

LCY 
LCY CHEMICAL CORP.
2021 ESG Report

ECO Prosperity for Our Greener Planet.

A white line-art illustration on a blue background. It depicts a stylized industrial landscape. On the left, there are several jagged, angular shapes representing buildings or structures. In the center, a tall, cylindrical chimney stack rises, with a single leaf sprouting from its top. To the right of the chimney is a structure with several vertical columns, resembling a classical building or a processing unit. Further right is a large, rounded, dome-like structure with a vertical pipe extending from its top. The entire scene is rendered in a minimalist, geometric style.

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Dual Cycle ∞ Circular Economy

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About this Report

This documentation represents the 3rd time that LCY Chemical Corp has published an ESG Report. This documentation covers environmental (E), social (S), and governance (G) efforts during the period from January 1, 2021 to December 31, 2021. This report will be produced every 1 to 2 years in the future and is available in Chinese and English on the official LCY Chemical Corp website.

• Reporting Period

- Date of 1st Publication: August 2012 (CSR Report)
- Publication Date of the Last Report: July 2021
- Publication Date of the Current Report: November 2022

• Reporting Scope

The financial figures in this documentation correspond to the financial data in the LCY Chemical Corp's consolidated report and are presented in New Taiwan Dollars (NT\$). Environmental and social information in this report includes LCY Chemical Corp's Taipei Office, Corporate R&D Center in Nanzi, factories in Taiwan (Dashe, Kaohsiung, copper foil, Xiaogang, and Linyuan), Logistics Station in Qianzhen, Kaohsiung, two factories in China (Huizhou & Zhenjiang), and the U.S. factory (Baytown); any inconsistencies in the reporting scope will be detailed in the report. LCY Group acquired LCY Bioscience Inc. (Canada) in 2019 and Bridgestone (Huizhou) Synthetic Rubber Co., Ltd. (AR Plant) in 2021, but related financial information is not material yet and will not be included in the reporting scope of non-financial disclosures in 2021.

• Reporting Standard & Third-party Assurance

This report was prepared in accordance with the GRI Standards (Core option), SASB Standards, and TCFD recommendations. Assurance engagement for this report is performed by DNV Business Assurance Co., Ltd. in accordance with GRI Standards (Core option) and DNV VeriSustain™ Protocol. Please refer to the appendix for the independent assurance report.

Guideline/ Standard	Organization
GRI Standards - Core option	Global Sustainability Standards Board (GSSB)
Sustainability Accounting Standards - Chemicals	Sustainability Accounting Standards Board (SASB)
Task Force on Climate-Related Financial Disclosures (TCFD)	Financial Stability Board (FSB)

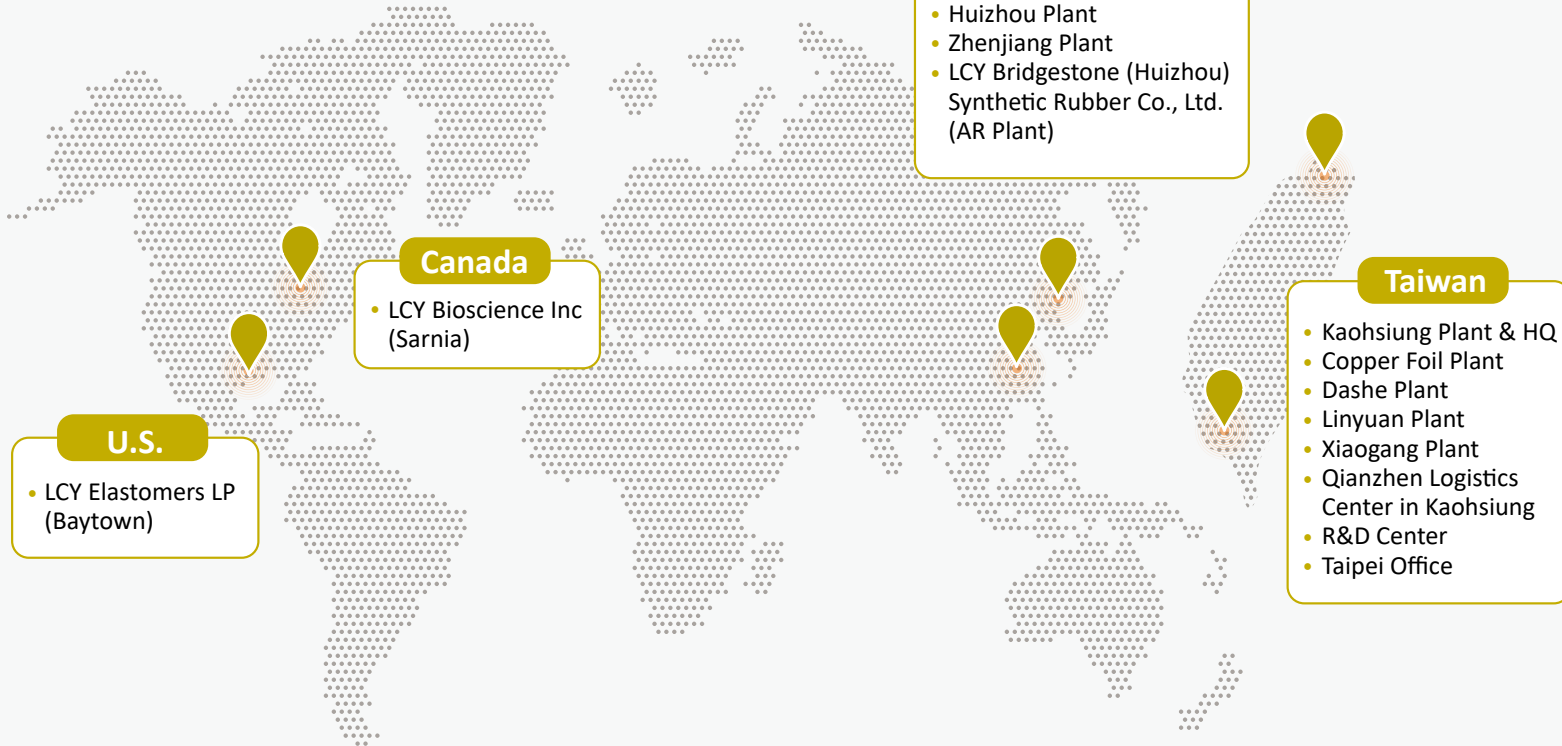
• Please see the appendix for the GRI index, SASB index, and TCFD index

• Material Changes

LCY Chemical Corp acquired Bridgestone (Huizhou) Synthetic Rubber Co., Ltd. at the end of 2021, but non-financial data will not be included in this documentation.

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• Locations



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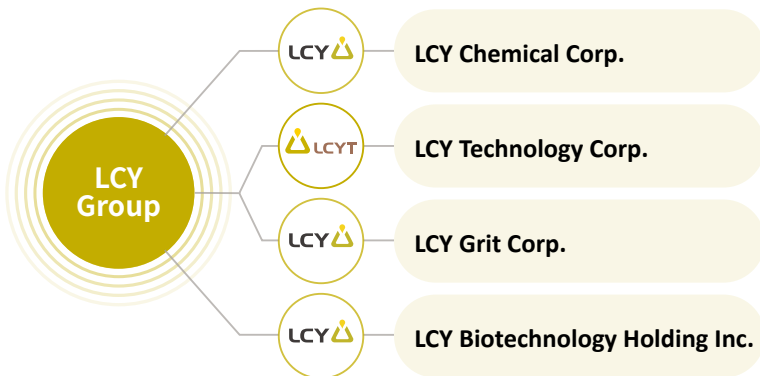
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• Contact Us

Please contact us if you have any suggestions or questions regarding this report.

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Working with Partners to Create a Circular Economy

The global manufacturing sector is currently under immense pressure to reduce carbon emissions. In Europe, the EU's Carbon Border Adjustment Mechanism (CBAM) will enter the transitional period in 2023 and begin levying floating carbon prices. In the U.S, the Clean Competition Act will begin levying carbon tariffs in 2024 and reducing carbon intensity baselines every year onward, driving carbon reduction in industries through increasingly stringent standards. Taiwan's economy has long relied on exports. In the future age of carbon pricing, reducing carbon emissions will be a social responsibility of corporations but, more importantly, a key factor that makes companies competitive.

LCYC is one of the world-leading corporations in materials and chemicals. We started investing in carbon neutrality over ten years ago, actively reducing our reliance on petroleum and injecting substantial resources to develop green materials and technology. In 2021, green products accounted for 5% of our total revenue. Building a circular economy is one of the critical strategies we've adopted to help us achieve net zero carbon emissions. We first introduced the circular economy model from the market and were able to successfully develop world-leading circular technologies and materials as we continued to research, develop, and innovate. Later, we gradually expanded circular economy applications and differentiated LCY from other competitors in the market, making us more competitive.

Pioneering the Technical & Biological Cycle for Chemical Materials

Created by the Ellen MacArthur Foundation, the butterfly diagram identifies resources in the technical cycle (not renewable) and biological cycle (renewable). The technical cycle focuses on the service model of reusing, remanufacturing, and recycling industrial products to continue creating value and reduce waste. The biological cycle focuses on reusing biological resources from agricultural, forestry, fishery, and

livestock industries and returning these resources to nature through composting, extraction, or anaerobic digestion. We are committed to innovating materials and have made strides to implement both the technical cycle and biological cycle, launching the EIPA Dual Cycle Circular Economy Model, a first in the technical cycle. We are proud to share that we are an important supplier in the global semiconductor industry that is actively promoting the circular economy. For the biological cycle, we've successfully developed a 100% bio-based bio-succinic acid, marking the commercial operations and global sales of a zero-carbon product.

Innovations in the Technical Cycle - Servitization of Chemical Products

We successfully developed the EIPA Dual Cycle Circular Economy Model, the world's first and only technology capable of converting waste solutions from semiconductor wafer rinsing into EIPA. We provide high-quality and high-purity IPA for wafer rinsing and then recycle the waste solution, which is then purified using exclusive technologies to reproduce EIPA of the same specs and grade. The recycled EIPA can then be used in semiconductor processes. When developing this technology, our research team had to overcome several challenges, but we were able to help semiconductor wafer manufacturers reduce carbon emissions produced from burning waste and reduce resource consumption by semiconductor fabrication processes; our technology is also now widely recognized by the market.

For plastics, a common target for recycling efforts on the market, we recycle and remanufacture plastic waste but also launched a comprehensive "Sustainable Plastic" solution, using styrene-ethylene-butylene-styrene (SEBS) as a plastic modifier. By enhancing the physical properties of waste plastics and reducing the difficulty level of remanufacturing processes, waste plastics can now be recycled over and over again. The SEBS process can also increase energy efficiency by 30% and productivity by 20%, which contributes to the 2050 carbon neutrality goal.

Message from the Chairman

Innovations in the Biological Cycle - 100% Carbon Neutral Bio-plastics

For the biological cycle, our R&D team in Canada successfully developed a bio-succinic acid produced from fermenting corn syrup using proprietary yeast. The bio-succinic acid is made from 100% biomaterials, the fermentation process produces zero carbon emission, and the entire process uses 63% less energy than succinic acids from liquefied petroleum gas. Plastic coatings made from bio-succinic acid can decompose completely into carbohydrates in a natural environment after 180 days without additional processing. Such plastic coatings are widely used by the largest coffee chain in North America for their paper cups. We also anticipate diverse applications for our bio-succinic acid in the future, which will create more pathways to building a sustainable future for our planet Earth.

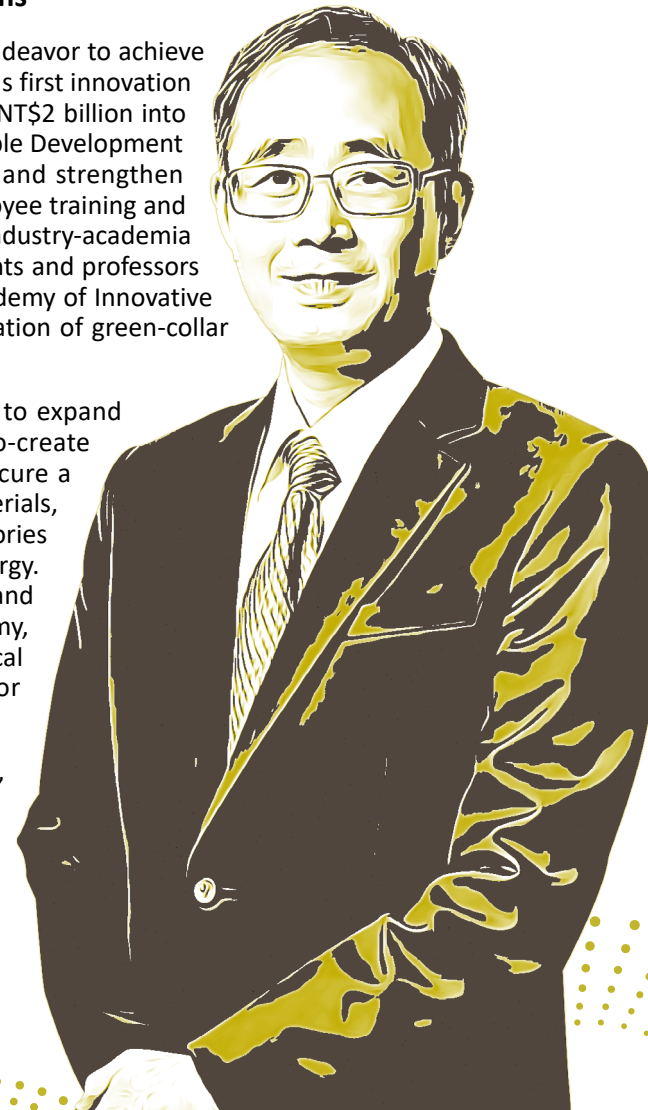
Cultivating Green-Collar Talents & Co-creating Circular Economy Ecosystems

Cultivating green-collar talents has always been an important strategy for us as we endeavor to achieve a circular economy and strive toward sustainable development. In 2019, we built Asia's first innovation hub for recyclable materials in Nanzi, Kaohsiung. As of 2021, we have invested over NT\$2 billion into researching and developing materials and promoted the Green Collar Talent Sustainable Development & Cultivation Program both internally and externally to expand recruiting efforts and strengthen interdisciplinary skills and mindsets. In 2021, we provided over 50,000 hours of employee training and educational training. Externally, we also collaborated with universities in Taiwan for industry-academia collaboration, funding advanced research in academia and encouraging young students and professors to engage in green research. In 2021, we became a corporate partner of NCKU's Academy of Innovative Semiconductor and Sustainable Manufacturing, working to cultivate the next generation of green-collar talents for Taiwan's manufacturing sector.

In addition to internal and external talent cultivation programs, we also continue to expand collaborations across the industry chain, collaborating with various partners to co-create a circular economy ecosystem. For resources, we work with recycling plants to secure a stable supply of waste (e.g., plastic, copper wires, etc.) that we can use as raw materials, drastically reducing resource consumption. For energy, we installed pipelines to factories of other sectors to capitalize on their waste steam, which we use as a source of energy. For service models, we broke the mold from traditional manufacturing operations and worked together with the semiconductor industry chain to achieve a circular economy, converting the recycling, purifying, and sales process of EIPA into a "special chemical leasing service" to drastically reduce carbon emissions from the semiconductor industry.

Environmental sustainability is a common goal for humanity. At LCY, we use research, development, and innovation to provide carbon reduction solutions. We continue to develop circular economy applications and invite partners in our industry value chain to join us in building a circular economy and sustainable future for our planet Earth.

Chairman Tsai-Hsing Hung *TH Hung*



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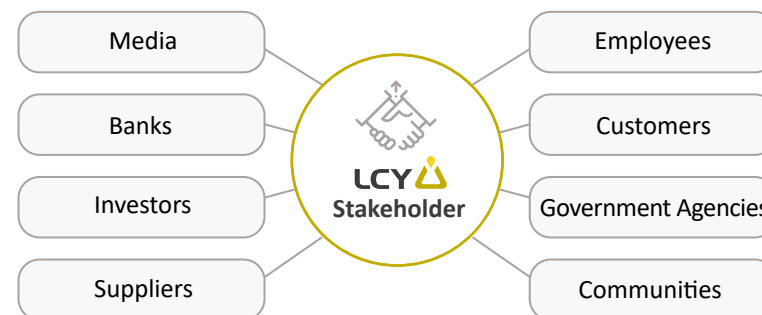
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Identifying Stakeholders & Material Topics

Stakeholders (Stakeholder Communication Channels)

LCY's ESG Sustainability Strategy Committee (ESG SSC) has conducted internal meetings to evaluate company operations and, thereby, identified eight major stakeholders: employees, customers, government agencies, communities, suppliers, investors, banks, and the media. We've collected feedback from all major stakeholders to understand their concerns and respond to their needs.



