



## DCI's Building Control System achieves intelligent management of Guangzhou Sunac Land

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## FROM THE EDITOR

What kind of sparks will be created when 8K meets AI abstract visual art?

In mid-November, Delta cooperated with Japan's renowned art museum, Tokyo's Mori Art Museum, in the exhibition "Future and the Arts". AI, for the first time, tries to learn human abstract concepts such as life, love, etc., and creates automatically a beautiful audio-visual work "Deep Meditation". The 280-inch spectacular image showcases beautiful details at 33-million-pixel ultra-high resolution, by which visitors can enjoy modern art that far exceeds traditional images at close distance, and witness the perfect combination of 8K projection technologies and future art. In this issue, we have more coverage from Tokyo's Mori Art Museum.

Also crossing into a new industry, Delta Controls ORCA building control system was recently implemented in Guangzhou Sunac Land, and successfully applied in various types of fields such as indoor ski area, indoor water park, shopping mall, resort hotel, theater, etc. Delta integrates more than 10,000 data points and makes use of BAS (Building Automation System) to control electromechanical devices inside the building. This application showcases the monitoring flexibility and openness of our technology in huge building group, and achieves energy efficiency and management cost reduction. "Special Report" has a complete coverage for you.

The smart quality precision system, co-developed by Delta Research Center (DRC) and IABG, has been successfully implemented in Wujiang Plant 2 and 3 and Dongyuan Plant 3 and 5 since 2017. Making use of new analytical technologies, the system detects exceptions in production quality, and together with production process related information, deduces the possible reasons for causing exceptions, significantly increasing the efficiency of production line staff in troubleshooting. The project was also awarded 11<sup>th</sup> "Delta Innovation Award" and came in 1st in 2018 "1<sup>st</sup> Delta Smart Manufacturing Technologies Forum". We conducted a special interview with the project supervisors and members from DRC and IABG, to share with us the important results.

In September this year, the world's largest Climate Week was held in New York, attended by the world's influential politicians, including Costa Rica's President, Spain's President, Denmark's Prime Minister, California Governor, Former US Secretary of State, etc. Together with more than a hundred business leaders, they gathered and appealed to the world to immediately reduce greenhouse gas emission. Don't miss this issue as Delta's correspondents bring you first-hand information from the site, and more exciting contents can be found in "Delta Green Life".

Brand Management Office

*Shan Shan Guo*





Guangzhou Sunac Land adopts the Delta Controls Building Automation Control System to achieve intelligent management

# DCI's Building Control System achieves intelligent management of Guangzhou Sunac Land

Text by BABG

With its openness and flexibility, the Delta Controls' Building Automation Control System has once again won users' praise after its successful introduction to the Guangzhou Sunac Land amusement park and related operations. The project adopts Delta Controls ORCA control system, and is integrated with the owner's Intelligent Building Management System (IBMS)—Huiyun System. With over 10,000 integrated I/O points, the control of the mechanical and electrical equipment in the building is achieved using the Building Automation System (BAS) to solve complex operation and maintenance problems, reduce management costs, and meet energy saving and consumption reduction goals.



Guangzhou Sunac Land covers an area of about 2.2 million square meters, and consists of eight operations: Snow World (indoor ski field), Water World (indoor water park), Sports World (similar to Kids World), Sunac Park (Theme Park), Sunac Mall (large-scale shopping mall), Lakeside Bar Street, Holiday Hotels and Grand Theatre.

Guangzhou Sunac Land is equipped with a number of PC workstations, which are located in the commercial Huiyun computer room, park monitoring room, refrigerator duty room, and studio city duty room. Its requirements are to monitor the mechanical and electrical equipment in the building, such as the central cold source system, heat source system, air conditioning and ventilating system, water supply and drainage system. In addition, the requirements for openness and integration of the BAS system are very high for connecting the BAS monitoring points of the huge project to the Huiyun system due to the large number of business operations and controlled equipment and the large building area involved.

Delta Controls' ORCA building control system uses OPC for system integration, which fully displays the flexibility and openness of monitoring ultra-large building groups. It works seamlessly with the Huiyun system to meet the requirements of centralized management with decentralized control and to solve the Huiyun system inability to set the control logic. In this way the owner can monitor various systems in one or more buildings from a single operation station or from any place, achieving management from "small to large".



Delta Controls ORCA building control system



For example, electromechanical equipment needs DDC to set multiple algorithms to ensure normal operations. Using parameter setting values such as the ORCAView system's open air supply temperature setting, return air temperature setting, and CO2 concentration setting, the Huiyun system needs only to adjust the target parameter values. The electromechanical equipment can further achieve energy savings through the default logic operation.

When the general building control system sets the DDC control mode, the conflict between the two systems may result in the failure of the upper Huiyun system. Therefore, Delta Controls' ORCA system adds settings of "BA mode/schedule/Huiyun mode" for the logic of each DDC module. Under the system setting of "BA mode", the equipment is controlled by the BAS system. The Huiyun system only monitors the running state of the equipment at this time and does not control the equipment remotely. When the mode is switched to "Schedule" mode each device is controlled at a fixed time per individually set schedule. The Huiyun system only monitors the running state of the equipment at this time. When the mode is switched to "Huiyun Mode", the equipment is controlled by the Huiyun system, while the BAS operating system only monitors the equipment.

To satisfy comfort requirements, the building control system of Delta Controls uses logic to adjust the operation of the equipment so as to reduce the operating cost of the building. In addition, the building control system of Delta Controls uses a computer control program to monitor and control the equipment of the whole building. It uniformly allocates all of the equipment's electricity consumption to optimize the control of the electricity load, effectively saving electricity and reducing unnecessary waste.

With the present cooperation of Guangzhou Sunac Land and Delta Controls, the ORCA control system is seamlessly integrated into the Huiyun system to meet its large and complex project requirements, and finally achieve monitoring and control of the equipment by the Huiyun system. The previous issue of only being able to monitor but not control is solved, and the electromechanical equipment is effectively guaranteed to operate in good condition, providing another outstanding example of Delta Controls technical expertise.



Amerlux and DCI had the synergy meeting in Oakland NJ. From Left to right, John Nicholls, CEO of DCI, Joseph Oberle, Chairman of Amerlux, Chuck Campagna, CEO of Amerlux

### **Amerlux shines with Delta BA solutions**

Interviews with Joseph Oberle, Chairman of Amerlux and  
Chuck Campagna, CEO of Amerlux

Text by BABG

It has been over 3 months since Amerlux, an LED architectural lighting solutions provider based in the U.S. state of New Jersey, joined Delta Group and empowered Delta's Building Automation (BA) forces. In this last issue of 2019, "Brand People" features interviews with the heads of Amerlux: Mr. Joseph Oberle, Chairman of Amerlux and Delta's Vice President of Corporate Development, and Mr. Chuck Campagna, CEO of Amerlux. We invited them to share their insights into the business opportunities and synergies brought by the integration of Amerlux and Delta BA solutions.





### "Amerlux Speaks the Language of Light!"

"Amerlux speaks the language of light," said Chuck. Amerlux focused solely on the lighting of supermarkets at its inception back in 1984. But today, Amerlux offers a wide ranging product portfolio, including track lighting, recessed down lights, linear systems, "made to measure" custom lighting systems, pendants, and outdoor architectural lighting products, which has made Amerlux a leading brand in the high-end North America lighting market over the past 2 decades.

To build and continue to strengthen such a brand asset, strong teamwork is key. "We pride ourselves on on-time delivery made possible by a dedicated team of engineers, customer support personnel and a fantastic production group." stated Chuck.

With the solid support of a highly trained sales force that spans the globe and one-stop service from initial design to final delivery, Amerlux has built a strong presence and reputation in the U.S., particularly in the North East and New York City. It continues to achieve great success, especially in the commercial, retail, hospitality and supermarket markets.



In Sep. 2019, leaders of the BABG gathered at Amerlux headquarters in Oakland, New Jersey to discuss the overall business integration and open the possibilities on how to create new opportunities





## BRAND PEOPLE



The Amerlux brand strategy is “to be the first choice for architects, lighting designers and interior designers for architectural lighting solutions.” said Chuck. “Amerlux has had strong relationships with key U.S. lighting specifiers and architects who are the key influencers in the architectural lighting channel,” stated Joseph.

To make sure that Amerlux reaches its target markets, the company uses various avenues for brand management, such as participating in the international exhibitions LightFair International, and LEDucation, and joining numerous retail, hospitality and supermarket tradeshow. As a leader in the lighting industry, Amerlux also conducts AIA seminars for numerous architectural, engineering and lighting design firms.

Chuck held a Town Hall with the entire company to let everyone know where Amerlux stands and the direction of company



### Collaboration with Delta BA for Business Growth

With the Amerlux acquisition, Joseph believes, “Delta is benefitting with product, design, engineering, and a better understanding of the lighting industry and channels.” Amerlux sales and product management talents are expanding Delta’s presence in specific markets west of the Mississippi River to help achieve 2020 sales growth.

For Delta’s BA business, Joseph says that lighting can be an integral portion of Delta’s growth strategy for buildings, given that lighting is everywhere in buildings and cities, and is becoming a major platform for the sensing and control of buildings and for smart IoT cities.



