



Asia-Pacific
Economic Cooperation

The Innovating for Public Urban Technology Transformation (INPUT2) Competition Report

APEC Policy Partnership on Science, Technology and Innovation

April 2024





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**APEC Policy Partnership on Science, Technology and
Innovation**

April 2024

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Produced by

Dun Xiaoyue
Shanghai Pudong International Exhibition Co., Ltd.
11/F, SK Building, No.149 Youcheng Road, Pudong New Area
Shanghai 200126

For
Asia-Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@apec.org
Website: www.apec.org

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Executive Summary

*“Conceive is the soul of innovation;
creativity is the source of innovation;
talent is the basis of innovation.”*

Prof C.C. Chen
INPUT2 Experts’ Panel Chair



Today, we are witnessing an unprecedented wave of innovation in the rise of science and technology in many fields, such as artificial intelligence, Internet of Things, new sources of energy, autonomous vehicles, virtual reality, space tourism, etc.

Conceive is the soul of innovation, creativity is the source of innovation, and talent is the basis of innovation. A successful innovation ecosystem cannot be separated from the concepts of freedom, openness, cooperation and inclusiveness, as well as fair market competition, intellectual property protection, and strong support from the network and big data.

The APEC Innovating for Public Urban Technology Transformation Competition (INPUT2) aims to advance toward a more prosperous Asia-Pacific region by fostering innovation through technology.

Within this report's pages, you will find briefings on outstanding solutions submitted to the competition, each earning critical acclaim and industry commendation for their notable contributions to the rapidly advancing domains of green economy, sustainable transport, and livable cities.

From the launch of the competition on 1 April 2023 to the deadline on 30 September 2023, the organizing committee received a total of 108 initial applications, ultimately accepting a total of 108 full entries from economies including China; Hong Kong, China; Malaysia; Mexico; Peru and Thailand.

This year's competition resulted in the APEC PPSTI Prize for Science & Technology Innovation (APSTI), including 3 Gold Awards, 3 Silver Awards, 5 Best Practice Awards, 5 Best Innovative Awards, 1 Best Inclusion Award, 1 Start-up Award, 12 Excellence Awards, and 10 Finalist Awards, totaling 40 awards.

The INPUT2 Report aligns with APEC's strategic priorities, serving as a channel for member economies to exchange knowledge and expertise. It concentrates on integrating new and innovative technologies and methodologies in the realms of green economy, sustainable transport, and livable cities, aiming to progressively benefit the APEC region and the world in general.

This report encapsulates cutting-edge innovations, breakthrough research, inspiring success stories, and insightful examples. Taken together, these

winning applications have the potential to make a significant impact on promoting the development of sustainable and livable cities within APEC member economies.

Executive Summary

“A good city should be nature friendly and community-centric at its core. ”

Prof Kim Won-soo
INPUT2 Experts' Panel Vice Chair



Throughout history, cities have been a primary place for human activities. They are repositories for capital and technology as well as for art and culture. And they grow into not just economic hubs, but also embodiments of human civilization. Rome and Beijing were the beating hearts of the world during the agricultural age, just as London and New York were during the industrial age. Yet over time, industrial development has turned the cities into dangerous culprits that now threaten our survival as a species.

The industrial revolution brought about an unprecedented explosion of cities, which are at the crux of the current crises. Cities are the chief emitters of greenhouse gases that cause global warming. Not only that, the growing inequality in urban areas is crushing the dreams of young people, while leaving aging populations vulnerable.

Good cities can change all that. A good city should be nature-friendly and community-centric at its core. This means it must benefit humans as well as the planet we inhabit. In doing so, a city can be small and networked. Small can be beautiful. It also can be free of all the afflictions of a crowded megacity, yet capable of providing the intimate and nimble advantages of a closely-knit community.

A departure from the traditional megacity model, these small and networked cities offer a promising solution. They present a harmonious blend of human well-being and environmental stewardship. By being nature-friendly and community-centric at their core, these cities strive to balance the needs of inhabitants with the health of our planet. This approach not only mitigates the environmental impact but also ensures that the benefits of urban development are shared by all generations.

I am very pleased to see that this competition is calling for solutions that will take us one step closer to small, beautiful, and connected cities. As outlined in a recent UN report on cities, the importance of advocating for diversity, economic resilience, governance, and sustainability in urban areas cannot be overstated.

In essence, the competition's call for solutions aligns with a broader vision - one that envisions cities not only as economic centers but as resilient, inclusive, and sustainable ecosystems. Through innovative approaches and

thoughtful design, we can forge a path toward cities that not only survive but thrive, fostering a better quality of life for all.

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Introduction



The APEC Innovating for Public Urban Technology Transformation Competition (INPUT2) aims to drive economic recovery in the post-pandemic era, attract innovations from various sectors, and provide a platform for market exploration and tech collaboration. It fosters Asia-Pacific collaboration for sustainable development and technological innovation, gathering diverse solutions for urban sustainability.

Established in 1989, the Asia-Pacific Economic Cooperation is an essential organization for the promotion of economic integration in the Asia-Pacific region. The APEC Policy Partnership on Science, Technology and Innovation aims to advance innovative scientific and technological cooperation and exchange.

Its strategic aims encompass fostering the market adoption of innovations, boosting innovation prowess, encouraging collaborative innovation among members, shaping a market-oriented landscape favorable to innovation, driving economic expansion, facilitating trade and investment, and realizing social harmony and sustainable development.

Officially endorsed by APEC PPSTI, the INPUT2 Competition is a project of the China Ministry of Science & Technology managed in collaboration between Shanghai Council for the Promotion of International Trade (CCPIT Shanghai) and Chinese Academy of Sciences Innovation Cooperation Center (Bangkok).

It has been guided in the spirit of PPSTI to encourage scientific and technological innovation, focusing on the theme of "Innovation for Public Urban Technology Transformation". It was initiated in April 2023 with the solid backing of 5 APEC member economies. The Project's Proposing Economy is the People's Republic of China, and its Co-Proposing Economies are Hong Kong, China; Papua New Guinea; Russia; and Thailand.

The competition launching ceremony was held on 28 April 2023 in conjunction with the 6th Digital China Summit, which was strongly supported by the Digital Summit Organizing Committee. Fuzhou is a representative city of China's digital economy in recent years, and as a representative city of China, Fuzhou has selected some excellent works to participate in this year's INPUT2 competition, showcasing the development results of digital Fuzhou.



INPUT2 Competition launching ceremony on 28 April 2024

Through official channels of APEC, as well as industry and academic networks, the competition has garnered interest and support from APEC member economies such as Chile; China; Hong Kong, China; Malaysia; Mexico; Republic of Korea; Peru; the Philippines; Singapore; Thailand.

Meanwhile, the competition invited a panel of 13 experts from 6 economies, comprising representatives from government, industry institutions, research institutions, and businesses. These experts cover diverse fields such as public transportation, economic research, innovative project investment, artificial intelligence, industrial internet, digital healthcare, robotics, integrated energy, material science, physics engineering, digital transformation, business model innovation, information systems, green architecture, and ecological cities.

The expert panel, hailing from China; Hong Kong, China; Malaysia; Mexico; Peru, and Thailand reviewed 108 submissions from government departments, research institutions, industry associations, research universities, businesses, and non-profit organizations in the Asia-Pacific Economic Cooperation (APEC) region. After initial screening, 40 finalists entered the first round of evaluation. The final award list was determined through a voting process by the expert panel.

APEC PPSTI Prize for Science & Technology Innovation (APSTI), including 3 Gold Awards, 3 Silver Awards, 5 Best Practice Awards and 5 Best Innovative Awards; 1 Best Inclusion Award for the promotion of gender



The INPUT2 Competition Launching Ceremony

equality, inclusiveness and women's empowerment, as well as children's groups; 1 Start-up Award for encouraging sustainable development and business expansion capabilities of start-ups; 12 Excellence Awards and 10 Finalist Awards, totaling 40 awards.

All finalist teams and all participating applicants were invited to attend the 2024 APEC Urban Sustainable Development Conference for Science & Technology Innovation APEC (INPUT2) Competition Workshop at the conclusion of the competition. During this workshop, participants had the opportunity to engage in knowledge-sharing workshops, network with industry leaders, and explore collaborative opportunities in the realm of urban sustainable development. The event aimed to foster a dynamic exchange of ideas and insights among participants, contributing to the broader discourse on science, technology, and innovation within the APEC community.

The 2024 APEC Urban Sustainable Development Conference for Science & Technology Innovation APEC (INPUT2) Competition Workshop was held to great reception at the Shanghai International Convention Center on 10 January 2024. The event was adapted into a hybrid format to allow for online participation, with all international competition applicants, participants and supporters invited to attend through the official online event platform.



Expert Panel Members, Competition Finalists, and Organizers at the Conclusion of the Event

Three parallel workshops were held on the same day of the event, covering topics such as "Green and low-carbon transformation; Environmental governance and ecological protection; Urban low-carbon application scenarios", "Urban transportation and new energy applications; Transportation planning and intelligent transportation systems; Intelligent networking; Autonomous driving technology", "Digital Transformation and Urban Governance", and so on. Experts, scholars and industry leaders from all relevant fields were invited to share their views, and a total of 37 award-winning cases also appointed representatives to report and exchange views on the participating projects.

On the day of the event, the leaders of the implementing agencies of the competition, members of the expert panel, professional audience from various economies and other guests were also invited to the stage to present trophies and certificates to the 40 winning case teams.

The venue drew nearly 200 in-person attendees, supplemented by an additional 500 online participants spanning the Asia-Pacific Region. This diverse audience observed the ceremonial awarding of trophies and certificates to the competition winners, along with engaging presentations by experts and the finalist teams.



The Main Auditorium for the INPUT2 Awards Ceremony

Teams from China; Hong Kong, China; Malaysia; Mexico; Peru and Thailand emerged as finalists. This report provides a synopsis of each of the 40 finalists' cases. It is hoped that the reader is able to draw as much inspiration from the varied and impressive works of innovation presented herein as the expert panel was able to during the review process.

Please enjoy the seeds of innovation laid out over the following pages that undoubtedly will serve as a catalyst for sustainable development within the public industries of APEC economies for years to come.

Background



The 2030 Sustainable Development Goals (SDGs) of the United Nations and the APEC Putrajaya Vision 2040 both emphasize the importance of achieving sustainable city development.

The three aspects of Trade and Investment, Innovation and Digitalisation, as well as Strong, Balanced, Secure, Sustainable, and Inclusive Growth, are intended to help realize this vision and create an open, dynamic, resilient, and peaceful Asia-Pacific community.

With high rates of urbanization and economic growth, as well as a number of new technologies, industries, and mechanisms that have emerged as leaders in global innovation and development, the Asia-Pacific area, where 60% of the world's population is concentrated, plays a significant role in the development of the global economy. The Asia-Pacific region encompasses a wide variety of economic forms and the degree of development of each economy varies. Each economy has its own resources, environmental advantages, and industrial characteristics at various levels, and it must combine these characteristics to explore the path of sustainable development, as it is noted in the 2022 AP-ISI, Asia-Pacific Industrial Sustainability Index.

This year's competition focuses on three key areas: green economy, sustainable transportation, and livable cities, closely aligned with the United Nations' 2030 Sustainable Development Goals and the Asia-Pacific Economic Cooperation's "2040 APEC Putrajaya Vision." Given the Asia-Pacific region's pivotal role in the global economy and its notable advancements in urbanization and economic development, the competition places a special emphasis on these three domains, representing not only a sustainable development path in line with regional characteristics but also a crucial initiative responding to global innovation demands.

The green economy is characterized by a market-oriented approach, grounded in traditional industrial economies, and aims for the harmonious coexistence of economic and environmental considerations. It encompasses high-tech industries such as low-carbon economy, circular economy, and ecological economy. This year's competition cases cover aspects like ecological agriculture, rural revitalization, environmental protection industries, energy-efficient and environmentally friendly equipment manufacturing, and industrial equipment upgrades.

In the field of sustainable transportation, the competition showcases innovative technologies and models related to promoting sustainable transportation systems, advancing low-carbon travel, smart transportation, intelligent connected transportation, autonomous driving technology, new energy applications, and tourism transportation.

It is against this background the inception of the Innovating for Public Urban Technology Transformation Competition (INPUT2) came about under the auspices of APEC and the guidance of China's Ministry of Science and Technology.

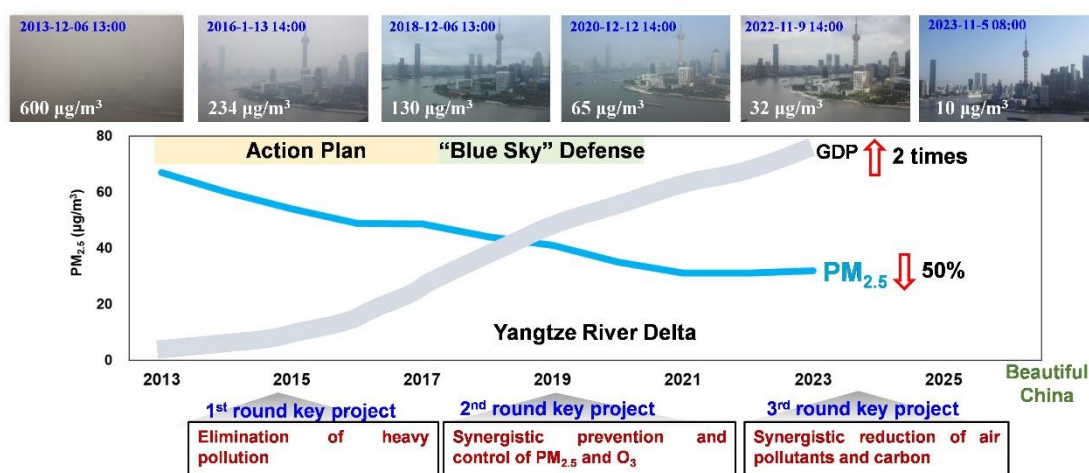
Below, the works of the INPUT2 competition winners are summarized and then detailed further in the pages that follow.