Stakeholder	Communication Channel	Frequency	Topics of Concern
 Employees	Labor-management meetings & GM Mailbox	Quarterly	<ul style="list-style-type: none"> Air Quality Occupational Safety & Health Chemical Safety & Environmental Management Hazardous Waste Management Management of the Legal & Regulatory Environment
	Employee Welfare Committee	Quarterly	
	Occupational Safety and Health Committee	Quarterly	
	Internal announcements: GM Mailbox, emails, posters, digital bulletins	When necessary	
 Customers	Product consultation, supplier surveys	Project-based	<ul style="list-style-type: none"> Chemical Safety & Environmental Management Water Management Hazardous Waste Management Air Quality Occupational Safety & Health
 Government Agencies	Official correspondences, communication meetings	When necessary	<ul style="list-style-type: none"> Occupational Safety & Health Air Quality Chemical Safety & Environmental Management Hazardous Waste Management Local Communities
 Communities	Meetings	When necessary	<ul style="list-style-type: none"> Community Relations Local Communities Occupational Safety & Health Hazardous Waste Management Air Quality
	Factory visits for visitors including local residents and school groups	When necessary	

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Stakeholder	Communication Channel	Frequency	Topics of Concern
 Suppliers	Audits for existing suppliers	When necessary	<ul style="list-style-type: none"> Occupational Safety & Health Hazardous Waste Management Air Quality Chemical Safety & Environmental Management Management/Labor Relations
	Reviews for existing suppliers	Annually	
 Investors	Annual shareholders' meeting ¹	Annually	<ul style="list-style-type: none"> Occupational Safety & Health Hazardous Waste Management Air Quality Chemical Safety & Environmental Management Management of the Legal & Regulatory Environment
	Investor conference ¹	Annually	
	Board of Directors meeting	Quarterly	
	KKR ESG survey, online courses	Multiple times each year	
	Financial performance report	Biquarterly	
CSR report	Annually or biannually		
 Banks	Meetings, ESG reports	When necessary	<ul style="list-style-type: none"> Occupational Safety & Health Hazardous Waste Management Air Quality Chemical Safety & Environmental Management Energy Management
 Media	Interviews (personal, written, phone)	When necessary	<ul style="list-style-type: none"> Hazardous Waste Management Air Quality Occupational Safety & Health Chemical Safety & Environmental Management Local Communities

¹The subsidiary LCY TECHNOLOGY is a listed company. The annual shareholders' meeting and investor conference refer to that of LCY TECHNOLOGY.

Identification & Disclosure of Material Topics

LCY continues to keep a pulse on global sustainable development trends. To identify the following list of material topics relevant to LCY, we referred to the GRI Standards published by Global Reporting Initiatives (GRI) and the guidelines for the chemical sector set forth by the Sustainability Accounting Standards Board for material topics of concern. In addition, we also looked at international sustainability ratings and industry benchmarks. In 2019, we identified 11 material topics and 3 topics of medium materiality through our identification process, which was confirmed by our ESG SSC. As we have plans to re-evaluate material topics once every 2-3 years, we will continue to use the 11 material topics and 3 topics of medium materiality for the year 2021. This report elaborates on the management approach and relevant actions of these topics in corresponding chapters. For topics of medium materiality, we will continue to observe their positive and negative impact on operations and re-assess stakeholder expectations before the next ESG publication to determine whether it is necessary to rank and manage topics accordingly.

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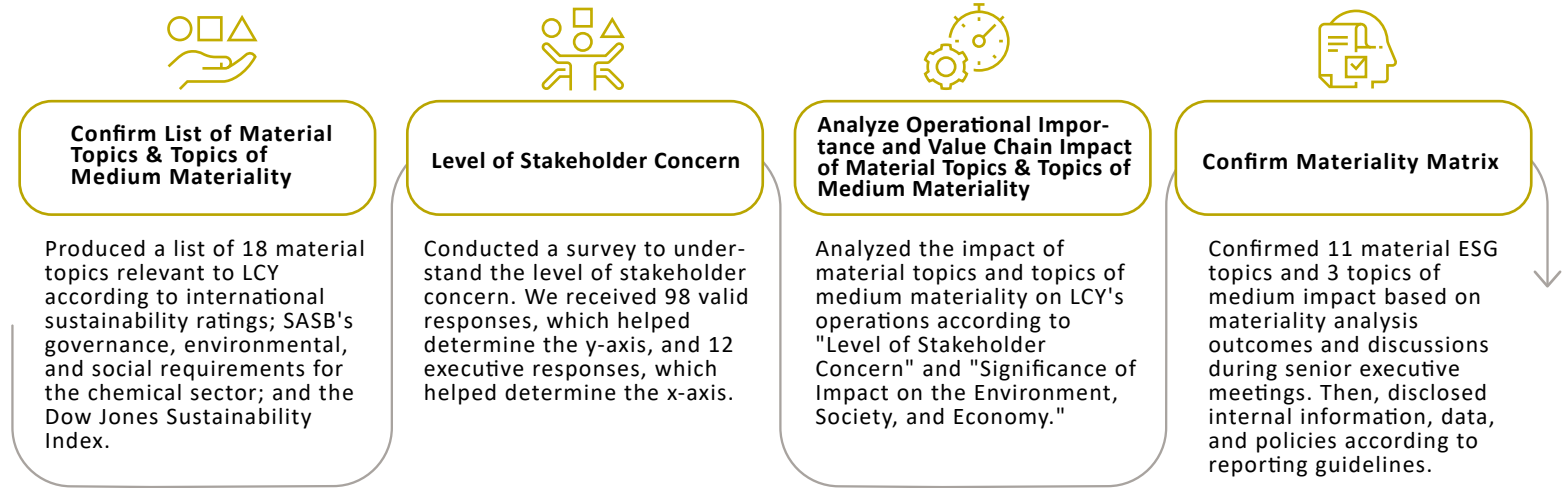
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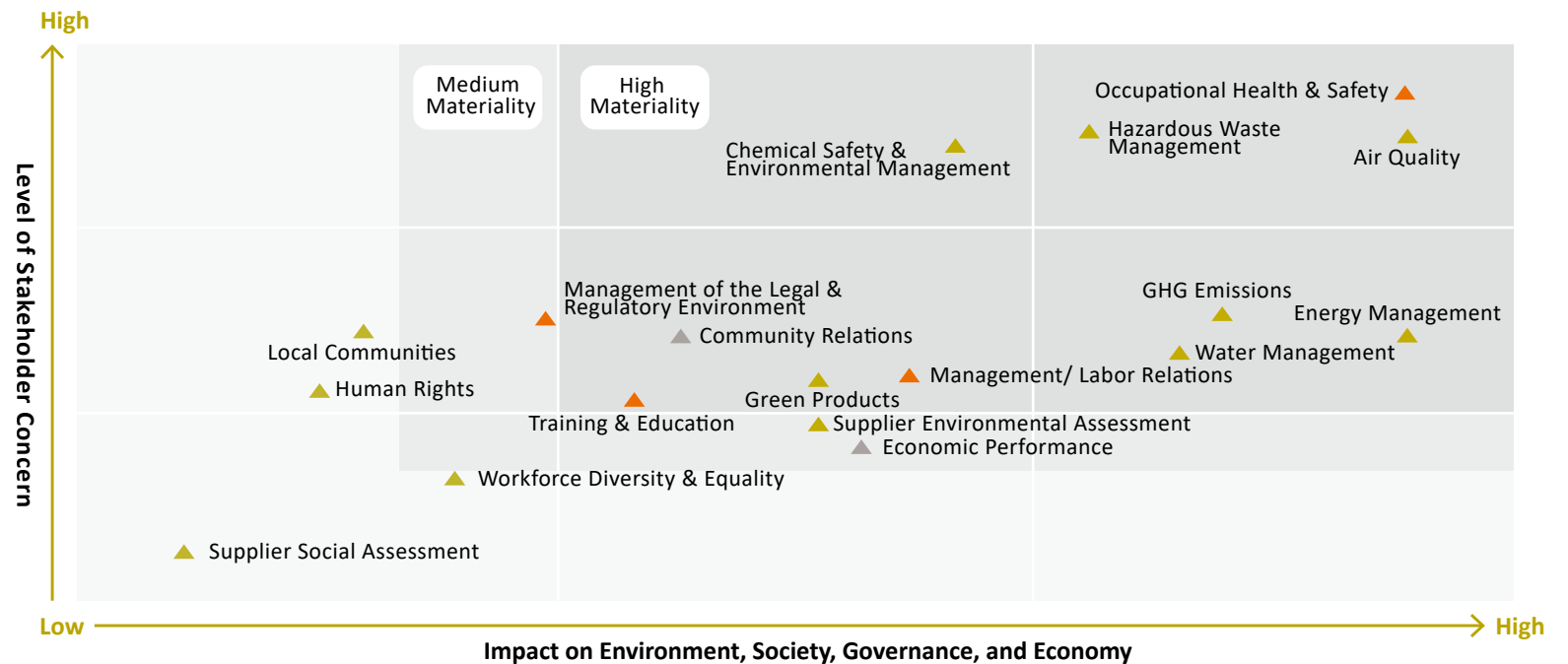
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Identification Process



Materiality Matrix



Identifying Stakeholders & Material Topics

Explanation of Material Topics and Its Boundary

Material Topics ¹	Significance to LCY Group	Significance of Impact			Related Topic		Major Policies (Related Chapters)
		Suppliers	LCY Group	Customers	SASB	GRI	
S Occupational Safety & Health	Potential risks to occupational safety and health in production processes or factory environments that, if not controlled, may result in injuries, fatalities, and other hazards. Ensuring workplace safety, developing safe, healthy, and comfortable labor environments, and continuing to reduce occupational incidence rates are the priorities for safe operations.	○	●		Employee Health & Safety Emergency Preparedness & Response for Occupational Safety	403: Occupational Health & Safety 2018	4.4.1 Occupational Safety Management
E Air Quality	Failure to properly manage pollutants generated during manufacturing processes may impact surrounding environments. In 2015, Taiwan launched phase one of the “Kaohsiung-Pingtung Air Quality Total Quantity Control Plan”. Failure to comply with the total quantity control requirements may lead to impacts on company operations.		●		Air Quality	305: Emissions 2016	3.4.1 Management Approaches to Air Quality
E Energy Management	Increasing global emphasis on climate change and stricter control imposed by government regulations mean that GHG emission audits, energy audits, and reducing energy consumption and GHG emissions have become essential tasks on LCY’s journey towards sustainable operations and enhanced resilience.		●		Energy Management	302: Energy 2016	3.3.2 Energy Management
E GHG Emissions	Manufacturing processes produce hazardous waste, but we can mitigate pollution to our environment through proper disposal, transportation, and implementing reduction strategies.	○	●	○	GHG Emissions	305: Emissions 2016	3.3.1 Carbon Management
E Hazardous Waste Management	In recent years, climate change has severely impacted our planet, with growing reports of heavy rainfall and droughts around the world. Water risks may have serious impacts on company operations and so effective water management is a critical task for sustainable operations.		●	○	Hazardous Waste Management	103: Management Approach 2016 306: Waste 2020	3.6 Waste Management
E Water Management	Avoiding the use of chemical substances potentially hazardous to the human body or health and effectively managing the storage and use of chemicals in factories are important tasks that impact product and operational safety.		●	○	Water Management	303: Water and Effluents 2018	3.5.1 Management Approaches to Water Resources
E Chemical Safety & Environmental Management			●	○	Chemical Safety & Environmental Management	416: Customer Health and Safety 2016	2.3.1 Chemical Management Procedures

● Direct Impact ○ Indirect Impact

¹The order of material topics is based on stakeholders’ scores and significance to LCY business and operations as determined in senior executive meetings, from highest to lowest.

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Material Topics ¹	Significance to LCY Group	Significance of Impact			Related Topic		Major Policies (Related Chapters)	
		Suppliers	LCY Group	Customers	SASB	GRI		
Material Topics	E Green Products	Progressively reducing environmental impact at all stages of the product's life cycle and creating economic value for customers are important pathways for the upstream industry chain toward a sustainable chemical future.	○	●	●	Product Design for Use-phase Efficiency	103: Management Approach 2016	2.1.1 Innovative Management 2.2.1 LCY's 6R Sustainability Strategy
	G Management of the Legal & Regulatory Environment	Ensuring legal compliance and internal/ external oversight and establishing a system for identifying applicable legal requirements and risk evaluation are critical for constructing strong corporate governance.	○	●		Management of the Legal & Regulatory Environment	307: Environmental Compliance 2016 419: Socioeconomic Compliance 2016	1.3.1 Compliance Culture
	S Management/Labor Relations	Strengthening the company's competitiveness and building a strong team is critical for achieving development goals and supporting growth for business scale. Employees are valuable assets. As such, we care about safeguarding employee interests, preventing injuries and poor health, valuing human rights, and providing comprehensive training and career development goals so that employees find room for growth in their work and personal lives.	○	●		-	401: Employment 2016	4.2.1 Promoting Employee Welfare
	S Training & Education			●		-	404: Training and Education 2016	4.3.1 Management Approaches to Talent Cultivation
Topics of Medium Materiality	S Community Relations	Company operations may have environmental and social impacts on surrounding communities. As such, how we communicate, give back, and ensure shared prosperity with local communities will impact sustainable company operations.		●		Community Relations	413: Local Communities 2016	4.5.1 Management Approaches to Community Relations
	E Supplier Environmental Assessment	To ensure sustainable supply chain operations, we must minimize negative environmental impacts through supply chain management and protect our environment.	●	●		-	308: Supplier Environmental Assessment 2016 414: Supplier Social Assessment 2016	1.4.2 Supply Chain Management Procedures
	G Economic Performance	To create a sustainable and better future for society and our business, we must maintain steady revenue growth and build a robust operational platform to create more value for investors, expand our influence, and create sustainable value for industries and the public.	○	●	○	-	201: Economic Performance 2016	1.1.2 Company Performance

● Direct Impact ○ Indirect Impact

¹The order of material topics is based on stakeholders' scores and significance to LCY business and operations as determined in senior executive meetings, from highest to lowest.

2021 ESG Highlights

Governance



▲ **29%** YoY growth

In 2021, LCY was unaffected by the pandemic and exhibited strong financial performances with a consolidated revenue of NT\$57.4 billion, which is a 29% YoY growth.

▲ **99%** After-tax earnings

In 2021, the consolidated after-tax earnings reached NT\$6 billion, which is a 99% YoY growth.

5% Revenue from green products

Revenue from green products reached NT\$2,811,907,000, accounting for 5% of total revenue.

▲ **66%** Innovative materials

Sales from products of innovative materials grew by 66% from the base year.

Environmental



▼ **1.34%** Energy intensity

Energy intensity decreased by 1.34% and overall energy consumption decreased by 0.22% from the previous year.

▼ **2.36%** Water consumption

Water consumption per production unit decreased by 2.36% from the previous year.

▼ **3%-8%** Reduce energy

AI monitoring systems helped reduce energy consumption by 3-8%.

Social



> **50,000** Employee training

LCY provided over 50,000 hours of employee training.

122 Flu vaccines

A total of 122 flu vaccines were administered to LCY employees for free (funded by the company).

100% Health checks

In 2021, 100% of employees underwent health checks.

25% Master's degree

25% of employees have a master's or higher degree, which increased by 1% from the previous year.

100% Employee retention

100% employee retention rate following childbirth.

