FROST & SULLIVAN

CHUNGHWA TELECOM RECEIVES THE 2023 COMPANY OF THE YEAR AWARD

Identified as best in class in the Taiwan data center services industry

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Chunghwa Telecom excels in many of the criteria in the data center services space.

AWARD CRITERIA

Visionary Innovation & Performance	Customer Impact
Addressing Unmet Needs	Price/Performance Value
Visionary Scenarios Through Mega Trends	Customer Purchase Experience
Implementation of Best Practices	Customer Ownership Experience
Leadership Focus	Customer Service Experience
Financial Performance	Brand Equity

Chunghwa Telecom: A Market Leader

Founded in 1996 and headquartered in Taipei, Taiwan, Chunghwa Telecom is a major telecommunications and internet data center (IDC) provider. Operating a vast network infrastructure encompassing fixed lines, submarine cables, and mobile networks (4G and 5G), the company provides various telecom services, including internet connectivity and data center services (DCS) specialized for internet-based operations. A first mover in the IDC market with over 20 years of experience, Chunghwa Telecom offers deep domain knowledge, advanced technological capabilities, unmatched data center capacities, and exceptional market insights, empowering the company to provide competitive and advanced internet DCS to accommodate wide-ranging needs.

Roadmap to Success: Customer-centric, Continuous, Proactive

Chunghwa Telecom is a preferred partner among hyperscalers and enterprises for its incomparable value proposition (i.e., Taiwan's largest domestic and international network bandwidth, next-generation data centers, and comprehensive and customer-centric DCS). Despite its market leadership, the company continually strengthens its position by investing in expanding its data center capacity. In 2022, the company reported double-digit growth in information technology (IT) load, bringing its total capacity to 70 plus megawatts, spanning three data centers. The company expects higher growth numbers in 2023 through layout optimization and updates to its existing data center equipment. Furthermore, in 2022,

Chunghwa Telecom initiated a batch of new builds across Taiwan, including in Zhubei, Banqiao, Taoyuan, Binjiang, and Xinyi, demonstrating high growth potential in the coming years.

> *"Chunghwa Telecom has progressively integrated artificial intelligence (AI) solutions to enhance its DCS and services in recent years. The company employs the cutting-edge technology to monitor internet traffic, detect and curb cyber-attacks, promote operational continuity through actionable insights that eliminate anomalies, predict future obstacles, and promote facility efficiency."*
>
> *- Rubini Kamal*
> ***Best Practices Research Analyst***

Chunghwa Telecom's unmatched resources and capabilities empower the company to provide customers with total DCS and customize them for various applications. When many enterprises shifted to a hybrid working model post-pandemic, the company leveraged its strengths in successful IT deployments and cloud-based services to meet the increasing demand for hybrid cloud architecture. Simultaneously, Chunghwa Telecom helps the banking and financial services industry to comply with local data regulations that mandate data storage within the country's borders. The company is expanding its offering to provide total solutions to edge customers.

By leveraging its IDC dedicated internet access, directly connected to its primary internet network, Chunghwa Telecom enables reduced router hops and faster forwarding time, minimizing network transmission latency to provide high data reliability. With more businesses requiring low latency and secure data processing to improve their services and applications' overall performance and to promote growth, Chunghwa Telecom is well-positioned to provide total solutions for potential edge customers.

AI-powered Pursuit of Excellence

Chunghwa Telecom has progressively integrated artificial intelligence (AI) solutions to enhance its DCS and services in recent years. The company employs the cutting-edge technology to monitor internet traffic, detect and curb cyber-attacks, promote operational continuity through actionable insights that eliminate anomalies, predict future obstacles, and encourage facility efficiency.

The company's research team is currently exploring utilizing AI to improve its infrastructure configuration, improving efficiency and, as a result, boosting operational performance, reliability, and scalability and reducing costs. It plans to merge energy optimization technology and integrate more high-performance power or air-conditioning equipment (e.g., transformer, uninterruptible power supply, variable speed pump and fan, and cooling water tower). On the software level, the company is endeavoring to utilize AI and the Internet of Things to enhance the temperature control of its hot and cool aisle to upgrade cooling efficiency and ensure optimal operating temperatures. Upon recognizing the colder temperature of its data center, the company is deploying more hot air control boxes with higher temperature set points in its cold aisle to optimize its temperature.

Moreover, Chunghwa Telecom frequently upgrades its content management system, facilitating frictionless access for customers to monitor and manage their racks or cabinets. The company is enhancing the customer-facing platform to improve usability and boost overall user experience.

