# Powering the digital future: Malaysia's data center opportunity

June 2025

By Michael Meyer, Olivier Rival, Daniel Oehling, Nurlin Salleh

BCG + DAYONE

Boston Consulting Group partners with leaders in business and society to tackle their most important challenges and capture their greatest opportunities. BCG was the pioneer in business strategy when it was founded in 1963. Today, we work closely with clients to embrace a transformational approach aimed at benefiting all stakeholders—empowering organizations to grow, build sustainable competitive advantage, and drive positive societal impact.

Our diverse, global teams bring deep industry and functional expertise and a range of perspectives that question the status quo and spark change. BCG delivers solutions through leading-edge management consulting, technology and design, and corporate and digital ventures. We work in a uniquely collaborative model across the firm and throughout all levels of the client organization, fueled by the goal of helping our clients thrive and enabling them to make the world a better place.

DayOne is a data center pioneer that develops and operates next-gen digital infrastructure for industry leaders who demand reliable, cost-effective and quickly scalable solutions.

Our cutting-edge facilities empower hyperscalers and large enterprises to achieve rapid deployment and enhance connectivity, driving transformative engagement and innovation as we shape the future of industries. DayOne's data centers are located across key markets, including Singapore, Johor (Malaysia), Batam (Indonesia), Greater Bangkok, Hong Kong SAR, Tokyo, and beyond.

Headquartered in Singapore, DayOne's leadership team draws on over two decades of industry experience and a track record of building Asia's largest data center business. With DayOne, they have created the SIJORI (Singapore, Johor, and Riau Islands) market as a global data center hub.

The brand name "DayOne" encapsulates our entrepreneurial spirit and relentless focus on customers, innovation, and growth. It signifies a mindset of respecting each day as an opportunity to embrace new possibilities, create impactful solutions, and deliver value across the markets we serve.

As demand for strategically located and customized data centers rises, DayOne's entrepreneurial spirit, customer-first strategy, deep local partnerships, and agile executional capabilities uniquely position us to power the growth ambitions of leading hyperscalers and large enterprises around the world.

# Contents


**02** Executive Summary

**04** Chapter 1: Building a leading data center hub in Malaysia

**06** Chapter 2: The data center-powered economic flywheel

**09** Chapter 3: Spillover effects to the broader economy

**12** Chapter 4: Shaping a sustainable industry

**14** Chapter 5: Recent Development and their implications

**16** Chapter 6: The road ahead

**18** Appendix: Methodology

# Executive Summary

## Building a leading data center hub in Malaysia

The rise of digitalization and generative AI (GenAI) is driving an unprecedented demand for data center (DC) infrastructure globally. Based on BCG's latest report "Breaking Barriers to Data Center Growth", global data center demand is projected to double by 2028, with GenAI inferencing workloads alone experiencing a 180-fold increase.

In Southeast Asia, these global trends are further elevated. A rapidly growing regional digital economy, coupled with accelerating digitization across industries, continues to drive the demand for sophisticated data center infrastructure to support applications ranging from e-commerce and streaming to AI-driven technologies. While Singapore has historically served as Southeast Asia's primary data center hub, its capacity constraints create an opportunity for additional regional hubs to emerge.

Malaysia's competitive advantages – availability of land, access to affordable renewable energy, strong regional and international connectivity and proximity to Singapore – make it a prime candidate to become a major data center hub. Recognizing Malaysia's potential, over 15 data center operators have recently made commitments to set up or expand their footprint in the country. We estimate that Malaysia's data center capacity – which includes operational capacity, capacity under construction, and capacity with relevant permits and land rights in place – could reach 4.2-6.1 GW by 2030, positioning it as one of the largest data center hubs in Asia, if not worldwide.

## The data center-powered economic flywheel

Establishing a leading data center hub can create a self-reinforcing cycle of economic benefits for Malaysia. As investments in data center capacity increase, they are likely to spur the professionalization of the industry and drive the development of the underlying infrastructure, such as water systems, power grids, and data connectivity. Suppliers will be incentivized to localize their operations, drawn by the growing demand and opportunities to serve the expanding local data center sector. These factors significantly improve economies of scale, cost efficiencies, and quality of services of data center providers in Malysia. This, in turn, drives higher demand for data center capacity in Malaysia—reinforcing the cycle of growth and development.

Data center investments generate a range of economic benefits for Malaysia that can be directly measured and attributed:

- **Direct and indirect economic impact:** Considering the spending on data center construction, operations, and backend services, every dollar of data center investment could generate a 2.6x multiplier effect in total economic output for Malaysia. Based on the projected supply of 4.2-6.1 GW by 2030, this translates to MYR 195-260 billion (USD 45-59 billion) in direct and indirect economic output from 2024 to 2030.

- **Supplier localization:** A thriving data center industry attracts global suppliers of data center equipment such as Wiwynn and EPG to set up local manufacturing facilities. These investments can generate an additional MYR 24-32 billion (USD 6-7 billion) of economic output from 2024 to 2030 and will also improve Malaysia's trade balance, economic sovereignty, and security.

- **Job creation:** We estimate that the data center sector can create 130,000 – 190,000 permanent jobs by 2030, ranging from construction to high-paying technical roles. For example, salaries of data center technicians are approximately double the national Malaysian income median.

- **Induced impact:** A growing data center industry will generate additional consumption in other sectors of the local economy. For instance, operators will require professional support services, and well-paid employees will generate additional domestic consumption. These induced effects are expected to generate additional economic benefits of MYR 70-95 billion (USD 15-20 billion) from 2024 to 2030.

## Spillover effects to the broader economy

Beyond the directly quantifiable economic benefits, establishing Malaysia as a major data center hub also creates spillover benefits that contribute to important national priorities such as catalyzing economic zones, enabling a vibrant digital economy, and improving Malaysia's competitiveness at a national level.

- **Catalyzing economic zones at the local level:** Data center investments can support the growth of local economic zones by spurring further investment in infrastructure and related industries. For instance, the development of the Virginia cluster has positioned the state as the largest data center market globally, contributing 2% of Virginia's gross domestic product (GDP). The state also has a thriving ecosystem that includes Amazon Web Services' second U.S. headquarters and a manufacturing plant by Hitachi Energy, a power solutions provider. Similarly, in Malaysia, data center investments can play a pivotal role in advancing local economic zones such as the Johor-Singapore Special Economic Zone (SEZ).

- **Enabling a vibrant digital economy:** Local data centers are a cornerstone for accelerating Malaysia's transformation in AI, as laid out in the Budget 2025[1], and for strengthening economic sovereignty and positioning the country as a key influencer in the regional digital landscape as defined in the Twelfth Malaysia Plan (12MP)[2]. The industry underpins a digital economy that is expected to generate 25.5 percent of GDP by the end of 2025[3].

- **Improving Malaysia's competitiveness at the national level:** A vibrant data center industry can serve as a springboard for Malaysian businesses to expand their expertise and become exporters of data center technical know-how globally, enhancing the country's economic sovereignty and security. Moreover, becoming a major data center hub for the region also positions Malaysia as a location to develop AI solution and, hence, enhances the country's digital competitiveness.

## Shaping a sustainable industry

Capturing the full potential of the data center industry, Malaysia will require an additional 6 GW of power capacity by 2030. To ensure this growth aligns with national sustainability goals, much of the required energy must come from renewable sources, necessitating investments in new renewable energy projects and infrastructure, including grid upgrades.

Malaysia is already making strides in this area through initiatives like the Corporate Renewable Energy Supply Scheme (CRESS) and Power Purchase Agreements (PPAs). These measures are helping data centers transition to renewable energy sources and adopt technologies that improve energy efficiency and water conservation. At the same time, data center players themselves are investing in advanced cooling and power solutions to support the sustainable development of the industry. The adoption of energy-efficient practices, such as liquid cooling and AI-driven power optimization, will be critical in reducing overall energy consumption. Additionally, investments in water treatment infrastructure and reuse technologies will be key to ensuring long-term sustainability while maintaining industry growth.

## Recent developments and their implications

Recent developments such as the introduction of DeepSeek's R1 AI model, the release of the US AI Diffusion Act, and the announcement of The Stargate Project may impact the trajectory on AI and subsequently the DC industry.

