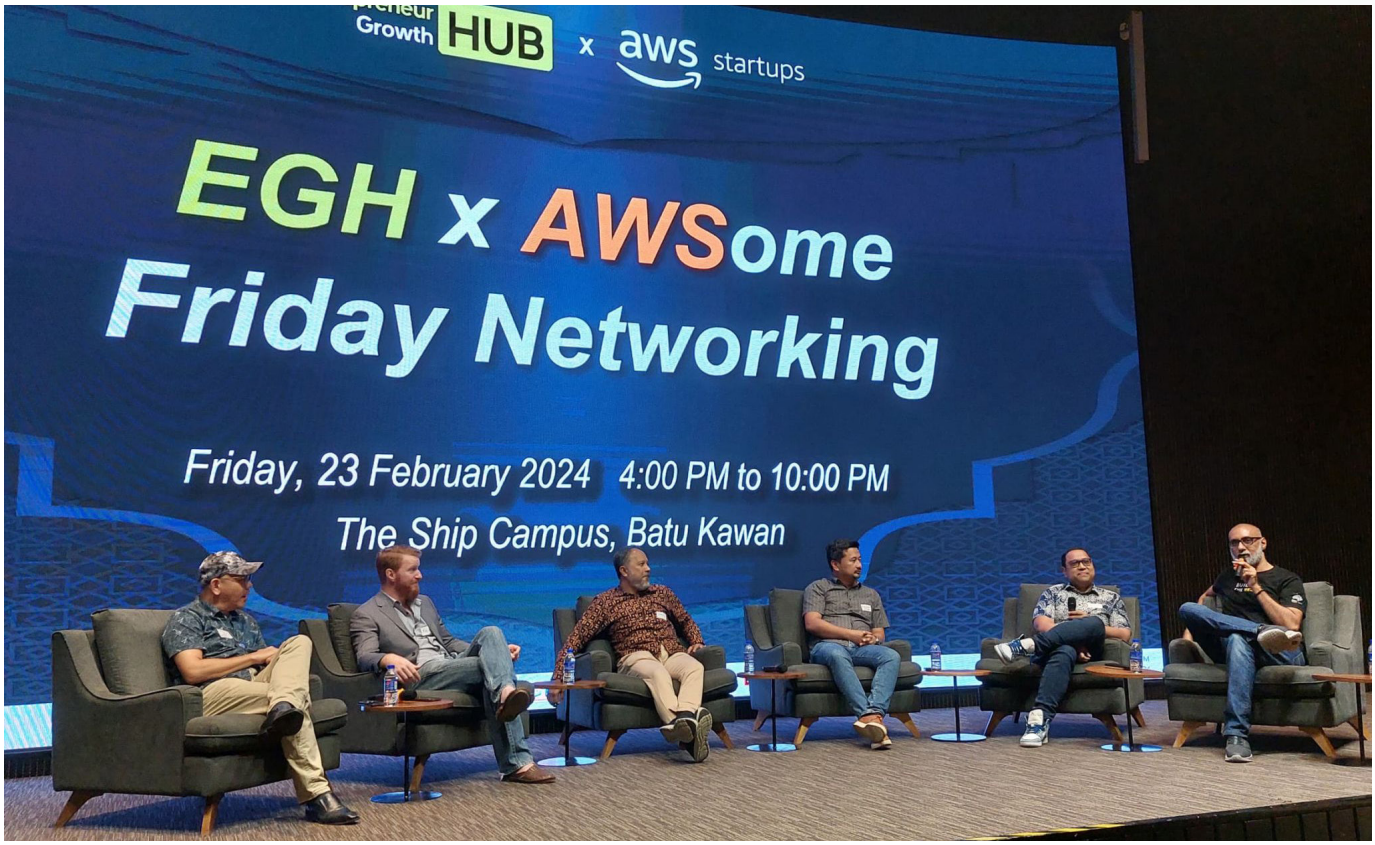
Over the past 10 years, entrepreneurs have created more than 8500 jobs and raised 4.9 billion Malaysian ringgit ($1.9 billion) in revenues. In Malaysia, the forum was attended by notable venture capitalists (VCs) including Khailee from 500 Global, Eric Cheng, founder of Carsome, Steven Sim, Deputy Finance Minister, and Tony Fernandes, founder of AirAsia, as well as more than 500 people among the VC community.

Antler MY Launch

ASEAN's leading accelerator, Antler MY Launch, held its launch event at the AWS office in Malaysia in August 2023. Antler, with a portfolio of more than 900 companies, invited startups and ecosystem partners to the event. One of the panels was led by Aerodyne's founder, Kamarul A. Muhamed.

MRANTI and AWS Health-Tech Connect

In 2023, MRANTI and AWS convened more than 300 attendees from Malaysia's public and private health care sector, including health-tech startups, hospitals, and VCs focused on health-tech investments, for a two-day event. The event featured sessions on AWS technology, health care use cases, regulatory compliance in health care, and the challenges and needs of hospitals. The event concluded with a pitch session where 10 health-tech startups presented to 10 VCs and hospitals.



Pitch Day Penang

Concentrating on active engagement with the community for the Region launch, AWS organized the Pitch Day event in collaboration with its partner, Ship Campus, in Penang. It was attended by more than 100 people, including early-stage startups whose teams presented their pitches to a panel of judges comprising VCs and ecosystem partners.

AWSome Friday

In 2023, AWS initiated the AWSome Friday community event in Malaysia with the goal of uniting businesses, spanning from enterprises to SMBs and startups, creating opportunities for all in preparation for the launch of the new AWS Region. This once-a-month gathering has quickly evolved into a recognized brand, which is expected to continue expanding throughout this year.

Supporting the AWS Partner Network

The AWS Partner Network (APN) is a global community that leverages AWS technologies, programs, expertise, and tools to build solutions and services for customers. The APN has more than 130,000 partners from more than 200 countries, with almost 70% headquartered outside of the United States. It provides partners with access to a dedicated portal, business and technical support and training, and benefits. Upon joining the APN, AWS Partners can enroll in the AWS Partner Path that best aligns with their organization to validate their offerings and demonstrate their AWS expertise. AWS has a vibrant APN in Malaysia, which helps locally owned businesses build innovative solutions and services, and enables enterprise and public sector customers to migrate to AWS, deploy mission-critical applications, and provide a full range of monitoring, automation, and management services for customers' environments.

The APN in Malaysia explores the intersection of innovation with local customs and values, showcasing the harmonious blend of technology and tradition. Globally, the APN includes tens of thousands of independent software vendors (ISVs) and systems integrators (SIs). AWS Partners build innovative solutions and services on AWS, and the APN helps by providing business, technical, marketing, and go-to-market support to customers. AWS ISVs, technology partners, SIs, and consulting partners help enterprise and public sector customers migrate to AWS, deploy mission-critical applications, and provide a full range of monitoring, automation, and management services for customers' cloud environments. AWS Partners in Malaysia include **Accenture, Axrail, CrowdStrike, Deloitte, eCloudvalley, Exabytes, G-AsiaPacific, GHL, Kyndryl, Maxis, Radmik Solutions Sdn. Bhd., Silverlake Axis, Tapway, and Uberfusion**.