Joseph Oberle, Chairman of Amerlux, was in the Amerlux employee meeting

Under the concept of Delta Building Solutions, Amerlux and the Delta BA team have been quick to work on both commercial and product integration with Delta affiliates, including Delta Controls, LOYTEC, VIVOTEK, and Delta's Lighting SBU. Joseph gave an example of successfully integrating DCI's O3 Sensor Hub, LOYTEC's DALI lighting control system, and VIVOTEK cameras into Amerlux fixtures at the Amerlux Oakland N.J. showroom for customers to see what is coming in the future. BABG Americas' engineering and commercial teams are already working together to specify cross business products, as well as make joint customer and specifier calls.

"Amerlux is very excited to have become a part of the Building Automation Business Group within Delta," said Chuck, "Delta's building automation technology is the perfect marriage for Amerlux's lighting products." Lighting is the "common denominator" in any building, since it can embed building automation technology such as HVAC controls, lighting controls, and security cameras. "Data gathering technology inside the light fixtures will give Delta a significant advantage over the competition."



### Sharing and encouragement from Joseph and Chuck

Chuck

My career path has been one that is very unconventional. I started a health club business that grew to three locations and thousands of members. It was here while owning my own business that I learned the basic principles of running a business. I learned the basics of lighting when working for General Electric Lighting. I couldn't have asked for a better place to start in lighting than GE. After 10 years at Genlyte I was recruited to become the President & CEO of Amerlux. It was a big risk that I took going from a huge company like Genlyte to a small company like Amerlux. However we had a core of very good individuals who worked hard, shared the same vision, and we grew at an 18% CAGR for 18 years!

If I could give any advice to my colleagues at Delta, it would be to believe in yourself and to stay true to yourself. No matter how high you climb you need to remain humble and be kind to people. Don't get me wrong, business can be very tough and it takes tough individuals to be successful in very competitive businesses. My father used to tell me "There's nothing tougher than true gentleness and nothing gentler than true toughness". You can be a tough business person, make tough decisions and stand your ground while still being humble and kind.

I have been extremely lucky in my career to be able to work in all facets of business with major multinational companies. Early in my career, I worked in manufacturing management at Euclid Inc., a manufacturer of heavy off road hauling equipment owned by Daimler Benz of Germany. I then moved to Picker International, a major manufacturer of medical imaging equipment, owned by General Electric of England, where I moved from production planning and supervision to leading their Nuclear and Ultrasound product lines. GE Lighting recruited me from Picker where I moved through numerous positions to the position of General Manager of Electronics, Wiring Devices, Home Electric products and ballasts, leading global engineering teams and the overall electronics business. I joined Delta in 2011 to help the region with growing our branded presence and offering.

My message to Delta colleagues is continue to reach out for new opportunities at Delta both within and outside of your current area of expertise. My success in my career has always been to exceed what the business was asking me to do and at the same time looking for more challenging assignments for my own career satisfaction.

Joseph

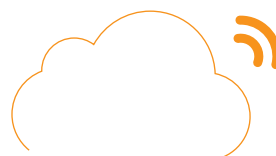




### DRC teams up with IABG to develop intelligent quality enhancement system

Text by DRC

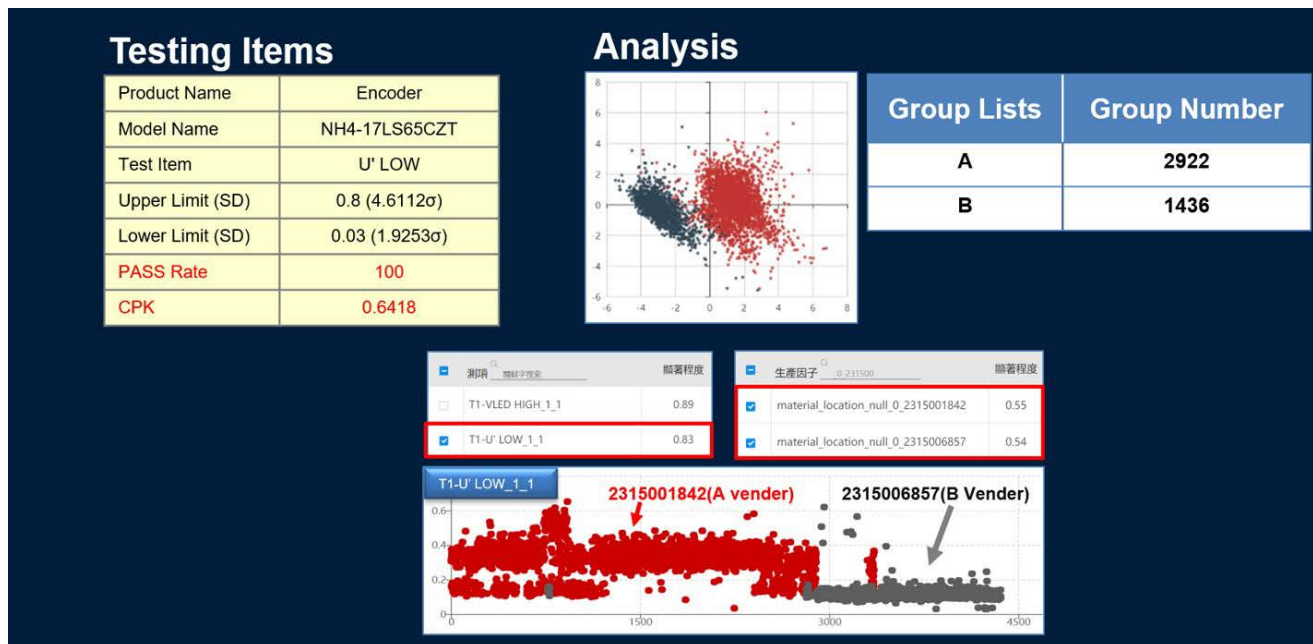
Quality enhancement has been on the minds of manufacturers for as long as the industry has been around. Given the complex and varied factors that affect production quality, manufacturers often spend a lot of time and resources and yet still find themselves struggling with efficiency and yield problems. Further compounding the problem is the difficulty involved in terms of industry knowledge and technique transfer that hinders quality improvement.





With the intelligent quality enhancement system developed by Delta Research Center (DRC) in partnership with IABG, manufacturers are able to address the anomalies that cannot be detected by conventional quality management methods, identify possible root causes of the issues through data-oriented diagnoses, and allow production line personnel to be more effective and efficient in troubleshooting. The system owes its origin to the need of the exploration of production test data. Delta's products are delivered to customers after meticulous testing. However, despite the tests, product returns still occur occasionally. Even with the introduction of the Statistical Process Control (SPC) technique, anomalies have not been eliminated entirely due to inappropriate specification settings.

In view of this, DRC looked to the use of unsupervised learning as a solution. In the case of not knowing the quality of a product, various dimensions are taken into account to allow data to follow the learning rules and users to observe the distribution of test data, or, the grouping of the data (such as Group A in red and Group B in gray in the graph below) from different aspects. When data are grouped, it usually means that variation or offset has occurred. The phenomenon can then be correlated with the 4M1E (Man, Machine, Material, Method and Environment) elements in the production process which are the key factors of production quality and possible sources of issues. After anomaly detection, root cause analysis serves as the core function module of the intelligent quality enhancement system. Building upon the system, DRC has been working on the development of an application module of solder paste inspection (SPI) data containing spatial information, feature extraction methods of SPI data, and multivariable "outlier analysis" module which allows users to add annotations on data to train outlier prediction models. With continuous interaction, the models can be constantly updated and finetuned to improve the accuracy of predictions as well as the quality of products.



The system provides insights to whether or not product test data are stable, main test items that are causing instability and the factors involved (the unstable state of Group A is higher than that of Group B), so that improvement strategies can be communicated and formulated with suppliers





## IoT SMART SOLUTIONS

The success of this project were attributable to a number of reasons: correct goal setting, division of work based on specialization between DRC and IABG, and Delta's strategic focus on AI. Well aware that quality was a pain point of the manufacturing industry, the project team set their goals in line with the practical needs of production lines. DRC and IABG each gave full play to their respective strengths. IABG took advantage of its deep understanding of the production landscape and rich experience in data acquisition to assess the needs of manufacturing facilities, pain points and data acquisition status on the front line. IABG also implemented the Mapping System, which it jointly developed with DRC, to assist factories with the test data structuring and storage work, and tailored the user experience (UX) based on user needs, as well as trained the users of the intelligent quality enhancement system. Meanwhile, DRC's data scientists, software development team and project management team focused on the development of the system and analysis modules.

Sean Chang, Senior Director of Smart Sensor & Meter Business Division of IABG, said "The project development spanned across Taoyuan, Taipei, Beijing and Wuhan. The seamless collaboration of IABG and DRC was what made the project such a success, with efficient and accurate communication constantly going between the two parties, from problem identification, goal setting, all the way to project execution. Moreover, the way the research and development work approached data—through grouping and root cause algorithms—made it possible to perform analyses based on data, allowing the intelligent quality enhancement system to be further expanded to other areas, not just on test data, but also on machine parameters or production process information, etc."

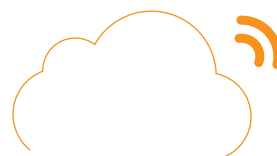
Dr. Vincent Lo, Leader of DRC AI CoE (Center of Excellence) said "Good data quality is pivotal to valuable and meaningful analysis. The project team made efforts to collect complete data and properly manage the data, so when they loaded the data into analytical applications, they could ensure a smoother flow and obtain better results."

Sean Chang further explained "The algorithm development team was engaged in the project requirement interview to match customer needs with algorithm functions, which not only helped improve development efficiency, but also sparked more ideas about how to best utilize various analysis dimensions."