Green Strategy

> *"Chunghwa Telecom demonstrates that innovation and sustainability can go hand in hand, delivering eco-friendly solutions without compromising performance or reliability. Its green data center sets the standard for sustainable infrastructure, combining state-of-the-art technology with a deep commitment to environmental responsibility. Furthermore, their ability to use immersive technologies such as AI and Big Data to develop monitoring and detection systems advances its data center to achieve greater operational efficiency."*
>
> *- Kriti Yadav*
> *Industry Analyst*

Being part of an energy-intensive industry, Chunghwa Telecom deeply understands its impact on the environment and pledges to shift entirely to renewable energy by 2030. The company's green strategy aligns with its customers' environmental sustainability agenda, as evidenced by the growing demand from hyperscalers and enterprises for greater measures by providers to drive operational efficiency and reduce power and water usage overall, including in the topology and infrastructure layers.

Among its green initiatives (in addition to optimizing its infrastructure), in 2022, Chunghwa Telecom conducted a major green power procurement drive. The company reportedly purchased 22 million kilowatt-hours (kWh) of renewable energy, including onshore wind power and solar photovoltaics. Chunghwa Telecom announced plans to buy 62 million kWh in 2023 and increase the amount purchased annually. Besides purchasing most of its renewable energy from third-party sources to reach its 2030 goal, Chunghwa Telecom is also exploring partnerships to generate its own renewable energy in the coming years. As of 2022, the company claims 10% of its data centers' power derives from renewable sources.

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Positioned for Growth

Chunghwa Telecom demonstrates high growth potential, with a proven track record of successful hyperscale data center deployments. In 2022, the company reported a high double-digit colocation revenue growth, driven mainly by United States-based hyperscalers. Among its customer wins in the same year are also a global search engine leader, a leading software company, and a major over-the-top player. One of the company's growth strategies is to scale alongside its customers, leveraging the expansion scope and plans of hyperscalers in the coming years.

Besides building on its excellent relationship with its existing customers, Chunghwa Telecom is driving growth with customer-centric offerings. For example, the company is developing a metered power billing program to provide customers with more flexible billing options. The company also continuously introduces promotional packages that include integrated one-stop services and solutions catering to various industries' needs and customer bases. With its extensive expertise, best-in-class capabilities, and

customer-oriented approach, Frost & Sullivan believes Chunghwa Telecom is well-positioned to drive the data center services space into its next growth phase, capturing market share and sustaining its leadership in the coming years.

Conclusion

Data centers in Taiwan are facing increasing demands from customers, primarily hyperscalers. Besides best-in-class data center solutions and services, there is a growing emphasis on data center providers to align with their customers' environmental sustainability goals. Optimizing operational efficiency, reducing power and water wastage, and employing renewable energy to power data centers are equally important to customers as high data reliability, scalability, security, and cost-effective solutions.

Frost & Sullivan applauds how Chunghwa Telecom tackles these challenges by continually exploring ways to integrate artificial intelligence to improve data center efficiency, enhance operational performance, data reliability, and scalability, gain better temperature control, and reduce costs. On the environmental sustainability front, Chunghwa Telecom pledges to completely shift to renewable energy by 2030. The company has started transforming from fossil fuel to renewable energy, purchasing green power from third parties to power 10% of its data centers, with more renewable energy procurement in its pipeline. Chunghwa Telecom is also looking into forming partnerships to produce its own renewable energy in the coming years. With its strong overall performance, Chunghwa Telecom earns Frost & Sullivan's 2023 Taiwan Company of the Year Award in the data center services industry.

What You Need to Know about the Company of the Year Recognition

Frost & Sullivan's Company of the Year Award is its top honor and recognizes the market participant that exemplifies visionary innovation, market-leading performance, and unmatched customer care.

Best Practices Award Analysis

For the Company of the Year Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Visionary Innovation & Performance

Addressing Unmet Needs: Customers' unmet or under-served needs are unearthed and addressed by a robust solution development process

Visionary Scenarios Through Mega Trends: Long-range, macro-level scenarios are incorporated into the innovation strategy through the use of Mega Trends, thereby enabling first-to-market solutions and new growth opportunities

Leadership Focus: Company focuses on building a leadership position in core markets and on creating stiff barriers to entry for new competitors

Best Practices Implementation: Best-in-class implementation is characterized by processes, tools, or activities that generate a consistent and repeatable level of success

Financial Performance: Strong overall business performance is achieved in terms of revenue, revenue growth, operating margin, and other key financial metrics

Customer Impact

Price/Performance Value: Products or services provide the best value for the price compared to similar market offerings

Customer Purchase Experience: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

Customer Ownership Experience: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

Customer Service Experience: Customer service is accessible, fast, stress-free, and high quality

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty

About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at http://www.frost.com.

The Growth Pipeline Engine™

Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fuelled by the Innovation Generator™.

Learn more.

Key Impacts:

- **Growth Pipeline:** *Continuous Flow of Growth Opportunities*
- **Growth Strategies:** *Proven Best Practices*
- **Innovation Culture:** *Optimized Customer Experience*
- **ROI & Margin:** *Implementation Excellence*
- **Transformational Growth:** *Industry Leadership*

The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

Analytical Perspectives:

- **Mega Trend (MT)**
- **Business Model (BM)**
- **Technology (TE)**
- **Industries (IN)**
- **Customer (CU)**
- **Geographies (GE)**