

FORMOSA PLASTICS GROUP

2021 Annual Report



Formosa Plastics Group at TITAS

Diversity and innovation with a comprehensive supply chain

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Formosa Plastics Group at TITAS Diversity and innovation with a comprehensive supply chain

Formosa Plastic Group (FPG) is dedicated to materials R&D and manufacturing technologies that are forward-looking and high-value. In the textile industry, FPG obtained 50% stake in the Swiss company Schoeller Textil AG in 2020. Both sides have collaborated in innovation, R&D, and technologies. Vertical integration allows for the development of functional, smart, and recyclable materials. FPG's advancement in sustainable materials will lead to more high-value products, improve our core competencies, and open a new chapter for Taiwan's textile industry.

Formosa Plastics Group | 2021 Financial Highlights

(In Thousands of USD, persons)

Company	Capital	Assets	Equity	Sales	Income Before Income Tax	Number of Employees
Formosa Plastics Corp.	2,298,931	18,679,295	14,560,862	7,608,362	2,972,853	6,237
Nan Ya Plastics Corp.	2,864,146	21,447,138	14,953,777	7,853,410	3,251,042	13,182
Formosa Chemicals & Fibre Corp.	2,116,716	18,183,168	14,119,557	8,793,249	1,504,645	4,594
Formosa Petrochemical Corp.	3,440,217	16,208,227	12,907,709	22,298,268	2,183,388	5,291
Nanya Technology Corp.	1,118,409	6,909,599	6,246,951	3,087,080	999,408	3,470
Nan Ya PCB Corp.	233,357	1,892,118	1,461,863	1,523,576	450,492	6,101
Formosa Sumco Technology Corp.	140,068	859,001	753,079	439,376	60,675	1,369
Formosa Taffeta Co., Ltd.	608,402	2,769,953	2,247,882	884,438	81,842	4,281
Formosa Advanced Technologies Corp.	159,705	513,979	444,276	358,945	69,493	2,399
Subtotal of Public Companies	12,979,951	87,462,478	67,695,956	52,846,704	11,573,838	46,924
Other Domestic Companies	2,735,889	24,472,886	21,384,737	7,222,616	760,448	32,445
Subtotal of Domestic Companies	15,715,840	111,935,364	89,080,693	60,069,320	12,334,286	79,369
Companies in U.S.A	1,440,281	16,863,156	13,148,597	8,627,558	1,603,853	4,241
Companies in China	6,711,193	14,522,428	9,839,692	13,097,593	1,807,862	19,173
Other Foreign Companies	6,473,091	15,671,929	7,098,402	7,073,742	1,269,604	13,776
Subtotal of Foreign Companies	14,624,565	47,057,513	30,086,691	28,798,893	4,681,319	37,190
Total of Formosa Plastics Group	30,340,405	158,992,877	119,167,384	88,868,213	17,015,605	116,559

^{*}NOTE:The financial data shown above is extracted from the individual financial statements of each company.



Preface

Formosa Plastics Group will always take the initiative and pay close attention to market dynamics and future trends. This is how the Group can flexibly adjust production and sales plans and investments to ensure a long-term competitive edge while constantly reminding itself to fully embody its management philosophy of "striving for excellence".



Throughout 2021, the COVID-19 pandemic continued to ravage the world. Since the development of COVID-19 vaccines, vaccination rates have quickly increased. Although the virus continues to evolve, developed western countries with higher vaccination rates have loosened domestic restrictions and lockdowns, gradually resuming economic activities and driving global market demands. These factors, along with continuing ease of financial and monetary policies, have allowed the global economy to recover significantly.



Chairman WenYuan Wong

With the strong recovery of the international economy comes an increase in the demand for petrochemical products. Meanwhile, in 2021, Texas was beset by abnormal weather, such as snowstorms in February and hurricanes in August, some petrochemical plants in Europe halted productions for various reasons, and China adopted measures to curb electricity use and productions due to rising coal costs in the 4th quarter. These factors led to constant imbalance of market supply and demand, greatly pushing up the price of petrochemical products.

Thanks to proper epidemic prevention and control, accelerating vaccinations, and strong demand from countries coming out from the lockdowns, Taiwan was able to continue its strong export trades and private investments, with the economic growth rate hitting 6.45%, the highest in nearly a decade. FPG also benefited from the increased global demand for petrochemical products and electronic materials, with both revenue and profit hitting records highs.

Business Operation Overview

The overall revenue of Formosa Plastics Group in 2021 was NT\$2.4608 trillion, which is an increase of NT\$775.6 billion (46%) from 2020. The company's pre-tax profit was NT\$471.2 billion, and annual profit increased significantly by NT\$339.8 billion (259%) from 2020.

1. Taiwan

In 2021, Formosa Plastics Group's various companies in Taiwan generated a total revenue of NT\$1.6633 trillion, representing a 42% increase from 2020. The pre-tax profit was NT\$341.5 billion, a 173% increase from 2020. This is mainly due to the increased consumption following the gradual lifting of global lockdowns, as well as the decrease in supply caused by the sequential shutdown of petrochemical plants in Europe and the United States due to various emergencies. The price increase of FPG's main products exceeded that of the raw materials, widening profit margins and resulting in one of the best performances in the company history.

The overall market conditions were positive in 2021. The companies in Formosa Plastics Group continued to expand domestic and foreign sales channels, diversify market risks, and actively develop the market for high-value and differentiated products, such as: Formosa Plastics'





anti-sticking dual ionic polymer PVC (used for medical equipment) and highly fluid and highly rigid PP (used in auto parts), Nanya's high-value copper foil (used in circuit boards) and polyester membrane (optical and electronic grade, for industrial use), Formosa Chemicals & Fibre's special grade PP (for car parts) and high-value PS/ABS (for home appliances, electronics, and auto parts). In 2021, the proportion of sales from these products increased significantly.



All employees conduct COVID-19 screenings to protect otherHa Tinh Steel Corporation

FPG also actively introduced artificial intelligence (AI) in smart production, quality testing, process optimization, maintenance and repair, and industrial safety forecasting. As of 2021, we have completed 554 projects with estimated annual benefits of NT\$3.674 billion. There are also 344 projects in progress, which are expected to bring in an additional NT\$1.415 billion of annual benefits once completed, culminating in total annual benefits of NT\$5.1 billion, which demonstrates the effectiveness of AI application.

2 United States

In the second half of 2021, the U.S. was once again hit by a variant of the COVID-19 virus. The resurgence of the pandemic, imbalance of the supply chain, and rising inflation resulted in a slight slowdown in economic growth. The

economy bounced back significantly from the acceleration of vaccination efforts and large-scale bailout and economic stimulus packages. The snowstorms in Texas in the first quarter shut down many local petrochemical plants, causing the price of petrochemical products to soar. Formosa Plastics Group's companies in the U.S. generated a total revenue of NT\$238.9 billion, a significant increase of 78% from 2020. In terms of profit, FPG not only turned losses to profits in 2021, but also saw a significant increase in pre-tax profits, which reached the record high of approximately NT\$44.4 billion, a record high in the company history.

3. China

In 2021, Formosa Plastics Group's various companies in China generated a total revenue equivalent to approximately NT\$362.7 billion, a 41% increase from 2020. The pre-tax profit was approximately NT\$50.1 billion, a significant increase of 145% from the previous year. This is mainly due to the order transfers resulting from the ongoing pandemic, monetary easing policies in Europe and the U.S., the promotion of infrastructure construction projects, and a surge in consumer demand, which rapidly increased the price difference of plastic upstream raw materials, such as PVC, PS, PE, and ABS. Profits from the aforementioned products at the Group's Ningbo plant have all hit a record high.

FPG benefited from the booming demand in the global electronics industry, profit from products produced by the Group's Kunshan Plant and Huizhou Plants, such as fiberglass (cloth), epoxy resin, circuit boards, and copper foil substrates. Growth in profits and also hit a record high.

4. Vietnam

The 2021 turnover of FPG's various companies in Vietnam was equivalent to NT\$179.7 billion, a significant increase of 69% from 2020. Take Formosa Industries Corporation, for example. The pandemic severely impacted Vietnam, with many places enacting the "three on the spot" model,



···· Formosa Ha Tinh Steel Corporation

which requires production, eating, and sleeping to take place at the same factory. There were other negative factors like the predatory pricing of textiles exported by China, but Formosa Industries Corporation was prepared. Thanks to a series of measures, such as cutting dead weight in terms of products and recycling fishing nets to create Nylon products, Formosa Industries Corporation was able to greatly increase the sales of various high-value products. As a result, Formosa Industries Corporation's 2021 profit also reached new heights.

Formosa Ha Tinh Steel benefited from the easing pandemic and gradual lifting of global lockdowns in 2021, and seized opportunities in the reviving global economy and revitalizing steel market. In addition to its operations in Vietnam, Formosa Ha Tinh Steel actively sought to obtain certifications from the EU and Southeast Asia, successfully getting orders from Italy, Spain, Portugal, and Brazil. At the same time, Formosa Ha Tinh Steel launched a flexible production and sales strategy in the third quarter and received orders ahead of schedule, which led to a substantial leap in profit in the second half of the year, boosting their annual profit to NT\$33.47 billion.

Implementing ESG Sustainable Development

For decades, Formosa Plastics Group has remained committed to its corporate tenets of "get to the heart of matters" and "strive for excellence", actively carrying out various management tasks to achieve sustainable development, from the 1993 5S management principles, the subsequent 1999 no leakage policy (no gas leakage, no water leakage, no oil leakage), and the formation of the company-wide "Energy Conservation and Emission Reduction Task Force" in 2006 to further promote energy conservation and emissions reduction.

In 2016, FPG went even further to promote a circular economy, taking the four aspects of circulation – raw materials, water resources, energy, and waste – into consideration to implement intercompany, inter-factories energy and resource integration. In 2018, FPG applied AI to our energy conservation, emissions reduction, and circular economy efforts and initiated digital transformation and further expand the effectiveness. In 2020, FPG expanded the "Energy Conservation and Emission Reduction Task Force" into the "FPG ESG Promotion Committee", ensuring that the entire enterprise is committed to various ESG (environmental, social, governance) tasks so that

the enterprise can move towards sustainable development.

After establishing the "FPG ESG Promotion Committee", the entire enterprise demonstrated its determination to fully promote sustainable development from top to bottom, not only continuing to promote energy conservation and emission reduction, circular economy, AI, AI+ simulation, and digital transformation, but also remaining committed to improving energy efficiency and production efficiency. The enterprise also improved its production technologies, developed and produced green products, and promoted recycling at the processing end and consumer end to expand carbon reduction and waste reduction effects.

FPG has been actively planning to build renewable energy and energy storage equipment, and also purchase green power certificates and carbon rights in response to future domestic and foreign regulations on carbon fees or carbon tariffs. FPG has also continued focusing on and introducing the most advanced carbon reduction technologies in the world, and is considering the possibility of using carbon-free fuels in the future.

FPG also actively gathered information on the latest carbon reduction technologies and collaborated with other institutions to develop carbon capture, utilization and storage (CCUS) technologies. In terms of the supply chain, raw materials, and equipment purchasing, FPG also worked with suppliers to develop energy-saving, recyclable products in order to expand the scope of sustainable development to the fullest extent.

While taking multi-pronged approaches to actively promote carbon reduction, companies in the group will also sign the SBTi (Science Based Target initiative) in 2022 to declare carbon reduction goals for the next 5-15 years and pledge to issue all relevant data into a "Task Force on Climate-Related Financial Disclosures (TCFD) Report", joining advocacy organizations with scientifically verified data to achieve transparency and recognition.

The following is an overview of our ESG measures and their results:

- 1. Environmental Protection (E)
- (1) Water Conservation

According to the statistics of the Ministry of Economic Affairs, although Jiji weir was initiated to supply water for the Sixth Naphtha Cracker Complex, industrial water consumption accounted for only 5% of the weir's water supply, while up to 93% went to supplying agricultural water usage in Yunlin County and Changhua County. Even so, FPG still implemented active measures to use precious water resources more efficiently by reducing the amount of water used in production processes, recycling water, and reducing loss due to evaporation. As a result, the water recycling rate throughout the region exceeded 91.5%, and the Mailiao Industrial Complex conserves up to 290,000 tons of water per day.

Additionally, according to the "Directions for Application Review on Proposal of Water Usage" published by the Ministry of Economic Affairs, the water recycling rate (R1) of the Mailiao Industrial Complex is over 98.8%, which is equivalent to each drop of water being reused up to 7.3 times.

In addition to using less water, FPG also took active measures to cultivate water resources. By increasing rainwater collection areas and modifying rainwater storage tanks to effectively improve rainwater storage and reuse, FPG managed to increase the rainwater collection rate to 87.8% in 2021. This allows an average of 20,088 tons of rainwater to be collected per day, which is enough to satisfy the domestic water usage of the 13,000 employees at the complex for approximately 3 weeks. Furthermore, FPG also invested NT\$5.4 billion to establish a 100,000ton seawater desalination plant in the Mailiao Industrial Complex.

(2) Energy Conservation and Emission Reduction

To further enhance its energy and resource usage efficiency, FPG established a dedicated unit for energy conservation and carbon reduction in 2006, with the Chairman of FPG serving as the convener. The unit hosts monthly meetings and set the annual energy saving target at 3% and the water conservation target at 5% to promote inter-plant, inter-company energy and resource integration.

According to the statistics, the average daily production output of Mailiao Industrial Complex has risen 5% in the past decade, but the average daily electricity consumption and steam consumption per unit of product have decreased by 17% and 18% respectively, while hourly electricity consumption and steam consumption have decreased by 13% and 15% respectively.

As for air pollution control, in order to continue promoting the optimization of environmental protection control technologies, FPG is working to reduce PM 2.5 emissions by installing wet electrostatic precipitators in cogeneration power plants and promote the reuse of heat emitted from boiler chimneys, thereby eliminating the visible pollution of white smoke from chimneys without using extra energy. The two improvement initiatives are well underway and are expected to be completed before 2023, after which the plants will be able to match natural gas emission standards.

In addition, all vessels traveling in and out of Mailiao Harbor must use low-sulfur fuel or energy-saving power, and vessels in the harbor must use shore-side electricity instead of burning fuel to effectively reduce sulfide emissions. These active environmental protection measures made Mailiao Harbor the first industrial port in Asia to be awarded the "EcoPorts Certification".

(3) Overall Water and Energy Conservation Investment and Results



FPG has always upheld its principles of balancing industrial development with environmental protection

Using Mailiao Industrial Complex as an example with the measures listed above, FPG has invested approximately NT\$34.4 billion into energy conservation, emissions reduction, and circular economy as of the end of 2021, completing 2,565 water conservation improvement initiatives to conserve 18.6 billion tons of water each year. At the same time, 9,266 energy-saving initiatives that can reduce CO₂ emissions by approximately 12.16 million tons each year were completed. The results are quite impressive, with combined annual water and energy conservation benefits reaching NT\$33.5 billion, making Mailiao Industrial Complex a true eco-industrial park.

Moreover, according to the evaluation results published by the international environmental evaluation index Carbon Disclosure Project (CDP) in 2021 (evaluation scores are divided into 8 grades, from A to D-), Nanya Technology was awarded the top score of A in climate change while Formosa Plastics, Nanya, Formosa Chemicals & Fibre, Formosa Petrochemical, Nan Ya Printed Circuit Board, and Formosa Taffeta also achieved an impressive score of A-. As for water resources, Formosa Plastics Corporation, Nanya, Formosa Chemicals & Fibre, Formosa Petrochemical, all scored A, while Nanya Technology and Formosa Taffeta scored A-. Such amazing performances demonstrated that FPG's long-term focus on

conserving energy and reducing emissions has been recognized by authoritative international organizations.