IABG and DRC worked hand in hand throughout the project, applying new data analysis techniques to detect variances in production quality and using relevant process data to decipher possible causes of anomalies. Since 2017, the intelligent quality enhancement system has been introduced to Wujiang plant 3, Wujiang plant 2, Dongguan plant 3 and Dongguan plant 5, etc. one after another. In addition, its outstanding performance has also earned multiple recognitions, including the Award of "New Business Model and New Business Process" in Four Major Awards of 11th "Delta Innovation Award" and the First Prize of the "First Delta Intelligent Manufacturing Technology Forum".



The intelligent quality enhancement system has been introduced to Wujiang plant 3, Wujiang plant 2, Dongguan plant 3 and Dongguan plant 5





## Delta honored as a Taiwan Top 20 Global Brand for nine consecutive years

Text by Corporate Communications

Delta has been successfully selected as one of the top 20 Taiwanese global brands for the 9<sup>th</sup> consecutive year with a brand value of USD297 million in 2019 in the prestigious Best Taiwan Global Brands assessment. In the aforementioned annual survey, which is organized by the Industrial Development Bureau and executed by Interbrand, Delta became the fastest Taiwanese large industrial brand in regards to brand value growth with a 12% year-on-year surge. Through its focus on the development of game-changing megatrends, such as smart green cities, 5G and 8K, as well as its devotion to corporate social responsibility, Delta has been able to increase its brand value to a historic high.

Ms. Shan Shan Guo, Delta's chief brand officer, remarked, "2019 has presented us with both opportunities and challenges. 5G technology is gradually entering its commercialization stage to become a key foundation of smart cities, and Delta is leveraging its core competence in high-efficiency power electronics and its strong IoT-based solution integration capabilities to nurture energy-efficient transportation, buildings, manufacturing and infrastructure for those cities. We have also utilized our display, power and thermal management technologies to create the world's first 36,000-lumen DLP® 8K laser projector, which demonstrates Delta's capabilities to seize business opportunities in the 8K broadcasting of the Tokyo 2020 Olympic Games. We are also cooperating with the Oriental Pearl Group to enable the world's first 8K imaging lab to develop innovative business models in the projection display field. Earlier this year, we have also acquired a majority stake in Delta Electronics (Thailand) to enhance our global manufacturing capabilities and customer service reach amidst a series of geopolitical risks."



Chief brand officer Ms. Shan Shan Guo received the Taiwan Top 20 Global Brands award on behalf of Delta

Innovation is a core focus for Delta as it commonly invests 7~8% of its annual revenues into R&D to advance its software/hardware integration expertise and realize IoT-based smart green solutions that help cities reduce their carbon footprint. Moreover, Delta is centered on improving efficiency for buildings with its IoT-based building management platforms and for low-carbon transportation with its bi-directional electric vehicle (EV) charging and energy storage solutions. The world's first LEED Platinum-certified data center at Delta's headquarters green building in Taipei is also a testament of its unique prowess in advancing energy-efficient information and communications infrastructure.

A few weeks ago, the Dow Jones Sustainability Indices (DJSI) selected Delta as a member of the DJSI World Index for the 9<sup>th</sup> consecutive year, and named it as the industry leader within the Electronic Equipment, Instruments & Components sector for its superior environment, social and governance (ESG) performance in 2019.





## Delta provides Mori Art Museum with advanced 8K projection to showcase AI artwork

Text by Corporate Communications

Cooperating with Mori Art Museum, a well-known art palace in Japan, Delta provides its leading 8K projection technology in the "Future and the Arts" to showcase "Deep Meditation", an audio-visual artwork by the artist Memo Akten with deep learning artificial intelligence (AI). Visitors from all over the world can experience the spectacular images of the 280-inch screen through the unique leading 8K projection technology that displays the exquisitely refined details brought by the 33 million ultra-high resolution. In a close distance, one can enjoy the beautiful images automatically generated by AI learning of the abstract human concepts such as "life", "love", "truth", and more.

Delta continues to promote the innovative application of 8K projection technology. Recently, Delta successfully made 8K large-screen live broadcasts of important international sports events and national traditional theatrical performances in Japan. Through the fascinating and clear imagery, the audiences feel closer to the stage details than if they were in the scene. In different occasions such as cinemas, theme parks, planetariums, commercial buildings and so on, 8K projectors can be used to create high-quality visual feasts, and for uses in medical and scientific fields that require ultra-high resolution, or for image simulations during product development procedures. The cooperation with Mori Art Museum uses the most advanced 8K projection technology to interpret modern art works that exceeds the box of the traditional image expression, allowing many art lovers to experience the spectacular and subtle beauty of 8K large-screen projection.

Mori Art Museum's "Future and the Arts" exhibition is held from November 19, 2019 to March 29, 2020. Guests from all sectors are welcome to visit the Mori Art Museum in Tokyo (53F, Roppongi Hills Mori Tower) to experience the beauty of Delta's 8K projection technology in the combination of future arts.



Cooperating with Mori Art Museum in Japan, Delta showcases the future art by combining AI deep learning with 8K projection. (Left to right) Mr. Kengo Ka, CEO of Digital Projection, Ms. Shan-Shan Guo, chief brand officer of Delta, artist Mr. Memo Akten, Mr. Bruce Cheng, founder of Delta Group, and Mr. Ching-Hsing Ko, director of DEJ



Mr. Bruce Cheng, founder of Delta Group (right), and Mrs. Yoshiko Mori, chairperson of Mori Art Museum, took photo at the opening ceremony



The spectacular visuals are projected on the 280-inch large screen through 8K projection technology that displays exquisitely refined details at 33 million-pixel ultra-high resolution



## The world's largest outdoor 8K projection from Delta at Sun Moon Lake

Text by Delta Electronics Foundation



Group photo of the attendees

The charity night screening "8K Projection at the Sun Moon Lake - Converging Greatness" organized by Delta Foundation was held on 10th and 11th of October. The world's largest outdoor 8K projection uses the world's leading video technology to interpreting humanity and cultural issues. Apart from showing delicate images showcasing Taiwan's water resources, the projection also incorporates performances of world-class children's choir and dances from the Thau Deer Chase Market Dance Group, touching the heart and bringing amazement to the thousands of audiences present.

The founder of Delta and the chairman of Delta Foundation, Bruce Cheng, also participated in person. He emphasized that the Delta Foundation wishes to raise public awareness to protect the Earth through the presentation of the video. In the past, the Delta foundation had produced a documentary in HD "The Rings of Formosa" in collaboration with the Chinese Public Television, and collaborated with director Bo-Lin Qi on Taiwan's first documentary film shot from the air, "Beyond Beauty - Taiwan from Above". Both are shot with the latest video technology and records nature's beauty and the scar caused by humanity. The documentary "Water with Life in Taiwan" includes the precious images of the droughts in warm winters, the coral bleaching, the disappearance of moss, land subsidence, etc. It records the impact of climate change and human activities on water resources, hoping to raise awareness of the crisis Earth is in through images projected with the latest 8K technology from Delta.

In this charitable event, "8K Projection at the Sun Moon Lake - Converging Greatness", Delta Foundation created an enjoyable experience from visual, audio and spiritual aspects with three elements of "technology", "culture" and the "environment", to convey our dependent relationship with water. Live world-class children's choir presented the famous kipahpah ima, opening this charitable event with the pure sound of the aborigines from heaven. The 8K projection technology allows the audience to experience the sceneries of Taiwan and calls for recognition of the issues we are facing in regard to our water resources. The Thau Deer Chase Market Dance Group also expresses the joy of their people to share the sacred and pure water and their mystical stories of roaming with the deer with their traditional dances. What's more, the projection was carried by a balloon flying 2.5 meter above the water in their performance.





## Delta holds brand campaign in Wuhan

Text by DGC

On 25 October, Delta held its brand campaign "IoT-based Smart Green Solutions" at the "Intelligent Manufacturing and Smart Park Collaborative Development Conference", incorporating all of its IoT-based smart green solutions under the theme "IoT intelligence" and introducing it to the smart park. In the campaign, Delta demonstrated its technical competence in areas such as smart green factories, smart green building, big data visualization, green datacenter, etc. At the same time, Delta's "smart green manufacturing roadshow truck" drove into Wuhan Hannan District, providing inspiration and solutions to over 150 participants from industrial parks, industrial manufacturers, vendors providing digitalized solutions and higher education research institutions. The roadshow truck has traveled across 66 cities covering 17,312 kilometers. And more than 7,000 visitors visited the exhibition since its launch in June this year.



Delta held "IoT-based Smart Green Solutions to Nurture Energy Efficiency in Cities" campaign at the "Intelligent Manufacturing and Smart Park Collaborative Development Conference", introducing its IoT-based smart green solutions to the customers

Delta's Chief Brand Officer, Ms. Shan-Shan Guo, stated that Wuhan is one of the major cities in the economic areas of the Yangtze River Basin, which features high-quality technology innovation centers and is considered "China Optics Valley". It is also one of the four major cities for science education and has nurtured considerable tech talents. Innovation is one of Delta's core values as well. To improve the energy conversion efficiency of our electronic products and provide energy efficient and environmentally friendly products and solutions to our customers, 7%-8% of the revenue is invested in research and development of technology each year. At the same time, Delta also actively supports scientific research and development of higher education institutions. By collaborating with Huazhong University of Science & Technology and Wuhan University, "Delta Power Electronics Science and Education Development Program" and "Delta Greentech Scholar Program on Environmental Law" throw full support for the cultivation of innovative talents. In recent years, Delta provided comprehensive green solutions for smart city through cross-department collaboration and technical innovations were developed in smart green manufacturing, green building, eco-friendly transportation and energy-saving communication technologies, etc. In the opening of the 7th CISM Military World Games, laser projections made by the associate company of Delta, Digital Projection, are used to display magnificent lights and shadow to audiences from around the globe.



