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This April, at the opening of the Kun opera "Yixiaji" produced by Master Kenneth Pai in the Peking University, Delta's world first DLP® 8K laser projector showed the actors' amazing expressions and delicately-made costumes on the 420 inch super large screen. The stunning presentation is a demonstration of lifestyle improvement through technology, and how performing arts are further immortalized through the perfect combination of technology.

The semiconductor industry is one of the top 10 key industries globally. In this issue's "Special Report", we are proud to present the successes that Delta high frequency UPS has received in the semiconductor business in China. In "About DSM", we have success case from IA, where Delta CNC machines IoT solutions used sensors and routers to create a bottom-up efficient automation system and help related industries march toward smart performances.

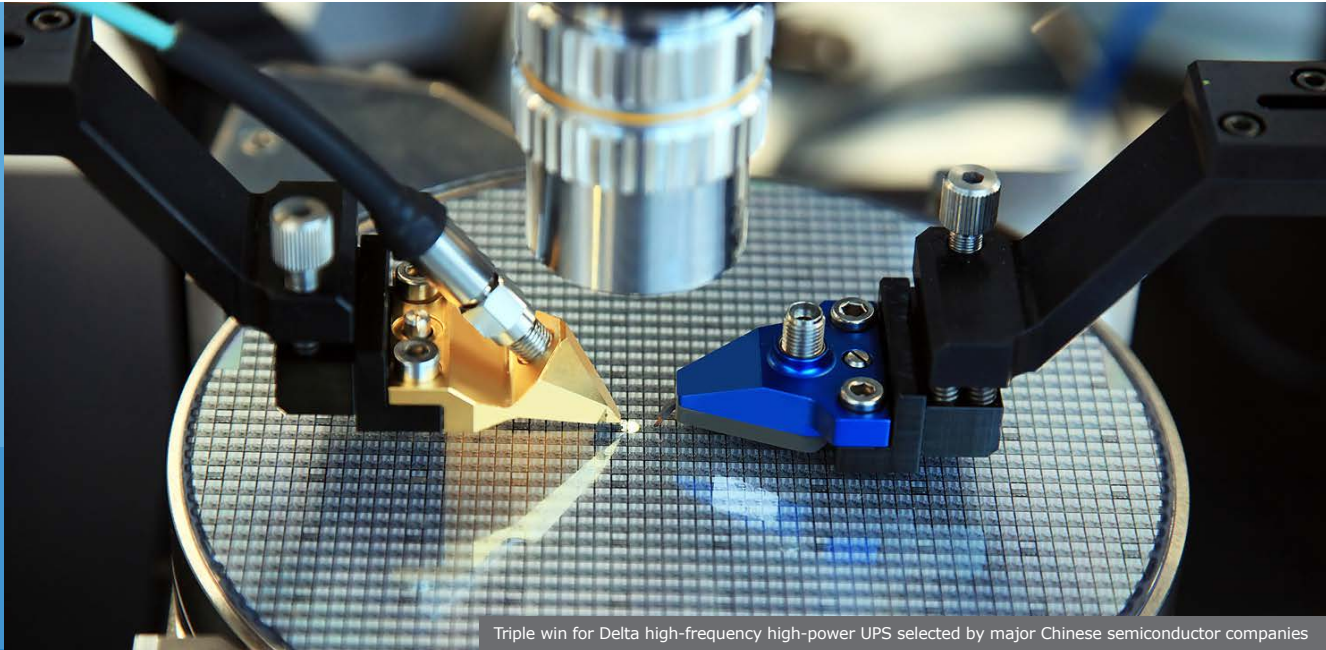
Delta is an industry leader in energy infrastructure with its innovative technologies. The company has also been active in the EV market for years, providing both software and hardware solutions to the market, which resulted in outstanding achievements and makes EVCS one of the fastest growing businesses now. In this issue's "Brand People", we had interviewed EISBG General Manager Herman Chang. He shared the business development focuses of EISBG as well as his strategies and thoughts on products and solutions branding..

Delta is dedicated to the trends of smart manufacturing and smart cities, and has showcased its products and technologies at this year's Hannover Messe in Germany, TECHNO-FRONTIER in Japan, and Infocomm in Beijing. Our efforts, backed by our corporate mission— to provide innovative, clean and energy-efficient solutions for a better tomorrow—has recently won us honors such as the R. O. C. (Taiwan) Presidential Innovation Award, and Global Views Monthly magazine's CSR "Annual List of Honors". As the pioneer of green buildings, Delta has built the largest number around the world. In the book launch of "Building Green Buildings with Delta", we have shared our nature-based green building construction methods. More details are in "Brand Circle".

In this issue's "Delta Green Life", we will introduce the definition of "blockchain", and the possibility of an energy market transformation through voucher transaction, energy storage promotion, and IoT power grid management. Besides, our colleagues in the Tainan Plant have shared their experiences with us in "People" column. Don't miss out on the content.

Brand Management Office





Triple win for Delta high-frequency high-power UPS selected by major Chinese semiconductor companies

Delta UPS selected by major Chinese semiconductor companies

Text by DGC

In recent years, the opening of new semiconductor industrial parks has become a popular trend in China. By consolidating its R&D design skills and utilizing DGC's excellent sales service, Delta has been awarded three high-frequency and high-power UPS procurement projects. The UPS projects are to be implemented at the new fabs of three semiconductor companies, among which includes the largest investment project in the history of the global semiconductor industry—this is creating a lot of buzz in the industry. This series of achievements shows that Delta UPS has established a leading position in the semiconductor industry and has become a model for success among the many significant business opportunities offered by the global semiconductor base in China.



Numerous opportunities in semiconductors with excellent potential in China

The semiconductor manufacturing industry is one of the top 10 global focus industries. Research shows that the overall regulatory goals and policy supports set by the Chinese government are expected to result in huge growth in Chinese semiconductor manufacturing capacity, especially in foundries, packaging, and testing during the 13th Five-Year Plan. Since 2017, at least five 12-inch fabs have begun construction in China. China is soon to become the world's largest base of 12-inch fabs.

Large semiconductor fabs require high quality and reliable power sources for their R&D department, IT, automated equipment, motor loading, and other factory facilities. They have higher requirements for power grid stability. For example, regarding automated equipment on the semiconductor production line, events such as a voltage flicker, a voltage drop, transient interrupted power supply, or loss of power are not tolerated. Even a slight drop in power supply quality may have an impact on production with severe repercussions and large financial losses. According to reliable calculations, any occurrence of equipment downtime at a wafer fab that causes suspended operations can result in losses as high as USD 2 million.

These factors are why semiconductor fabs generally use highly reliable and larger capacity UPS systems. An investment for a single semiconductor fab can also be in the tens of billions of dollars, of which 80% is for the procurement of equipment. The equipment demands are large in volume, highly technical, and with high added value. This is why UPS sales to the semiconductor industry are highly competitive among major UPS companies, with new Chinese semiconductor fabs as the most important battlegrounds.



Delta's innovative new products provide the ultimate reliable solution

Despite the large demand for UPSs in the semiconductor industry, performance does not necessarily have to be sacrificed for a better price-performance ratio. Due to potentially enormous losses caused by equipment downtime, the semiconductor industry requires a larger number of UPS units and higher power consumption compared to other industries. The semiconductor industry has a clearer definition of UPS product requirements: high reliability, high power-efficiency, high flexibility, and smart management.

Dr. Charles Tsai, MCIS General Manager at Delta, indicated that due to the strict requirements of the semiconductor industry, Delta's R&D and manufacturing of UPS products contributed to its absolute advantage. On top of the company's outstanding product performance and best-in-the-industry technology standards, Delta has world-leading R&D design skills that have developed a new product, the UltrOn DPM, which is customized for the semiconductor industry based on unique customer requirements and industry applications. The UltrOn DPM series is the only curve-tracing, high-frequency, high-power UPS in the industry, and it has a significant advantage over all its competitors.



Delta researched the unique features of industry applications to create the innovative UltrOn DMP high power UPS series, customized for semiconductor foundries



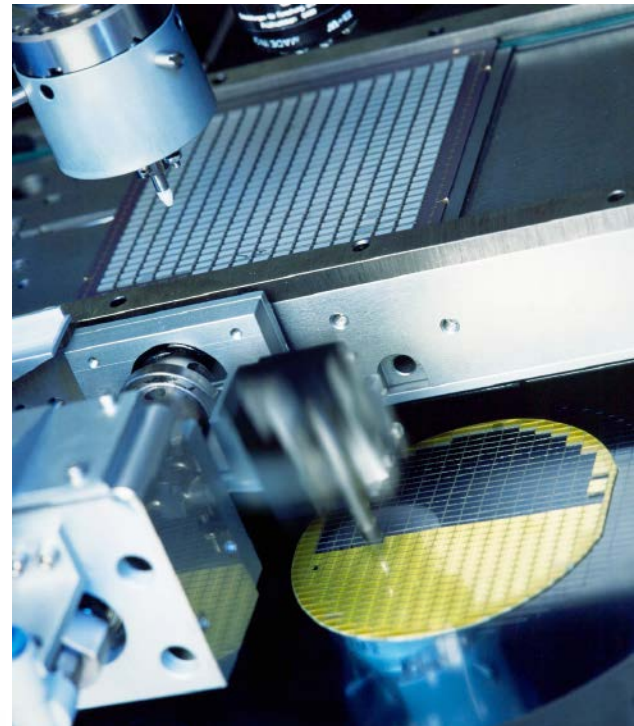
For this investment project, the largest in the history of the global semiconductor industry, Delta's UPS R&D team engaged with semiconductor enterprise users early on to fully understand the specific requirements of the industry, as well as users' desired targets for improvement. The UltrOn DPM is an innovative product series designed for semiconductor R&D and manufacturing. Its "curve-tracing function" makes it one-of-a-kind in the industry with key parameters and curve tracer support for high-level incident analysis and diagnosis, which fully satisfy the special specifications defined by the semiconductor industry. At the same time, the UPS series is designed with highly reliable key component redundancy, a key component warning function, with an eco-mode that reaches as high as 99% efficiency. It is currently the most power-efficient product in the industry that saves on large power bills over long-term customer use. The mode is also a unique design that takes both efficiency and reliability into consideration. It can keep an inverter in operation, run SCR and a connector in parallel, and ensure an uninterrupted supply of power to the load. These significant industry-leading technologies helped Delta use its absolute advantages to win the largest investment project in the semiconductor industry.



Developing semiconductor industrial park infrastructure to create greater business opportunities

In addition to winning the huge UPS procurement project, Delta is looking farther into the future than its peers regarding the wave of new semiconductor fab construction. Semiconductor fabs over 13,333 hectares mostly exist in industrial parks. These could be called small communities which have a packaging and testing facility, a scientific research and design center, an IC foundry, and large living quarters surrounding it. Potential business opportunities also lie within the infrastructure solutions.

Donald Yu, Managing Director of DGC, has high hopes for Delta's future in the semiconductor industry. He said "The Chinese government is ambitiously creating a local semiconductor industry. With the influence of the recent China and US IC incident, it won't be long before China becomes the world's largest semiconductor foundry base. This means that there will be even greater business opportunities for Delta in the future. UPS products are only the starting point we will be using to integrate other Delta solutions, such as electric vehicle charging stations and smart buildings. We will be fighting for a bigger share of the semiconductor industrial park investments that are worth tens of billions of dollars."



The automated equipment on the semiconductor production line has extremely high requirements regarding the power grid environment and power supply. Any disruption to the power supply can cause major financial losses



EISBG General Manager Mr. Herman Chang

The pursuit of excellence: Expanding brand influence with advanced technologies

Exclusive interview with EISBG General Manager Mr. Herman Chang

Text by Brand Management Office

Delta is an industry leader in energy infrastructure because of its innovative technologies. The company has also been active in the EV market for years, with products that span car components, charging piles, and charge management systems. Delta's solutions in software and hardware markets have continue to achieve great success. In this issue of Brand People, we are speaking to EISBG General Manager Herman Chang. We have asked him to share his blueprint for energy infrastructures and to reflect on his experience of 25 years at Delta.



Smart Grid, distribution plans for proper applications

"The development of the Energy Infrastructure Solutions Business Group (EISBG) is centered around two main fields: renewable energy and smart electricity," says Mr. Herman Chang. "In renewable energy, we have the Photovoltaic Inverter Business Unit (PVIBU) and the Wind Power Business Department (WPBD), and in smart electricity, we have established the E-Mobility and Smart Energy Solutions Business Department (ESESBU). This demonstrates that Delta is becoming more focused on the connected development of products and smart grids on top of the existing Electric Vehicle (EV) market." Regarding applications, our energy infrastructure solutions deal with daily power generation, transmission, distribution, and consumption. Our smart grid energy management system analyzes power consumption data and works with Delta's power storage system to better manage distribution and grid support during peak and off peak periods.

