AMAZON DATA CENTER INVESTMENT IN NEW ZEALAND:

Economic Impact Study

Contents

AWS in New Zealand was gifted a karakia by Maurea Consulting to support its intentions in Aotearoa New Zealand. A **karakia** is a traditional Māori blessing that calls for guidance, protection, and acknowledgement of ***ātua*** (higher being). Karakia are often used for the spiritual goodwill of a gathering and to encourage a favorable outcome. The Karakia Timatanga, a ***taonga*** (treasure), is cared for by AWS employees. It is used at the opening and closing of ***hui*** (meetings), honoring Māori tradition and culture in New Zealand:

Whātuia te rangi e tū nei
Whātuia te papa e takoto nei

Korowaitia ki te kahu ora
Korowaitia ngā pito mata,
ngā kura huna
Kia toitū
Kia toiroa
Kia toi kairangi
Kia puta, kia ora

Hui e, tāiki e!

Tie together all that is above
Tied together all that is from below

Nurture with the cloak of life
Nurture all potential and aspiration
Knowledge and "X-factor"
To be permanent
To be sustainable
To be excellent
Release and thrive

Bind and confirm!

Executive Summary

More than NZ$7.5 billion[1]

Total planned investment in support of the launch of the AWS Asia Pacific (New Zealand) Region

More than NZ$10.8 billion

Estimated gross domestic product (GDP) contributed to New Zealand by the AWS Asia Pacific (New Zealand) Region

More than 1,000 jobs

Estimated average full-time equivalent (FTE) jobs annually supported by the AWS Asia Pacific (New Zealand) Region

As Amazon invests in communities globally, including through Amazon Web Services (AWS)[2] Regions, it creates measurable and demonstrable economic growth in those regions. This AWS Economic Impact Study (EIS) examines the impact generated by Amazon's data center investment in the AWS Asia Pacific (New Zealand) Region. This study further outlines how AWS's presence in New Zealand will play a vital role in helping local customers harness cloud computing and advanced technologies such as artificial intelligence (AI), accelerating innovation and digital transformation while boosting productivity. Amazon's data center investments will also lead to a ripple effect across the New Zealand economy and local communities by creating employment opportunities, fostering community engagement, and upskilling the workforce.

Since establishing a presence in New Zealand in 2013, Amazon has progressively expanded its infrastructure in the country. In 2021, AWS announced plans to launch the AWS Asia Pacific (New Zealand) Region, providing New Zealand customers with onshore access to resilient and secure cloud infrastructure. This investment will continue to propel sustained growth across multiple industries in New Zealand, encompassing construction, energy consulting, engineering, maintenance, manufacturing, and security. These industries, in turn, will have a beneficial economic impact, particularly for local businesses.

The launch of the AWS Asia Pacific (New Zealand) Region provides New Zealand customers with the secure tools, services, and infrastructure necessary to build an AI-led digital economy and to compete globally. Digitally native businesses (DNBs) and independent software vendors (ISVs), including startups, online businesses, and software-as-a-service (SaaS) providers, are launching and scaling their businesses from inception to maturity on AWS. Emerging cloud infrastructure in New Zealand will help to nurture a vibrant technology 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. New Zealand technology companies that are part of the AWS Partner Network (APN), together with AWS customers, are leveraging AWS to drive cost savings, accelerate innovation, and better serve their communities and customers.

[1] Please refer to the Appendix for an overview of EIS methodology.
[2] References to Amazon and AWS may relate to various Amazon entities including, but not limited to, Amazon Web Services New Zealand Limited, Amazon Data Services New Zealand Limited, and Amazon Web Services, Inc. AWS may also refer to AWS services, products, methods, and practices, and the AWS brand and trademark. For more information on AWS generally, refer to https://aws.amazon.com/what-is-aws/.

The AWS Asia Pacific (New Zealand) Region gives developers, startups, entrepreneurs, and enterprises, as well as government, education, and nonprofit organizations, greater choice when running their applications and serving their constituents and customers. AWS provides partners and customers throughout New Zealand with the ability to solve critical low latency challenges, including through enhanced access to innovative cloud technologies, such as machine learning (ML), and Internet of Things (IoT), and to leverage Amazon's global investments in generative AI and AI agents.

Across industries, organizations are using AWS to benefit from the resilience it provides for critical workloads and the security of their customers' data. AWS offers the most secure cloud environment available, meaning customers have the ability to build services quickly, securely, and efficiently using AWS's world-leading technology. Trust forms the foundation of AWS's business and its customer relationships, and protecting customer data is central to upholding it.

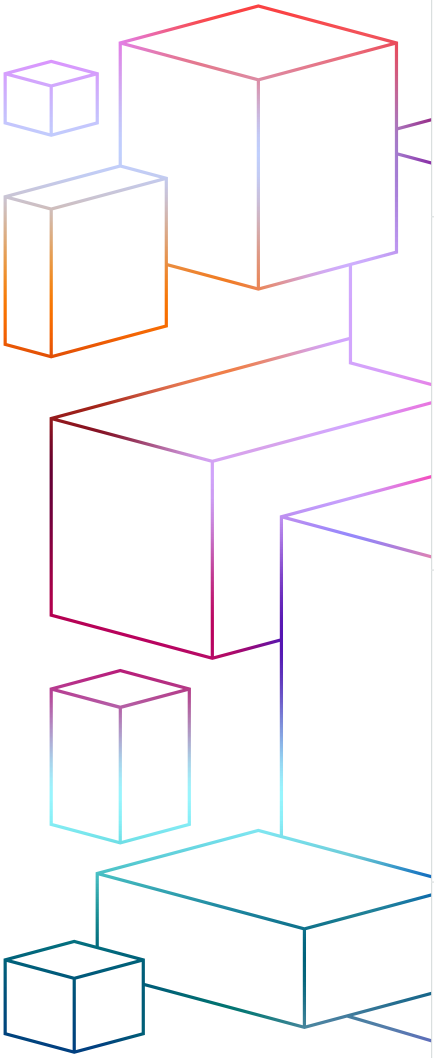
The AWS Region in New Zealand will be instrumental in advancing the country's digital ambitions and driving innovation across the New Zealand economy. Through the AWS Region in New Zealand, companies and organizations will be able to access a comprehensive portfolio of cloud services, including analytics, artificial intelligence, compute, database, Internet of Things, machine learning, mobile services, and storage.

AWS remains focused on developing the New Zealand cloud workforce and providing education initiatives to learners of all ages and backgrounds. It is also committed to increasing diversity in the technology sector through training programs that serve underrepresented communities, including women, Māori, and Pasifika. One example is AWS re/Start, a 12-week program that prepares individuals for cloud jobs.

Amazon is committed to building a more sustainable future and reducing its environmental impact, with a goal of reaching net-zero carbon across its operations by 2040, 10 years ahead of the Paris Agreement, as part of The Climate Pledge. In New Zealand, AWS has formed a long-term partnership with energy provider Mercury NZ, investing through a power purchase agreement to offtake approximately 50% of the renewable energy capacity of the 103-megawatt (MW) Turitea South wind farm, providing more renewable energy than the AWS Region will require at launch.

Amazon is committed to building a more sustainable future and reducing its environmental impact, **with a goal of reaching net-zero carbon across its operations by 2040.**

Economic impact of Amazon's data center investment in the Asia Pacific (New Zealand) Region



NZ$7.5 billion

Amazon plans to invest more than $7.5 billion New Zealand dollars in support of the AWS Asia Pacific (New Zealand) Region, including the capital and operating expenditures associated with constructing, connecting, operating, and maintaining the AWS Region. 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.

NZ$10.8 billion

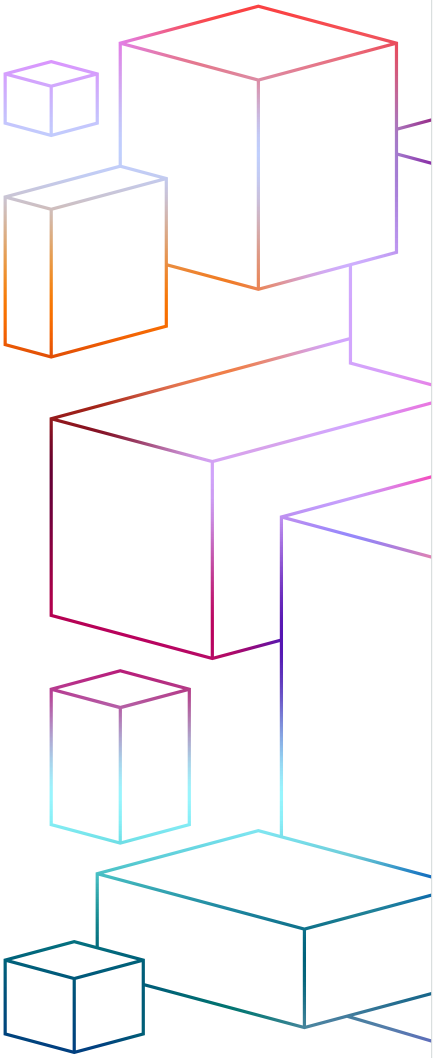
The investment associated with the AWS Region in New Zealand will contribute an estimated NZ$10.8 billion to New Zealand's total GDP. The level of growth that is attributable to Amazon's investment includes the value added by Amazon to New Zealand's information technology (IT) sector and in-country spending on goods and services related to the construction and operation of AWS data centers.

1,000 jobs

Amazon's data center investment is estimated to support an additional 1,000 full-time equivalent (FTE) jobs in the New Zealand economy. These jobs include both AWS direct employment as well as non-AWS employment in sectors supporting AWS infrastructure, such as telecommunications, non-residential construction, electricity generation, and data center personnel.

Ripple effect

Amazon's data center investments in the AWS Asia Pacific (New Zealand) Region are expected to lead to a ripple effect across New Zealand's digital economy, accelerating productivity gains, enabling the digital transformation of businesses, including startups, SMBs, and ISV customers, as well as companies that are part of the AWS Partner Network (APN), advancing cloud and digital workforce upskilling, supporting renewable energy projects, and contributing positively to the communities where AWS operates.



Downstream economic impact of cloud adoption and cloud-enabled AI Adoption in New Zealand

According to a recent study by Telecom Advisory Services, "Economic Impact of Cloud Computing and Artificial Intelligence in Asia-Pacific,"[3] cloud infrastructure adoption in New Zealand is estimated to have contributed more than $4.8 billion to New Zealand's economy in 2023, while cloud-enabled AI adoption added more than $275 million. From 2024 to 2030, cloud adoption is projected to contribute more than $2.7 trillion to Asia-Pacific's GDP, with cloud-enabled AI expected to contribute more than $202 billion in GDP to the economy in Asia-Pacific.

The study estimates that AI adoption contributed $775 per worker in productivity gains in Asia- Pacific in 2023. Considering the additional labor productivity increases attributed to generative AI, these gains are projected to rise up to $1,043 per worker.