Tapway, a homegrown Malaysian startup and a leading AI solution provider in Southeast Asia, uses AWS data analytics and ML technologies including Amazon SageMaker to transform images and videos into actionable insights for diverse industries. The startup's SamurAI computer vision solution on AWS is available on AWS Marketplace. "The launch of an AWS Region in Malaysia provides us with even lower latency to access key cloud services that power and scale our fast-growing AI Vision platform in a data-compliant way," said Lim Chee How, founder and CEO at Tapway. "We're excited to see how AWS's infrastructure investment in Malaysia will pave the way for Tapway to allow even more people to build, train, and deploy AI vision technology solutions quickly and affordably with their big data stored locally."

G-AsiaPacific is a fully integrated cloud advisory company based in Malaysia and operating in the Asia Pacific that is a Consulting Partner of the AWS Partner Network. "The new AWS Region in Malaysia presents a fantastic opportunity for us to build even better service offerings for our customers across the public sector, financial services, education, and beyond," said Mark Goh, CEO and co-founder of G-AsiaPacific. "With AWS, we can help our customers establish critical data governance and compliance policies, while meeting local data residency, sovereignty, and security requirements. AWS cloud services are also helping our customers experiment and iterate faster at lower cost, accelerating innovation across increasingly diverse industries. We plan to nurture more highly skilled cloud talent to better leverage the latest AWS capabilities and drive growth in Malaysia's vibrant digital economy."

Maxis, Malaysia's leading converged solutions company and AWS Advanced Tier Partner, taps into resources from the global community among the AWS Partner Network to drive innovation, modernization, and deliver enhanced personalized experiences for its customers. Maxis has leveraged more than **400 AWS accredited employees** to date that provide solutions to local businesses to accelerate cloud adoption.

AWS Brings Inclusive Generative AI Models to Malaysia and Southeast Asia

Large language models (LLMs) are often trained on data from the internet and other large data sources typically associated with high-resource languages. This term typically refers to languages, such as English, that have an abundance of linguistic resources available for natural language processing (NLP) tasks. It is critical that organizations gain the ability to easily customize their LLMs with local data in their native languages to foster social inclusion, stimulate economic growth by opening up new markets, and create improved citizen experiences. Culture influences everything.

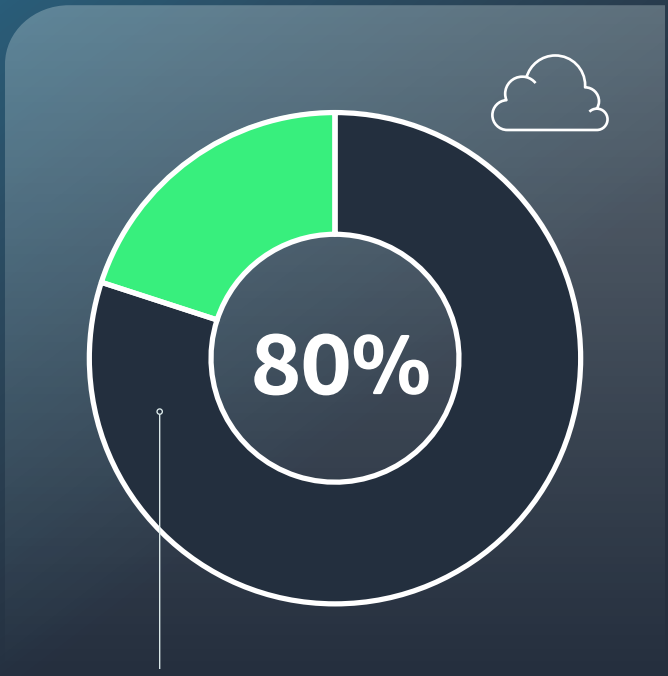
Generative AI, a type of artificial intelligence that can create new content and ideas, will have profound benefits for industries and society, and we are now observing the next wave of widespread adoption in Malaysia.

AWS is committed to fostering Malaysia's growth and innovation, particularly with the rapid rise of generative AI. As this transformative technology gains acceleration, Malaysia is well positioned to lead in its adoption. The expanding implementation of cloud technology across Malaysia is envisioned to democratize access to generative AI. To ensure successful adoption, AWS focuses on supporting customers through several key strategies. First, the importance of selecting a generative AI model that is tailored to specific use cases is emphasized, enhancing overall effectiveness. Additionally, user-friendly tools are provided that democratize generative AI within organizations, promoting broader use. Lastly, our purpose-built machine learning infrastructure is designed to deliver real-time, cost-effective AI responses with low latency and low cost.

AWS is continually accelerating its pace of innovation to invent entirely new technologies customers can use to transform their business. In 2014, AWS pioneered the serverless computing space with the launch of AWS Lambda, which lets developers run their code without provisioning or managing servers. And AWS built Amazon SageMaker, a fully managed machine learning service that empowers everyday developers and scientists to use machine learning—without any previous experience.

AWS also provides custom-built chips and processors to deliver better price performance for customers. AWS is committed to democratizing generative AI by offering customers a choice of cutting-edge large language models for implementing generative AI, each with its own unique strengths and characteristics. Customers in Malaysia are already taking advantage of some of the latest generative AI applications offered by AWS. Deriv, one of the world's largest online brokers, is using Amazon Q Business, across customer support, marketing, and recruiting departments to increase productivity, efficiency, and innovation.

With Amazon Q Business, Deriv has been able to boost productivity and reduce onboarding time by 45%.



Another example of customer transformation is Pos Malaysia Berhad (Pos Malaysia), which migrated multiple critical applications from an on-premises infrastructure to the AWS Cloud, and reduced time to market for new services by 80%.

Headquartered in Malaysia, 123RF is a global leader in stock photography and video content, serving more than 10 million registered users and three million subscribers worldwide. The agency continues to revolutionize creative workflow with cutting edge AWS AI and generative AI tools. In March 2023, 123RF launched an AI image generation service, which uses Stability AI's Stable Diffusion text-to-image foundation model and Amazon SageMaker to empower users to create custom images from text descriptions. It has transformed image search leveraging Amazon OpenSearch Vector and Amazon SageMaker to ensure users find the perfect visual with unparalleled precision, saving time and effort, and has enabled 123RF to accelerate development, double go-to-market speed, and boost AI-generated content sales by 20% within six months. To further solidify its commitment to a safe and responsible user experience, 123RF significantly enhanced its already robust content moderation system with the recent deployment of advanced capabilities powered by Amazon Bedrock, which carefully screens user-generated prompts for image services, ensuring adherence to copyright and content suitability standards. By using Amazon Bedrock, they were able to build, test, and deploy this to production within weeks.

AWS is also helping Malaysian companies use emerging technologies to improve citizen outcomes. For example, AWS is collaborating with Ramsay Sime Darby and Annalise.AI to deploy AI tools to enhance medical patient care. The Annalise Enterprise chest X-ray helps clinicians detect and identify the suspected presence of up to 124 findings in chest x-rays in less than 20 seconds. This will help health care providers act quickly, especially for conditions that require urgent interventions.

CelcomDigi is a leading telecommunications provider in Malaysia that is leveraging Amazon Bedrock to establish an AI Sandbox, driven through its Innovation Center, for its employees to experiment, innovate, and implement generative AI solutions. "The new AWS Region in Malaysia presents exciting opportunities for CelcomDigi, as we accelerate our transformation to be a leading telco-tech company," said Datuk Idham Nawawi, chief executive officer of CelcomDigi. "With the support of AWS infrastructure and AI services to power our business support systems and consumer applications, we strive to improve operational efficiencies and deliver better experiences to our customers. We look forward to strengthening our partnership, anchored by our shared commitment in driving innovation and building Malaysia's digital ecosystem."