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Strong Sustainable Governance

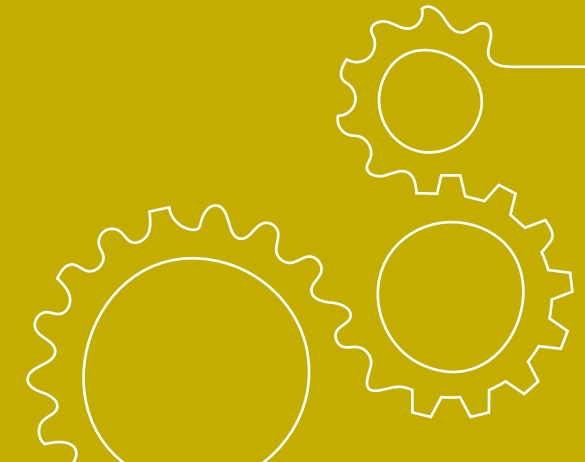
We pledge to create a strong corporate governance system, remain regulatory compliant at all of our operation locations, and practice honest and ethical business management. We are committed to establishing a corporate culture that is based on integrity and accountability. We will continue to implement the highest standards of business integrity at the operational level while formulating an effective governance mechanism. We aim to serve the long-term interests of the company and its shareholders while realizing the Group's social responsibilities. LCY Chemical Corp. was unaffected by the COVID-19 pandemic and continued to show strong financial performance in 2021. The company's consolidated income and consolidated after-tax earnings reached US\$1.91 billion (NT\$57.4 billion) and US\$200 million (NT\$6 billion), with a YoY increase of 29% and 99% respectively. The company had a high-performing year and announced the establishment of a new plant in Arizona.

▲ **29%**

LCY Chemical Corp. was unaffected by the COVID-19 pandemic and continued to show strong financial performance in 2021, with consolidated income reaching US\$1.91 billion (NT\$57.4 billion), a YoY increase of 29%.

▲ **99%**

Consolidated after-tax earnings reached US\$200 million (NT\$6 billion) in 2021, a YoY growth of 99%.



SDGs

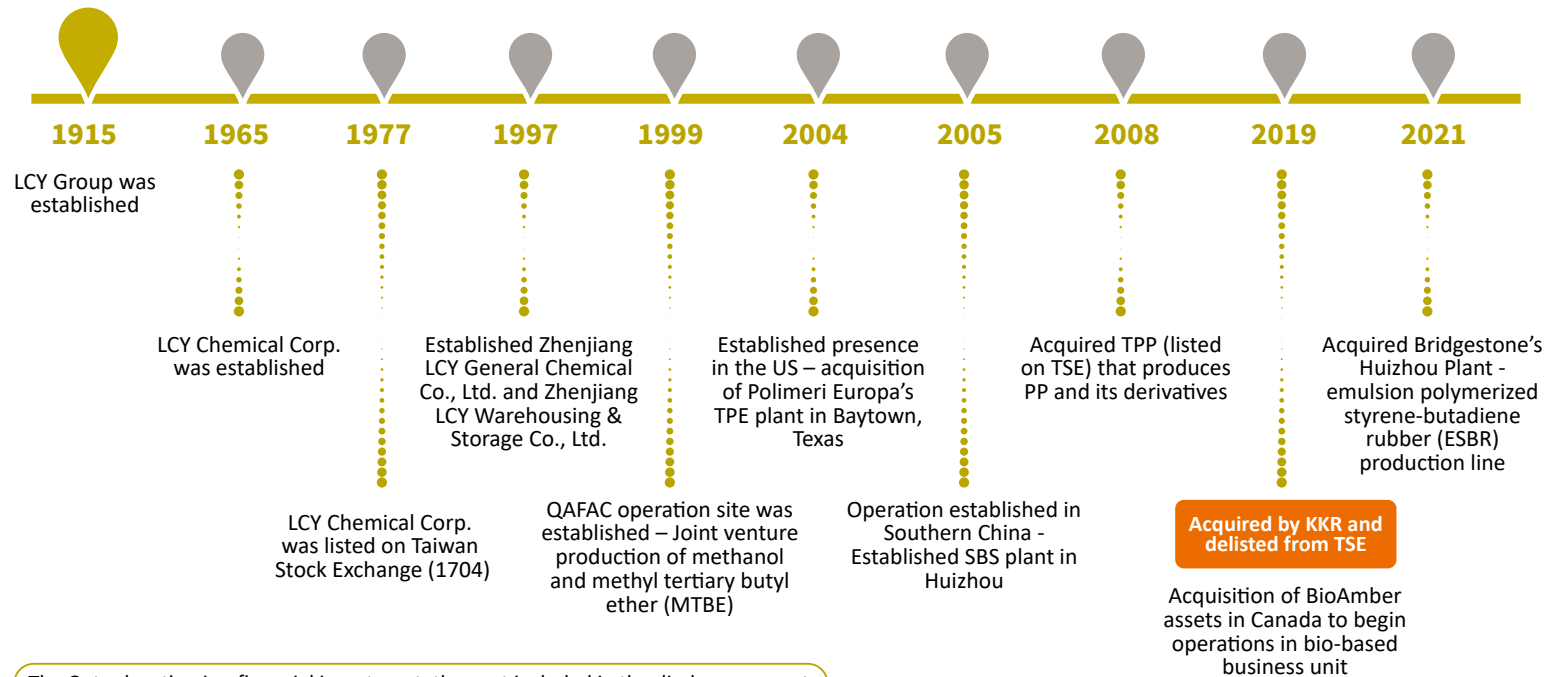


Laws and supervisory management

1.1 About LCY

1.1.1 About Us

LCY Chemical Corp. was established in 1965 and is committed to value creation through scientific innovations. The Company’s operational strategy is consolidated into the following six business units: Thermoplastic Elastomers, Performance Plastics, Methanol & Solvent & Water, Electronic-Grade Solvent Products, Bio-based, and Copper Foil. The Company continues its expansion in the field of materials science through corporate values that center around integrity, collaboration, innovation, and accountable leadership. Our operations span across Asia, North America, and the Middle East. Looking ahead, LCY Chemical Corp will utilize our continuous growth momentum to grow future material science talent and lead the industry’s transformation. In 2021, the Company announced the establishment of a new plant in Arizona, US to meet the materials demand for the US semiconductor industry.



The Qatar location is a financial investment, thus not included in the disclosure report.

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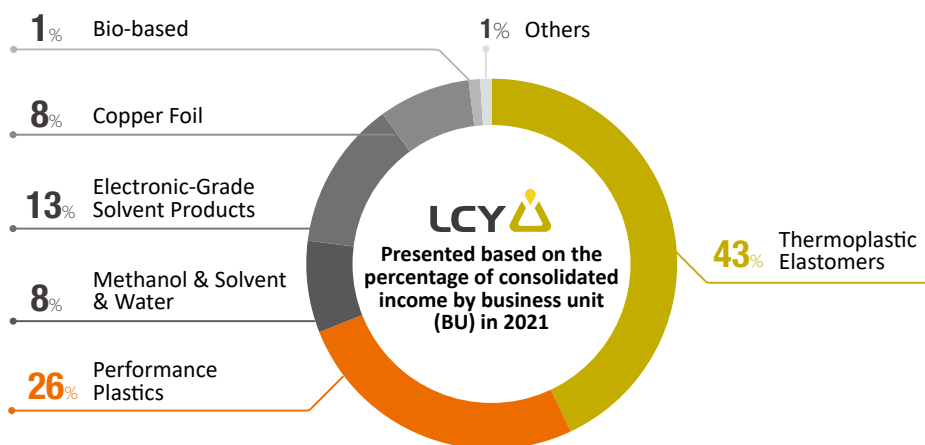
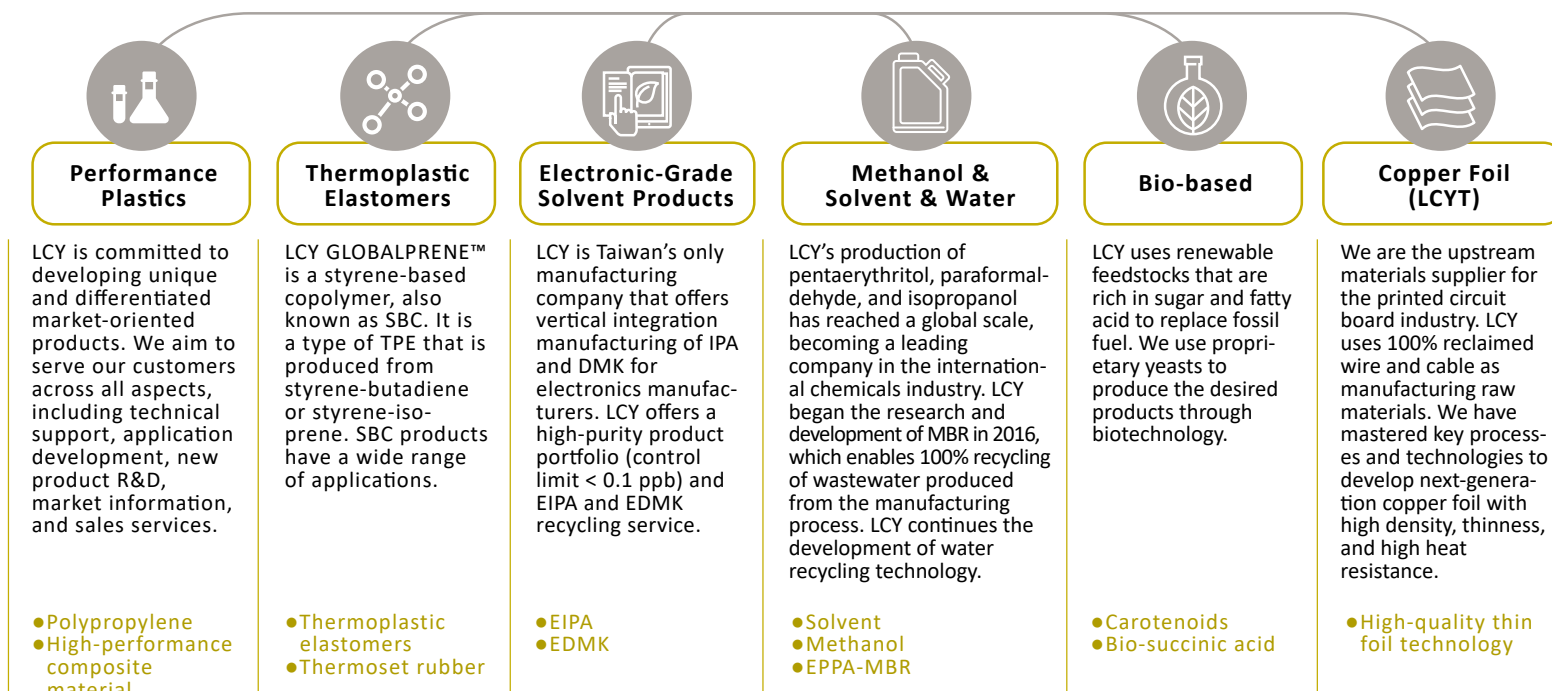
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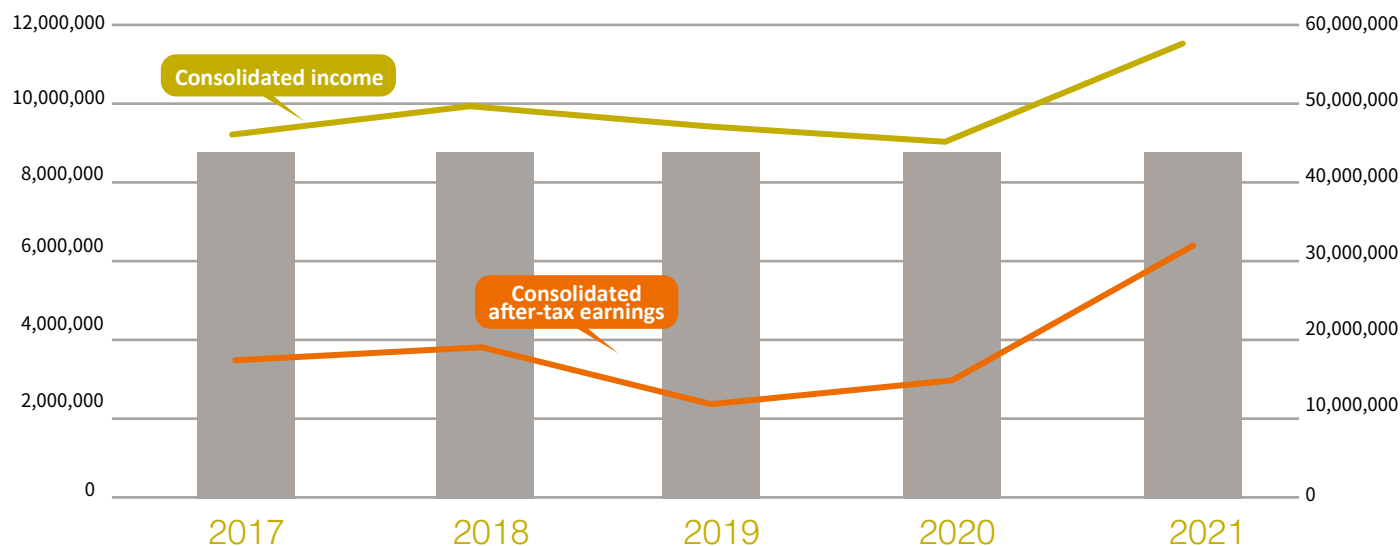
📍 LCY's Six Business Units



1.1 About LCY

1.1.2 Company Performance

LCY Chemical Corp. was unaffected by the COVID-19 pandemic and continued to show strong financial performance in 2021. The company's consolidated income and consolidated after-tax earnings reached NT\$57.4 billion and NT\$6 billion, with a YoY increase of 29% and 99% respectively. It was high performing year for the Company.



Capital	8,553,274	8,544,034	8,521,078	8,521,078	8,521,078
Consolidated income	45,320,290	49,796,616	46,404,845	44,353,391	57,434,512
Gross profit	7,231,971	6,857,258	6,991,426	7,822,999	12,003,383
Income tax	946,105	179,652	1,183,223	1,222,267	2,193,628
Consolidated after-tax earnings	3,672,663	3,922,153	2,394,557	3,037,944	6,043,232
After-tax earnings per share	4.2	4.5	2.9	3.6	6.9
Net asset value per share (Unit: NTD)	31.67	38.33	31.69	28.44	32.28
Employee salary and benefits	2,513,978	2,787,507	2,911,430	2,911,992	3,470,397

Unit: Thousand

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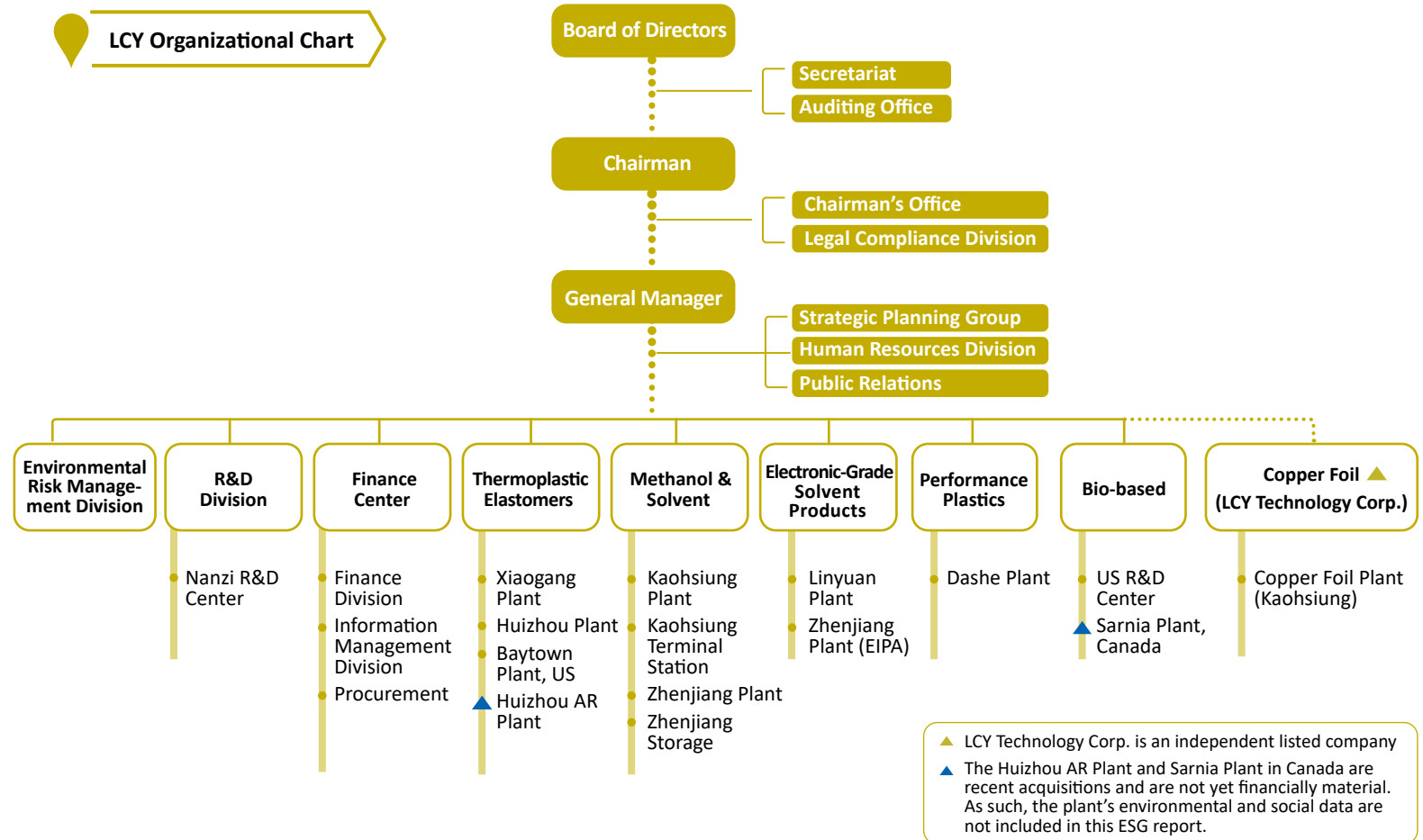
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1.2 Sustainable Governance

1.2.1 Corporate Governance

LCY Chemical Corp. pledges to create a strong corporate governance system, remain regulatory compliant at all of our operation locations, and practice honest and ethical business management. We are committed to establishing a corporate culture that is based on integrity and accountability. We will continue to implement the highest standards of business integrity at the operational level while formulating an effective governance mechanism. We aim to serve the long-term interests of the company and its shareholders while realizing the Group's social responsibilities. Our major subsidiaries include LCY Chemical Corp., LCY Grit Corp., LCY Technology Corp., and LCY Biotechnology Holding Inc. By establishing an appropriate internal control system, we can ensure that the company's internal rules are consistent with external regulations and are thoroughly carried out. This approach will lower operational risks and realize sustainable governance.



