



中華電信
Chunghwa Telecom

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TECHNOLOGY
INNOVATION
LEADER

*Enhancing Customer Impact Through
Powerful Technology Integration*

*RECOGNIZED FOR BEST PRACTICES IN THE
TAIWANESE 5G INDUSTRY*

F R O S T & S U L L I V A N

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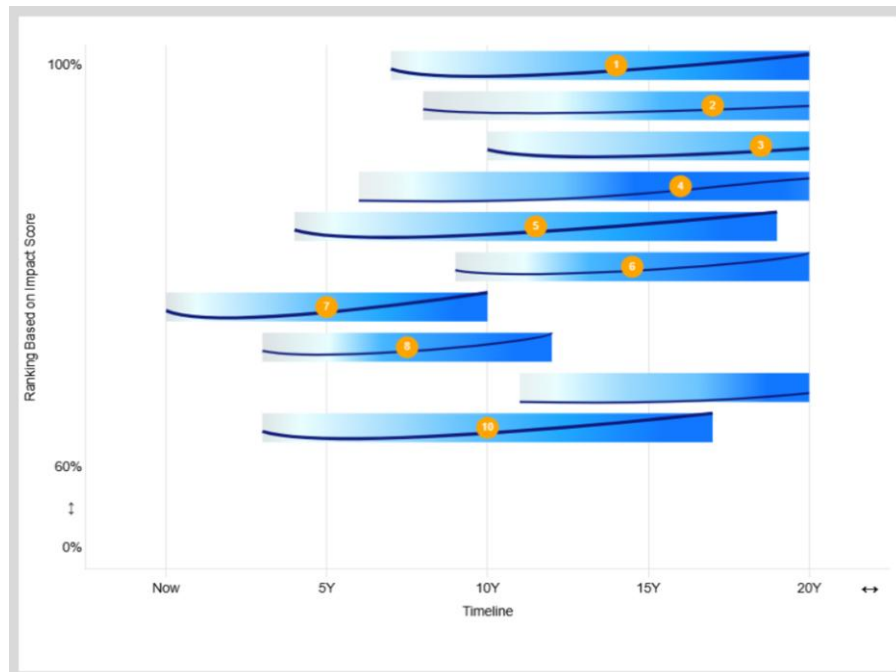
Best Practices Criteria for World-class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each recognition category before determining the final recognition 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 5G space.

RECOGNITION CRITERIA	
<i>Business Impact</i>	<i>Technology Leverage</i>
Financial Performance	Commitment to Innovation
Customer Acquisition	Commitment to Creativity
Operational Efficiency	Stage Gate Efficiency
Growth Potential	Commercialization
Human Capital	Application Diversity

Top Transformations Impacting Growth in the 5G Industry

Rank	Strategic Imperative	Timeline	Impact (%)	Impact Curve
1	Geopolitical Chaos Impact of trade tariffs on EV charging component costs	2031 - 45	87	Exponential
2	Transformative Mega Trends Rise of autonomous electric fleets in urban areas	2032 - 50	84	Polynomial
3	Industry Convergence Telecommunications and automotive sectors partnering for connected EV ecosystems	2034 - 51	77	Exponential
4	Transformative Mega Trends Government mandates for green public transportation systems	2030 - 50	76	Logistic
5	Competitive Intensity Entry of tech giants into the EV charging market	2028 - 43	72	Exponential
6	Geopolitical Chaos Political instability affecting infrastructure investments in certain regions	2033 - 44	68	Polynomial
7	Disruptive Technologies Development of ultra-fast charging technology reducing charge times to minutes	2024 - 34	67	Exponential
8	Internal Challenges Legacy IT systems hindering integration with modern e-mobility solutions	2027 - 36	64	Polynomial
9	Industry Convergence Integration of EV charging with renewable energy projects	2035 - 54	62	Logistic
10	Compression of Value Chains Direct manufacturer to consumer sales bypassing traditional dealerships	2027 - 41	61	Exponential