> **"The 123RF AI Image Generation service which uses Stability AI on AWS, with significant application of AWS SageMaker, has led to a seismic shift in our user experience and product lineup. It's as if we've handed our users a brush, empowering them to paint their imaginations into reality as we're seeing licensing rates of AI-generated content rising by 40% since its launch. Each licensed download is backed by 123RF's robust $25,000 legal coverage license, providing security and peace of mind for our users. This signifies the indispensable roles our AI Image Generator, Stability AI, and AWS SageMaker have played in our customers' journeys, solidifying their trust in our ability to innovate while we continue to redefine the boundaries of creativity in the ASEAN region."**
>
> —Alex P'ng, CEO of 123RF

AWS Women in Tech

AWS employees have amplified and supported company commitments to inclusion, diversity, and equity through their own advocacy that inspires girls and women to pursue education and careers in STEM (science, technology, engineering, and mathematics). Numerous STEM-focused employee communities exist within Amazon and AWS, such as Women in Technology, Women in Engineering, Women in AI/ML (artificial intelligence/machine learning), Women in Big Data, and She Builds. With total membership in the tens of thousands, the employee groups provide a sense of community and encourage women at AWS to champion efforts that grow representation.

In 2023, AWS held a Women Entrepreneurs event at its Kuala Lumpur office, aiming to amplify the voices and experiences of women founders and entrepreneurs. The session began with a keynote on Personal Branding by Noor Ammy, COO of MAVCAP, followed by a panel discussion led by Nurshaffira from Endeavor, featuring Xin-Ci, CMO of Storehub; Brianna Chang, Director of Women Who Code; Jian Li, CEO of Citrine Capital; and Lee Sweelin, co-founder of ManekNya & PichaEats. The event represented participation from more than 80 women entrepreneurs.

Training and Workforce Development in Malaysia

At AWS, we believe that the future of a prosperous Malaysia is tied to its digitally skilled workforce. Digital technology plays a vital role in driving innovation, growth, and productivity, while promoting resilience and agility to pivot quickly to improve operations. Malaysia will thus greatly benefit from building and maintaining a strong population of technology professionals and workers, with digital skills across a range of job functions and industries.

As digital transformation accelerates across the Asia-Pacific region, reshaping how people work and live, the value of upskilling a digital workforce has become increasingly critical to the growth of Malaysia's economy. The 2023 Gallup study, "AWS Asia Pacific Digital Skills Study: The Economic Benefits of a Tech-Savvy Workforce," conducted in collaboration with AWS, highlighted that organizations that employ workers with advanced digital and cloud technology skills experience greater business growth and innovation. For workers in Malaysia, acquiring these skills offers significant benefits, including the potential to earn salaries 106% higher than those without such expertise, with 74% of respondents reporting increased job satisfaction.[7] Investing in digital skills development, therefore, delivers substantial advantages for both individuals and employers alike. Training programs like AWS re/Start prepare the workforce for a digital economy and play a transformative role in improving lives across Malaysia, providing essential skills for the future.

AWS workforce development and training programs in Malaysia

As technology continues to shape the world, education, skills development, and talent play a pivotal role in driving innovation and economic growth, as well as societal progress. Since 2017, AWS has trained more than 100,000 individuals in Malaysia in cloud skills. As part of partner development programs, AWS supports the enablement of more than 150 AWS Partners with offices in Malaysia through comprehensive training and certification learning paths, immersion days, and workshops.

From new graduates and early career workers to mid-career professionals, AWS is working to drive inclusive growth in training the current and future workforce in Malaysia.

[7] Gallup. 2023. "AWS Asia Pacific Digital Skills Study: The Economic Benefits of a Tech-Savvy Workforce."

AWS Training and Certification equips individuals and teams with the skills to use AWS to innovate in the digital world. Since establishing local training operations in Malaysia, AWS Training and Certification has delivered training and certification programs to individual learners, customers, and AWS Partners to rapidly build cloud skills and close the skills gap. With training designed by AWS experts, learners at all levels can build with confidence, enabling leaders to drive transformation and deliver results in their organizations. AWS is also partnering with customers like PETRONAS to leverage skilling programs to train their employees. PETRONAS, a global energy and solutions provider with presence in more than 50 countries, has been an AWS customer since 2014. They are taking advantage of the AWS Skills Guild program – a comprehensive skills enablement program designed to build cloud fluency across the organization. These courses are self-paced digital training on cloud fundamentals that are made available to all 48,000 PETRONAS employees. To stay ahead of the evolving job landscape and skills demands, Bank Islam, Malaysia's first listed Islamic financial services institution, launched a broad staff upskilling program to give more than 4,000 Bank Islam employees access to foundational cloud skills. This was achieved through a combination of on-demand digital training, live instructor-led training, and interaction sessions, as part of a skills roadmap to establish the Bank Islam Digital Academy, a permanent learning center that will drive and grow digital skills across the organization.

AWS Skill Builder is a digital learning experience available in more than 200 countries and territories. It provides free skills training to millions of people around the world. Anyone with an internet connection and a desire to learn can quickly and easily access more than 500 free on-demand courses—including nearly 60 new cloud computing classes added in the past year. AWS also offers live, classroom-based training (delivered virtually or in-person) taught by AWS experts using presentations, discussions, and hands-on labs. AWS Skill Builder subscriptions give registered individuals and organizations access to exclusive learning materials built by builders for builders. In addition to over 500 free courses, four new learning experiences are available. These experiences help customers develop practical skills to help solve real-world problems.

AWS Academy empowers higher education institutions to prepare students for careers in the cloud by providing a free, ready-to-teach cloud computing curriculum. The curriculum prepares students to pursue industry-recognized certifications and in-demand cloud jobs. AWS Academy helps educators stay at the forefront of AWS innovation so they can equip students with the skills they need to get hired in one of the fastest-growing industries. AWS Academy courses include AWS Academy Cloud Foundations, AWS Academy Cloud Architecting, AWS Academy Machine Learning, and AWS Academy Data Analytics.