1.2 Sustainable Governance

Board of Directors

LCY Chemical Corp.'s board of directors is the company's highest governing body that is responsible for overseeing the overall operational accountability and the results of the management's policy implementation. For sound and effective operation, the board convenes at least once every three months to discuss operational strategy and business reports. The company has established the "ESG Sustainability Strategy Committee" (ESG SSC) to supervise and manage the following aspects: environment, health & safety, corporate social responsibility, corporate governance, sustainable development, and other public policy-related matters. ESG SSC reports to the board of directors and is supervised by the board. In addition, if deemed necessary or appropriate by the board, other functional committees may be established to facilitate resource optimization and efficiency.

LCY Chemical Corp. is 100% owned by KKY Co., Ltd, with the board of directors exercising the functional duties and power of the shareholders' meeting. The company's highest governing unit is the board of directors, which consists of three directors that are appointed by KKY Co., Ltd for a term of three years. The board convened five times in 2021, with an average attendance rate of 100%.



Chairperson **T. H. Hong**

Education MBA from Preston University, US

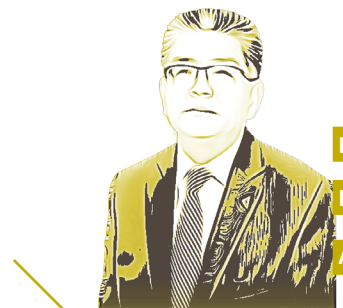
Age > 51



Director **Zhen Ji**

Education M.S from New York University, B.S from Indiana University of Pennsylvania, and an M.B.A from northwestern University's Kellogg School of Management

Age > 51



Director **Charles Wei**

Education Bachelor of Business Administration, Fu-Jen Catholic University

Age > 51

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1.2 Sustainable Governance

1.2.2 Sustainable Operation

LCY Chemical Corp. established ESG SSC which directly reports to the board of directors, with the chairman and general manager acting as the committee chair and vice chair respectively. The Chief Operating Officer takes on the role of Chief Sustainability Officer. ESG SSC reports to the board every quarter and receives supervision and recommendation from the board to integrate the company's sustainability outlook and development blueprint with our core capabilities. ESG SSC presented to the board three times in 2021 to report on the year's ESG planning and results.

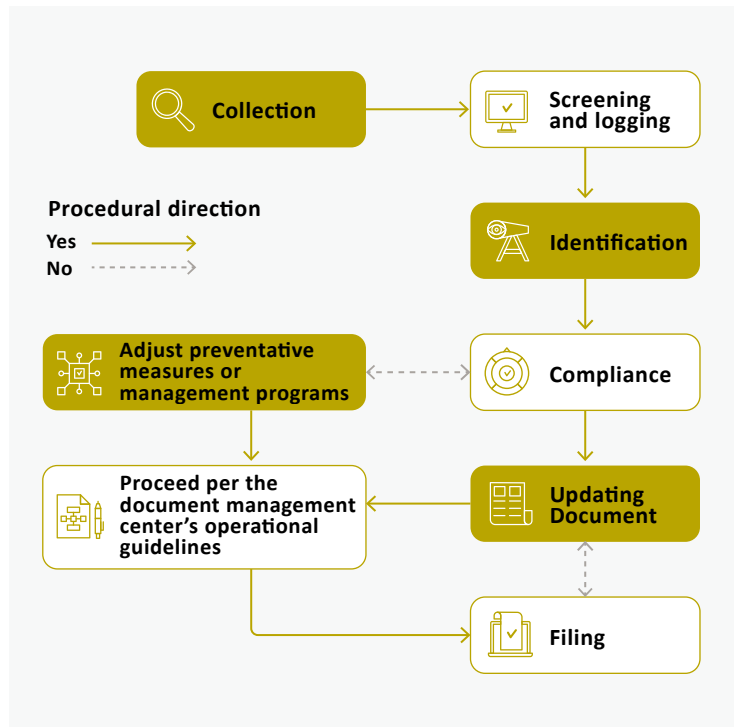
Cross-departmental working groups have been established under the ESG SSC in response to the increasingly difficult climate challenges and the much-needed carbon-reduction solutions. At the end of 2021, the working groups were restructured and optimized into four major groups, namely green transformation, social inclusivity, employee care, and corporate governance. Process optimization and TCFD working groups were merged with green transformation. The green transformation working group is further divided into four major working areas, including process optimization (TCFD included), energy and low-carbon tech, green products, and circular economy. LCY integrates sales, R&D, and production site teams to explore and formulate more ambitious carbon-reduction goals from the perspective of lowering climate risks. Our green transformation strategy is expected to be formulated in 2023. ESG SSC will set short, mid, and long-term sustainability goals, and will adjust and review all ESG issues and strategies accordingly.



1.3 Legal Compliance

1.3.1 Compliance Culture

LCY Chemical Corp. expanded the Legal Department to become the Compliance Division in 2020 and planned out compliance management guidelines in 2021. 2022 will be the year of beginning of the compliance management system. The Compliance Division and all relevant departments in authority continue to focus on the domestic and foreign policies and regulations at all of our sites to ensure regulatory compliance. To track, evaluate and manage the risks of regulatory changes, all responsible units and the plants' industrial safety and environmental protection offices pay close attention to any regulatory changes and are responsible for support and execution integration. "The company also provides irregular regulatory changes update information sessions,..." Our management goal is to be 0 violation.



Due to changes in international situation, countries have imposed trade sanctions to advance their foreign policy goals. LCY announced the "Trade Sanctions Compliance Policy" to all staff members and on the official website in 2020. In 2021, the company officially launched the sanctions list search tool to provide an effective channel for the employees to improve the company's due diligence system. It is also to ensure the company's operation complies with the relevant regulations as imposed by the countries' sanctions. We aim to create transparent and legal transactions and partnerships with our suppliers, clients, and partners. The Legal Team under the Compliance Division has continued to review the company's personal data protection procedures since the third quarter of 2020. In keeping with the Personal Information Protection Law of the People's Republic of China that went into effect on November 1, 2021, LCY simultaneously updated the relevant documents to facilitate regulatory compliance for LCY's subsidiaries operating in China.

In terms of corporate management in the context of social and governance aspects, all units should conduct regulatory identification within their jurisdiction to discuss and formulate the relevant operation management procedures. LCY subscribes to the government ministries' e-newsletters and participates in external seminars to provide the latest regulatory trends and relevant activities and information to the appropriate divisions. The company also provides educational training and information updates to the employees. In terms of EHS regulatory compliance, each responsible unit is accountable for the identification of EHS regulations. Regulatory identification, including collection, logging, identification, verification, and filing, shall be conducted per the plant's environmental and industrial safety management system. Response measures should also be carried out in response to material changes in regulations. To adhere to the global net-zero trend, Taiwan's Greenhouse Gas Reduction and Management Act and Renewable Energy Development Act are becoming increasingly stringent. LCY continues to strengthen our domestic plants' EHS regulatory management system and implement regular internal audits. LCY continues to support and participate in global sustainability initiatives to establish an international EHS regulatory management system.

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1.3 Legal Compliance

As a part of our emphasis on information security, LCY continues to optimize our information security procedures and introduced ISO/IEC 27001: 2013 information security management system while obtaining third-party verification. The company ensures the effectiveness and continuity of information security through an institutionalized, documented, and systematic management mechanism. We aim to improve information security risk response measures through technical updates. Employees' information security awareness is also enhanced through regular protection and backup drills to improve the response capabilities in case of unexpected incidents. To advance and implement the company's trade secret information control, in 2021, we identified the weaknesses and risks in the process of generating, transmitting, utilizing, destroying, and archiving trade secret information and data from the perspective of a data's life cycle. LCY established an operation management procedures and trade secret management mechanism that meet the needs of every plant and company division to further optimize the protection of our trade secrets.

Compliance

In adherence to our core value of being regulatory compliant while providing high-quality products and services, LCY ensures to adjust our operation in accordance with regulatory changes to meet the latest policy trend. To meet the increasingly stringent air pollutants, VOC emission, and water discharge standards from the regulatory bodies, our plants have made improvements by switching to low-polluting fuels (e.g., heavy oil to natural gas), installing waste gas treatment equipment, and adjusting the wastewater treatment compound. In addition, our plants are all adhering to the Regulations of the Labor Health Protection's stipulation that business units with more than 50 workers should appoint dedicated medical personnel to provide on-site clinical service. There were 10 EHS regulatory violations in 2021, including four environmental and six socio-economic violations, all of which have been improved. For details on the environmental violations and the follow-up improvement measures, please refer to 3.1.2 Environmental Regulatory Compliance. For socio-economic violations in the aspects of occupational safety and those related to the Building Act, please refer to 4.4.1 Occupational Safety Management for details.









1.3.2 Risk Management

LCY places great emphasis on the stakeholders' needs and the service quality provided to them. We are committed to identifying internal and external risks and promptly responding to them. We have established a comprehensive risk management system to support the company's growth and reduce potential risks to attain corporate sustainable operation. LCY stresses the importance of risk assessment. Our Environmental Risk Management Division, supervised by the board of directors, is the responsible unit that ensures all risk issues are presented to and managed by the highest management level. Emergency incidents that have become the focus of global attention are also listed as a material emerging risk, with necessary response measures implemented. For example, in response to the 2020-2021 COVID-19 pandemic, LCY headquarter and the plants tracked the latest pandemic trend, and convened for review meetings to update the relevant prevention and response measures to reduce the negative impact on our business operation.



1.3 Legal Compliance

Risk Categories and Audit Mechanism

Risk Category	Management Procedure	Audit Frequency	Highest Level of Risk Management
 Assets	<ol style="list-style-type: none"> 1 Finance Division's regular meetings 2 Board of directors convenes every quarter 	Conduct audits in accordance with the annual audit plan and daily auditing operations. Track follow-up improvement on notable abnormalities. Before issuing the report, communicate with the audited unit to verify audit-related matters. If found to be a material issue, it can be reported directly to the chairman (quarterly/annually).	Finance Division's highest level of leadership
 Exchange transactions			
 Investment	Finance Division calls for quarterly meetings		
 Legal compliance	The board of directors convenes every quarter		Board of Directors
 Information security	<ol style="list-style-type: none"> 1 Information Management Division meets twice a year 2 Information Security Committee meets once a year 	Executed by the Information Management Division; the Auditing Office conducts audits on the department's implementation and on-site sample review (quarterly/annually)	Information Security Committee
 Environmental and occupational safety	<ol style="list-style-type: none"> 1 The Environmental Risk Management Division meets on a monthly and quarterly basis. 2 A technical meeting is called every month. 3 The board of directors convenes every quarter. 	The Environmental Risk Management Division and the Auditing Office conduct audits on the department's implementation and on-site sample review (quarterly/annually)	Environmental Risk Management Division's highest level of leadership & Human Resources' highest level of leadership
 Emerging infectious disease	Review meetings are held	ISO 14001/ OHSAS 18001/ TOSHMS(CNS15506) Management review meeting	Environmental Risk Management Division's highest level of leadership & Human Resources' highest level of leadership
 Climate change	Conduct target reviews and risk assessments in conjunction with the ESG SSC	Consolidate daily management activities of each plant on climate change and energy issues, check the quality and effectiveness of plan implementation; report to the chairman every six months.	Board of Directors

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1.3 Legal Compliance

Risk Management Mechanism



Internal Audits

LCY Chemical Corp. refers to the Regulations Governing Establishment of Internal Control Systems by Public Companies to establish our internal control system. This is to reasonably ensure the effectiveness and efficiency of our operation, as well as the reliability, timeliness, transparency, and compliance of our reporting, and compliance with the relevant laws and regulations. Each unit implements an annual internal control evaluation to confirm the effectiveness of the internal control system and the reliability of corporate governance. The Auditing Office presents the self-evaluation result to the board of directors. Every year, the Auditing Office identifies the risk level based on the audit and internal control self-assessment results of the year. The Auditing Office also formulates the audit plan for the following year and reports to the board of directors every quarter on the implementation of the audit plan and the tracking of major abnormalities.

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1.4 Supply Chain Management

1.4.1 Supply Chain Overview

There are 405 suppliers for LCY Chemical Corp.'s production sites in Taiwan and China (suppliers for LCYT and U.S. Canada plants are not included). The suppliers can be categorized into feedstock & additives, equipment & packing material, contracted engineering project, and transportation. The company spent US\$678 million (NT\$20.3 billion) on procurement in 2021, with feedstock & additives as the primary procurement category at 91%. Local procurement in Taiwan makes up almost 90% of the total, followed by other parts of Asia, the Americas, and Europe.