The magnitude of the impact, though, is still far from certain and will likely play out differently over time and across geographies.

DeepSeek's R1 efficiency gains may seem a disruptive shock to the industry, but in fact are part of an anticipated exponential improvement in computing efficiency that has been accounted for in our demand projections. As AI models become more efficient and cost-effective, more AI use cases become economically viable and hence increase adoption which will likely outpace the efficiency gains. Even if there was a shock to AI-related DC demand, AI workloads account for only 14% of global DC demand at present and even less in Malaysia, limiting the implications on the overall market.

We project 75% of DC demand in Malaysia to come from within the country and the SEA region. Only a quarter of Malaysia DC demand is expected to come from outside SEA, and only a fraction of that from Western countries. Hence, developments aimed at keeping more domestic DC demand within the US will likely have limited impact on Malaysia.

In sum, we believe that the outlook on the Malysia data center industry and its benefits to Malaysia remain positive and within our projections.

## The Road Ahead

To fully capitalize on the opportunities that data centers offer, collaboration between government and industry is essential. Co-investments are needed in foundational infrastructure, including renewable energy, water supply, subsea cables, fiber networks, and the power grid. Tenaga Nasional Berhad (TNB's) Green Lane Pathway and the recent exemption on cabotage for foreign subsea cable repair vessels are important measures to accelerate the development of the digital infrastructure. Furthermore, drawing inspiration from Virginia's success with programs like the Tech Talent Investment Program and the Major Employment and Investment (MEI) Project Approval Commission, Malaysia should continue to work with the industry on developing the workforce, providing a business-friendly environment and setting up clear regulatory frameworks.

Through strategic initiatives like these, Malaysia has the potential to emerge as a leading data center hub, driving long-term economic growth and establishing itself as a key player in the regional and global digital economy.

1. *Budget 2025 accelerates Malaysia's transformation in AI.* (2024, October). MyDIGITAL. https://www.mydigital.gov.my/budget-2025-accelerates-malaysias-transformation-in-ai/
2. *Twelfth Malaysia Plan (12MP).* MyGovernment - the government of Malaysia's official portal. https://www.malaysia.gov.my/portal/content/31186
3. *Digital economy able to contribute 25.5pc towards Malaysia's GDP by 2025.* (2022, March). MIDA | Malaysian Investment Development Authority. https://www.mida.gov.my/mida-news/digital-economy-able-to-contribute-25-5pc-towards-malaysias-gdp-by-2025/

# Chapter 1: Building a leading data center hub in Malaysia

The rise of digitalization and GenAI is driving an unprecedented demand for data center (DC) infrastructure globally. Based on BCG's latest report "Breaking Barriers to Data Center Growth", global data center demand is projected to double by 2028, with GenAI inferencing workloads alone experiencing a 180-fold increase.

The same trends are playing out in Southeast Asia, a region that boasts a dynamic and rapidly growing digital economy. While some workloads need to be in-country to stay close to end users—for data sovereignty reasons (e.g. citizens' data for government digital services), or due to latency requirements (e.g. smart grid, autonomous vehicles)—about half of Southeast Asia's compute and storage needs can be served by regional and global data center hubs.

Singapore has served as the primary data center hub for Southeast Asia over the past decade, accounting for 60 percent of the region's supply in 2024. However, the exponential demand for data center capacity and Singapore's constraints have created an opportunity for other regional data center hubs to emerge.

Among the SEA nations, Malaysia is well-positioned to capture a significant share of regional demand. The country has several strategic advantages:

- **Cost efficiency:** Power accounts for 70-80% of a data center's operational costs. Malaysia offers some of the lowest electricity tariffs for high-voltage industrial use in Southeast Asia, making the country one of its most attractive locations[4]. In addition, industrial land is available at reasonable prices, especially in newly developing regions such as Pahang, Kedah, and Johor[5].

- **Renewable power potential:** Malaysia ranks second in renewable electricity generation per capita in Southeast Asia[6]. The country also has abundant untapped renewable energy sources, as well as policy frameworks that make renewable energy expansion accessible.

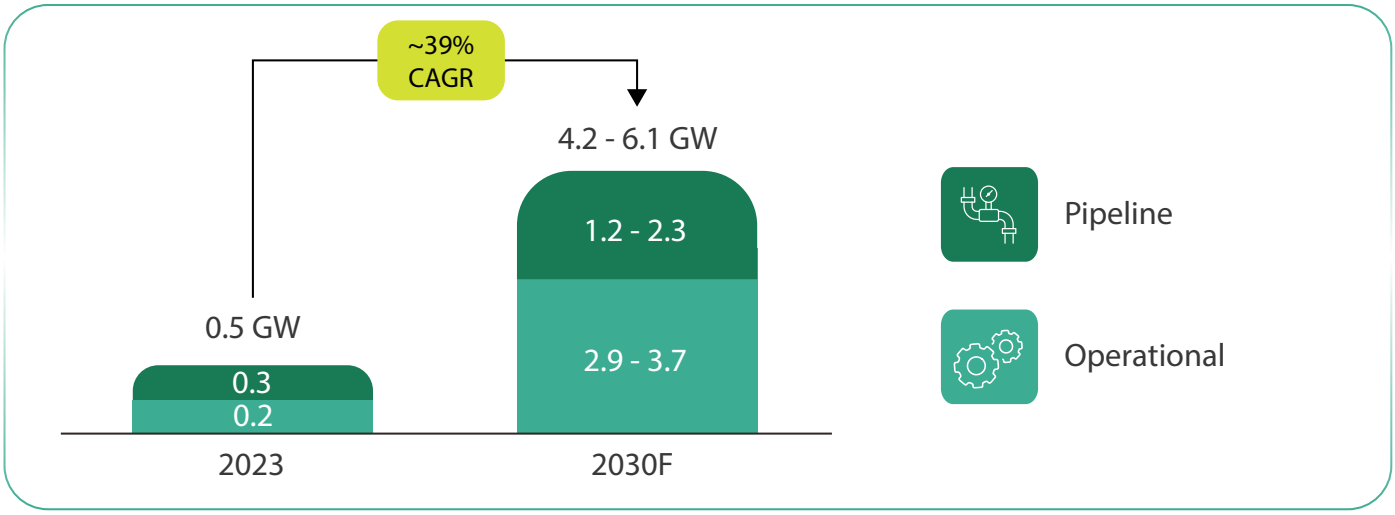
- **Subsea cable connectivity:** Malaysia has the third highest number of international subsea cables in the region, and it will launch six more international links in the next few years in Selangor, Johor, and Sarawak, representing a collective investment of over MYR 9 billion (USD 2 billion). The government's recent

4. *Data centre sector in Malaysia continues to grow.* (2024, July). The Edge Malaysia. https://theedgemalaysia.com/node/717281
5. *Land price in Malaysia: Trends and insights for 2025.* (2025, April). Own Property Abroad. https://ownpropertyabroad.com/malaysia/land-price-in-malaysia/
6. *Solar and grid flexibility critical for Malaysia's future electricity affordability and security.* (2024, August). Ember. https://ember-energy.org/latest-insights/solar-and-grid-flexibility-critical-for-malaysia/

exemption on cabotage for foreign subsea cable repair vessels expedites cable maintenance and minimizes downtime—an important operational advantage for global digital players seeking stable, well-connected data center hubs.

- **Proximity to Singapore:** Being neighbor to Singapore offers advantages with regards to both connectivity and demand. The state of Johor connects with nearby undersea cable landing stations in Singapore. At the same time, demand from Singapore can also be served from there, including workloads with low latency requirements.

## Exhibit 1 - Malaysia total data center market supply (operational and pipeline[7])




List of companies with announced data center projects in Malaysia: AirTrunk, ChinData, DayOne, PDG, Yondr, AIMS, Bridge Data Centres, Jakel/PiDC, NextDC, ST Telemedia, NTT, EdgeConneX, YTL Power, TSG, UEM Sunrise/Logos, and Vantage.

Note: Numbers may not add up due to rounding.