## Delta hosts the "K. T. Li Technology and Literature Lectureships" award ceremony to encourage academic technology and passion for literature

Text by Delta Electronics Foundation



Bruce Cheng, the founder of Delta and chairman of Delta Foundation, taking photograph with the award winners of the "K. T. Li Technology and Literature Lectureships"

In order to promote literary and technological achievements, Mr. Bruce Cheng, the founder of Delta and chairman of Delta Foundation, founded "K. T. Li Technology and Literature Lectureships," which has been its 18th year this year. On November 11th, Delta Foundation and National Cheng Kung University (NCKU) jointly held a series of "K. T. Li Technology and Literature Lectureships" events. During the events, the 8K environmental documentary "Water with Life in Taiwan" was played to commemorate Dr. Hwung Hwung-Hweng, the former President of the NCKU and a hydraulic academic.

During his speech, Mr. Bruce Cheng mentioned his motivation for setting up the awards. He primarily wanted to encourage people who have made significant contributions to research, invention, and innovation that lead to science and literary advancement. Dr. Su Fong-Chin, Executive Vice President of the NCKU, mentioned that it is especially meaningful to play the environmental documentary "Water with Life in Taiwan" in the award ceremony because the pronunciation of water in Taiwanese is similar to that of "beautiful" and the combination of literature and technology will lead to "beauty."

The series of activities on the day includes the "NCKU EE Foundation Delta Lecture" award ceremony, which gives Delta opportunities to work with various NCKU academics to develop new technologies. For example, a few of the award winners have helped Delta develop many technologies including robotic arm motion parameter, servo actuator verification, motor driver, light decelerator material and machinery and equipment diagnosis. Another new collaboration between Delta and the NCKU is the "K. T. Li Lectureships Delta NCKU Collaboration Program," in which Delta works with excellent professors from various departments such as Electrical Engineering, Statistics, Architecture, and Aeronautics and Astronautics for one to two years to develop advanced techniques. The research has been made on diverse products such as motor, power supply, micro-grid, lighting, and refrigerating system. It is hoped that both Delta and the NCKU can benefit significantly from this collaboration in the future and work together to improve well-being and harmony of humanity.

## Delta wins Thailand Energy Awards 2019 in three categories

Text by Delta Electronics (Thailand)

Delta Electronics (Thailand) received the Thailand Energy Award 2019 in Creative Energy, Energy Conservation: Green Building and Designated Factory. This year Delta's headquarters in Samutprakan won recognition as a retrofitted green building. In 2017, Delta was the first company in Thailand to receive the LEED (Leadership in Energy and Environmental Design) certification in the EBOM (Existing Buildings: Operations and Maintenance) category.

With the new renovations and measures in place, the Delta Energy Management Team can leverage the company's DIA Energie system and SCADA solutions to monitor and analyze energy consumption in real time for optimization. Delta also has activities to promote energy conservation and enrich the lives of employees including building lighting and air conditioning regulation during off hours and water and paper recycling.

This is the fourth year for Delta to win the award from the Ministry of Energy in recognition of factories, buildings and individuals that demonstrate responsible use of energy resources for sustainable development.



Mr. Pitisoook Chitkaseem, Delta Plant Administration Director (right), received the award on behalf of Delta from Deputy Prime Minister Somkid Jatusripitak





## Delta participates 2019 GreenBuild China

Text by Delta Electronics Foundation

U.S. Green Building Council (USGBC) held GreenBuild China 2019 on October 22-24 in Shanghai. The four major topics of panel discussion sessions this year include: "Achieving Net Zero: Present and Future", "Green Building and City 2050", "Building Climate Resilience and Quality of Life", "Sustainable Living: Production, Consumption and Lifestyle". The conference aims to explore topics such as low carbon cities, green value in sustainable buildings, integration of smart system in future green buildings as well as climate resilience.



Delta was invited to attend 2019 Greenbuild China and exhibited Delta's projects of green buildings as well as the IoT-based Smart Green Solutions

Delta Foundation applied to host one of the discussion panels with the topic "Resilience of Future Green Buildings and Cities". Executive Director of Delta Foundation, Mr. Wim Chang, and the Director of Public Welfare Division of DGC, Mr. Eason Chen participated the panel and shared cases of green buildings rebuilt by Delta after disaster and how green buildings served achieve community resilience in areas that suffered from natural disasters. Mr. Chang talked about two cases of campus reconstruction in Taiwan, which are "the Namasha MinQuan Elementary School" and "Y. S. Sun Green Building Research Center at NCKU" while Mr. Chen focused on two cases of reconstruction after Sichuan Earthquake, which are "Delta Sunshine Elementary School in Yangjia Town," and "Delta Sunshine Junior High School of Longmen". The green building of Namasha MinQuan Elementary School was designed by Bio-architecture Formosana (BAF) and one of the associate partners, Mr. Chang-Lien Lin, was invited to moderate the panel. He applied his architectural expertise to lead the discussion. In the forum, the public acknowledged and praised the company for actively providing assistance in welfare projects.

The topic of the other panel hosted by the senior director of BABG, Mr. Roland Chiang, was "The Green and Smart System for Future Building." He used clear examples to illustrate how building automation solutions helps to maintain healthy indoor environment and improve energy efficiency. In addition, the Delta Taipei HQ green data center has just received the world's first LEED v4 ID+C Platinum certification. On the day of the forum, Mr. Anderson Chang, the IT Infrastructure Manager of Delta China received the award on behalf of Delta. It is also the second Delta's data center that has been awarded the LEED certificate after Delta Wujiang data center (LEED v4 ID+C Gold-Level).

LEED is the most widely used green building rating system in the world and China has become the second-largest LEED market in the world with the US being the first. On the opening speech, Mr. Mahesh Ramanujam, the President and CEO of USGBC, mentioned that USGBC will be launching LEED Living Standard competition and research in China in 2020. The conference aims to engage green building experts and to promote the harmony between human built environment. It is worth mentioning that amongst the 28 panels, the panel that organized by Delta Foundation is the only one that focuses on green building education. This provides professionals from North Asia who are interested in green buildings with an opportunity to learn how to respond to and to mitigate the effects climate change through green building education.



## Delta's Modular Dynamic Datacenter provides full support for Capital Airport Power and Energy Command Center

Text by DGC

By virtue of its leading-edge technology and innovative design concept, Delta's Modular Dynamic Datacenter has become the Data Center of Beijing Capital Airport Power & Energy Co., Ltd.. By renovating the Internet connection within the company and establishing a digitalized data room, the data center will regulate and maintain energy supply for the terminal area, flight area, work area and living area of the Capital Airport.

Considering the strict security requirements of the Airport Power and Energy Command Center and the rapid growth of data volume in the next few years, Delta has provided more reliable and scalable solutions in the design of the computer room infrastructure. The new computer room adopts the Delta's modular Dynamic Datacenter. In the planning and design of the computer room, Delta takes into account of the characteristics of various units of electrical equipment. To simplify the circuit configuration in the computer room and improve safety, the logic circuits controlling these electrical devices were directly built onto power distribution cabinets and array cabinets. At the same time, the battery racks were built on the actual condition of the computer room and thus saves more space in the room. We increase the investment for customers by researching in more details.

The DPH series modular UPS used in the modular Dynamic Datacenter has not only high reliability, excellent performance and great overall efficiency as we have seen in other Delta's uninterruptible power supply systems, but also includes the (N+X) fault-tolerant design. With built-in control mechanism, the redundancy arising from power supply modules is automatically handled. The power distribution cabinet (PDC) in the modular Dynamic Datacenter is small in size. The HMI and communication interface are unified which greatly improves the space utilization in the computer room. While operating the datacenter, the Data Center Infrastructure Management (DCIM) system can provide a comprehensive and unified view of all IT infrastructure (virtual machines, servers, racks, etc.) and facility environment (power supply, cooling system, environment, etc.). It can transmit detailed information for the computer room management personnel to develop appropriate plans and predict future requirements of the data center.

Compared with the traditional computer room, the new Data Center of the Capital Airport Power & Energy Co., Ltd. provides on-demand scalability and can be expanded as demand grows. The energy consumption of the computer room is greatly reduced and thus is more environmentally friendly and energy-efficient, which made the modular datacenter well recognized by users.



Beijing Capital Airport Power and Energy Command Center adopts Delta's modular Dynamic Datacenter



### Delta's UPS systems make it into Approved Procurement List in China

Text by DGC



Delta's UPS systems have been highly recognized in China and other key markets in EMEA and Australia

Delta's UPS systems have been included into the 2019 Approved Procurement List of the Agricultural Bank of China and the Bank of China. The Modulon DPH series three-phase modular UPS helped the Wuhan Airport data centre achieve the 5A-level IDC certification by providing, not only the world's highest power density at 50kW for each 3U module, but also the lowest power footprint at 500kW for just 1sqm, as well as industry-leading AC-AC efficiency up to 96.5%. Delta's Ultron HPH series three-phase UPS supports broadcasting tower facilities for a radio and TV station in northeast China with its fully rated power (kVA = kW) and superior system expansion flexibility with N+X redundancy and configuration up to 480kVA (4 units) in parallel.