Commitment to Innovation and Creativity

By combining in-house technical expertise with innovation from technology partners, such as Nokia and Ericsson, technological innovator Chunghwa Telecom delivers several creative and key features. First, ultra-high-speed transmission. Through its collaboration with Nokia, the company has implemented 5G NR carrier aggregation, effectively combining multiple frequency bands to break past traditional bandwidth limits. This allows it to achieve Taiwan's record 5G download speed of 2.34 Gbps, enabling advanced applications such as ultra-high-definition (UHD) video, metaverse experiences, and generative AI, which all require massive data throughput and ultra-low latency.

Second, intelligent network management. By integrating AI and digital twin technologies into mobile network operations, Chunghwa Telecom developed predictive systems that anticipate congestion and dynamically optimize resources in real time. For example, during major national events with heavy traffic loads, the company successfully increased 5G capacity by more than 14%, ensuring seamless and stable connectivity for all users—something that static network setups are not able to achieve.

Third, smart energy-saving solutions. Chunghwa Telecom applies advanced AI, machine learning, and big data modeling to intelligently monitor and optimize energy use across mobile networks. Features such as automated deep sleep mode, where equipment powers down when not transmitting data, help the company achieve more than 30% in energy savings without compromising on performance, enhancing both operational efficiency and sustainability. Ultimately, a measure of success lies in how the company integrates these advanced technologies into a large-scale, intelligent, and sustainable mobile network and distinguishes itself by offering unmatched performance and adaptability.

Separately, Chunghwa Telecom leverages emerging technologies, including 5G, AI, and AIoT, to address key unmet needs and technological gaps in environmental conservation, particularly in real-time ecological monitoring, automated data collection, and rapid response to environmental threats, where traditional manual methods have not resolved challenges. Traditional conservation efforts face limitations such as inadequate workforce and coverage, labor-intensive tasks (e.g., time-consuming manual observation), and limited scope. There is also a lack of real-time monitoring ability, and data processing and response are slow. Without continuous surveillance capabilities, it is difficult to detect sudden environmental disturbances or changes as they happen. Depending on humans for manual data collection and processing hinders timely interventions.

Understanding that 5G and AI technology can directly address these gaps in environmental conservation, Chunghwa Telecom launched Taiwan's 1st black-faced spoonbill AI smart monitoring system powered by

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Mei Lee Quah,
Senior Director, ICT Research

5G technology, AI recognition algorithms for automated real-time identification of bird populations, and electronic fence technology to detect and alert of external disturbances. This system reduces the need for human intervention with 24/7 habitat monitoring, facilitating instant responses to potential threats and providing an innovative, scalable solution for biodiversity conservation. The system fills the gaps left by traditional conservation methods and offers a cutting-edge technological solution that ensures better protection of endangered species and ecosystems.

Moreover, Chunghwa Telecom has embraced its new vision of Chunghwa AI Ignites The Future with the objective of leading in AI technology and its applications. To achieve this, the company plays 2 major roles: first, as an enabler that provides computing power services, and second, as co-creator that assists in the development of AI applications. These roles promote digital transformation and net-zero transformation across various industries, enhancing operational synergies and strengthening industrial competitiveness. Internally, the company applies AI to optimize network performance, automate operations, and improve customer experiences, enabling more efficient 5G service delivery. Externally, the company is building robust AI infrastructure, including AI data centers, submarine AI services, and hybrid cloud solutions to support advanced 5G use cases such as digital twins and industry-specific applications. Chunghwa Telecom also works with academic institutions, cloud partners, and industry leaders to accelerate AI-powered 5G innovation. The synergy between AI and 5G will be central to its long-term revenue growth strategy.

