



NHOA.TCC\_Taipei Zhishan Charging Station ▲

# GREEN ENERGY

## 01

1.1 SPECIAL COLUMN BUILDING ALL-ROUND EV LOW-CARBON CITIES	21	1.4 UHPC ENERGY STORAGE CABINET_PATENTED INVENTION	25	1.7 ENERGY SOLUTION_SERVE SMES	30
1.2 ENERGY CREATION_DIVERSIFIED GREEN ENERGY OF WIND, SOLAR, GEOTHERMAL, AND MARINE ENERGY	22	1.5 ENERGY TRANSMISSION_ADVANCED ULTRA-HIGH POWER CELLS	26	NHQA NEW ENERGY BUSINESS OVERSEAS	31
1.3 ENERGY STORAGE_KEY TO ENERGY TRANSITION	24	1.6 ENERGY SUPPLY_NEW ENERGY, NEW LIFESTYLE	28		

TARGETS



**Energy Creation-Installed capacity of renewable energy by 2025 : 500 MW**



**Energy Storage- Global energy storage capacity by 2025 : >2 GWh  
Charging Service-5,000 to 10,000 charging spots by 2025**



**Energy Transmission (Power Cells)- Production capacity by 2024: 3.3 GWh/year**

2022 PERFORMANCE HIGHLIGHTS

### Renewable Energy

**Installed capacity**  
| Including: Taiwan & Mainland China  
| by the end of 2024  
**198MW**

**Power Generation**  
| Including: Taiwan & Mainland China  
| 2021-2022 cumulatively  
**1.66 /MILLION KWH**  
Equivalent to more than 83,332 metric tons of CO<sub>2</sub>e reduced

### Energy Storage

**Energy Storage Capacity**  
| by the end of 2023


**Taiwan 656.1MWh**      **Global >16Wh**

### Charging Stations

| by the end of 2022 (grid-connected + installing)  
| Including: Globe  
**1,311 /SPOTS**

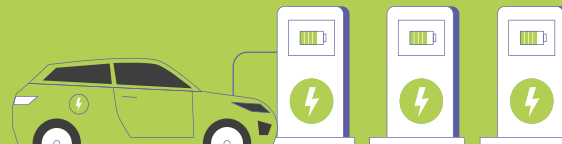
### UHPC Energy Storage Cabinet

**MOEA Invention Patent of portable cabinet and energy storage equipment**  
**NCSIST 12514-1/-8 Fire-resistance tests certified**



### V2G Charging Capacity

**25MWh**



### Production Capacity of Power Cells

| by the end of 2022  
**1.6GWh**

**R&D Investment 10% of revenue**

## 1.1/ Special Column **Building All-round EV Low-carbon Cities**

**POLICY** | TCC aims to create new living models of low carbon and green energy, including low-carbon construction materials, energy creation, energy storage, energy transmission, energy supply, and overall energy solution services, plus green logistics system service, so as to build all-round EV low-carbon cities for the future.



### **Energy Creation** | TCC Green Energy Corporation

Due to the high population density in Taiwan, TCC focuses on planning the very first wind-solar hybrid plant and fishery and electricity symbiosis project site with further engaging research on geothermal energy and marine energy.

### **Energy Storage** | NHOA.TCC

In 2021, TCC procured European energy storage company and renamed it as NHOA (New Horizons Ahead). Combining European experience, NHOA.TCC serves from green energy, energy storage equipment, energy management systems (EMS), charging solutions, to integrated services for smart microgrids.

### **Energy Transmission** | E-One Moli Energy Corp. & Molie Quantum Energy Corp.

E-One Moli Energy Corp. and Molie Quantum Energy Corp. are in the advanced electric vehicle industry chain, focusing on the development of high-power cells. They are exclusive battery suppliers for advanced electric aircrafts.

### **Energy Solution** | Support to SMEs on RE100

As the renewable energy retailer with the most self-built project sites and the largest green energy available in Taiwan, TCC supports small and medium-sized enterprises and electricity users with small demands to rapidly gain access to renewable energy, and offers flexible and appropriate renewable energy use solutions.

### **Energy Supply** | Fields of integrated services with solar, charging and storage application

TCC was the first to introduce the DC-DC charging technology integrated with green energy and energy storage. The supply of mains electricity, green energy, and charging services are regulated via the energy management system (EMS), which allows TCC to develop customized low-carbon charging solutions. This helps in creating a green supply chain.

## 1.2 / Energy Creation Diversified Green Energy of Wind, Solar, Geothermal, and Marine Energy

REN21 pointed out that wind energy and solar energy have become mainstream electricity sources and play a vital role on the path to Net Zero by 2050.

Collaborating with the governments, TCC committed to renewable energy development in wind, solar, geothermal, and marine energy as a pioneer in green energy. TCC had produced over 165 million kWh of green energy cumulatively in Taiwan from 2021 to 2022. Regarding the intermittency issue with solar and wind energy, TCC also invests in energy R&D such as power generation with ocean thermal energy conversion (OTEC), wave energy, tidal energy, and geothermal energy.