The unrivalled track record of Delta's UPS systems also extends to other key markets such as the Europe, Middle East & Africa (EMEA) region as well as Australia. Five of the twelve stadiums that held the 2018 FIFA World Cup Russia™ also have their

mission critical applications, such as field lighting, fire alarm systems and/or broadcasting and transmission equipment, supported by over 3 megawatts (MW) of Delta's UPS systems. In Australia, the Adelaide Airport, an air travel hub that serves over 8 million passengers annually, selected Delta's Modulon DPH series three-phase UPS to support its luggage handling systems and flight control platform.

Delta's UPS systems have been highly recognized in China and other key markets in EMEA and Australia.

### Delta and HTC-ITC sign contract to build Vietnam's first Uptime certified 2N T3 and green data center

Text by Delta Electronics (Thailand)

Delta signed a contract with HTC-ITC, a subsidiary of Hanoi Telecom, to build Vietnam's first 2N (two times the amount required for operation) Tier 3 Uptime (99.982% uptime) certified data center at HTC building. The new data center will operate according to Tier 3 standards of Uptime Institute, the world's most prestigious data center certification organization.

The milestone project with Delta and HTC-ITC marks the first data center installation in Vietnam with Tier 3 Uptime build standard. During the eight-month construction period, Delta will leverage data center infrastructure solution for rapid installation, energy-saving, optimal PUE and a modular and scalable architecture.

The new Tier 3 green data center will serve organizations and businesses operating in Vietnam, both local and from overseas, and satisfy their need for a high level of service in terms of features, stability and information security. Delta offers a turnkey solution from design, implementation and TCDD, TCCF Uptime certificates equipment along with excellent local SI for support.



Delta partners with HTC-ITC to build Vietnam's first data center with 2N Tier 3 Uptime standard





### Delta's AC motor drive for pumping unit helps digitalization of oil field

Text by DGC

Digital oil mining is developing rapidly with the continuous maturity of automatic control technology and network communication technology. To meet the requirements of intelligent oil mining and improved oil mining rate in the construction of digital oil fields, Delta has developed VFD-C2000-PP, a special AC motor drive for oil pumping units, based on the classic high-performance vector frequency converter C2000 series as the core and loaded with special functions suitable for oil mining technology in the oil field industry, to improve the efficiency of oil mining and realize the digitalization of the construction of oil fields.

Delta's special frequency convertor VFD-C2000-PP for the pumping unit has built-in 10k steps PLC. It adopts double rated design of common load / heavy load, high control bandwidth, realizes the integration of asynchronous motor / synchronous motor control, and adds special features suitable for oilfield application on the original software platform. VFD-C2000-PP is a special intelligent energy-saving frequency converter for oil fields. It can optimize the up/down stroke time of pumping unit by changing the operating frequency of the motor, so as to improve the oil extraction efficiency.



Delta's AC motor drive VFD-C2000-PP designed for oil pumping unit for Oil field industry

### Delta's SCARA industrial robot succeeds in manufacturing of 3C products

Text by DGC

With a high level of development in digital products such as smart phones and tablet PCs, the 3C industry is becoming more and more intelligent. As the output soars, the replacement time for products is shorter than before, which brings more new requirements to manufacturing. In the manufacturing process for 3C products such as notebooks, tablets and smart phones, there are many parts inside the outer casing of 3C products, which need to be glued by AB glue. It is undoubtedly the optimal choice to apply glue via machines in order to improve efficiency and maintain consistency in quality.

Different products have their own corresponding fixed glue path which are mathematically verified along with experimental test results meeting the requirements. Therefore, the dispensers indeed apply the AB glue evenly on the products following these path tracks. Delta's SCARA industrial robots can write motion programs according to the glue path to enable a point-to-point movement, while being able to withstand loading weight of the dispensing mechanism and complete automatic loading and unloading.

In actual tuning application, whenever some difficulties are encountered for the robot dispensing, the technical team would propose a solution immediately. For example, by reducing the accuracy of the position arrival, change in the end speed for the short line-folding robot would be reduced, with the glue evenly distributed. By individually adjusting the height of glue dispensing for the robot on the curved surface, the effect of the curved surface on the glue application would be eliminated. In addition, unlike the past, when the dispensing process requires manual loading and unloading, the Delta SCARA robotic arm features an added suction pad tool to enable automatic action of loading and unloading, thereby contributing to further improvement in efficiency.



Delta's SCARA industrial robot successfully used in manufacturing of 3C products



## Delta EV charging solutions power Nissan LEAF test drive at Thailand's highest peak

Text by Delta Electronics (Thailand)



Delta EV charging solutions support Nissan LEAF test drive in Chiang Mai, Thailand

Delta Electronics (Thailand) brought its Electric Vehicle (EV) charging solutions to support the Nissan LEAF test drive at Thailand's highest mountain - Doi Inthanon. As the official Electro Mobility Operator (EMO) for Nissan in Thailand, Delta joined the event to support charging for 10 Nissan LEAF EVs and to help educate drivers in EV charging while highlighting the benefits of the Delta AC Mini Plus EV charger for cross-country driving.

During the week-long test drive, four groups of around 80 media professionals drove 10 fully charged LEAF to the top of Doi Inthanon and back on a single overnight charge with the Delta AC Mini Plus. At the opening ceremony, members of Thailand's press explored the Delta's EV charging options including the AC Mini Plus EV charger and DC Wallbox EV charger. The DC Wallbox EV charger is a 25kW quick charger with CCS and CHAdeMO dual charging ports and 94% maximum power efficiency. Its small footprint and durability make it a good choice for fleet and commercial applications. The AC Mini Plus EV charger is a sleek and stylish 7.36kW charger that is easy to install for home and office charging.

At a height of 2,565 meters above sea level, Doi Inthanon in Chiang Mai province northern Thailand is the perfect location to demonstrate the power, safety and the practicality of driving and charging EVs in mountainous terrain. Delta partners with global EV leader Nissan in Thailand to raise awareness about charging safety and its nationwide quick charging network.

## Delta and TÜV SÜD PSB join hands to advance talent cultivation and enterprise transformation

Text by DRC

Technologies like Industrial Internet of Things, artificial intelligence, advanced robot technology, big data and data analytics are constantly evolving, which have the potential to bring about a radical transformation of traditional industries and manufacturing processes; not all companies, however, possess the knowledge or expertise to adopt these technologies in a manner that's best suited for their business models and operations. As a result, many companies are actively looking for customized and interactive training solutions to help their talent cultivation needed at the time of business transformation.

For this reason, TÜV SÜD PSB, located in Singapore, a branch of TÜV SÜD, German Testing, Inspection, Training and Certification Group, has signed a three-year Memorandum of Cooperation with Delta. Both parties will make good use of the rich experience of TÜV SÜD PSB in interactive instructor-led and e-learning courses, as well as the expertise of Delta in areas such as advanced manufacturing, smart industry, cyber-physical systems and analytics, both parties will co-develop new training courses that help companies embark on digital transformation and improve their manufacturing competitiveness. TÜV SÜD PSB and Delta will also develop a web-based and mobile application based learning platform that will allow users to complete e-learning courses covering various, important aspects of Industry 4.0 paradigm.



Delta CTO Dr. Thomas Li (right 2) signed a three-year Memorandum of Cooperation with Mr. Shankar Mohan (left 2), head of Business Assurance Division - ASEAN, from TÜV SÜD PSB, and witnessed by Mr. Richard Hong, CEO, TÜV SÜD ASEAN (left 1) and Dr. Jack Sheng Kee, Lab Director of Delta Research Center (Singapore) (right 2)



## Delta and JTC Corporation sign MOU for smart manufacturing development and training in Singapore

Text by Corporate Communications



Delta collaborated with JTC as strategic partners to drive adoption of Industry 4.0 technology. From left : Mr. Jackie Chang, VP of Delta SEA and India, Dr. Koh Poh Koon, Singapore's Senior Minister of State, Ministry of Trade and Industry & Ministry of National Development, and Mr. Ng Lang, CEO of JTC

Delta Electronics International (Singapore) and JTC Corporation (JTC), the lead government agency responsible to develop industrial infrastructure to support and catalyze the growth of industries and enterprises in Singapore, signed an MOU for collaboration as strategic partners to drive adoption of Industry 4.0 technology. Delta will set up an I4.0 Solutions and Training Center to support JTC customers, upskill SME partners and provide advanced automation solutions to tackle problem statements in Singapore's manufacturing industry.

The ceremony took place at the Industrial Transformation ASIA-PACIFIC (ITAP) 2019, a Hannover Messe event. Delta showcased its unique ecosystem of intelligent and energy-efficient solutions for Industry 4.0 manufacturing, connectivity and green smart city living. The fully automated 6-axis robot, housed on a cart and working with a machine by smart IoT cafe Crown Coffee, especially caught visitors' eyes and created quality customer experiences.

## Delta showcases smart green solutions at All Energy Australia 2019

Text by Delta Electronics (Thailand)

Delta showcased its wide range solutions for smart and green operations at All Energy Australia 2019 at the Melbourne Convention Centre. As Australia's most comprehensive clean and renewable energy event, All Energy was an excellent opportunity for Delta to launch its new DC City Charger and AC MAX charger products for EV charging alongside its Solar Hybrid Solution with its new H5A Solar Inverter and AC Coupled Battery.

Delta's broad event showcase included PV inverters, EV charging, LED lighting and industrial automation products that integrate as solutions. Country Manager for Delta Electronics (Australia) Pty Ltd, Mr. David Leal said, "Delta has been leveraging our industry leading power supply technology to develop highly efficient and reliable energy management products such as the EV charging stations and photovoltaic inverter. All Energy is an important event for Delta where we showcase our latest products and complete solutions for the Australian market."