Commercialization

Chunghwa Telecom has achieved significant progress in the commercialization of emerging technologies, including 5G, AI, and IoT. 5G’s high-speed and low-latency capabilities provide stable network support for AI applications, making for smoother, real-time interactive experiences. With network slicing technology enabled on the company’s 5G standalone (SA) network using Ericsson's Dynamic Network Solution (EDNS), facilitating large-scale events with the necessary 5G mobile network resources becomes possible. The

solution was validated in 2024 through various real-world applications. The results are not only making an impact on markets but also demonstrating cross-industry application potential. Chunghwa Telecom has made significant progress in the commercialization of 5G technologies and also played a key role in Taiwan in demonstrating the potential of 5G across various sectors.

Chunghwa Telecom's partnership with the Chiayi City Museum is a standout achievement where it launched Taiwan's 1st 5G city model interactive experience. By combining a robust 5G network and AI technology, Chunghwa Telecom transformed static city model exhibits into dynamic interactive experiences. Visitors engage with these models through their smartphones or other devices, enriching their understanding of Chiayi City's culture and history. Integrating 5G technology with cultural activities to create mixed reality (MR) immersive experiences represents an important step toward enabling cultural technological development. This application not only enhances museum experiences but also demonstrates the potential for 5G technology to transform cultural education. It allows visitors to explore and learn about various historical, artistic, and scientific topics in the museum in a more immersive way. In the future, the application's use can be expanded to other museums, cultural institutions, educational sectors, and even the broader tourism industry, creating significant commercial value and future growth opportunities.

Another standout achievement happened during the Metaverse Marathon in Tainan, where network slicing ensured uninterrupted live streaming and stable 5G mobile network connectivity, demonstrating the potential of 5G networks in large-scale, high-demand events. Chunghwa Telecom used Ericsson's dynamic network slicing solution at the event to ensure the automatic configuration of optimal network slices and deliver stable, high-quality live streaming experiences even during crowded gatherings.

Application Diversity

Chunghwa Telecom employs a diversified strategy for technology, application, and adoption, enabling technology to play an important role across different product lines and a wide range of application scenarios. For example, in 5G technology applications, the company has actively driven the widespread deployment of 5G and developed multiple innovative applications built on this foundation. Across product lines, 5G technologies integrate into smart city solutions, intelligent transportation systems, telemedicine platforms, and industrial automation solutions. These applications leverage 5G capability, that is, high-speed and low-latency connectivity, to produce real-time outcomes. Given its expertise in ICT solutions, Chunghwa Telecom offers comprehensive solutions that include cloud services, data center resources, and IoT management solutions for enterprises. These technologies are widely embedded in cloud products, enterprise digital transformation services, and large-scale enterprise and government projects, helping enterprises strengthen their operational efficiency.

In AI technology applications, Chunghwa Telecom has internally implemented AI technology for data analysis to help executives better understand market trends and optimize business strategies. Externally, the company has applied AI to drive industry innovation, such as integrating AI image recognition into traffic management products for real-time monitoring, violation detection, and accident reduction. The company's core technologies possess a high degree of flexibility and adaptability, allowing them to be employed across diverse product lines and applications to drive innovation, improve efficiency, and create more value across industries.

As an integrated telecom service provider, Chunghwa Telecom is committed to building comprehensive network resilience across sea, land, and sky. The company continues to expand submarine cable and microwave capacity between Taiwan's main island and surrounding islands. In addition to offering nationwide coverage with Eutelsat OneWeb's low earth orbit (LEO) satellites and being the exclusive agent

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for SES medium earth orbit (MEO) satellites, the company successfully integrated the ST-2 geostationary earth orbit (GEO) satellites with its 5G mobile network in January 2025 based on the 3GPP 5G New Radio for Non-Terrestrial Network (NR NTN) standard. Chunghwa Telecom has also partnered with Astranis to launch Taiwan's 1st GEO small satellite in 2025. The company utilizes multi-orbit satellite communication to ensure consumers remain connected during disasters, especially in remote areas, and enterprises benefit from the continuous operation of data

centers and critical networks even in extreme conditions.