Prior to his taking over at ESIBG, Mr. Chang was devoted to EV Charging Solutions (EVCS) for many years. He shared his observations with us "The growing maturity of battery technologies and falling prices shows that electrical transportation is the future. Delta EVCS is notably the fastest growing business at the moment. In the near future, from electrical passenger vehicles to buses, trucks, and ships, EV will become the world's main development in transportation."

Regarding EISBG strategies in the next few years, Mr. Chang says, "For renewable energy, we will focus on household and commercial applications. For smart electricity, we have equipment such as charging stations and piles, which are used in combination with power storage systems and energy management systems to conduct consumption trend analysis and management. These products will further be connected to smart grids and create a solution that satisfies the demands of application scenarios."



Diverse strategies, creating business opportunities based on practical applications

Mr. Chang has had extensive experience in the development of new products and new markets. He spoke with us about the strategies and opportunities in various regions "Our business started to develop in the USA, and then extended to Europe and Asia. We began in Japan, and have gradually moved to China in recent years." The US started developing EVs from very early on, which gave us the opportunity to enter the market. We worked with automakers such as GM on installations and implementations involving our charging station management software. In Europe, we released the leading DC Wallbox, which attracted renowned local power companies and oil companies to become our sales channels. This prior product success accumulated in Europe and America, and helped with current business developments in Japan. The Chinese market is particular because most competitors promote mid- to low-end products using low prices. An important issue for EISBG to tackle is to continue with the development of existing high-end products and to develop mid to low-end products suited for the Chinese market.

"Policies are also a major influence in the market." Mr. Chang added that the persistent issues of global warming and air pollution have prompted the European and American governments to plan a timeline for fuel and diesel vehicle replacement. China has reserved a certain amount of budget for charging station installations in each region. Regarding these opportunities, Mr. Chang also shared his opinion, "In Europe and America, we will partner with EV automakers or production regions. As for China, we will package optimized solutions to explore opportunities and the market through tender bids."



Successful partnerships promote Delta brand

Delta has gradually transformed from a product to solution provider. Mr. Chang talked to us about his brand management strategies, "We provide technologically advanced products and work with cross-industry partners to promote our brand." The product is the most direct brand communication tool. Whether it's our partnership with Farglory in the early years where EV charging systems are perfectly integrated in a residential environment, our pilot program "Ford Smart Living" with Ford, or even our future vehicle partnership with Nissan, these cases are the best campaign tools for building brand value through media coverage. "Good brand competitiveness doubles your results in marketing. The key to our success is our outstanding engineers and product optimization through personal experience." EISBG has planned to install charging stations at domestic and overseas offices. Only through personal trials and operations can we build better and more competitive solutions for our clients. Delta has set high expectations and goals for itself.



(From left to right) DET president Mr. Dick Hsieh, EISBG general manager Mr. Herman Chang and Delta India managing director Mr. Dalip Sharma at ELECRAMA 2018



Continuous improvement developing innovative product market share

Mr. Chang recently received the award for senior model employee. He spoke to us about his valuable experience during his 25 years at Delta. "Daring to challenge with new technologies, embracing creative marketing ideas, and continuing to improve, are the ways we grow stronger." Whether it is product or brand development, innovation is the only certain way to gain market share. He thinks that there is no end to product development, and that we must keep on trying to change, to innovate, and to improve, to stay ahead of our competitors.

"The way to success is to focus on the target market, develop suitable products, and balance practical applications with innovative technology." GM Herman Chang encourages us all with these inspiring words.



Group photo of The 10th Delta Innovation Award Summit.
(Herman, first from left in the front row)



Delta CNC machine IoT solution achieves digitalized factory monitoring and production management

Delta CNC Machine IoT Solution provides multiple equipment connection for smart production data management

Text by IABG

As manufacturing industries around the globe gear up for smart manufacturing, corporations are learning how to effectively acquire and manage their own production data to enhance market competitiveness. In the past, managers needed an enormous amount of labor hours to retain production and factory data. At traditional factories, operators meter data at a designated location and pass the data on to managing personnel and technicians to sort, evaluate, and diagnose if any equipment or production lines require adjustments or maintenance. This method is labor intensive and requires collaboration from a range of professionals to process the acquired data. Managers have difficulty making strategies with real-time data, and there is the potential risk for misjudgments and losses caused by deferred decisions. In addition, with the current labor shortages, manpower used for data metering on a regular basis is likely to burden companies with greater operation costs.





Equipment and production lines generate a great amount of data during operation, including, operating temperatures, fluid pressure, torque, control point, and more. This data can be measured by sensor devices, and then further categorized, analyzed, and integrated via data acquisition and monitoring systems to become a real-time and effective visualized data, such as current operating programs, heating time, cutting time, target processing statistics, and more. This helps managers acquire key data in time to plan more accurate strategies. To meet the demand for customer data management, Delta offers a comprehensive IIoT and data monitoring solution that covers the following aspects: data transmission devices for field equipment, data acquisition and collection with control devices, and a data monitoring and management system (SCADA) for the management level. This solution effectively resolves potential problems of manpower data metering, and data time sensitivity. It also reflects processing parameters and equipment operation status in real-time to support production analysis and prediction, and achieve digitalized factory monitoring and production management to create more benefits for companies.

For the production automation process, customers install data acquisition and monitoring systems into controller devices, such as CNC controllers or programmable logic controllers (PLCs) to directly engage in data collection, analytics and monitoring. Delta recently fulfilled the demand of a customer in China to integrate a complete automatic control, data acquisition, monitoring, and management solution. This solution adopts the following capabilities:

1. Field devices control machine temperature and pressure:

In actual operation, sensor devices play a great role in acquiring the data of production lines in factories. For example, the Standard Temperature Controller DTA Series acquires operating temperatures of equipment, and the Standard Multifunction Pressure Sensor DPA Series monitors parameters, such as pressure, of machine tools during processing.

2. Controller and switch devices for equipment control and data exchange:

This solution adopts the Compact Modular Mid-range PLC AS300 Series for controlling and giving commands. The AS300 Series can perform multitask control and high-speed data processing in real-time for the entire equipment and production line. In addition, the Managed Ethernet Switches DVS Series transmits the equipment data to the DIAView SCADA System for later analytics and monitoring processes.

3. Equipment IoT platform for machine data collection in the production line:

This solution adopts the Equipment IoT Platform DIALink for CNC-based machines that offer various modular functions to fulfill the demands of the machine tool industries. These functions help to collect and integrate the processing data of the CNC controllers in multiple production lines, including key data points, utilization rate calculated, processing conversion rate, and more. This data is primarily processed and further uploaded to the DIAView SCADA System via the Managed Ethernet Switches DVS Series for later comprehensive processes.

4. SCADA system to collect data for analytics and monitoring:

The DIAView SCADA System can real-time monitor each key production factor, analyze data collected from controllers and equipment IoT platforms, and then transform the data into real-time curves and history logs. The system can save data in the database later for visualizing production efficiency as well as potential issues, achieving more intelligent data management and helping customers find key causes and make predictions.





In actual application, Delta's CNC machine IoT solution brings the following advantages to our clients:

- **Easy operation for effective data collection:** The data between the DIALink Equipment IoT Platform and controllers can be transmitted only through Ethernet ports. In addition, DIALink offers a user-friendly interface featuring a built-in one-click scan that can list all points monitored.
- **Visualized data graphs for intuitive management:** The DIAView SCADA System adopts various built-in functions that users can self-define customized functions based on different demands. Graphical data information enables presentation and comparison of the operating parameters of the system through a smart curve. This solution also offers a bar chart function to highlight statistics to contrast numbers on each machine to help analyze production.
- **Total solution provides easier and more efficient integration:** Delta's CNC Machine IoT Solution adopts a variety of industrial automation products, including sensor devices for data acquisition, Managed Ethernet Switches DVS Series for data exchange, and Compact Modular Mid-range PLC AS300 Series for system commands, to integrate customers' existing production lines without requiring overall replacement. In addition, the Equipment IoT Platform DIALink features high network compatibility and supports multi-party driver brands, achieving a benefit of one-stop shopping to build the ideal automated production line for customers.

Delta's CNC Machine IoT Solution integrates a comprehensive automation system with sensor devices, Ethernet switches and controllers. In addition, the equipment IoT platform products matched with a powerful SCADA System play a crucial role of analyzing, monitoring and managing data from production lines to factories, to achieve real-time and efficient IoT. With factory and production data management in digitalization, the whole solution helps customers not only reduce required labor and time, but also guide industries to benefit from smarter manufacturing.



Delta has developed the Equipment IoT Platform DIALink for CNC-based machines that provides various machine tool data collection functions for a powerful IoT



The Equipment IoT Platform DIALink and DIAView SCADA System integrate existing production line and factory data, achieving more real-time data management for companies





Delta 8k Projector presents stills from Kenneth Pai's Kun Opera Production "Yixiaji"

Text by Delta Greentech



"Yixiaji" Executive Product Kenneth Pai (center), Delta founder and honorary Chairperson Bruce Cheng, and Delta CBO Guo Shan-shan attend "Yixiaji" VIP meeting and opera appreciation night to view the 29 still photos of the Kun opera



Delta and affiliated company Digital Projection jointly released the world's first DLP® 8K laser projector. Using technology in the service of art, the project presented the stills from the Kun opera "Yixiaji" in the Peking University Hall

What happens when you put Kun opera, the show of all shows, with a high-end 8k projector? On the night of April 11, the new "Yixiaji" ("The Story of the Hero" in Chinese), the story of Pan Jinlian, Wu Song, and Wu Dalang, will debut at Peking University. The play's Executive Producer is a renowned writer on both sides of the Strait - Kenneth Pai (Pai Hsien-yung). Delta projected 29 exclusive stills of the "Yixiaji" on a 400 inch super large screen with the world's first DLP® 8K laser projector. Through the astounding presentation of the projector, countless guests were first to see in photos the actors' performances, expressions, and delicately-made costumes.

Kun opera is a perfect combination of literature, music, and dance. In 2001, it was listed as one of the Masterpieces of the Oral and Intangible Heritage of Humanity by UNESCO. Since 2009, Executive Producer Kenneth Pai and Peking University have been collaborating in the Kun Opera Heritage Project and have created the "Classical Kun Opera Lecture", where students love, learn the classics in-depth, and even participate in performances. Pai especially thanks Delta founder and honorary Chairperson Bruce Cheng for providing the 8k projector to display the stills of "Yixiaji" in ultrahigh resolution for unparalleled intense drama.

Delta founder and honorary Chairperson Bruce Cheng indicated that the projector technology developed from 2k to 4k over the years. Delta and its affiliated company Digital Projection jointly developed the world's first 8k laser projector with 25k lumens in brightness, vibrant saturated colors, and 16 times the regular HD technology. The display technology presents the beauty of Kun opera art again, so that technology and humanities complement each other.

Delta CBO Guo Shan-shan indicated that the story of Pan Jinlian in "Yixiaji" allows the audience to experience humanity and emotions from a different mode through the novelist's compassion. These new songs enliven different quintessential opera characters and have planted a more stable foundation for the renaissance of Chinese Kun opera. For founder Bruce Cheng, a man described by the media as a "Confucian Entrepreneur", it is the most gratifying when using technology in service of culture and arts.



Delta empowers BSES with Innovative display solutions

Text by DSBU



Delta empowers BSES with Innovative display solutions

Delta, a leading provider of video wall solutions, successfully set up a multi-screen video wall at BSES Rajdhani Power Ltd (BRPL), in New Delhi, India. BRPL upgraded its control centre to meet the ever growing need for electricity in New Delhi, the capital of India. BRPL, one of the most trusted integrated utility companies in India, serves over 2.4 million customers and distributes power to an area spread over 750 sq. km. Delta's video walls at the control centre help operators' to view and monitor SCADA (Supervising Control and Acquisition of Data) operations, alarm lists, and event lists, to enable a highly centralized and integrated control centre.

The previous video wall at the control room, which had reached its end-of-life, consumed a huge amount of energy and involved frequent lamp changes. A sustainable and innovative setup was needed that could comfortably meet the growing electricity needs of the capital of India. Delta delivered that by installing its

Next-Gen LED-Lit DLP® video wall integrated with the ICON Pro Controller for this esteemed project. Flexible and reliable, Delta's video wall is envisioned to operate 24 hours continuously, supporting the BRPL SCADA Centre.

"To make sure our ongoing operations progress effectively and effortlessly, we had to replace our existing visualization system with a latest one that is best in the industry. Delta's extensive experience and expertise in installing Video walls has delivered a state-of-art set up at the SCADA centre. This high-performance control room, equipped with Delta's visualization technologies, has become one of the most critical centres of BRPL. In a nutshell, the product is robust, services are very good and response is immediate," commented a BRPL official.

Police Training Base chose Delta solutions for teaching multimedia system

Text by DGC

Recently, a police training base uses Delta's large-screen display system to create a new form of multimedia system and functional cloud-based desktop teaching system, further strengthening responsiveness of police force in major emergencies.