Malaysia's appeal is already drawing strong market interest. Over the past two years, more than 15 local and international data center operators have announced new projects in Malaysia. A significant part of these investments are happening in the state of Johor. DayOne, for instance, has established two large data center parks—Nusajaya Tech Park and Kampas Tech Park—totaling 121 MW of capacity in service and another 261 MW under construction. Similarly, Princeton Digital Group (PDG) recently delivered 52 MW of capacity in Sedenak Tech Park.

To project the data center market trajectory, we assessed the demand and supply of data center capacity in Southeast Asia and within Malaysia. On the demand side, we conducted interviews with colocation operators, hyperscalers, as well as data center end-users, including banks, telecom companies, e-commerce platforms, social media networks, streaming services, and AI companies, to understand their growth strategies and capacity requirements. On the supply side, we analyzed announcements of new data center projects and considered whether they meet key development requirements such as land availability, power infrastructure, and permits. We also considered factors such as project timelines, the availability of development prerequisites, and the status of the construction progress.

We estimate that Malaysia's data center market supply (operational and pipeline) will reach between 4.2 and 6.1 GW by 2030. This projected growth implies that operational data center capacity would increase at an annual rate of 39% between 2023 and 2030, making Malaysia one of the fastest-growing data center hubs globally. For comparison, Dublin grew at 20-25% and Mumbai at 15-20% annually between 2013 and 2023.

With this trajectory, Malaysia is poised to become a leading data center hub not only within Southeast Asia but also on a global scale, alongside established regional hubs such as Tokyo, Mumbai, and Sydney.

7. Pipeline refers to data center projects where construction has not yet started but operator has secured key requirements to start development (e.g., permit, land, power), or it is under ongoing construction. In additional, there are data center announcements where not all the requirements are not met – these projects are not included in the market supply estimates given the early-stage nature.

# Chapter 2: The data center-powered economic flywheel

Establishing a leading data center hub can create a self-reinforcing cycle of economic benefits for Malaysia. As investments in data center capacity increase, they are likely to spur the professionalization of the industry and drive the development of the underlying infrastructure, such as water systems, power grids, and data connectivity. Suppliers will be incentivized to localize their operations, drawn by the growing demand and opportunities to serve the expanding local data center sector.

## Exhibit 2 - A self-reinforcing economic flywheel

**Economics benefits:** Promoting data center investments in Malaysia creates a reinforcing flywheel

These factors combine to accelerate the growth of the data center sector by generating greater economies of scale, improving cost efficiency, and enhancing the quality of services and infrastructure as the industry matures. This, in turn, drives higher demand for data center capacity in Malaysia—reinforcing the cycle of growth and development.

To quantify the benefits generated by the economic flywheel, we used an established econometrics methodology. Economic impact was estimated in four dimensions:

**A.** Direct and indirect economic impact generated by data centers and their suppliers

**B.** Potential value unlocked with a more vibrant local data center supplier ecosystem

**C.** Employment opportunities generated from increased data center investments, and

**D.** Induced impact from additional consumption in other sectors of the local economy by employees of data centers and their suppliers

## A. Direct and indirect economic output from data centers and their suppliers

Direct economic impact stems from the capital and operational expenditures (CapEx and OpEx) spent locally by data center players, such as construction, utilities, and maintenance. Indirect impact, on the other hand, is derived from how these expenditures stimulate economic activity in the supply chain. Using Malaysia's Input-Output table, we can trace the ripple effects of data center spending, capturing the economic output generated by suppliers and related industries that support the data center ecosystem.

A significant driver of economic output is the construction of new data centers, which typically cost MYR 35-45 million (USD 8-10 million) per MW of new capacity. This is equivalent to MYR 65-90 billion (USD 15-20 billion) in direct impact based on the projected capacity expansion between 2024 and 2030. Notably, about 70% of this expenditure is spent locally, benefiting companies in Malaysia's construction sector—one of the country's top five industries.

Once data centers become operational, they continue to contribute significantly to the local economy through expenditures on utilities, maintenance, security, and other services. Based on the projected capacity growth, the direct economic output generated from data center operations will accumulate to MYR 30-38 billion (USD 7-9 billion) between 2024 and 2030.

Overall, the rapid growth of Malaysia's data center industry and the associated construction activities, is expected to generate between MYR 195-260 billion (USD 45-59 billion) in direct and indirect economic output from 2024 to 2030. This means that for every MYR 1 million of data center investment, an additional MYR 1 million of economic output is generated indirectly. The indirect impact also includes investment in the supporting infrastructure such as roads, utilities, and power systems. These developments benefit local communities by improving connectivity, reliability, and access to essential services.

## B. Value unlocked with a more vibrant local data center supplier ecosystem

While today's data center industry in Malaysia imports a sizeable share of high-value inputs such as networking equipment, cooling systems, data center management software, and prefabricated modules, this is likely to change as the industry grows and matures. As the development of other data center hubs shows, key suppliers typically use those to serve regional or global demand. Hanley Energy, a provider of power management solutions, for example, has set up production facilities in major data center hubs such as Ireland and Ashburn, Virginia, from which it exports to 32 markets globally.

As Malaysia's data center cluster becomes substantial in size, it will become increasingly attractive for suppliers to locate production and services within the country. This will not only further increase the economic impact retained in Malaysia (due to a higher share of spending incurred locally), but also reduce dependency on foreign digital infrastructure and services, promoting domestic resources and capabilities while lowering imports related to IT infrastructure and services. These suppliers could then export to the region and globally, providing further upside through expanded economic activity and contributing to an improved trade balance for Malaysia.

We are seeing early indications of such localization happening. For example, DayOne's global suppliers have announced MYR 1 billion investments to build integrated factories and service centers in Malaysia. Wiwynn, a Taiwanese IT equipment manufacturer, has announced plans for a MYR 68 million (USD 16 million) server rack integration plant in Johor to meet the booming demand in the cluster and to serve customers across Asia Pacific.

Based on our estimates, the localization of data center suppliers can generate MYR 24-32 billion (USD 6-7 billion) of additional direct and indirect economic output.

## C. Attractive employment opportunities for Malaysians

The expansion of the data center industry will create significant employment opportunities, both in the data center industry itself and in the broader supplier ecosystem. We estimate that, by 2030, the projected expansion can create 130,000-190,000 new jobs in Malaysia, equivalent to approximately 0.8% of the country's total employment.

While a large portion of these opportunities will materialize during the construction phase, it is important to note that the jobs for data center operations are highly technical and offer attractive career prospects. An entry-level data center technician, for example, typically requires a degree in mechanical or electrical engineering, or a certification from one of Malaysia's Technical and Vocational Education and Training (TVET) institutes, and data center-specific professional certifications from providers such as the Uptime Institute or EPI. Average monthly base salaries can reach MYR 5,000-5,500 (USD 1,150-1,250), which is about twice as much as the national median salary. Employment opportunities created in and around the data center industry will therefore boost the attractiveness of Malaysia's technology sector for local jobseekers.

