

## GSMA 5G TRANSFORMATION HUB

The world's most innovative 5G solutions



# 5G Catalysing for Digital Revolution in the Cement Industry

The Siam Cement Public Company Limited

In a collaborative initiative, The Siam Cement Public Company Limited, alongside AIS, Huawei, Yutong, and Waytous, is driving forward the development of a self-driving transportation system. The aim of this groundbreaking project is to enhance the transport of raw materials, with a particular focus on improving route planning and ensuring continuous, quick, and safe connections between vehicles.

Leveraging the unparalleled capabilities of 5G technology—including high speed, low latency of under 20ms, and the ability to connect a vast array of sensors—the platform meticulously controls the command signals across Siam Cement's multiple route sites.

Simultaneously, the project highlights the importance of workplace safety, particularly in hazardous jobs, by leveraging advanced 5G-powered self-driving systems. Furthermore, with a commitment to environmental sustainability, the solution utilises precise travel planning technologies and environmentally friendly electric vehicles (EV Trucks), making it a benchmark for industry-wide adoption.






# 5G Catalysing for Digital Revolution in the Cement Industry

## ⊕ CHALLENGE:

 Mining areas, often situated in remote regions, suffer from a lack of reliable cellular connectivity, making radio communication the primary operational medium. However, this mode of communication is often impractical and ineffective. Moreover, the hazardous nature of mining work has led to a scarcity of skilled workers willing to work in such environments. Furthermore, mining activities heavily rely on fuel, a nonrenewable resource that contributes to air pollution and incurs high costs.

## ⊕ SOLUTION:

 The solution leverages 5G technology to improve mining operations, focusing on two main areas. Firstly, the implementation of Autonomous Electric Vehicles (EVs) allows for unmanned transport of raw materials. Equipped with sensors for obstacle and collision detection, these EVs can also automatically navigate to charging stations when their battery levels drop below a set threshold.

Secondly, an intelligent dispatching system harnesses 5G, cloud, and artificial intelligence technologies for optimisation and real-time dispatch of trucks. This boosts efficiency and safety while reducing waiting times through a dynamic assignment system.


## ⊕ IMPACTS AND STATISTICS:

 The 5G Smart Autonomous Vehicle solution has shown measurable positive impacts and outcomes. It's enabled fuel cost savings of between 65% and 100% while also reducing carbon dioxide emissions by 35%. In addition to environmental benefits, it has also enhanced safety in the workplace and improved operational efficiency by over 20%.


## ⊕ WIDER IMPLICATIONS:

 The success of the 5G Smart Autonomous Vehicles Solution has broader implications and potential opportunities. The collaborative approach between OT, SI, and customers in crafting a solution that meets specific needs has proven effective and could serve as a model for similar initiatives. If adopted more widely or globally, this approach could drive significant changes in production quality and efficiency, pushing industries toward a 4.0 era. This innovation, thus, has strategic importance not only within its initial context but also in a broader industrial and societal sense.

## ⊕ STAKEHOLDERS:

 Siam Cement Public Company Limited, AIS, Huawei, Yutong, and Wayouts

## SOURCES AND FURTHER INFORMATION

 Please visit <https://business.ais.co.th/>  
Or email us at [business@ais.co.th](mailto:business@ais.co.th)



# Accelerating Autonomous Transportation Goals with 5G

## The Necessity and Superiority of 5G in Autonomous Vehicle Operations

5G, with its Ultra-Reliable and Low-Latency Communication (URLLC) capabilities, is a catalyst in the realisation of mission-critical services such as autonomous vehicles. The unparalleled reliability and latency of less than two-digit milliseconds ensure real-time communication between autonomous trucks, corresponding mining equipment, and control systems, bolstering safety and efficiency in transportation.

Moreover, 5G allows for the simultaneous connection and data transmission of a massive number of devices with sustained reliability. This means all autonomous vehicles within the mine can operate concurrently with optimal efficiency, demonstrating why 5G is necessary and unrivalled for this application compared to alternative technologies.