Delta has developed a 70-inch 3 rows×5 columns laser-based DLP single-screen display targeting application requirements for the police training base. As the base's multimedia system and functional desktop cloud system need to cater for displaying and switching between various types of complicated systems, the large-screen display system requires high brightness and true color to satisfy the requirements in real-time and flexible display, seamless optical stitching, and convenient subsequent maintenance. Hence, they selected laser DLP system for a better quality of display.



Delta's 4th generation light source DLP display unit.

In the project, Delta's 4th generation light source DLP display unit uses the latest pure laser light source technology, array redundancy laser module design, and Delta's self-developed fluorescent color wheel to provide ultra-high brightness far beyond LED light source, high contrast, and high uniformity. Its more than 120% of EBU wide color gamut provides excellent true color display. The projection core for the DLP display unit adopts a dual-CPU design, one for controlling communication, color adjustment, and optical detection, while the other for image processing ensures stable operation of the optical engine, effectively guaranteeing speed and quality of image processing. For light source, it uses fluorescent color wheel and unique highly-efficient vacuum heat pipe cooling technology, increases brightness and life for the light source, and achieves digitized frame-by-frame brightness adjustment. With a wider range for brightness control and constant color temperature, it can better ensure brightness and color uniformity for the entire screen.

The laser DLP display unit features a light source life of 60,000-80,000 hours, saving huge subsequent maintenance cost. The projector core's embedded automatic brightness and color balance adjustment system allows real-time detection of light source intensity and color, and it automatically controls and adjusts the brightness and color of all projector cores, effectively preventing drift in brightness and color. Color Sensor is used at the internal of the projector core for automatic color temperature compensation, providing a maximum guarantee for the entire display wall image with uniform color and brightness over a long period of operation.



Delta builds micro modular data center for coal mining equipment corporation

Text by DGC

Delta has recently announced its partnership with a largest domestic coal mining equipment enterprise to build a highly system-integrated and scalable data center infrastructure.

Based on overall plans and construction demands of the coal mining enterprise, Delta offers a micro Modular Data Center (MDC) series which aims to help industry users with quick deployment. For small data centers of less than 10 IT rack cabinets and 50 IT rack cabinets, a three-in-one system including an integrated power supply and monitoring system, a cabinet system, and a cooling system will be provided. It is easy and flexible for installation, smart and simple to manage, and it offers small data center users a great value for its cost, making it a highly applicable and perfect server room solution.

In terms of energy conservation, the MDC series uses the cabinets as carriers of the server room to satisfy the requirement for a safe equipment operation in the room environment. The air flow control system effectively isolates the mixture of hot and cold air without the need for additional air conditioning costs, which significantly reduces the power bill from uninterrupted operations.

The MDC series data center is also equipped with a mobile APP smart management mode. The APP saves enterprise IT management the need for a guard deployed at the server room. It provides the system operation information to the maintenance personnel at any time, which reduces some of the burden of maintenance work, secures the system, and protects the reliability of the corporate R&D and design data.



Delta Creates Micro Modular Data Center for Coal Mining Equipment Corporation

Application of dispensing glue on the laptop casing by Delta SCARA industrial robot

Text by DGC



Delta SCARA industrial robot

The 3C industry, represented by smartphones, has been rapidly growing in recent years. As production continues to expand, consumers are upgrading their devices at a faster rate. During the manufacturing process of 3C products, the numerous parts of the casing of laptops and smartphones require AB glue to assemble. Every product has its fixed, respective gluing patterns. The Delta SCARA industrial robot is capable of performing point to point applications. It is also capable of bearing the weight of the glue dispenser, while executing auto material loading and unloading, making it suitable for glue application.

To use the Delta SCARA industrial robot DRS series to control glue application, the motion programming will be written according to the glue patterns, for example, through the lowering position accuracy, utilizing MAXROUGH precision, terminal speed change of the short dogleg robot can be minimized, and glue distribution becomes more uniform. The program will be based on the speed of long segments and short doglegs respectively. Speed will be increased during longer segments and decreased during shorter doglegs to improve glue distribution. Through the introduction of simultaneous multi-task execution, the robot inspection efficiency of the start signal will be increased to conform to client usage habits.

In the past, glue application required the manual loading and unloading of materials. The Delta SCARA robotic arm is equipped with a suction cup that allows for automatic loading and unloading, further increasing efficiency. Software development for the Delta SCARA industrial robot is simple. It is capable of storing several programs for different products, achieving multiple functions on a single line. It also features stable operation, making it very suitable for broad applications in the industry.



Delta at Hannover Messe 2018

Text by EMEA

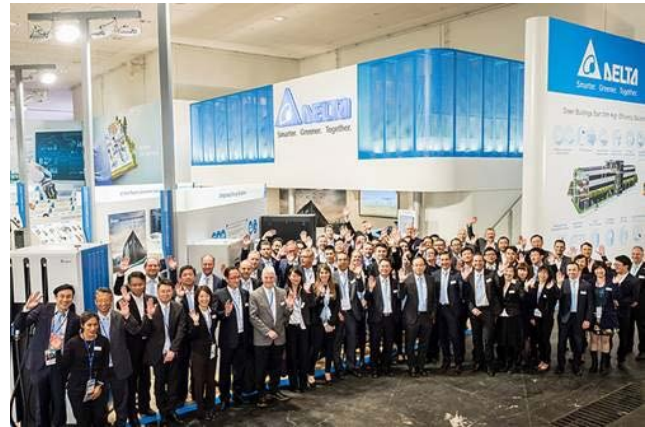
Delta highlighted at Hannover Messe 2018, its unique ecosystem of smart and energy-efficient solutions to realize smart manufacturing as well as safe and comfortable green cities.

At its press conference, Delta did underscore the superior features of its new High-Flexibility Multi-Tasking Smart Production Line, a 4-meter IIoT-based manufacturing platform integrating three robot workstations, software systems and a smart conveyor to offer visitors a live demo of smart manufacturing. In addition, Delta displayed an abundant range of solutions for sustainable cities, including the IoT-based Building Management Platform, which integrates our building automation technologies, IP surveillance equipment and smart LED lighting to deliver substantial energy savings and lower carbon emissions in commercial and industrial facilities.

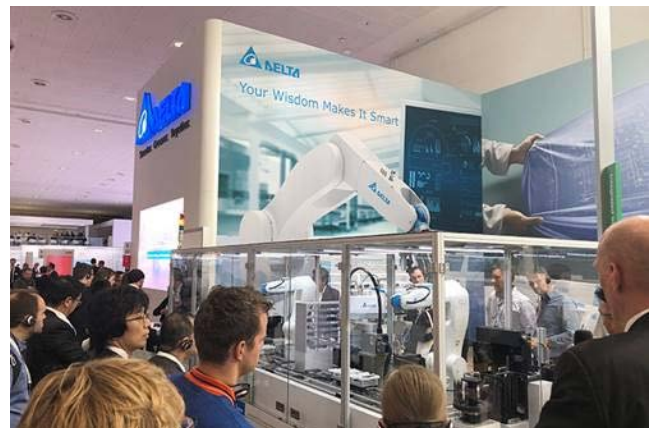
Mr. Jackie Chang, president & general manager of Delta Electronics in the Europe, Middle East & Africa (EMEA) region, said: "We are deeply proud to demonstrate at Hannover Messe 2018 that the utility, functionality and versatility of our integrated energy-saving solutions are advancing rapidly. Whether our EMEA customers are seeking to implement IIoT connectivity, energy monitoring and smart automation in their manufacturing platforms, or increase the energy efficiency, safety, comfort and market value of their buildings, or integrate EV charging infrastructure with renewable energy in their city, Delta is certainly the most suitable partner given our superior technology and accumulated experience in integrating total solutions."

Delta's exhibition at Hannover Messe 2018, offered an extensive range of solutions for a plethora of applications: For smart manufacturing, Delta presented its full range of Industrial Automation Solutions, which this year are led by the new High-Flexibility Multi-Tasking Smart Production Line, a highly sophisticated platform capable of producing different product types simultaneously through the support of Delta's own Delta Manufacturing Execution System (DIAMES), IIoT routers, machine vision systems, 6-axis articulated and SCARA robot workstations as well as a smart conveyor. Visitors had the opportunity to test this next-generation solution's live demo by placing and monitoring production orders of customized gifts via on-site PC and mobile devices. Our IoT-based Building Management Platform highlighted to visitors Delta's high-calibre expertise in enabling smart green buildings. This comprehensive system leverages the technologies of our subsidiaries LOYTEC, Delta controls and VIVOTEK to offer the unique capability of enabling seamless control of not only the most energy-related operations but also of other critical aspects of buildings such as security and comfort. Thus, the compatibility of our system with every single protocol commonly utilized in building control, such as BACNet, DALI, KNX, Modbus, EnOcean, OPC, LonMark, etc. and the utilization of our surveillance equipment and the newly-launched IoT-based Connected Lighting Solution, ensures that heating, ventilation & air conditioning (HVAC) systems, lighting infrastructure, elevators, EV chargers, energy generation systems and user-related applications (access, identification, etc.) can operate under energy-efficient and secure modes to allow customers the ability to improve their assets' operating efficiency, security, comfort, market value and carbon footprint.

The booth also featured energy infrastructure solutions developed to support two key megatrends that are transforming cities worldwide: Electric vehicles (EV) and energy storage. Delta's 150kW DC Ultra Fast EV Charger is currently the only one in the industry capable of charging 4 EVs at the same time, a key reason why it has been selected by our customers throughout Europe. Our Li-ion battery energy storage system ES30 series, scalable up to 90kWh, offers close to 2 hours of 30kW power supply through Delta's own power conditioning system, thus, ideal for mission-critical commercial and industrial applications such as data centres, factories, hospitals, convenience stores and more.



Delta at Hannover Messe 2018 – Group photo



Our High-Flexibility Multi-Tasking Smart Production Line is a big hit at the world's largest industrial fair



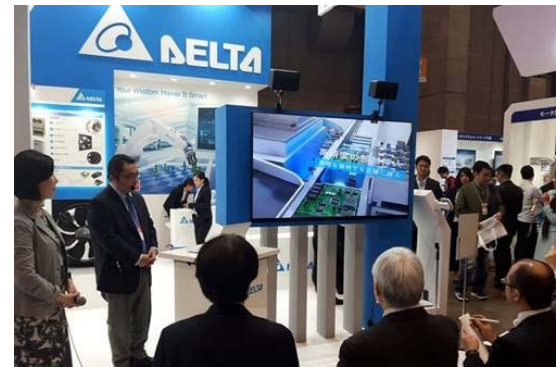
Delta showcases Automation and Energy Infrastructure Solution at Techno Frontier, Japan

Text by Corporate Communications

On April 18, Delta attended Techno-Frontier in Japan, during which the company unveiled its smart manufacturing with a blueprint of how it utilized its advanced automation and expertise to flexibly implement standardization, small-volume large-variety production, and customization, in which a new integrated robotic production line aimed for demands of the Japanese market. The display is a collaboration of various robots in combination with Delta's smart servo system and robot controller to enable automatic alignment of conveyor belts. Delta also expanded its integration of photovoltaic inverters, battery storage, energy management systems, and charging and management technologies for electric vehicles (EV). The company applied its experience in operating solar power plants in Japan to introduce energy infrastructure solutions targeting fast-growing EV charging grid applications.

Chief Brand Officer, Ms. Shan-Shan Guo, said that Delta continues to focus on the two major trends of smart manufacturing and sustainable cities, and it is committed to developing innovative energy-saving technologies to build IoT-based automation and infrastructure solutions for customers. With its advanced automation technologies and years of production expertise, Delta has created smart manufacturing modes across the factories, the production processes, and the equipment. Starting from its own factories, Delta has completed a smart manufacturing demonstration line that largely reduces manpower. For energy conservation and sustainability in cities, Delta offers solutions for a low-carbon city such as green buildings, EV charging, and intelligent lighting. At Techno-Frontier this year, we demonstrate our automation applications and energy infrastructure solutions as a practical example.

Mr. C.H. Ko, Executive Director of Delta Electronics Japan, stressed that Delta's long-term commitment to innovative and energy-efficient products and solutions as well as quality services for the Japanese market is widely recognized by customers in our three major business areas: power electronics, automation, and infrastructure.



Delta holds a press conference at the exhibition site to present its latest brand promotion video for smart manufacturing

Delta attends InfoComm China 2018

Text by DGC

Delta, the world's leading display solutions company, has participated in this world-class audiovisual event for three consecutive years. The company used the theme "Inspiring Innovation & Business Opportunities with Higher Resolution" to envision "smart cities", and showcased innovative display technologies and solutions based on 4k displays, big data mining analysis, smart education, and other fields, in the three major dimensions: technology, solution, and application. Its projector brand Vivitek and education solution Novo also attended the stage to showcase their world-leading achievements.

At IFC 2018, Delta and affiliated company Digital Projection jointly debuted the world's first 25k ultrahigh-resolution 8k DLP projector - INSIGHT Laser 8k. The product was based on INSIGHT Laser models that were widely received on the market. It uses Delta's exclusive optics and signal processor technology and Delta's strength in power sources and heat dissipation to fully display 8k, 33-megapixel video to the audience, making it truly the top solution for a wide range of applications such as shows, broadcasting, planetariums, and simulations and visualizations.