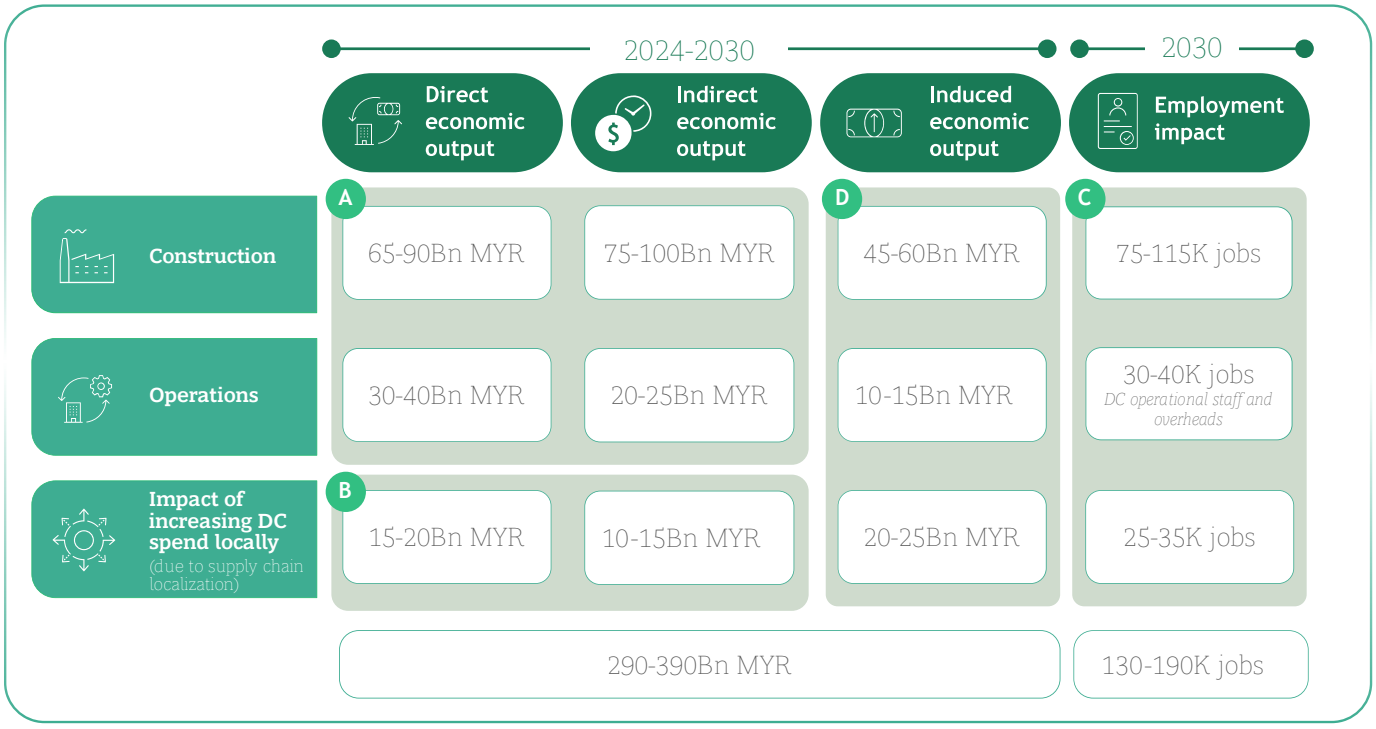
## D. Induced impact through increased local consumption

Finally, data center investments do not only create jobs within the industry and its supplier base, but also spark a ripple effect throughout the local economy. As local employment by operators and their upstream suppliers (e.g. accounting firms, maintenance providers, facility management companies) increases, employees spend their income on housing, daily necessities and discretionary items, further fueling economic activity locally and generating additional induced impact.

From construction through operations and supplier localization, this economic chain reaction is projected to generate an additional value of MYR 70-95 billion (USD 15-20 billion) for Malaysia's economy.

In summary, if the data center sector expands as we have projected above, these investments can generate a sizable MYR 290-390 billion (USD 65-90 billion) of incremental economic output for Malaysia from 2024 to 2030, bringing significant value and employment opportunities.

## Exhibit 3 - Data center contributions to economic output and employment in Malaysia



# Chapter 3: Spillover effects to the broader economy

Beyond the directly quantifiable economic benefits, establishing Malaysia as a major data center hub also creates spillover benefits that contribute to important national priorities such as catalyzing economic zones, enabling a vibrant digital economy and improving Malaysia's competitiveness at a national level.

Before exploring these spillover effects for Malaysia, we first draw learnings from a mature data center hub in the United States.

## Case study

### Northern Virginia: The world's largest data center cluster

Northern Virginia is home to the world's largest data center cluster, with over 4 GW of operational IT load in 2024. The data center industry has invested USD 37 billion over the past two years alone, directly accounting for approximately 2% of the state's GDP. In addition, the industry's demand for skilled labor has resulted in well-paying jobs, with salaries surpassing the state average.

However, beyond those direct economic contributions, the growth of the sector has enabled substantial spillover effects which improved the competitiveness of the local economy:

- **Spurring local workforce development:** Both the industry and the local government are investing in workforce development. For instance, Amazon Web Services (AWS) launched its first cloud associate's degree in collaboration with the Northern Virginia Community College in 2018, creating a direct pipeline of talent tailored to the needs of the data center sector. In the same year, the state introduced the USD 1.1 billion Tech Talent Investment Program (TTIP), a performance-based initiative to produce 31,000 additional tech graduates in computer science and engineering over 20 years, ensuring a steady supply of skilled workers to meet the demands of the industry and other sectors.

- **Catalyzing a local tech ecosystem:** The expansion of the data center valley strengthened Virginia's tech ecosystem and was one of the key factors for AWS's decision to locate its second headquarter in Northern Virginia. This development has further catalyzed investments in technology and innovation across the state. Today, Virginia is home to the third-largest cybersecurity sector in the US and has become a hub for innovation in cloud computing, AI and advanced analytics.

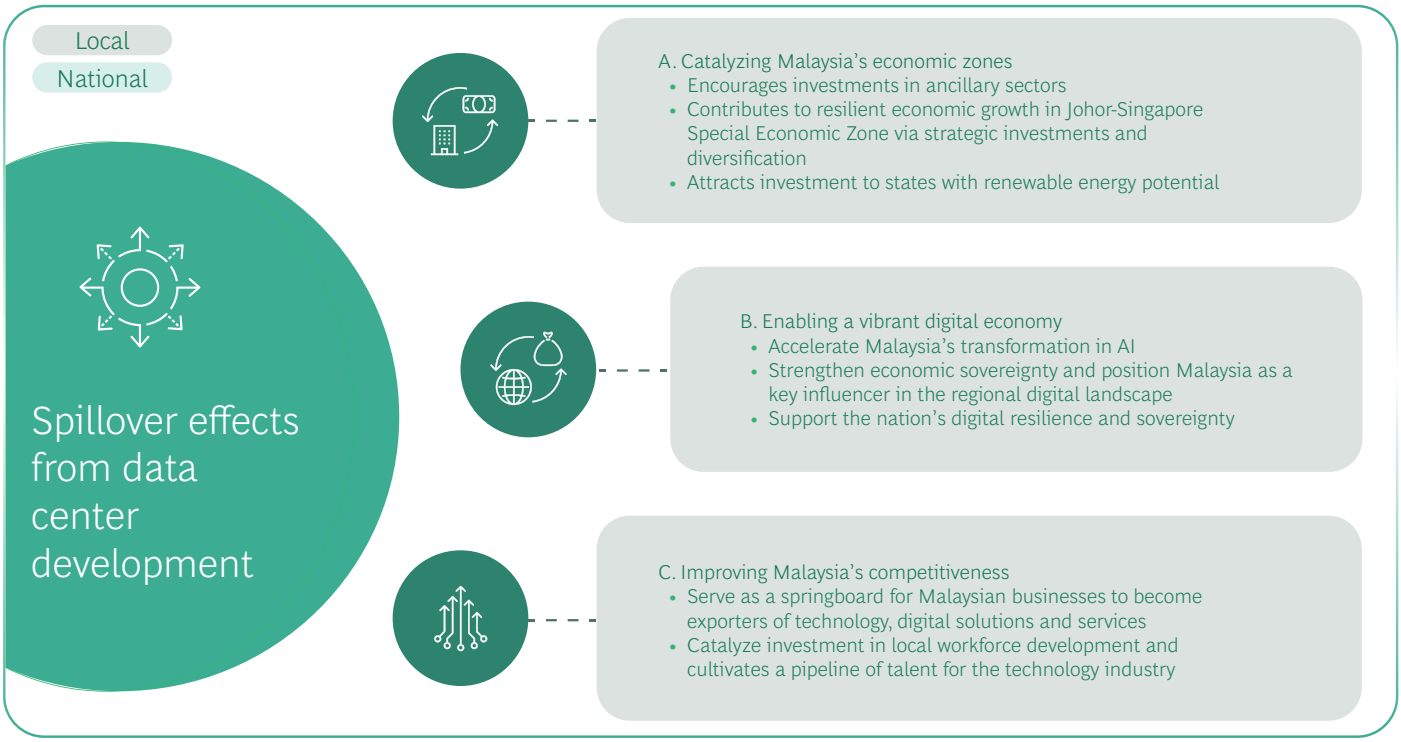
- **Expanding economic development to local communities:** Although the data center valley originated in Northern Virginia, hyperscalers have since begun to establish new campuses in ten other communities across the state. The diversification is driven by the need to create multiple availability zones for greater resilience. It has extended the economic benefits of data center investments to smaller towns and cities, enhancing infrastructure, creating jobs, and boosting local economies.