While 5G technology has demonstrated immense potential across various fields, it still faces challenges related to infrastructure construction, equipment development, and cross-industry collaboration. As the technology matures and application scenarios diversify, Chunghwa Telecom anticipates that these innovative services will be rapidly commercialized in the coming years; in particular, the company sees significant market potential in smart cities, enterprises, private networks, and smart health care.

Growth Potential

Chunghwa Telecom is committed to driving stable growth in revenue and profits as well as establishing a solid presence in emerging markets and new technologies. Striving to be Always Amazingly Ahead, the company is looking forward to steady growth over the next 1-2 years.

On the back of consistent growth in 5G subscriptions and revenue, the company has worked hard to transform to leverage its growth momentum, focus on technological innovation, and pursue strategic investments. With a stronger brand image, reinforced customer loyalty, and leadership in 5G SA and AI technology backed by strong mobile network infrastructure, the company is well-positioned to meet the evolving needs of consumers and enterprises. Its lineup of new services and applications will drive consumer segment monetization and customer experience as well as enterprise segment demand for enterprise-specific solutions. Gamers will benefit from a smooth and seamless gaming experience.

In the consumer and home markets, the company partnered with Pokémon Go to set up poke stops at 205 Chunghwa Telecom service centers across Taiwan, allowing people to enjoy capturing Pokémon while at the store. In the enterprise market, the company collaborated with KKBOX, a Taiwanese music streaming service, and introduced the 5G AI parallel space performance stage at the 20th KKBOX Music Awards. 5G SA was combined with network slicing capability to intelligently allocate mobile network resources for the AI interactive stage, ensuring sufficient 5G bandwidth in the crowded Kaohsiung arena. The event offered an enhanced customer experience and successfully attracted 2.8 times more viewers on the Hami Video platform in 2024 compared to 2023.

Chunghwa Telecom seeded future growth by strengthening its global partnerships. The company is working closely with Singtel and Advanced Info Service (AIS) to drive technological advancements and industrial digitalization in Taiwan by leveraging 5G, AI, and edge computing technology. The company's technological support, including 5G private network solutions for enterprises, will help enterprises develop and commercialize new applications, including smart cities, smart health care, smart transportation, smart energy, smart security, and smart building applications. To date, Chunghwa Telecom has helped many enterprises accelerate their digital and net-zero transmission initiatives with 5G private networks. These solutions not only enhance customer experiences but also help enterprises improve their competitiveness and create win-win outcomes across industries.

Human Capital

Chunghwa Telecom reinforces its strong customer-centric culture by treating employees as its internal customers and focusing on their needs and job satisfaction. Elements of its customer-centricity strengthen its human capital strategy, with the company emphasizing that employees are its most valuable asset.

The company has taken several steps to build a family-friendly workplace that boosts employees' sense of belonging and commitment. By directly boosting morale and improving retention rates, the company lays the foundation for stable operations and long-term growth. Internally, the workplace happiness index among employees rose to 89.84 points in 2024, up by 7.04 points from 82.8 points in 2022, clearly indicating employees' satisfaction has risen with the company's strategic initiatives. In 2023, the company received external recognition from the CommonWealth Parenting Magazine and was honored with the Gold Award for Happiness Enterprise and the Friendly Family Workplace awards. In 2024, it achieved 1st place in the large enterprises service sector at the CommonWealth Talent Sustainability Award.

In addition, the company is committed to creating a diverse, equal, and inclusive workplace that promotes happiness and offers benefits that go beyond legal requirements to support employees' career development and personal lives. In terms of employee training and development, the AGLOW framework, which stands for attraction, growth, leadership, opportunity, and winning, is applied to program design across all levels to help employees upgrade their skills and seek career progression. The company has also implemented child-rearing working hours for new parents, workplace mutual aid, a childcare service center, and the All-Aged Employee Care Program, catering to diverse employee needs across age groups. Thus, Chunghwa Telecom helps employees balance their family lives and career development, enabling them to work confidently while raising children; the company also helps senior employees as they age.