[3]Telecom Advisory Services. November 2024. "Economic Impact of Cloud Computing and Artificial Intelligence in Asia-Pacific."

Amazon Data Center Investment in New Zealand

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 AI, IoT, mobile, security, hybrid, media, and application development, deployment, and management from 120 Availability Zones within 38 geographic regions. 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 explore AWS and cloud computing in more detail, refer to the Appendix and visit aws.amazon.com.

The AWS Asia Pacific (New Zealand) Region and cloud infrastructure

An AWS Region refers to a geographical location in the world where we cluster data centers. We call each group of logical data centers an Availability Zone (AZ). Each AWS Region, including the Asia Pacific (New Zealand) Region, has at least three isolated and physically separated AZs. Each AZ consists of one or more discrete data centers with redundant power, cooling, and physical security. AZs are physically separated by a meaningful distance to mitigate the impact of the most common disasters that could affect data centers, and are connected by high-bandwidth, low latency networking, over fully redundant, dedicated metro fiber, sufficient to accomplish synchronous replication between AZs. This distinctive design of AWS Regions and Availability Zones gives customers the ability to operate production applications and databases that are more highly available, fault tolerant, and scalable than would be possible from a single data center.

In 2021, Amazon announced an investment of NZ$7.5 billion to support the launch of the AWS Asia Pacific (New Zealand) Region, strengthening digital services and cloud infrastructure across the country. Amazon's investment in establishing the AWS Region in New Zealand marks a significant advancement for customers, providing enhanced access to AWS technology and broadening the country's cloud infrastructure.

Since establishing its presence in New Zealand in 2013, AWS has steadily expanded its infrastructure offerings, deploying AWS Outposts, Amazon CloudFront Edge locations, and an AWS Local Zone. It has also established an AWS Direct Connect location, enabling customers to establish private connectivity between AWS and their data centers, offices, or colocation environments.

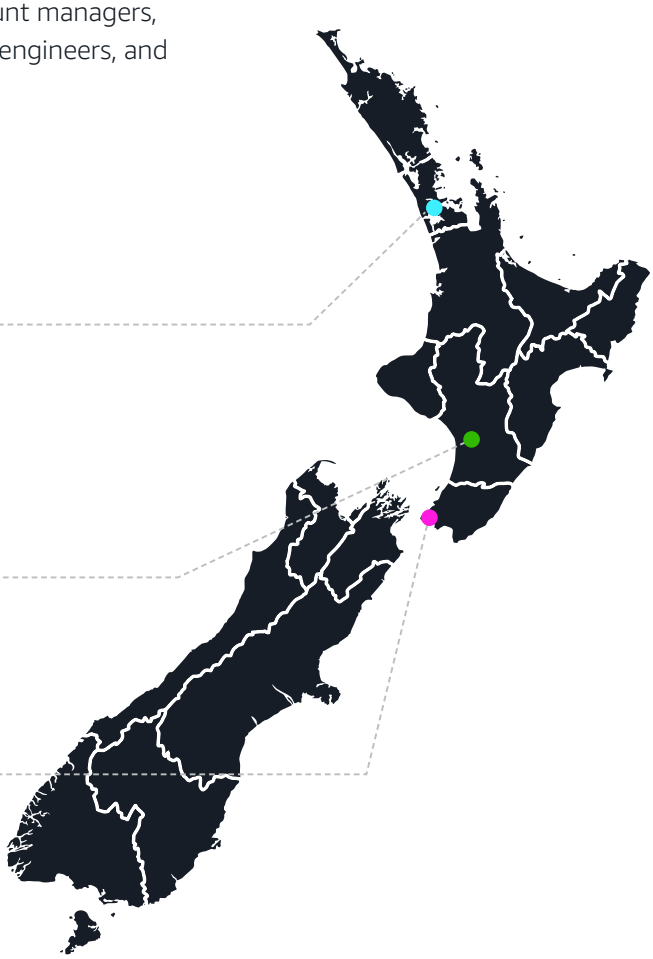
AWS's corporate offices in Auckland and Wellington are home to more than 150 highly skilled positions, such as solutions architects, account managers, sales representatives, professional services consultants, cloud engineers, and data center operators.

AWS locations in New Zealand

AWS Region in Auckland
AWS Local Zone in Auckland
AWS Direct Connect Auckland
AWS CloudFront Auckland
Corporate office in Auckland

Renewable energy project at Turitea South, which is located near Palmerston North

Corporate office in Wellington



Accelerating Digital Transformation in New Zealand with AWS

The investment in the New Zealand Region marks a significant advancement in expanding access to AWS services for customers in New Zealand, enabling them to leverage enhanced capabilities and support their digital transformation efforts. Customers in New Zealand use AWS to innovate, accelerate their businesses, and develop new activities, thus bolstering New Zealand's economy. By enabling customers to store data securely within New Zealand, the AWS Region supports meeting data residency preferences, reduces latency, and broadens access to cloud services across the country.

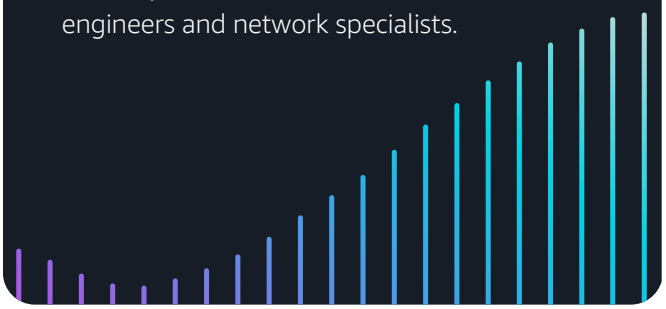
By expanding its cloud infrastructure in New Zealand, AWS is helping to create and support direct and indirect jobs, including highly skilled positions such as data center engineers and network specialists. Moreover, this investment will catalyze innovation and productivity gains, driving economic resilience. Furthermore, AWS's presence will strengthen tech ecosystems locally and stimulate investment. Ultimately, AWS serves as an engine for innovative ideas, heightened productivity, and a vibrant economy propelled by cloud infrastructure.

When AWS announced its plans to launch a region in New Zealand in 2021, the then-New Zealand Productivity Commission had recently emphasized the importance of increasing foreign direct investment (FDI) in New Zealand. The Commission said FDI should ideally be invested to grow new export markets, create a demand for skills, encourage more training, attract international talent, and build career paths that help keep skilled people in New Zealand.[4] In addition, it noted such investments should provide access to global value chains and, through the diffusion of innovation, help domestic firms raise their productivity and develop a network of specialized partners, such as suppliers and researchers, over the long term. In every respect, Amazon's data center investment meets the criteria for high-quality FDI to boost New Zealand business productivity and accelerate both domestic and global export-oriented growth.

Enhanced AWS cloud infrastructure in New Zealand enables customers to 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 New Zealand can innovate more rapidly, accelerate growth, and contribute to the country's burgeoning digital economy. The AWS Region in New Zealand provides an extensive and growing portfolio of services tailored to meet the needs of large enterprises, government agencies, academic institutions, SMBs, and startups, reaffirming AWS's commitment to fostering innovation and supporting diverse industries across New Zealand.

Notably, the establishment of the AWS Region in New Zealand coincides with the accelerated adoption of generative AI, which Goldman Sachs forecasts could generate an increase of $7 trillion in global GDP and raise productivity by 1.5 percentage points over the next decade. Gartner highlights generative AI as one of the most transformative innovations in the digital workplace, with the potential to bring about unprecedented changes in the future of work.

By expanding its cloud infrastructure in New Zealand, **AWS is helping to create and support direct** and **indirect jobs**, **including highly skilled positions** such as data center engineers and network specialists.



[4] New Zealand Productivity Commission, New Zealand firms: Reaching for the Frontier, April 2021. Note: Since its disestablishment in February 2024, the Productivity Commission's functions have been assumed by the Ministry for Regulation.

Economic impact of Amazon's data center investment in New Zealand

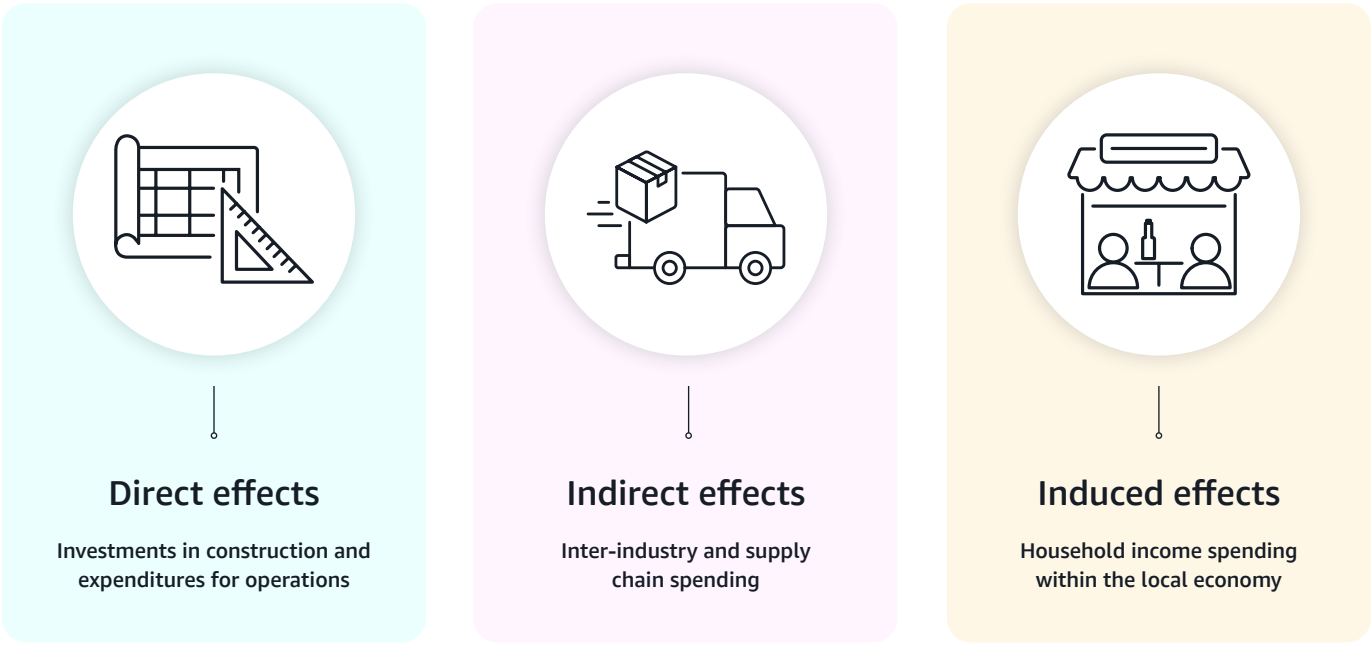
Amazon's investments have a measurable economic impact in New Zealand through the construction, connection, operation, and maintenance of AWS data centers. In New Zealand, Amazon **plans to invest more than NZ$7.5 billion in support of the launch of the AWS (New Zealand) Region**. All expenses are directly 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. AWS is committed to a progressive expansion of our local infrastructure and development of corporate operations to meet the projected demand for AWS services in New Zealand.