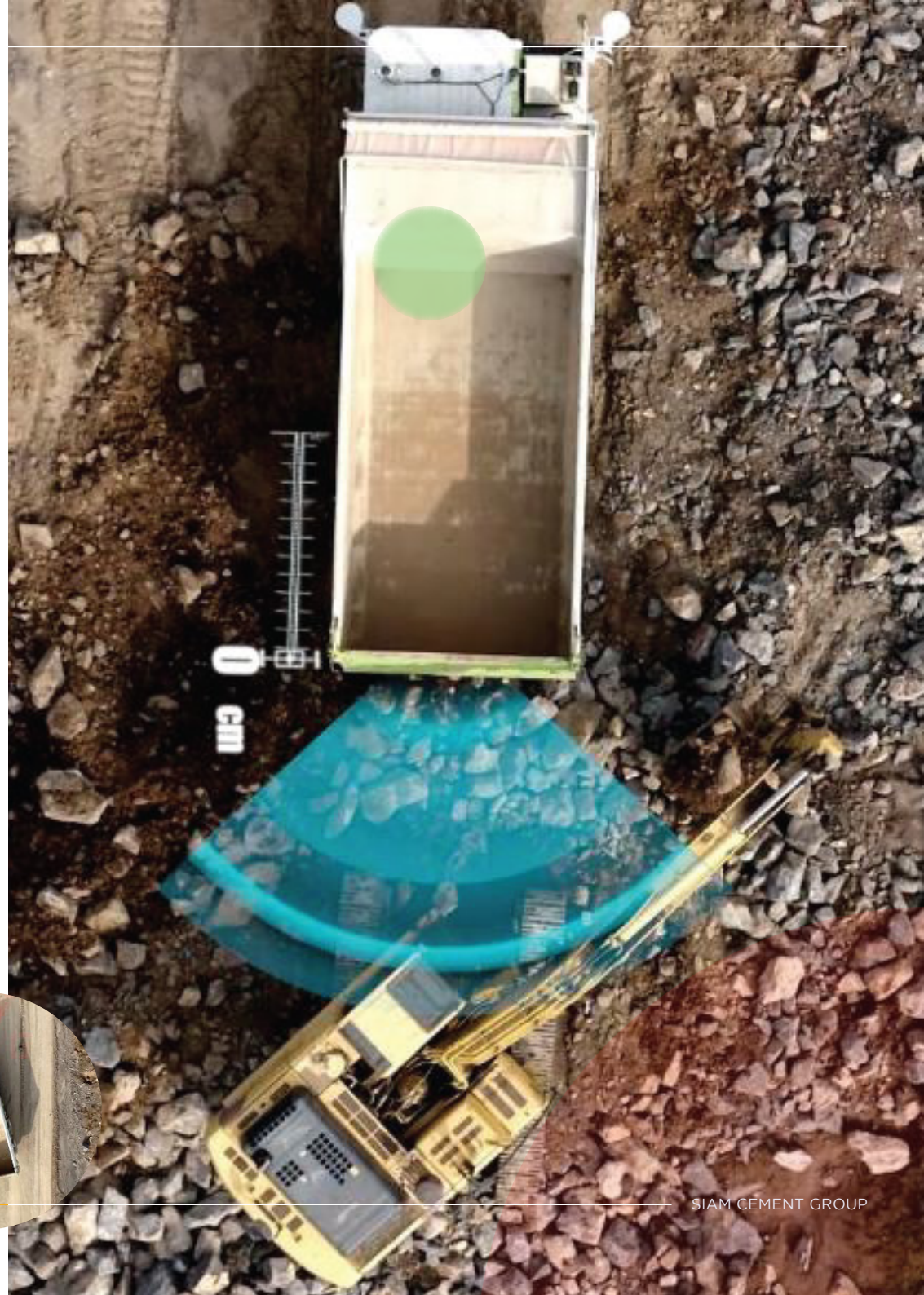


# Leveraging Autonomous Vehicles for Efficient and Safer Mining Operations

## Implementing a Tech-Driven Approach to Overcome Challenges and Optimise Efficiency

The solution's transformative impact is focused on addressing SCG's pain points and transitioning from human-driven operations to more digital and technology-driven processes. This shift is made possible with the use of unmanned autonomous trucks, which can operate and interact with the intelligent dispatching system, thereby unlocking the limitations imposed by human labour in complex environments. Conditions such as extreme heat or rain do not hinder these trucks, enabling 24-hour, three-shift continuous operations with enhanced safety and efficiency.

The project faced a significant challenge due to the location of operations being in a suburban area with no wireless communication options beyond radio. This problem was solved by setting up a dedicated 5G private network, ensuring all services run smoothly and privately in the mine.