Delta attends InfoComm China 2018 with the theme "Inspiring Innovation & Business Opportunities with Higher Resolution" to envision "smart cities"



Delta's brand Vivitek displays its outstanding large outdoor splice screen for drive-in theaters consisting of eight 18k lumen laser projectors DU9800Z



Delta showcases Data Center Solutions at DCD>Indonesia 2018

Text by DSBV

Delta Electronics (Thailand) PCL. subsidiary, Delta Energy Systems (Singapore) Pte. Ltd., showcased Delta's latest data center infrastructure solutions at DCD>Indonesia 2018. Datacenter Dynamics (DCD) hosted the summit for next-generation data center & cloud infrastructure at the Ritz-Carlton Jakarta. In its 6th year, the annual event brings together business and technology thought-leaders to discuss and find digital-era opportunities for the data center and cloud infrastructure industry in Indonesia.

At the event, Delta highlighted the Data Center Infrastructure Management (DCIM) solution. Mr. Jesse Zhuo, Delta Design Manager, came from Taiwan to give an on-site DCIM demonstration with a translation by the Indonesian Delta engineer Mr. Dadang. Many of the Delta partners and customers who attended the demonstration showed high interest in the single-platform software system that offers CIOs and IT managers a central view to track critical information and carry out controls. DCIM's excellent Power Usage Effectiveness (PUE) guarantees cost-effective and environment-friendly data center operations for customers. In addition, Delta displayed the Amplon RT series (single phase) RT6 kVA, N series (single phase) N3 kVA UPS, Ultrion series (three phase) HPH20 kVA UPS. Delta's UPSs boast maximum available power, unsurpassed energy efficiency and superior power performance that make them a top power protection choice for many data centers.

Delta leverages its core competencies to drive innovation in its power management solutions and power protection for data centers. With best-in-class thermal management and energy saving synergy, Delta data center solutions offer customers add-value in terms of reliability, convenience and Total Cost of Ownership (TCO) optimization.



Mr. Jesse Zhou (center left), Delta Design Manager and Delta team showcase Delta data center solutions at DCD>Jakarta 2018

Delta unveils innovative solutions at the 3 major spring industrial exhibition

Text by DGC

As the leading company in industrial automation, Delta has brought innovative solutions to the 3 major automation professional exhibitions, namely the 19th Shenzhen International Machinery Manufacturing Industry Exhibition in 2018, the 10th China CNC Machine Tool Fair (CCMT) and the 32nd International Exhibition on Plastics and Rubber Industries, to share Delta's latest developments with the industry.

Displaying high efficiency processing solutions focusing on the 3C industry

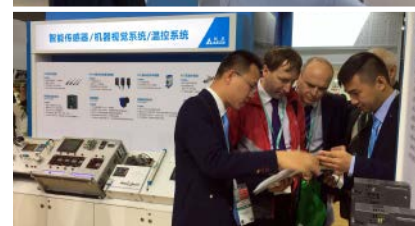
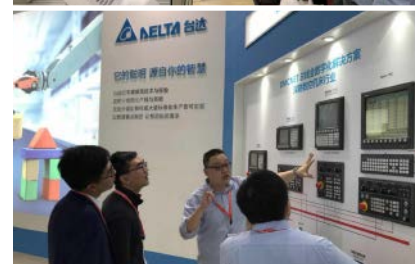
The Pearl River Delta area is home to a robust manufacturing industry, with the 3C electronics processing industry being its pillar industry. In the 19th Shenzhen International Machinery Manufacturing Industry Exhibition, held in the Shenzhen Convention & Exhibition Center, Delta has unveiled metal processing, glass and ceramic polishing, production assembly and transportation solutions for the developmental trends of the 3C industry.

Creating high performance CNC solutions to aid smart manufacturing

In the 10th China CNC Machine Tool Fair (CCMT), Delta has showcased CNC machine tools solutions with the NC300 and NC200 series as the core control and multiple innovative product solutions.

Focusing on industrial segments, displaying all electrical system solutions for rubber and plastics

The 32nd International Exhibition on Plastics & Rubber Industries (CHINAPLAS 2018) was held in Shanghai. Delta focused on extruders, injectors and blow molders. They can satisfy the developmental needs of the rubber and plastics industry for high efficiency, energy conservation and environmental protection.



Delta unveils innovative solutions at the 3 major exhibitions: International Machinery Manufacturing Industry Exhibition, China CNC Machine Tool Fair (CCMT), and the International Exhibition on Plastics & Rubber Industries



"Building Green Buildings with Delta" book release

Text by DGC



The China's National People's Congress (NPC) 2018 has come to an end, from which green development and the reduction of emissions remained a focal point, with every major company striving to lead the way by setting examples on these topics. Delta has donated or built 26 green buildings in the past 11 years, the largest number for any company, with 6 of which located in China. Delta has summarized its experiences and knowledge of green buildings with various characteristics and published this information in the Simplified Chinese version of the "Building Green Buildings with Delta" in Beijing on March 29. It aims to encourage others in participation of the green movements, maintaining sustainability and limiting the rising global temperature to within 2 degrees Celsius. Buildings are major energy consumers and account for 1/3 of the overall energy consumption. Therefore, in 2005, Delta was the first to use the concept of green buildings as the design basis for the company's factories or donated buildings. The designs were used on campuses, residential housing, and even temporary structures. To date, Delta has received 14 LEED's global certifications awarded by the U.S. Green Building Council.

Having personally orchestrated the Green Buildings Exhibition in 2015, the book's producer CBO Shan-Shan Guo has valuable experience in building green buildings with Delta. Shan-Shan also shared this experience on the international stage with the "Delta Green Building Exhibition" at the Grand Palais in France and subsequently at the Academy of Arts & Design, Tsinghua University. In Beijing, the green buildings exhibition was combined with Chinese scholarly ideas, which enriched the exhibition and resonated even better with the locals. However, the exhibition period was limited, and in order to influence a larger public, the highlights were collected and produced into this book. As Guo expressed, "The green buildings take reference from nature and conform to its surrounding location. In addition to being environment-friendly, they possess a beauty of going back to nature. Full of actual photos, this book allows readers to go over in detail Delta's journey in learning about green buildings over the years. Featuring renowned scholars and architects who have participated in the efforts, the 12 microfilms that are extended from various chapters on green buildings serve as a reader's guide and utilize real images to take readers to the original scene of planning for those green buildings, so that they get to understand Delta's original philosophy of devotion to the environment. It hopes to help more people get familiarized with green buildings by informing about their benefits and to expand the influence of green buildings."

Previous Chairperson of the Chinese Renewable Energy Industries Association Shi Dinghuan has witnessed Delta's dedication to the environment and energy conservation for more than 10 years. As he said in his speech, "Since 2006 until today, Delta has partnered with the Association and was the title sponsor for the International Solar Building Design Competitions. The company even invested in building the winners' competition projects. They have turned dreams into reality. For instance, after the 2008 Sichuan earthquake that destroyed many campuses, the theme of our 2009 competition became campus reconstruction. Delta donated to rebuild the Delta Sunshine Elementary School in Yangjia Township, Mianyang, the first campus with complete green buildings in the stricken area. For more than 10 years, I have been deeply moved by Delta's perseverance in taking actions based on the philosophy of green building environmentalism. Zeng Yanzhe, the elementary school's designer and Vice President of the China National Engineering Research Center for Human Settlements, said that these projects trained a large number of green building professionals and are great engineering examples to promote for advanced concepts. In a way, the competition itself is an important green building action."

Delta upholds its mission of "To provide innovative, clean and energy-efficient solutions for a better tomorrow" by implementing energy conservation and the reduction of emissions for its factories, products, and green buildings. In 2016 alone, the certified green buildings have saved 15.2 million kWh, an equivalent of 10.07 tons of carbon emissions. In the past seven years, Delta's energy-efficient products and solutions have saved its clients an estimated 20.8 billion kWh.



Delta CBO Shan-Shan Guo (middle), previous Chairperson of the Chinese Renewable Energy Industries Association Shi Dinghuan (second from left), Vice President of the China National Engineering Research Center for Human Settlements Zeng Yanzhe (second from left), U.S. Green Building Committee North Asia Managing Director Du Risheng (left), and the author of "Building Green with Delta" Evan Kao (right) at the book release event. Presenting Delta's energy-saving experience in building green buildings over the past 10 years



Delta MOOCx Platform teaches high school students Math

Text by Corporate Communications

The Delta Foundation and Ministry of Education's Ordinary Senior High School Curriculum Math Resource Center collaborated on the filming of "Junior High School Math Course", which is already available for free on DeltaMOOCx online course website and the YouTube channel Delta MOOCx. It offers a quick boost in math skills for 230,000 junior high students who will be taking the exam in May. On May 3, Bruce Cheng (Chairperson of the Delta Foundation), Kuo Kung-Bin (Vice President of the National Academy for Educational Research), TP Perng (Delta MOOCx Project Leader), and Tseng Cheng-Ching (MOOC Instructors Convener of the Ordinary Senior High School Curriculum Math Resource Center and a teacher at the Taipei Municipal Jianguo High School) jointly attended the charity online press conference to discuss about the features of this project and its future outlook.

Bruce Cheng, Delta founder and Chairperson of the Delta Foundation, indicated: I was not interested in math at one point in my youth, but I was fortunate to have many teachers who have inspired me. I agree whole-heartedly with the philosophy of the teachers at the Math Center and I think I am in a place to be able to help more students, which is why I have invited the best teachers to be filmed for courses that are available for students to learn and repeatedly review online. I believe the guidance of a good teacher and these junior and senior high school math courses will leave a much greater influence on the students than just one exam.

Tseng Cheng-Ching, a teacher at the Jianguo High School who was in charge of the filming, indicated that the teachers involved in the filming and planning processes are all members of the Evaluation R&D Group at the Math Center and the Junior & Senior High School Math Program Committee. They have extensive experience in the series research and understand the pain points of student learning. The junior high school math courses videos on DeltaMOOCx will definitely help students learn with more efficiency.

TP Perng, DeltaMOOCx Project Leader and Professor at National Tsing Hua University, concluded that Delta-MOOCx offers more than math courses, but of all the great teachers who have participated in the online course filming, the Math Center group was the most proactive team. Delta has currently attracted over 2 million views. Its influence is thousands times and more than when a good teacher reaches several hundred students in one year, so that more students can benefit.



Bruce Cheng (center, Delta founder and Chairperson of the Delta Foundation), Perng Tsong-Pyng (3rd from the right, DeltaMOOCx Project Leader), Kuo Kung-bin, (3rd from the left, Vice President of the National Academy for Educational Research), and Tseng Cheng-Ching (Teacher at Taipei Municipal Jianguo High School) jointly attend the charity online press conference for the release of the junior high school math course on the DeltaMOOCx online course platform.



Delta becomes the only company listed in CSR "Annual List of Honors"

Text by Corporate Communications



Delta is listed in Corporate Social Responsibility "Annual List of Honors" on Global Views Monthly Magazine. (From left to right) The attendees included Delta Foundation Vice Executive Director Wim Chang, Delta Foundation Executive Director Guo Shan-Shan, Delta Founder and Honorary Chairperson Bruce Cheng, and Delta spokesperson Jessie Chou

Delta was listed in Corporate Social Responsibility (CSR) "Annual List of Honors" on Global Views Monthly (GVM) Magazine, this is the second time the company has received this honor. The company has also received a total of 14 awards throughout these years, in demonstration of Delta's wide recognition for its long-term CSR commitment.

Bruce indicated his appreciation for the support and encouragement from the judges over the years. In order to promote corporate sustainability, Delta is aligning itself with the United Nations Sustainable Development Goals. The company follows up on climate change and implements real actions to reduce carbon emissions. In 2017, Delta became one of the first to set a Science Based Target (SBT) for carbon reduction. The company designated 2014 as the record year, with a goal of a reduction of 56.6% in greenhouse gas intensity by 2025. The company's target is the first in Taiwan and among the first 100 globally to have been approved by the Science Based Targets initiative (SBTi). At the same time, Delta has established an internal carbon pricing to internalize the economic costs of carbon emissions from its operations as a management tool in support of the company's de-carbonization strategy. It is a practical action that echoes to the 2 degrees Celsius of global warming limit. He said "Earth's climate is already in a mess in comparison to past years. The North Pole ice caps continue to melt. By estimations of environmental groups, without effective action, the global sea level may rise 6 meters in this century."

GVM understands that social enterprises are a part of the current-day enterprise spectrum, and it has become a bridge for promoting social enterprises while serving as a media platform by discovering outstanding models of these social enterprises. This year, the magazine has held the first GVM Social Enterprise Award - Social Enterprise Star and invited the winner of the 1st "Ethical Entrepreneur" Bruce Cheng as a presenter for his long-term devotion to CSR.