Besides the product launches, Delta's new positioning solution system attracted many visitors to the booth as a working example of how a Wi-Fi connected precision positioning solution provides operators a highly reliable and market leading efficient solution for industrial applications. Delta's intelligent and energy-efficient industrial automation products and solutions give manufacturers maximum control and allow them to unleash their full productive potential.

In addition, Delta joined the conference discussions on smart city technology. Mr. Adam Carey, Delta ANZ Regional Manager of Smart LED Lighting, presented-The future of city electrics and smart city technology at the Energy Efficiency Conference held on 24<sup>th</sup> October. Mr. Carey's presentation explored the evolution of smart city technologies and presented new business models to consider for a new smart energy future that delivers customers: flexibility and efficiency with a customer-centric approach.



Delta team showcases renewable energy, EV charging and automation solutions at All Energy Australia 2019





## Delta to exhibit smart EV charging infrastructure solutions at eMove360° Europe

Text by Delta EMEA



Delta demonstrated smart electric vehicle charging infrastructure at eMove360° Europe

Delta demonstrated smart electric vehicle charging infrastructure at eMove360° Europe and demonstrated smart electric vehicle (EV) charging infrastructure, aiming to provide solutions to optimise charging service and energy efficiency. The features are:

### **Solutions for Residential EV Charging:**

The highlight of this section is the V2X Charger, which brings Vehicle to Home/Building/Grid and provides bi-directional charge and discharge power conversion for EVs. Combined with Home Energy Management System (HEMS), the core of home charging infrastructure used to manage energy from the supply to consumption, enabling smart charging to both allocate electricity more efficiently as well as for supply grid services.

### **Solutions for Commercial, Semi-public EV Charging:**

Delta showcased the newly-launched AC MAX 22kW EV charger which meets the requirement for residential and commercial EV charging and can maximize charging performance, environmental adaptability and increasing the

### **Solutions for Public EV Charging Stations:**

Delta showcased the newly-launched AC MAX 22kW EV charger which meets the requirement for residential and commercial EV charging and can maximize charging performance, environmental adaptability and increasing the potential of charging services. We also showed the new 100kW DC City Charger, which is an ideal solution for charging the network, as it supports simultaneous charging output and dynamic load distribution, thus optimizing utilization rates of the charging site.

## Delta demonstrates smart building and smart city experience at SBE 2019

Text by Delta EMEA

Delta, along with its Austria-based subsidiary LOYTEC, has demonstrated its building automation solutions and its smart charging infrastructure solutions at the Smart Building Expo 2019 in Fiera Milano. The demonstration includes LOYTEC's L-DALI lighting control system, a platform that facilitates eco-friendly management of lighting infrastructure in buildings. Delta's M88H solar PV inverter, which boasts peak efficiency as high as 98.8%, as well as the 25kW DC Wallbox EV charger, an ideal solution to expand the reach of e-mobility in cities with its lightweight compact design and high power output, are vital parts of our showcase.

LOYTEC L-DALI Lighting Solution brings multiple benefits to end-users, ranging from being fully featured and scalable, to increased user comfort and energy savings. Installers benefit from leveraging unparalleled building and room automation with IoT integration. LOYTEC's L-ROC Room Automation solution fits mid- to large-scale buildings perfectly. Both solutions also boast unparalleled integration capabilities.

In order to help visitors fully enjoy the smart charging infrastructure solutions experience, Delta showcased a number of energy infrastructure products and systems. These include the M88H inverter, which has a peak efficiency of 98.8%, as well as the DC Wallbox EV charger, which offers an output power of up to 25kW and 94% efficiency.

There were much interest in its Smart Street Lighting Solutions. In addition to providing bright, low energy lighting, the product on display at Smart Building Expo 2019 combines an environment sensor, a surveillance camera, an EV charger and a display screen all on one pole. This multi-faceted solution is an asset to any private or public space. It can measure the air quality, provide the assurance of security surveillance, and act as a power supply for EVs, while sharing information and data about the air quality and an EV's charging status via its display screen.



Delta's booth at the Smart Building Expo 2019 in Fiera Milano



## The groundbreaking of Delta's new office building at Helmond Automotive Campus

Text by Delta EMEA

Delta held a groundbreaking ceremony for the construction of a new building in the Automotive Campus in Helmond, the Netherlands, on 25th of September. It will become the base for its industrial automation business in EMEA. The new building will meet rigorous environmental design demands and, given its green credentials, Delta plans to apply for a Leadership in Energy and Environment Design (LEED) Gold certification. The new building is currently expected to be operational in 2021, and will eventually house up to 150 employees.

"Delta is currently developing IoT-based Smart Green Solutions to drive energy efficiency and lower carbon emissions in cities across EMEA. Being a part of the Automotive Campus community will benefit Delta and its customers, by accelerating the pace at which it can quickly convert innovative ideas into solutions, while nurturing talent, exchanging knowledge and developing know-how", said Dalip Sharma, Delta's president for the EMEA region. He added: "In order to tackle numerous untapped opportunities, Delta is investing in this new building with the aim of strengthening the development in this diversified region to support the needs of the market, especially for our Industrial Automation Business Group."

The Helmond office will support multiple business operations including sales, R&D and service and test lab capabilities for Delta's Industrial Automation and Automotive businesses, which will greatly benefit business development. "Delta's presence in Helmond is set to trigger new partnerships and collaborations with other companies and institutes located on or near the Automotive Campus or, for example, the High-Tech Campus Eindhoven," said Tim Lee, head of Delta's Industrial Automation Business Group and e-Machine Business in EMEA. The Campus provides an environment boasting leading innovation, dynamic infrastructure and a wide range of talents. Delta's presence amid the vibrant Automotive Campus community, provides considerable potential for the company to grow even stronger as an energy efficiency solution provider.



The groundbreaking ceremony of Delta's new office at the Automotive Campus in Helmond, the Netherlands

## LOYTEC "Buildings under Control Symposium 2019" presents the latest IoT-based Building Automation Solutions

Text by BABG

LOYTEC hosted the Buildings under Control Symposium 2019 in Vienna to celebrate 20 years of LOYTEC from Oct. 22<sup>nd</sup> to 24<sup>th</sup>. At the event, the LOYTEC team showed partners from all over the globe that LOYTEC is ready for another 20 years of success. LOYTEC introduced their newly established sales force, in-depth product development capabilities, and a promising roadmap, fully responding to the future trends of the building automation industry.

LOYTEC demonstrated how its IoT-based solutions, integrated with Delta solutions, offer building automation strengths easily distinguished from others on the market, impressing the approximately 150 partners attending the event. LOYTEC shared how it has integrated its building automation solutions with Delta solutions, such as EV chargers, Vivitek projectors and VIVOTEK cameras, and explained how IoT can add value to the building world.

This year, more partners shared their success stories providing insights into the advanced features of LOYTEC products. The case studies of various vertical markets— office buildings, hospitals, schools, and luxury hotels—showed how the LOYTEC system is the best infrastructure solution for building services.

LOYTEC exhibited live product demos, so visitors were able to try out the solutions first-hand. The audience was especially enthusiastic about the unitary controller solution LIOB-585, recognizing it as a perfect solution to fulfill the market needs of all-in-one controllers. Its IoT function (node.js) allows connecting the system to almost any cloud services and to enterprise systems for scheduling, energy use and management, weather services and other IoT devices, without the need of mid-level and supervisory devices for IP connectivity.

This event created excellent momentum for LOYTEC, reinforcing the trust every attendee has in the LOYTEC brand, and encouraging their enthusiasm for the next 20 years.



IoT-based LOYTEC building automation system, integrated with Delta solutions, adds the values to the building world



## Delta shares IoT smart lighting solutions at 2019 DiiA summit

Text by BABG



Mr. Zhao Guo-Chao, Product Director of Delta GreenTech's Smart Buildings Division, delivering a speech on applications and examples of IoT architecture smart lighting control

As a strategic partner, BABG participated in 2019 DiiA China Summit cum DALI-2 smart lighting and application design forum on November 1<sup>st</sup>. During the event, Mr. Zhao Guochao, Product Director of DGC Smart Buildings Division, shared smart lighting of IoT architecture with more than two hundred experts attending the event and his talk was enthusiastically received.

This is the second time that Delta co-organizes China summit with the DiiA and its members. The summit has received recognition and support from China Illuminating Engineering Society and experts from the industry. Paul Drosihn, General Manager of the DiiA, made the trip from the United Kingdom to Shanghai, expressing his recognition of the summit, and the determination in establishing China market. Mr. Dou Lin-Ping, Secretary General of China Illuminating Engineering Society, was invited to deliver a speech. He highly affirmed the significance of the platform, and believed that China lighting industry should learn more about DALI protocol.

In the event, Mr. Zhao Guochao shared the applications and success stories of IoT-based smart lighting solutions including the astonishing energy-saving achievement at the Manchester Airport through multiple-system integrations, and the human-centered automated control at Wujiang Low Carbon Residence, which brought a lot of attention and discussion. The exhibition area not only showcases the powerful integrative LOYTEC L-DALI smart lighting control solutions, but also lightings from Delta's designer lighting brand, Amerlux, attracting many lighting designers and system integrators to linger and exchange ideas.

In response to the expectations of China's lighting industry, the DiiA plans to expand the scale of China summit next year, continues to promote DALI-2, and carries out deeper development and application in new technologies such as Di4 in China, providing users with better lighting experience, and playing a part for China's future smart lighting.