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● Gold Award - Livable Cities

“Technological Innovation Drives Synergistic Prevention and Control of PM_{2.5} and O₃ Pollution in the Yangtze River Delta Region of China”

- ⊙ Shanghai Municipal Bureau of Ecology and Environment
- ⊙ Shanghai Academy of Environmental Sciences



Continuous improvement in air quality in the Yangtze River Delta region

The Yangtze River Delta region is the largest economic zone in China as well as the top five in the world, which is an important international gateway to the Asia-Pacific region and a global manufacturing center. As an active driving force of the domestic economy, the region experienced a swift expansion in industry and economy through the years. As a result, the whole region encountered severe air pollution in 2013 characterized as the regional “air pollution complex” represented by high concentrations of both PM_{2.5} and ozone. High density of industrial chains and transportation networks have been imposing substantial environmental burdens to the region, resulting in a challenge between economic growth and environmental protection. It is urgently needed to strengthen scientific understanding in air pollution control in developing economies since the industrial structure, pollution sources, and concentration levels of various pollutants were significantly different compared to those in developed economies, making it difficult for China to follow their control strategies.

The Shanghai Academy of Environmental Sciences has been taking the lead in long-term air pollution researches in the Yangtze River Delta region in collaboration with domestic and local research institutions. In 2019, the Yangtze River Delta Joint Research Center for Ecology and Environment was funded and an official joint air pollution prevention and control coordination mechanism was established including Shanghai, Jiangsu, Zhejiang and Anhui provinces. Regional and local research centers, stations and laboratories joined together to tackle scientific problems. They have been

undertaking a series of domestic Key R&D research projects supported by Ministry of Science and Technology of People's Republic of China. Development in science and technology provide enormous support for the prevention and control of air pollution. The joint research team has developed an integrated regional decision support platform for synergistic prevention and control of PM2.5 and ozone, which incorporates economic development, energy consumption, emission reduction measures, air quality target, and environmental benefits. The research findings have been practically applied in the region and provided scientific support for achieving the air quality target during the 13th Five-Year Plan period. Tremendous improvement in air quality has been achieved. The visibility was below 20m in 2013 and reached more than 30km in 2023. Peak concentration of PM2.5 decreased by 75%. The increasing trend of ozone is alleviated. The heavy pollution days are almost eliminated.

Through years of efforts, there is a profound awareness that “science and technology” is critically important in addressing the challenge between environmental protection and economic growth, especially for developing economies. Hopefully, their success in air quality improvement can provide experience and reference for air pollution control in other economies and regions. Although significant progress has been made, a number of serious air quality management challenges remain, especially in the context of carbon neutrality and climate change. In the future, the research team will persistently address the forthcoming challenges to make a beautiful and low-carbon Yangtze River Delta, China and even a beautiful planet.

The product is deeply integrated with business and has strong feasibility. Alipay collaborates with the ecosystem for open and mutual wins. The product has cooperated with more than 100 cities, initially achieving scale implementation and effect verification. It plays an essential role in helping businesses improve efficiency and reduce costs for sustainable development, enhance passenger travel experience, assist in alleviating traffic congestion in urban transportation management, and hold significant social significance. Offline passenger flow analysis is also a crucial basic ability with broad application prospects in numerous industries.

Insight - Expert Commentary

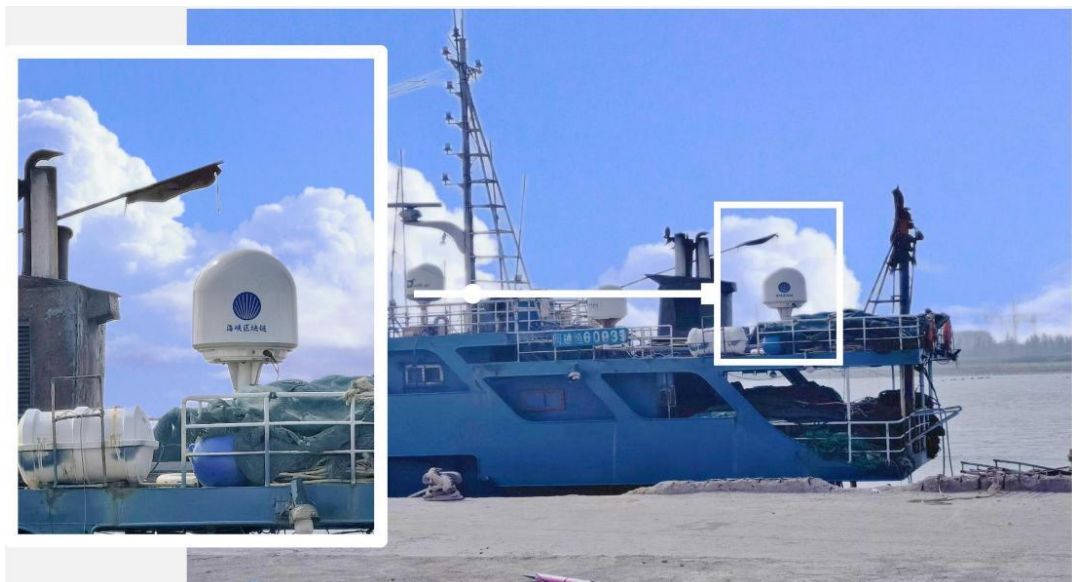
“Traffic congestion in most major cities is always a challenge, and the cities in ASEAN are famous for the congestion with the exception of Singapore with its advanced MRT system.

Hence a new Digital Intelligence Platform for Urban Mobility Optimization and its application will be most welcome for the city planners in Kuala Lumpur, Jakarta, Bangkok, and Manila.”

● **Gold Award - Green Economy**

“Smart Maritime IoT Integrated Solution Based on High-Throughput Satellite Communication”

◎ **Fujian Haixia Blockchain Information Technology Co. , Ltd.**



The "Maritime IoT" project enables coverage of broadband at the sea and seamless connection between the land and the sea

Relying on the new model of "1+1+N", the Maritime IoT project based on high-throughput satellite communication provides network support and technical support for the

construction of the intelligent ocean by fully utilizing new-generation information technology such as high-throughput satellite communication, big data analysis, artificial intelligence, Internet of Things, etc., and provides network support and technical support for government departments, sea-related enterprises, universities, research institutes and ordinary people, providing marine high-throughput satellite Internet, marine data center and a series of marine industry applications, and empowering the green ocean construction with digital technology. Government departments, sea-related enterprises, colleges and universities, research institutes and the general public to provide marine high-throughput satellite Internet, marine data centers and a series of marine industry applications, etc., to provide network support and technical support for the construction of the intelligent ocean, and to empower the high-quality development of the green economy with digital science and technology.

Insight - Expert Commentary

“With the help of high-throughput satellite antenna technology, the project has opened up the last meter of marine economic development, constructed a digital empowerment system for the marine eco-industry chain, and assisted in the construction of the fishery production safety system. With a wide range of services, the project will become a basic service for the management of vessels at sea, with a very good application prospect, and is expected to have a double harvest of economic and social benefits.”

● Silver Award - Livable Cities

“Cloud Infrastructure of Shanghai Healthcare Cloud”

⊙ China Telecom Shanghai

The Shanghai Health Cloud Base Project jointly applied by China Telecom Shanghai Company, Shanghai Municipal Health Commission, and Wanda Information has won the excellent case of urban digital transformation in 2022.

Shanghai Health Cloud Base is a cloud based platform jointly built by Wanda Information and Shanghai Telecom under the guidance of the Shanghai Municipal Health Commission. With Shanghai Health Cloud as the "main portal", it deepens the connotation of health actions, implements new strategies for chronic disease prevention and control, enhances new public service experiences, and comprehensively supports the implementation of the "four beams and eight pillars" medical reform plan, Provide 7 core applications for the entire population, including "appointment registration as scheduled", "health records can be checked at any time", "appointment vaccination does not need to wait", "family account family management", "family doctor online signature", "chronic disease management doctor help", and "intelligent testing of physical indicators", to create an "eight in one" health service model that integrates "medicine, medicine, prevention, care, health, and insurance".

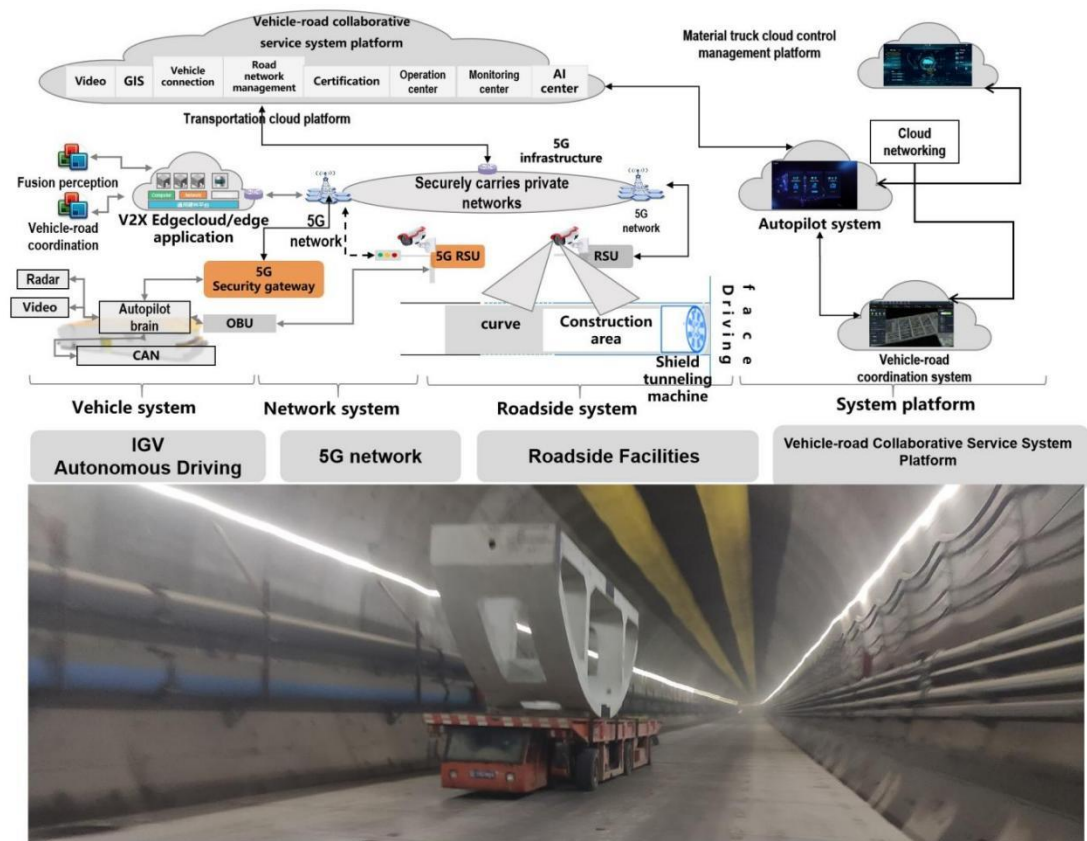
Insight - Expert Commentary

“The project is large in scale and wide in application, with advanced concepts, solid infrastructure, and great application effectiveness. It has been promoted to many cities with obvious effects and has become a necessary application system for city management and citizen service. It is innovative in many aspects such as technology, architecture, system, service mode, operation mode, etc. It is a project worth promoting. The suggestion is to enhance the intelligent service based on big data.”

● Silver Award - Sustainable Transportation

“Tunnel shield scenario, engineering vehicle driverless sustainable development application”

- ◎ China United Network Communications Co., LTD. Shanghai branch
- ◎ Shanghai Tunnel Engineering Co., Ltd.



5G+V2X enables smart networking for tunnels, integrating roadside perception, cloud decision-making, and real-time vehicle interaction for safe, unified vehicle-road ops.

In a relatively closed tunnel environment, this project uses the automatic driving IGV technology to complete the automatic driving of the trackless material transport vehicle under the premise of ensuring the positioning accuracy and obstacle perception, improve the transportation efficiency of materials in the tunnel, do a good job in the global path planning of the transport vehicle, and realize the safe transportation in the

tunnel. Relying on the 5G+V2X fusion network, create an intelligent network connection solution that supports roadside fusion perception, cloud-assisted decision-making, and real-time interaction of autonomous vehicles. Through the construction of "cloud network vehicles", vehicle and road coordination and integrated safety operation management are realized, and the network landing of autonomous transportation scenarios is realized for tunnels.

- **Silver Award - Green Economy**

“Turn Waste into Proteins”

- **Global Cerah Sdn Bhd**



Global Cerah Sdn Bhd's proprietary integrated system combines agricultural waste management and recycling into a sustainable solution fully automated by robotic process automation and temperature control.

The project integrates waste management of agricultural waste and production of alternative protein source into a sustainable solution by Robotic Process Automation (RPAs) and optic sensors. The company's vision is to turn waste into protein for the formation of agri-food circular economy. Firstly, the company collects the wastes from farmers and inputs into the waste treatment machinery for processing in order to remove acidic elements before two options: Option 1 Directly used as alternative fertilizers (feeds and fertilizers) or Option 2 pass those recycled output for black soldier fly (BSF) larvae to feed on and when they reach a maturity stage that consist of sufficient protein as feed meals and then dried up during the production system before send to feed meals producers or farmers in below-market price. The company's ultimate goal is decreasing production costs and over-reliance on imported feeds and fertilizers from the agriculture perspective.

- Start-up Award

“Intelligent Fault Catcher”

- Hong Kong Industrial Artificial Intelligence & Robotics Centre



FLAIR's Intelligent Fault Catcher utilises IoT sensors to monitor the operating condition of industrial equipment and predict upcoming faults.