Delta receives the "R. O. C. (Taiwan) Presidential Innovation Award"

Text by Corporate Communications

Delta was awarded the 3rd "R. O. C. (Taiwan) Presidential Innovation Award". The award was received personally by the Chairperson of Delta Electronics, Yancey Hai on April 30. The judges think that Delta is devoted to innovation and its sustainable development model gave Taiwanese innovation an opportunity to shine on international stage.

Yancey expressed: Innovation is Delta's corporate culture. In 2017, our R&D budget is 7.2% of the global revenue. We currently hold 8,687 patents and have been listed in the Dow Jones Sustainability Indices (DJSI) World Index for seven consecutive years and as a Top 20 International Brand from Taiwan. Our brand value is worth USD 250 million. On an environmental and social level, Delta has made self-determined contributions to carbon reduction. Our plants and offices continue to improve and innovate power-efficient solutions, and we promote green buildings as well as environmental and energy education through culture and arts.



Chairperson Yancey Hai receives R. O. C. (Taiwan) Presidential Innovation Award on behalf of Delta



Delta awards ISO 13485-Medical Devices Quality System

Text by DET

Delta Electronics (Thailand) PCL. is the first electronics manufacturer in Thailand to get the International Organization for Standardization (ISO) standard ISO 13485 Medical Devices Quality System. The ISO13485 certifies the company's responsible supply chain, eco-efficient operations, systematic environment management, logistics management and information technology in medical device production. Mr. Chatvithai Tantraporn, TÜV SÜD Thailand General Manager, presented the certification to Mr. Christopher See, Delta Materials Management Sr. Director, who represented the company. Headquartered in Munich, Germany TÜV SÜD is a leading technical service corporation catering to the industry, mobility and certification segments. Delta executives from R&D, Central Purchasing Control (CPC), Operations, Sales & Marketing, Quality and related departments attended the award ceremony at Delta headquarter in Samutprakarn.



Mr. Christopher K.M. See (7th from left), Delta CPC/ Materials Management Sr. Director, and Mr. Chatvithai Tantraporn, (7th from right), TÜV SÜD Thailand General Manager

The ISO13485 standard is a European harmonized standard for Medical Device Quality Management Systems. This standard will boost Delta's competencies in its current medical business in Europe and the USA and enhance its market expansion in emerging ASEAN markets. In addition, the ISO 13485 certification positions Delta to support the government's Thailand 4.0 Policy target to make the country Asia's medical hub that meets the needs of its aging population and attracts foreign patients for medical tourism. Thailand's Office of Industrial Economics forecasts that demand for medical devices in Thailand will increase 9% every year

Delta leverages its position as one of the industry leaders in Thailand and a responsible global citizen to boost development in Thailand's high-tech medical devices industry. The ISO13485 certification aligns with Delta's mission to drive innovation in products and solutions that bring benefits to society and prepares the company to meet growing business demand in global markets. The high industry standard aligns Delta's medical business development roadmap to several of the UN's Sustainable Development Goals (SDG) including good health and well-being, industry innovation and infrastructure, reduced inequalities and partnerships for the sustainability goals.

Delta Electronics Thailand prioritizes industries of the future for sustainable growth

Text by DET

Delta Electronics (Thailand) PCL. a listed company on the Stock Exchange of Thailand (SET), focuses on the future needs of business and society. The company prioritizes sustainable industry sectors including electric vehicles (EV), automation, big data, robotics and clean energy. As the company celebrates 30 years of remarkable growth in Thailand this year, Delta is excited to share its vision of a greener future with stakeholders and the wider community.

Delta Electronics Thailand ranked 94th, among 191 stocks, in SET's Dividend Universe 2017. The SET's Dividend Universe 2017 is a survey that aims to help investors select the best value investments. The SET Research Department selects companies in the SET Dividend Universe according to performance criteria including profitability, dividend payments and corporate governance.

Delta Thailand's offerings are in line with global mega-trends. The company leverages its strong position in key industries of the future to drive its sustainable growth.

"We are proud of the SET's recognition of our work over the past decades and we are happy to celebrate our 30th anniversary in Thailand this year. Looking forward, we are very excited about the years ahead and how well our business aligns with the future needs of business and society," said Mr. Hsieh Shen-yen, Delta Electronics (Thailand) President. "Delta is positioned to gain the benefits of exciting new technologies that will help the businesses and the world to operate in a clean and efficient manner. The world is changing fast, and we had agile adaption within Delta to put our resources into emerging technology sectors that will make the most impact."



Stock Exchange of Thailand
Dividend Universe 2017

Delta, ranked in SET Dividend Universe 2017, drives sustainable growth in line with global mega-trends



Delta Wujiang data center becomes world's first LEED v4 ID+C Gold-Level data center

Text by DGC



Andy To, Managing Director of the USGBC North Asia, awards Delta the LEED v4 ID+C gold level certificate. Donald Yu, Managing Director of DGC, receives the award on behalf of Delta

The data center of Delta's R&D and manufacturing center in Wujiang, China has been certified for LEED v4 ID+C (interior design and construction) gold level by the U.S. Green Building Council (USGBC) to become the world's first green data center to receive this rare honor. Since 2015, the Delta Wujiang Data Center has been utilizing Delta's own products and power-saving solutions; between the three years from 2015 until 2018, the annual average value of power usage effectiveness (PUE) has reached 1.29, on the gold level, and the center received a high LEED score.

Donald Yu, Managing Director of DGC, attended the award ceremony and indicated, "It is an honor for the Delta Wujiang Data Center to become the world's first data center certified with LEED ID+C gold level. This is a demonstration of Delta's capability and determination to creating green, power-saving data centers. Since 2006, Delta has been committed to construction of green buildings for all the new factories. The four Delta data centers around the world all use Delta's own products and power-saving solutions with the gold level as their objectives. We hope these experiences and technologies would help users benefit from the performance of the green data centers."

Andy To, Managing Director of the USGBC North Asia, indicated at the ceremony, "Congratulations to Delta with the world's first LEED ID+C gold-level-certified data center. It is a remarkable and extraordinary milestone for green data centers in China. We are pleased to see Delta's vision for sustainable development and its determination in raising the standards of the industry's overall infrastructure. We hope that in the future, Delta will continue to serve more users with the philosophy and values of green data centers."

Delta receives "2018 Outstanding HR Management Award"

Text by DGC

On April 13, as was announced at the enterprise summit "2018 Outstanding HR Management Awards", hosted by 51job, Inc., Delta Group received the honor of the "2018 Outstanding HR Management Award". Delta excels in its HR management model which encourages employee to promote and recognize the company's core value. Delta Group China Regional Head of HR Lin Zhengbing attended the ceremony as a special guest to share the company's technology-empowered HR management experience and exchange with and learn from HR professionals from all over the country, in a hope to improve Delta's employer brand.

Lin indicated that Delta's HR management has also adopted a human-centered hiring and management policy. We protect legal labor rights and benefits and are dedicated to each employee's career development. Delta has conducted several promotion training projects for employees of different talents such as the "Huangpu Project", "Star FAE Project", TDC, LDC, and others. They help employees improve professional skills and achieve career development.

At the same time, Delta also established a public training base to train skilled talent in groups and plan for comprehensive training systems for employees. At Delta's Wujiang production base, Delta established a "modern smart manufacturing and industrial automation center" as a means of technical and platform support for employee development. The center has five main training platforms as its carriers, including the "electrical repairs training room", "PLC training room", "robot training room", "software training room", and "soldering training room".



Delta receives "2018 Outstanding HR Management Award"



Delta awards Grand Prize at "China Automation Industry Annual Conference"

Text by DGC

The 2018 China Automation Industry Annual Conference and 13th Chinese Automation Industries Event Awards Ceremony were held in Shaoxing, Zhejiang Province. Delta was awarded three major awards for its outstanding performance in the industrial automation market last year. The awards include the "2017 Top 10 China Automation Field Company of the Year", the "2017 China Automation Field Person of the Year" for Andy Liu (IABG General Manager), and the "2017 Top 10 China Automation Field User-Trusted Product" for the standard compact vector control inverter M300 series. To date, Delta has received awards at this ceremony for 12 consecutive years, from which the company was awarded "Top 10 Company of the Year" award 9 times.

As the newly appointed young leader of IABG, Andy is leading the IABGs in a continuous march forward. The illustrious sales performance in 2017 for industrial automation far exceeded expectations. Andy pointed out that smart manufacturing is the future industry trend and will be the key competitiveness to be reinforced for global enterprises. Therefore, Delta will continue the course that has been set forth, which is to strengthen the strategies for industrial automation and seize opportunities to develop smart manufacturing in a hope of attaining new heights.

Delta's compact standard vector control inverter M300 series offers many advantages such as compactness, high functionality, highly reliable, and convenient installation. It transforms every invested industrial resource into bountiful results. The optimized structure and screw-less terminal design offer accessible examination and maintenance procedures while saving installation and repair times. The friendly user interface allows easy configuration of the parameters by using options of functions. The built-in USB allows quick copying of parameters and increases productivity.



Delta Awarded with Grand Prize at "China Automation Industry Annual Conference" for the 12th Consecutive Year

2018 International Intelligent Building Exhibition: Delta receives 2 major awards in building automation

Text by DGC

Selection of "2017 Companies from the Industry for Intelligent Buildings in China with Ingenious Product and Brand" is the first major award in building automation for the year of 2018. Delta is honored to be listed among the selection as a top-10 company with ingenious product and brand in the "Intelligent Lighting System" category. Around the same period, the "2018 Influential Brands in the Industry for Intelligent Building" also revealed the final list. Delta's perfect performance in the market in 2017 also got it rewarded with the award of "2018's Most Influential Product Agency in the Industry for Intelligent Building".

Zhao Guochao, Director of the Products Division for Smart Buildings, DGC, indicated that the market for intelligent building has arrived at a critical phase of accelerated development. This is a precious opportunity of development for Delta, the company devoted to using technological innovations to create comfortable building environments for its clients. In the past few years, Delta has experienced enormous growth in monitoring of building equipment and intelligent lighting. Through a series of influential engineering projects and the company's own rich set of professional skills, Delta has become a renowned company in the industry for intelligent buildings. The consecutive awards demonstrated a high level of recognition for Delta from its industry clients. The further integration and development of Delta's building automation business will certainly help the company attain new heights.

Delta has devoted a lot into the development of building automation in recent years. The company has two major product series in the field of building controls: LOYTEC and Delta Controls, which helps its customers create the overall building automation framework and achieve win-win in both user comfort and efficiency of energy consumption for buildings. In the field of smart lighting, it also continues to develop green and energy-efficient lighting solutions, satisfying the customer's needs in areas of street, building, commercial, and industrial lighting.



Delta receives two major awards in building automation



Delta and NTUT inaugurate the Delta Smart Manufacturing Lab to cultivate future talents

Text by IABG



Mr. Sea-Fue Wang (left) and Mr. Andy Liu (right) complete the contract signing for future cooperation

Delta IABG and National Taipei University of Technology (NTUT) have announced the inauguration of the Delta Smart Manufacturing Lab. The new lab is fully equipped with Delta's cutting-edge industrial automation products to build flexible smart manufacturing systems, a laser processing system, and an interactive AI Gomoku playing demo. The students of NTUT can get hands-on experience using Delta's industrial automation products and robot solutions in the lab. Delta IABG's General Manager Mr. Andy Liu and NTUT's President Mr. Sea-Fue Wang attended the inauguration ceremony, and celebrated their collaboration in cultivating future smart manufacturing talents.

NTUT's President Sea-Fue Wang expressed appreciation for Delta's continued support. In 2011, Delta and NTUT set up the Delta Automation Center, which comprised the Industrial Automation Laboratory and the System Application Laboratory. Since then, NTUT and Delta's long-term and close cooperation have cultivated thousands of young

talents for the industrial automation industry. The Delta Smart Manufacturing Lab will be a new milestone for collaboration in meeting the growing trend of smart manufacturing. President Wang said, "NTUT is currently applying for funding for a Technical Practical Training Program from the Ministry of Education. Once completed, NTUT plans to add more of Delta's automation products, creating even more possibilities for the future engineers of the manufacturing industry."

Delta IABG's General Manager Mr. Andy Liu indicated that smart manufacturing is the market trend of the future and the key to industrial success. Delta has long been dedicated to developing industrial automation products for smart manufacturing solutions. Delta is also working on promoting academic collaboration to develop more future talent for smart manufacturing. The Delta Advanced Automation Design Contest that has taken place every year since 2014 is an excellent stage for young talents to present the techniques they have learned with creativity and practical operations. NTUT teams frequently display their outstanding capabilities at the competition. Since collaborating with NTUT in 2011, Delta has attracted many excellent NTUT graduates with exceptional hands-on abilities to join the company. With the new Delta Smart Manufacturing Lab and the latest Delta products including robots, machine visual systems, and sensors, the company expects to cultivate more outstanding young talents, and elevate the overall performance of the manufacturing industry in Taiwan.