This study projects the planned investment in the AWS Region in New Zealand **will contribute more than NZ$10.8 billion to New Zealand's total GDP**.

These estimates are derived from internal data, the input-output (I-O) model, and statistical data provided by the Organisation for Economic Cooperation and Development (OECD). The GDP contribution by the AWS Asia Pacific (New Zealand) Region reflects the value added by AWS to the IT sector in New Zealand, as well as the direct, indirect, and induced effects of AWS purchases from the New Zealand data center supply chain.

Amazon's data center investment is estimated to **support an additional 1,000 full-time equivalent (FTE) jobs in the New Zealand economy**. These jobs include both AWS direct employment as well as non-AWS employment in sectors supporting AWS infrastructure, such as telecommunications, non-residential construction, electricity generation, and data center personnel.

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



Economic Impact of AI Adoption

What is the benefit of AI adoption?

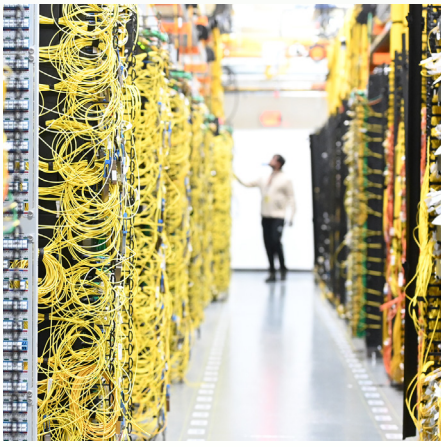
Organizations are continuing to advance their capabilities as they expand their adoption of AI. According to KPMG's GenAI Survey, 71% of senior business leaders at companies with revenues of $1 billion or more are leveraging generative AI to drive decision-making, while 83% of respondents anticipate increased investments in generative AI over the next three years.

The economic impact of AI adoption is substantial, reshaping industries, enhancing productivity, transforming labor markets, and driving overall economic growth. Here are notable ways AI is contributing to economic growth across industries:

- **Increased productivity and efficiency:** AI adoption boosts productivity by automating repetitive tasks, improving accuracy, and reducing time for data processing and decision-making. Industries such as manufacturing, health care, finance, and logistics experience significant efficiency gains, translating into higher GDP contributions.
- **Cost reduction and optimization:** AI-driven automation reduces operational costs by lowering labor expenses for certain tasks and minimizing errors. These cost savings improve profit margins and may lead to lower consumer prices, contributing positively to economic stability.
- **Job creation and transformation:** AI adoption creates new employment opportunities in fields such as AI development, data science, and cybersecurity. It also enhances existing roles across industries by expanding human potential and allowing workers to focus on higher-value tasks. This shift toward more advanced and specialized roles often leads to upskilling opportunities and the creation of new career paths.
- **Innovation and new market creation:** AI fosters innovation by enabling businesses to develop new products and services, creating entirely new markets and revenue streams. This leads to increased competition, dynamic markets, and the potential for economic growth in previously untapped industries.
- **Broader economic and societal benefits:** AI adoption can help to address significant societal issues while indirectly benefitting the economy. In health care, AI can lead to early disease detection and enable personalized treatments, reducing health care costs and improving the overall health of a population. In environmental sectors, AI can enhance energy efficiency, optimize resource utilization, and contribute to sustainability efforts, thereby supporting long-term economic resilience.

71%

of senior business leaders at companies with revenues of $1 billion or more are using generative AI data to drive decision-making, and 83% of respondents anticipate increased investments in generative AI over the next three years



The expanding role of cloud and cloud-enabled AI adoption in New Zealand's economy

In 2024, AWS and Telecom Advisory Services (TAS), a globally recognized research and consulting firm that specializes in economic impact studies, released the study "Economic Impact of Cloud Computing and Artificial Intelligence in Asia-Pacific." The study measures the economic impact of cloud computing and the adoption of cloud-enabled AI across the region.

In New Zealand, the study estimates the adoption of cloud infrastructure contributed more than $4.8 billion to New Zealand's economy in 2023, while cloud-enabled AI adoption has added more than $275 million. The study projects from 2024 to 2030, cloud adoption will add more than $2.7 trillion to Asia-Pacific's GDP, with cloud-enabled AI expected to contribute more than $202 billion in GDP to its economy. Cloud-enabled AI, in this context, refers to AI and ML platforms delivered by cloud service providers.

Energy productivity enhancement by cloud computing

Cloud computing's role in energy productivity in New Zealand

The Telecom Advisory Services study, "Comparative Assessment of Energy Productivity of Cloud Computing and Information Technology in Asia-Pacific,"[5] examined the impact of cloud computing technology on energy productivity, which refers to the economic value (GDP) added per unit of energy, measured in megawatt-hours (MWh) consumed. Increased energy productivity enables businesses and industries to produce more goods and services with the same amount of energy, thereby reducing production costs across industries. By this measure, the cloud excels. For a more detailed explanation of energy productivity, please refer to the section in the Appendix titled *Defining energy productivity*.

10%

The study found that **a 10% increase in New Zealand's cloud adoption rate enhances energy productivity, leading to an average increase of $6 per MWh in the country.**

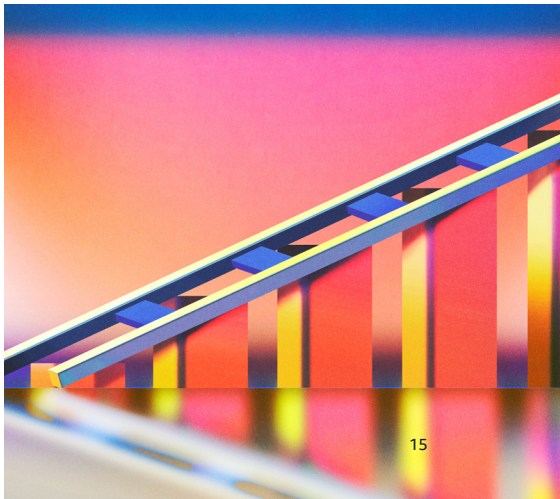
This improvement in energy productivity reduces production costs, enabling businesses to reinvest savings into innovation and expansion. As a result, this increased energy productivity is estimated to contribute $251.1 million in GDP to New Zealand's economy, **highlighting cloud computing's pivotal role in driving sustainable growth**. Additionally, the deployment of a single Availability Zone contributes an estimated $1.9 billion in GDP to Asia-Pacific's economy, with hyperscale data centers generating greater GDP impact than on-premises data centers due to economies of scale.

[5] Telecom Advisory Services. November 2024. "Comparative Assessment of Energy Productivity of Cloud Computing and Information Technology in Asia-Pacific."

Enabling Growth and Innovation in New Zealand

Already, thousands of active AWS customers in New Zealand use AWS monthly to save costs, experiment, and scale up both domestically and in export markets. Since 2013, AWS has been operating in New Zealand, supporting many of the country's well-known enterprises as well as small and medium-sized businesses to drive innovation and growth through cloud technology.

Customers from regulated industries with in-country data preferences are among the primary beneficiaries of an AWS Region in New Zealand. There are significant opportunities for further public cloud transformation for customers in sectors like financial services, telecommunications, and utilities. Additionally, customers with low latency requirements, such as those in the media and entertainment industry, can be important beneficiaries. Until now, workloads that customers needed to maintain in New Zealand have mainly operated on customers' premises or via local hosting providers with limited compute, storage, container, and database services. By contrast, the AWS Region in New Zealand will provide a far broader and more advanced set of services.



Accelerating enterprise growth, agility, and innovation

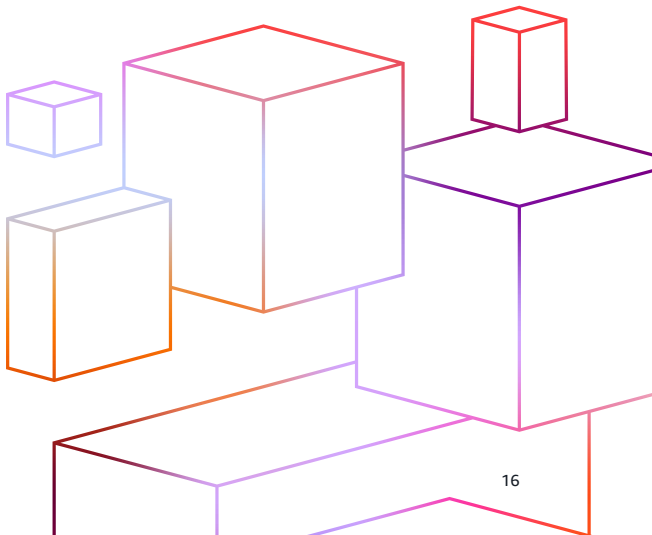
Many of New Zealand's most notable and successful enterprises are already harnessing AWS to spark innovation, enhance productivity, and advance economic growth in New Zealand.

Kiwibank, the largest New Zealand-owned bank, serves more than one million customers.

"A local AWS Region will be a game-changer, boosting performance, resilience, and security while keeping data closer to our customers. Kiwibank's partnership work with AWS on CloudUp for Her has already shown how cloud adoption drives both innovation and talent development. With this expansion, we will be able to scale faster, create more opportunities to upskill talent, and maintain the reliability and security our customers expect," said Ranjit Jayanandhan, general manager, Experience Hub at Kiwibank.

Vector, a New Zealand energy company, delivers energy and communication services to more than 620,000 residential and commercial customers across Auckland. "We're currently using AWS to run a significant portion of our digital workloads as we migrate, modernize, and transition toward a more sustainable environment. With local, faster access to AWS services through the region, we can accelerate our vision of creating a new energy future. We are excited to be among the first companies in New Zealand to embrace the latest advancements in cloud technology," said Jerry Li, general manager, Digital Technology, Vector.

One NZ, one of New Zealand's leading telecommunications companies, has been leveraging AWS's cloud capabilities and generative AI, including Amazon Bedrock, to drive new levels of customer experience and satisfaction within its contact center. Within three months of going live, One NZ achieved a 10% increase in customers who report engaging with a knowledgeable and friendly representative, and a 10% increase in customer trust. "We are excited about how One NZ will be able to leverage in-region workloads to support low latency and AI-driven customer experiences that make the most of AWS's generative AI, machine learning, and analytics capabilities to further enhance our customer experiences," said Jason Paris, CEO, One NZ.