### First Large Wind-Solar Hybrid Power Plant

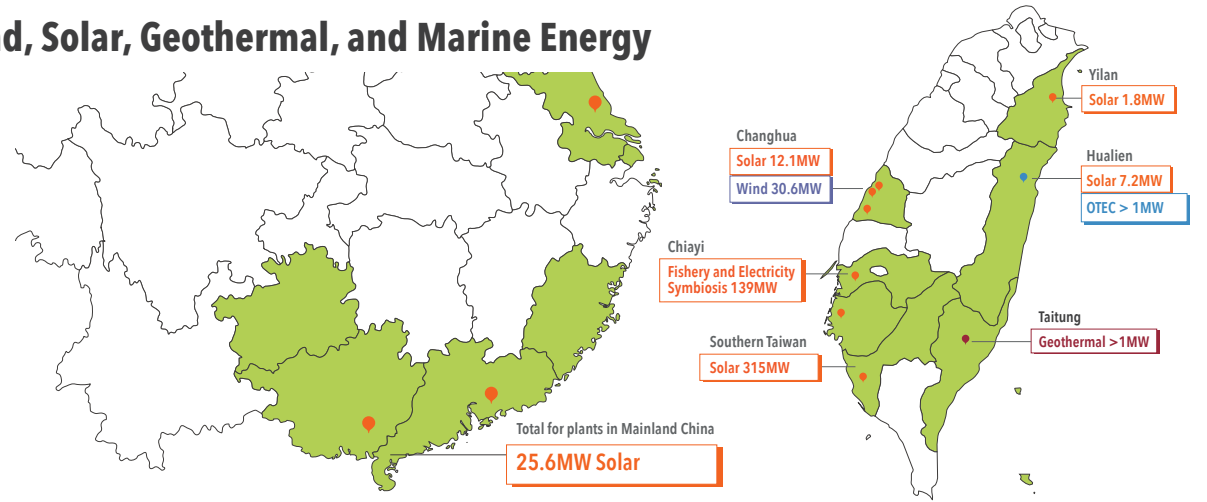
Changhua has an ample wind energy along its coastline. TCC Green Energy Corp. built 2 wind turbines in the Changbin Wind Power Phase I in 2019. Also, combined with the 12.1-MW PV system of the Changhua Coastal Industrial Park, TCC Green Energy Corp. established the first hybrid power plant with solar and wind energy combined in Taiwan, which has been connected to the public grid for power generation since November 2020.

Starting from 2022, TCC Green Energy Corp. commenced the Wind Power Phase II at Changbin to install 3 wind turbines with the capacity totaled up to 9 MW, expanding the diversified renewable energy project sites.



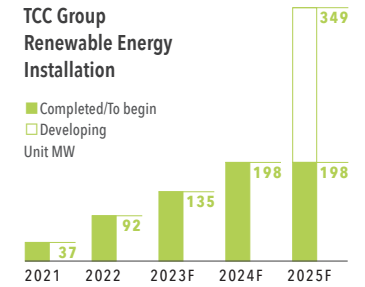
### First Fishery and Electricity Symbiosis Project Site

The fishery and electricity symbiosis project site at the border between Yijhu Township and Budai Township, Chiayi, is the first fishery and electricity symbiosis project site in Taiwan. After research, stakeholder feedback, and thorough planning based on scientific data, we have successfully created a win-win-win scenario for the environment, ecology, and energy generation. Upholding the development philosophy of "put agriculture and fishery at the core; add value with green energy," we support the transition of traditional fisheries. TCC Green Energy Corp. established the Fishery Management Foundation and funds the public aquacultural facilities in the community. Upon the completion, the Fishery Management Foundation assisted in promoting smart aquaculture as well. For the recently developed project sites, TCC Energy Corp. visited each landowner before construction to understand the needs. In October 2022, the fishery and electricity symbiosis project site became the first in Taiwan that was fully connected to the grid with an installed capacity of 44.3 MW in total and can generate power up to 54 million kWh annually, equivalent to the power consumption close to 15,000 households. The Phase II at Yijhu, Chiayi, is projected to complete in 2023 with the installed capacity totaled 22 MW, followed by the installation of Longjiang Fishery and Electricity Symbiosis of 60 MW.



### Expanding Solar & Wind Energy System Installation

To put the rooftop spaces of TCC and its subsidiaries to good use, TCC installed PV equipment at the TCC Headquarters, Linyuan Advanced Materials Technology Co., Ltd., E-One Moli Energy Corp. at the Southern Taiwan Science Park (STSP), Dadu Branch and Linyuan Branch of Taiwan Transport & Storage Corp., RMC Plants, Suao Mine, TCC Low-carbon R&D Center, and TCC DAKA, maximizing the benefits of PV installation as well as leveraging the merits of power generation and sunshade and heat insulation. It is expected to expand the rooftop spaces utilization over the Low-carbon R&D Center and the Port of Hoping in 2023. As for wind energy, TCC Green Energy Corp. plans to develop large wind farm in northern Taiwan in 2023, which is projected to offer 27 MW upon completion.