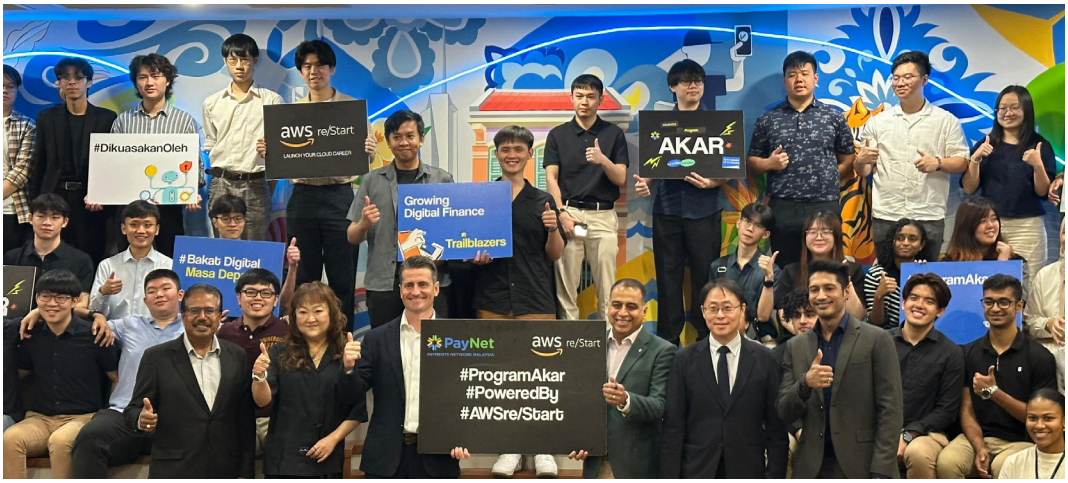
AWS Educate offers free, self-paced digital training to individual learners who are self-motivated to learn about the cloud. Through AWS Educate, students 18 years and older can access hundreds of hours of training and resources curated specifically for new-to-the-cloud learners. Training content is organized into six groups, including Most Popular Courses and Labs, Cloud Skill Basics, Cloud Skill Advanced, Prepare for Workplaces, Learn on Twitch, and Young Learner. AWS Educate also offers free hands-on labs to learn, practice, and evaluate cloud skills in the AWS Management Console.

In March 2021, The Department of Polytechnic and Community College Education (DPCCE) engaged with AWS via AWS Educate on a pilot project titled ROBONEO AWS DeepRacer Challenge for its polytechnics and community colleges in Sabah. This project is aimed at cultivating interest in cloud computing, robotics and machine learning, and supported by the MOHE as part of its longstanding objective to deliver the advanced human capital needs of Malaysia. The competition attracted 240 participants, with 196 participants completing the DeepRacer badge on AWS Educate, and 156 of them going further into the contest that tested their creativity and skills in virtual tracks to design machine learning models and deep-diving into cloud and robotics technologies.

AWS Skills Guild is a comprehensive enablement program that helps large enterprises with their transformational objectives, both technical and cultural, by building cloud fluency across the business, including at the executive level, driving collaboration and partnership with the technologists and accelerating AWS adoption. PETRONAS's AWS Skills Guild propelled Aiyna Nazieha Muhamad to become the first female to win the PETRONAS Exclusive AWS Virtual DeepRacer, marking the fastest time ever recorded in Malaysia.

AWS re/Start is a full-time, classroom-based skills development and training program that is free for learners preparing for careers in the cloud and connects them to potential employers. The program aims to build local talent and is targeted to unemployed and underemployed individuals, with no technical experience required to apply. The program is currently **launched in more than 60 countries across the globe, including in 17 countries in Asia-Pacific**.

The first cohort in Malaysia started their training in December 2021 and will graduate in March 2022, with the class of 25 coming from various backgrounds ranging from teaching to customer service, to offer a full-time, 12-week training focused on AWS fundamentals, and practical, professional skills. Learners experience scenario-based training, hands-on labs, and coursework to gain the skills required for entry-level cloud roles. Participants also receive resume and interview coaching to help them prepare for interviews with potential employers. AWS is collaborating with World Education Placement Services to provide free cloud computing skills development and job training through the AWS re/Start program. This is a free, 12-week, entry-level cloud skills program that helps prepare unemployed and underemployed learners for vital careers in cloud computing, and connects them with employment opportunities at local employers.



In July 2024, AWS and PayNet announced Program AKAR powered by AWS re/Start, a new cloud skills initiative in Malaysia that aims to bridge the growing skills gap in Malaysia's digital economy. Program AKAR powered by AWS re/Start is the first financial services-aligned cloud skills program that has been curated specifically for entry-level talent in Malaysia, and equips university students with transferrable skills that can be leveraged for careers in financial services. PayNet and AWS welcomed the first cohort of 50 learners from the Asia Pacific University in July 2024. These students will be given opportunities for internships with organizations across PayNet's payments network upon completion of the program.

Ganesan Mahesan, a re/Start alumnus from Malaysia, faced the challenge of securing a professional job when the COVID-19 pandemic began.

"**During the pandemic, I struggled to find employment in my field. I came across the AWS re/Start program, and it was an excellent introduction to core cloud concepts. I was excited to learn new skills.**"

Through the program, Ganesan secured a job with chemical company Evonik as an IT Support Engineer.

"**As we transform our business digitally and capitalize on cloud services, we see the value that programs like AWS re/Start provide in helping us identify entry-level cloud talent. It can be challenging to hire workers with in-demand digital skills in the current climate. But AWS re/Start graduates have the exact digital skills to support our growth and help innovate new products. We're continuing to upskill them so they can advance their careers and support our digital transformation.**"

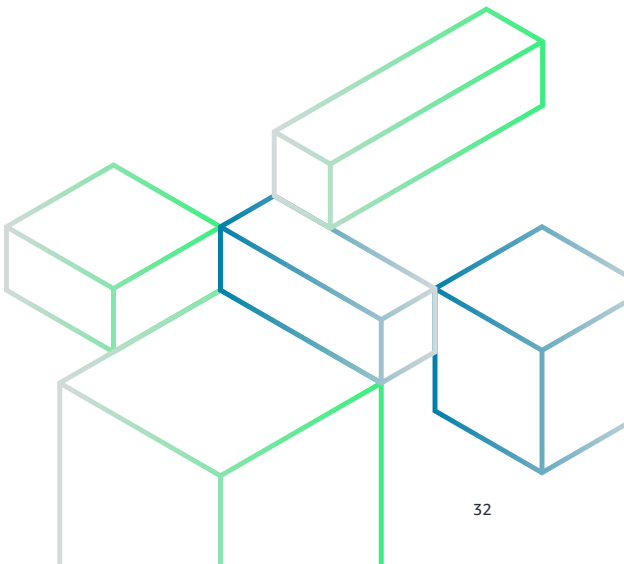
—Tan Yih Bing, Senior HR Director, Evonik

A significant majority of the global workforce has faced challenges in keeping pace with the rapid shift toward cloud computing. Among decision makers surveyed, 64% state cloud skill gaps within their teams, according the Enterprise Strategy Group's Research Insights paper, "Understanding the Value of AWS Training to Organizations." Technology research published by Gartner forecasts that global spending on public cloud services will increase from $490 billion in 2022 to $591 billion in 2023, reflecting a growth rate of 20%. To address these skill constraints—spanning workforce organization, partner communities, and leadership teams—cloud enablement training and certification programs are critical at every industry level. These programs should be designed to help cultivate cloud fluency, advance modernization skills, and equip teams to build, run, and scale solutions in the cloud while continuously optimizing efficiency and costs.

AWS Skills to Jobs team will launch the Tech Alliance in Malaysia in October 2024. The Tech Alliance model brings together a coalition of companies, government agencies around the world, workforce development organizations, and education leaders to address the skills gap in academic, technical, vocational and professional institution curricula. Tech Alliance model helps to better prepare learners for entry-level tech careers in areas such as cloud support, software development, and data analysis. Launched in 2023, the initiative currently focuses on three priority regions in the United States as well as Egypt, Germany, India, Italy, Singapore, Spain, and Latin America, Canada, and Caribbean (LCC) areas. Through the unique collaborative effort of the Tech Alliance, educational institutions can integrate industry expertise into their programs of study, while employers get access to a pipeline of job-ready talent. To better align curricula to in-demand jobs, AWS, employers, and educational institutions collaboratively design and vet skills maps that identify the critical skills and competencies that learners need to develop. Employers provide additional support by evaluating curricula, developing capstone projects, providing internships and apprenticeships, and participating in hiring events exclusive to Tech Alliance educational institutions.