Supporting the Global Growth of Startups and Technology Partners

In New Zealand, AWS is helping startups to succeed at home and globally. Drawing on our own origins as a startup and an extensive history of working with enterprises globally, we help founders access the resources, expertise, and tailored programs they need to grow at scale. Today, more than 80% of unicorns, as listed by Pitchbook, operate on AWS, reflecting the trust and impact of our cloud services for high-growth companies.

Digitally native businesses (DNBs), including startups, SaaS providers, and other ISVs, are growing from inception to maturity on AWS. Many New Zealand startups are leveraging AWS to accelerate growth and drive innovation, particularly among the rapidly advancing field of generative AI.

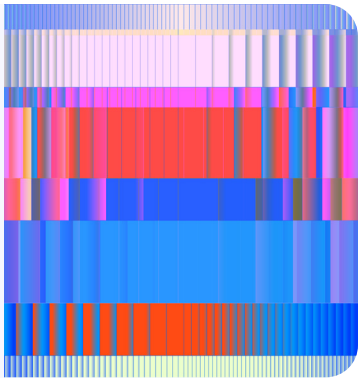
Orion Health, a New Zealand–based health care software company, delivers clinical and citizen-facing solutions for national health systems globally. To improve productivity, Orion Health deployed Oribot on AWS, enabling staff to retrieve information from more than 500,000 internal records in less than a minute. This has accelerated support case resolution, reduced internal search delays, and enabled more time for higher-value tasks.

Xero, a global small business platform, helps customers accelerate their business by bringing together the most important small business tools, including accounting, payroll, and payments— on one platform. Leveraging AWS since 2016, Xero has scaled its platform globally, enhancing its features and enabling continual innovation.

"Amazon's commitment to the New Zealand tech industry through its NZ$7.5 billion investment is promising. It is a significant vote of confidence that will help connect New Zealand tech exporters with new global opportunities across the AWS ecosystem and the broader Amazon network," said Bridget Snelling, Xero country manager, New Zealand.

Together, AWS and Xero are investing in the future of New Zealand's tech workforce by supporting the training and upskilling of local talent.

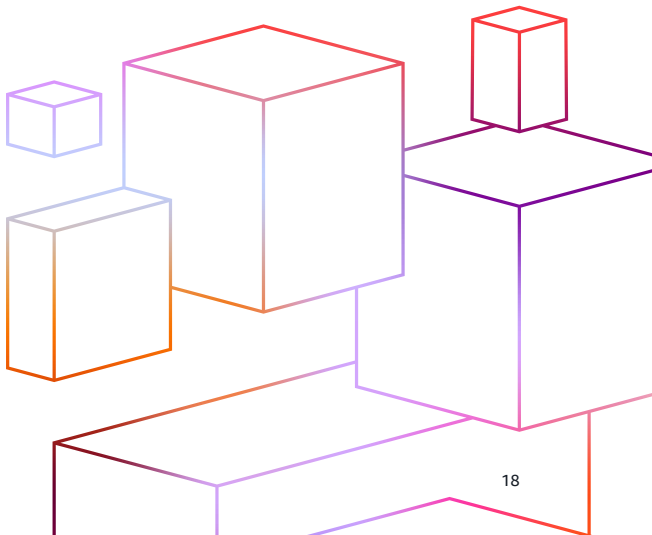
> "
>
> Deploying Oribot on AWS has helped Orion Health eliminate internal search delays and improve the speed and accuracy of support case resolution. Oribot not only surfaces relevant information but also connects it across silos—helping staff discover known issues, previous resolutions, and related insights across product documentation and support history. AWS helped us move fast with the right tools and support."
>
> **James Stainton**, VP Global Operations, Orion Health



MATTR, a New Zealand-based organization providing digital trust solutions, supports both public and private sector customers in building secure, privacy-preserving experiences. By leveraging AWS locally, MATTR ensures New Zealand's needs relating to sovereignty are met while offering verifiable identity solutions backed by global-scale infrastructure. "This milestone is significant, allowing our team to deliver more options to New Zealand customers for their TrustTech solutions, helping to ensure that New Zealand's unique needs around data sovereignty can be met. This provides choice for New Zealand customers using MATTR's verifiable credential and digital identity solutions backed by world-class infrastructure from AWS available locally as the foundation for growth and scale," said Martin Eichenberg, Head of Site Reliability & Operations at MATTR.

Vxceed develops SaaS solutions for global consumer packaged goods companies and ground transport providers. In 2024, Vxceed launched a strategy to integrate generative AI into its solutions, including LimoConnect 247, designed to simplify user interactions and improve operational efficiency. The LimoConnect 247 solution enables efficient access to key data such as vehicle fleets, health and safety records, and logbooks. Internal data reflects that it saves staff at least 10 minutes per book update and 15 minutes per query—time that would otherwise be spent navigating policies, procedures, or seeking senior guidance, according to Cyril Ovely, chief technology officer and co-founder.

As part of this broader initiative, Vxceed also integrated Amazon Bedrock into its LimoConnect Q solution, combining advanced AI capabilities with strict data security and privacy requirements. This integration enables Vxceed to deliver enhanced solutions for its customers, including highly regulated sectors such as government and transportation, driving progress while maintaining the highest standards of security.



Digitalizing the agriculture sector

New Zealand is recognized globally for its leadership in agriculture and high-quality food production. As the sector undergoes rapid digital transformation, New Zealand farmers, producers, and growers are increasingly adopting cloud-based technologies to improve efficiency, resiliency, and sustainability. According to a 2022 AgritechNZ report, digital adoption in farming has increased by 59% in recent years, and data is playing a central role in this shift. Farms globally are leveraging advanced technology such as IoT devices and AI, using tools like Amazon SageMaker to help predict the optimal harvest times and AWS RoboMaker to develop robotic and autonomous harvest solutions. To support this innovation, AWS is working with agriculture businesses across New Zealand to explore new ideas and business models.

Hectre, a New Zealand fruit technology startup, is expanding globally, including in the United States, with its cloud-based fruit-sizing software, Spectre. Using computer vision and AI, Spectre can accurately detect and measure fruit within seconds. Hectre uses AWS for data processing, enabling Spectre's algorithms to operate at speed and scale. The company recently enhanced its infrastructure by implementing a new processing cluster using AWS, further increasing its capacity and efficiency. As more enterprise-level packing and processing centers adopt this innovative technology, Hectre is using cloud technology to drive innovation in the agriculture industry and scale its impact internationally.

For more than 30 years, the Foundation for Arable Research (FAR) has supported New Zealand growers and farmers in producing food and feed in ways that are both profitable and environmentally sustainable. In collaboration with AWS Partner Custom D, FAR developed Ask FAR, a virtual assistant built on Amazon Bedrock. Ask FAR helps growers and farmers quickly identify solutions to specific crop issues and challenges in the field, from pest and disease management to planning decisions that shift daily with changing conditions.

"When we are scouting the fields looking for problems or we are planning, we have to make quick decisions about what we will do. With diseases and insect pressure changing every day, we need an application that is accessible and easy to use. With Ask FAR, I can get my phone and find answers straightaway." Marty Skurr, New Zealand Arable Farmer

AgriTech School

Launched in 2024, the AgriTech School supports New Zealand farmers, producers, and growers by providing accessible, cloud-focused learning opportunities and practical resources to strengthen digital capabilities. The program offers curated digital skills courses through AWS Skill Builder, an online learning center for learners of all levels, with specialized curated content tailored for the agricultural sector. Topics include robotics, IoT, AI, ML, and data analytics—technologies increasingly used to drive digital transformation and improve operations. AWS Agritech School is available through AWS Connected Community, where businesses can access events, workshops, and complimentary one-on-one consultations with AWS experts, as well as exclusive discounts on software and cloud services.

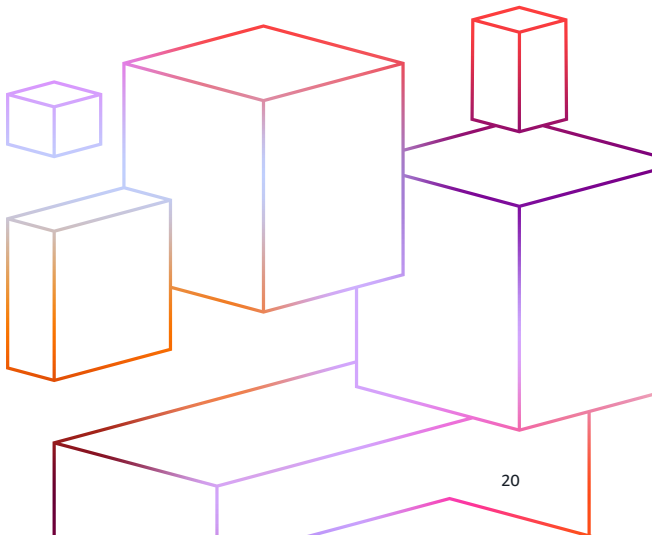
Empowering New Zealand's Business Community with Advanced Technologies

AWS supports New Zealand's businesses by helping organizations enhance their capacity for innovation and accelerate digital transformation. Small and medium-sized businesses form the foundation of the economy, representing 97% of all businesses in the country. By harnessing AWS technology, these businesses can advance their digital transformation initiatives and innovate at an accelerated pace, while simultaneously optimizing costs and improving operational efficiency. In today's macroeconomic environment, the flexibility and cost savings of cloud services for SMBs make them an essential driver of growth.

In 2022, New Zealand SMB Trends Research found that SMBs in New Zealand are progressively relying on the partner ecosystem, preferably local partners, to deliver projects. In New Zealand, AWS's panel of local partners includes Arcanum, Eliza, Koam, and Lancom. Regardless of their digital maturity, SMBs can leverage AWS's comprehensive suite of services to improve security measures, optimize data storage and utilization, develop websites and applications, and enhance customer service.

To empower small and medium-sized customers in New Zealand and accelerate their digital transformation, AWS launched the AWS Lift program in 2023. This initiative is part of AWS's long-term commitment to democratizing technology access. It enables more businesses in New Zealand to leverage innovative technologies and infrastructure, thereby accelerating their growth and competitiveness in the market. The AWS Activate Startup Program underscores AWS's dedication to supporting local businesses and driving digital transformation.

AWS Lift can alleviate the cost pressures faced by SMBs. As they begin experimenting on AWS Cloud, these businesses can develop the operational knowledge and transform processes to drive new revenue growth.