- **Promoting Sustainability:** The energy-intensive nature of data centers has incentivized investment in renewable energy infrastructure. Virginia's Clean Economy Act drove the adoption of long-term Power Purchase Agreements (PPAs) by data center operators, which, in turn, accelerated the development of solar and wind projects in the state. These investments have created new opportunities for the renewable energy sector and contributed to Virginia's leadership in the sustainable energy transition.

## Spillover effects for Malaysia

Considering how other global data center hubs have developed and the context for Malaysia, we believe the development of the data center industry can create spillover effects that would benefit Malaysia at both the local and the national level.

## Exhibit 4 - Spillover effects from data center development




## A. Catalyzing Malaysia's economic zones

A growing data center ecosystem can encourage investments in ancillary sectors such as real estate, logistics, and utilities, creating a dynamic economic environment. By spurring the development of integrated economic zones, the data center industry not only supports digital transformation but also enhances the competitiveness of the economic zone.

Today, Kuala Lumpur (Klang Valley) and Johor are the major data center clusters in Malaysia. Johor has been attracting an outsized share of interest from data center players due to its proximity to Singapore. A booming data center industry is poised to become a key pillar of the Johor-Singapore Special Economic Zone proposition to support cross-border digital connectivity and data flows for passport-free and digital cargo clearance. Furthermore, the development of a local ecosystem would contribute to resilient economic growth through strategic investments and diversification, which is one of the key objectives outlined in the Johor Sustainable Development Plan (PPMJ) 2030.

Other states including Pahang, Kedah, Sabah and Sarawak could also host data centers, given their renewable energy potential. Data centers operators are often anchor tenants in new industrial parks, and their energy use can trigger further investments that enhance the attractiveness of the entire zone. For example, in the Delapan Special Border

Economic Zone in Kedah, the real estate private equity firm AREA is developing a 156-acre data center campus, upgrading local power infrastructure to meet data center demands and preparing the land for industrial use.

Over time, as data center players explore locating close to renewable energy sources, remote areas such as Kedah and Pahang could also see more industrial parks coming their way. Having data centers in these regions could bring other investments and boost their economies. For that to happen, though, improvements in subsea cable connectivity, local fiber networks and power infrastructure will be needed.

## B. Enabling a vibrant digital economy

Data centers are a key enabler of a Malaysian digital economy that is expected to generate 25.5 percent of GDP by the end of 2025[8]. And while much of the required compute and storage capacity could also be hosted overseas, localizing the industry can form a cornerstone for accelerating Malaysia's transformation in AI, as laid out in the Budget 2025[9], as well as for strengthening economic sovereignty and positioning the country as a key influencer in the regional digital landscape as defined in the Twelfth Malaysia Plan (12MP)[10].

Recent breakthroughs in AI – including generative and agentic AI as new frontiers – are enabling productivity gains across industries and opening opportunities to create new products, business models and ultimately transform the economy. Fast adopters stand to gain significantly and secure lasting competitive advantage. With the region's digital economy expected to grow exponentially in the coming years, a robust data center infrastructure offers the reliability and scalability required to meet the increasing demand for AI-driven solutions. This strategic positioning can strengthen Malaysia as a pivotal node in the regional and global AI development landscape.

Moreover, the establishment of data centers within Malaysia supports the nation's digital resilience and sovereignty. Locally housed data ensures compliance with Malaysian regulations and enhances security by reducing reliance on foreign infrastructure. This not only safeguards critical data, but also supports local economic growth by keeping data-related activities within national borders. A resilient digital infrastructure also underpins innovation and provides contingency in the face of global disruptions. By fostering a self-reliant digital ecosystem, Malaysia is better equipped to protect its economy and citizens from cyber threats, while enabling secure and efficient operations for businesses and government entities.

## C. Improving Malaysia's competitiveness

A vibrant data center industry can serve as a springboard for Malaysian businesses to expand their expertise and become exporters of technology, digital solutions and services. Lessons can be drawn from successful international companies such as Collen Construction and Kirby Group Engineering in Ireland. Both companies leveraged Ireland's vibrant data center ecosystem to transform their operations. Collen, founded in 1810, evolved into the largest data center general contractor in Ireland, while Kirby expanded from a local electrical contractor to a global player in the data center industry. Similarly, Malaysia's data center boom can empower local companies to evolve into high-value businesses, export their expertise, and play a significant role in the global ICT supply chain.

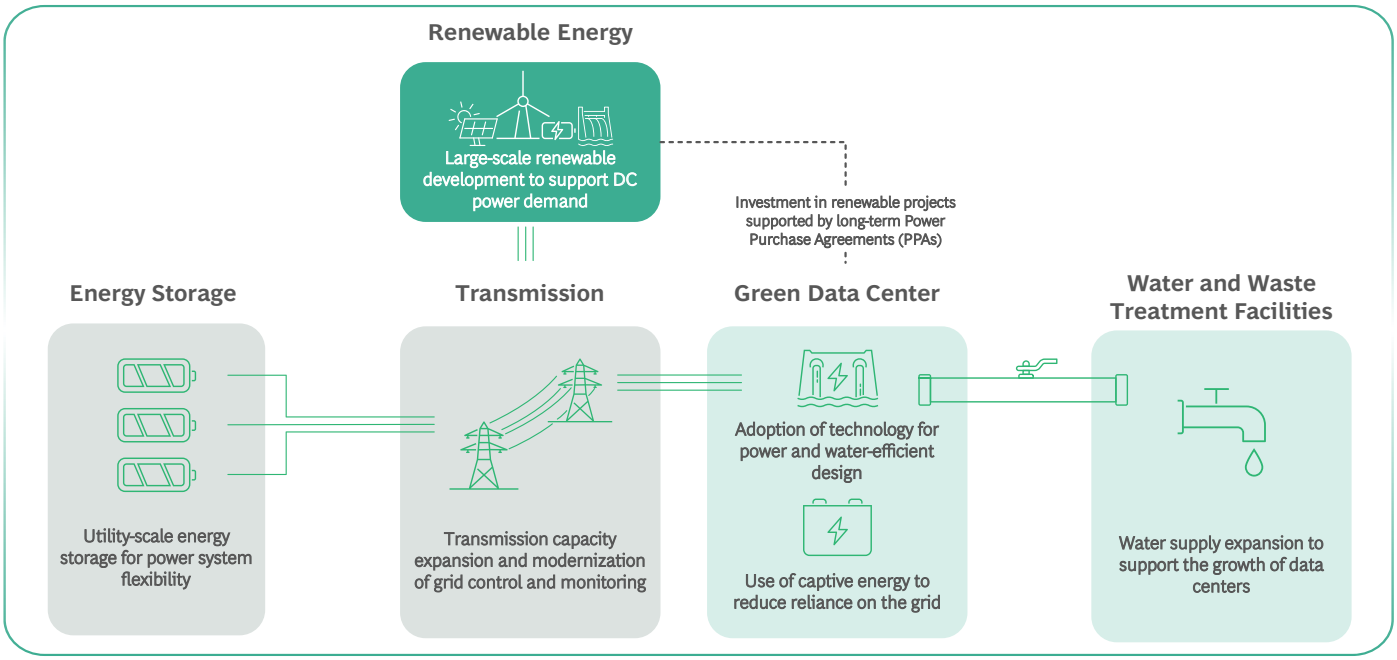
When we look at the development of other global data center hubs, we see that the demand for highly technical talents also catalyzes investment in local workforce development, which further cultivates a pipeline of talent for the technology industry. In Virginia, for instance, AWS has collaborated with local colleges to place over 100 interns and trainees annually in its data centers, many of whom secured full-time roles. A similar trend is emerging in Malaysia. Companies like DayOne have partnered with Universiti Teknologi Malaysia (UTM) and Multimedia University (MMU) to offer internships, research projects, and specialized courses tailored to the data center industry. Management trainee programs also provide hands-on experience for young professionals, setting them on a path to leadership in the sector. Hyperscalers like Google and AWS are collaborating with institutions such as UNITAR International University, Perkeso, and the Ministry of Higher Education to deliver upskilling and certification programs. These efforts equip Malaysians with cutting-edge technical skills, enabling them to unlock the full potential of data center infrastructure and driving broader economic impact through enhanced productivity and innovation.