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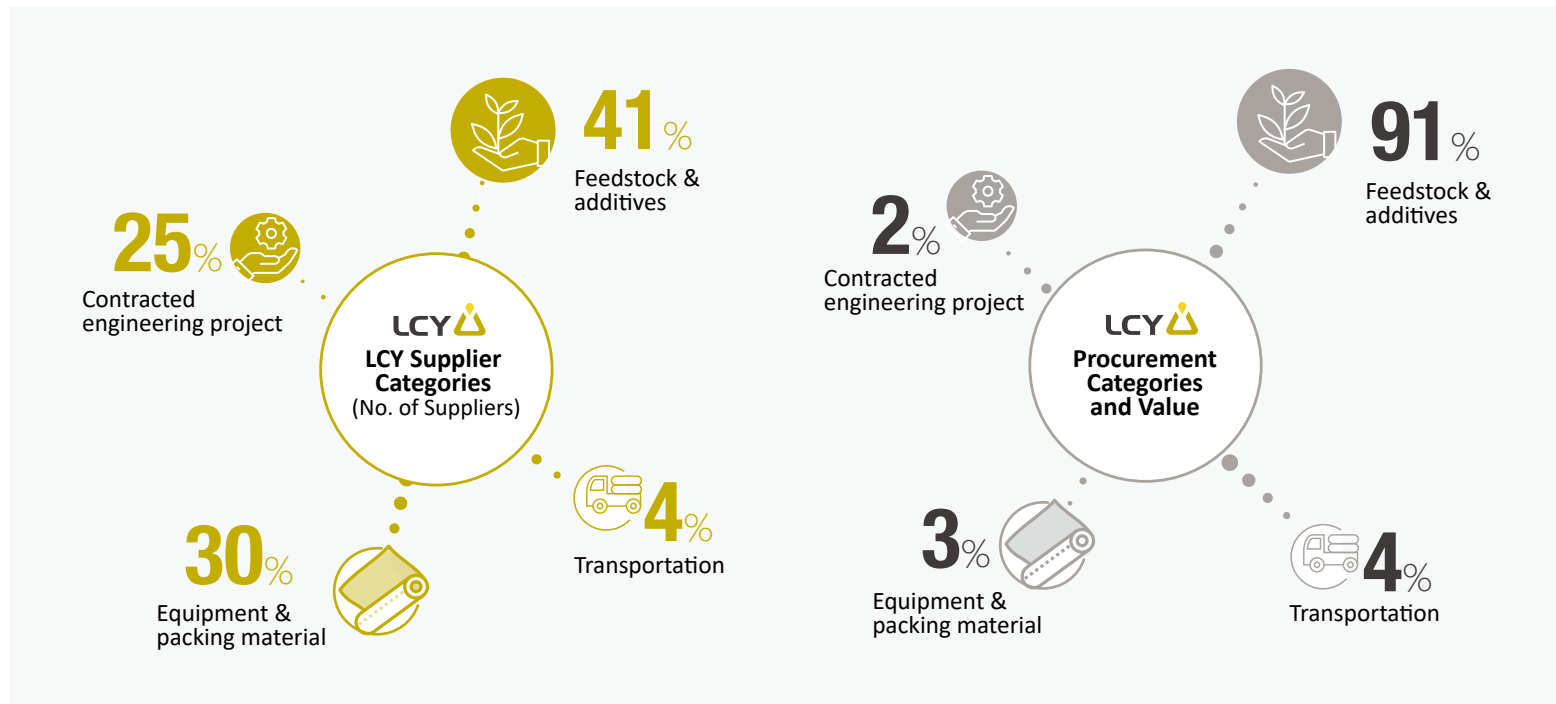
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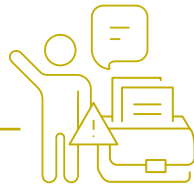
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1.4 Supply Chain Management

1.4.2 Supply Chain Management Procedures

Before officially signing with a supplier, LCY reviews supplier status and expectations through a comprehensive evaluation and communication process. In addition, we ask the supplier to sign the “Declaration for Business Partner Supply Chain Security” and “Honesty and Integrity Transactions Undertaking.” After the partnership officially begins, LCY keeps an open communication channel with the supplier through an annual audit and evaluation process to maintain a sound supply chain operation. During the partnership, the plants can raise a flag with LCY’s supplier management unit through our internal communication channel for any defects in quality, quantity, industrial safety, environment, and other aspects, and it shall be handled accordingly. If an employee actively or passively disrupts the procurement discipline, suppliers are encouraged to disclose such misconduct to LCY’s relevant management unit through post or email. The supplier’s official name, contact information, and records and evidence of misconduct shall be included.



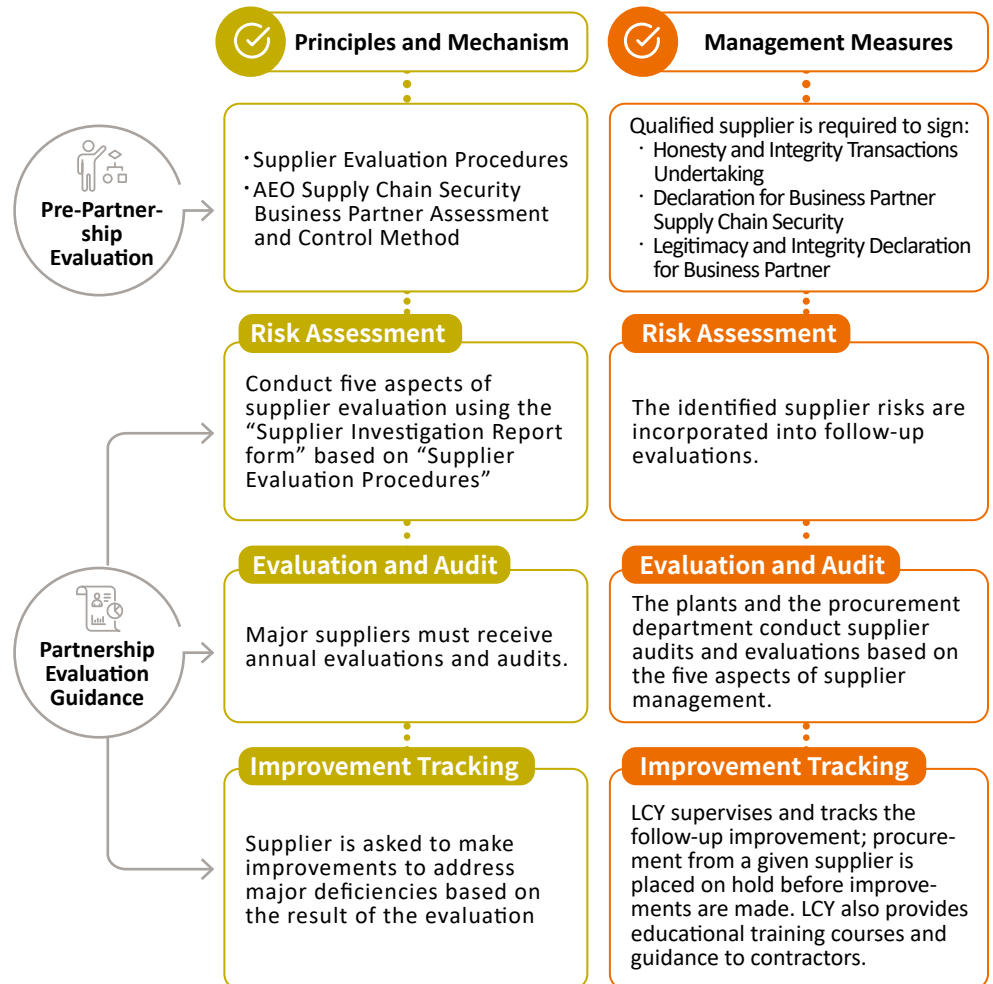
Reporting mailbox

P.O.BOX 587 Taipei Guangfu, Taipei City 105936 (Audit Office)

E-mail gm@lcygroup.com

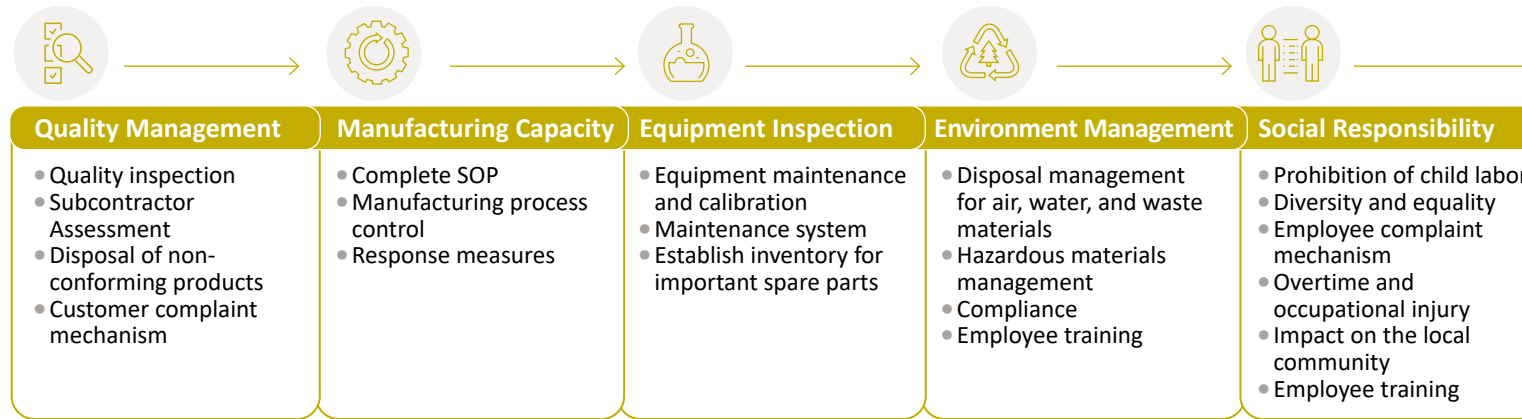
Supplier Evaluation and Management Procedures

To guarantee supply chain sustainable operation, we must ensure to meet work safety, human rights, and moral principles standards. It is also imperative to decrease the negative impact on the environment to facilitate environmental protection. In addition to the Ethical Corporate Management Best Practice Principles that apply to all members of the board and all LCY employees, LCY also requires our suppliers to meet the relevant supplier management procedures to facilitate partnership and growth across all five aspects of supply chain management.



1.4 Supply Chain Management

Five Aspects of Supply Chain Management



New Supplier Evaluation

LCY actively seeks out new suppliers every year in response to the user, policy, and product demand, as well as our departure from former suppliers. LCY services more than 400 companies around the world, many of whom are world-class global manufacturers. While our customers strive to enhance product and supply chain safety, we are also committed to providing our customers with guaranteed services. LCY has established an internal Authorized Economic Operator (AEO) Supply Chain Business Partner Evaluation and Control Protocol in accordance with the Regulations Governing the Certification and Management of the Authorized Economic Operators by the Customs Administration of the Ministry of Finance, which initiated the AEO mechanism in 2013. While integrating our internal principles to properly execute AEO policy, we also conduct a risk assessment and planning for new suppliers and apply the same standards to existing suppliers to fully implement our supply chain safety management system. Preference will be given to suppliers with international standard certifications (including ISO 9001, ISO 14001, IATF 16949, OHSAS 18001, TOSHMS, etc.) to increase the service standards of our supply chain. In addition, there will be internal discussions on the feasibility of using social and environmental standards as a screening criterion for supplier selection. It shall be implemented if found feasible.

New Supplier Evaluation Process



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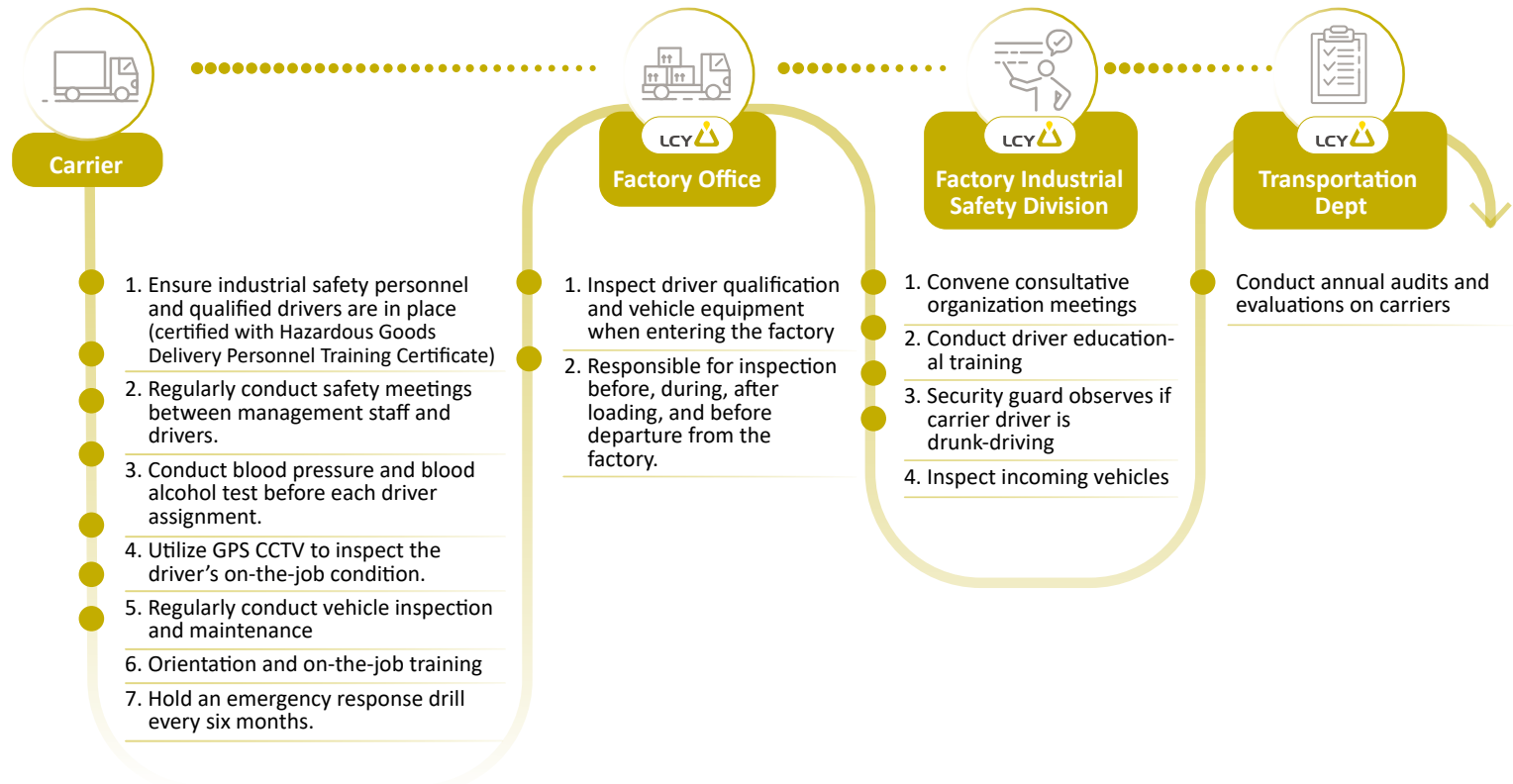
Carrier Management

Much of the LCY supply chain involves the transportation of chemical feedstock and chemical products. Therefore, we underscore the safety management of our partner carriers to make sure they are regulatory compliant. According to our Management Guidelines for Transportation Operation, there are inspection procedures in place to ensure the safety of product loading and unloading operations; the procedures cover transportation safety from the carrier vehicle's arrival at the designated factory or location for pickup/unloading to departure, as well as the notification process for transportation outside of our plants.



Important transportation-related regulations

- ✓ Designated Routes for Tank Cars Transporting Hazardous Goods
- ✓ Professional Training for Personnel Road Transporting Hazardous Regulations
- ✓ Toxic and Concerned Chemical Substances Transportation Management Regulations
- ✓ Regulations for the Labeling and Hazard Communication of Hazardous Chemicals
- ✓ Regulations for Labor Safety of High-pressure Gas



1.4 Supply Chain Management

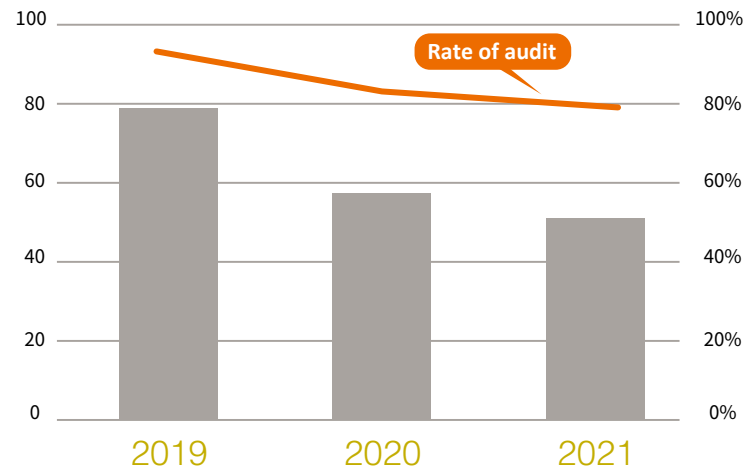
Management of contracted engineering projects

Engineering construction site safety is important to us, as such, LCY has established safety management procedures for the contractors. A Construction Project Contracting Unit was established in mid-2020 to focus on sustainable supply chain management and developing long-term and sustainable relationships with our contractors. After contract signing and prior to project initiation, LCY calls for a consultative organization meeting with the contracting company, contractor site manager, and its occupational health and safety management staff. A toolbox meeting is called before a day's work to explain industrial safety policy, operation guidelines, response mechanism and review feedback to ensure contractor staff is fully aware of LCY's management method. To achieve environmental sustainability, the procurement of construction materials is gradually shifting towards green materials. In terms of waste disposal, LCY asks suppliers to comply with government regulations and relevant provisions for the appropriate disposal to fulfill our social responsibility in the procurement process.