Learners in the alliance gain access to hands-on support from industry professionals and can enroll in courses that are applicable to in-demand tech jobs. Since launch, Tech Alliance Singapore has reached more than 20,000 learners in 2023 through partnership with universities, polytechnics, and skilling agencies. In the ASEAN region, 70 employers actively participate in Tech Alliance activities, connecting 5,864 learners to entry-level tech jobs. Additionally, 45 Tech Alliance sessions have been delivered, and 75 educational partnerships established.

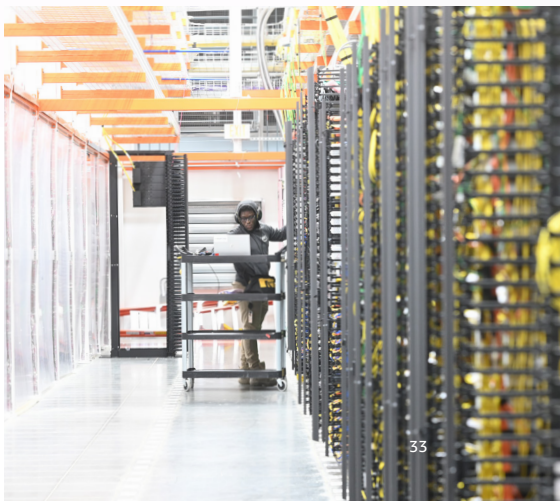
The Ministry of Economy through its Strategic Change Management Office, MyDIGITAL Corporation, has co-curated the Executive Digital Leadership Programme (EDL) with the prestigious Asia School of Business (ASB) in collaboration with MIT Sloan Management and Amazon Web Services (AWS). The EDL aims to provide access to **empower executives** in the public and private sectors with leadership skills and knowledge necessary to thrive in a digital economy, to **nurture** change agents for digital transformation by equipping future and current leaders with forward-thinking perspectives on digitalization and to **cultivate** a high degree of understanding of emerging technologies, integration strategies and key elements of successful digitalization. In 2023, AWS kicked off the EDL with three sessions comprising 150 executive civil servants presenting on topics such as Responsibility in the Age of Gen AI and Digital Innovation Culture.



Security and Compliance

At AWS, security is our top priority and security in the cloud is a shared responsibility between AWS and our customer. One of the many benefits of moving to the cloud is the improved security, and our core infrastructure is built to satisfy the security requirements for the military, global banks, and other high-sensitivity organizations. This is backed by a deep set of cloud security tools, with **more than 300 security, compliance, and governance services and features**, as well as support for **143 security standards and compliance certifications** including PCI-DSS, HIPAA/HITECH, FedRAMP, GDPR, FIPS 140-2, and NIST 800-171. AWS also consistently achieves **third-party validation for 1000s of global compliance requirements**. AWS customers receive access to more than 2,500 security controls by using AWS Artifact. AWS is investing significantly in security to implement state-of-the-art security systems at all levels and to be able to guide customers in understanding and executing best practices to manage and reduce security risk, and protect networks and data.

This shared model can help relieve the customer's operational burden as AWS operates, manages, and controls the components from the host operating system and virtualization layer, to the physical security of the facilities in which the service operates. The customer assumes responsibility and management of the guest operating system (including updates and security patches), other associated application software, as well as the configuration of the AWS provided security group firewall. Customers should carefully consider the services they choose as their responsibilities vary depending on the services used, the integration of those services into their IT environment, and applicable laws and regulations. The nature of this shared responsibility also provides the flexibility and customer control that permits the deployment. This differentiation of responsibility is commonly referred to as security "of" the cloud versus security "in" the cloud.



Spotlight: Highlighting AWS Talent

"After joining AWS in 2020, I have witnessed what empathetic leadership looks like first-hand, especially during and following the COVID-19 pandemic. I feel truly empowered by my leaders here at AWS to experiment and drive initiatives to help our customers succeed on the cloud, create impact locally in Malaysia and across the region with my expanded scope, and raise the bar on my personal career goals. I am passionate about giving back to the community. I can see the tangible impact I am making with my career at AWS and look forward to doing more in the future."

—Kelly Soh, Principal Customer Solutions Management Leader

Joining this industry has been a transformative journey. It has not always been easy, but continuous learning has been key. Our customers have been the greatest teachers, as their challenges drive us to innovate. At AWS, we excel in providing solutions, particularly through our unique 'working backward' method. This approach starts with envisioning the product as complete and crafting a press release from the customer's perspective, ensuring our developments meet their needs precisely. I'm excited to be working with a company that supports innovative ideas and the opportunity to work hard, have fun, and make history."

—Nora Rahim, Senior Account Manager

I graduated from the University of Malaya with a master's in mechanical engineering, and in 2022, I joined AWS as a Colo Mechanical Engineer. Working with colleagues across APAC, AMER, and EMEA has been an incredible experience. I love how diverse my team is, and, as a Malaysian, this job exposes me to different cultures around the world. I'm thrilled to be part of this field, and AWS's dynamic culture inspires me to stay ahead in the fast-paced technology industry."

—Kavin Subramaniam, Colo Mechanical Engineer

"I graduated from Multimedia University specializing in robotics, and today I am proud to be a controls engineer with AWS. What drew me to AWS was its culture of innovation and its data-driven approach, which inspired a whole new way of thinking for me. Working here has been incredibly rewarding, offering me the opportunity to cover multiple markets in the APAC region. With Malaysia growing as a tech hub, I am constantly inspired to be working with many talented people at AWS, as well as training the next generation of technologists in Malaysia. "

—Sivan Saminathen, Controls Engineer

After completing my master's in electronic business from Melbourne, I returned to Malaysia and held various roles in the ICT industry. Joining AWS in 2020 as head of business development capture for Malaysia, I became account director for the central government in March 2022. At AWS, I am passionate about helping customers deliver impactful initiatives that benefit Malaysian citizens, and I am particularly proud of the work that I do to advance the government's cloud transformation journey."

—Suryani Hanipah, Account Director, MY Public Sector

AWS InCommunities in Malaysia

Building on the measurable economic impacts of its investment, training, and workforce development programs in Malaysia, AWS is also committed to being a good neighbor by creating a positive impact in the communities where it builds and operates data centers through its community engagement initiative, AWS InCommunities.

AWS InCommunities launches innovative programs that will have a lasting impact in AWS Regions around the world where employees work, live, and raise their families. The efforts of AWS InCommunities are largely focused on four areas to meet the needs of communities: 1) science, technology, engineering, arts, and mathematics (STEAM) education; 2) local skills development; 3) sustainability; and 4) meeting hyperlocal social impact.

AWS and SOLS Foundation launch TVET Academy

This year, AWS InCommunities and the SOLS Foundation collaborated to launch the TVET Academy (Technical and Vocational Education and Training), a seven-month training and employment support program. The program helps students to develop academic and job-readiness skills and professional competencies. AWS is working with TVET Institutes to recruit 100 students from lower-income families, preparing them for careers with adequate digital skills sets. In collaboration with AWS, the TVET Academy will provide training and coaching as well as connect graduates to suitable employers to apply for employment opportunities.