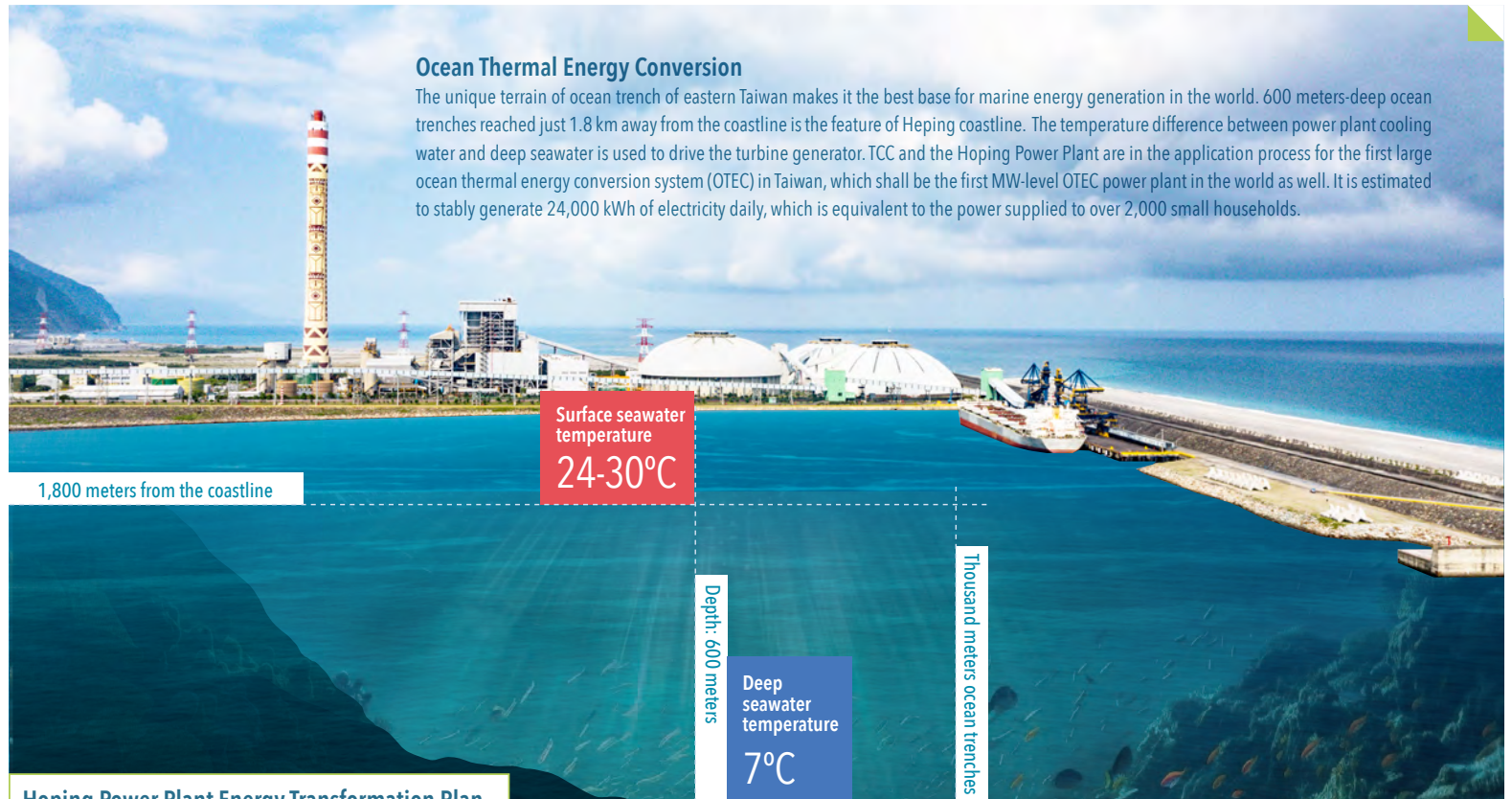


## Foresightedly Research and Development in Sustainable Energy

### First Geothermal Energy Base with Hot Spring in Taiwan

TCC has commenced the development of geothermal potential in East Rift Valley. TCC has been working with CPC Corporation for the drilling of wells for the Vakangan Geothermal project in Taitung. In 2023 Q2, TCC worked with ITRI for capacity testing and geothermal turbine planning. The geothermal power plant construction is expected to complete in 2024 Q4.

Meanwhile, TCC has cooperated with LDC Hotels & Resorts Group to establish the Vakangan Geothermal Green Energy Park in 2022. Upon official operation, it shall become Taiwan's first geothermal energy base with hot spring.



### Ocean Thermal Energy Conversion

The unique terrain of ocean trench of eastern Taiwan makes it the best base for marine energy generation in the world. 600 meters-deep ocean trenches reached just 1.8 km away from the coastline is the feature of Heping coastline. The temperature difference between power plant cooling water and deep seawater is used to drive the turbine generator. TCC and the Hopping Power Plant are in the application process for the first large ocean thermal energy conversion system (OTEC) in Taiwan, which shall be the first MW-level OTEC power plant in the world as well. It is estimated to stably generate 24,000 kWh of electricity daily, which is equivalent to the power supplied to over 2,000 small households.

### Hopping Power Plant Energy Transformation Plan

#### Bioenergy

TCC has been researching on the plan for ammonia co-firing and worked with professor Keng-Tung Wu at the National Chung Hsing University on the pilot assessment project of gasifiers. The pre-planning was completed in December 2022, including

- (1) survey on the biomass and waste material sources in Taiwan;
- (2) means of access, transportation, and storage;
- (3) selection of gasification system;
- (4) economic benefit analysis and investigation and analysis of pertaining laws and regulations.

#### Small Hydropower

Each unit at the Hopping Power Plant has 22 cms height of cooling water, which is to condense the low-pressure steam after turbine work into water, before discharged into the sea via sea cofferdams. Now that the sea cofferdams offer potential energy, we thus planned to set up small hydropower units at the existing warm water discharge canals. The hydraulic model tests and hydraulic analyses for the small hydropower installation at the discharge canals on the south and north side were completed successively in December 2022. Further planning will be executed afterward.