1.4.3 Supply Chain Audit

The annual supply chain audit for major suppliers is organized by the procurement department. A major supplier is collectively evaluated and defined by the factory, quality control section, and procurement based on the feedstock used for the year. All feedstock supplier for medical-grade products are considered major suppliers. The audit program is conducted by the factory, quality control section, and procurement based on the five aspects of supply chain management. If material deficiencies are found, immediate improvement is required from the supplier with close supervision and tracking by LCY. No procurement shall be made before improvements are made. In 2021, there were 66 major suppliers, 51 of which were audited, with an audit rate of 77%, which is a slight decrease of 4% from the previous year. The COVID-19 pandemic delayed many on-site audits to 2022, which contributed to the lower audit rate. In addition to our continued supervision and management of suppliers, LCY will place a stronger management emphasis on increasing supplier audit rates in the future. We also aim to encourage suppliers to obtain ISO 9001 and ISO 14001 certifications to improve the quality of the overall supply chain management.

LCY Supplier Audits in the Last 3 Years ● No. of audited supplier
— Rate of audit



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Leading Circular Innovation

5%

Revenue from green products reached NTD \$2,811,907,000, representing 5% of overall revenue

▲ 66%

The proportion of annual sales from innovative material products increased by 66 % from the baseline year

LCY has set up the first innovative hub in Asia for recycled materials in Nanzih, Kaohsiung as a platform for creativity and inspiration. We devoted great effort to R&D innovation and increasing investments in equipment and facilities to establish LCY Nanzih R&D Center as a international-grade innovation hub. At the same time, LCY also fosters R&D talent and employs almost 150 R&D professionals from fields such as chemistry, materials, chemical engineering, analysis, and even market development. Approximately 40% of the staff at the R&D Center possess a doctoral degree. Our employees aim for sustainability and circularity within the economy and the environment. They are collectively devoted to creating industry chain value within the circular economy in order to realize our vision for a greener future.

	Long-term 2030 Targets	Short-term 2020-2022 Targets	2021 Achievements
Proportion of annual sales from innovative material products	▲ 76%	▲ 24%	66%
Annual sales of solvent recycling services	▲ 43%	▲ 15%	62%
Total water recovery from using MBR products on the market	+950%	+160%	123%

Note: baseline year is 2019



SDGs

6 CLEAN WATER AND SANITATION | 8 DECENT WORK AND ECONOMIC GROWTH | 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE | 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Green Products

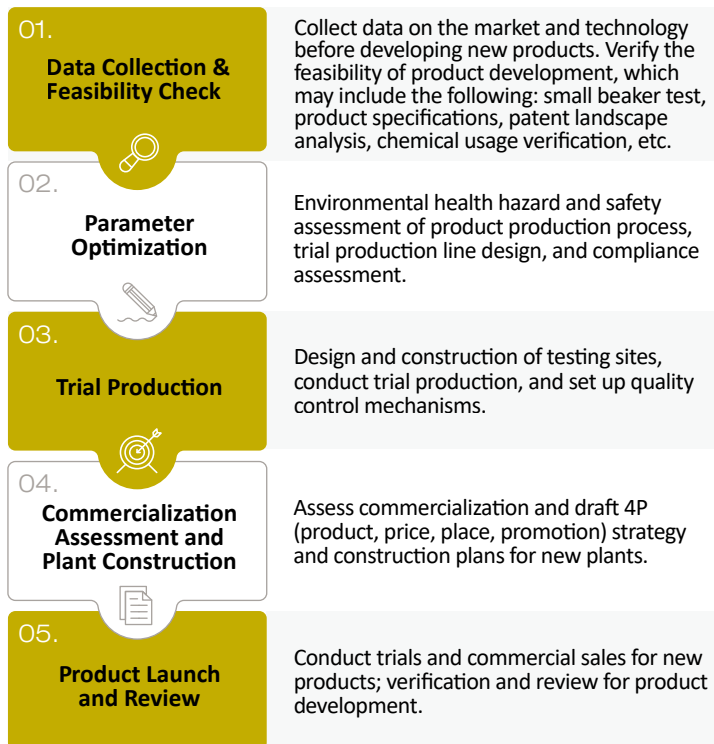
Management of Chemical Safety & Environment

2.1 Cornerstone of Innovation

2.1.1 Innovative Management

The LCY R&D Center is the primary supervisory department for R&D of chemical products. In addition to developing brand new products, the department also includes several subunits that work on extensions of the supply chain. New innovative products take into consideration resource efficiency on the client's end and encompasses innovation of three aspects: product, process, and business model. Through five stages of R&D management, LCY incorporates environmental safety and health, technological development, market assessment, patent risks, compliance, and other factors of consideration as basic requirements for managing R&D progress, budget, and legal compliance. We also provide financial bonuses as incentives to employees when patents or trade secrets associated with product designs are granted by the relevant patent authorities.

The Five Stages of LCY's R&D Management



Asia's First R&D Center for Recycled Materials

The LCY R&D Center moved into its new address in 2019. Since 2021, LCY has invested 2 billion to create Asia's first hub for innovative R&D of recycled materials and set up a platform for innovation, inspiration, and creativity. LCY has always valued real innovation and entrepreneurship, and value creation is our prime operational strategy in hopes of revolutionizing how we use resources. We devote great energy to R&D and innovation, and invest in equipment and facilities to furnish a world-class innovation hub at the Nanzih R&D Center. At the same time, LCY also fosters R&D talent and employs almost 150 R&D professionals from fields such as chemistry, materials, chemical engineering, analysis, and even market development. Approximately 40% of the staff at the R&D Center possess a doctoral degree. Our employees aim for sustainability and circularity within the economy and the environment. They are collectively devoted to creating industry chain value within the circular economy in order to realize our vision for a greener future.

Platform for Innovation, Inspiration, and Creativity

Since LCY started the platform for innovation, inspiration, and creativity, five to six research teams participate in the platform each season. If their ideas are verified through the platform's technology and on the market, then they will continue to develop their ideas into patents or trade secrets. Internally, LCY also offers incentives for innovation to reward outstanding creativity amongst our employees. The process of endless trial and error - all the way to the actualization of an idea and creation of a product - is a road fraught with challenges, but it can also be filled with innovation and rewarding fun.



Au-Yeung
Ka-Chun

Researcher

I created a new fabric with polypropylene and modified fibers and then fashioned garments out of the new fabric. The result is a lighter material that is warm, water-resistant, and recyclable.

Researcher



Li Shi-Wei

I'm in charge of the CPI (colorless polyimide) project, which can create higher definition displays for monitors. To ensure product stability, I had to personally test over a hundred formulations, and my team tested over 500. The entire process was filled with trial, error, and optimization.

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2.2 Sustainable Products and Services

2.2.1 LCY's 6R Sustainability Strategy

LCY incorporates LCA (life cycle assessment) into fundamental product design. In accordance with universal standards or guidelines used in Taiwan and abroad, e.g.: Sustainability Accounting Standards Board (SASB), Restriction of the use of Hazardous Substance (RoHS), Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), etc., and in consideration of the characteristics and development of products at various departments, LCY has created the 6R Sustainability Strategy: Renewable, Recycling, Replace, Reduce, Repurpose, and Recovery. The 6R's are derived from the 12 Principles of Green Chemistry in order to ensure full utilization of resources during our manufacturing processes. Not only do we seek to minimize the environmental impact of our products, but we are also extending our impact to the consumer cycle as well. With our considerable capacity for R&D, LCY redesigns sustainable products that meets the needs of end users and successfully redefines our position and role within the industry. Revenue from green products reached NTD \$2,811,907,000 in 2021, accounting for 5% of our total revenue.

Renewable

- Bio-succinic acid
- Carotenoid

Recovery

- Converting steam waste from China Steel Corporation (CSC) into heat energy for LCY

Repurpose

- Expanded Polypropylene (EPP)
- Thermoplastic vulcanisates (TPV) as a lightweight material for automotives
- SBS GP-3760 for bitumen modification



Recycling

- EIPA Dual Cycle manufacturing creates a circular economy to reduce waste for the semiconductor industry
- PCR PP (Post-Consumer Recycled Plastic)
- PENTA-T1603 (Products converted from waste)
- TPV Outsole (Recyclable outsole material)

Replace


- SEP GP-8501U for 5G communication
- Medical-grade SEBS GP-9645D

Reduce

- Energy-saving polypropylene ST860K, ST868K, ST869K
- Membrane Bio-Reactor (MBR)

2.2 Sustainable Products and Services

LCY's 6R Sustainability Strategy



Renewable

Biomass


- Derived from natural and renewable resources such as plant starch, carbohydrates, and fibers
- Polymeric materials synthesized via direct microbial fermentation
- Waste that is biodegradable (to yield carbon dioxide or organic matter) under certain conditions
- Compostable



Recycling


Converting Waste into Resources

- Materials or technologies for recycling or reuse
- Designing recyclable processes



Recovery


- Use energy recaptured from the manufacturing process
- Convert energy waste (e.g., steam) into products



Replace


Replace/avoid/reduce the use of risky materials

- Use of raw materials abides by international directives on banned or restricted substances, e.g.: RoHS, REACH, etc.



Repurpose

- Make end products more lightweight
- Extend the life of end products
- Increase energy efficiency during product use
- Minimize environmental impact of manufacturing



Reduce

Reducing the environmental impact of manufacturing

- Reduce emissions of air pollutants such as sulfur dioxides (SO_x), nitrogen oxides (NO_x), and hazardous air pollutants (HAPs)
- Reduce water consumption or improve water utilization
- Reduce waste
- Reduce energy consumption

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2.2 Sustainable Products and Services

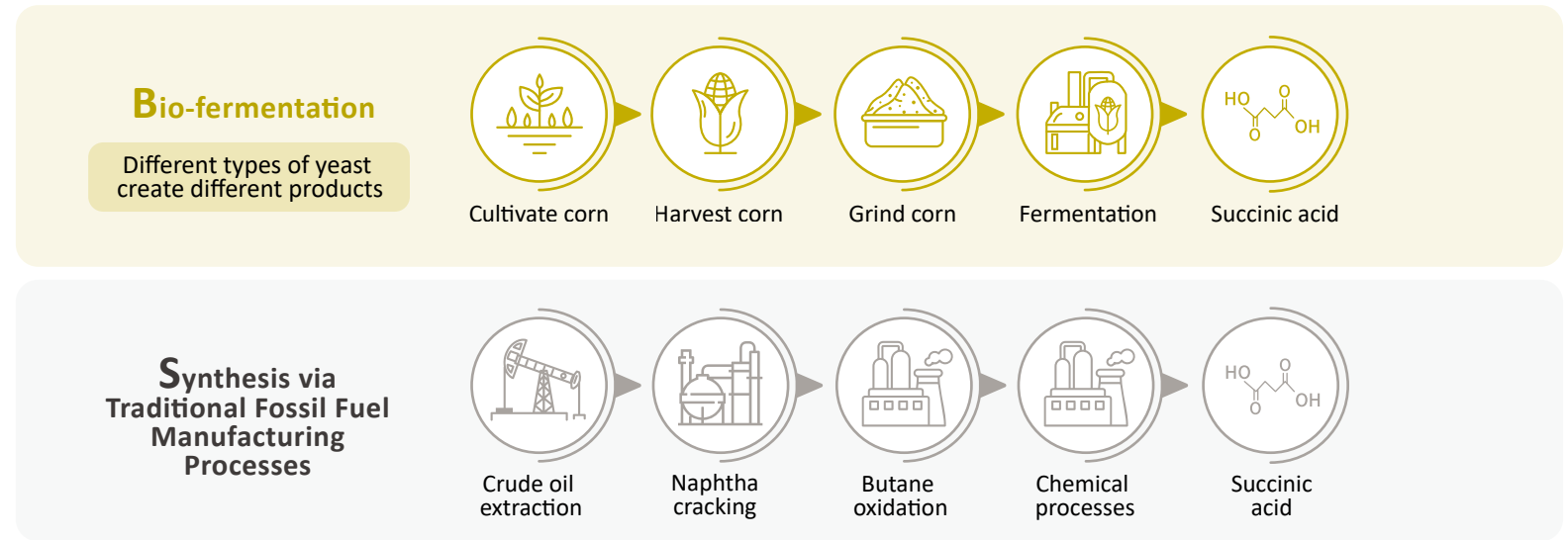
2.2.2 Innovation in Green Materials

Renewable Materials

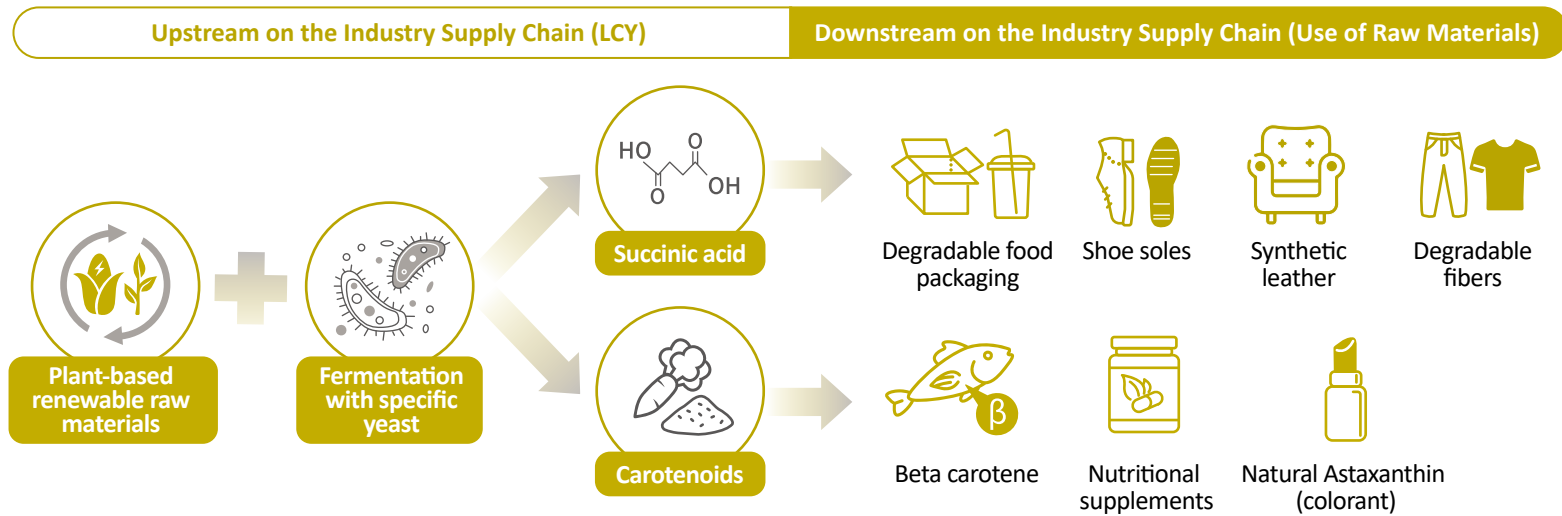
Bio-based Succinic Acid- Plant-based Plastic Made Without Fossil Fuels

LCY bio-based succinic acid can replace traditional plastics as it is fully degradable under normal temperature and pressure conditions. The material can be used in coffee cup lamination or packaging materials to reduce the carbon emitted when disposable coffee cups are incinerated. The world’s largest coffee chain, major global brands, and worldwide coffee chains have all begun using succinic acid to laminate their disposable coffee cups. Bio-based succinic acid, unlike traditional manufacturing processes, is created by bio-fermentation of corn syrup. Specifically designed yeast converts corn syrup into succinic acid, which is further crystalized and purified from the fermentation solution. LCY bio-based carotenoids are used to create all-natural and plant-based Astaxanthin, which can serve as a natural vitamin or antioxidant as it is created from natural fermentation processes. Astaxanthin can also be used as a colorant for cosmetics and is already widely used in animal feed, food, and nutritional supplements.