Zero Waste Malaysia's Green Wira Programme

The Green Wira Programme (GWP) is an educate-the-educator initiative that equips local educators with the knowledge of zero waste principles and skills needed to develop and implement sustainability projects in their schools. GWP aims to empower 50 local educators in schools across Kuala Lumpur, Putrajaya, and Selangor through a series of curated modules, webinars, and in-person workshops.

This year, AWS sponsored two local schools with seed funding and three months of mentoring to implement their unique sustainability initiatives. The two selected schools are SK Telok Panglima Garang, with the Green Recycle House project, where they built and manage a Materials Recovery Project that functions as an environmental education hub and school waste management system; and SMK Taman Melawati, with the EcoSmart Energy project, where they implemented a rainwater harvesting system and LED lighting to reduce electricity and water wastage. This program is endorsed by the Ministry of Natural Resources and Environmental Sustainability of Malaysia.

As part of the InCommunities Forward Plan, AWS aims to:

- Provide K–12 students access to STEAM learning opportunities and promote equity in STEAM education in infrastructure communities.
- Implement sustainability initiatives related to water and biodiversity to benefit local communities.
- Launch hyperlocal projects to address challenges faced by communities, such as education and health care.

AWS partners with the Malaysian Nature Society (MNS) to promote the study, appreciation, and conservation of Malaysia's natural heritage, focusing on biological diversity and sustainable development. The MNS team hosted the AWS team at the serene Kuala Selangor Nature Park for a morning of mangrove planting. The MNS team's work in preserving and expanding the forest includes vital efforts at the Kuala Selangor Nature Park, where the mangroves contribute significantly to creating ecological and societal benefits.

Sustainability

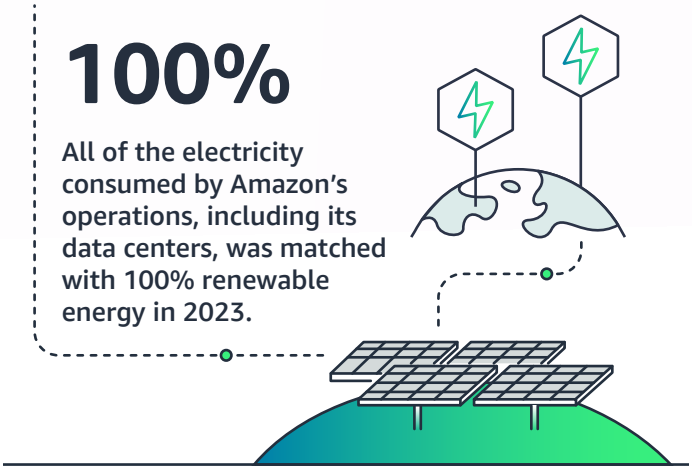
The Climate Pledge to achieve net-zero emissions

Amazon is committed to becoming a more sustainable business and reaching net-zero carbon across its operations by 2040, 10 years ahead of the Paris Agreement, as part of The Climate Pledge. Amazon co-founded The Climate Pledge and became its first signatory in 2019. In December 2023, PKT Logistics Group became the first Malaysian signatory to The Climate Pledge, joining more than 500 organizations globally to accelerate the world's path to net-zero carbon. As part of its Climate Pledge commitment, Amazon was on a path to power its operations with 100% renewable energy by 2025, five years ahead of the original 2030 target. This year, Amazon announced that it had met its 100% renewable energy goal seven years ahead of schedule. All of the electricity consumed by Amazon's operations, including its data centers, was matched with 100% renewable energy in 2023.

Amazon is the world's largest corporate purchaser of renewable energy, according to Bloomberg New Energy Finance. To date, Amazon has announced more than 500 renewable energy projects globally, which are expected to generate more than 77,000 gigawatt-hours (GWh) of renewable energy each year. Amazon will continue to invest in renewable energy, including in Malaysia, to meet its net-zero carbon by 2040 goal. Organizations that migrate to or build on AWS can benefit from the net effect of Amazon's sustainability efforts to reduce their carbon footprint.

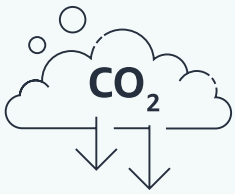
100%

All of the electricity consumed by Amazon's operations, including its data centers, was matched with 100% renewable energy in 2023.



Achieving emissions reductions: AWS's renewable energy impact in cloud operations

AWS contributes toward the Climate Pledge goals by constantly improving the energy efficiency of its computing resources and by increasing the share of renewable energy in total consumption by its data centers. As a result, the carbon footprint of cloud computing with AWS is lower than that of on-premises and most other data center providers. According to the report, "Moving onto The AWS Cloud Reduces Carbon Emissions," conducted by Accenture, AWS infrastructure is up to 4.1 times more energy-efficient than on-premises infrastructure. By adopting AWS's cloud infrastructure, private and public sector organizations can align with AWS's energy efficiency and clean energy goals, while meeting their own computing needs.



434
metric tons

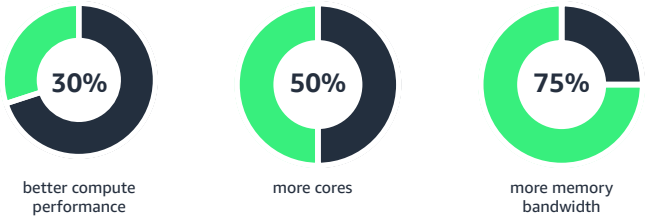
Greater access to renewable energy resources for cloud providers would result in additional emissions removal of up to **434 metric tons per year, compared with the grid baseline. Powering cloud services with 100% renewable energy would bring total workload energy-related carbon reductions to 1,976 metric tons per megawatt per year**. This advantage is attributable to the combination of more energy-efficient servers, higher server usage, and excellence in sustainable design achieved by AWS infrastructure.

AWS is committed to minimizing the environmental impact of its business. In addition to helping increase agility and reduce costs, moving to AWS is also significantly more sustainable, as customers no longer must provision for peaks, and the infrastructure is designed to operate efficiently at scale. Organizations will need to make energy-efficient computing an even higher priority as they seek to minimize their environmental impact and their compute demand grows.

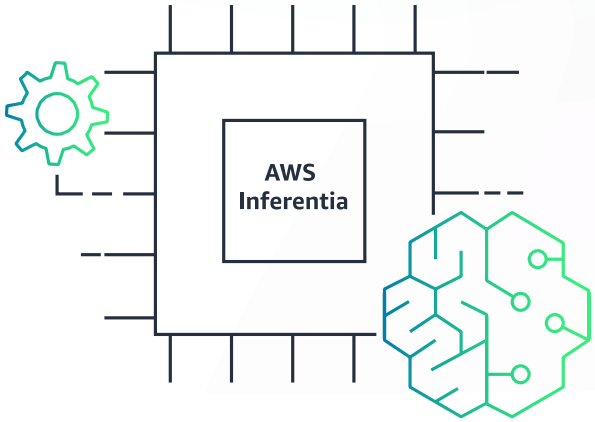
AWS is actively partnering with customers and partners in Malaysia to define their sustainability goals and taking practical steps to achieve them. In September 2023, AWS announced its collaboration with PETRONAS and Gentari, a global clean energy company, to accelerate sustainability and decarbonization efforts in the global energy transition. This initiative includes decarbonization of Amazon's India transportation network by working with third-party delivery service partners to further electrify their transport vehicles. It also focuses on efforts to deploy electric vehicles (EVs), integrate low-carbon solutions, leverage AWS cloud technology, and enhance digital skills development.