#### Emissions Reduction Project

In 2022, a turbine retrofit plan reduced coal usage, leading to a 6.7% drop in carbon emissions compared to 2020. Electrostatic dust collection and air pollution control upgrades are implemented from 2019 to 2022. Upon completion, both air pollutant concentrations and particulate matter concentrations will be lower than the regulatory standards by 50%, and the maximum performance can be lower than the emission standards for gas-fired power plant. Air pollution emissions decreased by 33% in 2022 compared to 2016.

### 1.3/ Energy Storage Key to Energy Transition

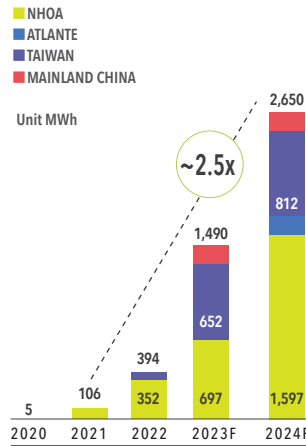
Smart energy storage development is one of the key business at TCC. Through energy storage, green energy can be stored stably and safely despite of the intermittency.

According to BloombergNEF (BNEF), TCC becomes the fourth largest energy storage enterprise in the world in 2021 by establishing NHOA.TCC. With technological resources combined, TCC builds large energy storage systems, effectively storing energy generated in off-peak hours and discharging during peak hours. NHOA.TCC partakes in the electricity trading platform and help stabilize power grids. It is estimated to reach an installed capacity of 500 MWh for the energy storage systems in Taiwan.

The charging stations of NHOA.TCC also combines energy storage system with the DC hybrid charger ("charger" hereinafter), maximizing the energy efficiency. Compared to other charging stations, it mitigates the potential burden of huge power demand to power grid, becoming one of the key technologies to realizing low-carbon charging stations.

#### ~2.7GWh Global Capacity

| by 2024



#### Diversified Applications R&D with Energy Storage Lab

NHOA.TCC is committed to the R&D and, installation of energy storage systems and charging stations. NHOA.TCC sets up a lab to conduct reliability assessment. At present, the lab mainly aims for testing of medium (100-500 kWh) and small (<100 kWh) energy storage products, along with testing of system integration between EV charging and energy storage equipment. Also, the whole container energy storage

product has been installed into the lab with the same battery scale for long-term operation testing. In the future, the lab plans to add conditions of various products for behind-the-meter (BTM) energy storage and reverse power flow testing. Scenario simulation of various fields (e.g. electricity uses of commercial buildings, charging stations, heavy electricity consumers, etc.) will be introduced. It shall develop both outdoor and indoor energy storage cabinets with liquid cooling technology integrated and more diversified application scenarios for indoor/outdoor chargers.

#### TCC Energy Storage Cabinet Application GCCA Carbon Reduction Case



#### The Only Self-made High-efficiency AFC for Grid Rescue in 0.1 Sec in Taiwan

The first Automatic Frequency Control (AFC) Smart Energy Storage System in Taiwan is connected to the grid and operating. During the blackout incidents on May 13 and May 17 in 2021 as well as the power outage on March 3 in 2022, it swiftly stabilized the grid. We help Taipower improve power supply stability, and resolve issues of power ramping in dispatch in circumstances like instant power spikes and reduced power supply from PV systems at sunset.

## 1.4 / UHPC Energy Storage Cabinet – Patented Invention

### The First Low-carbon, Fire- and Explosion-resistant Energy Storage Cabinet in the World

#### Features of Patented UHPC Energy Storage Cabinet

<b>Low Carbon</b> 50% less carbon emissions than metal energy storage cabinet	<b>Fire-resistant</b> CNS 12514-1/-8 of NCSIST (TAF Accreditation Lab) certified; both tests of fire integrity and flame retardancy under burning at 1,000°C passed	<b>Fire Extinguishing</b> Three-staged fire extinguishing: Novec1230, water sprinkle, water pipe	<b>Compressive Strength</b> Compressive strength of over 17,000 psi	<b>Weather Resistant</b> High in impermeability and weather resistance. Less susceptible to environmental changes
--	--	---	--	--

**Structure Safety**  
 IBC, IEC62933, UL9540



TCC continues to focus on optimizing the UHPC Energy Storage Cabinet products and develops the integrated plug interface with our supplier, Busway. Outdoor and indoor energy storage cabinets are included in standardized products.

#### Outdoor Energy Storage Cabinet

Outdoor Energy Storage Cabinet has modular and containerized design, flexible expansion, and versatile deployment. TCC is confirming the requirement regulations for design. Aside from itself, the outdoor energy storage cabinet can also work with chargers.

#### Indoor Energy Storage Cabinet Integrated with Liquid Cooling Technology

With a better flexibility and rapid cooling property, UHPC Energy Storage Cabinet product complies with building regulations of different periods, making it more friendly and safer to be used indoor. It can also work with indoor chargers combined.

TCC gave birth to the first low-carbon fire-resistant energy storage cabinet in the world. The product employs ultra-high performance concrete (UHPC), reducing approximately 50% of carbon emissions compared to the metal energy storage cabinet of the same size. Also, as UHPC features low thermal conductivity and high compressive strength, it acquired the 2-hour fire-resistance certification of CNS12514-1/-8, and passed both tests of fire integrity and flame retardancy under burning at 1,000°C.

The conventional metal energy storage cabinet cannot be put in a building according to the Fire Services Act in force. Hence, UHPC energy storage cabinet has a great market potential as it may become the best option for buildings. We have applied for multiple patents for this product and have obtained the invention patent of "portable cabinet and energy storage equipment" in 2022.