The carbon emissions of FPG reached a peak in 2007 with 61.48 million tons, making 2007 FPG's base year for carbon reduction. After years of promoting energy conservation, emission reduction, and circular economy, emissions were reduced to 51.83 million tons by 2020, a 15.7% decrease from the base year. The short-term goal is to lower emissions to 49.18 million tons by 2025, a 20% decrease from the base year. The midterm goal is to lower emissions to 39.96 million tons by 2030, a 35% decrease from the base year. Moving forward, FPG will continue to stay in line with government policies and the international promotion of ESG, while making plans to move towards achieving the long-term goal of carbon neutrality by 2050.

2. Social Responsibility (S)

(1) Friendly Workplace

FPG has long built a friendly and happy

workplace environment to continue attracting and recruiting outstanding talent. FPG provides professional and new technology training to help employees cultivate diversified professional skills and also takes care of the health and welfare of employees, allowing every employee to reach their full potential in a position suitable for their skills. In 2019 and 2021 FPG earned the title of "Happy Enterprise" for two consecutive years in the voting event organized by the 1111 Job Bank. In 2021, 18 companies in the Group received accolades, such as the Health Promotion Label and Excellent Healthy Workplace Award, which shows how much the group values and cares for its employees.

(2) Social Outreach

FPG remains committed to its management philosophy of "taken from the community, given back to society". In addition to the establishment of three universities and the Chang Gung Memorial Hospital, FPG has founded multiple foundations and charitable trusts, giving back over NT\$76.4 billion to the community over the



••••• The Chairman was invited as an award presenter and officiating guest for the 16th " Charity Award"

years. FPG's main charitable projects include (see attachment for details):

- Campus reconstruction: Since the 921 earthquake, FPG has sponsored the reconstruction projects of 76 school buildings throughout Taiwan that have deteriorated with age or have been stricken by natural disasters. Through these projects, FPG has rebuilt more than 900 classrooms.
- Welfare for the elderly: FPG has donated approximately 1.15 million doses of the pneumococcal vaccine with a total market value of nearly NT\$990 million for senior citizens over the age of 75. According to research by Chang Gung Memorial Hospital, the vaccine can reduce the infection rate by 76% and the mortality rate by 91%. These donations saved the government over NT\$14.3 billion in medical expenses for pneumonia treatments. Meanwhile, FPG also provided subsidies for improving housing

- for the elderly, established senior health centers, donated funds and equipment to the Yunlin County Evergreen Canteen, and supported other charitable programs.
- The Rainbow Program and Sushine Program: FPG provided health education, psychological counseling, and skill training for drug-addicted inmates with AIDS (Rainbow Program) and drug offenders (Sunshine Program). FPG also provided regular follow-up counseling after inmates are released to help them find employment, cutting recidivism rates from 60-80% down to approximately 10%. Because of these programs, FPG's Chairman received the 11th "Charity Award" from the HK & Macau Taiwanese Charity Fund. In addition to donating all of the prize money, the Wang Jhan-Yang Charitable Trust Fund also donated a matching amount to expand the project.
- Welfare for women and children: FPG



····· Ha Tinh Steel Corporation organized a charity lunch box event to help those in need

promotes many welfare programs for women and children, including medical and financial assistance for patients with rare diseases, education support for minor welfare institutions, support for minors that have left welfare institutions, professional early intervention and treatment for children with developmental disabilities (benefiting over 28,000 children and 92 institutions), financial assistance for families affected by domestic violence, scholarships for lowincome students, work-study programs at social welfare institutions, financial support for students in remote areas, talent training programs in remote areas, grants for school lunches in elementary and junior high schools in Yunlin County, donations towards childcare subsidies provided to grandparents caring for children ages 0-2, donations to provide funds for 7th grade girls to receive the HPV 9-valent vaccine, English courses for students in the remote areas of Hualien and Taitung Counties, and support for the development of preschool children in vulnerable families

• Other social welfare programs: In addition to providing funding to train young athletes in sports like tennis, table tennis, billiards, and golf, FPG also actively promotes performances by local art and culture groups, such as: The Ming Hwa Yuan Arts & Cultural Group, I Wan Jan Puppet Troupe, and Apple Theater, making arts and culture events more accessible to people in remote areas and helping local art and culture groups to grow.

Many of the charitable programs promoted by Formosa Plastics Group were the first of their kind in Taiwan and were widely praised, allowing the Group to elevate the quality of their services and meet the goal of sustainable operation. Under the Chairman's leadership, Formosa Plastics Group is fully realizing the two founders' wish to give back to society.

(3) Corporate Governance (G)

Sound corporate governance has always been the cornerstone of FPG, as the Company actively practices its management philosophies of "diligence, perseverance, frugality and trustworthiness", "strive for excellence", "positive contribution to the society", and "sustainable development", focusing on the industry, setting targets, formulating measures, and carrying them out to the fullest. At the same time, FPG follows laws and policies protecting the rights of shareholders, strengthening the functions of the company's board of directors, actively improving the transparency of the company's financial and business information, and respecting the rights and interests of stakeholders. As a result, Formosa Petrochemical and Nanya Technology both ranked in the top 5% in the 7th Corporate Governance Evaluation published in 2021. The 5 listed companies in the Group – Formosa Plastics, Nanya, Formosa Chemicals & Fibre, Nanya Technology, and Nanya Circuit Board - were all selected in the TWSE Corporate Governance 100 Index, demonstrating that FPG's corporate governance achievement is well recognized.

Future Operating Environment

In 2021, although the world continued to experience waves of the COVID-19 pandemic, there was a massive boom in consumption and demand as developed countries gradually relaxed restrictions in the second quarter, thereby driving up overall demand and facilitating the gradual recovery of the economy. However, the imbalance between supply and demand has caused the prices of raw materials to skyrocket, and the inflation rate of various countries have continued to rise significantly since the latter half of 2021.

In addition to the high inflation rates, the Russia-Ukraine war broke out on February 24, 2022, triggering sanctions from the U.S. and other

Western countries, and resulting in a sharp rise in international energy and food prices. Oil prices also rose sharply, at its peak even approaching the \$140 USD mark. The war greatly exacerbated the already severe issues of inflation and raw material shortage. Since there are no signs of relief in the short-term for the ongoing pandemic and strain on logistics, and the development of the Russia-Ukraine war remains uncertain, the impact on the global economy will become more profound as these issues persist.

Rising inflation and the Russia-Ukraine war are the two major variables that will affect the future direction of the global economy. In the face of rising global inflation, the U.S. has tightened its monetary policy by raising interest rates, but accelerating the pace of increasing interest rates may slow down economic growth. The Russia-Ukraine war and the sanctions imposed by

Western countries will also severely impact the supply of oil, natural gas and food, resulting in a marked rise in energy and food prices, which will significantly increase global inflation and severely impact the recovery of the global economy. These two variables affect one another while also affecting the monetary policy of the U.S., exacerbating and complicating future economic situations. This greatly increases the risks and uncertainties of the global economy, which may lead to a slowdown of economic growth.

In addition to the two aforementioned major international variables, Taiwanese industries are also facing major issues, such as economic and trade marginalization, carbon reduction, and energy structure adaptation. The Regional Comprehensive Economic Partnership (RCEP) led by China officially took effect in January 2022, the scale of which far exceeds the CPTPP



Ha Tinh Steel Corporation plans to increase the capabilities of the steel industry and further secure Vietnam's place as a steel heavyweight in Southeast Asia



FPG Mailiao Eco-Industrial Complex

(Comprehensive and Progressive Agreement for Trans-Pacific Partnership) that took effect at the end of 2018. The relationship between Taiwan and China currently remains tense, and although Taiwan was first to apply to join the CPTPP, there are still many obstacles to overcome in terms of whether Taiwan can successfully become a member. China and Hong Kong account for more than 40% of Taiwan's exports. They are the most important investment and production bases for Taiwanese businesses, and also the biggest growing markets. After the RCEP comes into effect, it will definitely have a trade diversion effect on Taiwan. We suggest the government should face this issue head on and respond accordingly to reduce the impact.

In response to climate change, countries around the world are working towards carbon reduction. The EU plans to impose a carbon tariff in 2023. Companies need to work hard to keep up with the global trend of carbon reduction.

Taiwan's industry is dominated by manufacturing, which has long worked to

conserve energy and reduce carbon emissions. The circular economy is currently the most effective way to save energy and reduce carbon in the industry. However, regulations such as the use of green energy by large electricity consumers have already caused a considerable impact on the industry. Therefore, FPG suggests that the government look to the policies of the EU, the U.S., and Japan and consider the vulnerability of energy sources in Taiwan when establishing energy supply structures. The government should not give up on any form of energy allocation, and instead use the most appropriate energy supply structure to ensure stable and sufficient energy supply in Taiwan, so that industries remain in Taiwan can sustain economic development.

Future Outlook

Looking forward to 2022, despite the severe international political and economic issues looming ahead, FPG will continue to maintain a sense of caution and devote itself to business

operations with a careful and pragmatic attitude. For enterprises, no matter how the external environment changes, maintaining a solid operating foundation and being flexible in all situations are the essential elements in responding to rapid global changes.

To strengthen its global competitiveness, FPG continues to devote itself to the development and sales of high-value, differentiated, and green products, and to broaden the breadth and added value of product applications, so as to seek transformation and upgrade proactively. FPG also pays close attention to market trends, actively planning and expanding new overseas markets and diversifying market risks in hopes of creating a solid corporate foundation with diverse values and generating new prospects for development in changing times.

To enhance operation performance, FPG has also continued to promote AI and AI+simulation, as well as digital transformation to improve production efficiency and the energy utilization rates. The goal is to increase profits by NT\$20-30 billion annually, thereby improving operational efficiency and maintaining stable operations.

As for business development, in terms of electronic products, in response to the development of 5G and AI ingelligent, Nanya Technology has introduced 10nm grade production technology at existing semiconductor fabrication plants. In order to build a foundation in the DRAM industry and strengthen its global competitiveness, Nanya Technology plans to invest about NT\$360 billion in the next 7 years to upgrade its existing plants and construct a new plant to introduce several generations of 10nm technology and products.

Regarding overseas business, FPG continues to promote various investment and expansion projects, including the new cold-rolled stainless steel plant in China's Fujian Province, the expansion of petrochemical raw material production capacity in the Ningbo Plant, and the electronics material expansion project in Huizhou.

Furthermore, Formosa Ha Tinh Steel in Vietnam has been actively improving the quality of its products. The company has obtained certifications from multiple Southeast Asian countries since 2016. In 2021, it also obtained EU certification and continued to expand export sales. In response to Vietnam's transportation infrastructure demands, the company has developed high-strength steel products planning to advance to the auto parts industry to better expand the high-value market. Formosa Ha Tinh Steel also plans to establish an "auxiliary processing zone" in the northwest part of the steel plant, implementing vertical integration to form the Ha Tinh steel industry chain to increase the capabilities of the steel industry and further secure Vietnam's place as a steel heavyweight in Southeast Asia.

Not only is achieving net-zero emissions important for keeping in line with international standards, but its success or failure is also an important variable that will affect the development of the industry over the next few decades. In the pursuit of sustainable development, FPG has not only continued to promote ESG sustainable management strategies like energy conservation, carbon reduction, and circular economy, but also further expanded its commitment to the research and development of various plastic product recycling, cooperated with downstream supply chain operators to establish recycling mechanisms, and developed biodegradable and green environment-friendly products.

In response to the global trend of energy conservation, carbon reduction, and new energy development, FPG will integrate all the new energy production and sales departments within the group to promote the development and layout of new energy business, doing its part to protect the environment, continuing to move towards the long-term goal of achieving carbon neutrality by 2050, and pursuing the sustainable development of the enterprise.

Donors	Main Social Welfare Projects	2021	As of 2021
	Established Ming Chi University of Technology, Chang Gung University, and Chang Gung University of Science and Technology		
	2. Established Chang Gung Memorial Hospital		41,526
Formosa Plastics Group	3. Made donations towards earthquake and typhoon relief and sponsored campus reconstructions	2,413	
	Organic vegetables, food waste recycling, afforestation		
	5. Donated epidemic relief supplies and the Executive Yuan relief fund.		
	6. Local contributions		
Founder and	 Established Ming Chi University of Technology, Chang Gung University, and Chang Gung University of Science and Technology 	0	26.042
the Wang Family	2. Established Chang Gung Memorial Hospital	0	26,842
	3. Donation of cochlear implants		
	Disability welfare such as improving the quality of early intervention institutions.		
Wang Chang-Gung Charitable Trust Fund	 Welfare for minors and women - Donated to the Orphan Scholarship Program, healthy breakfasts for junior high school students in disadvantaged families, donated to the Foundation for Scholarly Exchange's Hualien and Taitung English Teaching Assistant Program, etc. 		2,427
(Founded in October 2002)	3. Welfare for the elderly - Pneumococcal vaccine donations for the elderly, Donated to the Smart Long-term Care Assistance System and the FHC Volunteer Program, etc.	305	
October 2002)	4. Sports promotion - Athletic trainer assistance program		
	5. Health research - "Formosa Plastics Group - Fulbright" Scholarship		
	6. Educational support and other subsidies for indigenous students		
	7. Welfare for the disadvantaged and others - Homeless service plan, etc.		
	 Welfare for minors and women - Scholarships for children and teens, nutritional breakfast subsidy, medical and economic assistance for patients with rare diseases, economic assistance for families affected by domestic violence 		1,372
	 Inmate assistance - Sunshine Program rehab program (for inmates with drug offenses), purchase lacquerware made by inmates of Taichung Prison, Ministry of Justice Inmate Family Assistance and Care Program, etc. 		
Wang Jhan-Yang	3. Welfare for the Elderly - Pneumococcal vaccine donations for the elderly, Meal Delivery Program for Elders Living Alone in Mailiao and Taixi Township, Wisdom Foundation Dementia Family Support Program, etc.		
Charitable Trust Fund (Founded in March 2006)	4. Health promotion - Strategic research on building new health risk concepts, research into preventable factors behind leading causes of death in Taiwan, and health promotion research, etc.	79	
	5. Cultural sponsorship - Development Program for Taiwan's Characteristic Cultures,		
	Mind Theater campus tour, Yunlin local puppet theater campus performances, etc. 6. Sports promotion - Flaming Stars Athletic Talent Cultivation Program, Future Stars Athletic Talent Overroom Training Programs etc.		
	Athletic Talent Overseas Training Program, etc. 7. Educational support and other subsidies for indigenous students		
	8. Welfare for the disadvantaged and others - Taiwan New Economy Foundation's Industry Environment Excellence Program, lighting improvement program for social		
	welfare institutions (children's institutions, study programs, elder-care institutions) 1. Disability welfare - Employment assistance program for mildly autistic people		
China Pag	2. Welfare for minors and women - Scholarships and talent training programs for remote areas, Donated to the Foundation for Scholarly Exchange's English Teaching Assistant Program, etc.		874
Ching Pao Charitable Trust Fund (Founded in June	3. Welfare for the elderly - Housing improvement and home appliance subsidy program, The Foundation for the Welfare of the Elderly's Make a Wish Program,	48	
2010)	 Rural Elders Assistance Program, etc. 4. Donated vehicles to social welfare organizations, provide holiday bonuses to low-income households in Mailiao, donated daily necessities and rice to social welfare organizations, emergency aid, assistance program for Yunlin veterans and their families, donated daily necessities to the Chinese Christian Relief Association (1919) food bank, etc. 		