In terms of compensation and benefits, several salary adjustment initiatives have been implemented, including salary increments greater than 3%, additional meal and transportation allowances, and a one-time performance bonus, to ensure employees are fairly compensated for excellent performance. As a proactive measure, the company conducts annual employee engagement and happiness surveys to understand how employees perceive the company, work environment, leadership, culture and diversity, and inclusion efforts. Based on survey results, improvement plans are developed so the company is constantly raising the bar in nurturing its greatest asset.

Conclusion

Chunghwa Telecom's approach to pushing boundaries and meeting its commitment to building comprehensive network resilience across sea, land, and sky through technology-based innovation is commendable. The company combines internal technical expertise with tools and solutions from external technology providers to meet the evolving needs of consumers and enterprises. In doing so, it has made significant progress in commercializing 5G technologies and played a key role in demonstrating 5G's potential across various sectors in Taiwan.

With its strong overall performance, Chunghwa Telecom earns Frost & Sullivan's 2025 Technology Innovation Leadership Recognition in the Taiwanese 5G industry.

What You Need to Know about the Technology Innovation Leadership Recognition

Frost & Sullivan's Technology Innovation Leadership Recognition is its top honor and recognizes the market participant that exemplifies visionary innovation, market-leading performance, and unmatched customer care.

Best Practices Recognition Analysis

For the Technology Innovation Leadership Recognition, Frost & Sullivan analysts independently evaluated the criteria listed below.

Technology Leverage

Commitment to Innovation: Continuous emerging technology adoption and creation enables new product development and enhances product performance

Commitment to Creativity: Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

Stage Gate Efficiency: Technology adoption enhances the stage gate process for launching new products and solutions

Commercialization: Company displays a proven track record of taking new technologies to market with a high success rate

Application Diversity: Company develops and/or integrates technology that serves multiple applications and multiple environments

Business Impact

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

Customer Acquisition: Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

Operational Efficiency: Company staff performs assigned tasks productively, quickly, and to a high-quality standard

Growth Potential: Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

Human Capital: Leveraging innovative technology characterizes the company culture, which enhances employee morale and retention

Best Practices Recognition Analytics Methodology

Inspire the World to Support True Leaders

This long-term process spans 12 months, beginning with the prioritization of the sector. It involves a rigorous approach that includes comprehensive scanning and analytics to identify key best practice trends. A dedicated team of analysts, advisors, coaches, and experts collaborates closely, ensuring thorough review and input. The goal is to maximize the company's long-term value by leveraging unique perspectives to support each Best Practice Recognition and identify meaningful transformation and impact.

VALUE IMPACT			
STEP		WHAT	WHY
1	Opportunity Universe	Identify Sectors with the Greatest Impact on the Global Economy	Value to Economic Development
2	Transformational Model	Analyze Strategic Imperatives That Drive Transformation	Understand and Create a Winning Strategy
3	Ecosystem	Map Critical Value Chains	Comprehensive Community that Shapes the Sector
4	Growth Generator	Data Foundation That Provides Decision Support System	Spark Opportunities and Accelerate Decision-making
5	Growth Opportunities	Identify Opportunities Generated by Companies	Drive the Transformation of the Industry
6	Frost Radar	Benchmark Companies on Future Growth Potential	Identify Most Powerful Companies to Action
7	Best Practices	Identify Companies Achieving Best Practices in All Critical Perspectives	Inspire the World
8	Companies to Action	Tell Your Story to the World (BICEP*)	Ecosystem Community Supporting Future Success

*Board of Directors, Investors, Customers, Employees, Partners

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 Generator™

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:

- Megatrend (MT)
- Business Model (BM)
- Technology (TE)
- Industries (IN)
- Customer (CU)
- Geographies (GE)