#### Involvement in Energy Storage Fire Certification and Regulation Adjustment

To pursue a high safety standard, NHOA.TCC worked with the fire department to undergo fire exercises of energy storage system, which has become the teaching materials for firefighting SOPs. The cooperation also helps establish contingency SOPs, and push for the formulation of outdoor energy storage system fire certification.

#### Promotion of Indoor Energy Storage Installation Regulations

The UHPC Energy Storage Cabinet of TCC is certified against CNS 12514-1/-8 and comes with three-staged fire-extinguishing devices to ensure safety. To relieve the load of Taipower, NHOA.TCC pushed for indoor energy storage system. The system supplies emergency power to residential buildings and commercial buildings with distributed energy storage system and reduces the use of power generators, thus achieving power use optimization and carbon reduction.

#### TCC's UHPC Energy Storage Cabinet Commercially Applicable in Taiwan; TCC Cooperated with the Convenience Store Giant to Build Asia's 1st "Convenience Store on New Energy"

The first UHPC Energy Storage Cabinet in the world has been deployed in 7-11's 10,000th store in Asia—Yawan Store, Tainan. This model prioritizes the use of solar energy and small energy storage system. In the event of power outage, the microgrid will automatically switch from grid-connected mode to islanded mode, supplying power necessary for emergency and life support with the PV system and energy storage batteries. It is estimated that the Yawan Store can maintain a minimum of 4 to 6 hours of uninterrupted power supply for lighting, surveillance system, cashiers, automatic doors, etc. This energy storage cabinet can significantly reduce carbon emissions as well. Take the Yawan Store for example, it can generate 5,500 kWh of green energy annually, which is equivalent to a carbon reduction of approximately 2,761 kg per year. NHOA.TCC assists 7-11 in building the "Convenience Store on New Energy," which symbolizes the market potential of TCC's UHPC Energy Storage Cabinet.



## 1.5/ Energy Transmission

### Advanced Ultra-High Power Cells

TCC has dedicated to world-class high performance and superior quality rechargeable lithium-ion cells products for years and been focusing on ultra-high power cylindrical cell niche segment. E-One Moli Energy Corp., part of TCC Group, is the leader of ultra-high power cell. Ultra-high power cell is high energy density and its charge-discharge power is 5-10 times larger than ordinary power cell. E-One Moli Energy Corp. regularly invests 8-10% of total sales a year into R&D. High performance and high safety are E-One Moli Energy Corp.'s two focuses to maintain TCC's leadership in the high-end market.

#### Research on Battery Materials with Suppliers

The testing platform for graphite as a negative electrode material is under development. The initial R&D progress has reduced the battery impedance by around 4% and improved capacity fading by 5%. In response to the demand for electrode density increase, E-One Moli Energy Corp. is undergoing the second iteration for material optimization, which is expected to raise the electrode density by 10% and the energy density by 2%. Also, E-One Moli Energy Corp. conducts small pouch cell RD assessment in order to offer products feature in high density and high compaction density, and to improve the capacity, first-cycle performance, and impedance. E-One Moli Energy Corp. plans on high power battery product R&D testing and assessment, and QAT for trial production testing. It is projected to mass produce in 2025.



**E-One Moli Energy Corp. and International Aviation Companies Develop eVTOL Capable of 32-km Flight with 10-min Charging**

E-One Moli Energy Corp. cooperated with Archer Aviation in the U.S. and Vertical Aerospace in the U.K. to announce that the Archer's latest aircraft, eVTOL Midnight, is to use the 21700 ternary batteries produced by the new plant of E-One Moli Energy Corp. at Kaohsiung. With a 10-min charge, eVTOL Midnight can carry out flight of 32 km and offer 10,000 trips averagely.

**CLIENT FEEDBACK**

Our partner E-One Moli Energy supply the high-power lithium-ion cells for our #VX4 aircraft – the same technology that's used at NASA.

#### Investment in Group14, a New Silicon Material Supplier

In March 2022, E-One Moli Energy Corp. signed an MOU with Group14, a new American silicon material supplier, planning for the silicon material used in the future decade. The silicon-carbon material of Group14 offers a capacity of 2,121 mAh/g and a first-cycle Coulombic efficiency of 92.5%. Compared to conventional silicon-oxygen anode battery, the capacity is raised by 30%, and the first-cycle Coulombic efficiency by 6.9%. The materials from Group14 can increase battery life by 17%. It is projected to mass produce in 2025.

#### Battery and Quality Assurance System Optimization

E-One Moli Energy Corp. continues to optimize the current process and improve the yield rate, along with innovation on various technologies and development of AI approaches. At present, E-One Moli Energy Corp. has successively improved the production management system, introduced AI-powered smart manufacturing inspection system in the process, and developed the early warning model for equipment health.

The complicated quality management rules, developed by E-One Moli Energy Corp., are compiled into a management database, which reduces human errors and automatically produces statistical process control (SPC) chart in 30 minutes, and issues warnings. Throughout the production process, production elements are carefully managed with the PDCA cycle, i.e. Plan, Do, Check, and Act, improving the Process Capability Index (Cpk) to assure the product yield rate. In addition, through the introduction of AI-powered machine vision inspection system to Automated Optical Inspection (AOI), the Company are able to automatically detect defects in electrodes in real time, such as the defects in coating shape, exterior, and thickness. Thus, E-One Moli Energy Corp. can reduce issues of invalid manufacturing and waste, ensuring the quality, quantity, and safety of battery products.