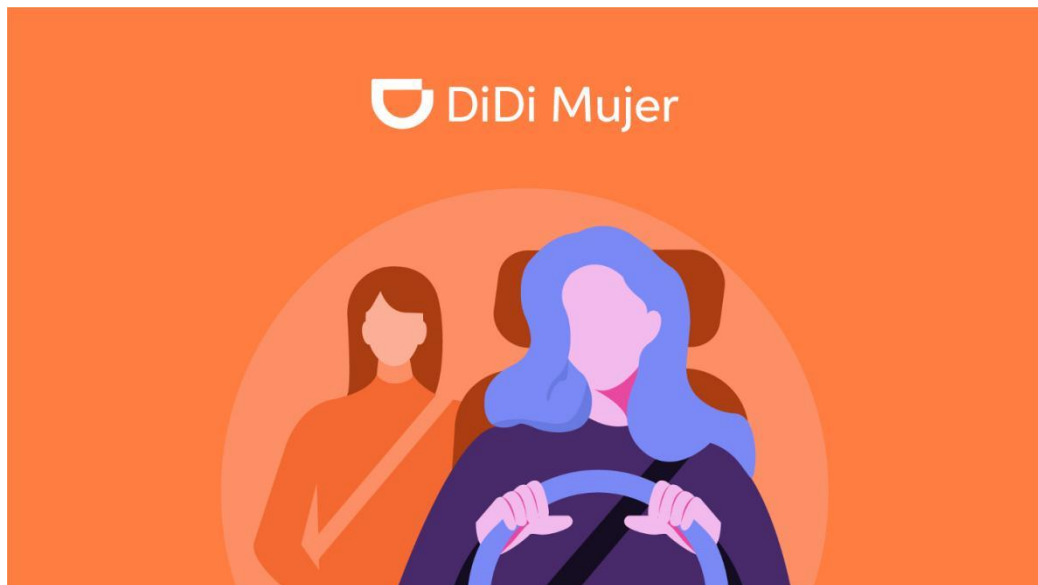
Prognostic and Health Management (PHM) systems are some of the main protagonists of the Industry 4.0 revolution. Efficiently detecting whether an industrial component has deviated from its normal operating condition or predicting when a fault will occur are the main challenges these systems aim at addressing. This project selected two scenarios to apply the PHM, including elevators and platform screen doors.

This project proposes the use of IIOT, 5G, and edge computing technology combined with the PHM approach. The project focuses on two industrial scenarios, elevators, and platform screen doors. By utilising IIOT, 5G, and edge computing technology, the PHM approach can monitor and analyse the real-time data of industrial components. It can detect anomalies and deviations from normal operating conditions and predict when a fault will occur. This improves safety and reliability while extending the life-cycle of equipment and improving capabilities in equipment repair, ultimately boosting equipment sustainability.

- **Best Inclusion Award**

“DiDi Mujer”

- DiDi



DiDi Women--care, support & empower

With presence in 10 Latam economies, DiDi has found out that in some of these economies, gender violence is a major barrier that prevents female users getting around, especially during night times. To solve this problem and create a more inclusive environment for both female drivers and passengers, the company developed DiDi Mujer function, which enables female drivers to select trips only from female passengers, and the drivers may activate or deactivate this feature at any time or location. It has created more opportunities for our female drivers with flexible income and our female passengers the freedom to move around. The option, now available in Chile; Mexico; and Colombia, prioritizes women’s safety during the trip with the platform and promotes gender equality in the mobility industry.

Insight - Expert Commentary

“The starting point of promoting gender equality and safeguarding women’s rights and interests is good.

The replicability and application prospects need to be improved, and it is necessary to consider the differences and feasibility of different regions, on the one hand, the safety of taxi rides is affected by a variety of factors, and on the other hand, as to whether the supervision is in place in the actual operation, and whether there is any phenomenon of gender deception.”

- **Best Practice Award**

“Visual Data Governance and Empowerment Platform of City”

◎ Shanghai Big Data Co., Ltd.



Urban visual data governance and empowerment platform, powered by Shanghai city governance experience, to empower a new paradigm of visual data.

SHData Visual center platform is a visual intelligent PaaS platform, serving the city, enterprises and industry, relying on artificial intelligence technology, big data and cognitive experience of urban video application scenarios to provide a new generation of video reading, video computing ability, empowering data, technology and innovation ability for city digital governance scene. The platform is oriented by visual data business requirements, aiming at data-sharing applications, Governance and unified empowerment of visual data. Being open and shared, the company desire to build a full-business visual data governance system, to realize the deepening governance of the basic data of visual image, visual business data, visual computing data and visual operation and maintenance data; To Build a sustainable intelligent visual computing ecology in the city, Provide an open visual computing framework, Support the diversified management and calculation dispatching of heterogeneous computing power algorithm; Unified enabling export, Provide visual capabilities with standard services, And refined authority management and quantifiable empowerment effectiveness statistics, Realize the integrated development of video full-service intelligent applications; Building a visual security risk control system, Realize the full link security guarantee of visual image data aggregation, storage, governance, application, sharing.

● Best Practice Award

“Introduction to Intelligent Inventory Application Scenarios for Shanghai Tower”

① Shanghai Tower Construction and Development Co.,Ltd.



An example of Digitized Scenarios for Intelligent Inventory Application at Shanghai Tower

With the development of construction, the number of assets is becoming increasingly large, and the need for their management is becoming increasingly urgent. Traditional asset management methods can no longer meet the requirements. In the face of a large number of complex construction assets involving a wide range of professional types and a multitude of concealed works, traditional inventory methods, which require a large amount of manpower, resources, and financial support, highlight an urgent need for a more intelligent management approach.

In response to the above difficulties, Shanghai Tower has conducted research to combine sensor data sources with the information technology system. By using the sensor data of the equipment and facility systems as a touchpoint, it can be considered that the equipment meets the inventory requirements if the data is available online. By extracting the equipment and facility logic from the BIM system, the presence of relevant components can be assumed if the front-end, back-end, and main equipment data of a group of facilities are available online. Moreover, using a property management information-based inspection system, offline inventory of the main equipment without sensors is conducted, achieving "online inventory + offline verification". In conclusion, fully utilizing information technology and big data approaches makes it possible to conduct a comprehensive asset inventory of buildings.

Based on information technology and big data, the asset inventory method effectively reduces traditional inventory costs and improves the management efficiency of intelligent buildings. This provides a more effective solution for asset inventory of

complex high-rise buildings. It exhibits good replicability and promotability for asset inventory of super high-rise buildings and complex building complexes. It will also provide data support for daily asset management and operation management of buildings, enabling super high-rise buildings to achieve high-quality comprehensive asset management, improve operation efficiency, and provide a basis for management decisions.

Insight - Expert Commentary

“Starting from the actual needs of Shanghai Center Tower Construction and Development Co., Ltd, the project develops an intelligent asset inventory system to address the pain points of ultra-high-rise buildings, providing a more efficient solution for asset management.”

● **Best Practice Award**

“Exploring the Architecture and Structure Integration of High-Speed Railway Stations in the Dual-Carbon Context: From Efficient, Resource-Saving, High-Performance Structures to the Prospects of Sustainable and Resilient Cities”

◎ **China Railway Shanghai Design Institute Group Co., Ltd.**



In the context of the long-term vision for a resilient city, the Yangzhou East High-Speed Rail Station project is pioneering the multidisciplinary application of resilience theory in the fields of urban planning, architecture, structural engineering, and materials. It seamlessly integrates architectural aesthetics with structural techniques, empowering the low-carbon and sustainable development of a resilient city through efficient and resource-saving high-performance structures.

In the ecological and economic resilience dimension, this project has developed an economically viable and innovative high-performance roof structure system, which has been applied to the Yangzhou East Station's cross-line canopy project. It addresses the pain points of post-construction maintenance challenges and high maintenance costs associated with high-speed rail building roof structures. The new high-performance roof structure system primarily consists of the following components: A novel H-shaped castellated beam with corrugated web as the main structural component of the roof system. It is externally located under the ceiling, making it convenient for full-life-cycle maintenance; A high-durability roof enclosure structure made of high strength duplex stainless steel tubes and stainless-clad bimetallic steel tubes, which is embedded within the ceiling and is dedicated to ensuring maintenance-free operation throughout its entire life cycle.

In the social and cultural resilience dimension, the project is dedicated to fostering a symbiotic relationship between building and the city. It has established a standardized comprehensive assessment system and evaluation process, which allows for the detailed implementation of resilience requirements from the urban and community levels down to the building level. During the projects' service life, a participatory design process is employed, ensuring that stakeholders and the community are actively involved. This approach enables full-life-cycle project management, where input and feedback from various stakeholders are considered thoroughly.

Architectural aesthetics serve as a significant representation of empowering social and cultural resilience. The project integrates both cultural and natural elements in the creation of public spaces, crafting a city platform rich in cultural significance. It aims to create an ecological, livable, and civilized resilience urban space. Drawing inspiration from the floral windows in Yangzhou's classical gardens, the project incorporates local cultural symbols into public architectural spaces.

Insight - Expert Commentary

"The H-shaped steel beams with corrugated web design, an economical design method, is innovative and suitable for temporary basic service facilities, or event organizing venues. It is easy to install and low maintenance cost. However, the scope of application may be limited by some objective conditions."

- **Best Practice Award**

**“The “Hello Old Friend” Smart Phone Booth -
Assisting Digitally Disadvantaged People --
Supporting Quality of Life and a Humane City for
People”**

- ◎ **China Telecom Shanghai**

With the acceleration of global urbanization, global cities will face new and tougher challenges in economy, life and governance. On the basis of Shanghai's own characteristics, China Telecom Shanghai has seized the historic opportunity of a century of great changes and the digital technology revolution to help Shanghai build a "open and innovative, inclusive, safe, resilient and sustainable" Hello Friends Smart Guard Shanghai system, bringing together century-old friends of the city's streets - traditional public phone booths, traditional query hotlines, and traditional broadband infrastructure facilities - into a one booth, one network, full-scene digital inclusion system. and traditional broadband infrastructure facilities into a kiosk, a network and a full-scene digital inclusion system, helping urban citizens, especially the elderly, the disabled, the migrant population and other digitally disadvantaged groups, to integrate into the city's digitalization process without discrimination, so that all residents of the city can enjoy the "real convenience" and "hidden dividends" brought by digitization. This will enable all city residents to enjoy the "real convenience" and "hidden dividends" brought by digitalization, and form a beautiful digital inclusive new life in which people can live without any worries, travel without any obstacles, and be safe without any worries, so that everyone can enjoy a quality life and feel the temperature in a practical way, and also provide benchmarks for the digital inclusive services of global cities, and make China's contribution to the community of destiny of the whole mankind.

The project was included in the key scenes and key work of Shanghai's urban digital transformation and the Shanghai Municipal Government's People's Project, and the team won the first prize of the 2nd Guanghua Cup Gigabit Optical Network Innovation and Application Eastern Region, the first prize of the Guanghua Cup Gigabit Optical Network Innovation and Application Digital Life Circuit Finals, and the Outstanding Case of the Global Smart Cities Conference, among other honors.

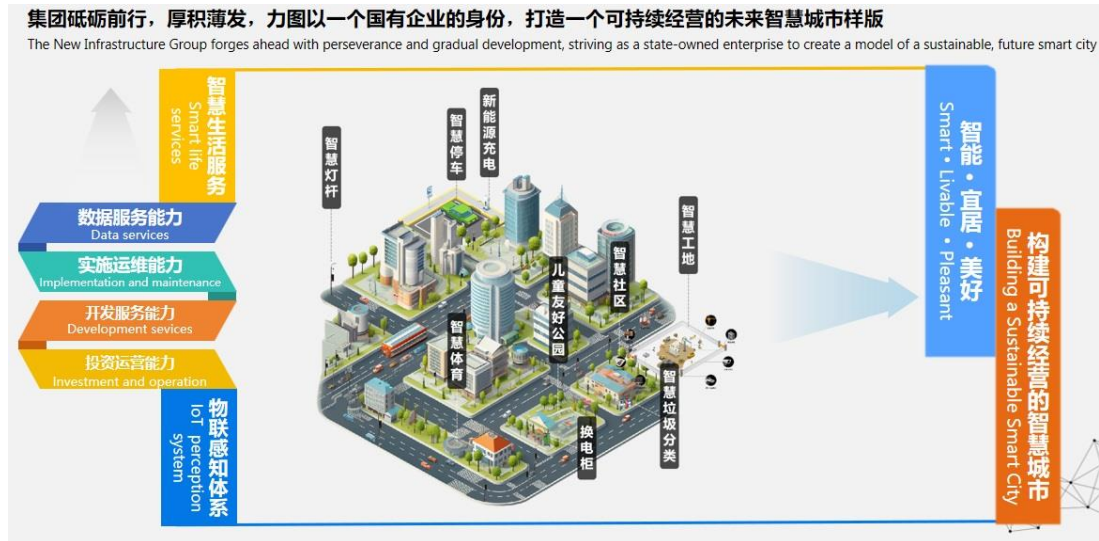
Insight - Expert Commentary

“This proposal is good for enhancing the friendly face of the city or economy, and can be used at international airports, train stations, urban streets corners or shopping centres, with simple interface and welcoming voices in different languages. The various telecom companies may use this concept to promote their Corporate Social Responsibility (CSR) to enhance a more friendly society catering to the elderly and foreigners.”