Unit: NTD million

Donors	Main Social Welfare Projects	2021	As of 2021
	1. Disability welfare - Improving the quality of early intervention institutions		
	2. Welfare for minors and women - Funds for school lunches for elementary and junior high school students in Yunlin County, funds for the construction of welfare institutions for minors and women, etc.		1,733
Wang Jhan-Yang Social Welfare	3. Inmate assistance - Rainbow Program (inmates with drug addiction and AIDS), donation to the Taipei Prison Environment Improvement Project, etc.		
Foundation (Founded in August	4. Welfare for the elderly - Pneumococcal vaccine donations for the elderly, donation of funds and equipment to the Yunlin County Evergreen Canteen	147	
1995)	5. Culture - Sponsored the Vienna Philharmonic New Year Concert		
	6. Educational support and other subsidies for indigenous students		
	7. Welfare for the disadvantaged and others - Sponsored the renovation of Mailiao Kongfan Temple, Donations to the Mailiao Township Library and volunteer firefighting group		
	1. Disability welfare - Improving the quality of early intervention institutions, donation to the Yunlin Physical Therapy Youth Association for building repairs	190	1,575
	2. Welfare for minors and women - Ching Pao Scholarship, part-time student workers at social welfare organizations, donation to the Taipei Orphan Welfare Foundation, donation towards breakfasts for junior high school students from disadvantaged families, etc.		
Ching Pao P.D. Charitable Foundation	3. Welfare for the elderly - Housing improvement and home appliance subsidy programs for the elderly, Active Aging Center Program, donation towards establishing healthcare plans for remote areas, etc.		
(Founded in November 1995)	4. Health promotion - donations to environmental protection research projects at Chang Gung University and Ming Chi University of Technology		
	5. Educational support and other subsidies for indigenous students		
	6. Welfare for the disadvantaged and others - Donations to the Chang Gung Memorial Hospital Social Welfare Foundation, United Way, and the Dharma Drum Mountain Humanities and Social Improvement Foundation, donated to various social welfare organizations and county/city government social welfare programs		
	Disability welfare - Early Intervention Service Efficacy Enhancement Program		76
Ming-De Foundation	Welfare for minors and women - Donations to CGU Choir and the Nantou County After-School Program for Indigenous Students	0.2	
(Founded in July 1974)	3. Educational support and other subsidies for indigenous students	Ī	
,	4. Welfare for the disadvantaged and others - Printed books by the Founder, educational support and other subsidies for indigenous students		
Jin-che Indigenous	Welfare for minors and women - Work-study programs and emergency relief for indigenous students		13
Foundation (Founded in April	2. Educational support and other subsidies for indigenous students	1	
1997)	3. Welfare for the disadvantaged and others - Donation to the Yilan Leshui Community Development Association		
	Formosa Plastics Group	2,413	41,526
Total	Founder and the Wang Family	0	26,842
	Foundations and Charitable Trusts	770	8,070
	Total	3,183	76,438



Formosa Plastics Corporation

FPC commits to developing innovative and high-value materials and processing technologies, and AI technology to enhance the long-term competitiveness.



The Company (Formosa Plastics Corporation) generated consolidated sales of NTD 273.59bn in 2021, reaching 137% of its target of NTD 198.98bn and was up by 47% from NTD 185.81bn generated in 2020. Consolidated pre-tax profit came in at NTD 85.95bn in 2021, reaching 248% of its target of NTD 34.65bn and grew by 256% from NTD 24.16bn generated in 2020



Chairman **Jason Lin**

Because of the acceleration of COVID-19 vaccinations worldwide, the global economy rebounded strongly in 2021 with easing the pandemic restriction and launching expansionary fiscal and easy monetary policies continuously by countries to make the demand recovery for petrochemical products. On the back of recovering demand as well as the frequent occurrence of supply disruptions, caused by the force majeure from the US peers due to the snowstorm in February and hurricane in August in Texas, unexpected shutdown from the peers in the US and Europe, supply chain difficulty and energy policy in China, the imbalance of supply and demand triggered the price surge for petrochemical products. Especially, prices for polyvinyl chloride (PVC), ethylene vinyl acetate copolymer (EVA), N-butanol (NBA), acrylonitrile (AN) and epichlorohydrin (ECH) all achieved historical high levels in 2021.

Benefitting from the widening product spreads thanks to the larger increase in average price than that in raw materials prices, the Company's operating profit of NTD 60.16bn climbed up by 252% or by NTD 43.06bn in 2021 from 2020. Despite the fact that dividend income of NTD 3bn in 2021 decreased by NTD 0.35bn from 2020, the Company's investment income increased significantly by NTD 18.24bn to NTD 23.45bn

from Formosa Petrochemical Corp. and FPC-USA, which led to its pre-tax income's strong growth of 256% in 2021, hitting the record high levels since the Company was established in 1954.

Looking back into 2021, with the rising vaccination rate in major countries and the loosening COVID-19 prevention measures, global economy has seen robust recovery since Q2 in 2021. However, in view of the highly contagious Delta variant, several economies re-implemented the prevention controls. Together with the supply chains difficulty, shortage of energy sources and surging energy prices, the pace of global recovery slowed down in H2 of 2021. In spite of impact from Taiwan government's severe pandemic restrictions on Taiwan domestic consumption, Taiwan's economy achieved the highest growth in 2021 in the last eleven years, thanks to resilient export order demand driven by the resumption of global trade activities, and the increasing enterprise investment triggered by easing monetary policies.

In order to mitigate the crisis of global warming and extreme weather, more than 130 countries have targeted to achieve "net-zero emission" by 2050 and speeded up to implement several carbon emission controlling measures, of which European Union has announced that the carbon emission data of certain imports goods



•••• The Chairman of FPG inspects Xingang SAP Plant.

would start being required to disclose in 2023. Furthermore, European Union will begin imposing carbon tariffs in 2026, in which China, the US, Japan and Canada have also shown intentions to follow. As Taiwan is formulating policies related to total carbon emission controls, carbon trading and carbon fee pricing, if those policies cannot meet international requirements regarding netzero emission plan, carbon tariffs and reductions of carbon in supply chains, Taiwanese companies may be subject to double taxation and their international competitiveness will also be impacted.

Moreover, to attain net-zero emission goal by 2050 and promote "non-nuclear home", Taiwan government has targeted to achieve "20% renewable energy power generation, 30% coal combustion, and 50% natural gas" in 2025 and guarantees the stability of energy supply. Despite Taiwan has independent power grids, the government completely discarded carbon-free nuclear energy as a mean of power generation and instead replace it with enlarged capacity of natural gas and renewable energy. However, for natural gas, Taiwan is highly depended on imports (98%

from foreign countries) and there are problems of limited storage capabilities and transporting issues. For renewable energy, it is faced with challenges of unstable power supply and delayed construction timelines. In light of the power outages in March 3, 2022 and two times of regional power outages in 2021, companies have become cautious of stability of power supply in Taiwan, which not only poses risk to the long-term industry development but also brings about more uncertainties for Taiwan to achieve the goal of net-zero emission by 2050.

In addition, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) has been formed, and Regional Comprehensive Economic Partnership Agreement (RCEP), which spans 15 countries, covers more than 2.2bn people, and accounts for about one-third of global GDP, has also officially taken effect starting from 2022. In the short term, RCEP's impact to Taiwan is not too significant with low deduction of tariffs rate, long preferential period, exempt from tariffs about 70% of Taiwan's exports to the ASEAN region and some of Taiwanese companies already having plants in ASEAN region. However, in the long term, due

to Taiwan's less than 10% covering of free trade agreement (FTA) with trades partners and the mounting tariff pressure, it may not only harm Taiwan's international trade, but also force more companies to relocate production plants outside Taiwan and, therefore, result in the hollowing-out for industries, which will decelerate the growth momentum for the export-oriented Taiwan, especially for the sectors of petrochemical, steel and textile.

In light of low-carbon transformation trend and the increasingly challenging business environment, it's recommended that government should not only develop a fair tax incentive scheme to encourage corporates' commitments in carbon reduction mechanisms, but also develop carbon pricing related policies to eliminate the gap with international standards and strengthen capabilities of carbon management. It is also crucial to review and compare Taiwan's current energy transformation policies with the practices of Europe, the US, Japan and other countries, and re-plan a more suitable power generation structure without sacrifice of any energy sources to ensure stable and sufficient power supply in Taiwan and make the manufactures operate without concerns. Moreover, to offset the negative impact from RCEP on the industries, Taiwan is encouraged to cultivate a business environment with more clear and comprehensive business regulations, and actively promote to join CPTPP and have bilateral trade agreements with important international business partners. The collaboration between the government and the industries is highly encouraged to strengthen our economic and industrial advantages by providing more comprehensive business policies and regulations, improving carbon pricing mechanisms and incentive measures, ensuring stable power supply, and joining regional economic integration, so as to overcome the challenges ahead.

In response to the lingering effect from COVID outbreak, supply chain disruption, the petrochemical capacity additions from peers, the Company adheres to the two founders' philosophy "stainable operation and contribution to society" and has benefitted from the more than 20-year developments in 5S management, energy conservation, carbon reduction, circular economy and artificial intelligence (AI). The Company has fully supported the supply of raw materials for medical masks and hygiene products since 2020, and in 2021, targeted to stop supplying disposable plastics for consumers by 2025. In addition, the success in developing anti-bacterial oyster shell powder, anti-fouling compound resin, biodegradable and green plastic and carbon capture technology are the fruitful results of realizing social responsibility and corporate citizenship missions.

The Company's purpose is to make small breakthroughs through innovative R&D and product design to change human consumption behavior, thereby creating a huge positive impact on social well-being. Among them, the "P-Tex Biomimic Zwitterionic Anti-fouling Plastic" was developed in cooperation with the Company's investee, PuriBlood Medical Co. Ltd., and was awarded the "Enterprise Innovation Award" in the 18th National Innovation Award in 2021.

Furthermore, the Company has been proactively engaging in the development of AI technology, to enhance operational efficiency in



**** FPC is dedicated to promote circular economy and developed anti-bacterial oyster shell power successfully.

five aspects "optimization of production and sales, quality assurance, intelligent maintenance, industrial safety and environmental protection and cost reduction". In 2021, 113 out of 201 AI projects have been completed with an estimated annual benefit of NTD 460mn. Besides, the Company continues to select outstanding talents to train in Taiwan's AI schools. As of the end of 2021, 76 talents have completed the training. In an effort to cultivate more high-end AI talents in order to build a solid foundation for digital transformation, the Company continues providing systematic training courses to employees, interacting with companies and academic institutions outside the Company, inviting domestic and foreign experts for speeches, building platforms to hold competitions, etc. Since 2021, the Company has also developed automatic machine learning and "Data lake" platform to ensure operational improvement.

Moreover, to satisfy the customers' need, the Company evaluates the performance of production, selling and R&D regularly, and develop the new products and applications with mastering the international trend. To achieve the goal of customer-oriented digital transformation and the optimization in selling and production to improve the service quality and lower the working burden on its workers, the Company set up "FPC E-commerce Platform" which combined the Enterprise Resource Planning (ERP) information and AI technology and has been worked online. In addition, in order to provide total solutions to customers, the Company continued to promote product-integration marketing to develop business and create a win-win situation.

Furthermore, to pursue a reasonable profitability, strengthen business and reduce the negative impact from any business challenges, the Company implemented the improvement measures including circular economy development, project improvements promotion, the consumption of water, energy, and the utility usage volume per unit reduction. The Company accomplished 1,226

projects in 2021 with an annual benefit of NTD 1.59bn.

At the same time, the buildings, including the 2 founders' offices in the Kaohsiung plant, the birthplace of Formosa Plastics Group, were registered as monument by the Kaohsiung City Government. The "Kaohsiung Y.C. Wang and Y.T. Wang Brothers Park" will be established in the 2.5 hectares original site. The restoration and reuse project of the park is currently underway. The project is expected to complete by 2022 and will be opened to public by district.

The Company, its China Ningbo and the US subsidiaries mainly produce plastics and chemical fiber raw materials.

The sales volume of PVC in 2021 increased by 2% from 2020to 1,670K tons, given (1) the imbalance of supply and demand for global PVC market with supply disruptions from the US snowstorm in February and hurricanes in August 2021 as well as the ongoing shipping bottlenecks and (2) the benefit of more customers of the Company with long-term contract. The sales volume of caustic soda in 2021grew by 13% from 2020 to 1,520K tons, given (1) the growing demand for caustic soda driven by new capacity addition of alumina and nickel mines in Indonesia, (2) the decreased supply and raised PVC prices caused by unusual the US weather and (3) the increased production with the rising ethylene dichloride (EDC) prices and the favorable combined profits from the EDC and caustic soda.

The sales volume of High density polyethylene (HDPE) in 2021 decreased by 10% from 2020 to 474K tons, given (1) market was in oversupply situation with a continued capacity expansion globally, (2) sales volume was dragged down by the decreasing demand for disposable packaging film materials amid global trend of reduction in the usage of plastic materials, (3) the weak market buying impacted by energy policy and stricter controls on commodity prices in China, and (4) the

decreasing supply and demand of the subsidiary of HDPE plant in the US affected by shortage of ethylene and limited capacity of delivery vehicles.

Despite the new capacity addition from China peers, the sales volume of polyethylene vinyl acetate (EVA) in 2021 increased by 2% to 294K tons from 2020, given (1) to promote packaging filming with the growing demand for the solar cell encapsulation film, and (2) to boost differentiated products, such as high VA foam material with the increased shoes materials demand. Despite aggressive expansion into Vietnam and Bangladesh market to increase sales volumes of differentiated products, the sales volume of linear low density polyethylene (LLDPE) in 2021 decreased by 8% to 484K tons from 2020, given (1) a high competition in the LLDPE market owing to new capacity addition from global peers, and (2) the declining productions and sales volume from the US subsidiary's HDPE plant.

The sales volume of acrylic esters (AE) in 2021 increased by 9% to 573K tons from 2020, given (1) the tight supply with the unexpected shut down from global peers, and (2) the market expansion to the US and Europe due to downstream customers raised inventories levels to prevent supply disruption impacted by unpredictable shipping delivery. The Company's supply of N-butanol (NBA) is mainly for captive

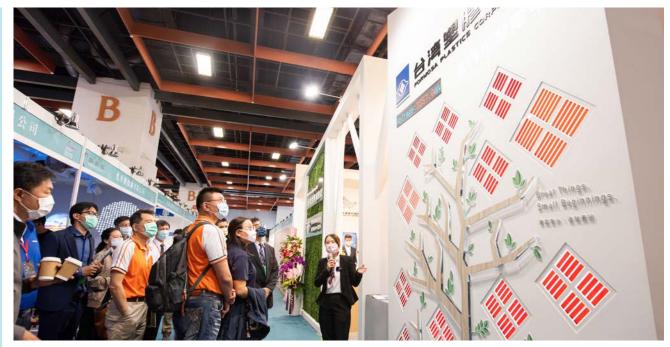
use by AE plants and sales volume in 2021 decreased by 11% to 213K tons from 2020 due to productions suspension for the replacement of catalyst. The sales volume of super absorbent polymer (SAP) in 2021 decreased by 9% to 168k tons from 2020 because of the decreasing shipments to the US and Europe markets on shortage of upstream materials, acrylic acid, and surging freight rate.

The sales volume of Polypropylene (PP) in 2021 decreased by 2% to 957K tons from 2020, because of the part of peers shutdown in the US due to the snowstorm in Texas and the imbalance PP supply and demand in Central and South America. The sales volume of AN in 2021 increased by 11% to 280K tons from 2020 given (1) less shipments from western countries due to unexpected shutdowns from the US and European peers, and (2) the strong demand from downstream ABS products due to the rising of stay-at-home economy. The sales volume of methyl methacrylate (MMA) in 2021 grew by 4% to 85K tons from 2020 as the Company engaged more in the spot market transaction during the unusual supply tightness in the US and Europe markets. The sales volume of epichlorohydrin (ECH) in 2021 decreased by 1% to 96K tons from 2020 due to the low inventory levels in the end of 2020, despite the booming of the wind energy and 5G industries to support demand for downstream





····· Circular economy - slippers are made from oyster shells.