US Intel Lab invites Delta Research Center to demonstrate research into smart fields

Text by DRC

In April this year, the Delta Research Center was invited by Intel Lab, US to travel to their research headquarters in Santa Clara, California to participate in the annual seminar of "National Taiwan University IoX Center Workshop on Augmented Collective Beings" hosted by Intel and to share its achievements and research capabilities in smart fields. Delta was the first private Taiwanese company to be invited to the annual seminar, fully demonstrating the world class research capabilities of Taiwanese enterprises.

The two main research topics Delta demonstrated were: "Smart Manufacturing - Automatic Defect Classification" and "Smart Living - Indoor Air Quality Sensing", developed by Delta's research teams in Taipei and Singapore, respectively. The Automatic Defect Classification (ADC) demonstration displayed the visual recognition system developed by the Taipei team. It can be used to improve the manufacturing process of displays, assisting the manufacturer to analyze display testing results by categorizing and detecting flaws to improve the production process, with an inspection accuracy rate of 97% above. The Singapore team, on the other hand, explored how to use IoT detection methods to analyze the composition of the air for improving air pollution and standards of living. Both subjects have earned a lot of interest from Intel Lab researchers, opening up possibilities for future collaboration. Executives from Intel were also impressed by Delta's investment and achievements on innovation and R&D.

Already a corporate partner to NTU IoX center, Delta has also started a new corporate partnership with NTU through its research center last year. By combining Delta's practical industry experience and NTU's academic research capabilities, Delta hopes to develop more opportunities for AI and IoT applications.



The research team demonstrated research topics and results of Smart Manufacturing and Smart Living at Intel Lab, US



Delta Hosts Malaysian Partners at Delta Cup 2018 Golf Tournament

Text by DET



Delta managers and partners at the Delta Cup 2018 golf tournament

Delta Electronics (Thailand) PCL. subsidiary Delta Energy Systems (Singapore) Pte. Ltd., held the Delta Cup 2018 golf tournament for partners at the Kota Permai Golf Resort in Selangor, Malaysia. The event was an opportunity for Delta to show its appreciation to partners and boost cooperation for the further growth of Delta's Building Automation and Infrastructure Solutions business in the region.

On the tournament day, 47 Delta partners enjoyed an 18-hole golf match at one of the top golf resorts in the country. After the match, Delta invited the attendees to lunch at the country club followed by video introductions of the company and Green Building Solutions. At the end of the event, Delta awarded trophies and thanked its valued partners for joining Delta Cup 2018.

Delta Cup 2018 proved to be a fun competition for everyone and a fruitful networking session for Delta's channel partners, distributors, consultants and contractors. The premier golf resort offered an intimate setting for Delta to maximize branding exposure. Delta supports activities and events to strengthen partner relationships as part of its commitment to collaborative business and mutual benefits for stakeholders.



Delta Tainan office

PEOPLE

Creating a better future in Tainan – Delta Tainan Plant

Text by Delta Tainan



Kevin Wu / Delta CNC System BD-TN Manager

One month before my discharge from the army in 1999, I went for a job interview at Delta Tainan plant. This was my first interview, and I got my first job in Delta that day. I was very grateful to Dr. David Tsai for interviewing and recruiting me, giving me the chance to serve Delta. At that time, we were a small team of less than 20 people, all with high passion for research and development. Whenever we had new ideas, we would plunge into discussion round the whiteboard and implement them into the products in the fastest time. I remember that the table tennis table in the office serves as a meeting desk as well as our dinner table.. After dinner, we got together regardless of job positions to play table tennis and relieve stress.



PEOPLE & PRODUCT

In the early days, the product team specialized in CD-ROM development. In 2001, under the leadership of Dr. David Tsai, we developed AC servo drive and motor, as well as key component products for human machine interface. In 2006, Delta built its own diamond-rated green building in Tinan Science Park, and we then moved from the rented plant in Nanxing Road in Yongkang District to a place to call our own. After the key component products of motion control had achieved stable growth, we moved on to motion controller development. And as our team expanded with the growth in performance, in 2012, Motion Control Business Unit moved to the extended 2nd phase building, where its exterior resembles a ship leading us in striding forward.



During free time, Kevin (in orange top in the back row) hiked the Meiling Scenic Area with colleagues

During this process, I was very grateful to the leadership by the superiors, and the close teamwork. I witnessed how technologies were built from nothing, and the team grew from 20 to over 300 members. We were like a seedling growing and prospering under the hard work of everybody and nutrients of the company. Besides the technological research and development and products from the joint efforts of the entire team, what I treasure most in the past 19 years is in fact the passion during our discussions on advanced product technologies in front of the whiteboard or conference table, and the close-knitted relationship between colleagues.

During the weekends, I often weed and fertilize my garden, which is a good way to relieve stress. Taking care of my fish tank

is also my weekend pastime, and I find that the looks of the fish tank usually reflects my daily life. If I am too busy at work, the tank will be full of algae, and the waterweeds will not look nice. But if it is taken good care of during the weekends, it will look green and beautiful. With good coordination of the fishes, shrimps, snails, waterweeds, lighting, nutrients, and carbon dioxide, it will look nice too without having to spend too much time looking after. I feel that aquatic ecology is like a miniature of the world. Observing the balance of the aquarium environment makes me realize that only by achieving the balance between work and life can one accumulate energy and continue to move forward together with the company.



Yuanming Liu / Delta CNC System BD-TN Sr. Supervisor

I joined IABG CNC Controller Department of Delta's Tainan plant as a firmware engineer in motion control in 2014, in charge of trajectory planning and process flow design. I majored in automatic control in my studies and hence have high interest and passion in research and development of IABG's products and work content. IABG is like a big laboratory outside the campus, which fully integrates theory and practice. We are bold and innovative in terms of theory, and cautious in product verification. Whenever an idea from our colleagues is able to solve the customer requirements, it gives us a great sense of achievement.



PEOPLE & PRODUCT

The application of CNC control needs to go with Delta's self-developed drives and motors. Hence, it often requires cross-department cooperation and discussion for customer's application. During the process, I am able to accumulate more professional skills and ideas on automated control in the shortest time. Most importantly, we do not work alone in IABG. We help each other and are glad to share among the colleagues. We learn and grow through sharing experiences, and strive towards producing better products, as well as continually accumulating strong technological competency.

In IABG, I get to know a lot of working partners and friends. We help each other during work, and are dedicated in product analysis and development. In our spare time, we often go out together and talk about anything under the sun, and have lots of fun. It makes me feel that IABG is a professional and vibrant team, and all of us have deep relationships with each other in work and life.

I love outdoor activities. Mountain climbing, natural scenery sightseeing, and visiting attractions and historical sites are my favorite pastimes. Tainan offers many interesting attractions and famous snacks, and I often drive to downtown area just to enjoy nice food to reward myself after hard work.

I would like to thank Delta Brand News for giving me the chance to share with everyone my work and life at Delta. I also hope to enjoy every moment of my life working at Delta in the future.



Yuanming is a nature-loving person. Here's a picture he took at the Longgong Waterfall in Chiayi



Delta Electronics launches a 24V 120W CliQ III Series of DIN rail power supply

PRODUCT

Delta launches CliQ III Series of DIN Rail Power Supply for harsh industrial environments

Text by DET

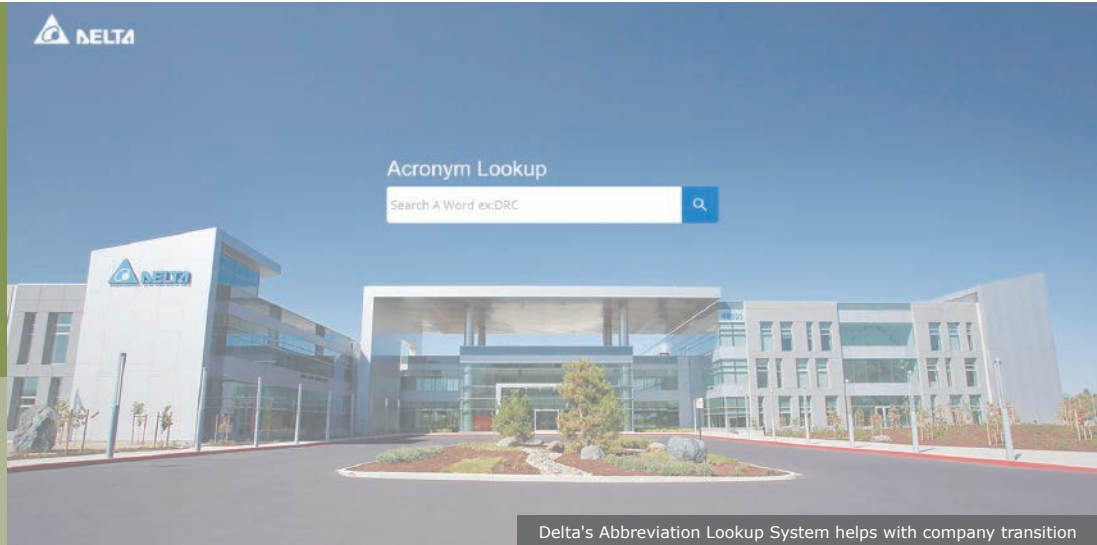
Delta Electronics launches a 24V 120W CliQ III Series of DIN rail power supply. The new high power density product has a wide operating temperature range of -25°C to +70°C, providing full power up to +60°C. It can successfully start up at extremely low temperature of -40°C. Like the rest of the CliQ family of DIN Rail products, conformal coating is applied on the PCBAs to protect against common dust and chemical pollutants found in industrial applications. The product is encased in rugged yet light-weight and full corrosion resistant aluminium casing.

Major safety approvals include IEC/EN/UL 60950-1 for Information Technology Equipment (ITE) and UL 508 for Industrial Control Equipment (ICE); EMI comply with EN 55032, Class B and fully compliant with RoHS Directive 2011/65/EU for environmental protection.

The DRP-24V120W1CAN comes with 24V 120W output and has built-in active PFC with high power conversion of up to 91% efficiency. The universal AC input product is also certified for DC input. Some other features include compliance with harmonic current IEC/EN 61000-3-2, Class A, power boost 150% up to 5 seconds and built-in DC OK relay contact. The intelligent overload protection in constant current mode makes the power supply suitable for battery charging applications.

Highlights & Features:

- ▶ Universal AC input voltage range
- ▶ Built-in constant current circuit for charging application
- ▶ High efficiency of up to 91% at 230Vac
- ▶ Power Boost of 150% for 5 seconds
- ▶ SEMI F47 compliance at 120Vac
- ▶ Extreme low temperature cold start at -40°C
- ▶ Built-in DC OK Contact and LED indicator for DC OK



PRODUCT

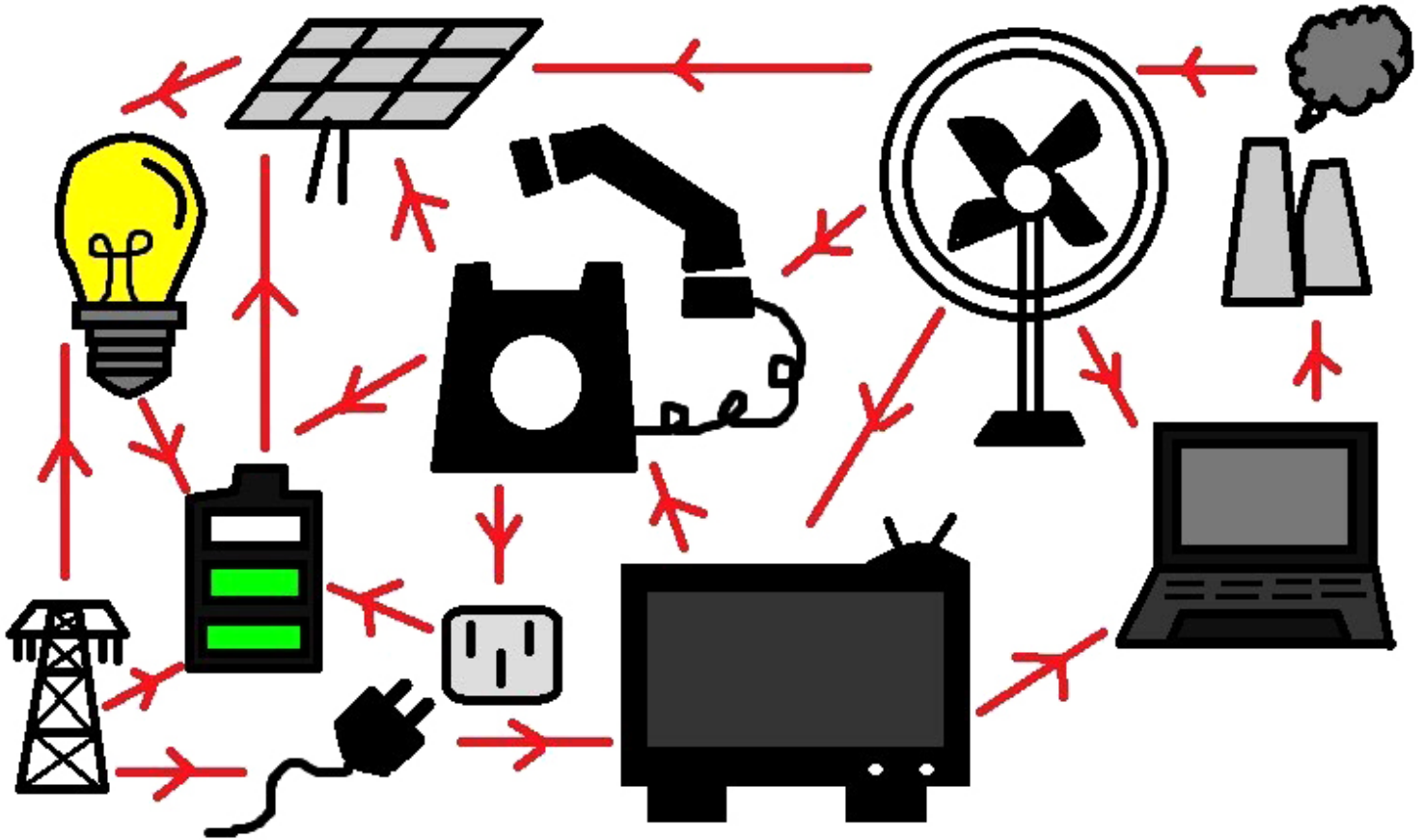
Delta's Abbreviation Lookup System helps with company transition

Text by DRC

The most important part of a corporate transition is the transfer and sharing of knowledge. In order to promote employee knowledge exchange and learning, and accelerate enterprise solution business, Delta has recently added an "Abbreviation Lookup System" to its company intranet website. Delta employees can access the system with a personal computer or mobile device and quickly look up over 3000 Chinese and English abbreviations commonly-used within Delta and the industry. It improves the efficiency of the company transition.