AWS's global infrastructure is built on custom hardware, which is optimized for one set of requirements—workloads run by AWS customers. This results in efficiency advantages at both the server and facility levels in its cloud infrastructure, and it translates into dramatically less energy used to perform the same unit of work.

AWS designs server systems with great attention to power optimization, using the latest technology components. It runs servers at higher usage levels than enterprise data centers, leveraging the ability to share and dynamically allocate resources in the cloud. One of the most visible ways AWS is using innovation to improve power efficiency is its investment in AWS chips, like the AWS Graviton family of processors. AWS Graviton-based instances use up to 60% less energy than comparable EC2 instances. The latest Graviton4 provides up to 30% better compute performance, 50% more cores, and 75% more memory bandwidth than current generation Graviton3 processors, delivering the best price performance and energy efficiency for a broad range of workloads running on Amazon EC2.



In 2021, AWS launched AWS Trainium, a high-performance machine learning chip designed to reduce the time and cost of training generative AI models—cutting training time for some models from months to days. This, in turn, means building new models requires less capital and power, with potential cost-to-train savings of up to 50% and energy-consumption reductions of up to 25%, versus comparable instances. Trainium2 was introduced in November 2023 and is designed to deliver up to 4 times faster training than first-generation Trainium chips and will be able to be deployed in EC2 UltraClusters of up to 100,000 chips, making it possible to train foundation models (FMs) and large language models in a fraction of the time, while improving energy efficiency up to 2 times.



AWS Inferentia is AWS's power-efficient machine learning inference chip—it is up to 54% more energy efficient and can reduce costs by up to 90% relative to comparable instances. In April 2023, the company announced that Amazon EC2 Inf2 instances powered by AWS Inferentia2, are generally available. Inf2 instances are the first inference-optimized instances in Amazon EC2 to support scale-out distributed inference with ultra-high-speed connectivity between accelerators. Customers can now efficiently deploy models with hundreds of billions of parameters across multiple accelerators on Inf2 instances. Compared to Amazon EC2 Inf1 instances, Inf2 instances deliver up to 4 times higher throughput and up to 10 times lower latency. Since the underlying AWS Inferentia2 chips are purpose-built for DL workloads, Inf2 instances offer up to 50 percent better performance per watt than other comparable Amazon EC2 instances.

Reducing water usage and returning water to communities

In addition to a commitment to energy efficiency and renewable energy, AWS is dedicated to conserving and reusing water in its operations. AWS collaborates with both the private sector and public entities to support water availability in communities where it operates data centers. On the hottest days when AWS needs water for cooling, it has optimized systems to use minimal water. Outside air is cooled through an evaporative process and pushed into the server rooms to keep hardware at stable operating temperatures. During cooler months, where possible, outside air is supplied directly to the data center without needing to be cooled. AWS is constantly innovating the design of its cooling systems, and it uses real-time sensor data to adapt to changing weather conditions to further reduce water use.

AWS also evaluates the opportunity to reduce its consumption of potable water and is actively expanding the company's use of non-potable and recycled water for cooling purposes. In certain regions, the company works directly with utilities and regulators to obtain approval for the use of recycled water in direct evaporative cooling technology. AWS is continuing to work with water utilities in various regions to expand this recycled water infrastructure. Through these actions, it is actively contributing to sustainable water solutions by reducing its impact on the local potable water supply for the communities where it operates. AWS also uses on-site, modular water-treatment systems in multiple regions, which allow the company to remove scale-forming minerals and reuse water for more cycles. Increasing its "cycles of concentration" contributes to reducing the water intake needed to cool its data centers. Along with reducing water usage, AWS also actively looks for opportunities to return water to the communities where it operates.

For AWS, running our operations sustainably means reducing the amount of water we use to cool our data centers. Our holistic approach minimizes both energy and water consumption in our data center operations and guides the development of our water use strategy for each AWS Region. It starts with evaluating climate patterns, local water management and availability, and opportunities to use sustainable water sources.

AWS will be water positive by 2030, returning more water to communities than it uses in its direct operations. AWS's global water use efficiency metric of 0.19 liters of water per kilowatt-hour (kWh) demonstrates AWS's leadership in water efficiency among cloud providers. AWS is already well on the path to becoming water positive through innovative programs to lower water use across facilities by using cloud technologies to continually improve water efficiency and investing in projects that deliver water back to communities. This initiative adds to Amazon's $10 million commitment to Water.org to support the launch of the Water & Climate Fund, which will deliver climate-resilient water and sanitation solutions to 100 million people across Africa, Asia, and Latin America. This donation will directly empower 1 million people with water access by 2025, providing 3 billion liters of water each year to people in water-scarce areas.

Helping customers become sustainable cloud users

The AWS Well-Architected Framework helps customers improve their cloud architectures. The framework consists of design principles, questions, and best practices across six pillars—Operational Excellence, Security, Reliability, Performance Efficiency, Cost Optimization, and Sustainability. The Sustainability Pillar helps AWS customers structure their cloud architecture to reduce energy consumption and improve efficiency. The framework helps customers reduce their carbon footprint by integrating sustainability goals, impact measurements, maximized workloads, managed services, and actions to reduce downstream energy usage. AWS also offers the customer carbon footprint tool to help customers calculate the environmental impact of their AWS workloads. The tool uses easy-to-understand data visualizations to provide customers with their historical carbon emissions and helps them to evaluate emission trends as their AWS use evolves, estimate the tonnage of carbon emissions avoided by using AWS instead of an on-premises data center, and review forecasted emissions based on current use.

The forecasted emissions show how a customer's carbon footprint will change as Amazon continues to power its operations with 100% renewable energy and drives toward net-zero carbon by 2040 as part of The Climate Pledge.

The Amazon Sustainability Data Initiative (ASDI) seeks to accelerate sustainability research and innovation by helping customers minimize the cost and time required to acquire and analyze large sustainability datasets. ASDI supports innovators and researchers with the data, tools, and technical expertise they need to move sustainability to the next level. ASDI currently works with scientific organizations like the Earth Observatory of Singapore at Nanyang Technological University to identify, host, and deploy key datasets in AWS, including weather observations, weather forecasts, climate projection data, satellite imagery, hydrological data, air quality data, and ocean forecast data. These datasets are publicly available to anyone.

Additionally, ASDI provides cloud grants to those interested in exploring the use of AWS's technology and scalable infrastructure to solve big, long-term sustainability challenges with this data. The dual-pronged approach allows sustainability researchers to analyze massive amounts of data in mere minutes, regardless of where they are in the world or how much local storage space or computing capacity they can access.

Perspectives on AWS's role in Malaysia's digitalization agenda

"The launch of an AWS infrastructure Region in Malaysia provides access to new and emerging technology for Malaysian entities and businesses of all sizes, boosting our country's capabilities for digital innovation. This milestone is a significant step towards fulfilling the vision of Malaysia's New Industrial Master Plan 2030 to build a highly skilled, innovative, prosperous, inclusive, and sustainable economy. We recognize the transformative power of digitalization, cloud computing and AI as key drivers in Malaysia's effort to become a manufacturing and services hub within Asia. As the largest investment made by an international technology company in Malaysia, the AWS infrastructure Region will help ensure Malaysia remains competitive on the global stage."