2021 Taiwan International Architecture & Design Expo(T.A.D)-Dyesensitized cell (DSC)

product of epoxy.

In terms of capacity expansion, in order to strengthen the competitiveness, the Company aggressively expanded its capacities and conducted debottleneck projects. In Taiwan Complex, the debottleneck project of PP plant in Linyaun with new capacities by 10K tons to 484K tons per annum is expected to be completed by the H1 of 2022. The debottleneck project of PVC plant in Renwu, Linyaun and Mailiao with new capacities by 100K tons to 1,415K tons per annum is expected to be completed in the end of 2022. In addition, the Company has set up a medical material center in Renwu to produce medicalgrade compound resin and natural antibacterial materials such as PVC, PE and PP. It is expected to complete and put into production in the end of 2022. The newly built aerogel new material plant in Renwu with an annual production capacity of 12 tons is expected to complete in H1 of 2023.

In Ningbo Complex, the new PDH plant with annual capacity of 600K tons propylene and the EVA debottleneck project with new capacity by 28K to 100K tons per annum is expected to complete and commence production in the end of 2022. In US Complex, the new Texas 1-hexene

plant with capacity of 100K tons is planned to be completed in the end of 2025.

Furthermore, in Kaohsiung, the Company's storage tank in Qianzhen District will be moved to the Phase II intercontinental petrochemical zone. The Company has rent the land and dock from Kaohsiung Taiwan International Ports Corporation for petrochemical usage and will build 12 storage tanks and 1 salt warehouse, which are expected to be completed gradually by the end of 2022.

In terms of equity investments, FPC-USA's (22.66% owned by the Company) pretax income hit historical high at USD 1.37bn in 2021. Despite overall the US economic activities still impacted by pandemic, the rebound in FPC-USA's earnings was supported by surging average prices of ethylene, propylene, PE, PP and PVC thanks to the rapid rollout of vaccines to drive recovery in business activities, stable increasing demand for petrochemical products and the Texas snowstorm in Q1 2021 to lead to declining supply of overall petrochemical products. Looking into 2022, given acceleration in global vaccinations, ongoing increase in manufacturing output and the North American petrochemical players' cost advantages in the procurements of natural gas and

raw materials, the operating rate for olefin, PE, PP, PVC and other downstream plants is expected to remain stable while the product prices may correct from the high levels due to the increase in supply. As the equipment inspections has been completed in 2021, FPC-USA's loss from maintenance shutdown and equipment inspections are expected to narrow significantly to support FPC-USA's 2022 income achieving the same levels in 2021.

In addition, the loss of Fujian Fuxin Special Steel Co., Ltd. (29.16% owned by the Company) in 2021 has narrowed significantly from 2020 given the order shifting effect, the US and Europe's easing monetary policies and supports for new infrastructure projects has led to strong growth in export of downstream household appliances and metal products, driving the demand and products prices for stainless steel. It is expected that in 2022, China's policies such as stabilizing the price and supply of commodities and imposing export tariffs will curb steel exports. Moreover, in order to promote carbon neutrality, China's further implementations in energy policy and power restrictions will lead to more markets volatility. Fujian Fuxin expects to enhance the sales contribution of higher-profit nickel-free differentiated products, such as 400 series and super ferritic. Fujian Fuxin also aims to increase the OEM for hot rolling steel stainless steel and carbon steel and enhance the purchase of carbon steel from Formosa Ha Tinh Steel Corporation. The new cold rolling mill plant project with 300K tpa capacity was put into production from Q1 2022, which is expected to enlarge the synergy of vertical integration and enhance the competitiveness.

In view of the demand in advanced nodes from Taiwan's semiconductor industry, Formosa Daikin Advanced Chemicals Co., Ltd. (50% owned by the Company) has built up new capacity for hydrofluoric acid by 13K tons to 43K tons annually in Dafa Industrial Park, and has commenced production in Q1 2022. Furthermore, Formosa Tokuyama Advanced Chemicals Co.,

Ltd. (50% owned by the Company) in Linyuan with annual capacity of 30K tons of electronic-grade IPA has been put into production in H1 2022.

In terms of research and development, the Company spent NTD 2.7bn on R&D in 2021, accounted for 1% of the Company's revenues. These R&D expenses were mainly spent on new formulation development, production process improvement, product quality upgrade, energy consumption saving, and human resources cultivation to increase added value and lower cost. In 2021, the Company completed 56 R&D projects with an annual benefit of NTD 210mn. Meanwhile, the Company conducted R&D on advanced production technique and to commercialize specialty products including zwitterionic anti-fouling compound resin, green plastic, environmental friendly plasticizer-free PVC, highfluidity HDPE fiber material, electronic grade packaging EVA film, high-performance BOPE packaging material, TC780 modulus reinforced carbon fiber, dry-jet wet-spinning ultra-highstrength carbon fiber, low-odor high-fluid SAP, post-SAP neutralization process, biodegradable PP, anti-bacterial oyster shell powder PP and high fluidity and high rigidity PP automotive materials, which has achieved good results.

In order to enhance the competitiveness, the Company actively invested in the key technology development and applied for both domestic and international patent. In 2021, the Company received approval on 21 patents, and had a total of 207 effective patents as of the end of 2021. Laying on the foundation of continuingly improving R&D capabilities, the Company accelerates the development of scratch resistance, flame resistance, toughness, gas barrier, dielectric products through its new high-end equipment center in Mailiao, coupled with virtual laboratory and talents in production process simulation. Meanwhile, in response to the new normal post the pandemic, the Company set up medical materials center and continued to work with industry experts and academic area to specialize ultra-highperformance PP melt-blown filter materials and zwitterionic anti-fouling compound resin, as well as natural anti-bacterial and beauty-related green products.

Among them, the "Capture and Reuse of Flue Gas ", which was a joint project with academic research institutions, was qualified to receive the subsidy from Ministry of Economic Affairs in 2019. It was put into trial operation in October 2021 and expected to complete the testing project in H1 2022. At the same time, in order to support the development in 5G industry in Taiwan, the Company will cooperate with Industrial Technology Research Institute and downstream companies to form a 5G industry alliance. In addition, the Company was qualified for the innovative R&D program of "Polyolefin Materials Technology Development Plan for 5G Base Stations" by Ministry of Economic Affairs in June 2021, and will expand its R&D towards products such as 5G and 6G base station radomes, antenna elements and composite cables.

On the operational safety and environmental protection front, the Company always puts emphasis on industry developments and environmental protection equally. As of the end of 2021, the accumulated investments on operational safety, environmental protection, and firefighting reached NTD 26.8bn, which was mainly spent on controlling pollution, energy saving, waste and greenhouse gases reduction, and operational safety and firefighting improvement. The Company's pollution treatment and emissions are better than national regulatory standards.

In 2021, there were 4 business units praised by competent authority. Among them, besides the fact that the carbon fiber plant in Mailiao was awarded the Excellent Manufacturer of Greenhouse Gas Reduction by the Industrial Development Bureau of the Ministry of Economic Affairs, Haifeng plant and Mailiao ECH plant were praised by Yunlin County for strong performance on occupational safety and health. In addition, the Company was

also awarded as Green Purchasing Excellent Entity by the Taipei Environmental Protection Bureau.

In terms of water and energy conservation and greenhouse emissions reduction, in 2021, the Company accomplished 1,073 improvement projects. Total water saved amounted to 3,280 tons/ day, while greenhouse gas emissions reduction reached 309K tons/year. Other ongoing 1,100 improvement projects would further conserve water by 9,687 tons/day and reduce greenhouse gas emissions by 243K tons/year. According to the results announced by Carbon Disclosure Project (CDP) in 2021, the Company was ranked "A-" in climate change assessment and "A" in water resources assessment. Both achievements were among the top rankings within many wellknown international chemical companies, which shows that the Company's efforts in energy saving, emission reduction and circular economy in response to climate change have achieved considerable results.

Besides, in order to enhance operational safety, prevent occupational disasters, and ensure the safety and health of labors, the Company not only continued to conduct overall equipment inspection, implement Standard Operating Procedures (SOP), Management of Change (MOC) and Process Hazard Analysis (PHA) operations, and strengthen inspections of machinery and equipment for improvement, but also introduced AI such as Limited Space Image Recognition Technology to assist construction safety, implement daily safety and health inspections of the construction sites before, during and after construction to prevent unsafe operational behaviors, and workers' digitalize the supervision documents to improve the quality and efficiency of sites management. Meanwhile, the Company has developed smart wearable devices to assist inspections and maintenance and monitor the health conditions of workers. The Company also introduced AI smart detection system for pipeline leakage at Renwu Complex to 24-hour monitor key production process areas and effectively detect the location of VCM and chlorine leaks. This detection system will be installed in all the other complexes to ensure the safety of employee and equipment, which are expected to help employees to work in a safe and healthy workplace and ensure the stable and zero-accident operation for the Company.

In view of the increasingly stringent environmental regulations, the Company continues to improve the elimination of white smoke from the chimneys of Renwu Complex and to promote carbon neutrality and zero discharge of wastewater in each Complex. At the same time, each plant is reducing volatile organic compounds (VOCs) and streamlining equipment components to gradually replace the low-leakage equipment components. This is also supplemented by the application of infrared detector (GasFinder) to strengthen autonomous inspections for a friendly environment.

Looking into 2022, the global economic activities is expected to return to normal and sustain the same growth momentum in 2021 with the gradual normalization of COVID-19 prevention measures by countries, the rising vaccinations globally and the support of fiscal stimulus policies and infrastructures projects by the US, European countries, Japan and India. Nevertheless, the mounting pressure from ongoing inflations, gradually tighter monetary policies and higher possibility of rate hikes have been weighing on the global economy and slowing down the growth momentum in 2022 following the strong growth in 2021. According to the latest forecast by the International Monetary Fund (IMF), the global economy will grow by 3.6% in 2022, still above the average long-term growth trend.

However, the spread of the new variant COVID-19 virus has led to a more severely global pandemic. The resumption of COVID-19 control measures may weaken the rebound of economy growth. Besides, the risks from rising inflation, the impact on global economy from the monetary

policies shifts in the US and Europe, supply chains bottlenecks, uncertainties from the follow-up of China-US trade tension, extreme weather, the impact on the energy price by the conflict between Russia and Ukraine and geopolitical tensions are still need to be closely monitored in the future.

In terms of supply, IHS forecasts that the global ethylene capacity will increase around 13.49 million tons in 2022, and China and US in total account for 80% of the new capacity. In terms of demand, based on the global ethylene demand growth of 1.0x of GDP growth, incremental demand should only be 8.7 million tons in 2022. While polypropylene net capacity increase will be 9.69 million tons in 2022, mainly in China, by 7.3 million tons. Based on 1.2x of GDP growth, the incremental polypropylene demand should only be 7.1 million tons in 2022. The global ethylene and propylene market will be oversupplied.



FPC Flue Gas CO₂ Capturing and Utilization Pilot Plant



FPC team inspects the plant of Formosa Tokuyama Advanced Chemicals Co., Ltd.

Furthermore, after the last upcycle of petrochemical industry during 2015-2019, a large number of new capacities of ethylene, propylene and downstream derivatives in China and the US resulted in market oversupply in 2020. On top of this, the impact of COVID-19 in 2020 on business activities has weighed on demand and led to the decline in petrochemical industry. In 2021, the competition pressure from Asian lowcost coal-based petrochemical peers was eased thanks to the pandemic-triggered labor shortage, shipping bottlenecks, the surge in energy & commodity prices due to extreme weather and carbon neutrality trend, and the energy policy in China leading to decreasing supply of coalbased petrochemical products or lower outputs from several petrochemical producers affected by power-outage. Meanwhile, with the popularity of vaccination, sufficient supply of liquidity and economy recovery, strong demand for petrochemical products led to the historically prosperous year for the industry in 2021. Looking into 2022, the upcycle is expected to sustain on the back of resilient demand for petrochemical products and the ongoing supply disruptions due to COVID-19, shipping bottlenecks and increasing

awareness on carbon neutrality in countries.

Moreover, in response to carbon peaking and carbon neutrality goals as well as the surging coal prices on supply shortage, China has disclosed action plans to control energy consumption intensity and total amount, and set control targets and review the effectiveness for each administrative area. The implementation of electricity and production restrictions will not only limit the operating rate for coal-based petrochemical plants, reduce the outputs and exports of petrochemical products, but also push up the production cost and thus further support the pricing for petrochemical products in Asia market with the marketization of electricity prices and lingering shortage of energy supply. In the long term, to achieve carbon peaking and carbon neutrality goals, China will accelerate the pace to phase out inefficient petrochemical plants and industry consolidation. Together with the decreasing new capacity from the US peers and their preference to export to regions with higher ASPs, such as Central and South America and Europe market, the product sales of the Company are expected to benefit from the lesser pressure from competition.

In 2022, in view of carbon transition wave globally, countries have successively announced their commitments in carbon neutrality. In light of the inevitable trend of carbon management, the Company realized it has been increasingly important to respond to the decarbonization trend in time. For the development of sustainability, the Company will use AI technology to promote energy saving and carbon reduction, improvement in low-carbon productions, energy transition, circular economy and other ESG strategies. Meanwhile, the Company will engage more in the developments of carbon reductions, more R&D for environmentally friendly products such as plastic recycling, biodegradable and green plastics in order to create diversified values and lead the Company towards the goal of "carbon neutrality by 2050", and join hands with upstream and downstream supply chains to create a zero-carbon future.

Meanwhile, the Company aims to focus on the development of AI and innovation through the acceleration in AI transformation and digitalization and build digital ecosystem for operation management to optimize process, improve output and quality, reduce raw material and energy consumption, and ensure workplace safety and environmental protection. Moreover, considering health care, technological innovation and new economy trend post the pandemic, the Company commits to developing innovative and high-value materials and processing technologies, and exploring the applications of anti-bacterial oyster shell powder through the collaboration with investee, Puriblood Medical Co., Ltd. The partnership allows the Company to use zwitterionic anti-fouling technology to develop medical-grade compound resin, and further apply it to the fields of consumer, medical and industrial supplies. This development is aimed not only to enhance the added value of products, but also to make contributions in the improvement of social well-being.

Moreover, there will be more days of maintenance shutdown for ethylene capacity in Taiwan in 2022 than which in 2021. The Company expects that the supply of ethylene and propylene feedstock will decrease, and will seek for imports to cover the shortfall in raw material, aiming to reach the target of "full production and sales". Meanwhile, the Company will conduct deepdive review on petrochemical plant management, and continue to promote a comprehensive inspection on equipment and the implementation of Process Safety Management (PSM), in order to manufacture under zero accidents. Besides, in response to the regionalization trend of the supply chain caused by COVID-19, the Company will not only continue to expand differentiated product markets, but also will accelerate digital transformation by using AI technology to optimize production & sales and introducing smart manufacturing, and through remote marketing to actively expand into new customers and new markets in an attempt to enhance the Company's long-term competitiveness. The Company will also aggressively promote the capacity expansion and debottleneck projects in Taiwan and overseas. Through the efforts above, the Company expects to strengthen its business in preparation of any new challenge and threat, and to make another year of strong earnings performance.