- **Best Practice Award**

“5G + Innovative Applications Empower the Smart City Development of Fuzhou”

◎ **Fuzhou Chengtou New Infrastructure Group Co., Ltd.**



Fuzhou Chengtou New Infrastructure's "5G+ Smart City" project is rooted in the strategy of sustainable urban development. By deeply integrating advanced technologies such as 5G, cloud computing, big data, Internet of Things (IoT), and artificial intelligence, it seamlessly merges new infrastructure construction with urban digitalization, aiming to transform Fuzhou into a new type of smart city characterized by universally beneficial and convenient public services, leapfrogging industrial development, and enabling insightful urban governance. The project aims to establish a "1+2+N" city-level data management system: "1" spatial digital base built on an MEC cloud resource pool to create the "5G+ Smart City Basic Platform", strengthening data governance and integrated applications; focusing on the two threads of urban governance and industrial development to create "N" applications, thereby comprehensively enhancing urban services for citizens and industrial service capabilities, realizing the "vertical and horizontal interconnection and unified network management" of urban management. Currently, the "5G+ Smart City" project has completed the construction of various application scenarios such as smart communities, smart parking, smart construction sites, smart lamp posts, smart umbrellas, smart waterlogging monitoring, and smart gas monitoring. These provide diverse, efficient smart management services for the city in terms of security governance, convenience services, environmental monitoring, safety warnings, and emergency guarantees. In the future, the project will continue to adhere to a people-centered urban development philosophy, building an ecological community for smart city application and moving towards the goal of a smart, resilient, and livable new type of smart city.

Insight - Expert Commentary

“The project utilizes 5G to carry out technological innovation and application, empowering the development of Fuzhou smart city and giving full play to the technological advantages of 5G. The project has created new scenarios of 5G applications, and adopted advanced technology and specific application scenarios with a certain degree of innovativeness, providing an important basic function guarantee for the smart city. The suggestion is to focus on characteristic applications to maximize the application effect.”

● **Best Innovative Award**

“Taicang Smart Health Project”

◎ Taicang Dejia Health Management Co., Ltd



Healthcare and Wellness Nursing Humanoid Robot

Taicang Dejia Health Management Co., Ltd is committed to becoming a leading brand and active explorer in the global intelligent healthcare industry. The company's products and services cover the healthy elderly, semi-disabled elderly, disabled elderly, women, children, individuals affected by social anxiety, and other groups of people in need of care, and provide comprehensive intelligent care solutions based on core technologies such as artificial intelligence and robotics for the healthcare industry. The company's relentless pursuit is to ensure the happiness of the elderly, the peace of mind for their children, and the reassurance of society.

The company has independently developed a number of globally leading innovative achievements. So far, they have launched Obstacle-avoiding Autonomous Driving AI Wheelchair Robot, Intelligent Toileting Nursing Robot, Companion and Care AI Robot,

Metaverse (VR) Anxiety-relieving Hyperbaric Chamber, and related intelligent service platforms.

They consistently adhere to the principles of technological innovation and open cooperation. Together with partners from various regions, the company is dedicated to advancing the application and promotion of intelligent healthcare technology. The company aims to provide a better, diversified, intelligent, personalized and comprehensive community-based healthcare experience for the elderly, women, children and individuals affected by social anxiety in APEC economies. This effort contributes to the sustainable development of local healthcare industries and the construction of harmonious and livable urban communities.

Insight - Expert Commentary

“Based on emerging technologies to realize the help and care for vulnerable groups is highly promising, but especially need to pay attention to the needs of vulnerable groups, while safeguarding the dual needs of physical space and mental space, in order to better play its value.

This project has launched robots for different types of people, has better control of the market positioning of the product, is innovative and highly replicable, and has a high application value.”

- **Best Innovative Award**

“Innovative AR Scenario Promotes the Tourism to Upgrade--Empowering Tourism with FU Metaverse Competence”

- ◎ **Fujian Baibaotu Technology Co., Ltd**



Metaverse of Three Lanes and Seven Alleys, AR has variety 3D contents superimpose over the physical world.

Three Lane and Seven Alleys is one of China's top ten historic and cultural streets, representing the historical and cultural essence of Fuzhou, China. It is also an invaluable "Architecture Museum of Ming and Qing Dynasty". With the rapid development of the internet, the scenic area aims to enhance its tourism product appeal by incorporating digital technology into real-world settings. Through a "light asset, low investment, dynamic update" approach, the goal is to sustainably attract visitors to the scenic area and businesses, expanding the incremental cultural and tourism commercial space. This approach seeks to break free from the current reliance on "ticket sales and store rents" as the main source of revenue for the scenic area.

The "FangXiang ARventure" project is built upon the Fu Metaverse urban infrastructure platform ("Fu Metaverse" platform) with its advanced "3D mapping + spatial computing + visual recognition" technology. With the support of 5G technology, it delivers a novel interactive experience that seamlessly blends the virtual and real worlds. It has created 12 typical application scenarios in areas such as historical and cultural reenactment, revitalization of ancient houses, and cultural artifact preservation. Additionally, it offers numerous augmented reality (AR) entertainment experiences, including AR real-world navigation, AR digital tour guides, AR check-ins, AR treasure hunts, and blind-box lotteries. By combining the cultural and tourism industry with AR and VR technologies, this project brings significant innovation to traditional cultural tourism service models, enhancing the overall tourism experience.

The combination of cultural tourism with the metaverse promotes the inheritance of history and culture by innovation, breathes life into history and culture, and creates new cultural tourism forms. The scene construction is centered around the digital economy, focusing on the daily urban life scenes, allowing the public to truly enjoy the development outcomes of culture, commerce, travel, and digital technology. This project aims to elevate the societal level of spiritual consumption, offering a precious "Metaverse" experience accessible to all.

Insight - Expert Commentary

"The project integrates 3D map, spatial calculation, and visual recognition technology to reproduce historical and cultural scenes, which is one of the important programs of the current meta-universe cultural tourism application. The project is based on the historical and cultural scenes of the Three Square and Seven Alleys in Fuzhou, combining the cultural characteristics of Fuzhou City to create digital animation scenes, based on the fusion of virtual and real forms of expression, adding new vitality to the scenic spots while helping the publicity and promotion of folk culture, and the project's implementability, sustainability, and reproducibility are all very high."

● Best Innovative Award

“Child-Friendly Smart Park Design: A Case Study of Minjiang Park in Fuzhou”

◎ Fuzhou Planning & Design Research Institute Group Co.,Ltd.



The Kid-Friendly, Smart Park ensures children's safety through the adoption of digital technology, providing a peaceful and fun environment.

The project takes one of the most popular parks in Fuzhou, the Minjiang Park, located in the core area of the Liangjiang Four Banks and along the Minjiang River, as the

base area. Based on the principle of prioritizing children's development, the project integrates digitization with child-friendly elements, taking into account the needs of children for safety, learning, and social interaction. It aims to build a "Minjiang Huitong" digital intelligence brain for children and create a growing park that respects children's right to play, ensures their safety, and guides their exploration and sharing. Through the application of digital scenarios, the project promotes the transformation of public spaces to be more child-friendly, with distinctive features that can be replicated and implemented. It aligns well with the theme of "urban sustainable development and technological innovation" in this competition and meets the requirements of the competition in the field of "livable city construction".

Insight - Expert Commentary

"The project design concept is advanced, innovative, technology selection is suitable, system positioning is reasonable, application scenarios have characteristics, I hope the project can be implemented as soon as possible to produce practical results as well."

● **Best Innovative Award**

“Repurposing Gives New Life To Retired EV Batteries - Harnessing The Potentials Of Retired EV Batteries”

◎ **Hong Kong Productivity Council**



Repurposing Gives New Life to Retired EV Batteries - Harnessing The Potentials of Retired EV Batteries

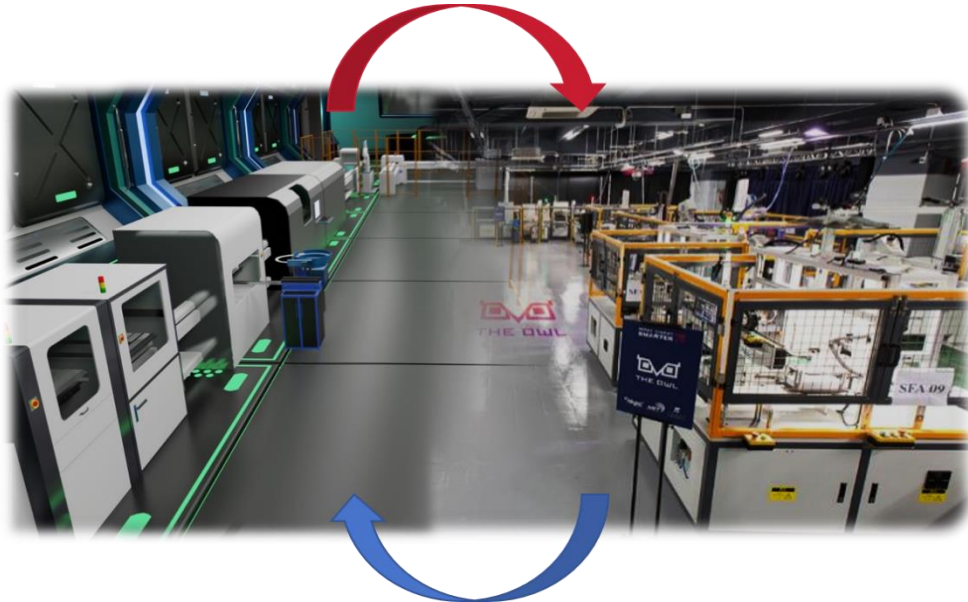
Similar to rechargeable batteries used in typical battery-powered devices, electric vehicle (EV) batteries are degrading over time and ultimately the performance of which will no longer be suitable for propelling vehicles. In Hong Kong, China waste EV batteries must be appropriately handled under the Waste Disposal Ordinance. Most EV manufacturers or dealers have engaged licensed collectors to collect/handle their waste EV batteries. After proper preliminary treatment, these waste EV batteries are exported to appropriate treatment facilities in Belgium; Japan; or Korea for proper handling and/or recycling. In general, to extract valuable metals from Li-ion batteries, recycling companies usually dismantle an EV battery into component levels and then shred the parts into small pieces or powders. The separation process would sort the different materials, and chemical treatment such as hydrometallurgy treatment is applied to extract the rare metals. Although there is no unified definition, typically, EV manufacturers would regard an EV battery as reaching its end-of-life once the total energy capacity of the battery declines below 70% - 80% of its initial value, and replacement of the battery is needed. Such a retired battery removed from EV ends its first life application as the traction battery of an EV. In contrast, it can still be useful for other less demanding energy storage applications.

Therefore the project aims to extend the lifespan of retired EV batteries by providing a solution that overcomes the technical challenges of reusing them. HKPC's proposed solution is built on the project's well-integrated intelligent battery management system that allows using different brands of retired EV batteries, each with different State-of-Health (SoH) and State-of-Charge (SoC). These will be repackaged as second-life batteries for application in ESSs. Moreover, they recognise the high potential value of Building Integrated Photovoltaics (BIPV) in Hong Kong, China due to its densely populated nature. As such, the project has developed a hybrid system that integrates their proposed reuse solution with the BIPV system. To achieve this goal, HKPC will design a systematic technical procedure to repurpose retired EV batteries into second-life batteries while developing a new intelligent AI model to control and manage battery status more efficiently and safely. Partnering with industry experts will allow us to solve the challenges of repurposing retired EV batteries and software issues. HKPC firmly believes that this project could build a 'reference' in the market, enabling others to reuse their retired EV batteries by considering their proposed solution, thereby reducing the chances of recycling them. HKPC's ultimate goal is to create a universal second-life EV battery system capable of using all kinds of retired EV batteries in their system.

- **Best Innovative Award**

“Industrial Metaverse Empowered Data Driven Digital Twin Toward Manufacturing”

◎ Hong Kong Productivity Council



The fusion of IM concepts and the HKPC-patented technology, realising the optimisation cycle of “design”, “build”, “operate”, “train” and cyber-physical superposition.

To become "Global Recognised Manufacturers," an innovative product realisation process is required. The state-of-the-art Industrial Metaverse (IM), enabled by revolutionised virtualisation technologies and Information & Communication Technology (ICT), will lead the manufacturing industry to a quantum leap in technological advancement that can not only benefits their business but also promotes sustainability by reducing resource consumption. The cyber replica of the product realisation processes helps manufacturers optimise product development and manufacturing steps, shortening product time to market while fully considering resource optimisation. Early validation can be conducted via the comprehensive digital representation of physical cell and human-machine interaction, which lowers the setup costs, shortens lead times, reduces the carbon footprints and mitigates occupational health and safety issues by considering ergonomics. The interactive features and vast array of customisation options by “Gamification Manufacturing” make it easier for people, especially the younger generation access the industrial environment. By embracing this disruptive IM technology, manufacturers can move forward to “Go Greener” .

Insight - Expert Commentary

“Industrial Metaverse is the current development direction strongly supported by China, and this project constructs a digital twin world of product production through the development of hardware facilities such as human-computer interaction interfaces and related software applications.”

● Excellence Award

“Large-space public buildings integrated photovoltaic/thermal systems”

⊙ Shanghai Jiao Tong University

Significance: Focusing on the low-carbon transformation of the building sector in the Dual-carbon strategic goal, the project’s team concentrates on the photovoltaic transformation path of public buildings via introducing new structures and concepts, e.g. the self-adaptive photovoltaic/thermal (PV/T) public building system. It improves the conversion efficiency of solar energy and contributes to the theoretical and technological progress of PV/T public building systems.

Project: The project’s team proposed an adaptive PV/T public building system that has the advantages of high solar energy utilization efficiency, recyclable materials, and wide application range. They carried out research and development of lightweight photovoltaic building materials, and the conversion mechanism of PV/T public buildings, theoretical analysis of PV/T public building structural safety. They developed the central monitoring system of the PV/T public building based on the programmable logic controller and solar controller to control the building, energy and structural performance, and realized the monitoring-feedback-control multifunctional intelligent building.

Applications: The research results have been applied to the Japan Pavilion of the Shanghai World Expo, the renovation of the Water Cube of the National Swimming Center, etc. The project’s team was invited to participate in the China International Industry Exhibition in 2023.

Insight - Expert Commentary

“The project’s technical highlights and difficulties to overcome are clearly introduced, and the prospects for promotion are good.”

- **Excellence Award**

“PV inspection robots”

- ⊙ Huzhou Leaping Technology Co.,Ltd.