**Battery Megafactory in Kaohsiung Expected to Start Production in 2023 H2**  
 Molie Quantum Energy allocated NT\$12 billion to establish the first battery megafactory in Taiwan at Siaogang District, Kaohsiung. The main products shall be high-end, high-capacity, and high-charge-discharge ternary batteries. It is planned with an annual production of 1.8 GWh, mainly for high-end clients in the areas of

luxurious electric supercars and aerospace technology. In 2023, Molie Quantum Energy established Taiwan's first "high-end lithium battery lab", dedicated to pursue breakthroughs. Meanwhile, big data-powered AI technology and fully-automated process lines are introduced to optimize the performance.

**Gold Level of Taiwan's Green Building Labeling and LEED Gold Certified**

The sustainability concept has been incorporated in the design at the start. The systematic designs regarding ecology, green construction materials, solar energy, energy- and water-saving, and waste reduction are introduced to build a green factory in compliance with the Green Building Labeling of Taiwan and LEED certification.

- 42+% of energy saving**  
high-efficiency air-conditioning system structure with inverter control, combined with the process heat recovery system
- 30% of water-saving**  
installation of rainwater harvesting ponds; adoption of water-saving toilets and automatic flushing urinals and hydrants.

**The amount of water conserved and carbon sequestered will be raised by 1 fold and 50% respectively**  
 native plants will be planted, along with creation of greens and flowerbeds to elevate the rainwater permeability and reduce flooding.

**Molie Quantum Energy Automotive Certifications in 2022**  
 Molie Quantum Energy Automotive has obtained IATF 16949 certification and expects to obtain the Declaration of Conformity in 2023 Q3.



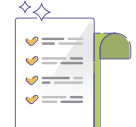
**E-One Moli Energy Corp. STSP Plant II Green Building Labeling Diamond Certified**

**About 25% of STSP Plant II are green spaces, cutting 7,597 metric tons of CO2 annually.**

The rainwater harvesting system in STSP Plant II supplies 20-30 metric tons of irrigation water daily. Clad metal sheets are employed to save the power consumption of air-conditioning. Also, eco-friendly materials are extensively used for interior renovation.

**Product Certifications in 2022**

- UL1642 / IEC62133  
Basic requirements of battery pack safety certification
- UN38.3  
Conformity to battery transportation regulations
- ROHS / REACH  
Conformity to the compliance with the restricted substances in products and the requirements of green supply chain



**Battery Safety Improvement via R&D**

To raise the safety of advanced lithium-ion battery for application in the aerospace industry, E-One Moli Energy Corp. collaborates with KULR Technology Group, Inc. ("KULR") in thermal material development and management technology. In 2022, E-One Moli Energy Corp. and KULR have cooperated to improve battery safety and reduce the risks of accumulated energy and gas when battery fails. E-One Moli Energy Corp. shall continue cooperate with KULR to introduce materials of heat- and compression-resistance, special additives featuring retarded combustion reaction, unconventional metallic materials, and optimized safety design so as to present the extremely safe ultra-high power batteries.



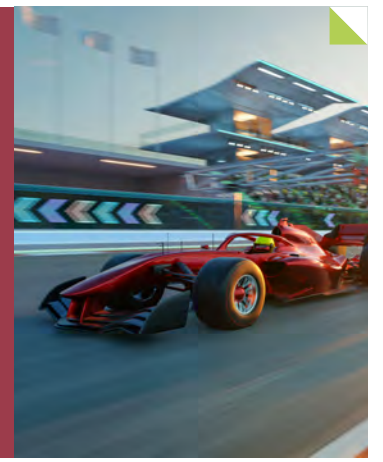
**The First Year of Battery Recycling**

The year 2022 marked the first year of recycling for E-One Moli Energy Corp., which initiated the mid- and long-term R&D plans:

- Working with MIT professors, target material restoration of retired batteries and high-safety electrolyte for research while ongoingly develop restoration technology of discarded cathode materials.**
- Together with Onyx Ta-Ho Environmental Services Co., Ltd., study waste slurry recycling, develop mass-producible recycling technology, and work with the Canadian team for effective waste cathode recycling.**
- Together with the client eVTOL, study the second-life applications of retired battery modules for TCC's future energy storage plan and to create a sustainable battery ecosystem chain.**

**Development of Expandable Battery Module with Williams Grand Prix Engineering Limited**

E-One Moli Energy Corp. and Williams Grand Prix Engineering Limited jointly define the specifications and develop expandable battery module for application in multiple areas. The battery module is expected to produce a module of ultra-high power and high degree of freedom, which can be applied to various high-end projects. In 2023, E-One Moli Energy Corp. plans to post researchers at Williams Grand Prix Engineering Limited to involve in the project firsthand and develop the prototype system for performance and safety tests.



## 1.6 / Energy Supply New Energy, New Lifestyle

TCC creates a lifestyle where people and vehicles can charge together. TCC has expanded into EV and charging markets in Taiwan, Europe, and America in 2021 and aims to build the largest energy storage base in Taiwan at Heping, Hualien, and Suao, Yilan. TCC is the only energy corporation with capabilities in green energy, battery, energy storage as well as EV fast charging R&D and manufacturing.



### First ever DC-DC Charging Station in Taiwan Only 40% of the Power Supply Capacity of Other Suppliers Required

EV charging requires as much grid power as charging four convenience stores at the same time, which significantly influences the grid. Coupled with energy storage, NHOA.TCC will require lower grid power to charge the vehicles. Charging at 180 kW only requires 40 kW, while the rest is supplied by the energy storage system.