2021 FPC Environmental Protection Improvement Presentation



Nan Ya Plastics Corporation

NPC will seize innovative technological applications, and green and circular economy opportunities to maximize benefits with minimum investment



In 2021, Nan Ya Plastics Corporation (hereinafter "NPC" or "the Company") recorded a consolidated revenue of NT\$411.67 billion, showing a 50.6% increase over NT\$273.35 billion in 2020, and a consolidated pre-tax income of NT\$103.46 billion, growing by 239.9% compared to NT\$30.44 billion in 2020.



Chairman Chia-Chau Wu

As Covid-19 vaccination coverage grows and regions lift lockdown measures one by one, there has been a resumption of consumerism along with the emergence of new technologies, bringing strong demand from the stay-at-home economy, remote learning, and work from home (WFH) while the downstream supply chain has been actively replenishing its inventory, leading to a strong electronics materials market. Moreover, rising crude oil prices have led to the inflation of various petrochemical products, leading NPC to record new record-setting pre-tax and after-tax profit and earnings per share (EPS).



••••• Vertical integration from raw material supply, R&D, production, processing, to sales. The Company has a complete supply chain.

The four major product categories of NPC operations are plastic processing, chemicals, polyesters, and electronic materials.

In terms of plastic processing, NPC continued to engage in the research and development of new applications, new materials, and products that meet environmental protection trends and have unique specifications to increase the Company's ratio of differentiated and high-value product sales. Automated monitoring equipment was also deployed to ensure consistent quality throughout the production process. In addition, NPC also expanded to high-end and potential emerging markets to boost sales by promoting e-commerce and online marketing techniques, which helped to enhance production capacity utilization and reduce costs.

By leveraging the advantage of decentralizing production and having set up plants both domestically and overseas in Taiwan, China, the USA, and Vietnam, the Company can adjust the production and sales operations at each plant on a timely basis to provide services that satisfy customer needs. Through a combination of efforts, NPC is able to maintain sound profitability in the plastic processing business in spite of the pandemic.

In terms of chemical products, in line with vertical integration and division of labor in the



Nanya Cybar Shopping Mall - to sell products all over the world

Sixth Naphtha Cracking Plant in Mailiao, NPC's products, including ethylene glycol (EG), Bisphenol-A (BPA), 1,4-butylene glycol (1,4BG), plasticizers, phthalic anhydride (PA), 2-ethylhexanol (2EH), and epoxy resin (Epoxy), have been vertically integrated into upstream and downstream industries to form a complete supply chain that supports the development of downstream industries such as polyester, electronics, and plastic processing, respectively.

As demand for chemical products is picking up, downstream vendors have been actively replenishing their inventories. Moreover, as Texas was hit with the worst storm of the century and operations were suspended at many petrochemical plants, there has been a shortage in plasticizer raw materials, resulting in increased prices of chemical products.

Continuing the market status for BPA in the end of 2020, the demand for downstream epoxy applications was strong in the wind power industry in 2021. Moreover, prices were kept high as there was a market shortage of the material, leading to a significant profit contribution from this business. The increased crude oil prices also benefited the EG market price. The Company also experienced increased productivity and sales volume after the new EG2 production line in Texas began operation. Prices of 1,4BG products have all increased, leading to a dramatic increase in both revenue and profitability. Overall, profits from the chemical products business have significantly grown.

In terms of polyester products, both domestic and export sales and shipping volume of PET resin from the Company's Taiwan plant have grown; while the sales mix of yarn products has been adjusted to increase visibility. Moreover, NPC actively introduced green products including recycled products; the demand for recycled polyester filament and knitting fabric from Kunshan plant has recovered, leading to significant growth in revenues and profitability over the previous period.

Because of the increasing awareness of environmental protection worldwide, there are unlimited business opportunities in recycling and the circular economy. NPC has been actively investing in the research and development of relevant products—those made with recycled



Nan Ya PCB has long been focusing on the development and production of circuit boards and IC package substrates.

materials from PET bottles, oceans, and textiles, as well as biodegradable and alternative energy products. The Company also expanded toward the applications of recycled polyesters to enhance recycling efficiency and expand the application of fiber products. This will help NPC to segment the market and to expand its business scope, thereby achieving further profit growth.

In terms of electronic materials, the impact of the COVID-19 pandemic in 2021 gave rise to a new economy and new business opportunities such as the stay-at-home economy and remote working and learning. These trends have led to strong demand for laptops, game consoles, servers, and network communication equipment. As a result, the overall electronics industry experienced significant growth over the previous years. Moreover, the new production capacity at Copper Foil Plant 4 at Xingang has also helped all product revenues to greatly surpass those of 2020, helping the Company to record the highest revenue, as well as a significant increase in profits compared with 2020.

IAs countries will adopt stronger new energy

vehicle policies in the future, the development of lithium batteries will be accelerated. Moreover, innovative applications such as electric vehicles and intelligentization will also boost the demand for electronic materials and upstream raw materials. By leveraging its comprehensive vertical integration throughout the supply chain, adjusting production and sales strategies, and actively promoting differentiated products, NPC will increase sales proportion of niche products with high added value and functionality, as well as flexibly adjust the production capacity in Taiwan and China to drive for the continued growth of both revenues and profits.

Nan Ya Printed Circuit Board Corp. (Nan Ya PCB), an investee of NPC, has long been focusing on the development and production of circuit boards and IC package substrates. In 2021, Nan Ya PCB actively sought business opportunities in high-end IC package substrates including next-generation computer processors and graphic chip substrates. In addition, to increase the sales proportion of high-value products, the investee also partnered with customers to co-develop large-scale and high layer count IC substrates for



····· Nan Ya Technology Corp.

artificial intelligence (AI) and high performance computing (HPC) applications, resulting in record-setting revenues and profits.

With the development of advanced technologies including chiplet packaging and heterogeneous integration, the demand for highend IC substrates will continue to grow. The supply of ABF substrate continued to fall short, and to meet future development trends, NPC has actively strengthened its R&D competency and continued to resolve bottlenecks as well as to expand production capacity to meet market demand. In particular, to resolve its bottleneck, Jinxin plant began related production in the first quarter (Q1) of 2022, and Shulin plant has planned a two-phase expansion, which will greatly enhance both revenues and profits. Going forward, Nan Ya PCB will work closely with customers to obtain more next generation and high-end product orders, and will continue to deploy AI and big data into production management in order to optimize production processes, increase yield and productivity, and continue its operational performance.

Nan Ya Technology Corp., another company invested by NPC, is committed to the development, manufacture, and sales of dynamic random-access memory (DRAM) products. Though problems including supply shortage in 2021 have indirectly led to a small-scale rebound in the DRAM market, but the aforementioned investee flexibly adjusted its product mix to respond to market fluctuations and customer demand. It also reduced its inventory accordingly. As a whole, the annual average price has increased by over 40% in 2021 compared with the previous year, thereby achieving significant revenue growth.

On top of continuing to optimize the 20nm product portfolio and enhancing product value and diverse applications, Nan Ya Technology Corp. will also actively plan its autonomous technical development skills and production process conversion in 2022. Its operating strategies will be

focused on promoting 10nm products with new processes and mass production.

Looking forward to 2022, besides having a heightened baseline due to rapid economic recovery in 2021 and the ongoing pandemic and logistics and transportation bottleneck in the supply chain, the Company is also faced with inflation and its various effects. If the United States accelerates the shrinking of its balance sheet, exchange rate fluctuation is expected to worsen, and export-focused Taiwan will be confronted with the exchange rate risks.

Excluded from the Regional Comprehensive Economic Partnership (RCEP), though Taiwan has been actively applying for entry to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) to mediate tariff barriers, uncertainties in Taiwan's entry continue to exist due to international frictions.

Moreover, in response to the global carbon neutrality issue, Taiwan will soon announce her strategies and paths toward achieving "2050 Net Zero Emissions", and competent authority will request companies to disclose their responses to climate change in their Corporate Social Responsibility (CSR) Report. Reducing carbon emissions has become an unavoidable cost and risk to corporate operations.

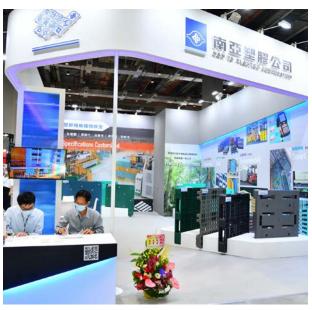
With the complex global situation and market development trends, NPC will strengthen its business growth and profitability through four major operating strategies, namely, "optimizing product portfolio to meet high-end applications", "continue to vertically integrate the supply chain to satisfy customer needs", "achieve circular economy to reduce carbon emissions", and "use AI to execute digital transformation".

Through these strategies, NPC will actively develop new materials for 5G high-frequency and high-speed networks, and new-energy vehicles and automotive electronic substrates to promote the development of relevant materials throughout

the supply chain. In addition, the Company will also seize innovative technological applications, and green and circular economy opportunities to maximize benefits with minimum investment. By achieving intelligentization in the production process, the Company also hopes to achieve its goals in reduction, reuse, and resource recycling.

In response to subsequent localization of advanced materials and market demand, the Company will achieve diverse production deployments in Taiwan, China, the United States, and Vietnam. In addition to the new plant for high-value copper foil in Xingang, Taiwan, and ABF substrate production line in Kunshan, China, having commenced production in 2021, several investments will also be completed and ready to start production this year, including the release film in Shulin plant and ABF substrate in Jinxin plant in Taiwan, and BPA plant in Ningbo and copper foil substrate and glass fiber in Huizhou plant in China.

Within the next couple of years, Nan Ya PCB Co., Ltd. will expand its ABF substrate plant. NPC is also actively looking to enter markets with advanced applications such as medical materials, and it will also develop new products and increase production capacity on a timely basis to continuously drive for business performance.



Series of Asia Industry 4.0 & Intelligent
Manufacturing Exhibition



Formosa Chemicals & Fibre Corporation

Promote green products, to live up to the theme: "We Produce, We Recycle", and create a responsible and sustainable operational environment.



With the easing of the COVID-19 pandemic in 2021 and thanks to the stimulus policy adopted by governments around the world, demand on the market returned and accordingly the global economic recovery continued. The rising oil prices internationally also drove prices of petrochemical products. With the joint efforts from everyone, the Company's operations have returned to be comparable to the pre-pandemic level. The consolidated revenue came to NT\$365.8 billion in 2021, an increase of NT\$112.5 billion and 44.4% from that in 2020, which was NT\$253.3 billion mainly because of the easing pandemic in 2021 and the reduced supply on the market as a result of abnormal weathers suffered in countries around the world and frequent glitches reported by counterparts. Oil prices and selling prices of petrochemical and plastic products surged compared to those in 2020, which contributed to an increase of NT\$92.5 billion in selling prices. As for the quantities sold, the growing demand on the market contributed to increases in the sales of most products compared to those in 2020, except for PP and PS that were under service and acetone as a result of reduced demand in pandemic prevention. Plus, the expansion in the throughput of Ningbo phenolic ketone and PIA that has been completed one after another, the sales climbed by NT\$20 billion.



Chairman **Hung Fu Yuan**

In terms of profit, the consolidated pre-tax profit totaled NT\$50.2 billion in 2021, an increase of NT\$25.4 billion and 102.5% from that in 2020, which was NT\$24.8 billion mainly because of the post-pandemic economic recovery around the world. The recurrent nature of the pandemic, however, resulted in an imbalance in international trade order and the supply chain. Prices for the first half of the year rose because of flourishing demand yet the demand on the market gradually flattened following the rebound for the second half of the year. The fluctuating prices of raw materials and products slowly narrowed the processing spread. Nevertheless, the annual business profit

grew 124.7% from 2020, with an increase worth NT\$19.1 billion and the equity investment income and cash dividends increased NT\$6.8 billion in total

For 2021, despite the persistent impacts of the recurrent and unstable COVID-19 pandemic on the global economy, with the economic recoveries in Europe and America and the consumption stimulus policy adopted by governments around the world, the demand for oil consumption grew. The West Texas crude oil WTI climbed all the way from less than US\$50 per barrel in the beginning of the year to over US\$75 per barrel at the end

of the year. By the same token, naphtha rose 53.6%. In the beginning of the year, ice storms in Texas and glitches reported by counterparts were frequent, which even led to skyrocketing prices of certain petrochemical products and unprecedented selling prices of benzene, ABS, and PP. Comparable rises occurred for the other petrochemical and plastic products as well. The Company was optimally profitable for the first half of the year. For the second half of the year, however, the shortage in cabins and containers remained; the stress in the shipping industry led to soaring shipping costs; the supply chain was caught in obstruction; prices of energies skyrocketed; the energy consumption and intensity dual control system was enforced in Mainland China due to intensive power consumption; and new throughput was commissioned. As a result, despite the fluctuating high prices of crude oil, with gradually sliding prices of both petrochemical and plastic products, the market turned conservative and the Company's revenue and profitability slowed down, too. Nevertheless, production, distribution, and profitability continued to grow comparably throughout the year. The cage change program for higher value was fruitful, too.

As part of the consolidated revenue in 2021, the parent company's net revenue was NT\$187.4 billion, accounting for 51.2% of the consolidated revenue. Subsidiaries that contributed to the revenue included Formosa Industries Corporation in Ningbo, Formosa Industries Corporation in

Vietnam, and Formosa Taffeta Co., Ltd., totaling NT\$178.4 billion accounting for 48.8% of the consolidated revenue. Main contributors to the parent company's revenue are petrochemical and plastic products. Both combined had a net worth of NT\$174.7 billion, accounting for 93.2% of the parent company's revenue. Among them, petrochemical products totaled NT\$108.4 billion or 57.8% and plastic products NT\$66.3 billion or 35.4%.

Operational highlights of respective major products throughout 2021 included all-around production of the Company to be expanded reflective of market demand under the premise that safety production is ensured and continued promotion of water and energy conservation and reduced consumption and emissions to improve the circular economy as well as proactive initiation of AI-driven production in order to further enhance quality of products and reduce the costs in addition to maximized high value-oriented developments and keeping track of new business opportunities that contribute to profitability.

In terms of petrochemical products, multiple energy improvement projects such as thermal integration, addition of heat separator to the heterogeneous unit, and replacement with the new-generation transalkylation and heterogeneous catalysts were completed for the second and third aromatic hydrocarbon plants to significantly reduce energy consumption. Water-saving and



••••• Energy transformation - to promote the clean energy technologies continuously.



Wen Yuan Wong, Chairman of FPG, patrolled ABS plant of FCFC.

energy-conserving improvements including multiple effect distillation (MED) were completed for the SM plant in Mailiao. In addition, the debottleneck improvement project began in 2020 for the Ningbo phenol plant in Mainland China. The annual throughput of phenol is increased from 300 thousand tons to 400 thousand tons and that of acetone from 185 thousand tons to 247 thousand tons to effectively enhance the operational performance and increase profits. Although the supply of PTA increased because of the devotion of additional throughput in Mainland China, product spread continued to drop. Due to the low energy consumption, optimal quality, and steady lead time of Ningbo PTA that are highly trusted by customers, however, production on full throughput was maintained throughout the year. The output of production lines in Taiwan, on the other hand, was adjusted accordingly reflective of the distribution and efforts continued to be devoted to the optimization of processes in respective plants so as to bring down the processing cost. The new production line of PIA in Ningbo that has an annual throughput of 200 thousand tons was commissioned on May 17, 2021. Continuous efforts will be devoted to exploring potential new customers of bottle chips, low melting point cotton, and coatings on the local market. Plus, the existing throughput in Taiwan, it will hopefully further increase the presence of the Company's PIA on the global market.