PV Module Inspection Robot for photovoltaic power stations" replace the manual inspection of photovoltaic plants, achieves an over 95% recognition rate for typical faults and anomalies in photovoltaic components

Based on the high-passability crawler chassis, equipped with a high-resolution dual-optical gimbal and an edge computing module with high computing power, through the self-trained PV module defect inference model, it can intelligently detect PV module hot spots, dust, dirt, cracks, occlusion, loose connectors, animal invasion, Abnormal situations such as module overturning, and the detection situation can be uploaded to the integrated management system in real time, and the inspection report of the photovoltaic power station is automatically generated, so that the power station operation and maintenance personnel can eliminate defects in time and effectively improve the power generation in the life cycle of the photovoltaic power station.

At the same time, the robot carries an automatic fire extinguisher, through the pyrotechnic recognition algorithm, can independently find the possible spontaneous combustion of the component, and quickly extinguish, when the surface of the component or plug is detected with abnormal high temperature, it can also cool down and push the alarm in time, so as to minimize the possible loss of the power station.

In addition, combined with virtual reality technology, the power station is digitized, and the operation and maintenance personnel can immerse themselves in observing the photovoltaic power station through the robot perspective and remote operation function, so as to achieve the effect of the whole station without leaving home, greatly improving the operation and maintenance experience and reducing the operation and maintenance workload of the photovoltaic power station.

Insight - Expert Commentary

“The idea is rigid and answers the validated problem. I am sure that this will help lots of users in the remote area in supervising their solar farm.”

● Excellence Award

“Zero Carbon Technology - Online Intelligent Digital Human/Offline Intelligent Workstation”

◎ Shanghai Zero Carbon Online Investment Co., Ltd.



Zero carbon online AIGC carbon neutral intelligent service cloud platform realizes the collection, analysis and optimization of carbon emission data through intelligent digital technology, provides enterprises and individuals with low-carbon development solutions, and promotes Digital transformation. Through artificial intelligence technology, precise calculations of carbon emissions for enterprises can help them understand their own carbon emissions and develop corresponding emission reduction measures.

This project conveys low-carbon concepts and knowledge to the public through digital platforms and interactive experiences, enhances public low-carbon awareness and action, and promotes the common realization of low-carbon development throughout society.

Insight - Expert Commentary

“The Zero Carbon Technology -Online Intelligent Digital Human/Offline intelligent Workstation using the AIGC Accelerator or AI-Generated content is a good innovation for providing the information required for monitoring the carbon emission at every

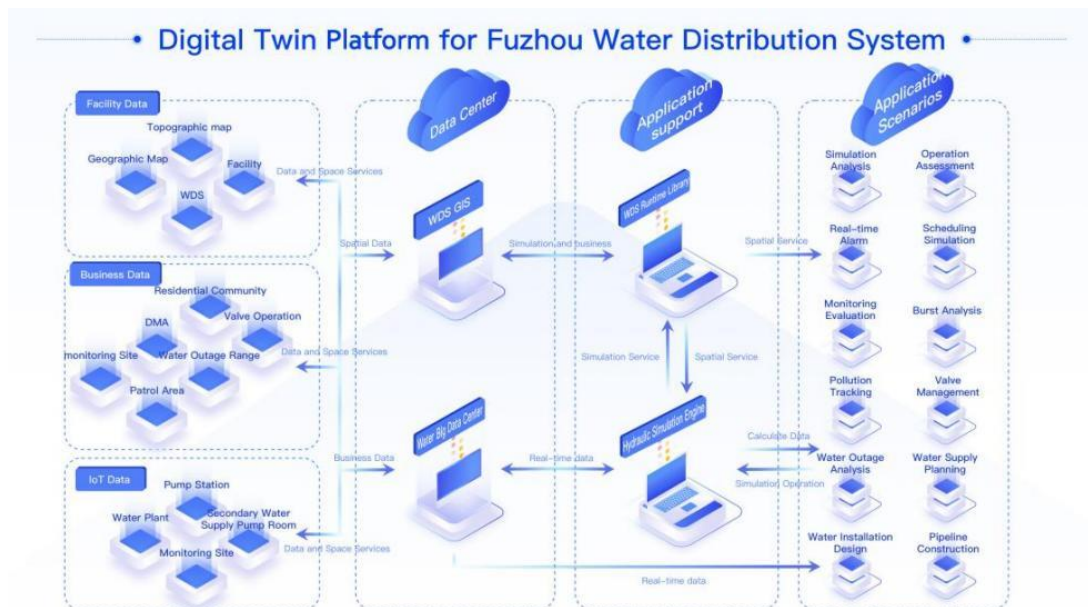
stage of the industrial or other processes to achieve carbon neutrality and shall contribute to the speedy adaptation of relevant information and data to perform continuous improvements in different sectors.

While this system will presumably be used in PR China first, it can be adapted to be used on the international stage and promoted as an international tool to achieve carbon neutrality.”

● **Excellence Award**

“The Digital Twin Platform of Water Distribution System in Fuzhou”

◎ **Fuzhou Water Group Co., Ltd**



Digital Twin Platform for Fuzhou Water Distribution System

The digital twin platform of the water distribution system includes three modules: the water distribution system GIS comprehensive service platform, the big data center, and the hydraulic model. The water distribution system GIS comprehensive service platform realizes the digital management of the asset data of the water distribution system, ensures the accuracy of the facility data, and provides functions such as pipe burst analysis and valve management. The big data center realizes the monitoring equipment of 9 water plants and 841 Minute-level data collection sensors, and integration of user information, water supply and sales volume and other business data. The hydraulic model of the water distribution system fits the operating status of the water distribution system in real time, and provides decision support such as real-time warnings, program simulations, and emergency response.

The project built the world's largest and most precise water distribution system digital twin platform to help Fuzhou's smart city construction, and was selected as the 2021 Smart Water Typical Case by the Ministry of Housing and Urban-Rural Development, and the 2023 Digital Scene Innovation Professional Competition by the Science and Technology Innovation Bureau. The second prize is of industry demonstration significance, and the project construction achievements mainly include:

1. Realize the comprehensive digital management of the water distribution system and its ancillary facilities;

2. Support the scientific formulation of the operation, maintenance and scheduling of the water distribution system, reducing costs and increasing efficiency. The maintenance cost of pipe network decreased by 47.5%, and the unit energy consumption decreased by 16.8%;

3. Fit the operation status of the pipeline network, detect abnormalities in time, and improve emergency response capabilities. The qualified rate of pipe network pressure exceeds 99%, and the timely repair rate exceeds 98%; the leakage rate drops from 20.14% in 2018 to 6.19% in 2022, and the loss amount is recovered by CNY128 million.

4. Help improve the water quality of water supply. By the end of 2022, the average water quality turbidity of the pipe network will drop to 0.22NTU, which is 24% lower than before construction, and the water quality of the pipe network will be steadily improved.

Insight - Expert Commentary

“The Digital Twin Platform of Water Distribution System in Fuzhou has a certain value for improving urban water supply management. The management of the water supply pipe network system does still have many problems that need to be solved, and the digital twin system is also a type of solution that is currently more respected, and the project's control of the problem and the selection of the solution are just right.”

- Excellence Award

“Smart City Management Platform of Fuzhou New District (New District’s Smart Brain 1.0)”

◎ Fuzhou Investigation & Surveying Institute Co.,Ltd.



The IOC and Smart application systems are built based on the same foundation, such as intelligent hub and digital base

With the aim of achieving unified digital base sharing, support for an intelligent hub, lean urban governance, a comprehensive understanding of inhabitant and environment, and efficient people’s livelihood service management, Smart City Management Platform of Fuzhou New District establishes a digital base, an intelligent hub consisting of a CIM platform and an intelligent IoT platform, and an intelligent city operation centre (IOC), and conducts intelligent urban governance with intelligent inhabitant and environment, intelligent livelihood services and other urban application scenarios. The Fuzhou New District is focused on sharing and opening data, as well as interconnecting and exchanging data with the province and city. The new district is committed to building a smart city management platform, which will serve as a pioneering demonstration of the regional integration pilot in Fuzhou City. This platform will make Fuzhou New District a more livable and workable place, helping it to develop in a high-quality and sustainable way. Furthermore, the platform is expected to promote the construction of an ecological civilization city in Fuzhou New District.

Insight - Expert Commentary

“The project's planning is complete and comprehensive, with appropriate technology choices, and it has completed a CIM platform, five urban governance application systems, two ecological green city systems, and one livelihood service system.”

● Excellence Award

“Research, development and application of high-class heavy truck autonomous system based on mass production”

⊙ Inceptio Xingchuang Intelligent Technology (Shanghai) Co., Ltd.



Heavy trucks equipped with Inceptio Technology's autonomous driving system are driving on highways

Inceptio Technology is an autonomous driving technology and operations company focused on long-haul logistics scenarios. They adhere to the core strategy of "full-stack self-research + production-driven + deep operations." They have independently developed full-stack L3 and L4-level autonomous driving technology and closely collaborate with the automotive industry to provide logistics customers with safer and more efficient autonomous driving technology and a new generation of TaaS (Transportation-as-a-Service) freight networks. The company's name is derived from the historical figures of Emperor Qin Shi Huang and Emperor Wu of Han, symbolizing the creation of a new landscape in logistics transportation through autonomous driving technology and conveying the beautiful expectations for the technology-enabled logistics industry.

Inceptio's heavy-duty truck autonomous driving system is the industry's first truck autonomous driving system designed for mass production, featuring full-stack self-research, including algorithms, software, computing platforms, and chassis integration. It includes unique algorithms for addressing the challenges of heavy-duty truck autonomous driving, such as long-range perception, adaptive robust control, and fuel-

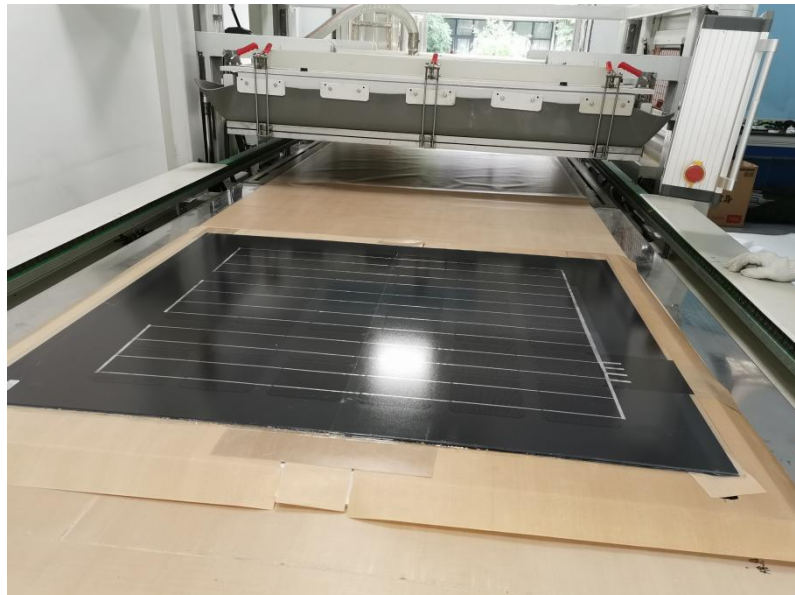
saving algorithms. It also incorporates unique safety management software for functional safety and information security, enabling intelligent safety switching. The system covers steering, braking, power, and power supply systems, offering an L4-level chassis interface.

Inceptio's intelligent trucks are the industry's first commercially viable products compliant with automotive regulations and achieved L3-level mass production by the end of 2021. They were among the earliest to achieve large-scale commercial deployment, and their safety and cost advantages have been validated. Currently, they have engaged in large-scale commercial operations with several logistics industry leaders in express delivery, fast freight, and less-than-truckload sectors. As of September 2023, intelligent heavy-duty trucks equipped with Inceptio's autonomous system have surpassed 50 million kilometers in commercial operation. In the global field of autonomous driving trucks, they have pioneered a new milestone in commercial operations.

- **Excellence Award**

“High-Reliability Hybrid PV/T Module Technology for Achieving Building Energy Carbon Neutrality”

- ⊙ **School of Energy and Power Engineering, Nanjing University of Science and Technology**



Successful pilot production of PV/T modules using a specialized two-stage lamination process method has been achieved.

Building-Integrated Photovoltaic-Thermal (BIPV/T) technology combines solar energy benefits with buildings, offering an efficient, low-carbon, and cost-effective solution for meeting electricity and thermal energy needs. By integrating solar energy into

buildings, it enhances functionality and value, making it a crucial solution for renewable energy utilization and sustainable building energy. This project specifically addresses the significant demand for carbon neutrality in building energy. It focuses on the challenges faced by the global building energy sector, particularly in developing economies, where there is a contradiction between the increasing trend of building energy consumption and the need to reduce fossil fuel usage. To tackle these challenges, the project conducts key technological research on high-reliability flat-plate PV/T modules and develops advanced processing techniques suitable for large-scale industrialization. This research effectively resolves the long-standing international challenges related to stability and lifespan that have hindered the progress of PV/T module technology for over 50 years. PV/T modules possess the dual functionality of power generation and heat supply, enabling simple alternatives to existing solar thermal and PV applications. Typical applications include household applications like "PV+Water heating" and industrial applications such as "PV+Preheating." BIPV/T applications are particularly advantageous. Furthermore, as a zero-carbon energy technology that is efficient, economical, and capable of generating electricity and heat simultaneously, PV/T technology has tremendous potential to become one of the key technologies for achieving carbon neutrality in future energy systems. Overall, this project demonstrates outstanding technical expertise and maturity, providing critical foundational technical support for the development and promotion of advanced BIPV/T applications. It is of great significance in realizing global goals for carbon neutrality in the building energy sector and promoting the development of the renewable energy industry.

Insight - Expert Commentary

"This project has achieved a series of results in the industrialization research and development of High-Reliability Hybrid PV/T Module Technology, solved the international problems of insufficient stability and life span that constrain the Hybrid PV/T Module Technology to exceed 50 years, and has built a pilot industrialization line of Hybrid PV/T Module, but the stability of the process needs to be further demonstrated. The industrialization line of the Hybrid PV/T Module has been built. However, the stability of the process needs to be further demonstrated."