Advancing Science, Education, and Public Sector Digital Transformation

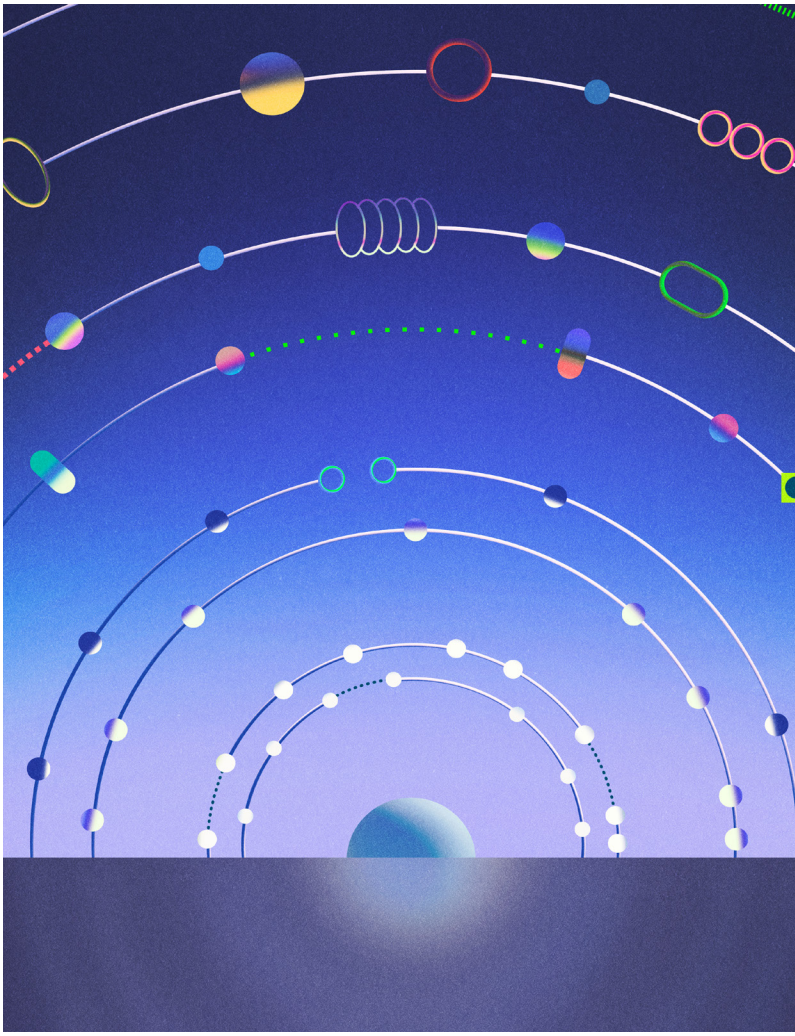
Government, education, and nonprofit organizations in New Zealand and globally face compelling challenges as they seek to accomplish complex initiatives with limited resources. Public sector leaders turn to AWS for the scale, power, and reliability needed to serve citizens more effectively, accelerate digital transformation, and focus more of their resources on core missions.

The AWS Region in New Zealand will play a pivotal role in advancing the country's digitization ambitions, meeting the rising demand for cloud services while supporting innovation. This new infrastructure will help nurture a vibrant community where startups, SMBs, enterprises, and public sector organizations can collaborate, experiment, and thrive with access to the latest technologies, including generative AI, ML, and IoT.

In an era defined by digital transformation, public sector, advanced research, and education organizations are leveraging cloud technology to drive innovation and scale their services regionally. The adoption of cloud solutions like AWS has enabled institutions to enhance operational efficiency, reduce costs, and deliver more effective services to citizens. The following case studies illustrate how AWS is enabling New Zealand organizations to achieve significant strategic business outcomes across cloud transformation, security, and sustainability.

As the government agency responsible for New Zealand's property rights, property information, and Crown land regulatory systems, including the implementation of New Zealand's overseas investment rules, **Toitū Te Whenua Land Information New Zealand (LINZ)** manages critical national datasets including property titles, survey data, topographic maps, hydrographic charts, and the geodetic system.

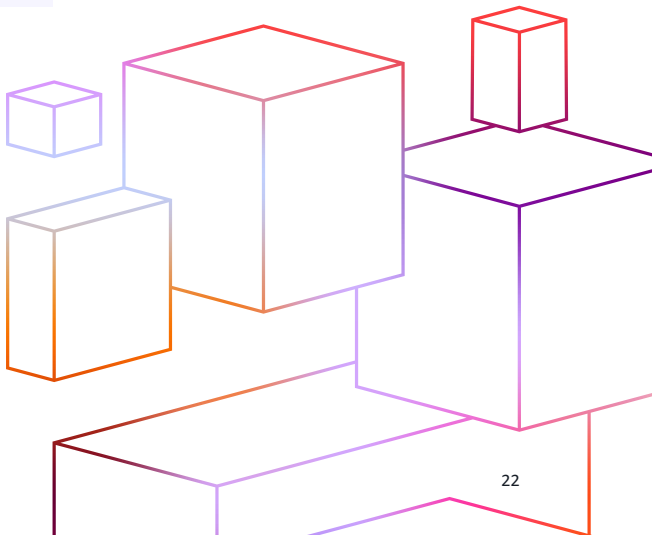
By leveraging AWS services including Amazon S3 for secure storage of geospatial datasets, Amazon EC2 for web hosting and data processing, Amazon RDS for managing relational databases, and AWS Lambda for serverless computing, LINZ has expanded its public-facing services, improved processing efficiency of large datasets, and enhanced disaster recovery capabilities. In the future, LINZ plans to expand its use of AWS through adding advanced geospatial processing capabilities, migrating legacy systems to the cloud, and leveraging the AWS Region in New Zealand for in-country data storage and improved speed.



Education Perfect (EP) is an EdTech platform that empowers educators to personalize learning and enhance student outcomes in the classroom. Its suite of learning, assessment, and insight tools helps teachers tailor instruction while supporting students in reaching their full potential. Today, more than 1.8 million K–12 students across 5,000 schools globally rely on EP for daily learning, revision, and assessment. As a fully cloud-native business, Education Perfect has developed its platform entirely on AWS, leveraging secure, resilient services and advanced tools, including data management and ML to deliver reliable, scalable digital education.

Since 2010, **GNS Science** has leveraged AWS to successfully deliver GeoNet, New Zealand's land and geological hazard monitoring system, which provides near real-time notifications to Android and iOS devices during seismic events such as earthquakes and volcanic unrest. In addition, GNS Science develops and maintains the National Seismic Hazard Model (NSHM) along with a growing portfolio of scientific applications and platforms on AWS. GNS Science was the first New Zealand organization to publish research datasets on the Registry of Open Data on AWS, providing researchers worldwide access to high-quality seismic data at scale.

The Amazon Sustainability Data Initiative (ASDI) and the AWS Open Data Sponsorship Program seek to accelerate research and innovation by helping customers minimize the cost and time required to acquire and analyze large 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 to identify, host, and deploy key datasets in AWS, including weather observations and forecasts, climate projection data, satellite imagery, hydrological data, air quality data, and ocean forecast data. These datasets are publicly available to anyone. ASDI provides promotional credits to those interested in exploring the use of AWS's technology and scalable infrastructure to solve significant, long-term sustainability challenges with this data. The dual-pronged approach enables 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.



Supporting Māori digital aspirations and data sovereignty

In Aotearoa New Zealand, AWS has been listening and learning to better understand Māori aspirations in the use of cloud technology, and we have gained valuable insights from Māori customers, partners, and advisors. A common theme is the importance of safeguarding Māori data in a digital world and upholding respect for *te ao* Māori, which encompasses Māori knowledge and cultural perspectives. It remains essential to consult with communities, to build trust, and to ensure Māori voices are reflected in digital and technology decisions.

"At AWS, we recognize the value of Indigenous knowledge, and the opportunities for communities to leverage the latest technology such as generative AI to safely and securely preserve their culture and language, while also enabling access to years of Indigenous songs, stories, and artwork," said Louise Stigwood, managing director for the Public Sector in Australia and New Zealand at AWS.

AWS is honored to support Māori-owned businesses and Māori-Iwi entities among its customers in New Zealand, including **Kiwa Digital**. Kiwa Digital develops digital tools that help preserve Indigenous languages and cultural knowledge and is currently collaborating with iwi and hapū in New Zealand and indigenous groups in the United States. Its work has included media localization projects, such as supporting the Cherokee Nation with the launch of Amazon Prime Video's *The Lord of the Rings: The Rings of Power* voiced in the Cherokee language.

To build CultureQ, Kiwa Digital leveraged the AWS Māori Data Lens, which helps organizations build solutions on AWS that incorporate Māori data perspectives into their workloads. CultureQ leverages Caitlyn, a generative AI platform built on Amazon Bedrock, to recognize cultural patterns across artifacts and expand understanding of Indigenous knowledge to help individuals develop cultural context. For example, when it encounters a word such as *aroha*, a Māori term meaning compassion, love, and empathy, it interprets the word not just literally but in relation to its cultural significance in Māori culture.

The launch of the AWS Region in New Zealand provides all New Zealanders the ability to store their data in New Zealand on the AWS Cloud without compromising performance, innovation, scale, or security. We understand that some customers may have needs that extend beyond where their data is stored, and AWS is committed to expanding its capabilities to help all customers meet their respective requirements. From the very beginning, AWS has always believed it is essential that customers have control over where their data is stored. Today, AWS continues to empower customers to manage and protect their data in accordance with their needs, ensuring that data is never moved without explicit instruction from the customer.

Māori Data Lens for the AWS Well-Architected Framework

In 2024, together with Māori advisors, a first iteration of the Māori Data Lens for the AWS Well-Architected Framework was developed. This lens is the first of its kind for AWS globally that focuses on Indigenous data, specifically Māori data considerations. An AWS Well-Architected Framework lens is designed to provide a technology, industry, or domain specific perspective aligned with the AWS Well-Architected Framework. The Māori Data Lens allows customers to apply important Māori data considerations when designing and operating reliable, secure, efficient, and cost-effective systems in the cloud. This lens is designed to be a living resource that can grow and adapt alongside the evolving questions and considerations Māori have about how to secure and protect their data as a *taonga* (treasure).

The lens is a framework of practical questions and considerations. When combined with Māori knowledge and expertise, AWS customers can begin to use cloud technology in a way that empowers adherence to important cultural and ethical dimensions for safeguarding Māori data. As a starting point, we have aligned the insights shared with AWS's established best practices for architecting secure, reliable, and cost-effective applications in the AWS Cloud. Together, these guidelines strengthen the durability and protection of Māori data.

To date, advice and feedback from Māori advisors and customers have been instrumental in helping to shape this resource. At AWS, we are grateful for their ongoing partnership and insights. We recognize that perspectives differ, and that *tikanga* (defined as customary protocol or practice) among Māori continues to evolve. We welcome feedback on enhancing this resource to better serve the needs of Māori customers and partners.

Expanding the AWS Partner Network in New Zealand

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, which has more than 140,000 partners from more than 200 countries, provides partners with access to a dedicated portal, business 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 and growing APN in New Zealand, including AWS Partners such as Accenture, Datacom, Deloitte, and Slalom. This network 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.

Datacom, one of the region's largest homegrown technology companies, is an AWS Premier Consulting Partner. "Our strategic partnership with AWS enables our team to leverage AWS cloud and advanced services, such as AI and ML, to help our customers accelerate their cloud transformation, boost productivity, and adopt new customer experiences," said Justin Gray, Managing Director, Datacom New Zealand. "What underpins the strength of our almost 20-year partnership is our mutual commitment to infrastructure investment, security, and privacy. We look forward to being among the first New Zealand organizations to leverage AWS's new Region in New Zealand for our public and private sector customers."