8. *Digital economy able to contribute 25.5pc towards Malaysia's GDP by 2025.* (2022, March). MIDA | Malaysian Investment Development Authority. https://www.mida.gov.my/mida-news/digital-economy-able-to-contribute-25-5pc-towards-malaysias-gdp-by-2025/
9. *Budget 2025 accelerates Malaysia's transformation in AI.* (2024, October). MyDIGITAL. https://www.mydigital.gov.my/budget-2025-accelerates-malaysias-transformation-in-ai/
10. *Twelfth Malaysia Plan, 2021-2025.* RMK12. https://rmke12.ekonomi.gov.my/en/documents/twelfth-plan

# Chapter 4: Shaping a sustainable industry

A growing data center industry will undoubtedly require significant resources, such as power and water, and necessitate upgrades to the national utility infrastructure. These efforts must prioritize sustainability, aligning with Malaysia's national agenda. The National Energy Transition Roadmap (NETR), introduced in 2023, sets ambitious goals: achieving a 40% renewable energy share by 2035 and 70% by 2050. If Malaysia's data center capacity grows to approximately 4.2 GW by 2030, this will demand an additional 6 GW of power and 200 million liters of water annually, requiring substantial investments.

## Exhibit 5 - Spillover effects from data center development



## Fostering renewables development through PPAs and captive energy solutions

To meet Malaysia's renewable energy goal, facilitating Power Purchase Agreements (PPAs) will be key. A PPA is a long-term contract in which a company or utility buys electricity from a renewable energy generator at a pre-agreed price. These long-term agreements help reduce investment risk for renewable energy providers and support the development of new capacity. For example, in the United States data centers contribute two-thirds of renewable PPAs. Such agreements include Google's PPA with SB Energy Global LLC in Texas to procure 942 MW from four solar power plants, which accounts for three quarters of the plants' output.

Malaysia is seeing early signs of data center operator's long-term commitment to renewable energy. DayOne and AirTrunk were among the first to sign data center-specific renewable energy PPAs; DayOne has also partnered with TNB to explore renewable energy solutions to power its facilities and is collaborating with SK Ecoplant to explore hydrogen-powered Solid Oxide Fuel Cell technology.

Providing the right framework to facilitate renewable energy development will be essential to drive sustainable development in the industry, and some of the recent policies in Malaysia are steps in the right direction. For example, the Corporate Renewable Energy Supply Scheme (CRESS) allows corporates in Peninsular Malaysia to purchase electricity directly from renewable energy producers, fostering a more competitive and diversified renewable energy market and raising funds through the System Access Charge mechanism to support grid upgrades. The Large-Scale Solar (LSS) program is also facilitating development of captive sources and adding green capacity to the grid.

With substantial energy demand, data centers can become major off takers of renewable PPAs, catalyzing the development of more large-scale renewable projects. Furthermore, as data centers progressively scale their investments in renewable energy, economies of scale could bring development and operational costs down. These measures not only reduce carbon footprints but also mitigate the risks of future electricity price volatility—securing more predictable operating costs for data center operators and other companies alike.

## Increasing energy efficiency with industry guidelines

A data center's energy efficiency is measured in PUE, the ratio of the facility's total power use to the power its computing equipment consumes. The lower the PUE, the more energy efficient the facility. Globally, average PUE has significantly improved over the past two decades from 2.5 in 2007 to 1.6 in 2024.

Many data center operators have been driving innovations in data center cooling technology to improve power efficiency. This includes the use of liquid cooling systems, evaporative cooling, and artificial intelligence-based optimization to reduce energy consumption. At the same time, regulators in relevant jurisdictions, such as Singapore and Dublin, are playing increasingly active roles in defining guidelines for power efficiency.

In Malaysia, the ongoing revision of the Technical Code on Green Data Centers by the Malaysian Technical Standards Forum will establish clear guidelines for energy intensity and carbon footprints of new data center developments. The revision marks an important step towards improving the sustainability of data centers in the country.

## Advancing water efficiency solutions

Water availability is a pressing concern for Malaysia, with some states experiencing droughts and others prone to flooding. And as data centers need large amounts of water for cooling purposes, ensuring adequate water supply while not jeopardizing that the infrastructure can meet long term industrial and residential needs, states such as Johor, Selangor, and Kedah have set ambitious water reserve margin targets (25%, 18%, and 15%, respectively, by 2030).

Part of the solution lies in investing in water supply infrastructure, which has started happening in Malaysia. For example, Ranhill SAJ in Johor plans to invest in water treatment plants and pipeline upgrades to supply an additional 2,000 MLD by 2030. Similarly, Air Selangor is completing the Rasau Water Supply Scheme, capable of producing 1,400 MLD of treated water. In addition, data center water consumption can also be managed through innovative cooling designs, water reuse, and increased water supply. Many global operators are addressing this challenge. For example, QTS has developed a proprietary minimal-water cooling design, whereas Microsoft's Quincy Water Reuse Utility conserves 380 million gallons of potable water annually.

While adding data centers will increase water and power demand, sustainable growth is possible if data center operators, government bodies, and other stakeholders collaborate effectively.

# Chapter 5: Recent Development and their implications

Drivers of growths for the data center industry have been very clear and sustained in recent years, especially with the rise of AI. The road ahead is however marked by significantly higher uncertainty, both from rapid technology evolution and from geopolitical shifts. The first few months of 2025 offer a vivid illustration of these more uncertain times, with the introduction of DeepSeek's R1 model (January), U.S. AI Diffusion Act announcement (January) and subsequent rescindment (May), and US tariffs announcements (April). The magnitude of the impact, though, is still far from certain and will likely play out differently across geographies.

## Recent developments around AI

We see three major global developments shaping the industry:

- **Rapid technological evolution:** E.g. the introduction of DeepSeek's R1 AI model with notable algorithmic improvements and related efficiency gains, new releases of reasoning models by several companies (for instance, deep research by OpenAI), radical improvements in AI video generation (e.g. Veo 3 in Google Gemini).

- **Access restrictions on AI technology:** E.g. AI Diffusion Act announced by the US administration, aiming to govern the export of US technologies, from chips to AI models, to third-party countries. While this particular policy was rescinded in May, other restrictions are being reaffirmed (e.g. on EUV lithography for AI chip manufacturing) or considered.

- **Increased tariff on goods:** E.g. announcement of minimum baseline and reciprocal trade tariffs by the US administration in April, and responses by countries outside US. While not specific to the datacenter industry, announcements of broad tariffs on goods by the US adminisation will create frictionsOngoing tariff tensions are starting to affect critical components in the data center supply chain. These tariffs could push up capital and operational costs for new data center builds globally. However, the broader context remains one of structural undersupply: demand for AI infrastructure continues to far outpace the availability of power, land, and build-ready sites. As a result, even in the face of rising costs, global demand for data center capacity is expected to remain robust in the near to medium term.

Some observers have argued that these developments could have a net negative impact on global DC industry, as the efficiency gains from new AI models like Deep Seek R1 will outpace the increase in demand while technology access restrictions and tariffs may hamper the competitiveness and subsequently demand for DC capacity in countries like Malaysia. We come to a different conclusion.

## Global implications

We expect global DC demand to remain in line with previous projections, despite the recent technological evolution:

- **Efficiency gains in AI are anticipated and baked into projections:** DeepSeek's R1 efficiency gains came as a surprise to many and may seem a disruptive shock to the industry, but in fact are part of an consistent, exponential improvement in computing efficiency. We have recently seen also other examples of notable improvements in model efficiencies e.g., with Google's Gemini 2.0 Flash. This exponential improvement in computing efficiency is an anticipated evolution that has been accounted for in our DC demand projections.