- Excellence Award

“Fuzhou New Area Binhai New City Intelligent Connected Transportation New Infrastructure Construction Project”

◎ Fuzhou Data Group Co. , Ltd.



With the core elements of "vehicle, road, cloud, network, and map," the development objectives follow the "1+1+1" model, aiming to construct an open digital automotive city industrial development system.

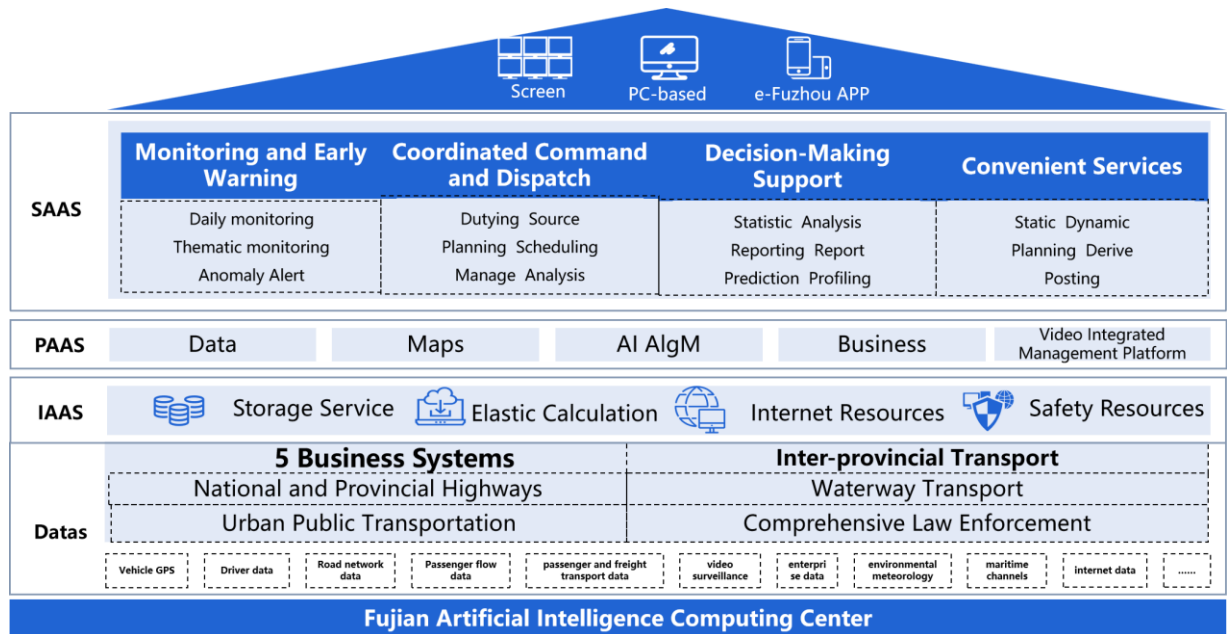
Fuzhou New Area Binhai New City Intelligent Connected Transportation New Infrastructure Construction Project answers the call of transportation power and digital China construction, combines its own industrial advantages and basic characteristics, and focuses on promoting the construction of innovative digital vehicle city.

The project will complete the construction of new infrastructure on 80 square kilometers of main roads in Binhai New City, deploy vehicle supervision platform and vehicle-road collaborative cloud control platform, introduce self-driving taxis, self-driving buses, sweeper and car sales, etc., realize vehicle-road collaborative innovation application services by integrating vehicle-road and cloud, and create a new high point for domestic leading economic and industrial development of digital vehicle city, thus facilitating the rapid development of the digital economy industry in the new District.

● **Excellence Award**

“Fuzhou Comprehensive Transportation Operation Monitoring and Coordination Center (TOCC) ”

◎ **Fuzhou Data Group Co. , Ltd.**



Fuzhou Comprehensive Transportation Operation Monitoring and Coordination Center (TOCC) Architecture Diagram

Through the application of new technologies such as big data, cloud computing, blockchain, artificial intelligence, and mobile internet in the transportation system, and following the principles of "data integration as the foundation, demand for services as the guidance, and combination of peace and wartime", Fuzhou Data Group aims to establish one comprehensive transportation operation monitoring and dispatch center, one comprehensive transportation data resource center, four comprehensive transportation application systems, and one guarantee system to form a transportation information system that provides strong support for the development of "Digital Fuzhou, City Brain".

Insight - Expert Commentary

“The Fuzhou Comprehensive Transportation Monitoring and Co-ordination Center (TOCC) at first sight is similar to the various monitoring systems implemented in all cities. However, creating a smart management system using big data and offering the public a user-friendly and convenient system may be the difference between this and other systems.

The aging public transportation systems in ASEAN members including Jakarta, Kuala Lumpur, Bangkok and Ho Chi Minh City are in need of a fresh approach and updating in order to provide a user friendly and efficient system.

Since the Fuzhou TOCC has been completed, it is timely for the commercialization of the system but with international collaboration to understand the different laws and regulations in decision making and operation of the various systems in the ASEAN cities.

We would propose a formal dialogue with the various decision makers or promoters of new transport management systems and to customize the TOCC to be used in such cities.”

● **Excellence Award**

“Micro-zero-carbon cycler based on integrated energy regulation technology”

⊙ **Beijing HyperStrong Technology Co., Ltd.**

In the realm of dual carbon, Beijing HyperStrong Technology Co., Ltd. has introduced the notion of a "zero carbon micro-element" as an all-encompassing energy solution. This concept aims to enable each unit within the economy and society to achieve zero carbon emissions by utilizing their own zero-carbon energy resources based on local conditions. The company proposes a "bottom-up" energy revolution to implement this approach. Self-production and self-use contribute to the integration of energy production and consumption, thereby enabling the realization of a self-sustaining zero-carbon cycle within economic and social micro-units. This cycle encompasses the entire process from energy production to consumption, with zero-carbon energy serving as the fundamental component.

The zero-carbon micro unit uses the pre-installed house as the physical carrier, and relies on the multi-port integrated energy control unit of photovoltaic, energy storage, power grid, diesel power generation system and load, and the orderly power consumption strategy based on big data analysis of energy consumption and photovoltaic power generation prediction ability to achieve the zero-carbon goal of energy self-sufficiency. Zero-carbon micro-element can not only operate off the grid for a long time, but also connect to the large power grid, and achieve energy interconnection in the region according to the cloud scheduling strategy, forming a more resilient and smarter power grid energy supply system. At the same time, it has certain attributes of life, and can be easily expanded into a variety of commercial or public property practical uses (such as zero-carbon recycling cabins, zero-carbon security boxes, zero-carbon hotels without electricity, zero-carbon unmanned supermarkets, emergency relief facilities, etc.), which can be simpler and more reliable to meet the people's pursuit of a better life, especially in areas without electricity or weak electricity.

Insight - Expert Commentary

“This area is relatively novel and still in the developing stage. There is a huge potential of it can be commercialised in mass. This means the cost has to be much more effective and applicability has to be more user friendly. Good idea and has massive potential.”

● Excellence Award

“Autonomous Air-Ground Cooperative Tunnel Inspector”

⊙ **Hong Kong Productivity Council, Civil Engineering and Development Department, Hyder-Meinhardt Joint Venture**

Inspection of the internal surface of the tunnel is an essential yet challenging task in tunnel construction. Timely identification of diversiform tunnel surface defects (e.g. water leakage, concrete cracks and spalling, etc.) is critical for quality control in the construction stage, as well as regular inspection in the operation and maintenance stage.

Conventional tunnel inspection methods rely on visual checking and manual recording of the inspection results inside the congested tunnel environment, which is time-consuming and inefficient. In recent years, advancements in AI and robotics technologies show promising prospects in tunnel inspection. In this project, an autonomous air-ground cooperated inspection system using UAV and UGV is currently under development for efficient and accurate tunnel surface inspection and defects detection. By integrating state-of-the-art techniques of robotics, precise positioning, and sensor fusion, the system can automatically inspect tunnel surfaces and generate detection reports.

The system adopts three state-of-the-art techniques, namely the edge-computing device on air-ground cooperated system for on-site AI inspection, the heterologous robotic system for air-ground cooperation and integration with automated total station for precise positioning. By building upon these techniques, the inspection system can achieve efficient and accurate inspection of defects (e.g., concrete cracks, spalling and water leakage) on the internal surface of the tunnel.

The proposed system provides an innovative solution for automatic tunnel inspection with the techniques of precise positioning, air-ground cooperation, and sensor fusion. This can significantly alleviate the heavy workload of inspection personnel, improve operational safety on tunnel sites, and increase automation in the construction industry.

Insight - Expert Commentary

“The autonomous Air-Ground Cooperative Tunnel Inspector is very innovative and answers the need for the use of robots to inspect tunnels and construction sites instead of human labor.

The many MRT tunnels and vehicular tunnels in China, ASEAN and APEC economies will be the main beneficiaries of such a system and we are confident that it will be further developed to have more applications than just tunnels and construction sites including dams and water tunnels for water transfer.

Proper maintenance and repairs will enable the long life of the tunnels as well as public security. We look forward to working with the promoter team in the ASEAN region with the localization of the technology and its application.”

● Excellence Award

“Human-oriented outdoor thermal environment evaluation and optimization design”

◎ Hong Kong Polytechnic University



Dr. Yu Yichen presenting the project <Human-oriented outdoor thermal environment evaluation and optimization design> on behalf of a team from Hong Kong Polytechnic University

Rapid urbanization in Asia-Pacific cities has intensified the urban heat island effect, leading to more frequent and extreme heatwaves that endanger public health and constrain outdoor life. There is an urgent need to retrofit public open spaces with both passive cooling and active cooling technologies. This project aims to enhance liveability, sustainability, and outdoor thermal comfort in cities through an integrated

approach. Its primary goal is to develop a series of solutions to the urban overheating problem, encompassing both design and implementation phases.

This project aims to develop a simulation tool incorporating computational fluid dynamics (CFD), a multi-nodal thermoregulation model, and thermal comfort model to accurately predict thermal perception in dynamic outdoor environments. First, the most effective CFD turbulence model will be identified to precisely simulate the flow field surrounding the human body. Next, a human thermoregulation model will be adapted to reflect dynamic outdoor conditions, integrating the impact of dynamic wind and radiation. The CFD simulation will be paired with the human thermoregulation model to predict skin and core temperatures at a given environment. These key physiological parameters, drawn from the combined CFD-thermoregulation model, will feed into a thermal comfort model. The thermal comfort model incorporates an empirical correlation between physiological parameters and thermal sensations for stable and uniform indoor conditions. Since thermal alliesthesia, which is common in outdoor environments due to large spatial and temporal variations, is not currently incorporated, the team plans to update this empirical correlation using a large-scale, real-life collected datasets collected in different activity levels and different outdoor scenarios.

Integrating these models will enable accurate prediction of thermal perception predictions under dynamic and transient outdoor thermal environments and provide quantitative evaluations of the effectiveness of passive or active improvement measures. Additionally, the team is also engineering a radiant cooling panel that provides localized spot cooling to pedestrians via infrared radiation, and at the same time minimise the unwanted condensation using a novel thin membrane to prevents condensation.

For the implementation of cooling strategies in urban spaces, the team suggests a "need-based improvement" approach. This method is based on the product of discomfort level and usage volume (need of improvement, NOI). A ranking system will be established to prioritize areas for thermal comfort improvement, with the highest priority given to locations experiencing severe thermal conditions and high usage volume. This tool has great potential to assist urban outdoor environment planning to better allocate resources or strategies for improving outdoor thermal conditions. A demonstration at a large commercial park in southwest China will showcase real-world implementation.

This holistic initiative will produce knowledge and tools enabling better outdoor thermal comfort design, improved public health through increased time outdoors, and lower city-wide energy consumption with less reliance on air conditioning system. As over one-third of the global population resides in humid subtropical climates, the proposed solutions are broadly applicable and hold substantial commercialization potential in the face of ongoing urban overheating.

Insight - Expert Commentary

“The design methodology and modeling, in this case, can help urban planners and designers to provide more comfortable semi-open and open outdoor environments by assisting in the planning of building layouts, the selection of wall and flooring materials, the placement of green infrastructure, and the adoption of proactive measures to improve outdoor thermal conditions. The membrane-assisted radiant cooling panels developed in this project can also be applied as active cooling in outdoor scenarios.

It is recommended to further deepen the research and promote the practice based on the existing research results, including updating the outdoor thermal comfort model to include "thermal sensation" in the outdoor environment. Develop a comprehensive ranking system to prioritize the improvement of thermal comfort performance in urban spaces. Improve the design and performance of the Membrane-assisted radiant cooling panel system by improving the strength and lifetime of the shield and enhancing the spectral IR transparency. Develop cost-effective radiant cooling panels that address large-area applications and integration with design, and extend to other climate zones to meet different needs and application scenarios for cooling and heating.”

● Finalist Award

“Industrial Park VOCs Gas Monitoring and Intelligent Early Warning Service System Based on Semiconductor Sensors”

⊙ Aerospace Kai Tian Environmental Technology Co., Ltd.



VOCs intelligent early warning monitoring devices help enterprises to develop EHS system much more precisely

1. Development of Ceramic Semiconductor Sensing Components and Their Matching Systems:

The proposed semiconductor sensors will utilize new ceramic semiconductor materials to fabricate the sensing elements, aiming to achieve the goal of low concentration

(ppm level) and high precision monitoring of VOCs. The designed sensing components will consist of a heating coil, aluminum tube, and the new ceramic semiconductor material. The internal resistance of the sensing element will change when VOCs gas contacts the surface of the new ceramic material. By measuring the resistance change, the gas concentration can be determined. Two metal electrodes will be placed at the ends of the aluminum tube to measure the semiconductor resistance.