As far as plastic products are concerned, thanks to the economic recoveries in Europe and America because of the easing pandemic, the demand for raw materials and supplies in bulks returned globally in 2021. Customers were more willing to make purchases. The ice storm in Texas in February also pushed up prices of petrochemical products. Purchase orders for exports to Mainland China continued to grow, too. Sales of plastic particles were optimal. The spread significantly expanded as well. Both the plant in Taiwan and that in Ningbo made unprecedented profits. The Company continued with the cage change program for the sustainability of plastic products in 2021 by promoting high-value products and market diversification. High-value PS/ABS products exceeded 45%, PP 50%, and PC only 25% and pending further efforts. In terms of market diversification, on the other hand, most accomplishments were achieved for PP products. The market share in Mainland China already dropped to 33%.

As far as textile and fiber products are concerned, despite the demand impacted by the pandemic in Taiwan and Vietnam and other unfavorable factors such as the three on-the-spot policy implemented in Vietnam and the pricecutting competition among textile products to be exported of Mainland China, business operation remained steady with optimal profits in 2021 with early preparations and proactive control

over business opportunities plus the obviously improved operations for nylon and textile products after restructuring and implementation of the policy to keep what is valuable and reject what is worthless and powerful promotion of high value, environmental protection, and recycling. Among the textiles, the throughput was adjusted and maximized for natural cotton yarn and the sales of high-value yarn grew 112%. Profits made by the plant in Taiwan and that in Vietnam were the highest over the past 10 years.

Sustainable business development has always been a focus for the management and ESG (environmental protection, social responsibility, and corporate governance) tasks have been paramount in the Company's operations over the years.

For improved industrial safety, the Company formed the Sustainable Safety Mechanism Group in 2019 that enforces the people-centered safety strategy, discovers safety management blind spots at a depth to eliminate potential risks, and communicates to employees to reinforce their safety awareness and boost safety in the workplace. In 2021, the Company was honored by the "Sustainable Safety Mechanism Group" Award and the "Excellent Occupational Safety and Health Institution" Award. In 2022, the promotion will be continued from scratch for comprehensive improvements. Outstanding cases will be released on a quarterly basis of PHA, ISA/SOP, MOC,

and false alarms to fulfill the experience-sharing purpose and educational training for contractors and employees will continue to be enforced; equipment MI will be enhanced; and employees' safety cultural thoughts will be changed while working towards zero hazards.

In addition, to cope with the extreme changes to the operational environment brought about by the digital technology and the industrial setting, the Digital and Energy Transformation Project Team was formed in December 2021 to take charge of digital and energy transformation efforts throughout the Company. Digital transformation mainly includes: Digitalization, optimization, and AI application in four aspects, namely, smart operation, operational dynamics management, smart care, and factory and process safety. Energy transformation mainly includes: Continued efforts in the promotion of water and energy conservation, establishment of coal reduction and energy transformation strategies, development of solar power, and clean energy technologies such as small water power and wind power generation as well as enrollment in the Science Based Targets Initiative (SBTi) and the Task Force on Climate-related Financial Disclosures (TCFD) in order to be on a par with international climate change-related initiatives and to answer to the global carbon reduction trend. Over the years, energy conservation and carbon reduction accomplishments accumulatively totaled NTD \$11.32 billion, with 5,585 engineering



····· Oyster Rope Recycling and Reuse Presentation on 2021 Earth Day.

improvement projects completed, saving a total of 69,500 tons of water per day, 1,210 tons of steam per hour, and 119 thousand kWh of electricity per hour.

As investments by the Company continued, the new throughput of 200 thousand tons per year in the Ningbo facility for PIA was commissioned in May 2021. The annual throughput of composite materials of the three plants across the Taiwan Strait under the Plastics Department combined reached 132 thousand tons. In early 2022, the scope of operation also covered recycling of plastics while transformation continued. In addition, the throughput of the ABS plant in Ningbo will continue to be expanded by 250 thousand tons in 2022 and the process for an annual output of 1.5 million tons will be added to the PTA plant in Ningbo in 2023. The most advanced production technologies will be adopted to be unparalleled in the industry.

2022 will still be a year of major challenges brought about by the collection of carbon tax, the international political and economic situation, the recurrent nature of the pandemic, the persistent supply chain issue and continuously climbing inflation pressure as a result of the port backlog and the shortage in cabins and containers, and the interest rate rising cycle in Europe and America. The many uncertainties are pegged with subsequent economic change globally. Plus, the rising cost of energy and the excessive investments in and commissioning of new petrochemical and plastic throughputs in Mainland China that will lead to customers remaining conservative, the Company is faced with even greater challenges in its business operation than those in 2021. If the pandemic grows towards lighter symptoms and influenza-oriented; therapeutic drugs become available; and the world can cope with the virus, with reduced pandemic control measures, gradually resumed economic activities, and gradually normalized supply chain, port backlog caused by insufficient manpower resolved, a decline in the shipping cost, lessened cost, and

improved purchasing power, the new throughputs will contribute to gradual yet expedited digestion and it will help with the Company's operation and development of business opportunities.

The Company will stay firm in coping with the operational stress in 2022. Besides continuing with the circular economy and energy conservation/ emission reduction and keeping only the best under its production and distribution structure, the promotion of smart plants with the introduction of AI will be continued for enhanced production and management efficiency. In light of the fact that carbon neutralization has become a world issue, the Company defined its goals and enforced them last year, with an ultimate goal of comprehensive carbon neutralization by 2050. The phased goals were already disclosed during the 2021 General Shareholders' Meeting. The carbon emissions would be reduced by 15% by 2030 compared to 2020. The detailed plans and schedules prepared by respective departments will realize a reduction of 18.6%. The emission reduction plan, in particular, includes improvement in energy conservation, fuel transformation, energy conversion, development of green renewable energies, and CO₂ recycling.

In 2021, the Company already laid the groundwork for the development of green products, such as nylon scraps and recycled fishing nets. For the time being, the goal of 500 tons a month has been fulfilled. Meanwhile, the circulatory recycling mechanism is in place through collaboration with downstream service suppliers to live up to the theme: "We Produce, We Recycle". This year's goal will be 1,250 tons a month so that the recycled caprolactam accounts for 12% of the total amount consumed. Meanwhile, the Company works with plastics recycling businesses and holds shares in them to hopefully ensure sources of plastics to be recycled, to secure the production of value green materials, and to create an accountable and sustainable operational environment, answering to sustainable development trend and goal under global climate change.



Formosa Petrochemical Corporation

Expedite the development of high-value products and diversified product categories through digital transformation and application of artificial intelligence - achieving sustainability and co-prosperity with the environment.



In 2021, FPCC generated NTD 620 billion in sales revenue, a 49.3% increase compared to NTD 415 billion in 2020; consolidated earnings before tax was NTD 60.5billion, an 59.8% increase compared to NTD 8.6 billion in 2020. EPS came in at NTD 5.19



Chairman **Bao-Lang Chen**

Foreword

Over the past year, widespread vaccination effort led to the lifting of restrictions in major developed economies. As people returned to POST-COVID-19 life, economic activity began to reactivate gradually. In the meantime, accommodative monetary policy and transportation constraints triggered both commodity and crude oil price hikes. During this period, stable operation in Mailiao complex was accomplished by flexible sales and operations strategy which adapted to volatile market environment. Hence, FPCC delivered a remarkable performance in 2021.

Petroleum Refining

Well-rounded sales and operations plan is developed to achieve profit maximization. Product mix and production models of each refined petroleum can be flexibly adjusted based on market price differentials. In the first half of 2021, due to sluggish oil demand, FPCC slashed refinery throughput, scheduled routine maintenance, and took time to upgrade refinery equipment. In the second half of the year, oil demand recovered along with increased refinery utilization rate. As a result, annual profit increased significantly compared to 2020.

In terms of production, the average daily throughput reached 387,000 barrels (+3.5% YOY). The increase is mainly resulted from the recovery of RDS #2 in July, 2021 and then utilization rate raised because of improved product spread.

As for domestic market, FPCC put a great emphasis on sales channels expansion and petroleum sales increase. Also, diverse marketing channels have been utilized to raise brand awareness and expand customer base. Starting from Sep 2021, FPCC collaborated with President Chain Store Corporation to launch Formosa Member Day On Saturday in order to attract members refueling at Formosa petrol station. Furthermore, increasing brand exposure by showing our brand name on well-known TV programs strengthened brand image. Although the surge in COVID-19 cases in Taiwan last year had slowed transport activity pushing domestic sales volume went down, market shares growth still reached 1.3% compared with 2020.

With regards to foreign sales, oil demands rose progressively as various countries lifted lockdowns. FPCC exported gasoline at 2.8 million kiloliters (+57% YOY) and diesel at 7.3 million kiloliters (+6% YOY).



Expand the cooperation with oil dealer to increase market share

Basic Petrochemical Materials Business

Basic Petrochemical Materials business is deemed as the upstream plants in the vertical production chain which supplies raw material to downstream units constantly. By utilizing economy of scale and flexible feedstock usage to achieve optimized production arrangement, FPCC demonstrated the benefits of vertical integration. In the first half of 2021, numerous petrochemical plants in Texas shut down due to the Winter Storm Uri. Supply shortage led petrochemical products price remained high, therefore, product margin increased greatly. However, in the second half of 2021, suffering from high feedstock costs, weakened demand, and new capacities online, petrochemical business's profit was not as high as expected but the annual profit grew significantly compared to 2020.

Utilities Division

The primary mission of our cogeneration units is to offer stable and sufficient power to all units within Mailiao complex. Moreover, having a sustainable development mindset, FPCC is not only devoted to improving the efficiency of turbine generators but introducing the most advanced technology to raise the efficiency of pollution prevention. Those works remarkably reduced carbon emissions. In 2021, an upward trend was seen in the coal price because of global economic recovery and supply reduction in major production countries. Due to the surge in coal cost, the overall profit of utility division declined compared to 2020.

2021 Sustainable development

Environmental, social, and governance topics (ESG) are getting more attention from



... NKFG pandemic-preventing result announcement campaign

global firms. With no exception, FPCC believes putting more focus on environmental protection, governance, and community can create the momentum of sustainable development. Accordingly, FPCC formed a team led by our chairman to promote ESG. We have committed to producing gas-fired power, renewable energy, and energy storage system as we strive to mitigate the environmental impact step by step.

Furthermore, FPCC adopted big data and AI to navigate the company. We have optimized the process models to achieve high-value products with low energy costs. In 2021, we completed 18 projects related to AI implementation, with estimated benefits up to NT\$4 Billion. We are also taking actions to reduce energy consumption and carbon emission. 210 proposals were raised in Mailiao complex in 2021, and all the cases were addressed properly. We are making progress in many areas. To be more specific, our complex

conserved 5,691 tons of water per day, saved 4,232 kW per hour and reduced 173.5 thousand tons of GHG emissions. Furthermore, FPCC tries to obtain water resources in various ways. Our desalination plant with a daily capacity of 100,000 tons is under construction.

Corporate governance also plays a critical role in FPCC's long-term strategy. We are devoted to transparency and protection of the interest of the investors. Additionally, FPCC keeps enhancing the function of board directors, making the company execute governance-related policy more efficiently. According to the evaluation from the Taiwan stock exchange corporate governance center, FPCC ranked top 5% out of 905 listed companies.

FPCC is always dedicated to community investment as we believe giving back to society and to those people in need are our sacred missions. We collaborated with charity foundations



· · · · Refinery in Mailiao

to support children and people who suffered from violence, poverty, and pandemic. The company will continue to work closely with communities and help support their needs.

2022 Sales Goals

For petroleum products, our estimated sales volume for gasoline and gasoil are 4.940 million KL and 9.568 million KL respectively. We keep bringing more member feedback activities to retain a solid relationship with existing domestic customer group; on the other hand, we will continue to expand the customer base via various marketing channels such as TV, broadcast, internet, and sports events. Regarding the export market, we proactively cooperate with oil majors and trading houses to expand our oil market shares in Singapore, Malaysia, New Zealand, and Australia.

In respect to petrochemical products, the expected sales volumes of ethylene, propylene,

and butadiene are 3.107 million MT, 2.506 million MT, and 434 thousand MT respectively. The petrochemical plant, with stable operation, will meet the feedstock needs of the downstream units while selling the excess products in the international market to obtain higher profit. As for the Utility division, the key role is to provide consistent electricity and steam to meet the demand of all units in Mailiao complex.

Outlook

As the world enters 2022, global economic outlook is still blurred by the spread of coronavirus variants while supply chain disruption, inflation, monetary policies, and geopolitical risks all make commodity prices and money flow more unpredictable. In addition, the worldwide collective actions to combat climate change have brought out much stricter environmental regulations and eventually come to an unneglectable trend toward energy transition, which the petrochemical

industry will have to engage and adapt to in the future.

Facing the shifts in operating environment and industry, we are planning to do more than just concentrate on our core business. Digital transformation, AI application, low-carbon technology development, and clean energy investments are all deemed as our strategic focuses to boost the competitiveness in this industry. While increasing both energy and material efficiency, we still can expedite the development of high-value products and diversified product categories

-achieving sustainability and co-prosperity with the environment.

Stepping into FPCC's 30th year, the ups and downs we had experienced in the past strengthened the growth of our business. We sincerely appreciate the continued support and trust from every shareholder and look forward to jointly creating a brighter future.



•••• Strengthen company's competitiveness by digital transformation and artificial intelligence



Formosa Plastics Group-US. Operations

FPG U.S. operation has always had a core management goal of ensuring sustainable operation and growth. Achieving this goal relies heavily on our continuous efforts to emphasize environmental and safety management, long-term human resources training, and staff quality improvement.



Formosa Plastics Group - U.S. Operations consists of Formosa Plastics Corporation, U.S.A. (FPC USA), Nan Ya Plastics Corporation USA (NPC USA), and Nan Ya Plastics Corporation, America (NPCA). In 2021, the total revenues for this group of companies were US\$6.6 billion, which represents a 50% increase from the US\$4.4 billion in revenues achieved in 2020. Although the Covid-19 pandemic continued to ravage worldwide due to the variant virus (Delta & Omicron), it caused profound impacts on regional economic activities. Still, with the rapid promotion of vaccines, major economies, including the U.S., UK, Eurozone, and other regions, have been gradually lifted and opened up, business activities have resumed, and the manufacturing industry has continued to grow steadily. Among them, the U.S. manufacturing purchasing managers' Index (PMIs) in 2021 remained between 57.7 and 63.4, indicating that the U.S. manufacturing industry has recovered from the Covid-19 pandemic and continues to expand strongly. In the U.S. petrochemical industry, the overall demand grew steadily; however, due to the freezing climate in the Gulf of Mexico in the first quarter, the output of various petrochemical products decreased, and the supply was insufficient. As a result, the prices of ethylene propylene raw materials and olefin products such as PE, PP, and PVC continued to rise sharply month by month, and it lasted until the fourth quarter to stop growing and falling back. The company enjoyed increasing revenue and profit in 2021 due to tight overall supply and rising prices.

In terms of production, following the core vision of sustainable business management and continuous improvement. All Texas plants conducted the critical 10-year equipment comprehensive and in-depth inspection starting in 2020, finally completed in the first half of 2021. Due to the freezing climate in Texas, equipment inspection, and annual maintenance, the overall operating rate dropped to about 70%. Furthermore, during 2021, the company has continuously improved product quality, process, production efficiency, benchmarking among the peer industry, etc. We believe these improvements will contribute to an advantage in cost positions and competitiveness in the marketplace.

In the Olefins and Polyolefins segment, our oil & gas operations were supplied with natural gas, ethane, and propane by the spot market. In 2021, our olefin crackers produced 3 million metric tons

of ethylene and 390,000 metric tons of propylene. Polyolefin operations had 1.73 million metric tons of polyethylene (PE), and 920,000 metric tons of polypropylene (PP) produced.