## Delta Controls O3 Sensor 2.0 awarded 2020 AHR Expo Innovation Award for Building Automation

Text by BABG

Delta Controls O3 Sensor 2.0 combines seven different sensors, and its ability to provide the most precise sensing information within the building has won itself the 2020 AHR Expo Innovation Award for Building Automation.

Equipped with IoT functions, O3 Sensor 2.0 can be used as an independent room controller, which combines temperature sensing, occupancy detection and humidity sensing with wireless network. This innovation uses Sensor Fusion to enhance room control, which increases user experience and reduces user detection error.

O3 Sensor mounted on the ceiling enables various functions to be optimized from the best angles of the room, and can easily read body heat, keyboard noise or other movements to accurately detect usage status. It can also quickly detect a user leaving the room, thereby saving valuable cost of facility management.

Compared to the previous generation O3 sensor, 2.0 has better independent operation features, and does not require O3-DIN zone controller to achieve detection function. In terms of configuration, it can be done through the cloud, without the need for enteliWEB software. Communication protocols (MQTT, BLE, RESTful API and BACnet) are also added to allow detection information to be obtained through different methods.

Delta Controls will be exhibiting O3 Sensor 2.0 in 2020 AHR Expo, and with this product innovation, it hopes to change the definition of user satisfaction in the industry.



Delta Controls O3 Sensor 2.0 awarded 2020 AHR Expo Innovation Award for Building Automation





E4E group photo

### PEOPLE

## Delta Research Center (DRC) Education for Enterprise (E4E) Team

Text by DRC



Vita Liu / Learning Designer

While I was on an internship during my master's studies, I participated in the initial study carried out by the Education for Enterprise (E4E) team in Delta Research Center (DRC). After that, I joined E4E again with two years of training experience in e-learning and provided my expertise to the production of digital courses, the design of learning tool and the planning of new learning method. E4E team focuses on empowerment in teaching and learning at work and aims to broaden their professional experience and knowledge. The team develops methods and tools that can be used by various departments for internal training and customer service. The development strategy of every method and tool is based on the strengths and features of Delta's products and services. We are dedicated to becoming the pioneer in the field of smart manufacturing.

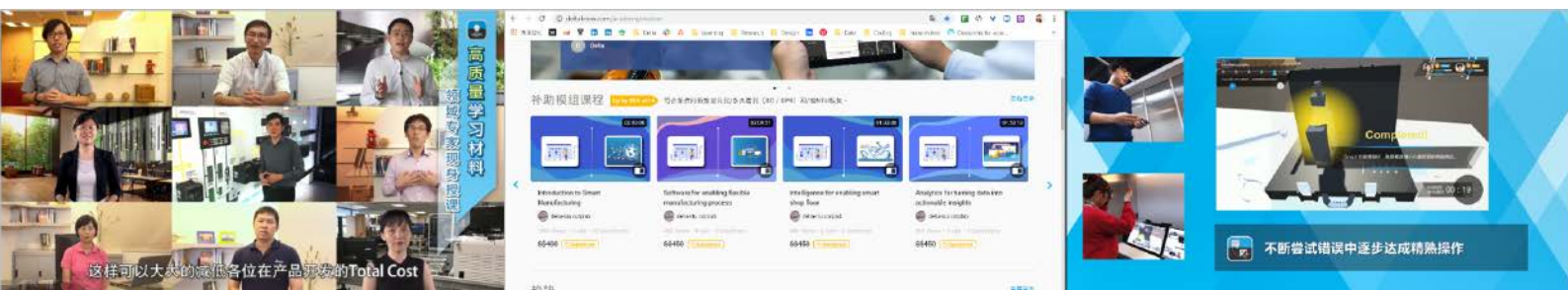


## PEOPLE & PRODUCT

There is a wide range of professionals in our team, including front- and back-end engineers, user interface engineers, project managers, UI/UX designers, learning designers and multimedia designers, etc. We may come from different backgrounds, but everyone contributes significantly to each project.

Currently, E4E is working in three major fields under the topic of "learning and empowerment at work". In addition, the concepts and technologies created in these fields have been granted patents in many countries.

1. Content Service : Since 2018, we worked with dozens of R&D units in the company to develop their patterns of thinking in teaching literacy and drew up the syllabus and learning map in Industry 4.0. We have also developed more than 20 types of video lessons, gradually establishing the knowledge structure in the realm of smart manufacturing.
2. Academy (web/app) : It contains an effective course recommendation mechanism, a visualized interface that suits the trend of fragment-based learning, a content structuring feature, a remark feature that generalizes key points and questions, the online and offline course edit module as well as the test module. It is a prototype of smart learning technology.
3. Phonebooth : The conventional training method in the manufacturing industry adopt hands-on practice. Therefore, we developed a learning stimulation system that includes collaboration, reflective practices, interactive operations activities and gamified learning. Not only does this system learning fun, but also facilitates the progress in learning.



(From left to right) A screenshot of Content Service, the main page of Academy platform, and the demo for phonebooth simulating learning that generalize high-quality courses

All of the technologies and ideas in these fields are developed from the internal demands of the company and were later adopted by external clients after optimization and adaptation. We have received much positive feedback and appraisal. We also worked with other departments of DRC and Integration Lab in Wuhan to develop video and simulation courses for our internal solutions. In addition, since 2018, Delta HR has introduced Academy in all of Delta's overseas branches. Currently, the external solutions have been adopted by Singapore Nanyang Technological University and the Board of Architects Singapore, and we offered them customized Academy and paid courses as well. Meanwhile, to expand our service scope, we are also collaborating with certification organization TÜV SÜD PSB to launch a series of certified courses.

Personally, I decided to become a teaching and learning practitioner because I am passionate about helping people gain knowledge and acquire new skills. Working on the projects of E4E, we're able to gain different perspectives on learning from teaching design, learning technology, interactive design and gamification. The main purpose and the greatest pleasure in the job was that I could interact and work with people in different disciplines to create learning tools and methods that actually benefit others.



Delta's newest PJP series of open frame power supply for lighting applications

PRODUCT

### The new PJP open frame power supply for lighting applications

Text by Delta Electronics (Thailand)

Delta's newest PJP series of open frame power supply is specifically targeted for lighting applications. The two models come with 48V constant voltage in 200W (PJP-48V200WBAA) and 400W (PJP-48V400WBAA) output power. The built-in active PFC products are designed in a small standard industrial 3" x 5" footprint and have a wide operating temperature from -40°C up to +80°C (+70°C for 200W) across the entire input voltage range of 85 to 305Vac based on a convection cooled design. It features low earth leakage current < 500  $\mu$ A as well as low inrush current < 20A. Its optimum thermal management allows for high power efficiency up to 90.0%.

The products include major international safety standard for lighting application according to UL 8750, IEC 61347-2-13 and other approvals according to IEC/EN/UL 60950-1, IEC/EN/UL 62368-1 and are certified for EMI standards according to EN55032 Class B.

#### Highlights & Features:

- Universal AC input voltage range
- 200W with fan cooled and up to 150W convection cooled
- 400W with fan cooled and up to 200W convection cooled
- Standard industrial footprint of 3" x 5"
- Low inrush current < 20A and low earth leakage current < 500 $\mu$ A
- Conforms to harmonic current IEC/EN 61000-3-2, Class C
- Up to 90.0% efficiency
- Extreme low temperature operation at -40°C
- Lighting approvals to UL 8750, IEC 61347-2-13 and other approvals to IEC/EN/UL 60950-1, IEC/EN/UL 62368-1





Speech by the President of Spain, Pedro Sánchez (Source: La Moncloa)

## In Climate Week NYC, international corporations lead the way towards low carbon emission objectives

Text by Delta Electronics Foundation

In September this year, the largest climate week in history (Climate Week NYC) is being held in New York. The world's most influential politicians such as the president of Costa Rica, the president of Spain, prime minister of Denmark, the governor of California and former secretary of state and thousands of business leaders gathered to call for the immediate reduction of greenhouse gas emissions.

In fact, this extravagant climate event has been held for 11 years. Since 2009, the Climate Group planned and held this event every year. The date is set in September which coincides with meeting of the United Nations General Assembly, trying to spark debate among nations regarding environmental issues.



### **Objective of temperature increase within 1.5°C: the Climate Group leads corporations forward**

Before exploring the topics of this Climate Week, first we must introduce the Climate Group. This organization was established in 2004, capable of leading various mega international enterprises such as Google and Facebook. This organization promotes actions related to climate based on the objective of limiting temperature rise of no more than 1.5°C. Currently, the Climate Group has successfully promoted several reputation projects such as We Mean Business (in which Delta participated), RE100, EV100 (in which Delta participated), EP100, Under2 Coalition, Policy Action and Future Fund.

At this Climate Week, the Climate Group hosted series of workshops, hoping to promote a top-down approach to sustainable business opportunities. For example, once a corporation joins the EV100 or RE100 initiative, it must increase the business opportunities in clean energy industry. The process would also influence local supply chain to use electric cars or green energy. The best example is that after Apple joins the RE100 initiative, it demands that vendors of its supply chain need to switch to green energy.

However, faced with the expectation of the brand enterprises, the mid-stream vendors and downstream vendors must conduct financial and environmental assessments and possibly take their business environment into consideration before deciding to join the initiative. Regarding the EV100 initiative, the common difficulty is with logistics. That is before the electric trucks become universal, switching to electric vehicles in transportation is a challenge.