2. Development of Machine Learning Models for VOCs Intelligent Early Warning:

(1) In the data preprocessing phase, methods such as Z-score and moving average will be used to filter abnormal data. Linear interpolation and nearest neighbor interpolation will be employed for data imputation. Principal component analysis and other methods will be utilized to reduce the dimensionality of the data.

(2) In the establishment of the intelligent early warning model, a bidirectional recurrent long short-term memory neural network (BLSTM) will be adopted to predict VOCs concentration at a single point based on data from a single point. Attention mechanism will be incorporated, and a bidirectional structure will be used for both forward and backward temporal connections learning. A CNN will be employed to predict the VOCs concentration at a single point using information from multiple monitoring points.

(3) The online learning part of the model aims to continuously adjust the model's parameters to adapt to the variability of VOCs concentration in the industrial park. Regularization, activation function variation, hyperparameter optimization, and expansion of the dataset will be utilized to improve the model's generalization ability.

● Finalist Award

“Carbonebook Enterprise Carbon Management Platform”

⊙ Shanghai Carbonebook Co.,Ltd.

Carbonebook™ is a carbon emission management SaaS solution that has been certified by the SGS, an international authoritative certification organization, providing carbon accounting, carbon emission reduction, and carbon assets management services for clients in various industries based on big data, artificial intelligence technologies etc.

Based on powerful data support, Carbonebook™ provides enterprises with customized modeling, supply chain carbon management and related carbon emission reports, and helps enterprises build a measurable, traceable and manageable scientific carbon management system. Together with enterprises promoting carbon

emission reduction throughout the industry, corporate users can benefit from environmental and economic aspects.

The Carbonebook™ SaaS carbon management platform directly serves 750 customers, covering multiple industries such as chemical and biological industries and manufacturing. 24 million tons of Co2e carbon emissions have been identified, of which 12% have been reduced.

Insight - Expert Commentary

“The Carbonebook Enterprise Carbon Management Platform has been applied and proven in the market. The system can efficiently carry out carbon emissions accounting for industries and businesses and manage the carbon footprint from raw material sourcing, production, sales, transportation, usage and disposal.

However, it is still mainly a static system based on collection and analysis of data. I would like to see more novel applications of Artificial Intelligence and individual customization of the system to bring it to the next level of innovation and to make it a cutting edge, a dynamic system able to be replicated easily worldwide.”

● **Finalist Award**

“Fujian Artificial Intelligence Computing Center”

◎ **Fuzhou Electronics & Information Group CO.,LTD.**



The Fujian Artificial Intelligence Computing Center is the first large-scale AI computing cluster in southeast China, using a Chinese self-developed full-stack AI computing infrastructure.

Fujian Artificial Intelligence Computing Center is located in Fuzhou Binhai New Town. Constructed and operated by Fuzhou Electronics & Information (Group), Ltd. owned by Fuzhou New Area Group, the center is the first large-scale AI computing power

cluster in southeastern China and the only project gaining approval to construct the National New-generation AI Public Computing Open Innovation Platform (preparatory) in Fujian province, which has been listed as part of domestic AI computing power strategy system. Fujian AI Computing Center is expected to incorporate computing power of 400P. Now the first phase of 105P computing power has completed construction and put into use, including 100P AI training computing power and 5P reasoning computing power. The center consists of AI training service system, AI reasoning service platform, data center management platform, with the ability to provide full scenario, multi-dimensional artificial intelligence services to the whole province, including AI deep learning framework. Its cabinets are equipped with more than 500 model algorithm libraries, among which there are several hundred-billion-level AI foundation models based on natural language processing. The center displays five highlights as being domestically researched and developed, green low-carbon, with high density computing power and integrated operation platform, and fostering collaboration between industry, academia, and research.

At present, Fujian Artificial Intelligence Computing Center has reached cooperation intentions or signed contracts with 171 companies and scientific research institutions. It has also signed cooperation agreements with Renmin University, Xiamen University, Fuzhou Data Technology Research Institute and other scientific research teams in the field of artificial intelligence to jointly introduce Chatlmq multi-modal foundation model, Bailu· Jiaye sign language translation foundation model and DDE geological fault model etc.

- **Finalist Award**

“A solution for the digital and intelligent transformation of small and medium-sized enterprises in the park based on AI technology”

◎ **Terminus Technology Group Co., Ltd**



At the Artificial Intelligence Open Innovation Center of Terminus Smart Industrial Park, enterprise employees are undergoing AI algorithm training

The Terminus Artificial Intelligence Open Innovation Center focuses on the park and focuses on the segmented field of artificial intelligence. By building a standard physical space of 500-3000 square meters, it mainly provides low-cost and low threshold artificial intelligence industry incubation services for small and medium-sized enterprises in the park, providing urban digital transformation solutions. Supported by the artificial intelligence capability platform as the core technology, they assist enterprises in incubating their own artificial intelligence technology based on their own industrial data and feeding it back to the industry, achieving the digital transformation of enterprises. It is suitable for various planned, under construction, and existing digital economy industrial parks, and is committed to creating digital industry demonstration parks with local characteristics that can drive the development of urban digital economy.

Insight - Expert Commentary

“The concept of the Terminus Artificial Intelligence Open Innovation Centre is interesting as it focuses on the development of artificial intelligence and its applications as well as the incubation services for SMEs in the traditional High Tech Park. Its target of providing urban digital transformation solutions and assisting enterprises in incubating their own artificial intelligence technology based on their own industrial data and applying such technology for the digital transformation of enterprises is interesting. Furthermore, such a centre can be used for existing digital economy industrial parks as well as for parks under development.

ASEAN members are actively promoting the digital economy, and many data hubs have been set up in Malaysia, Singapore and Thailand with the aim of storing data and supporting the AI industry. However, there are no active AI Innovation Centre established yet in many of these digital economy hubs and thus there is a great opportunity of the concept to be developed and implemented in the future. In Malaysia, we can foresee the establishment of such AI Innovation Centres in the various industrial parks, and we shall need a proper working model and financial model which can be applicable.”

● **Finalist Award**

“Gulou Intelligent Brain Project”

⊙ **Office of the Leading Group for the Construction of the Gulou Demonstration Zone in Digital Fujian**

“Digital Fujian” marks the conceptual origin and practical starting point of “Digital China”. In Gulou District, the only county demonstration area in the practice of “Digital Fujian”, China's first convenient call center 12345 has been built and promoted economy-wide. In 2018, Gulou District released the Three-Year Action Plan for the Construction of Digital Gulou District and proposed the Gulou Intelligent Brain Demonstration Project. Gulou Intelligent Brain won the “2020 China’s Leading Smart City” and “2021 China’s Leading Smart City” in the Asia-Pacific region, as well as honorary titles such as “Excellent Practice Award for Digital Government

Construction” , “China Urban Governance Innovation Case Award” , “Digital Government Management and Innovation Award” , “Top Ten Cases of Innovative Social Governance of the Year” , etc. Currently, Gulou Intelligent Brain has entered the 3.0 stage.

In the process of evolution, Gulou Intelligent Brain adheres to the principles of adapting measures to local conditions, scientific planning, and moderate advancement. Based on Big Data, IoT, Artificial Intelligence and other technologies, Gulou Intelligent Brain integrates Data Center, Digital Twin full-portrait city platform, urban AI capability center and basic capability center to create a digital base, aggregate discrete resources, and connect data silos. Focusing on the "five-in-one" of digital party and government, digital economy, digital governance, digital society, and digital ecological civilization, the Intelligent Brain empowers applications in specific scenarios.

In the future, Gulou District will adhere to its basic positioning and strive to build a modern international city and the "most beautiful window" in the Asia-Pacific region. With the goal of creating a happy city that is "livable, resilient, innovative, smart, green, and humanistic", and starting from the positioning as a Intelligent Social Governance Experimental Base, they will continue to make efforts in the fields of new infrastructure, data empowerment, public support capabilities, and digital urban application scenarios to fully empower the sustainable development of Gulou District.

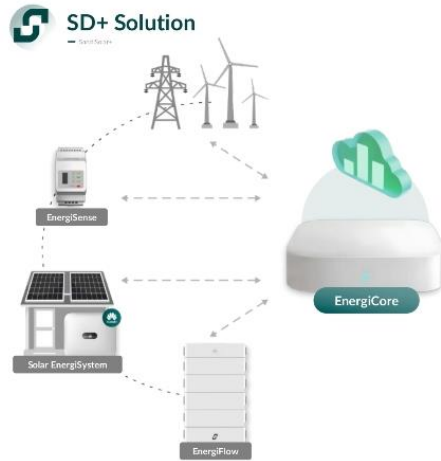
Insight - Expert Commentary

“The project is a practical point of "Digital Fujian", with a solid technical foundation, wide coverage, great influence and rich service content. However, the smart city project is more important to the application effect. We hope that the project can reflect more social changes brought by the system in terms of implementation effects.”

● **Finalist Award**

“SD+ whole-process intelligent energy management ecology”

◎ **Yunnan Shangding New Energy Co., Ltd**



Intelligent Hardware Solution

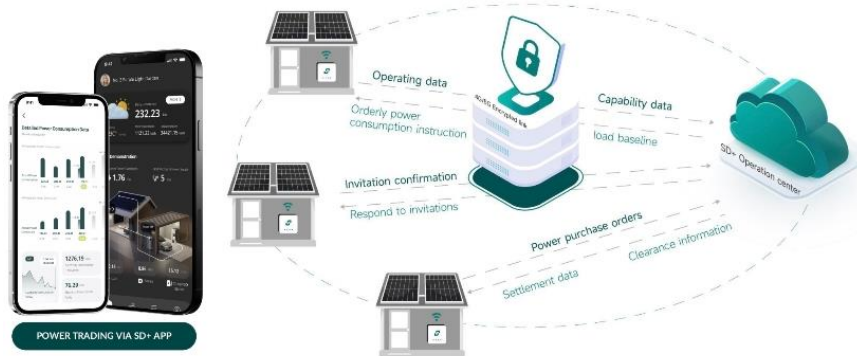
EnergiCore
Smart Gateway for Industrial Power Applications

We break down brand barriers, seamlessly connecting inverters of different types from all brands. A robust communication infrastructure for photovoltaic devices.

<p>Supporting Remote Monitoring</p> <p>Connected via the 4G LTE network. Enables remote configuration, monitoring, and maintenance of devices. Automates power station operation to optimize its overall performance.</p>	<p>Participating in Microgrid Operations</p> <p>Edge computing mode for microgrids. Links every power station to the microgrid. Engages in real-time power scheduling, trading, and balancing on both the generation and load sides.</p>
<p>Facilitating Power Transactions</p> <p>Aids the Energy Exchange in managing microgrids. Seamless transition between power sources. Delivers stable and cost-effective energy to users around the clock.</p>	<p>Optimizing Power Scheduling</p> <p>Offers electricity usage strategies. Utilizes economies of scale to achieve the optimal grid scheduling. Maximizes the generation benefits for end-users.</p>

SD+ Solution
— SandSolar —

End User Participation



SD+ Solution
— SandSolar —

Full Eco System



SANDISOLAR+ MICROGRID

SD+EcoCloud controls your power

SD+ EnergiUnit as a unit, SD+ through AIOT technology to create a multi-category power source can be used, through the intelligent gateway control, and energy storage to achieve the power scheduling of intelligent energy management ecological SD+ EcocloudSD+ joint suppliers and local service providers to provide quality services, from multiple perspectives to increase the value of energy, improve energy

utilization, to help you achieve the From the generation, storage and consumption of electricity to the booking and trading of electricity.

SD+ EnergiUnit's future-proof solutions

4 simple steps: SD+ EcoCloud's smallest components help users intelligently manage energy input, storage, consumption and trading.

(1) Solar Energy System: SD+ provides PV system design and installation services in conjunction with a local service provider. SD+ EcoCloud intelligently monitors the system, predicts power generation based on weather data, and uses it to plan power consumption, helping users reduce electricity costs.

(2) EnergiCore: The smart gateway receives and analyzes data from smart meters and smart furniture, optimizes power consumption and scheduling through intelligent algorithms, and achieves remote control of controllable loads and power consumption management.

(3) EnergiSense: The smart meter is mainly responsible for collecting and transmitting power consumption data, assisting users in energy saving optimization and power consumption safety monitoring.

(4) EnergiFlow: stores excess PV power generation and activates it when the system is not generating power, solving the problem of PV consumption to ensure efficient energy use, and can also be used to reduce peaks and valleys to save electricity costs. Users can realize the management and scheduling of EnergiFlow through SD+EcoCloud.

Insight - Expert Commentary

“Good project. Contains several essential elements in one system. Easy to generalize and optimize. However need more evidence in the current international practice in the Philippines and Thailand as there is quite a lot of competitors in this energy optimization area.”

● Finalist Award

“E-Surfing Digital Platform for Comprehensive Service in Rural Area”

⊙ E-surfing Digital Life Technology Co.,Ltd.

E-Surfing Digital Rural Platform, a digital rural platform planned and constructed by China Telecom, is positioned as a new digital infrastructure platform for implementing the domestic rural revitalization strategy. In accordance with the overall goal of "intelligent life, intelligent production, and digital governance", relying on China Telecom's broadband, 5G, and IoT access capabilities, it gathers and connects various intelligent devices, driven by data, and connects digital governments and smart cities upwards, Connect farmers' smart families downwards, horizontally connect with various agricultural and rural application platforms, and internally connect

with China Telecom's grid management related systems, building a comprehensive information service platform that provides comprehensive and three-dimensional services for agriculture, rural areas, farmers, and grassroots governments.