After feedbacks and suggestions from the Delta Technology Strategy Meeting (TSM) in 2017 and 2018, DRC Solutions Services Team has developed the "Abbreviation Lookup System" which includes common Chinese and English abbreviations of the internal organizations, products, systems, and solutions, as well as of the industry terms. The information includes the abbreviation, the full phrase and the definition, and is accessed by a single, optimized interface for quick user-access. Yancey Hai, Chairperson of Delta Electronics, has promoted the use of the "Abbreviation Lookup System" in multiple internal events. The convenient search for the abbreviations and definitions used in various fields is a fast track to trans-departmental consensus and allows for successful communication and collaboration during the transition to a Solution Business.

The "Abbreviation Lookup System" supports feedback terms, which is a two-way interactive method that allows the system to grow continuously with the expansion of our business and knowledge and facilitates the company transition.



How will a decentralized block chain change the power sector? (Drawn by Lala Wang)

Four possible ways that “blockchain” will revolutionize the energy market

Text by Tino Wang / Delta Electronics Foundation Climate and Energy Project Officer

The term Blockchain has been increasingly mentioned in the media in recent times. It is going through a similar effect as “cloud”, “big data”, and “the Internet of Things” in the past. These technologies have been considered to be revolutionary in the world and have even changed the methods in many industries.

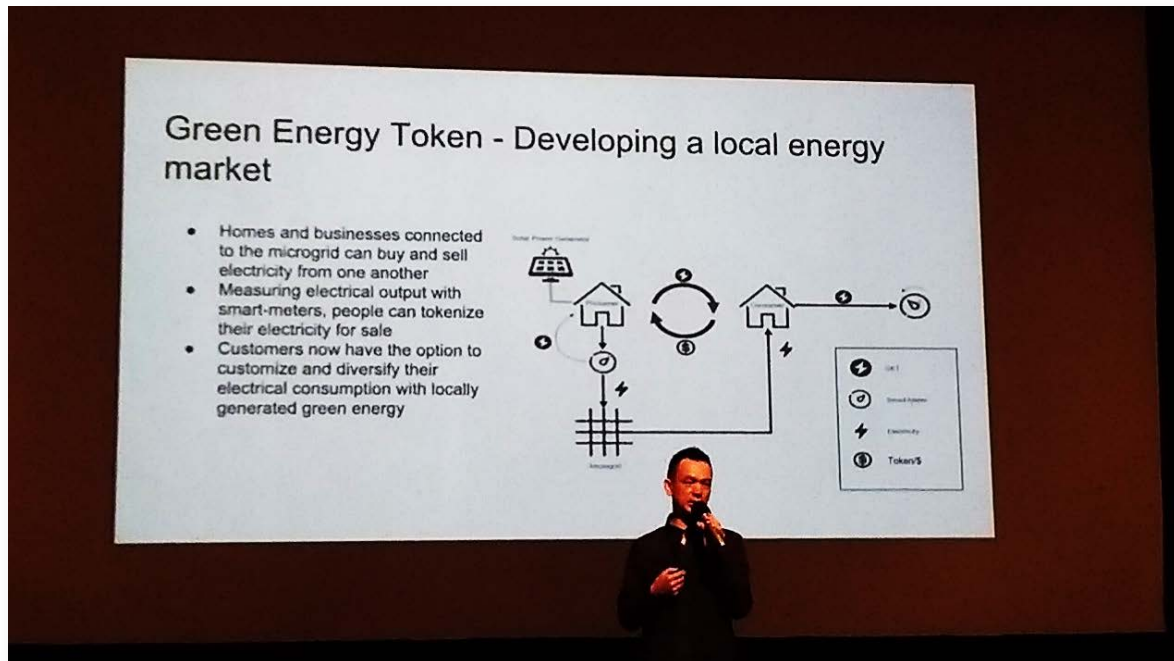
However, what are block chains? Many people may not understand it.

To keep up with discussions on block chains, I have participated in 2 consecutive, thought-provoking seminars: Trust 4.0 Block Chain Application Scenario Summit and Change the Future: the application and prospects of block chains. The seminars explored future applications of block chains in climate control and green energy promotion. I have also bought technical books to study, in an attempt to answer everyone’s questions.



The magic of block chains: a decentralized point-to-point trading system

First, we will get to know the definition of block chains. Basically, it is a type of “decentralized, distributed ledger”: It is a digital, giant ledger that can be added to indefinitely and it is time stamped so it cannot be edited.



The CEO of Digital Treasury Corporation, Jacob Lee, introduces the ways to develop a local energy market through green energy tokens

Why is this technology necessary? In the past, financial transactions require a third party to verify the identity of the two traders, and all transaction records and ledgers are stored in a centralized system. This means banks have to invest large sums into data security resources and management costs to prevent hackers from stealing or changing the information.

Bitcoin, developed from the concept of blockchain, has formed an infinitely long digital ledger through mathematical principles and encryptions. A copy of this ledger is stored at every node; that is, a computer or server utilizing the block chain. This drastically lowers the possibility of unauthorized changes to the trades to near zero. Information will not disappear once it is written into the block chain; records will continue to be made. When block chains are applied to digital currencies such as bitcoin, there is no need for a traditional third-party institution or broker management system. This allows users to establish direct trades from point to point (P2P).

Therefore, block chains can dramatically reduce personnel costs and errors. The safeguard utilized is called “Smart Contract”; it uses algorithms to automatically execute set contract terms. It can be applied to electronic payments, proof of identity, digital medical records, voting, and other identity-related fields. It can even be used for stock listing, insurance, roaming charges for telecommunication, charity donations, food distribution, and numerous other fields. Lastly, block chains can lower verification costs or solve problems with information asymmetry.



ICO (Initial Coin Offering) does not need to be distributed by an exchange, allowing the general public to participate in renewable energy investments

The 4 prospects of block chain: revolutionizing the future of the energy market

The current discussion for block chains is mostly focused on digital finance and electronic payments but whether this technology be applied to the energy sector.

A traditional power grid is managed by a large electrical company. People who want to utilize new power sources (e.g. renewable energy sources) cannot clearly tell what percentage of the electricity they use is generated through renewable sources. When and from which power plant did the power come from? How can they sell their excess power to their neighbor? If we study the characteristics of the block chain technology and integrate expert opinions, in the future, block chains can be applied to the energy sector in the following 4 ways:

- 1.Certification transaction:** Renewable Energy Certificate (REC), currently promoted by the government, can produce green energy tokens through block chains. This allows a clear division of costs between different power generation methods, releasing the potential of renewable energy in trading. Domestically, there is a solar power inverter company, Kiwi Energy, ready to introduce block chain technologies.
- 2.Crowdfunding:** The energy industry has, in the past, shown signs of clear monopolies and consolidated capitalistic characteristics. This causes it to be very difficult for small investors and innovators to join the industry. Jacob Lee, CEO of the Digital Treasury Corporation, thinks that the focus of renewable energy has been on solar and wind power in recent years. In fact, Taiwan is rich in geothermal resources and an energy cooperative ICO platform should be developed using block chains.



- 3.Promoting energy storage:** As everyone knows, intermittent power generation, solar and wind, needs to be coupled with energy storage equipment to reduce the risk of unstable energy production. Through blockchain technologies, low cost power stored during off-peak hours can be sold during peak hours more easily. In Germany, companies are using IoT (Internet of Things) technologies to manage charging conditions of EV Chargers, and selling the power to users in need through Ethereum.
- 4.Power grid management:** The cool-sounding blockchain, when combined with Internet of Things, big data, and other digital technologies, will push the power grid towards intelligent controls, demand response, and harmony of distributed power operation. For example, when power generation fails in a certain place, the Internet of Things can immediately detect the faulty equipment. A smart contract will send a message and report to the repair teams. This will reduce the maintenance cost and malfunction losses for the power grid.



A German company tested the possibility of using Ether(ETH) to pay for electric car charging

The energy market will transform from a traditional centralized management system to a distributed form where “everyone is a power company”. At this point in time, blockchain can be a critical driving force for the ideal future of the democratization of energy and free trade. Of course, risks exist behind the apparently endless potential. It is definitely an area to watch.



Delta Foundation attends EETW for the first time in 2018 to be follow up on the world's latest information in energy-efficiency and campaign strategies

Inside IEA: three main energy efficiency takeaways

Text and photos by: Evan Kao / Project Director of the Delta Foundation

Here along the Tropic of Cancer, summer has arrived early in Taiwan, with temperatures in mid-May already exceeding 35 degrees Celsius. 9800 kilometers away in Paris, the capital of France, winter lingers on, with early mornings around 10 degrees Celsius, streets there are often engulfed in drizzle and mist. One could mistake it for the City of Fog (London) and not the City of Lights.



During my last visit to Paris for COP21, I witnessed the birth of the Paris Agreement. Three years later today, I am back here for the Energy Efficiency in Emerging Economies Training Week (EETW) hosted by the International Energy Agency (IEA). The history of EETW traces back to 2015. It is a free course on energy efficiency for developing countries and has since trained over 800 people. This year, hundreds of attendees from different countries are in the courses. The intensive 5-day course teaches the latest energy efficiency concepts in four fields: buildings, industry, lighting and appliances, and transportation.

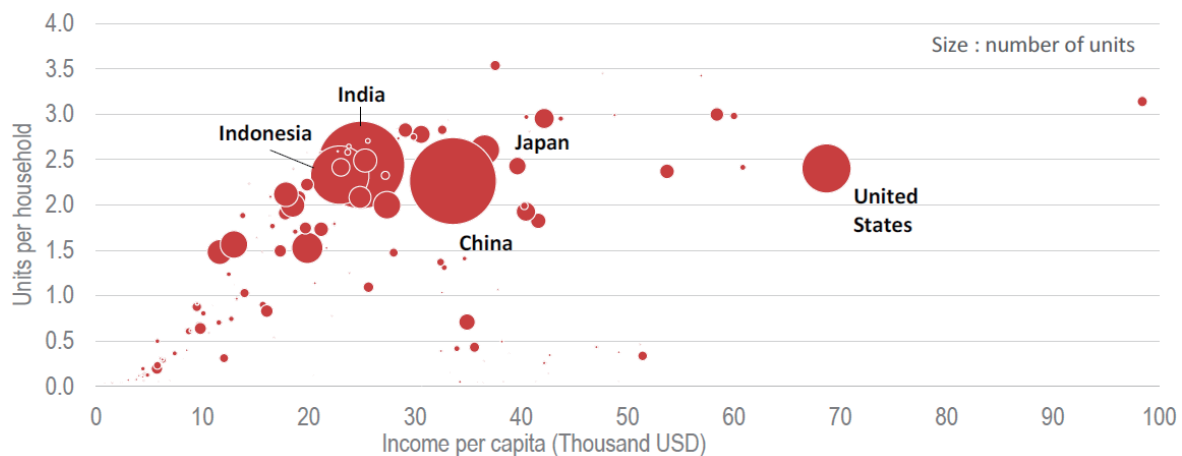
The opening ceremony was attended by many IEA executives, including Vinay Mohan Kwatra (the Ambassador of India to France), Monica Aspe (Ambassador of Mexico to the OECD), and Klavs A. Holm (Ambassador of Denmark to the OECD). In his opening speech, Faith Birol, IEA Executive Director, mentioned that the improvement of energy efficiency is a critical issue with no time to waste; it plays an important role in the mitigation of global warming, the adaptation to climate change, and the prevention of environmental pollution.