### **Ahead of the government, numerous corporations show their determination**

Although reducing carbon emission brings many challenges for private businesses, on Climate Week NYC, many corporations committed to stricter objectives and operation standards. Some of these actions are even more aggressive than that of government agencies. For example, the world-renowned fashion group, Kering, and the world's largest energy management firm, Schneider Electric, set a carbon-neutral target for their own operations and supply chain. Amazon made the commitment of purchasing 100 thousand electric trucks, 10 years earlier than originally planned. Over 80 corporations committed to science-based carbon reduction targets (SBT), developing climate related strategies based on scientific calculations. The target is to achieve zero net carbon emissions in 2050.

In addition, many corporations, including Unilever, agreed to contribute to objectives related to biodiversity. Through accession to the One Planet Business for Biodiversity coalition, protect and restore biodiversity through combinations of the supply chain and products, corresponding to the Global Assessment Report on Biodiversity and Ecosystem Services, hoping to avoid the risk of the extinction of 1 million species. On the other hand, HP will work with WWF to restore 200 thousand hectares of forests and invest US\$11 million in conservation.

In terms of the funds raised, the Climate Week also achieved great results: Totally 130 banks in 49 countries (representing US\$47 trillion worth of assets) passed "The Principles for Responsible Banking" during the meetings of the meeting of the United Nations General Assembly, making commitments that their investments in the future would be consistent with the sustainable development goals (SDGs) of the Paris Agreement. And the Bill & Melinda Gates Foundation, World Bank and countries including the Netherlands, Switzerland and Germany announced plans to invest US\$800 million to help over 300 million small food businesses cope with frequent floods, drought and extreme weather. Australian entrepreneur, Andrew Forrest, also donated US\$300 million and invited the Fortune 500 companies to participate on their own initiative and end plastic pollution together.

As Climate Week NYC commenced, more international companies have gradually realized the risks and opportunities of climate change. Indeed, actions by the corporations are becoming more significant since the signing of the "Paris Agreement" and in the uncomfortable political atmosphere caused by Trump's declaration to withdraw from the Paris Agreement. This "bottom-up" will become the new driver for this era.



According to the latest IEA report, the global energy efficiency ratio continues to drop

## IEA's new data: global energy efficiency ratio continues to drop

Text by Delta Electronics Foundation

There are various methods to combat climate change, and energy efficiency, known as an "invisible energy", is generally regarded as the most important "first fuel", having the highest mining value. International Energy Agency (IEA) estimates that if annual global energy intensity can be reduced by 3%, and lesser primary energy (example: coal, oil, natural gas, sunlight, etc.) is used to generate higher gross domestic product (GDP), we can achieve the greenhouse gas emissions target set in "Paris Agreement".





However, good things never last. Though the reduction of energy intensity was close to 3% during the year of the Paris Climate Conference (2015), the improvement dropped consecutively in 2016 and 2017, hitting a record low of 1.2% last year, deviating even further from the 3% target! What is going on? IEA examines the reasons in their "Energy Efficiency 2019" report published in November.

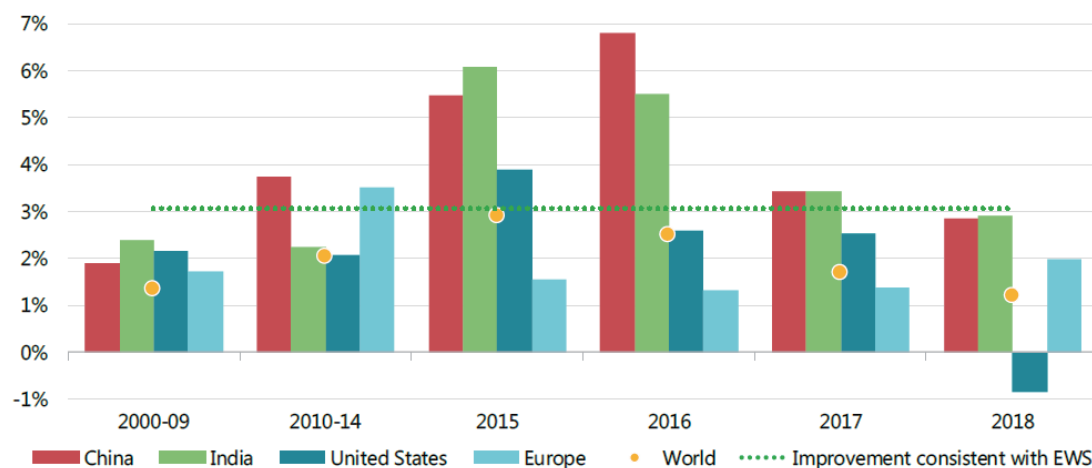
### China and the United States industries prosper, pushing up the demand of energy

Firstly, there is a drop in energy intensity of China and the United States due to the huge expansion of energy-intensive industries, which led to the spike in total energy demand, and IEA specially highlighted China's steel industry and United States' petrochemical industry.

Next, let's look at the performance of China's steel production. For the whole of 2018, China actually increased its global market share in steel production by more than 3%. The total energy consumption for production is an astonishing 4% of the world's energy. Further analysis shows that more than 80% of domestic crude steel production uses less energy-efficient coal furnace for smelting. Besides, with the continued expansion of domestic steel demand last year, energy efficiency improvement continues to deteriorate inevitably.

Perhaps it was because of Trump's support that United States' petrochemical industry development was unrestrained. In the past two years, natural gas and crude oil extraction increased by 21% and 30% respectively, driving energy consumption in processes such as refining and processing. IEA report shows that despite the drop in energy intensity improvement for China, India, and the European Union, the ratios are still above 0% (indicating that there is still improvement). The United States, on the other hand, sees a drop from 2.5% to nearly -1%, indicating there is no energy efficiency improvement, but deterioration instead. This proves that petrochemical industry is highly energy-consuming.

**Figure 1.3. Primary energy intensity improvement**



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Source: IEA (forthcoming), *World Energy Outlook 2019*; IEA (2019a), *World Energy Balances 2019* (database).

Energy efficiency improvement in various parts of the world drops, especially in the United States, which shows a decrease instead



### Frequent extreme weather events increase the use of gas and electricity

Besides high energy consumption by the industry sector, the increasingly frequent global extreme weather events have become one of the culprits. This year, according to World Meteorological Organization (WMO), the world experienced the hottest period in the past 4 years, with the highest temperature recorded in 2018!

Let's take a closer look at the climate information in various regions. Last year, Europe's daily average temperature was 1.8°C higher than the past average temperature, hitting above 2°C between April and August; electricity consumption during this period increased by 20%. North America was exceptionally cold in April, October and November, with temperature lower than the past average temperature, and natural gas consumption increased by 14-20%.

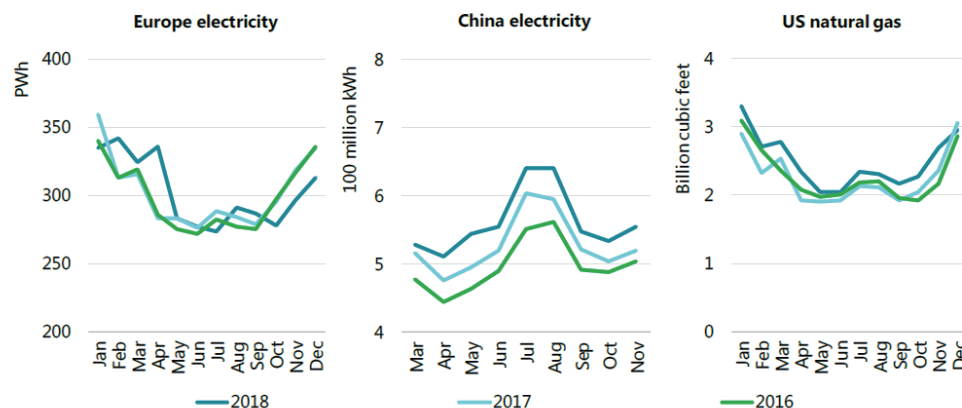
Undoubtedly, the above data prove that extreme weather will directly increase the heating and cooling demand of buildings sector. In the future, with climate change and rapid global warming, the occurrence of extreme weather events will lead to huge electricity consumption, and the importance of energy-saving buildings is something that we cannot ignore.

### Is digitalization energy-saving or energy-consuming? IEA is still unable to determine

Something refreshing is that IEA's current report also touches on using digitalization to promote energy efficiency in three main sectors, namely buildings, industry, and transport. Take buildings sector for example, implementing technologies such as smart socket, thermostat, window control, light control, home energy management system and regional heating is likely to reduce 10% of buildings sector's electricity demand by 2040. For industry sector, by adopting strategies such as AI computing and energy management, there is a possibility of 30% energy saving. For transport sector, technologies such as Internet of Vehicles and shared services may be able to help reduce 50% of carbon emission by 2050.

However, the report also highlights that data center and data transmission network in digitization are just as energy consuming, using approximately 460 TWh last year, which is 2% of the world's electricity demand. Currently, IEA is still unable to determine whether a balance can be stricken between energy-saving and energy-consuming in digitization, and whether there will be rebound effect. However, it seems that in order to maximize the energy-saving effect of digitization, building green data centers and transmission is inevitable.

**Figure 1.9. Europe and China monthly electricity consumption and US monthly gas consumption, 2016-18**



Source: ENTSO-E (2019), *Monthly Domestic Values*; CEC (2019), *Data/Statistics: Monthly Statistics of China Power Industry*; EIA (2019b), *Natural Gas Monthly*.

Electricity and natural gas consumption in various regions increases along with the occurrence of extreme weather events