- **Finalist Award**

“HoneyNet for Actionable Threat Intelligence”

- ⊙ **Hong Kong Applied Science and Technology Research Institute Company Limited (ASTRI)**

Most people mistakenly think they are immune to cyber threats. However, the new trend of cyber terrorism targets Critical Infrastructures (CIs) like power supply, telecommunications, mass transportation, and financial services, causing significant social impact. Proactive investment in cybersecurity to thwart attacks becomes necessary. Honeypot captures large volumes of attacker activity data for analysis, but without automated intelligent tools, it is impossible for cybersecurity experts to extract valuable, actionable intelligence from the data. ASTRI's HoneyNet platform addresses these issues, making it easier to scale up Honeynets and automatically obtain actionable intelligence. This allows law enforcement and CIs to take proactive measures early on, preventing severe social impact. The actionable intelligence found can directly reduce losses by pre-emptively blocking attacks from bad IPs and malwares. HoneyNet provides global, industry, and company threat intelligence to help companies prioritize resources for specific attack types and malwares, thereby increasing cybersecurity investment effectiveness. It also enhances public cybersecurity awareness by providing global statistics and industry-leading indices, illustrating that cyber threats can occur anywhere, anytime, and in any format.

- **Finalist Award**

“Sustainable Aeroponics With Potential To Absorb Carbon Dioxide And Clean The Air Based On Algae”

- ⊙ **Federico Villarreal National University**

The shortage of soil suitable for cultivation and, above all, the increase in environmental pollution, produced mainly by fuel in industrial economies such as those that make up the APEC, and the high temperatures due to water scarcity, are problems that have generally been raised. against climate change, where the project's aeroponics would be a key ally and even as a remediator of polluted air and for its ability to capture sunlight through an algae system, which in turn converts the heat

potential obtained by the sun, and converts it to electricity, hydroponics being energy independent, and can be taken to other places without worrying about energy consumption.

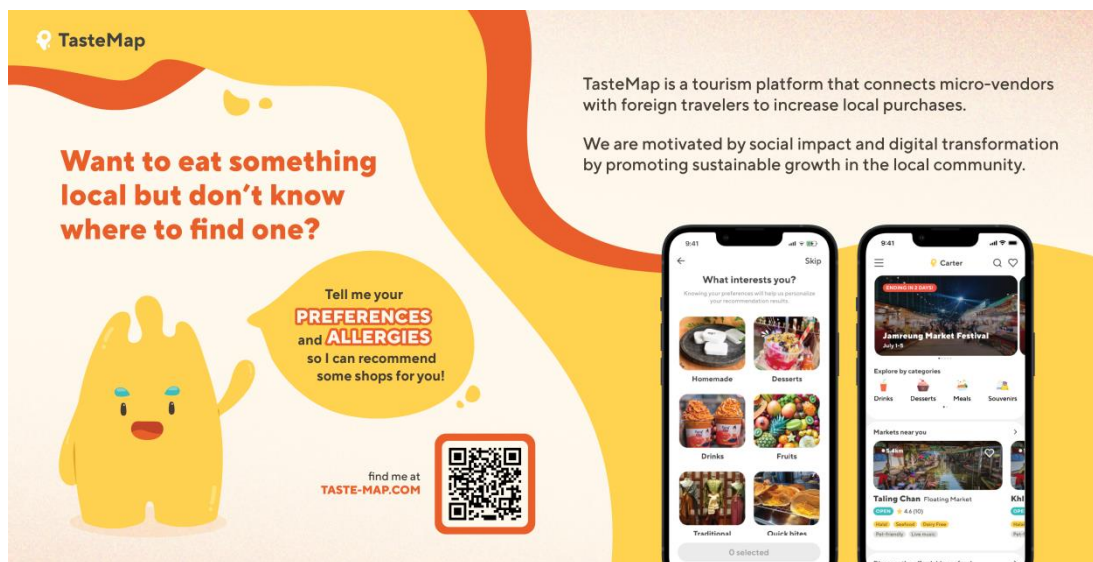
Where the project's team developed a technology to clean the environment through algae, but that in turn, the base consists of 3 tubes that, in turn, would be protected by a filter, so that it does not suck plastic or paper like that, Where the 3 tubes are responsible for absorbing the impure air of a economy where the aeroponics is located, and transfers it to the algae, causing the algae to provide us with oxygen, and it will be released at the top of the aeroponics base.

Practically, aeroponics would be part of the solution to problems that were already raised 5 years ago, such as food and environmental pollution. And also that the aeroponics system is independent with the energy issue, which would make the most of it, capturing sunlight and converting it into electricity.

● Finalist Award

“Taste-Map: Platform for Local Tourism”

⦿ The Hominians Company Limited



TasteMap: A travel website fostering local experiences. Connects foreigners with micro-vendors, aiding growth. Encourages spending, offers vendor support, and expands services.

Taste-Map, under the banner "Taste the Local," is an innovative platform aiming to elevate the local Thai tourism experience. Despite tourism accounting for 22% of Thailand's GDP, only 0.02% of this revenue trickles down to small-scale vendors, many of whom number in the hundreds of thousands.

In recent years, local Thai customers have shifted their purchasing habits towards more convenient options, including large retailers and e-commerce. However,

international tourists, a demographic with significant purchasing power, remain keen on authentic local experiences. An impressive 70% are in pursuit of genuine local culture and believe that technology can enhance their travel experiences.

While many international tourists frequently visit local markets, actual purchasing remains limited due to concerns about hygiene, unfamiliar products, and subpar signage. Both vendors and market owners face barriers in accessing this affluent customer base, largely due to technological and informational gaps.

Taste-Map addresses these challenges head-on. The platform, accessible via a travel website, personalizes the market experience for tourists. By inputting key details such as age, preferences, and dietary restrictions, tourists receive tailored shop recommendations. Additionally, an integrated micro-map provides shop locations, ratings, and reviews, helping to bridge language barriers, build trust, and facilitate increased spending among foreign visitors.

For market vendors and owners, Taste-Map offers a comprehensive management application, equipped with in-depth analytics, reporting tools, and business suggestions powered by artificial intelligence in a user-friendly chat-room style. The aim is to help these businesses thrive and adapt to the evolving demands of modern tourism, creating a win-win for both tourists and vendors.

Monetarily, Taste-Map's first version operates on a premium subscription model for market owners. While basic market page creation is free, a monthly premium provides access to data analytics, financial management tools for vendors, and campaign-creation capabilities for customer incentives. Looking ahead, Taste-Map envisions onboarding over 1,000 market owners, 490,000 market vendors, and serving 190 million tourists within five years. Plans also include expanding to various tourist cities, incorporating floating vendors, food courts, malls, and event spaces, aiming to generate substantial revenue.

Founded by a group of students passionate about leading Thailand into a brighter future without leaving anyone behind, Taste-Map has secured substantial funding for prototype development, market testing, and vendor training. With a steadfast commitment to transforming Thai tourism, Taste-Map confidently invites you to "Taste the Local." Visit www.Taste-Map.com and prepare to use our management applications soon.

Conclusion



Participants signing in at the 2024 Innovation Conference

We would like to express our heartfelt thanks to the economies and everyone involved in the competition, especially each member of the Expert Panel for their valuable time, as well as to the participating teams who submitted such excellent applications, and to all the government agencies, research institutes and enterprises that enthusiastically participated in

and invested in the process of the competition, for their strong support and full participation.

The remarkable engines of human civilization – Science Discovery, Science & Technology Revolution, and Industry Revolution—propel economic development. The INPUT2 Competition, a seed in this transformative landscape, flourishes due to your unwavering support. Whether you're a seasoned contributor to sustainable urban development, an expert, a trailblazer, or a passionate newcomer, your collaborative efforts form an indispensable force propelling this competition forward.

We trust that the insights within this report will not only ignite ideas but also fuel your determination to advance in your respective fields. Your contributions can significantly impact the promotion of innovation in science and technology globally and specifically in the Asia-Pacific region.

Delve into the summaries of the competition award winners' work to draw on the rich insights and innovation that embody the essence of the INPUT2 competition. We extend an open invitation to contact us, explore collaboration prospects, and together, spark new ideas that transcend boundaries.



2024 Innovation Conference Entrance

Award Winners' Information

Award	Project Name	Submitted by
Livable Cities Gold Award	Technological Innovation Drives Synergistic Prevention and Control of PM2.5 and O3 Pollution in the Yangtze River Delta Region of China	Shanghai Municipal Bureau of Ecology and Environment ; Shanghai Academy of Environmental Sciences
Sustainable Transportation Gold Award	Digital Intelligence Platform for Urban Mobility Optimization and Its Applications	Alipay (Hangzhou) Information Technology Co., Ltd.
Green Economy Gold Award	Smart Maritime IoT Integrated Solution Based on High-Throughput Satellite Communication	Fujian Haixia Blockchain Information Technology Co. , Ltd.
Livable Cities Silver Award	Cloud Infrastructure of Shanghai Healthcare Cloud	China Telecom Shanghai
Sustainable Transportation Silver Award	Tunnel shield scenario, engineering vehicle driverless, sustainable development application	China United Network Communications Co., LTD. Shanghai branch, Shanghai Tunnel Engineering Co., Ltd.
Green Economy Silver Award	Turn Waste into Proteins	Global Cerah Sdn Bhd
Start-up Award	Intelligent Fault Catcher	Hong Kong Industrial Artificial Intelligence & Robotics Centre
Best Inclusion Award	DiDi Mujer	DiDi
Best Practice Award	Visual Data Governance and Empowerment Platform of City	Shanghai Big Data Co., Ltd
Best Practice Award	Introduction to Intelligent Inventory Application Scenarios for Shanghai Tower	Shanghai Tower Construction and Development Co.,Ltd.
Best Practice Award	Exploring the Architecture and Structure Integration of High-Speed Railway Stations in the Dual-Carbon Context: From Efficient, Resource-Saving, High-Performance Structures to the Prospects of Sustainable and Resilient Cities	China Railway Shanghai Design Institute Group Co., Ltd
Best Practice Award	The “ Hello Old Friend ” Smart Phone Booth - Assisting Digitally Disadvantaged People ---Supporting Quality of Life and a Humane City for People	China Telecom Shanghai

Award	Project Name	Submitted by
Best Practice Award	5G + Innovative Applications Empower the Smart City Development of Fuzhou	Fuzhou Chengtou New Infrastructure Group Co., Ltd.
Best Innovative Award	Taicang Smart Health Project	Taicang Dejia Health Management Co., Ltd
Best Innovative Award	Innovative AR Scenario Promotes the Tourism to Upgrade--Empowering Tourism with FU Metaverse Competence	Fujian Baibaotu Technology Co., Ltd.
Best Innovative Award	Child-Friendly Smart Park Design: A Case Study of Minjiang Park in Fuzhou	Fuzhou Planning & Design Research Institute Group Co.,Ltd.
Best Innovative Award	Repurposing Gives New Life To Retired EV Batteries - Harnessing The Potentials Of Retired EV Batteries	Hong Kong Productivity Council
Best Innovative Award	Industrial Metaverse Empowered Data Driven Digital Twin Toward Manufacturing	Hong Kong Productivity Council
Excellence Award	Large-space public buildings integrated photovoltaic/thermal systems	Shanghai Jiao Tong University
Excellence Award	PV inspection robots	Huzhou Leaping Technology Co.,Ltd
Excellence Award	Zero Carbon Technology - Online Intelligent Digital Human/Offline Intelligent Workstation	Shanghai Zero Carbon Online Investment Co., Ltd.
Excellence Award	The Digital Twin Platform of Water Distribution System in Fuzhou	Fuzhou Water Group Co., Ltd
Excellence Award	Smart City Management Platform of Fuzhou New District (New District' s Smart Brain 1.0)	Fuzhou Investigation & Surveying Institute Co.,Ltd.
Excellence Award	Research, development and application of high-class heavy truck autonomous system based on mass production	Inceptio Xingchuang Intelligent Technology (Shanghai) Co., Ltd
Excellence Award	High-Reliability Hybrid PV/T Module Technology for Achieving Building Energy Carbon Neutrality	School of Energy and Power Engineering, Nanjing University of Science and Technology
Excellence Award	Fuzhou New Area Binhai New City Intelligent Connected Transportation New Infrastructure Construction Project	Fuzhou Data Group Co. , Ltd.

Award	Project Name	Submitted by
Excellence Award	Fuzhou Comprehensive Transportation Operation Monitoring and Coordination Center (TOCC)	Fuzhou Data Group Co. , Ltd.
Excellence Award	Micro-zero-carbon cyler based on integrated energy regulation technology	Beijing HyperStrong Technology Co., Ltd.
Excellence Award	Autonomous Air-Ground Cooperative Tunnel Inspector	Hong Kong Productivity Council, Civil Engineering and Development Department, Hyder-Meinhardt Joint Venture
Excellence Award	Human-oriented outdoor thermal environment evaluation and optimization design	Hong Kong Polytechnic University
Finalist Award	Industrial Park VOCs Gas Monitoring and Intelligent Early Warning Service System Based on Semiconductor Sensors	Aerospace Kai Tian Environmental Technology Co., Ltd.
Finalist Award	Carbonebook Enterprise Carbon Management Platform	Shanghai Carbonebook Co.,Ltd.
Finalist Award	Fujian Artificial Intelligence Computing Center	Fuzhou Electronics&Information Group CO.,LTD
Finalist Award	A solution for the digital and intelligent transformation of small and medium-sized enterprises in the park based on AI technology	Terminus Technology Group Co., Ltd
Finalist Award	Gulou Intelligent Brain Project	Office of the Leading Group for the Construction of the Gulou Demonstration Zone in Digital Fujian
Finalist Award	SD+ whole-process intelligent energy management ecology	Yunnan Shangding New Energy Co., Ltd
Finalist Award	E-Surfing Digital Platform for Comprehensive Service in Rural Area	E-surfing Digital Life Technology Co.,Ltd,
Finalist Award	HoneyNet for Actionable Threat Intelligence	Hong Kong Applied Science and Technology Research Institute Company Limited (ASTRI)
Finalist Award	Sustainable Aeroponics With Potential To Absorb Carbon Dioxide And Clean The Air Based On Algae	Federico Villarreal National University
Finalist Award	Taste-Map: Platform for Local Tourism	The Hominians Company Limited