Deloitte, a leading AWS Partner in New Zealand, is collaborating with AWS to help organizations accelerate digital transformation and adopt AI-driven solutions. As part of this partnership, Deloitte and AWS launched an AI-powered contact center solution built on Amazon Connect during NZ Techweek, showcasing how AI can improve customer service and boost productivity across the sector.

"We view the launch of the AWS Region as an important step forward in New Zealand's technology sector that will enable our customers to generate even more business value from cloud solutions," said Damian Harvey, Technology Partner at Deloitte. "Training and certification are key to the development of our people, and we see the region as driving further education around cloud as the demand for AWS skills increases."

Security and Cloud Resilience

AWS offers the most secure cloud environment available, meaning our customers have the freedom to build services quickly, securely, and efficiently using AWS's world-leading technology. The trust of our customers is the foundation of our business at AWS, and protecting customer data is essential to maintaining it. AWS works closely with customers as they navigate regulations around data security and privacy to understand their needs, and offers services, tools, and resources to secure their data. AWS provides customers with guidance on using AWS in the context of New Zealand privacy considerations, as well as in other jurisdictions.

One of the primary benefits of moving to the cloud is enhanced security. AWS's infrastructure is designed to meet the stringent security requirements of the military, global banks, and other high-sensitivity organizations. We are committed to helping our customers achieve the highest levels of security, privacy, and resiliency using our technology.

AWS customers always retain ownership and control of their digital content, including where it is stored, how it is stored, and what access is granted to whom. AWS continuously raises the bar on privacy safeguards with services and features that enable the implementation of user-defined privacy controls, including advanced access control, encryption, and logging features AWS facilitates easy encryption of data in transit and at rest, using keys either managed by AWS or fully managed by the customer. Customers may also bring their own keys that were generated and managed outside of AWS. AWS customers can store their content in any of our Regions and retain the exclusive right to move content between AWS Regions.

Our comprehensive services enhance the ability to meet core security, confidentiality, and compliance requirements, including Amazon GuardDuty and the AWS Nitro System, which serve as the underlying platform for our EC2 instances. The AWS Nitro System is designed to enhance workload confidentiality and restricts operator access. It eliminates any mechanism that would allow system access to Amazon EC2 servers, including logging in, reading memory of EC2 instances, or accessing data stored on instance storage and encrypted EBS volumes. As with existing regions, the AWS Region in New Zealand will be built for high availability and resiliency, powered by the AWS Nitro System to help ensure the confidentiality and integrity of customer data. Additionally, services such as AWS CloudHSM and AWS Key Management Service facilitate secure generation and management of encryption keys AWS Config and AWS CloudTrail deliver monitoring and logging capabilities, which are essential for compliance and audit.

Resilience

Cloud resilience refers to the ability for an application to resist or recover from disruptions, including those related to infrastructure, dependent services, misconfigurations, transient network issues, and load spikes. Cloud resilience also plays a critical role in an organization's broader business resilience strategy. Resilient applications are those built with high availability—the percentage of time the application is available for use—and also those with a disaster recovery or continuity of operations plan in place.

Amazon has made significant investments in building and running the world's most resilient cloud. AWS has designed a unique and highly available global infrastructure, built safeguards into our service design and deployment mechanisms, and instilled resilience into AWS's operational culture.

In 2024, global analyst firm Frost & Sullivan released a report titled "Is Your Cloud Resilient Enough? What to Look for in Cloud Infrastructure Design." The report found that IT decision-makers in New Zealand are unwilling to compromise on app availability, security, performance, or compliance when they move workloads to the cloud. As such, they show a strong preference to partner with the cloud service provider that designs its infrastructure for maximum resilience. Based on the Frost & Sullivan analysis, across the Asia-Pacific region, AWS offers the most resilient architecture and delivers the fewest outages.[6] The report provides a simplified schematic of AWS's global Region architecture, which is being implemented in all AWS Regions, including the new Region in New Zealand.

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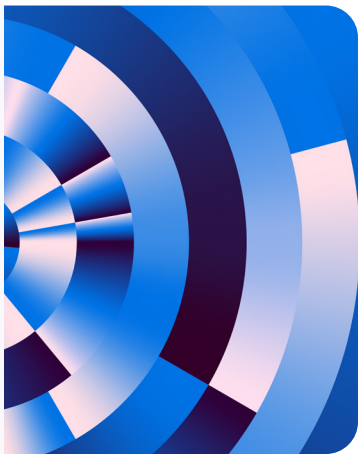
> Cloud uptime is very important to New Zealand businesses. Ninety-two percent of New Zealand enterprises surveyed by Frost & Sullivan agree that their business 'requires a cloud service provider that designs its infrastructure for resiliency.' For these businesses, it is wise to partner with AWS, which has built the most resilient architecture in Asia-Pacific, resulting in 2.7 times lower downtime than the nearest competitor."
>
> **Lynda Stadtmueller,**
> Research VP and Global Practice Area Leader,
> Information & Communications Technology at Frost & Sullivan



[6] Frost & Sullivan. 2024. "Is Your Cloud Resilient Enough? What to Look for in Cloud Infrastructure Design."

Compliance

AWS has achieved internationally recognized certifications and accreditations, demonstrating compliance with rigorous international standards, such as ISO 27017 for cloud security, ISO 27701 for privacy information management, and ISO 27018 for cloud privacy. The AWS Cloud is supported by **more than 300 security, compliance, and governance services and features, as well as adherence to 143 security standards and compliance certifications** including PCI-DSS, HIPAA/HITECH, FedRAMP, GDPR, FIPS 140-2, and NIST 800-171.

AWS consistently achieves **third-party validation for thousands of global compliance requirements**, demonstrating its commitment to maintaining the highest standards of security. Through AWS Artifact, customers **receive access to more than 2,500 security controls, enabling them to meet complex compliance and governance needs**. Additionally, AWS invests significantly in state-of-the-art security systems at all levels, while guiding customers in adopting best practices to reduce security risks and to protect their networks and data.

Security and Compliance – A Shared Responsibility

At AWS, security is our highest priority. In the cloud, protecting systems, data, and access is a shared responsibility between AWS and its customers. The shared responsibility model can help reduce 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.

AWS's shared responsibility model provides flexibility and control, enabling customers to tailor deployments to meet their specific business requirements. This distinction of responsibility is commonly referred to as security "of" the cloud, which AWS manages, versus security "in" the cloud, where customers retain greater control and responsibility. Customers should carefully evaluate the services they select, as their responsibilities vary depending on the services used, how those services are integrated into their IT environment, and the applicable laws and regulations

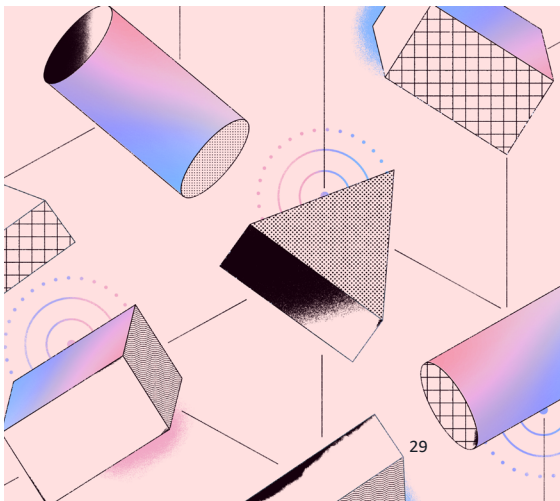
[6] Frost and Sullivan. 2024. "Is Your Cloud Resilient Enough? What to Look for in Cloud Infrastructure Design."

AWS's Commitment to Digital Skills Development in New Zealand

At AWS, we believe that the future of a prosperous New Zealand 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. New Zealand will greatly benefit from building and maintaining a strong and growing population of technology professionals and workers with cloud skills across a range of job functions and industries.

Recent research highlights the increasing importance of upskilling the workforce to support the growth of the New Zealand digital economy. According to the AWS Asia Pacific Digital Skills Study: The Economic Benefits of a Tech-Savvy Workforce, commissioned by AWS and conducted by Gallup, workers in New Zealand who use advanced digital skills–including cloud architecture or software development–contribute an estimated NZ$7.3 billion to New Zealand's GDP. These individuals earn, on average, 19% higher salaries than their peers with similar educational backgrounds who do not use digital skills at work. The study also found that digital workers are benefitting from more than just a boost in their income: 72% of advanced digital workers express higher job satisfaction, compared to 55% of workers with basic skills, and 52% with intermediate digital skills.

Another notable report, "Building Digital Skills for the Changing Workforce in Asia Pacific and Japan (APJ)," prepared by the consulting firm AlphaBeta and commissioned by AWS, found that 76% of organizations that invested in digital skills training experienced increased revenue, 91% improved employee productivity, and 80% reported higher employee retention. As digital transformation accelerates, the need for digital capabilities is becoming increasingly essential across sectors, with the report identifying cloud computing and cybersecurity at the time of publication as the top two most in-demand skills by this year, yet fewer than one-third of organizations have a training plan in place.



The importance of digital skills for New Zealand

Graeme Muller, CEO of NZ Tech, stated, "Increasing digital skills enables New Zealanders to move into highly skilled, secure, and well-paid technology jobs—which exist right across the economy, from tech companies to the agricultural sector, finance, retail, professional services, government, and many more. If New Zealand's economy is going to reach its true potential, we need to utilize a broader range of digital skills and training approaches—vocational education, higher education, and industry certifications—to support more New Zealanders from all backgrounds—and particularly those underrepresented in tech roles today—to move into highly paid and meaningful tech careers".

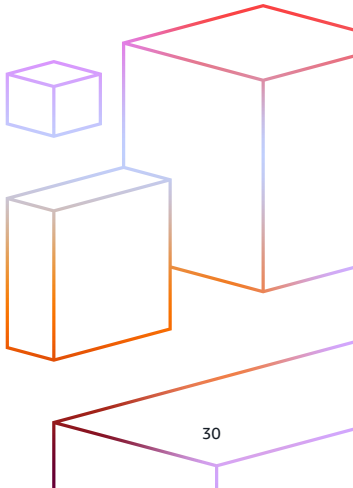
Supporting an inclusive, cloud-skilled workforce in New Zealand

AWS is committed to upskilling New Zealand's next generation of digital talent and empowering New Zealanders with cloud expertise to unlock new career paths and drive organizational digital transformation. Since establishing local training operations in New Zealand, AWS Training and Certification has delivered programs to individual learners, customers, and AWS Partners to develop cloud skills. 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 programs advancing a more diverse tech workforce in New Zealand

AWS and the New Zealand government are collaborating to promote greater diversity in the technology sector by training underrepresented communities, including women, Māori, and Pasifika. Programs such as the free, 12-week AWS re/Start, prepare individuals for cloud careers. AWS is dedicated to democratizing knowledge and making sure all individuals, regardless of their background, education, or social status, have the opportunity to build technical skills. AWS also collaborates with partners to improve digital literacy and strengthen cybersecurity capabilities through initiatives such as Cyber Skills Aotearoa.