Manufacturing Process of Bio-based Products



2.2 Sustainable Products and Services



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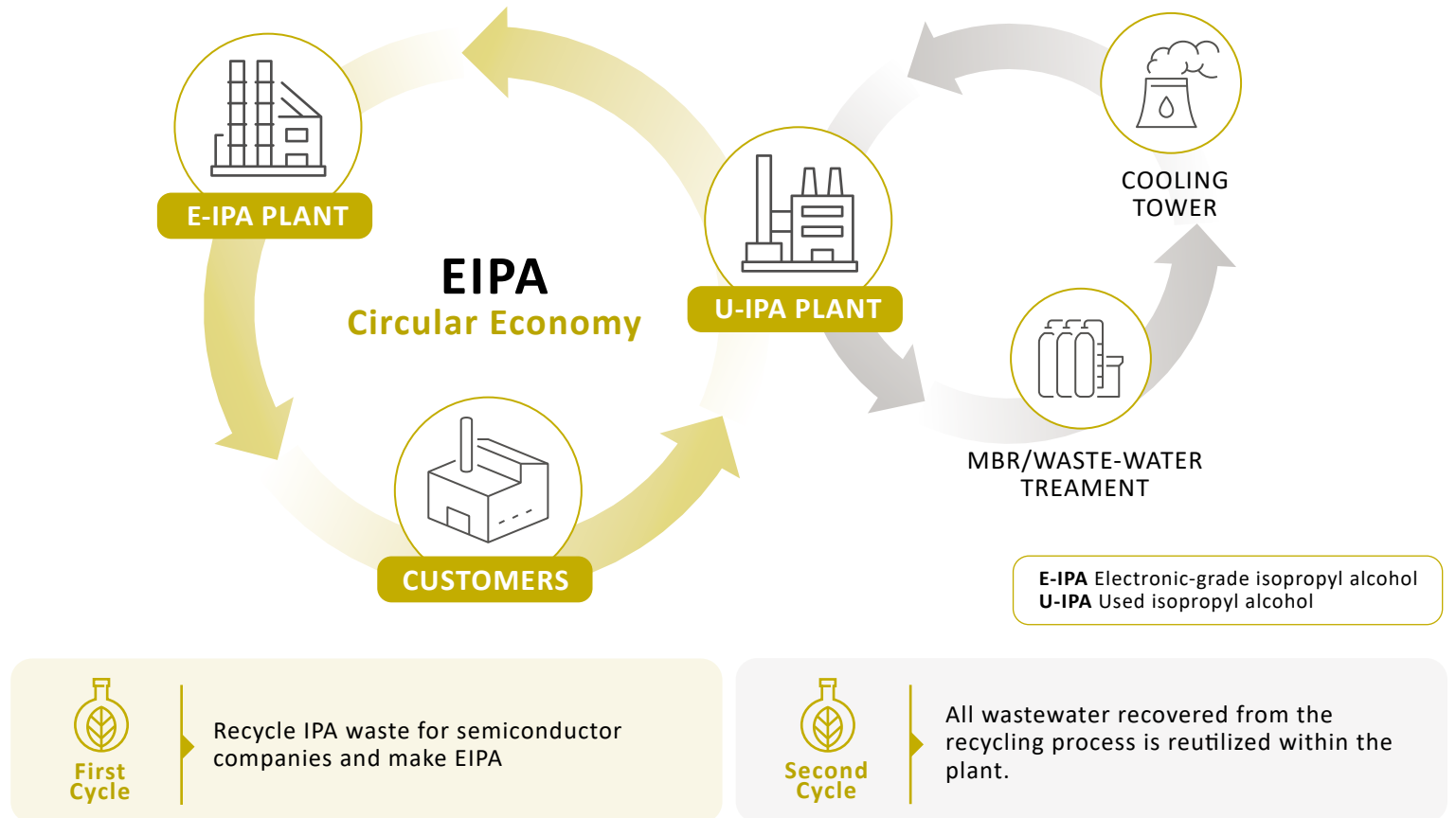
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2.2 Sustainable Products and Services

Recycling

EIPA Dual Cycle manufacturing creates a circular economy to reduce waste for the semiconductor industry

LCY is the largest manufacturer of EIPA (electronic-grade isopropyl alcohol) in Taiwan and the first to create a dual cycle system to recycle IPA waste liquid used in wafer rinsing. Isopropyl alcohol waste consists of 10 wt% IPA and 90 wt% water. Through LCY's proprietary process, used IPA can be repurified into electronic-grade IPA. LCY has also developed a special membrane bioreactor (MBR) and wastewater treatment system that filters and yields water for industrial use. LCY has successfully developed a revolutionary new waste recycling technology to assist downstream clients with recycling and reusing IPA waste. IPA is purified and reclaimed from waste liquids, then repurposed into new products. Water produced from the purification process supplies the cooling towers at LCY's Linyuan Plant to maximize resource utilization.



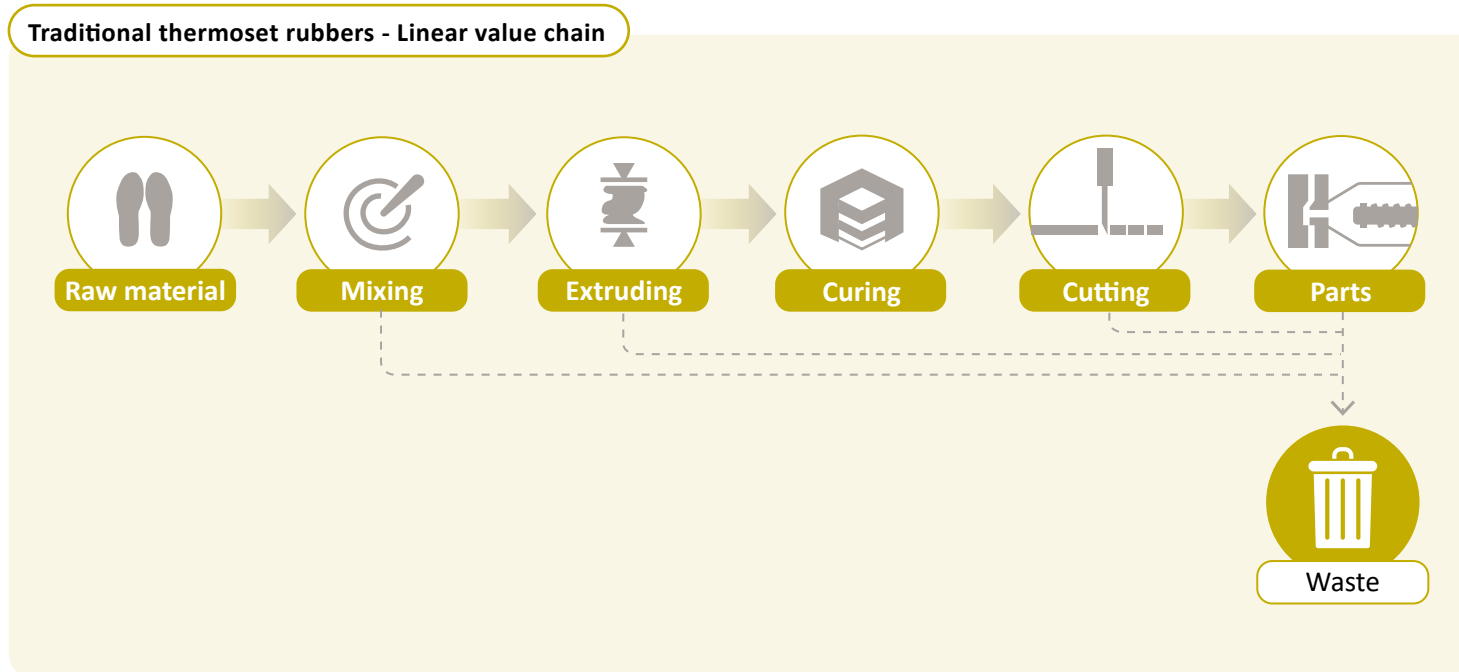
2.2 Sustainable Products and Services

Recycling

TPV Outsole — A recyclable next generation material for outsoles

LCY developed an eco-friendly and green rubber - thermoplastic vulcanizates (TPV). The manufacturing process of TPV creates waste that can be recycled and repurposed for a 5-10% reduction in manufacturing waste¹. Unlike traditional thermoset rubbers, TPV can be continuously extruded and molded into products with complex shapes and multiple colors, greatly reducing the demand on equipment, manpower, and energy for the manufacturing process.

¹ 2018 Common Standards Report on Raw Material Consumption in Footwear Manufacturing



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2.2 Sustainable Products and Services

Replace

SEP GP-8501U for 5G Communications — A Safe Alternative for Chloroprene Rubber

SEP GP-8501U is used in 5G infrastructure, specifically within fiber optical cable filling gels and special polymer thixotropy. It is also commonly used as a better substitute for animal-based thickeners to thicken and modify the rheological properties of grease. SEP GP-8501U can maintain function under harsh environmental conditions and has outstanding heat resistance, thereby imparting the end product with desirable characteristics such as a longer life cycle, lower energy consumption, and less waste generation. SEP GP-8501U is also used as a modifier to improve the impact strength and low-temperature properties of commonly used plastics, establishing itself as a replacement for chloroprene rubber (CR) and polyolefin elastomers (POE). Chloroprene rubber contains halogens, which can pose as a health risk, and therefore, SEP GP-8501U is a safer substitute. Please refer to the following table for successful substitutions:

Successful Substitutions

TMAH-free, low toxicity electronic-grade cleaners

TMAH can be absorbed through the skin and cause respiratory depression, making it highly lethal and there is currently no known antidote. In Taiwan, there have been several instances of improper use of TMAH leading to death. LCY developed a Non-TMAH Poly-siloxane Remover, a TMAH-free cleaner that eliminates the risk of exposure to TMAH and has better cleansing properties.



Substitute for Talc to reduce health risks

Talc is added to the TPE-SIS product series as a raw material for dedusting agents. Yet in recent years, Talc has prompted safety concerns regarding risks to human health and the environment. To ensure safe use, LCY has developed a method to completely replace talc within our products. Not only do we avoid use of similar raw materials, but we've also improved product function and have fully replaced talc in all the products within the SIS series.



Alternative for traditional PVC medical materials

Rubber products made with SEBS GP-9645D possess high transparency and excellent elasticity and can be used in medical tubing and films (e.g., IV bags). As it is halogen-free and does not require plasticizers, SEBS GP-9645D products can replace traditional PVC medical materials. The material is not easily degradable and exhibits excellent resistance to UV and ozone, as well as outstanding chemical stability.



Reduce

SBC Series — Rheology Modifiers

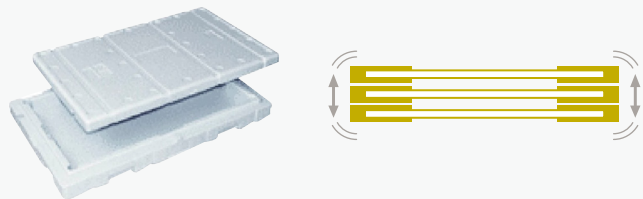
SBC products can be added to recycled plastics to promote multiple recycling. GLOBALPRENE™ SEPS is a hydrogenated styrenic block copolymer with isoprene segments. After hydrogenation, the copolymer is composed of polystyrene (S)-polyethylene (E)-polypropylene (P)-polystyrene (S) and thus, abbreviated as SEPS. Hydrogenation SEPS virtually eliminates the double bonds in the diene molecules, significantly reducing degradation caused by O₂, O₃, and UV and improving the application temperature and transparency.

2.2 Sustainable Products and Services

Repurpose

EPO Foam — Lightweight and Recyclable Foaming Material that Conserves Energy

Traditional expanded polyethylene/polypropylene (EPE/EPP) has excellent impact resistance, chemical corrosion resistance, and abrasion resistance, while expanded polystyrene (EPS) has high modulus, excellent dimensional stability, thermal insulation, and low-density foaming properties. Yet both EPE/EPP and EPS also possess some functional disadvantages, i.e.: EPE/EPP foams have poor dimensional stability and EPS foams exhibit poor chemical resistance to organic substances. The R&D team at LCY has therefore developed a new type of expanded polyolefin (EPO) foam that has high impact resistance and bending strength, as well as excellent compression strength, which can be used as cushioning material for large electronic products or components, as well as for automotive materials.



▲ Boxes for transporting LCD modules ▲ Liquid crystal panel

If we could decrease the height by a little bit, then we can fit three layers.

An additional layer means a **50%** increase in productivity!



Cushioning material for large electronic products or components



Product Use

Home appliances, IT products, or parts and components of IT products.



Reduce Usage

The impact resistance of EPO is **2.5** times higher than EPS, and higher durability means reduction in use of raw materials.



Better Transportation Efficiency

EPO has a bending strength that is approximately double that of EPS and compression strength **20%** greater than that of EPP. This translates into better loading efficiency and reduction of the environmental impact from transportation.

Note: Zhang, H. Y., Wang, L., Wang, Y. L., (2019). Cushioning Performance of EPO Materials. *Packaging Engineering*, 40, 99-104.; Liu, X., Lv, P., Yang, L., Wang, J., (2018). Performance analysis and application of EPO cushioning material in packaging and transportation of washing machine. *Journal of Appliance Science & Technology*, 0(5), 70-73.

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2.2 Sustainable Products and Services

Automotive materials	
<p>Product Use</p>	<p>Bumper materials, calf shock-absorbing materials, spare tire gaskets, floor gaskets, interior decorative parts, etc.</p>
<p>Lightweight</p>	<p>Use of less materials to create parts with the same rigidity. Decreasing the overall mass of a vehicle by 10% can increase fuel efficiency by 6%~8%. Every 100 kg reduction in total car mass translates to a 0.3~0.6 L reduction in fuel consumption per 100 km and a 5.0 g reduction in CO₂ emissions per km.</p> <ul style="list-style-type: none"> ▲ An improvement in fuel efficiency ▼ Reduction in greenhouse gas emissions
<p>Better Safety Performance</p>	<p>Higher impact resistance (1.2 times that of EPP) at the same foaming rate.</p>
<p>Chemical and Oil Resistance</p>	<p>Able to maintain performance over time without being affected by external conditions.</p>
<p>High Dimensional Stability</p>	<p>Complex parts designed to fit perfectly together reduce noise during driving.</p>

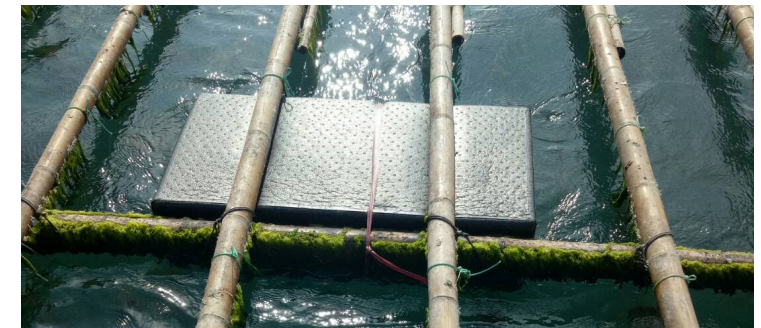
Note: Zhou, S. H., Chen, J. T., (2018). Application of Thermoplastic Elastomeric Materials in Research of Lightweight Automotive Materials. *Jiangsu Science & Technology Information*

LCD Display Alignment Films (TCA/TCAA) - Innovative low-carbon technology

LCY is actively developing electronic materials and relevant products with high technology thresholds. The R&D team has successfully developed mass production of TCA and TCAA, which are important raw materials for the application of alignment films in LCD displays. Our innovative process utilizes petrochemicals of lower economy value as starting materials and yields a 21% reduction in the amount of waste liquid produced during manufacturing compared to other processes (results from an LCY study). Also, special monomer design and patented formulation means that the transparent polyimide products that are produced do not require storage at low temperatures. It also can reduce the operating temperature for the customer, greatly decreasing energy consumption.

Expanded Polypropylene (EPP) – Reducing the burden of plastics in oceans

Beginning in 2018, LCY has partnered with the Tainan and Chiayi local governments, as well as the Ocean Conservation Administration, to replace styrofoam buoys on oyster rack with EPP, as it has zero toxicity and is a hundred percent recyclable. This effectively prevents Styrofoam from polluting the oceans, as well as reduces the formation of microplastics. EPP is also the most important material in making lightweight automotive vehicles, as it is impact resistant and can reduce fuel consumption.