- **Efficiency gains in AI to drive accelerated adoption:** Efficiency gains like those of Deep Seek's R1 will trigger new AI applications to become economically viable and significantly increase the adoption of AI. Emerging applications such as real-time AI reasoning, generative media creation, and large-scale simulations are expected to sustain and amplify compute demand despite efficiency gains. In a recent BCG survey of 500 IT procurement professionals, 50% of respondents stated that their companies will increase spend on AI following the recent trends, while 30% report that investment plans are unchanged.

- **AI constitutes only a fraction of DC demand:** According to Goldman Sachs research, AI constitutes only 14% of global DC demand at present[11]. Even if AI-related DC demand triples over the coming three years, it will only account for 20% of global DC demand. Most of DC demand continues to be driven by traditional enterprise workloads such as file storage, transaction processing and conventional business applications. With 50% of global enterprise computing still being on-premises[12], there is a long runway for continued growth of DC demand from traditional enterprise workloads as more companies migrate to the cloud.

We also do not expect the recent tariff announcements to significantly impact the DC supply and demand equilibrium in the medium term:

- **DC supply remains tight:** Supply of DC capacity remains tight with less than 3% of DC capacity in North America currently being unoccupied, according to The Economist[13]. Many of the DC projects currently in the planning or construction phase around the globe are already pre-leased for the coming 10-15 years.

- **Long lead times for new supply announcements to materialize:** Whilst some of the recent supply announcements across major markets are ambitious, it will likely take a long time for these capacity additions to materialize given long lead-times for local permitting and, more importantly, significant supply backlogs of several years for critical equipment such as power.

In sum, we remain positive on the outlook of the global DC industry despite the recent developments.

## Implications for Malaysia

We expect limited impact in Malaysia, given strong regional demand, rapidly maturing data center industry and push to strengthen domestic supplier ecosystems:

- **Majority of Malaysia DC demand from within SEA:** We project 75% DC demand in Malaysia to come from within the country and the SEA region. Only a quarter of Malaysia DC demand is expected to come from outside SEA, and only a fraction of that from Western countries. Hence, developments resulting in keeping more domestic DC demand within the US or other Western countries will likely have limited impact on Malaysia.

- **AI smaller fraction of DC demand in SEA context:** Based on BCG's recent global AI sentiment research, SEA countries currently experience a lower adoption of AI compared to the global average. This also suggests that within SEA, DC demand related to AI is lower than the global average of 14%, and subsequently the exposure of Malaysia's DC industry to potential AI-related demand shocks is less pronounced than in the global context.

- **Strong conviction around SEA DC demand for traditional enterprise workloads:** Compared to the global average, SEA companies have 90% of enterprise computing still on-premises[14], which makes an even stronger case for the future growth of DC demand from traditional enterprise workloads. In a recent survey conducted by BCG in collaboration with Singapore's Infocomm Media Development Authority, IT executives across sectors and SEA countries emphasize their companies' bold ambitions to transition significant share of their enterprise workloads to the cloud over the coming years.

- **Competitive position in SEA:** Relative competitiveness of Malaysia's DC industry compared to other SEA countries remains largely unchanged by announcements of access restriction and tariffs, which are often of comparable nature and magnitude across SEA countries. Availability of land, access to affordable renewable energy, strong regional and international connectivity and proximity to Singapore still make a strong case for Malaysia to become a leading DC hub in the region.

- **Localized supply chain:** The industry's focus on localizing key parts of the datacenter supply chain is providing beneficial beyond initial expectations, in an increasingly challenging global trade context. Local supply chain will help provide certainty on cost and timelines for DC developments in Malaysia.

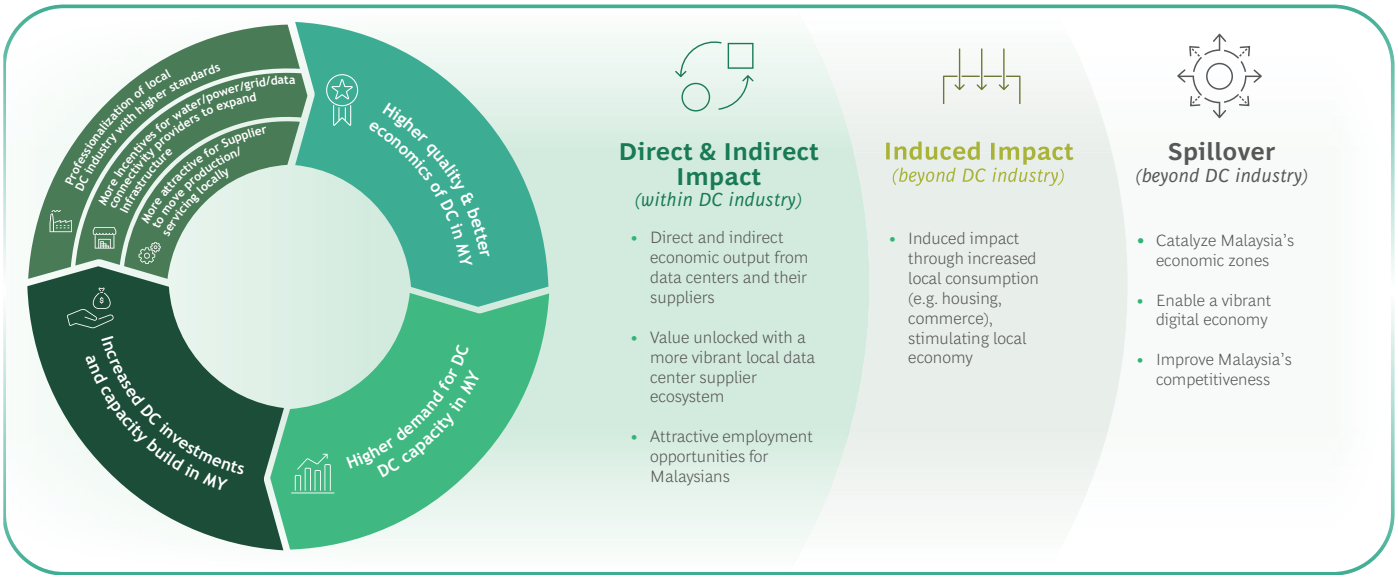
Given the limited impact of the recent developments on the global DC market and the SEA-centric demand structure of Malayasia's DC industry, we believe that the outlook on the Malysia data center industry and its benefits to Malaysia remain positive and within our projections.

11. *AI to drive 165% increase in data center power demand by 2030.* (2025, February). Goldman Sachs. https://www.goldmansachs.com/insights/articles/ai-to-drive-165-increase-in-data-center-power-demand-by-2030
12. *Flexera 2024 State of the Cloud Report.* Flexera. https://info.flexera.com/CM-REPORT-State-of-the-Cloud-2024-Thanks
13. *The data-centre investment spree shows no signs of stopping.* (2025, February). The Economist. https://www.economist.com/business/2025/02/05/the-data-centre-investment-spree-shows-no-signs-of-stopping
14. *Asia/Pacific State of Cloud: adoption trends, challenges, and preferences.* (2024, September). IDC: The Premier Global Market Intelligence Company. https://www.idc.com/getdoc.jsp?containerId=AP51592524

# Chapter 6: The road ahead

Building Malaysia into a leading data center hub offers a transformative opportunity to elevate the nation's digital economy. As we have argued above – and as we summarize in Exhibit 6 – the economic benefits of data center investments go far beyond the industry itself. They extend into the supply chain, multiply in the local and national economies, and have the potential to support important elements of Malaysia's digital and sustainability agenda. And they persist despite recent development in the broader AI landscape.

## Exhibit 6 - Economic benefits of data center investments



Realizing this vision, however, will require effective collaboration between the government (on the national, state and local level), the data center industry (industry organizations and individual players) and stakeholders in the wider ecosystem (e.g. utilities and training providers). Competitive tax incentives, grants, and subsidies tailored to attract data center operators and related industries will be instrumental in enhancing Malaysia's competitive advantage. For example, Virginia's tax incentives for tech companies and suppliers were a cornerstone of its rise as a global technology hub. Similarly, programs like Virginia's Major Employment and Investment (MEI) Project Approval Commission supported large-scale projects by tying incentives to job creation and salary benchmarks, thereby ensuring the development of high-quality, well-paying jobs.