**Resolve the Charging Anxiety of EV owners and Raise the Charging Spot Efficiency via LINE**

**7,612** friends reached  
**91%** of push message CTOR

Gender ratio  
**80% male & 20% female**  
75% of the membership older than age 35

### Charging UI over LINE Switch smoothly between Charging and Living

Domestic car brands and third-party charging providers require EV owners to download their apps for charging. The apps are feature-oriented closed UIs and seldom used outside of charging. NHOA.TCC's charging UI is built on LINE, which 95.7% of Taiwanese use daily. This approach is convenient for EV owners and helps NHOA.TCC reach potential customers through LINE's UI, which has a 93% weekly penetration rate. NHOA.TCC offers service information and green living news on its LINE UI before, during, and after charging. This encourages EV owners and potential customers to use the UI even when not charging, allowing for a smoothly transition between charging and daily life.

### Renewable Energy Combined To Create Pure Green Charger 24K Green

Three DAKA Smart Flower PV systems and an energy storage system power 24K Green, the first pure green charger in Taiwan, are established at TCC DAKA Station. Meanwhile, rooftop PV panels are installed onto the charging station to supply renewable energy to the machine room. This charging station not only consumes power, but generates green power. The 24K Green charger cut 1,581 kg CO<sub>2</sub>e emissions in 2022. In addition, Lequn and Zhishan Stations also have PV panels on their rooftops with an energy storage system stores off-peak energy for peak demand.

Charging Stations



**STATION** TCC DAKA Station  
**TYPE** Relay station, the first pure green charger in Taiwan  
**FEATURES**

- "24K GREEN" DAKA smart power PV systems provide energy storage equipments
- Free access to the shared electric bicycles



**STATION** Tainan Yawan Station  
**TYPE** Residential station  
**FEATURES**

- Collaboration with Uni-president Enterprises Corp.
- Patented UHPC Energy Storage Cabinet used
- The first station with green-powered UPS(Uninterruptable Power System)



**STATION** Taipei Lequn Station  
**TYPE** Urban station  
**FEATURES**

- The 1st station launched in the "Pilot Program for EV Fast Charging Stations" cooperated with Taipei City Government
- "Sustainability Space" created for sustainable ecological image exhibition; the new low-carbon cement art Everlasting Bench made of UHPC
- The lightening of the station is fully provided from the PV system on its rooftop; complete firefighting equipment available



**STATION** Taipei Zhishan Station  
**TYPE** Suburban station  
**FEATURES**

- Echoing with the EV promotion program of Taipei City Government
- Observatory on the 2nd floor
- Complete firefighting equipment available



**STATION** Nantou Fleur de Chine Hotel Station  
**TYPE** Hotel-based station  
**FEATURES**

- A station in partnership with LDC Hotels & Resorts Group
- 6 slow chargers are installed



Diversified Charging Services	Electric Passenger Car	Electric Truck	Slow Charging in TCC
Location	Crayon Plant, Yilan Taisugar Sugar Factory, Taitung Guangfu Sugar Factory, Hualien Palais de Chine Hotel, Taipei	IKEA Logistics Center TTS Taoyuan Warehouse	Operation Headquarters Low-carbon R&D Center

Cooperation with MIT for Charging Station Site Selection Model Research

In February 2022, TCC collaborated with MIT to conduct studies on charging station site selection using big data and AI algorithms, including EV penetration rate prediction, charging traffic flow prediction, regional load variation prediction, and regional power grid impact assessment. TCC plans to apply the results to select charging station sites in Taiwan, Mainland China, Europe, and the States, thereby expanding TCC's charging service business globally.

Future Plan

TCC offers charging services integrated with energy storage system. Compared to other AC-DC charging stations, TCC's integrated system reduces grid load by almost 90% during peak hours and 70% during off-peak hours. TCC plans to expand to convenience stores and malls with new products, the "Charging-Storing Hybrid Charger" and "Hybrid UPS." TCC aims to reach 50 stations by the end of 2024 in the first stage of expansion.

## 1.7 / Energy Solution Serve SMEs

In alignment with SDG 7 “ensure universal access to affordable, reliable and modern energy services”, TCC established subsidiary Energy Helper TCC Corporation on August, 2022; and we commit to providing a certain percentage of green energy annually to export-oriented SMEs to support them in achieving their carbon reduction goals.

### Energy Helper TCC Corporation – Green Energy Trading Platform

Energy Helper TCC Corporation launched “Green Energy Trading Platform” on November 22, 2022, to establish the one-stop energy management services. TCC has become the renewable energy retailer with the most self-built project sites and the largest green energy available on the platform in Taiwan, thanks to the diversified types of renewable energy available. It is projected to have 103 MW of installed capacity of renewable energy, equivalent to approximately 150 million kWh of green energy, for sale in 2023 first for the local enterprises to be competitive in the international supply chain.

“Online Green Energy Consultant” was initiated over the “Energy Helper TCC Corporation Green Energy Trading Platform.” Using the big data computing, the clients can access optimized solutions based on their carbon reduction targets and consumption. Besides buying, other businesses can also sell their energy on the platform for improved allocation of green energy market resources.

TCC has installed multiple green energy systems in our plants for self-consumption and has unbundled Renewable Energy Certificates (RECs) that can be used for both green energy transmission and REC acquisition assistance. For clients facing intermittent issues, “Energy Helper TCC Corporation” is well-equipped to offer stable green energy services and comprehensive tailored integration solutions for enterprises.