# Rising Demand for 5G in Asia Pacific

## Exponential Growth and Enterprise Adoption in the Region

Market research firm, Frost & Sullivan, anticipates a significant surge in the 5G sector within the Asia Pacific region. The projections indicate that 5G growth will increase from \$2.13 billion in 2020 to an astounding \$23.89 billion by 2025, representing an impressive compound annual growth rate (CAGR) of 62.2%.

Observing this trend, we foresee a high rate of 5G adoption among enterprises. This is largely due to the role of 5G technologies, such as network slicing and private networks, in delivering 5G services. A case in point is the transformation of Somboon Advance Technology towards Industry 4.0, a process in which 5G was instrumental.

The trend is not isolated to mining alone; a significant number of enterprises in the region are focused on transitioning into smart factories. The adoption of digital transformation and Industry 4.0 practices are becoming increasingly commonplace, creating a robust demand for 5G in the Asia Pacific region.



# Lessons from this 5G Implementation

## Ecosystem Building as a Key Success Factor

Through observations of various use cases, it is noticed that building a strong ecosystem is an integral part of project development within the Asia Pacific region. The support of all stakeholders in this ecosystem greatly facilitates the adoption of technology within the business environment.

This can serve as a vital lesson for other regions, emphasising the importance of establishing a collaborative ecosystem when implementing 5G technology. The collective support of all involved parties can significantly accelerate technological adoption, consequently driving business transformation and progress.



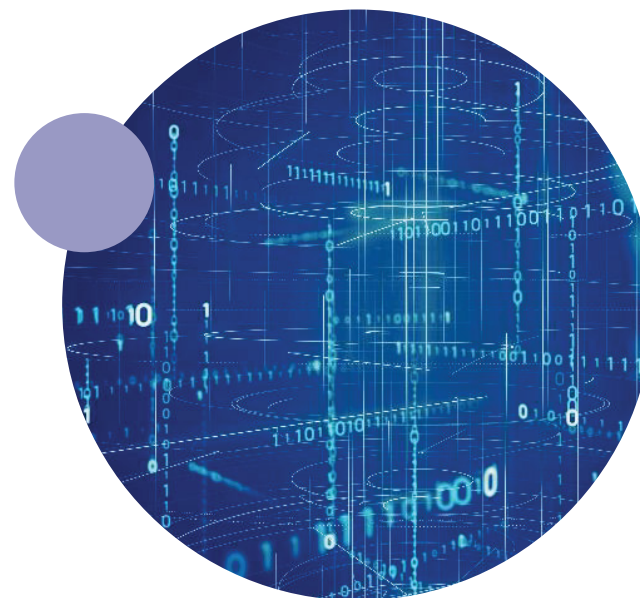
# The Future of 5G in Asia Pacific

## Emerging Trends and the Impact of Standalone 5G

In the past two to three years, we've observed an increasing awareness amongst both private and public sector organisations about the potential benefits of implementing 5G technology in their operations. Many have embarked on trials with various use cases, from predictive maintenance and autonomous drones to remote training. A number of these use cases have even entered commercial stages, with smart factories and smart green mining being prominent examples.

These success stories have established a blueprint for effective collaboration within the 5G ecosystem, encouraging others to transition from experimental trials to full-scale commercial applications. As such, we anticipate a continued trend of increasing 5G adoption across various sectors in the Asia Pacific region, bolstered by the introduction of standalone 5G and its transformative potential.

***"With an anticipated 18% CAGR for smart manufacturing IoT connections between 2021 and 2030, Industry 4.0 and IoT deployments are primed to drive significant industrial transformation."***



## About the GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry, and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

For more information, please visit the GSMA corporate website at [www.gsma.com](http://www.gsma.com).

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## GSMA 5G Transformation Hub

The GSMA 5G Transformation Hub is a source of information on some of the most innovative 5G solutions in the world. This portal contains case studies detailing design, benefits, key players, measured value and the future impact of scaling up these 5G solutions worldwide. The 5G Era is now firmly established and this family of standardised GSM technologies, including mmWave, are being rolled out successfully across the globe. The GSMA 5G Transformation Hub, launched at MWC Barcelona in 2022, provides details of how 5G is best placed to deliver real value for a range of key sectors including manufacturing, energy, transportation, media and live entertainment, smart cities and construction.. Many more case studies will be added, in the coming months, covering even more industries and the GSMA is asking Members to nominate innovative 5G case studies to add to this global digital showcase. The 5G Transformation Hub and this particular Case Study are both sponsored by Qualcomm.

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## About this case study

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