Through collaboration with community organizations, AWS has introduced initiatives such as Whānau Day and Dream House events, launched with partners in 2022 to broaden participation in cloud and technology pathways in New Zealand



In 2022, AWS made a commitment to the New Zealand government that it would train 100,000 people in cloud skills over five years. Since that time, AWS has provided training to more than 50,000 individuals. AWS continues to deliver on this commitment through a range of programs available to New Zealand customers. The following programs are part of AWS's commitment to fostering a diverse, inclusive, accessible, and equitable workforce:

AWS Skill Builder is an online platform that offers more than 600 on-demand courses, ensuring anyone with an internet connection and a desire to learn can quickly and easily access cloud education. 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, AWS has developed new learning experiences, such as AWS Builder Labs, which offers hands-on guided exercises to develop practical skills for common cloud scenarios, and SimuLearn, which features realistic simulated scenarios powered by generative AI on Amazon Bedrock. These experiences help learners develop practical skills to help solve real-world problems.

AWS re/Start is a free full-time, classroom-based skills development and training program that prepares individuals for careers in the cloud and connects them to potential employers. The program aims to build local talent and is designed for unemployed and underemployed individuals, with no technical experience required to apply. AWS re/Start also provides professional skills training such as resume and interview coaching to prepare individuals for job interviews with local tech employers. In New Zealand, re/Start specifically helps women, Māori, and people of Pasifika heritage develop the skills needed to pursue careers in cloud technology. Since its launch in May 2022, the program has placed graduates into positions with AWS Partners and customers.

AWS Skills Guild s a comprehensive enablement program that helps large enterprises meet technical and cultural transformation goals. It builds cloud fluency across the business—including at the executive level—while driving collaboration with technologists and accelerating AWS adoption.

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 to enter and succeed in one of the fastest-growing industries.

AWS Educate offers free, self-paced digital training to individual learners who are self-motivated to learn about the cloud. Through AWS Educate, students who are 18 years old 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 sections, 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.

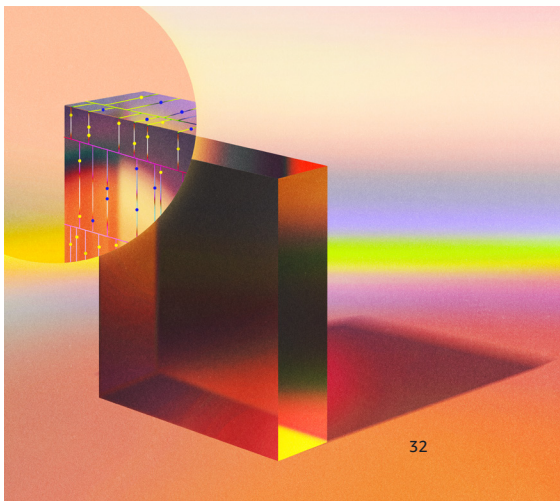
Artificial Intelligence and Cloud Innovation

AWS makes AI accessible to more people—from builders and data scientists to business analysts and students. Offering the most comprehensive set of AI services and resources, AWS delivers security, privacy, and responsible AI governance to more than 100,000 customers, enabling these organizations to innovate at an unprecedented rate. AWS is developing foundational building blocks for generative AI development to help customers achieve better price-performance for training and inference. These include highly flexible model-building and inference capabilities through Amazon SageMaker, enabling lower costs and latency for customers' applications, as well as integrated tools for agent creation and orchestration.

Additionally, services such as Amazon Aurora and Amazon OpenSearch support the use of existing data, including data stored locally in New Zealand, within generative AI solutions using retrieval augmented generation (RAG) solutions.

AWS expands access to free AI training globally

Artificial intelligence is the most transformative technology of our generation. To unlock its full potential in addressing the world's most pressing challenges, AI education needs to be accessible to anyone with a desire to learn. In 2023, Amazon announced AI Ready, a commitment designed to provide free AI skills training to 2 million people globally by 2025. To achieve this goal, Amazon launched new initiatives and scaled our existing AI training programs, removing cost barriers, so learners everywhere can develop the skills needed for an AI-enabled future.



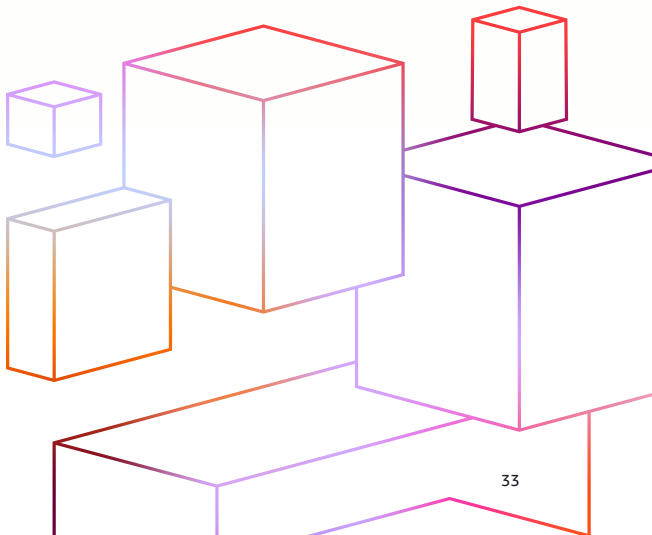
Implementing transformational Generative AI with AWS

Generative AI, a type of artificial intelligence that can create new content and enables the development of novel applications, is poised to deliver profound benefits for industries and society. AWS is committed to fostering New Zealand's growth and innovation, particularly with the rapid rise of this technology. According to KPMG's GenAI Survey, 71% of senior business leaders at companies with revenues of $1 billion or more are leveraging generative AI to drive decision-making, while 83% of respondents anticipate increased investments in generative AI over the next three years.

As adoption accelerates, AWS is collaborating with customers across diverse industries in the country—finance, agriculture, education, and government—to harness the potential of generative AI. This collaboration helps organizations address complex problems, improve customer experiences, and drive innovation. With the expansion of cloud technology in New Zealand, AWS customers have the opportunity to be a leader in generative AI adoption, opening up new markets, fostering social inclusion, and enhancing citizen experiences.

To ensure successful adoption, AWS focuses on supporting customers through several key strategies. First, selecting a generative AI model that is tailored to specific use cases will enhance overall effectiveness. Additionally, user-friendly tools are provided that democratize generative AI within organizations, promoting broader use. Lastly, purpose-built machine learning infrastructure is designed to deliver real-time, cost-effective AI responses with low latency and minimal cost.

As generative AI evolves, AWS remains committed to democratizing access by offering customers a broad selection of innovative large language models, each designed for specific strengths and use cases. With the most comprehensive set of AI services, tools, and infrastructure, AWS supports more than 100,000 customers in using AI and ML to unlock the value of their data, while building on a foundation of security, privacy, and responsible AI governance.



Building and deploying AI agents

AWS enables organizations to develop and deploy generative AI agents that integrate with organizational applications, databases, and third-party systems. These agents use natural language capabilities to interact across the entire technology stack, providing organizations with the ability to retrieve information, perform routine tasks, and access insights more efficiently.

Generative AI agents offer a powerful solution by automatically interfacing with company systems, helping organizations scale operations while reducing operational complexity. This technology is playing an increasingly critical role in supporting intelligent workflows across industries.

The benefits of using AI agents

AI agents can enhance business operations and improve customers' experiences.

Improved productivity: AI agents are autonomous intelligent systems performing specific tasks without human intervention. By delegating repetitive work to AI agents, business teams can focus on mission-critical or creative activities, adding more value to their organizations.

Reduced costs: Businesses can use intelligent agents to reduce unnecessary costs arising from process inefficiencies, human errors, and manual processes. Their consistent, adaptable models support more streamlined operations across changing environments.

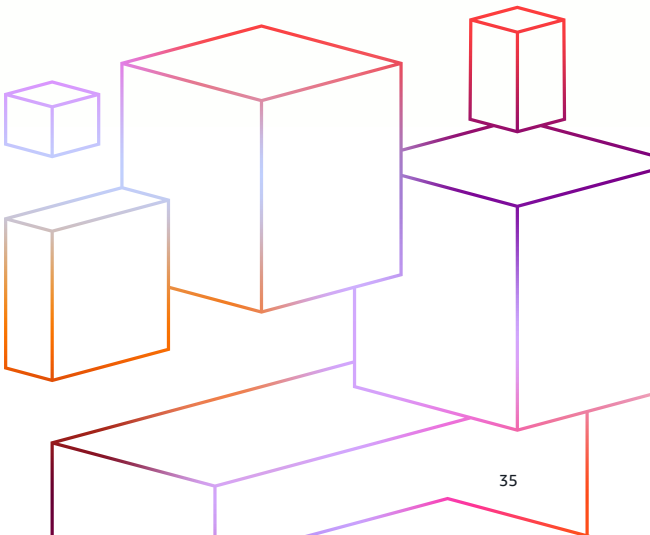
Informed decision-making: Advanced intelligent agents use machine learning to process significant volumes of real-time data, enabling business leaders to make better predictions and more strategic decisions. For example, AI agents can analyze product demand in different market segments to support effective ad campaigns.

Improved customer experience: Customers increasingly seek engaging and personalized experiences when interacting with businesses. AI agents support this by providing personalized product recommendations, prompt responses, and innovative services to strengthen engagement, conversion, and loyalty.

Innovating with AI securely using AWS industry-leading capabilities

AWS AI infrastructure and services are designed with built-in security and privacy features to ensure customers retain control over their data.. To accomplish this, AWS enables customers to build with security and confidentiality across every layer of the generative AI stack. Customers need the ability to secure the infrastructure used to train LLMs and other foundation models (FMs), build with tools that support secure development and implementation, and run applications built on FMs with embedded security and privacy they can trust. The AWS approach to securing AI infrastructure comprises three key principles:

1. **Complete isolation of AI data from the infrastructure operator**: The infrastructure operator must not have the ability to access customer content and AI data, such as AI model weights and data processed with models.
2. **Ability for customers to isolate AI data from themselves**: The infrastructure must provide a mechanism to allow model weights and data to be integrated into hardware, while remaining isolated and inaccessible from customers' own users and software.
3. **Protected infrastructure communications**: The communication between devices in the ML accelerator infrastructure must be protected. All externally accessible links between the devices must be encrypted.