#### Green Energy Trading Platform

| As of March 2023  
Number of members: **225**  
Project sites owned by non-TCC enterprises in negotiation to be commissioned for energy sale: **5**

#### Online Green Energy Consultant

Offering various green energy solutions using **AI data analytics**  
**1,141** accesses of Green Energy Consultant since the launch in November 2022

#### Specialist of Energy Helper TCC Corporation

**15 clients** have accessed complete planning by professionals

#### Energy Helper TCC Corporation Provides Green Energy to ACER

Energy Helper TCC Corporation entered the green energy trading market and assisted other industries to cut carbon emissions by acquiring green energy. In April 19, 2023, TCC signed Corporate Power Purchase Agreement (CPPA) with Acer Group and provided green energy generated by Chang-Wang wind farm to Acer Group. TCC provides Acer approximately 10 million kh of green energy annually, and takes collaborate actions towards the 2050 net-zero target.



### Future Plans

#### Launch of Electricity Trading Platform

- Energy Helper TCC Corporation will add an Electricity Trading Platform Consultant to its website in 2023 to provide clients with resources for demand reduction, energy storage equipment, and generator equipment. The consultant will assess the suitability of client resources, thereby enabling a distributed electricity system and connecting small resources to the grid.

#### Convenience in Green Energy Procurement

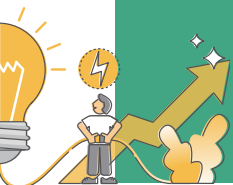
- Energy Helper TCC Corporation Corporation's platform will be continuously optimized to make green energy procurement as easy as online shopping.

#### Achieving RE100 with Energy Storage Resources Combined

- Enterprises can achieve RE100 in various ways, such as purchasing unbundled RECs to compensate for grid energy consumption. TCC offers renewable energy and green energy storage products to assist clients in achieving RE100.

### TCC joined the Energy Trading Platform (ETP) of Taiwan Power Company

Through the ETP, TCC supports the grid stability, obtains service income, and ushers in benefits to the new energy business entity of TCC. The projects TCC is involved in include all the projects on the ETP, including d-Reg and E-dReg in the Regulation Reserve as well as Spin Reserve and Supplemental Reserve. The grid-connected large-scale energy storage projects in Zhangbin and Hoping of Hualien are involved in the d-Reg and E-dReg services. With the 30 MW demand resources integrated with the 2.2 MW behind-the-meter (BTM) energy storage system, the Hoping plant participates in the Supplemental Reserve ancillary service. The STCP Plant of E-One Moli Energy Corp. also participates in the Regulation Reserve ancillary service with a 1.2 MW/1.7 MWh BTM energy storage system. Moving forward, Energy Helper TCC Corporation shall provide proxy services for operations on the energy trading platform.





## NHQA New Energy Business Overseas

NHOA is a subsidiary to TCC. TCC invested in Engie EPS, an European energy storage company, for 65.15% of its share and renamed it NHOA (New Horizons Ahead).



NHQA derives its name of “Noah” from the biblical story Noah's Ark. The figure of Noah epitomizes mankind's epoch-making moment after the Great Flood.

The line below the NHQA brand identifier symbolizes a new vision. Ω, one of the Greek alphabets resembling the rising sun to take the place of O, is also the unit of electrical resistance in Ohm's law. Facing the new horizon of green energy, NHQA confers on the brand a new beginning and mission.

### NHQA

Live in harmony with the Earth  
Create a better future  
for the generation to come



**NHOA Energy**

NHOA Energy is a leading global energy storage system integrator, with many project sites located in developing countries. With the development of markets and technology, there is great market potential in integrating small microgrids with PV panels and small batteries.

According to the plan of NHOA Energy across the five Continents, NHOA Energy plans to connect 1 GWh or more of energy storage capacity to the grid by 2030. Also, NHOA Energy aims to establish the world's largest energy storage project site in Taiwan, with an installed capacity of 400 MWh.

**Free2Move eSolutions**

Free2Move eSolutions, under NHOA, is dedicated to developing EV fast charging infrastructure. It has begun deploying the world's largest bidirectional EV fast charging V2G project and building the largest virtual power plant with energy storage.

Expected to be added by 2025

EV fast charging stations

Weekly capacity

2,750

CHARGING EQUIPMENT

**The Largest Charging Network in Southern Europe**

Across the traffic hubs of Europe

Establishing

215

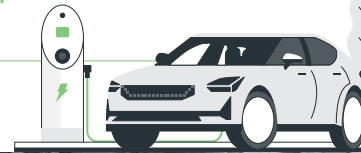
100% GREEN ENERGY CHARGERS

**Atlante Co.**

NHOA's Atlante Co., which is dedicated to the development of EV fast charging infrastructure, has inaugurated or is building 1,300 or more fast and ultra-fast charging stations. In addition, Atlante Co. targets the focused cities, corridors, and neighborhoods of industrial parks in Southern Europe to build a strategic network and has approximately 2,000 new project sites under development.

Install and operate | **5,000~10,000**  
fast and ultra-fast charging spots  
in Italy, France, Spain, and Portugal by 2025

Install over | **35,000**  
fast and ultra-fast charging spots  
by 2030



Source: Stellantis

**KLC**  
ready to go green?

✔ TCC has expanded our charging landscape to Portugal by acquiring KLC, the largest company of EV fast charging stations in Portugal.

KLC has established the most EV fast charging stations in Portugal. Acquiring KLC provides several benefits, such as increasing the number of charging stations, gaining European market experience, lowering new platform costs, and making Atlante Co. the leader of the charging business in Iberian Peninsula.