Takeaway No.1

"air conditioning" power consumption is growing rapidly

Past discussions regarding energy efficiency often immediately involves power conservation in households, such as turning off the lights, upgrading to energy-efficient equipment, and air conditioning temperature settings. It could also refer to government requested energy conservation in the industry, or high power consumption standards for products. However, IEA teaches us that the concept of energy efficiency doesn't end there. Three new important takeaways can be summarized from this year's courses.

Evolution of global air conditioner ownership



By 2050, around 2/3 of the world's households could have an air conditioner. China, India and Indonesia will account for half of all AC units in buildings in 2050.

By 2050, around 2/3 of the world's households will have an air conditioner, and the prevention of subsequent energy loss and grid impact is necessary



The first takeaway is the drastic growth in "air conditioning" power consumption. In the Future of Cooling, recently published by IEA, it was pointed out that the energy consumption giant in the next 30 years is not EVs, nor bitcoins, but the cooling systems hidden in buildings, such as air conditioning, fans, and dehumidifiers. It is estimated that the number of the world's cooling equipment will explode to 8 billion units by 2050, more than twice that of 2016 (3.4 billion units). Among these equipment 5.6 units will be air conditioners which require over 6,000 TWh (6 trillion kWh), almost the equivalent of "1 China" in power consumption.

Even worse is that in comparison with developed countries, such as USA and Japan with over 90% install rate of air conditioners, several emerging countries in the tropical regions, such as India (5%) and Indonesia (7%), only have single digit install rates. This means economic growth will inevitably result in fervent installations. How could the public needs be satisfied while the power grid avoids any blackouts during peak hours? This would rely on significantly higher energy efficiency standards for cooling equipment.

Takeaway No.2

"truck" emissions are accelerating at high speed

A second surprisingly discovery is that the area of which GHG emissions are growing the fastest is not in the industrial or buildings fields, but rather in transportation, by "Trucks".

Since the early 70s, transportation has always been the world's largest consumer of fuel. According to statistics in 2015, almost two thirds of the fuel products are feed into various transportation tools (66%), and trucks takes the lead in the growth emissions from burning fossil fuel, more than cars, aerospace, or shipping.

How can we improve the fuel efficiency of HDVs?

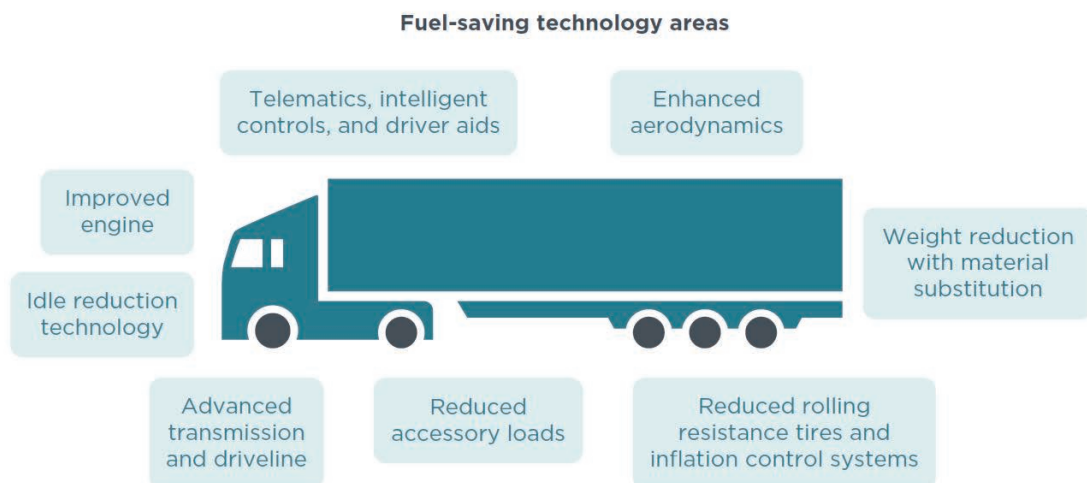


Figure 2: Tractor-trailer fuel-saving technology areas

Sharpe (2017). Barriers to the adoption of fuel-saving technologies in the trucking sector.

The booming development of logistics demands has brought about the dramatic rise of emissions from land transportation "trucks"; nations must find ways to improve the related energy efficiency



IEA experts reminded us that the deceleration of the explosive growth in truck emissions can only be achieved if governments of all nations adopt measures, such as the optimization of logistics efficiency, the replacement of transportation fuel (such as by electric power or biofuel), and the improvement of energy efficiency. With proper management, 50% of the unnecessary truck fuel demands can be reduced by 2050.

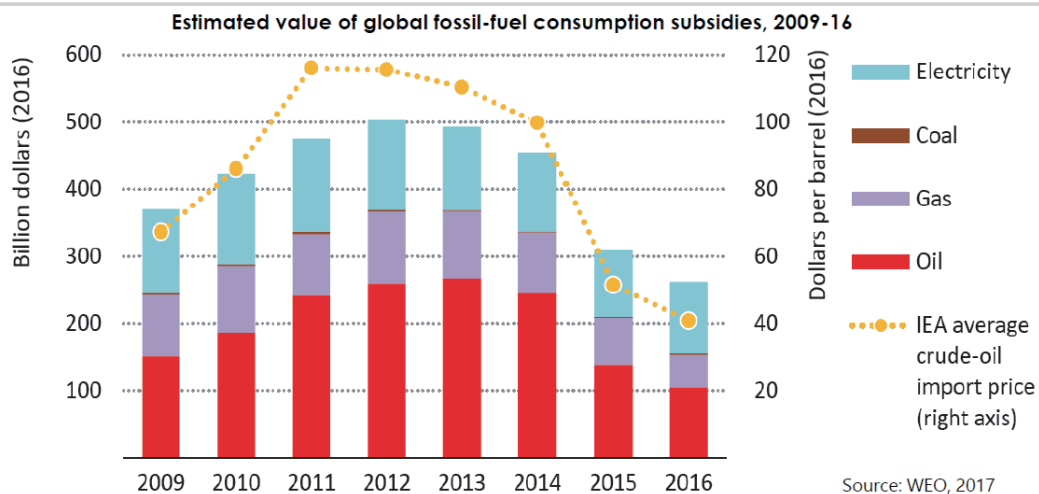
Takeaway No.3

fossil fuel "subsidies" must be eliminated

The final concept that connects the whole courses is the elimination of "fossil fuel subsidies". This term may seem unfamiliar, but Taiwan has always been on the radar of international organizations in their fossil fuel subsidy surveys. For many years, Taiwan has provided benefits to the fossil fuel industry using tax income and major subsidies to energy prices.

Statistics show a strong correlation between fossil fuel subsidies and international oil prices. The fall of oil prices in recent years resulted in the global fossil fuel subsidies reaching nearly 500 billion USD at one point. The subsidies subsequently dropped dramatically to 262 billion USD in 2016. A notable situation in the past is that "fossil fuel" is the main subsidy recipient, but on said year it fell behind "electricity prices" (41%, first time ever to lead fossil fuels with 40%).

Subsidies follow the global market price



Lower prices and bolder policies mean that the value of global fossil-fuel consumption subsidies declined again in 2016, to \$260 billion

The global fossil fuel subsidy credit follows the fluctuations of oil prices; in 2012, it nearly reached 500 billion USD

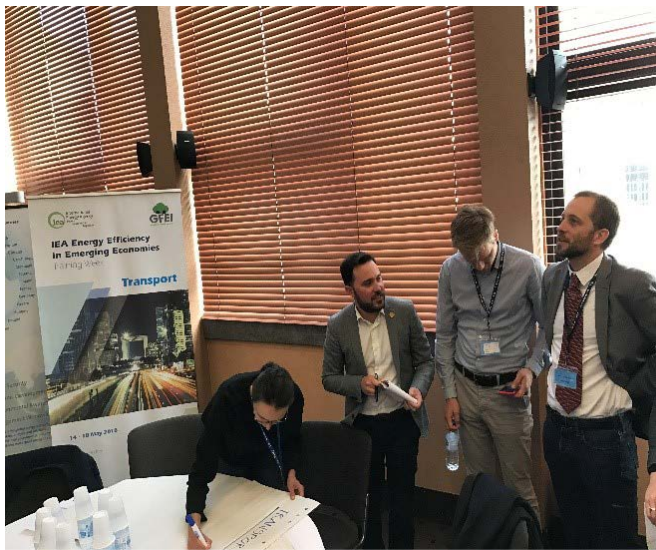
Why is it essential to eliminate fossil fuel subsidies? If the government continues to subsidize fossil fuels with high emissions (such as coal, natural gas, and petroleum), it is encouraging the public and the industries to consume energy with high carbon-emissions and high environmental risks. This increases the nation's dependence on fossil fuel and provides no relief to fiscal burdens, which in turn restricts investment in energy efficiency and renewable energy; causing a vicious cycle. This is why international environmental and climate groups have been campaigning for the "Global Divestment Mobilisation" movement in recent years. They demand the government to publish all improper subsidy plans and call for the financial businesses to divest from high-risk energy sources.



The Training Essentials

discussion + sharing + practice

Delta's main energy issue and social campaign theme over the years has always been the "improvement of energy efficiency". Taiwan is always thinking about introducing new energy sources, and we hope to raise awareness for energy conservation, waste reduction and smart applications, so that this energy island which is 98% reliant on energy imports can transition to gain extra adaptation time. Therefore, every report published by IEA, the world's top research institution, must be read and studied by all of us researching energy topics.



IEA's robust course requires students to follow lectures, share their experiences at home and actual cases, and make group presentations on stage

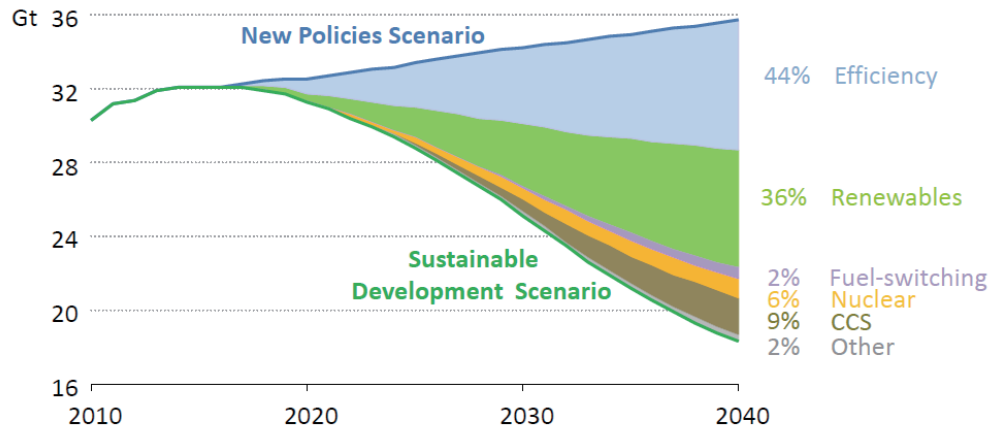


During the process of the 5-day training, I discovered that IEA not only wishes to promote its own reports or repeat long-standing energy efficiency knowledge, but rather to learn about the issues faced by nations during energy transitions from the international students, as well as to share the situations and actual cases in each country to inspire reflection and serve as models.

What I find most interesting is that students do not just listen to the IEA researchers or experts from international organizations speak on stage, they are asked by the teachers to share their practical experiences and opinions. For instance, during the discussion on fossil fuel subsidies, we heard different response models from various countries. Some students from oil exporting countries shared that this topic is particularly difficult for them because oil is right in their backyards. The public do not understand why they must accept a reasonable oil price that reflects the environmental costs but wish for the prices to be as cheap as possible. When we talked about whether the popularization of EVs may lead to a greater electrical power crisis, there were stark differences in everyone's opinions. Some consider the best way is to optimize pedestrian-friendly spaces in the city (by encouraging travel on foot or bikes) and improve public transportation service quality. This view is not recognized by several Southeast Asian students, because a personally-owned vehicle (an imported one would be best) in these countries is a display of personal status. For them, public transportation is a nightmare (it's hard to even imagine 6-hour commuting per day), and if it is financially possible, locals would never think of public transportation.



Global CO₂ emissions in the New Policies and Sustainable Development Scenarios



Further improving energy efficiency accounts for 44% of the cumulative CO₂ emissions savings in the Sustainable Development Scenario

IEA has clearly stated that to achieve the temperature control goal stated in the Paris Agreement, 44% of the carbon credit offsetting must be done through energy efficiency improvements

The most interesting class was a group assignment where each group adopts a renowned world city and is given a 50 million USD budget and 18 different plans of various costs to decide how to best utilize the money. The groups have to use the energy efficiency and transportation background knowledge learned from the class in their discussions and convince the mayor of the city to agree to their proposal. They must present the proposal on stage, receive questions and interpellations from the judges, and defend their proposal to win support.

For more interesting reads similar to this one, please visit our "Low-Carbon Living Blog" for future articles.

Reference /

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