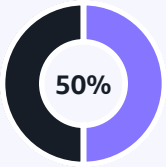
AWS commitment to responsible AI

As AI adoption grows, AWS is committed to developing and deploying AI responsibly, guided by eight core dimensions: fairness, explainability, privacy and security, safety, controllability, veracity and robustness, governance, and transparency. These pillars ensure that AI systems function as intended, safeguard data, prevent disparities in performance across different groups, remain reliable and resilient, and provide customers with clear explanations of how decisions are made. AWS also emphasizes transparency by equipping organizations with the necessary information to make informed decisions and ensuring that robust governance are in place to manage AI responsibly throughout its life cycle. AWS takes a people-centric approach that prioritizes education, science, and our customers—to support responsible AI development with tools like Amazon Bedrock Guardrails for Amazon Bedrock, Amazon SageMaker Clarify, and more. Each AI service undergoes rigorous evaluation against these principles before being deployed, helping customers build and scale AI solutions securely and ethically.

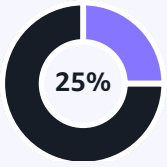
AWS is the first major cloud service provider to announce ISO/IEC 42001 accredited certification for AI services, covering Amazon Bedrock, Amazon Q Business, Amazon Textract, and Amazon Transcribe. ISO/IEC 42001 is an international management system standard that outlines the requirements for organizations to manage AI systems responsibly throughout their life cycle. Technical standards, such as ISO/IEC 42001, are significant because they provide a common framework for responsible AI development and deployment, fostering trust and interoperability in an increasingly global and AI-driven technological landscape. Through deep engagement with multi-stakeholder organizations such as the OECD AI working groups, the Partnership on AI, the Responsible AI Institute, and the National AI Advisory Committee, as well as strategic partnerships with universities globally, we are committed to collaborating with organizations and institutions to advance AI and ML technology responsibly and build trust.

AWS Trainium: Energy-efficient AI and ML chips built for performance and sustainability

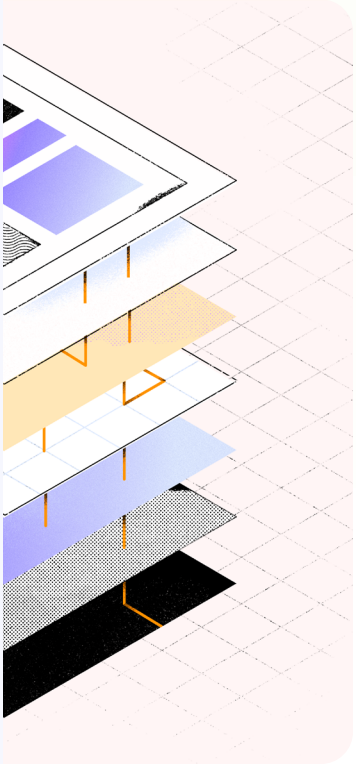
In 2021, AWS launched AWS Trainium, a family of AI chips purpose built by AWS for AI training and inference to deliver high performance while reducing costs. By reducing training time for models from months to days, new AI models can be developed with less capital and power, with potential training cost 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, while being three times more energy efficient. Trainium2 is able to be deployed in EC2 UltraClusters, which will scale out distributed model training across hundreds of thousands of Trainium2 chips interconnected with third-generation, low latency petabit-scale EFA networking. AWS has also unveiled Trainium3, its next-generation AI training chip, which is planned for release this year, setting a new standard for performance, power efficiency, and density.



Potential cost-to-train savings of up to 50%



Energy-consumption reductions of up to 25%



AWS and Sustainability

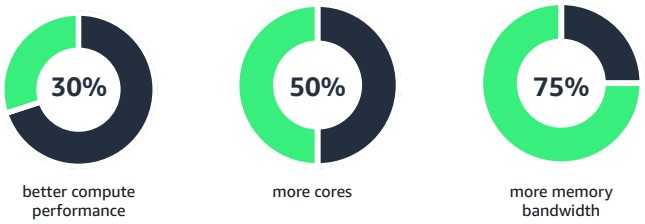
Amazon is committed to reaching net-zero carbon across its operations by 2040, 10 years ahead of the Paris Agreement, as part of The Climate Pledge. Amazon is the world's largest corporate purchaser of renewable energy, for the fifth year in a row, according to Bloomberg New Energy Finance. To date, Amazon has supported more than 600 renewable energy projects across 28 countries, representing more than 20 gigawatts of clean energy capacity, and once fully operational, the projects are expected to deliver 56,881 gigawatt-hours of energy annually. Organizations that migrate to or build on AWS can benefit from the net effect of Amazon's sustainability efforts to reduce their carbon footprint.

Amazon launches first renewable energy project in New Zealand

In 2024, Amazon and Mercury NZ announced a long-term corporate power purchase agreement (PPA) for Turitea South, a 103-megawatt (MW) wind farm under construction in Manawatū near Palmerston North, New Zealand. Once operational, Turitea South is expected to generate 370 gigawatt hours (GWh) of renewable energy per year. Amazon will purchase approximately 50% of the renewable energy capacity of Turitea South, exceeding what will be required to power the AWS Region in New Zealand at launch. This is Amazon's first renewable energy project in New Zealand, and the first corporate PPA between an energy company and technology provider in the country. With this long-term commitment, Amazon is supporting the development of new renewable energy capacity in New Zealand. As part of Amazon's renewable energy strategy, which prioritizes purchasing renewable energy beyond the country's existing grid mix, AWS's role as a guaranteed consumer helps ensure the project's long-term viability.

AWS's approach to energy efficiency

AWS has been, and remains, focused on improving efficiency in every aspect of its infrastructure and operations. From the highly available infrastructure that powers servers to techniques used to cool data centers to the innovative server designs available to customers, energy efficiency is a key priority of every part of AWS's infrastructure. Efficiency advantages at both the server and facility levels in cloud infrastructure translates into dramatically less energy used to perform the same unit of work. 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, "How 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 renewable energy goals, while meeting their own computing needs. As New Zealand customers move their workloads from enterprise data centers to AWS, the carbon footprint of these workloads is reduced due to much lower energy consumption.



Using the latest technology components, AWS designs server systems with great attention to power optimization. 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 Graviton3 processors, delivering the best price performance and energy efficiency for a broad range of workloads running on Amazon EC2.

Reducing water usage

In addition to a commitment to energy efficiency and renewable energy, AWS is dedicated to conserving and reusing water in its operations globally. If 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. 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.

Helping customers become sustainable cloud users

The Sustainability Pillar in the AWS Well-Architected Framework helps customers improve their cloud architecture. 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, 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 stays on path to powering its operations with 100% renewable energy and drives toward net-zero carbon by 2040 as part of The Climate Pledge.

Appendix

Overview of cloud computing

Understanding cloud computing and its benefits

Cloud computing enables the on-demand delivery of IT resources over the internet with a pay-as-you-go pricing model. Instead of investing in, owning, and maintaining physical data centers and servers, organizations can access technology services, such as computing power, storage, and databases, from cloud service providers (CSPs) on an as-needed basis.

This model delivers transformative benefits to businesses. It offers unparalleled agility, enabling organizations to quickly scale resources as they need them, deploying hundreds or even thousands of servers in minutes, leading to faster innovation. The pay-as-you-go pricing approach reduces upfront capital expenditure, making it cost-efficient for businesses. Cloud infrastructure supports rapid global deployment, providing businesses with the ability to innovate faster and focus on developing applications to transform customer experiences. Furthermore, CSPs offer highly secure global infrastructure, empowering businesses with the ability to manage, encrypt, and retain their data. AWS, as a leading CSP, provides the most secure cloud computing capabilities globally that enable businesses to operate efficiently at scale.

AWS infrastructure was specifically designed with operational resilience in mind. An AWS Region is a physical location where we cluster data centers. Each Region consists of a minimum of three isolated and physically separate Availability Zones within a geographic area. An Availability Zone is one or more discrete data centers with redundant power, networking, and connectivity. Availability Zones give customers the ability to operate production applications that are more highly available, fault tolerant, and scalable than would be possible from a single data center. AWS customers retain control over where their data and workloads are hosted, and they can choose to have their data stored and processed in one or more specific Availability Zones.

Scalability, agility, resilience, and cost efficiency

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 a "pay-as-you-go" and "pay-as-you-grow" operational strategy, improves a startup's ability to meet its growth demands. Further, reliable cloud infrastructure enables 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) infrastructure. 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.

AWS helps customers launch and grow their businesses. AWS has a dynamic global cloud community, with millions of active customers every month and more than 140,000 AWS Partners from over 200 countries. By providing access to cloud computing, AWS lowers the cost of starting new businesses, encourages innovation, and spurs the development of new technologies.

Defining energy productivity

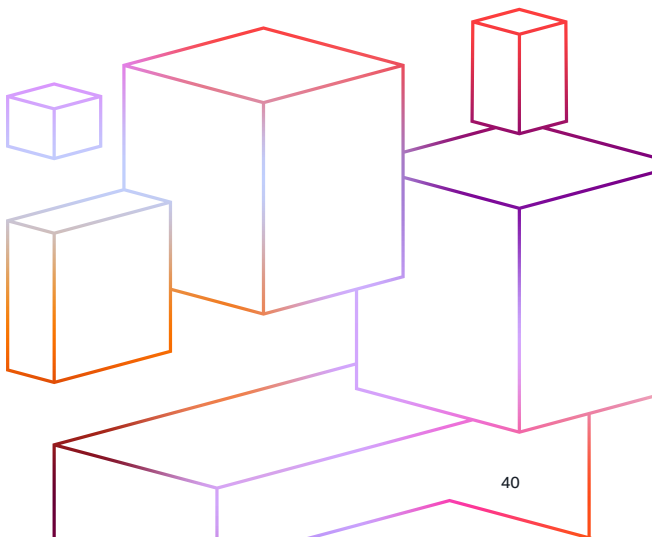
What is energy productivity?

Energy productivity is a measure of how efficiently energy is used to produce economic output. It is typically measured as the amount of economic value generated per unit of energy consumed. High energy productivity means more economic output is produced with less energy, which is beneficial both for economic growth and environmental sustainability.

Enhancing energy productivity with cloud computing

Cloud computing significantly enhances energy productivity by consolidating computing resources, optimizing energy use, and reducing overall energy consumption across multiple industries. By centralizing computing infrastructure in highly efficient data centers, cloud computing minimizes the energy required for individual organizations to run their own servers and data centers.

Cloud computing's high energy productivity yields economic benefits by reducing operational costs for companies, enabling them to focus on core business functions rather than managing IT infrastructure. Environmentally, increased energy productivity in cloud computing supports sustainable development goals by lowering the carbon footprint of digital operations. As demand for cloud services grows, the energy productivity gains from cloud computing are expected to continue contributing positively to sustainable growth.



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 New Zealand dollar spent in a specific industry on that industry itself and 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 that 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 Amazon data center 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 Amazon data center investment. Jobs at a given firm may support existing production demand and be retained by Amazon data center investment or may also be created as a result of new demand.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