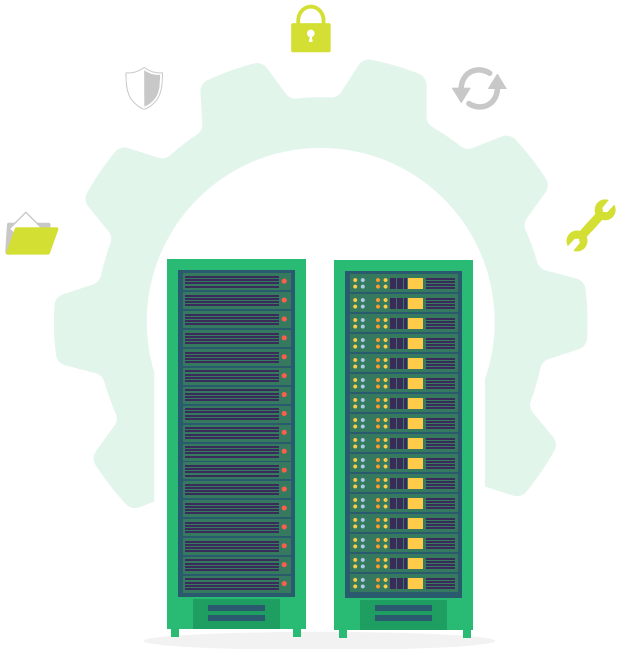
In addition to financial incentives, co-investments are essential to develop critical infrastructure, such as renewable energy, water supply, subsea cables, fiber networks, and the power grid. Establishing a supportive regulatory framework is equally important to accelerate Malaysia's data center growth. Clear, consistent and forward-looking policies can promote sustainability and incentivize renewable energy adoption. Initiatives such as the Corporate Renewable Energy Supply Scheme (CRESS) and the Large-Scale Solar (LSS) program mark promising progress, but further efforts are required to streamline processes, encourage private-sector participation, and expand green energy capacity.

The data center sector itself can also play a catalytic role in Malaysia's energy transition. As major future energy offtakers, data centers are well-positioned to drive demand for renewables and help shape a more sustainable national grid.

Whilst the case for Malaysia's DC industry remains sound despite the recent uptick in uncertainty policy makers can help to further derisk and solidify the future trajectory. This includes proactively supporting the build-up of a diverse local industry with providers from different technological and geopolitical backgrounds – to minimize the implications of protective measures from individual countries and specific technology shocks.

Proactive supplier localization, build-up of a well-trained workforce and support of local research and innovation are even more important to enhance the competitiveness of Malysia's DC industry. Finally, policy makers should actively monitor the global developments in this dynamic industry and adjust the national and local DC strategies as needed.

By fostering strategic public-private collaboration, implementing targeted policies and incentives, championing sustainable practices, and prioritizing workforce development, Malaysia can build a world-class data center ecosystem. Drawing inspiration from global success stories, Malaysia has the potential to redefine the landscape of regional data center hubs, delivering transformative economic growth and long-term benefits for its society.



# Appendix: Methodology

## Malaysia data center Capacity Projection

### Malaysia data center Capacity Projection

Our projection for Malaysia's data center capacity is grounded in a comprehensive methodology. To create an estimate of the demand for data center capacity in SEA, we interviewed a wide range of end users such as financial institutions, telecommunication companies, e-commerce businesses, and AI developers, to gain insights into end user digitalization needs and how it translates into demand for data center capacity in the region. On the supply side, we interviewed colocation operators and hyperscalers to identify critical drivers of data center capacity and supply trends.

To validate our findings, we triangulated these insights with publicly available industry announcements, factoring in development stages and projected completion timelines.

### Economic Impact

Our estimates of the economic impact of the data center industry on Malaysia used input-output analysis with the expenditure approach. BCG has used this methodology in multiple economic impact studies. The methodology is globally recognized and combines rigor and practicality.

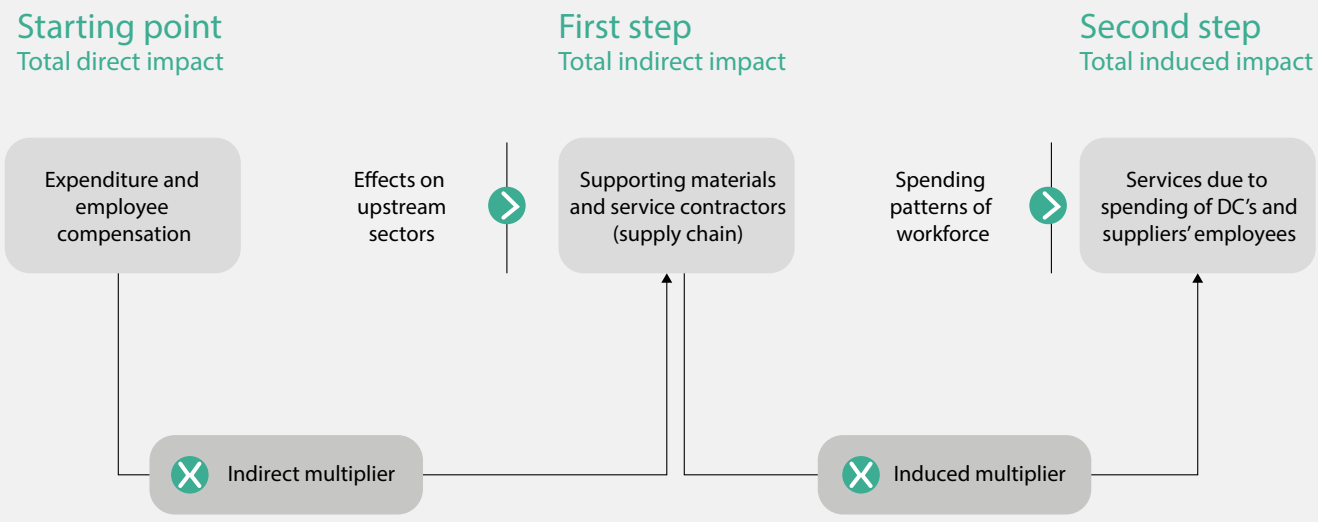
**Direct output impact** is the product of data center total spend and domestic share of inputs. Data is obtained and synthesized from various sources including industry and market reports, publicly available financial data, and expert interviews.

**Indirect and induced output impact** are calculated using input-output analysis. Input-output models are based on the analysis of direct expenditure data to estimate the additional impact of a given industry on other sectors.

- **Indirect impact,** also known as supply chain impact, measures the economic impact of products and services used in the supply chain that supports a given industry. This is done by assigning a multiple to the effect that various sectors have on each other, as defined by national input-output tables (from OECD). As an example, spending on installation services requires direct input of tools, components, and so on.
- **Induced impact** measures the economic impact resulting from payroll spending attributable to the industry. Sectors that benefit from this impact include retail, food, and lodging.

Direct employment impact is estimated based on BCG's projection of data center capacity in Malaysia, and data on employment in the construction phase and operation phase, obtained and synthesized from the sources above.

Indirect and induced employment impact is derived from indirect and induced output impact and is based on ILO and DOSM employment data (number of workers) by sector, normalized by economic output per sector.



# About the Authors

**Michael Meyer** is a Managing Director and Senior Partner in the BCG Munich office. You may contact him by email at Meyer.Michael@bcg.com.

**Olivier Rival** is a Managing Director and Partner in the BCG Singapore office. You may contact him by email at Rival.Olivier@bcg.com.

**Daniel Oehling** is a Managing Director and Partner in the BCG Singapore office. You may contact him by email at Oehling.Daniel@bcg.com.

**Nurlin Salleh** is a Managing Director and Partner in the BCG Kuala Lumpur office. You may contact her by email at Salleh.Nurlin@bcg.com.

For information or permission to reprint, please contact BCG at permissions@bcg.com.

To find the latest BCG content and register to receive e-alerts on this topic or others, please visit bcg.com.

Follow Boston Consulting Group on Facebook and Twitter.

© Boston Consulting Group 2025. All rights reserved.
6/25

BCG + DAYONE