For the Chlor-Alkali, the FPC USA Utility Venture's power plant generated electricity to electrolyze brine to produce 1.06 million metric tons of caustic soda and chlorine. These materials then pass through our ethylene dichloride (EDC), vinyl chloride monomer (VCM), and polyvinyl chloride (PVC) process to produce 1.46 million metric tons of PVC resin. NPC USA made 60,000 metric tons of rigid PVC film, and NPCA had 48,000 metric tons of flexible PVC film produced using a portion of the PVC resin.

In the PET/Fiber segment, FPC USA supplied the ethylene for NPCA to produce 1,190,000 metric tons of ethylene glycol, 860,000 metric tons

of polyester derivatives, and NPC USA to produce 11,000 metric tons of PET Rigid Film.

Our set marketing strategy is to balance production and sales, set North American customers as the key focus area, and continuously export as a corresponded outlet. We strategically selected specific product grades to expand our customer base and formed partnerships through research and new product development. In North America, we focused on high-growth, high-profit margin segments across customers of different sizes. We also begin to reduce the sales of one-time used plastics gradually. We have already set up regional bonded warehouses and storage stations in Europe, Taiwan, and Korea to support our capacity expansions in the export market. In 2021, we achieved the sales target of 10,000 metric tons of polyolefin products per month in these areas. Besides, we continue to grow in Mexico, Central America, and South America by taking advantage of low freight costs.

Regarding FPC USA's phase 4 expansions, the High-Density Polyethylene III plant, Olefins III plant, Lolita Packaging plant, Low-Density Polyethylene, Ethylene Glycol II, and Utility III plants have been fully commercialized into routine operation from 2019 to 2020. These new expansions have further improved the overall polyethylene and polyester product portfolios, enhancing the company's competitiveness.

FPG U.S. operation has always had a core management goal of ensuring sustainable operation and growth. Achieving this goal relies heavily on our continuous efforts to emphasize environmental and safety management, long-

term human resources training, and staff quality improvement. We also begin evaluating carbon reduction strategies and focus on value-added and environment-friendly products development. We will continue to enhance the customer-oriented sales service and management functions - by focusing on long-term customers who demand excellent product quality and services. Ultimately, we believe these implementations will improve our global presence, increase profitability and grow the market share.

Looking forward to 2022, with global travel and business activities gradually resuming, manufacturing growth will continue. Due to favorable factors of natural gas and raw material prices, the operating rate of olefins and their downstream plants (PE, PP, PVC) in the North American petrochemical industry is expected to remain stable and high. The product prices are expected to fall from high-end due to increased supply. The critical 10-year equipment comprehensive and in-depth inspection of the plants was completed in 2021. We estimated that the production and sales volume would increase in 2022. We could significantly reduce the cost of maintenance and the shutdown loss, and maintain the profit at a level comparable to that was in 2021. However, the global Covid-19 epidemic, global supply chain bottlenecks, environmental protection, and carbon reduction projects may cause various raw material prices to rise. Global and U.S. high inflation and pressure to raise interest rates are not conducive to economic growth. Hence, it is expected that the overall financial situation in 2022 is still not optimistic, and the overall strategy still needs to be cautious and conservative.



····· Olefins III Plant in Point Comfort. TX



Other Investments

In addition to these four major corporations, the Formosa Plastics Group has many other affiliates.

Our domestic affiliates include:

NanYa Technology Corp., Nan Ya Printed Circuit Board Corporation, Formosa Sumco Technology Corp., Formosa Taffeta Co., Formosa Advanced Technologies Co., Formosa Heavy Industries Corp., Mailiao Power Corp., Formosa Daikin Advanced Chemicals Co., Ltd., Formosa Asahi Spandex Co., Hwa Ya Power Corp., PFG Fiber Glass Corp., Formosa Environmental Technology Corp., Formosa Idemitsu Petrochemical Corp., Formosa BP Chemicals Corp., Formosa FCFC Carpet Corp., Formosa Oil (Asia Pacific) Corp., Formosa Plastics Transport Corp., Formosa Plastics Marine Corp., Nan Ya Photonics Inc., Formosa Biomedical Technology Corp., Formosa Technology Corp., Formosa Lithium Iron Oxide Corp.,

Our overseas affiliates include:

Formosa Plastics Corporation, U.S.A., Nan Ya Plastics Corporation, USA, Nan Ya Plastics Corporation, America, Formosa Ha Tinh Steel Corporation and P. T. Indonesia Nan Ya Indah Plastics Corporation. FPG's investments in Mainland China include Formosa Plastics Corporation, Nan Ya Plastics and Formosa Chemicals & Fibre Corporation.



···· Formosa Plastics Marine Corporation



····· Formosa Ha Tinh Steel Corporation



Non-Profit Organization—Medical Care Chang Gung Memorial Hospital

Chang Gung Memorial Hospital implements Artificial Intelligence in clinical medicine fields with a patient-centered way, and will continue to use "Informatization" as an overall strategic tool to become a more technology- and information-advanced hospital.



In order to achieve the goal of "service quality improvement and appropriate medical cost control", Chang Gung Memorial Hospital has continuously evaluated Taiwan's environment and needs with the exploration of each core problem for more than 40 years. Patient orientation is our central belief to develop environmental innovation and high-quality medical care. Taking good use of limited resources maximizes the effectiveness and the contribution with unstoppable progress of Taiwan's medical standards.

Established in 1976, Chang Gung Memorial Hospital (CGMH) is now in its 46rd year of operation. Adhering to the belief of "What is Taken from the society is to be used in advancing the interests of the Society", we have overcome numerous obstacles during that timeframe. By integrating teaching, research, services and sound management, we have created an institution that serves the public as we strive toward upgrading the level of medical care and enhancing the well-being of the society.

1.Teaching

As a teaching hospital, we have launched cooperative programs with Major medical schools in the country to provide their interns with clinical training. We have also developed a highly respected resident training system designed to nurture highly competent attending physicians in different specialties. In 2021, 188 residents finished their training program at CGMH for promotion to Attending Physician. Over the years CGMH has graduated over 4,406 students to achieve excellent. Performance in their respective careers in the medical profession.

2.Research

To encourage R&D , we provide funding for clinical research , basic Medical research and international studies for our medical , nursing , technical and administrative staffs \circ In 2021 we

supported international studies for 21 research staff personnel, and conducted more then 3,205 medical research projects under the Ministry of Science and Technology and Ministry of Health and Welfare. In addition, we provided Funding of US\$ 137.23 million, and published 3,315 SCI qualified papers. 67 patents, 8 patent authorizations, 57 Research Innovation Award winning projects and 46 winners. The academic research results and published manuscripts contribute greatly in the academic fields.

3.services

As one of the biggest general hospitals in Taiwan, both our facilities and our level of health care are on par with first-rate hospitals around the world. By the end of 2021, we offered 11,000 beds with health care services provided by over 25,500 employees • In 20201we served over 8.25 million outpatients and admitted almost 248,000 patients for inpatient services.

4. Management

To achieve the goal of enhancing service quality and controlling Medicalcosts within reasonable limits, for over 45 years we have Constantly evaluated local conditions and needs, inquiring into the root Of every problem. With patients at the center of our mission, we have embraced innovations allowing us to provide the best possible medical care, to make the most of limited resources and to enhance the quality health service in the country.



 Achieve epidemic prevention goals with Intelligent Technology during the COVID-19 pandemic.

Following the Founder, Mr. Yung-Ching Wang's idea, Chang Gung Medical Foundation has dedicated ourselves in consolidating work flows, human resources and facilities with technology to assist the operation and improve the quality of medical service. We have also made efforts to implement Electronic Medical Record and Smart Hospital policies in order to enhance medical information security, In 2019, Chang Gung Memorial Hospital became the first hospital that receives field certification of

"Healthcare Information Management Systems Society (HIMSS)" Level 7, the highest level of this certification, showing great approval of our information infrastructure and application, Chang Gung Medical Foundation will continue the use of Informatization as a systematic strategic tool, becoming a tech-savvy and information-based organization.

Valuing the necessity of artificial intelligence as part of the future development, Chang Gung Medical Foundation set up the Artificial Intelligence Core Laboratory to apply AI technology on clinical use, assisting diagnosis and avoiding human resource waste at the same time.

The laboratory also focuses on combining communication technology and existing resources to make the process of medical service more convenient. For example, clinic visits, hospitalization, prescription pick-ups etc.

In the future, the laboratory will work on developing mobile telemedicine equipment with high resolution using 5G technology. The results could allow patients from distant areas or under the influence of pandemic to keep accessing medical services.

During this once-in-a-century pandemic, Chang Gung Memorial Hospital developed the "Infection Control Information Platform", connecting personal travel and contact history data from the National Health Insurance Cloud Database to collect Travel history, Occupation, Contact History, and Cluster History (TOCC) of patients and employees. All information systems in the hospital can be linked to remind medical staffs of the patient's relevant information during the medical process.

Meanwhile, through business intelligence

application, the infection control department can monitor all fever patients from all wards in the hospital on a real-time basis to discover pulmonary infiltrate cases based on medical records and quarantine them to prevent hospital-wide infections.

On the other hand, the "Infection Control Technology Platform" developed during the COVID-19 pandemic implemented the fully automate process of PCR test to meet all clinical demand while combining the Smart Specimen Identification System to automate the process from distributing specimens according to the inspection tickets to generating laboratory profiles and the corresponding tags. The aforementioned process greatly increased the efficiency of laboratory tests, capable of conducting 5800 specimen test per day and generating reports within 3 to 6 hours, the total number is up to 300 thousnd which is the largest capacity in Taiwan.

In addition, our hospital had applied technology to all aspects of infection control. For example, the PPE supply monitor and abnormal use alarm system, video consultation system and the telemedicine system.

In the area of organ management, we continue to promote the Concept of organ donation and perform organ transplants • In 2021 CGMH received organ donations form 95 people and performed organ transplants that included 110 cornea cases, 6 heart cases, 13 lung case 80 kidney cases (include 31 case of vivo transplant), 187 liver cases (include 55 case of vivo transplant), The hospitals also handled 5 body donations •

CGMH has also been active in providing advanced social services • In 2021 • CGMH provided relief to over 3.09 million patients • CGMH have taken an active part in Social welfare such as Charity project of sport medicine, Mobile health care project for rural schools in Yilan County, The protection of children and youths program, Health care system of communities in Yunlin County, Telemedicine service, Medical volunteer programs by employees, etc.representing An outlay over US\$ 23.84 million from our social service fund •



2nd Annual Academic Conference of Chang Gung Sports Medicine, 2021



Non-Profit Organization—Education Chang Gung University

Employing internationalization to promote innovation, the university keeps enhancing teaching and research in various fields, continues working on industrial innovation, and facilitates international academic exchanges in response to social demands and trends.



From the very beginning of the establishment, Chang Gung University has been planning long-term curricula and academic research programs under the educational motto of "Diligence, Perseverance, Frugality, and Trustworthiness". These endeavors have helped the university achieve its goal of "combining theory and practice in education programs". In addition, efforts have been made in pursuit of excellence in instructions and academic research and long-term promotion for holistic education of its students.

Chang Gung University was established in April 1987 under the name of Chang Gung Medical College, with the aim of preparing future outstanding medical professionals. In order to support the economic development of the nation, Chang Gung Medical College later introduced the engineering and management programs to prepare young talents in these fields, and was renamed to Chang Gung College of Medicine and Technology. In August 1997, the Ministry of Education formally approved the name change to Chang Gung University. At present, Chang Gung University has three colleges: Colleges of Medicine, Engineering and Management and includes 18 departments, 3 bachelor's degree programs, 23 master's programs, 7 master's degree programs, 12 doctoral programs, and 1 doctoral degree program. Furthermore, the Department of Biomedical Engineering and the Graduate Institute of Artificial Intelligence will be established in the 111th academic year. The university is also in the process of applying for setting up the College of Intelligent Computing.

From the very beginning of the establishment, Chang Gung University has been planning long-term curricula and academic research programs under the educational motto of "Diligence, Perseverance, Frugality, and Trustworthiness". These endeavors have helped the university achieve its goal of "combining theory and practice in education programs". In addition, efforts have been made in pursuit of excellence in instructions and academic research and long-term promotion for holistic education of its students.

There are 592 full-time and 681 part-time faculties and preceptors currently. CGU has 6,930 students, including 5,236 undergraduate students and 1,694 postgraduate students. In addition to classroom learning, students are required to participate in various internships and cooperation programs with Formosa Plastics Group, Chang Gung Memorial Hospitals and other institutions in order to achieve the goal of "combining theory and practice" . There are plenty of opportunities for various practical training or work-study programs available to students during semester breaks. These programs are designed to allow them to gain working experience and to develop proper working ethics before graduation. In response to the needs of industry as well as the growing trends of artificial intelligence, the university has introduced a number of credit programs and micro programs, and expand the summer credit program as well as the digital innovation program. These programs are also available to the students who desire to develop additional expertise or secondary specialty in addition to their major programs. Graduates of Chang Gung University have proved their abilities and competence at work or during their advanced studies; they also are well liked by their employers because of their devotion and ethics displayed in the workplace.

Our interdisciplinary research centers develop key technologies and jointly participate in domestic and international organizations to assist in solving significant social and environmental



..... Industry-university cooperative professional talent cultivation in computer memory.

issues. For instance, the Molecular Medicine Research Center continued participating in the US Cancer Moonshot Program to contribute to the prevention and treatment of cancer. The Research Center for Emerging Viral Infections developed the "New Coronavirus Neutralizing Antibody Detection Technology" and won the silver award of the "Technology Transfer Award" of the 2021 Taipei Biotech Awards, as well as the "Outstanding Technology Transfer Contribution Award" of the Ministry of Science and Technology in 2021. In conjunction with the College of Engineering, the Research Center for Emerging Viral Infections has successfully developed the "COVID-19 Neutralizing Antibody Testing Automation Platform". In terms of academic performance, the US-based Stanford University has recently released a list of World's Top 2% Scientists in 2021. Chang Gung University was ranked the 9th nationwide and the first among all domestic private universities. According to the 2021 Academic Ranking of

World Universities (ARWU) published by the Shanghai Ranking Consultancy in 2021, CGU was ranked at the 456th place globally and the 1st among all private comprehensive universities in Taiwan. Based on the 2021 CWTS Leiden Ranking exclusively based on bibliometric indicators published by Leiden University in the Netherlands, CGU was ranked within the top 300 in the world and the 2nd in Taiwan, closely following National Taiwan University. CGU is indeed an exemplary university that is impactful on Taiwan's scientific development.

Chang Gung University places emphasis on the equal development of morality, literacy, and professional abilities, integration between the individual and groups, and harmony between body and mind. Students are expected to develop into well-balanced individuals and are also encouraged to shape a lifelong learning attitude. Besides, indicators including caring and giving, teamwork, humanity and art, self-reflection, selfdiscipline, and innovation and progress, etc. are used to measure the effect of holistic education. These endeavors are made to ensure our students to transform into individuals who have balanced development in all aspects, have moral integrity, and maintain their principles. As a result of our efforts, Chang Gung University was honored to be named as a "Life Education Featured School" by the Ministry of Education in 2021. This award is an endorsement to our devotion to holistic education as well as an affirmation of our ultimate educational goal of the cultivation of sound personality in our students.

Chang Gung University aims to develop into a top-notch university with distinctive global vision. Using internationalization as a strategy to promote innovation, the university keeps enhancing teaching and research in various fields, continues working on industrial innovation, and facilitates academic exchanges with international institutions in response to social demands and trends. In addition, the university will persist on edification of its students by encouraging them to care for humanity and to devote themselves to serving society. The university's mission is to educate good young generation to develop sound personality, to acquire specialized knowledge and skills, to possess excellent learning capabilities, to believe in lifelong learning, and to develop a global mindset.