—Tengku Zafrul Aziz, Minister of Investment, Trade, and Industry (MITI)

AWS's 29.2 billion investment underscores the robust confidence global investors have in our economic policies and potential. AWS's advanced cloud solutions will play a crucial role in accelerating our national digitalization agenda, enhancing public sector efficiency, fostering innovation across all sectors and ensuring we have the right digital infrastructure in Malaysia to future-ready our nation's economy. The economic impact of AWS's investment is profound, with thousands of high-quality and high wage jobs being created, directly contributing to Malaysia's economic growth. This collaboration will also spur new business opportunities especially of AI-driven startups and drive technological advancements, ensuring a prosperous future for all Malaysians."

—YB Rafizi Ramli, Minister of Economy

AWS's substantial investment is a strong vote of confidence in Malaysia's digital economy. This collaboration will enable us to harness cutting-edge technologies, positioning Malaysia as a leader in the digital era, especially as Malaysia hosts ASEAN in 2025. AWS's investment in Malaysia will further expand the ecosystem by fostering collaboration between public and private sectors using regional best practices, implementing skilling initiatives and increasing global competitiveness through AWS's capacity building in the civil service. Additionally, it will inevitably encourage all sectors to adopt technology and innovation. This partnership is a catalyst for the digital transformation of our nation, fostering a thriving digital economy."

—YB Gobind Singh Deo, Minister of Digital

We are delighted to witness AWS's robust commitment to Malaysia with its 29.2 billion Malaysian ringgit investment. This not only marks a significant milestone in our journey towards becoming a digital economy but also aligns perfectly with our Madani Framework, which emphasizes sustainable and inclusive growth. By leveraging AWS's cutting-edge cloud technologies, we are set to enhance our scientific and technological landscape, fostering innovation and creating substantial economic opportunities across various sectors. This partnership is a testament to our welcoming policy environment and our continuous efforts to empower our industries through high-impact digital solutions."

—YB Chang Lih Kang, Minister of Science, Technology, and Innovation

AWS's investment highlights Malaysia's appeal as a sustainable and innovative economy. We welcome AWS's commitment to leveraging technology for sustainable development, ensuring a greener future for our nation. AWS's cloud solutions will help us implement environmentally friendly practices, reducing our carbon footprint and promoting green innovation. AWS's investment will create numerous jobs, driving economic growth while adhering to our sustainability goals. This partnership exemplifies how technology can be harnessed to achieve economic and environmental progress simultaneously."

—YB Nik Nazmi, Minister of Natural Resources and Environmental Sustainability

AWS's 29.2 billion Malaysian ringgit investment is set to revolutionize Malaysia's digital landscape. This partnership will create over a thousand jobs and cultivate a highly skilled workforce, essential for our global competitiveness. It is a key driver of Malaysia's economic progress, fueling innovation, attracting quality investments, and ensuring sustainable growth. By providing access to all user levels—rakyat, startups, SMEs, MNCs, and the government—this investment paves the way for a future of inclusivity. MIDA's support was pivotal in securing AWS's commitment, navigating the investment landscape smoothly."

—En. Sikh Shamsul Ibrahim, CEO of Malaysian Investment Development Authority (MIDA)

Appendix

EIS methodology

To measure the economic impact of data center investments, AWS uses a Nobel Prize–winning model developed by Harvard economist Wassily Leontief, the input-output (I-O) model. In processing the model, AWS uses a conservative framework to define investment and calculate economic multipliers, which represents the "as built" world. AWS Economic Impact Studies can be directly correlated with what it took, or what AWS is actively planning to do, to construct, connect, operate, and maintain the data centers in a given AWS Region.

I-O models are used to measure the impact of the expansion or contraction of one economic activity on other economic activities, and on the local economy as a whole. In the I-O model, "local" is typically a country, but could also be a smaller geographic area (for example, a county in the U.S.), or a region in the EU (for example, Lombardy in Italy). The method uses historical data from the country, and in this report, data maintained by the OECD. The data shows the impact of each Malaysian ringgit spent in one industry on all other industries. AWS uses standard procedures for calculating multipliers from the I-O data supplied by the OECD. See, for example, Ronald Miller and Peter Blair, Input-Output Analysis: Foundations and Extensions, 2009, Cambridge University Press.

The estimated economic impacts represent the cumulative effects of the following:

- **Direct effects** are created by expenditures from AWS direct suppliers by supplying AWS with goods and services to support the AWS Region. These include construction firms, colocation providers, and power companies.
- **Indirect effects** are created by business-to-business purchases from indirect suppliers in the supply chain who supply goods and services to AWS's direct suppliers to support the AWS Region. These include firms that provide AWS suppliers with construction labor and materials.
- **Induced effects** are created by the household spending of employees in the supply chain receiving compensation to support the AWS Region. These include firms that supply goods and services to workers' households.

The monetary figures presented in this document are derived from Amazon internal data and prepared in accordance to the above methodology for computing economic impact. The above methodology is not based on accounting standards and has not been subject to audits conducted by an independent accounting firm. Accordingly, the figures presented differ from in-country statutory financial statements and reporting.

Glossary

Amazon CloudFront: Amazon CloudFront provides businesses and web application developers with a secure and cost-effective solution for distributing content with low-latency and high-data transfer speeds. By using the AWS backbone network, CloudFront accelerates content distribution by routing each user request to the most optimal edge location that can best serve that content. Customers can enhance security with traffic encryption and access controls, and benefit from AWS Shield Standard, which defends against distributed denial of service (DDoS) attacks at no additional cost. Notably, Hulu relies on Amazon CloudFront to consistently provide high-quality video streaming services to millions of people.

AWS Local Zones: AWS Local Zones place select AWS capabilities, including compute, storage, and databases, closer to end users. With AWS Local Zones, customers can easily run highly demanding applications for their users, such as media and entertainment content creation, real-time gaming, simulations, and machine learning. For example, Epic Games uses AWS Local Zones to deliver enhanced player experiences for its popular Fortnite game.

gross domestic product (GDP): Gross domestic product quantifies the economic impact of AWS investment. Following the value-added approach, GDP represents the final value of goods and services produced by an economic activity in terms of the sales value (gross output) less any related investment (intermediate inputs) required to produce the output.

gross investment: Gross investment includes the total costs paid by AWS to construct, connect, operate, and maintain AWS infrastructure across its full life cycle. These costs include the full value of capital expenditures and operational expenditures necessary to realize the project, such as imports of servers and employment of marketing professionals.

jobs supported: The jobs supported by AWS investment quantifies the number of full-time equivalent (FTE) jobs created and retained at businesses that supply AWS and its suppliers. FTE is a concept used to normalize full-time and part-time jobs, where two employees working 50% of the time add up to one FTE. The input-output model measures the number of jobs supported by AWS investment as a function of the ratio of total compensation and average compensation for workers in sectors required to produce the output supporting AWS purchases. This measures the total compensation and jobs supporting AWS investment. Jobs at a given firm may support existing production demand and be retained by AWS investment or may also be created as a result of new demand.