···· The 9th President Handover Ceremony



Non-Profit Organization—Education Chang Gung University of Science and Technology

Founded to support commitment to humanity and integrity, its vision is to be, in every aspect of health care, the highest-quality school and the source of the highest-quality nurses entering the field.



The institution today known as the Chang Gung University of Science and Technology (CGUST) was first established as the Chang Gung Institute of Nursing, a two-year junior nursing college granted approval by the Ministry of Education in 1988. In 2002, the university underwent restructuring, becoming the Chang Gung Institute of Technology.



···· Gallery of CGUST History

In early 2004, the university's Chiayi Campus was created to address the need for healthcare professionals in the Yunjia area healthcare system. The college finally transitioned to its modern iteration as the Chang Gung University of Science and Technology (CGUST) in 2011.

Currently, the Linkou and Chiayi campuses maintain two colleges, a Center for General Education, three graduate programs, and six departments. The institution's two colleges include the College of Nursing and College of Human Ecology; the Nursing Department, Graduate Institute of Nursing, Department of Gerontology and Health Care Management, Department of Respiratory Care, Child Care and Education Program, Department of Cosmetic Science, Department of Nutrition and Health, and the Graduate Institute of Health Industry Technology comprise CGUST's post-secondary departments. The five research centers include the Clinical Competency Center, Chronic Diseases and Health

Promotion Research Center, Geriatric and Long-Term Care Center, Research Center for Food and Cosmetic Safety, and Research Center for Chinese Herbal Medicine. The university embodies the pragmatic spirit of technical vocational education, helping fulfil a need for healthcare professionals in society.

The university's outstanding performance has been recognized by students, parents, and numerous institutions both nationally and across the world.

- All departments have passed the "Professional Education Certification" of the Taiwan Evaluation Association, ensuring that the university fulfills nationally accredited teaching quality assurance standards.
- The school placed in the Top 6 medical universities for Global Views Magazine's



Through hands-on learning, students from CGUST Department of Nutrition and Health Sciences program learn how to prepare healthy foods that are delicious and nutritious.

"Taiwan's Best Universities" ranking in 2021.

- Times Higher Education's 2022 World University Rankings ranked CGUST as Number 2 in their list of Taiwan's best private science and technology universities, further awarding CGUST 1000+ achievements in the fields of "Clinical and Health" and "Life Sciences."
- According to the Ministry of Education's Public Information on University, CGUST's enrollment rate in the 2021-2022 academic year was 97.99%, ranking first among Taiwan's private universities of science and technology; the retention rate was 97.88%, the highest rate nationally among vocational universities.
- From 2018 to 2021, the school was

awarded NT\$242.84 million by the Ministry of Education's "Higher Education Sprout Project" (HESP).

The Chang Gung University of Science and Technology has grown since its founding, reflecting the strength of the University's central tenets and educational principles. Currently, the University employs 321 full-time teachers and enrolls 6,397 students. With additional expansion of excellent academic programs over the years, the University seeks to nurture high-quality professionals in the healthcare industry.

CGUST is a health sciences university w hich places an equal emphasis on research and teaching performance alike. Founded to support commitment to humanity and integrity, its vision is to be, in every aspect of health care, the highestquality school and the source of the highestquality nurses entering the field. To develop the spirit of diligence and endurance in its students, and to enable them, in both theory and practice, to apply that spirit for the benefit of society, the University has cooperated with Chang Gung Memorial Hospital, the Formosa Plastics Group, and 301 other organizations to provide students with a wealth of internship opportunities. The students are thus offered chances to accumulate work experience and hone their skills. This strategy is designed to help students achieve their educational goals of combining work experience with classroom knowledge concretely, placing them in an advantageous position in today's competitive job market.

Moreover, the University has implemented a mandatory on-campus residence policy to pursue integration of school education with guidance and discipline. Based on the belief that ethical and moral education is developed in daily life, the policy aims to promote holistic student development, encouraging emotional awareness, humility, respect for life, and conscientious engagement with society. These programs cultivate students as consummate professionals, with love and patience for their work.

With respect to academic research, the University encourages teachers to participate in research projects in cooperation with the government, Chang Gung Memorial Hospital, and the Formosa Plastics Group. Efforts

in cooperative research projects with other industries are strongly supported as well. In the academic year of 2021 alone, the university received 202 Industry-University Collaboration Projects with grants values approaching \$5,890,402.05 USD. A total of \$1,872,042.25 USD in grants was awarded from the Ministry of Science and Technology for 59 research projects, and a total of \$1,545,294.98 USD in grants was awarded from governmental offices for 48 research projects. In addition, grants totaling \$2,473,064.82 USD were accumulated by 95 cooperative projects between the University and the private sector.

In response to the rapid changes in society, the University is dedicated to improving its administration, with personnel as its central consideration. Moreover, CGUST's learning environment is constantly being improved to support the ideal of providing quality health care for the general public. As we move forward, our aim toward perfection will continue to guide the development of the University administration, teaching, research, industry cooperation, and student development. The Chang Gung University of Science and Technology continuously strives to foster top-quality professionals who provide the best professional education.



···· Practices in safe transfer techniques



Non-Profit Organization—Education Ming Chi University of Technology

In the pursuit of adhering to the spirit of perfection, we strive for excellence in everything, keep making self-improvement, and are tailored to the requirements of the development of the whole industrial economy in order to continue cultivating professional talents with good character.



In the 1960's while both the industrial and economic developments were taking off in Taiwan, there was a lack of mid-level professionals in the industries. In response to the developmental needs, Mr. Y. C. Wang and Mr. Y. Z. Wang, the founders of Formosa Plastics Group, donated the funds for the establishment of the University in December 1963 in order to strengthen the cultivation of talents.

The University is located on the hillside of Kueizi Village in Taishan District, New Taipei City and was originally named "Ming Chi Institute of Technology." The campus occupies an area of 62 hectares with vast green areas and beautiful yet tranquil sceneries. More than 200 years ago, during the reign of Emperor Chienlong in the Ching Dynasty, the "Ming Chi Academy," founded by a Tributary Scholar, Mr. Hu Cho-yu in Southern Fukien, was located in the vicinity of the University. At that time the Academy was a center of intellectual and cultural hub and was also the cultural origin of northern Taiwan. This university was named "Ming Chi" with an aim to encourage the faculty and the students to learn from the virtuous elders and to embrace heritage and vision as their own mission.

With the exceptional operational performances and in response to the need for talents due to the economic development and the industrial advancement in Taiwan, the School was approved in 1999 for its transformation into "Ming Chi Institute of Technology." After being awarded Excellence by the annual evaluation conducted by the Ministry of Education (MOE) for six consecutive years, the Institute was approved again in 2004 for its further transformation into "Ming Chi University of Technology." The University currently hosts 4,492 students (4,097 students in the day division and 395 students in the continuing education division), 195 faculty members, and 114 staff members. The University consists of the College of Engineering, College of Environment and Resources, and College of Management and Design, offering 11 M.A. programs, two Ph.D. programs and 10 departments. All the departments and graduate institutes have passed the certifications of IEET (Institute of Engineering Education Taiwan) and ACCSB (Accreditation of Chinese Collegiate School of Business), showing that the University's educational system is on the international track.

Due to the fact that all the units of Ming Chi received top rankings and the school was ranked number one nationwide in the 2011 MOE Evaluation of Technological Universities, Ming Chi was approved to self-evaluate since 2016 instead of being evaluated by the MOE. In that year, Ming Chi passed the MOE evaluation on technological university affairs and self-evaluation on colleges. According to the data collected from Web of Science, Ming Chi ranked the third among all the technological universities and colleges in the year of 2020 in producing SCI/SSCI papers per author, including assistant professors and above, and ranked number one among all private technological universities nationwide. Surface and Coatings Technology in 2019 announced that Ming Chi ranked number seven worldwide in terms of the cumulative number of articles published in that journal from years 2016 to 2018. In 2018, the Institutional Research Center was established to develop a databased decision-making model to implement efficient and effective school management systems and pursue sustainable school administration. The average amount of subsidies per student at Ming Chi received from the MOE (including MOE grants, Teaching Excellence Program funds, and Higher Education Sprout Project grants) has led other funded technological universities for years. Ming Chi, which has been awarded certificates of information security management system (ISMS) ISO-27001, and environmental management system (EMS) ISO-14001 every year, is an outstanding technological university with excellent traditions and achievements.

The motto of the University is "Diligence, Perseverance, Frugality and Trustworthiness." In terms of "Diligence and Perseverance," we expect the students not only to work hard but also to do the right and useful things. Students are encouraged to build their wisdom and enhance self-confidence through the accumulation of such useful experiences.



···· Functional Atmospheric Plasma Lab

When students live simple and honest lives, they can concentrate on the pursuit of their life goals. Based on this foundation and equipped with the professional knowledge and skills, all our students are expected to become useful members of the society. Ming Chi has been a boarding school since its establishment. Through this shared on-campus living, students are encouraged to maintain a regular life, strong body and mind, while fostering grounded characteristics and good moral character. The Mindfulness Center was established in 2016. A selective course of Mindfulness for general education was offered to help students boost their concentration and observation. In 2018, the general education course "Design Thinking" was offered to guide students to develop interdisciplinary skills, to inspire their creative thinking, and to lay the foundation for them to explore practical problems and solve problems in the future. From 2019 to 2021, Ming Chi was awarded the "Excellent Green Procurement Performance" school by the Environmental Protection Department, New Taipei City. Moreover, since teachers also live on campus, they can better guide students and live up to the standards of propagating the doctrines of the ancient sages, who would not only teach but also clarify any doubts.

In order to take both theory and practice into account, and to help students develop the spirits of self-supporting, hard working, and endurance, Ming Chi has implemented the co-op programs by alternating regular classes and internship in four years. Students are arranged to participate in full time practical internship program for one year in the Formosa Plastics. This allows students to receive salaries from the work so that they could reduce the financial burden of their families and complete their studies. Through the internship, students are able to learn the techniques relevant to their professions as well as the practical

management skills. Students are also able to experience the meaning of diligence, perseverance, frugality and trustworthiness and develop the attitude of being down-to-earth and always getting to the bottom of everything. The overseas internship system is unprecedented. Presently the practical training program has expanded to various industries and companies in the U.S., Switzerland, Mainland China, Indonesia and Vietnam. The amount of students working overseas has accumulated to 593 till now. Moreover, Ming Chi has been selected to establish a project office to facilitate nationwide vocational schools in offering co-op programs. The practical training program has expanded to various types of industries with over 150 companies participating in the program. Students' performances are highly accredited in the industry. Ming Chi has also received lots of recognition of "Excellent Performances in Industry-Education Cooperation" evaluated and selected by the Chinese Institute of Engineers. The gap between school education and the employment among industries is effectively shortened, realizing the educational goals in connecting industries and education. According to the 2020 university ranking released by Global Views Magazine, Ming Chi ranked number one in the technology category of comprehensive universities among all other private technology universities. The Ming Chi alumni of the past years have received positive affirmation from the academic, industries, and business fields. In addition, to continue the founder's spirit of caring the financially/ physically challenged, Ming Chi has been offering scholarships of NTD 150 million accumulated until now.

Beginning from the academic year 2004, Ming Chi started to recruit aboriginal students in the four-year college in order to extend our concerns for the aboriginal students. Ming Chi has funded the aboriginal students up to NTD 430 million. This program has gained much appreciation from the aborigines and acclamation from the public in the society. Moreover, in coordination with the needs in lifetime learning and returning education for technical training, Ming Chi provides employee training for enterprises as well as career guidance for young adults. Meanwhile, in order to satisfy the needs of the alumni and members of the society in continuing education, the Division of

Continuing Education was established. This Division has offered in - service master program. In 2016, Dual Award Master's Degree Program was offered between Ming Chi and University of Cincinnati. Further in 2017, Ming Chi together with National Taiwan University of Science and Technology set up dual award Ph.D.'s degree program. In 2019, Dual Award Master's Degree Program was offered between Ming Chi and Northern Illinois University. Ming Chi has signed more than 90 sister school partnership agreements with overseas schools striving toward a goal of globalization.

practical researches and to provide industry - academia services for enterprises. With the development of internship opportunities, the industry academia cooperation relations are actively being built. Utilizing the resources of intern students, guidance teachers, specific research centers, the Industry - Academia Cooperation Center, and the Innovation and Incubation Center, we are able to achieve close cooperation with the industries and improve the research quality and quantity, and further contribute the research findings to the industries. While the education purposes as well as the advancement of technological force in the industries are achieved, a win-win situation is also created.

After the institute was upgraded to the university level, in addition to the usual devotion in the maintenance of the existing educational beliefs and practice, Ming Chi also focuses on "Industry-Academia Cooperation." Ming Chi has frequently been honored by the Chinese Institute of Engineers for its excellent practices in industry-academia cooperation. The iAuto team from Taiwan, consisting of Ming Chi University of Technology, National Taiwan University, L. L. iAuto Technology LTD, the Formosa Plastics Transport Corporation, and Industrial Technology Research Institute, took the runner-up prize in the 2019 Dubai World Challenge for Self-Driving Transport. Eight professors from Ming Chi are on the list of the "World's Top 2% Scientists 2020," released by Stanford University in 2021. According to the 2021 statistics released by the Ministry of Science and Technology (MOST), Ming Chi has ranked number four nationwide, and number one among private technology universities in the category of the average amount of funding per project director. In MOE's

2021 announcement, Ming Chi ranked number one among universities and colleges nationwide for its per capita amount of teachers' intellectual property rights. MOE also announced in 2021 that Ming Chi ranked the third nationwide, and number two among private technological universities and colleges in the average amount of conducting public and private industryacademia cooperation projects per project holder. These honors demonstrate the fruitful results of developing collaborative relationships with industry partners. In recent years, by means of continuously integrating the resources of various colleges, ten research centers have been established: the Biochemical Engineering R&D Center, the Center for Plasma and Thin Film Technologies, the Chinese Herbal Medicine Center, the Battery Research Center of Green Energy, Organic Electronics Research Center, Center for Reliability Engineering, Research Center for Intelligent Medical Devices, Artificial Intelligence and Data Science Research Center, Center for Environmental Sustainability and Human Health, and Intelligent Vehicle R&D Center. The faculty and students are always encouraged to participate in practical researches and to provide industry-academia services for enterprises. With the development of internship opportunities, the industry-academia cooperation relations are actively being built. Utilizing the resources of intern students, guidance teachers, specific research centers, the Industry-Academia Cooperation Center, and the Innovation and Incubation Center, we are able to achieve close cooperation with the industries and improve the research quality and quantity, and further contribute the research findings to the industries. While the education purposes as well as the advancement of technological force in the industries are achieved, a win-win situation is also created.

Education is the foundation of a nation and its importance is hardly surmountable. Ming Chi looks for "perfection" in every aspect including school administration, research, industry cooperation, and cultivation of students' integrity. We seek the best for everything we do, and pursue self-improvement at all the times. We hope to continue nurturing professionals with sound personality to work with the need of industrial economic development, and fulfill the university social responsibility. We aim to set a new model for the vocational education in Taiwan.

HEADQUARTERS

No.201, Dunhua N. Rd., Songshan Dist.,

Taipei City 105076, Taiwan (R.O.C.)

Tel: 886-2-27122211 Fax: 886-2-27178412 http://www.fpg.com.tw



FORMOSA PLASTICS CORPORATION, U.S.A.

9 Peach Tree Hill Road, Livingston. NJ 07039-5702, USA

Tel: 1-973-992-2090 http://www.fpcusa.com