2.3 Responsible Chemical Management

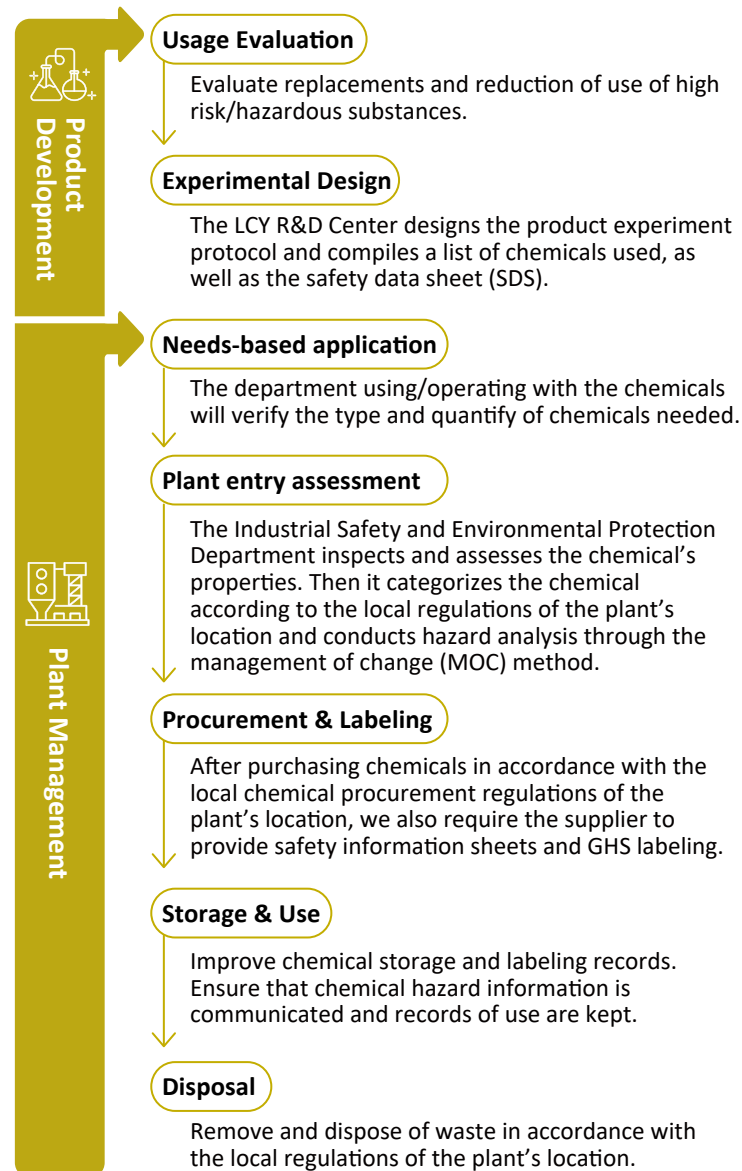
2.3.1 Chemical Management Procedures

Chemical management can be divided into two major management mechanisms: product development and plant management. Through these mechanisms, LCY is able to evaluate replacements and reduction of use of high risk/hazardous substances before the product enters official mass production. We also cooperate with the Industrial Safety and Environmental Protection Department to assess the hazards, health, and safety of our manufacturing environment and processes to ensure that LCY's operations and production will not be impacted in any way. LCY's Environmental Risk Management Department and the Industrial Safety and Environmental Protection Departments at each individual plant are the units primarily responsible for plant management. The Environmental Risk Management Department sets forth chemical management guidelines that begin when the chemical enters the plant and encompasses the entire duration of its life cycle. The guidelines include five major management stages, from needs-based application, plant entry assessment, procurement labeling, storage and use, to disposal. LCY continuously monitors regulatory updates from the competent authority to understand the impact thereof within our plants, as well as to discuss response measures, to ensure that the chemical operations at each plant and relevant departments are carried out in accordance with local regulations. These efforts also safeguard the health and safety of our employees when using chemicals. In 2021, revenue from GHS Category 1 and 2 chemicals reached NTD **\$10,816,160,000**, accounting for **18.83%** of LCY's total revenue. All of these products must fully (100%) comply with LCY's requisite hazards and risk assessment.



Chemicals belonging to GHS category 1 and 2 must **100%** comply with LCY's requisite hazards and risk assessments

Chemical Management Procedures



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2.3 Responsible Chemical Management

LCY manufactures a wide range of products. Aside from various solvents and basic chemical materials for methane derivatives, LCY also offers other product lines such as performance plastics, thermoplastic vulcanizates (TPV), and copper foils. These products do not pose a major risk to human health or the environment in and of themselves. Therefore, the assessment of hazard and risks of these chemicals are primarily focused on plant management, and risk management mostly addresses chemical properties, EHS risks, and process hazards, etc.

Chemical Hazards and Risk Assessment

Chemical Properties



- Categorize and manage chemicals according to chemical control banding and risk levels.
- Compliance assessment of international banned/restricted substances directives such as RoHS, REACH, etc., safety data sheet update check, chemical incompatibility check.

EHS Risks



Identification of ISO 14001 Environmental Considerations: We regularly assess the risk level of possible sources of risks in our daily operations every year and prepare corresponding management measures.

Process Hazards



Process Hazards Analysis (PHA): We use the HAZOP (hazard and operability analysis) method to identify, assess, and control process hazards associated with manufacturing, use, and storage of hazardous substances within plants.

2.3.2 Responsible Chemical Research

The use of chemical substances has become inextricably tied to every aspect of our daily lives. In the face of concerns with the safety of using various chemicals, LCY hopes to tap into our incredible R&D capacity to gradually reduce the use of high risk and highly controversial substances at our plants and in our products. We expect to do so through two major strategies: developing alternatives and substitutes, as well as innovating our manufacturing processes. Also, we will work with our clients and assist them with developing alternatives to decrease the potential impacts of various substances to human health or the environment.

2.3.3 Smart Chemical Management

The R&D Center adopted an online chemical management system in 2019 and has been steadily expanding system functions every year. The system utilizes AI technology and currently holds information on the properties of over 20,000 chemicals, allowing users to quickly look up the latest status and management of all chemicals held within the R&D center. The system's PDA and APP functions allow for quick and easy access to records, queries, and reviews of chemical operations, and a QR code function allows users access to information on the type, quantity, distribution, and hazards of all laboratory chemicals, anywhere at any time. Pairing this system with chemical control banding (CCB) is an effective way to manage chemical and exposure risks. Through IoT and AI technology, we have streamlined management for more direct and timely control of chemical operations in the plant to improve operational efficiency and enable companies to respond to the rapidly-changing market environment. The dynamic infographic interface of our early warning system allows us to monitor in real-time the various manufacturing parameters associated with chemicals. Supervisors and management of all levels can monitor chemicals and detection alarms with electronic noses via their mobile devices, allowing them 24/7 access to production data and ensuring safer manufacturing operations.









2.4 Digital Innovation

2.4.1 Digital Transformation Strategy

LCY Chemical Corp has been proactively promoting digital transformation since 2014, focusing on cultivating a top-down change in the digital mindset of our employees to integrate technological tools and conduct digital analysis. During the campaign, we hosted LCY Insights Users Conference in tandem with LCY AI School. The LCY Insights project is in charge of setting up a company-wide smart factory strategy platform, which will help change how our employees collect data and information. The platform provides a digital-based framework, upon which further logical processes like deduction, discussion, and decision making can occur. Furthermore, the platform can provide advanced information visualization, report automation, and real-time monitoring, which will help LCY create safer, optimized, and more stable manufacturing processes, conserve energy, and reduce emissions. The aforementioned changes help LCY reduce operational risks and build greater corporate resilience to achieve smart manufacturing goals for sustainability and co-prosperity.

The series of courses offered by LCY AI School covers topics on highlights of smart manufacturing in the chemical industry, construction and application of smart machinery, and strategies to incorporate AI technologies, etc. The topics gradually increase in difficulty to provide a step-by-step introduction to Big Data and smart manufacturing, as well as the core values therein, to our employees. The courses also empower and encourage each plant to continue brainstorming smart management solutions that incorporate AI technology that is slowly maturing. Examples include using real-time manufacturing parameters to predict of product quality, calculate optimal operating parameters, predict equipment maintenance, estimate energy savings with smart controls, detect anomalies, and identify images of operational safety, etc. These efforts will help develop optimal smart manufacturing solutions that are safe, energy efficient, and stable.

2.4.2 Digital Innovation & Application

 <p>▲ 80% Accuracy Over 80% accuracy when forecasting trends in the price of raw materials</p>	 <p>▼ 3%-8% Energy consumption Smart controls to conserve energy and reduce emissions may decrease energy consumption by 3-8%</p>
 <p>▲ 90% Accuracy Over 90% accuracy when predicting quality with multi-process parameters</p>	 <p>▲ 80% Accuracy Over 80% accuracy in precise predictive maintenance on critical equipment</p>
 <p>Monitor safety and controls anywhere through smart phones and tablets</p>	 <p>6 seconds Updated Inventory monitoring of hazardous chemicals is updated every 6 seconds</p>

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2.4 Digital Innovation

Strategic Platform to Predict Cost of Raw Materials and Product Prices

LCY collaborated with academic and research institutions to enhance the platform by using data science technology to predict the cost of chemical materials. We are also continuing to explore a strategic platform to predict the cost of major chemical materials and product prices, and current predictions of the cost of raw materials are over 80% accurate. An AI chatbot has also been introduced after continued optimization, with back-end programming that is capable of automatically accessing costs of raw materials in real-time, developing a price forecasting model for major raw materials, predict future trends in prices, and answer relevant questions 24/7 about the rise and fall of the cost of raw materials. In the future, we intend to incorporate real-time manufacturing data of raw materials, as well as the existing price forecasting model, with data from maritime shipping and coastal inventories to create calculable data. This data will be used to establish a decision-making model for overall company operations that aligns with the current situation and status, providing a powerful tool to assist procurement personnel in making decisions.

Energy Savings with Smart Controls May Reach 3-8%

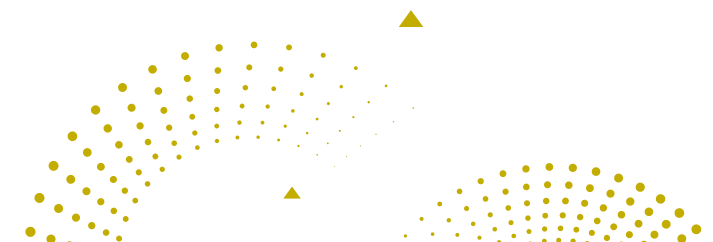
LCY plans to analyze large amounts of data and construct models using AI technology to yield smart controls that optimize multiple targets. Smart controls can reduce energy consumption of plant chillers, conserve water by predicting the best time to clean solar power systems, and stabilize energy savings for the distillation system, in order to be more energy efficient and reduce carbon emissions. Energy savings are predicted at around 3-8%. In response to company-wide adoption and development of AI applications, AI models are constantly updated even after successful development – changes in the time, environment, and manufacturing process will prompt offsets in the model. Therefore, LCY developed an internal AI model monitoring platform to continuously track and update AI functions automatically to ensure the accuracy of the model. At the same time, LCY also holds regular discussions with plants and subject matter experts to stay on top of new developments and strive for excellence.

Over 90% Accuracy when Predicting Quality with Multi-Process Parameters

Access process parameters via the company’s data platform to develop AI models and predict quality in real-time. Provide alerts when the predicted value is exceeded and abnormal process data is detected as a powerful operational aid for production units. Also, the AI team is delving deeper into model training to identify factors that impact optimum control conditions and give dynamic parameter suggestions to the production unit for optimum operations. The project accuracy rate is between 90% to over 99%.

Over 80% Accuracy in Precise Predictive Maintenance on Critical Equipment

LCY uses and AI model to analyze equipment data to identify issues and major factors affecting the health index of critical equipment such as cutters, compressors, and mixers. This allows us to organize multiple equipment variables into a clear and simple health index for a single equipment. The index is then visualized and presented in real-time on the website to provide plants with a reference for when they should schedule maintenance in advance. The system also automatically reports early warnings of potential equipment failure to minimize the impact on production due to issues in equipment availability. Since going online, the predictive power of the system for maintenance of critical equipment is over 80%.



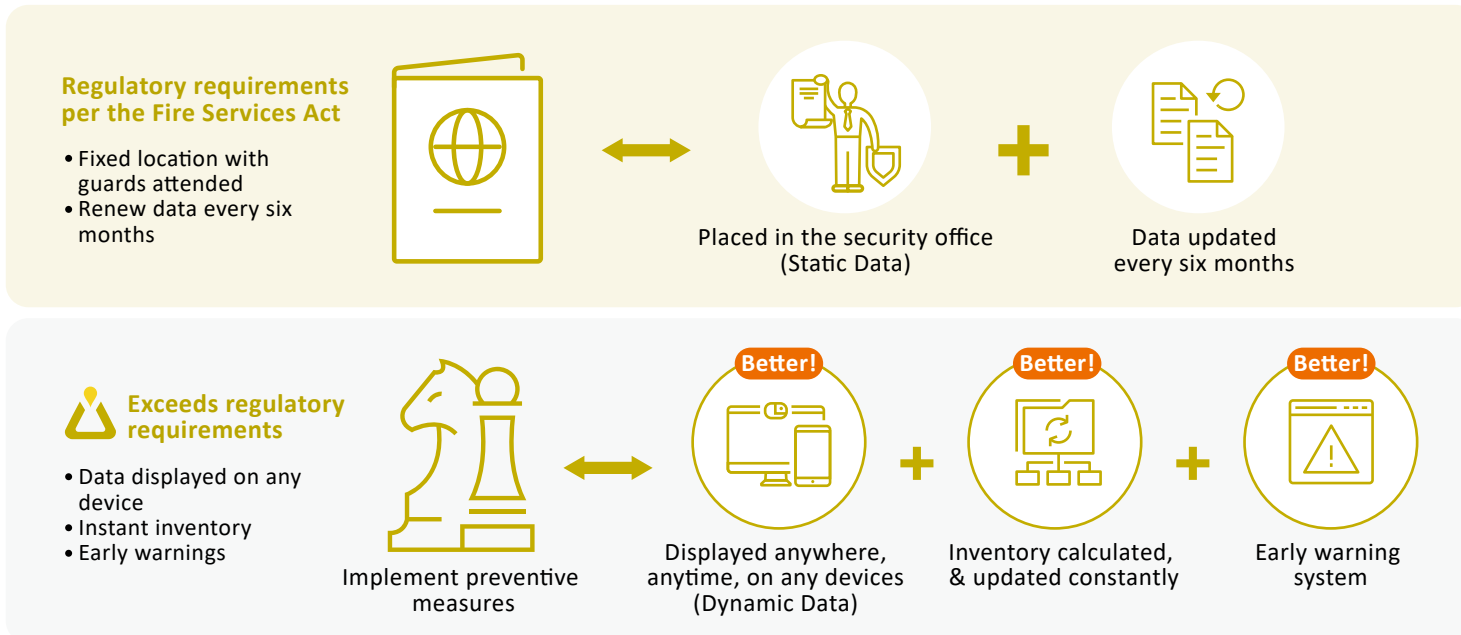
2.4 Digital Innovation

Monitor and Control Through Smart Phones and Tablets Anywhere, Anytime For Safety

Employee safety and the environment protection are the cornerstones of sustainable development that the chemical industry strives for. System functions allow enhanced communication and delivery of notifications beyond the control room for major alerts. The contents of notifications include suggested actions for dealing with emergencies, and the actions are regularly reviewed and updated, allowing valuable experience to be passed on. Power BI reporting tool is integrated within the system for advanced analysis, providing a powerful basis for alarms review – a move that will effectively decrease the number of alarms while maintaining strict adherence to MOC protocols. This will also reduce the stress on operators and the time it takes to respond to incidents, which will allow LCY to focus on responding to other abnormal situations, reducing the risk of accidents, and enhancing plant safety.

Hazardous Chemicals Inventory Updated Every Six Seconds For Better Control – Exceeding Regulatory Requirements

According to the Fire Services Act and the Establishment Standard and Safety Control Regulation for Manufacturing, Storing, Processing Public Hazardous Substances and Flammable Pressurized Gases Places, plants should provide a billboard of the type and quantities of chemicals on site to facilitate disaster rescue, ease decision-making during disasters, and protect the safety of rescue personnel. The billboard should be placed at a designated location within the security office or any office where personnel are present 24/7. The billboard should also be updated every six months. By utilizing the system platform's ability to capture and analyze data, LCY is exceeding regulatory regulations by providing dynamic and real-time data of chemicals stored on site anywhere, anytime and on any devices. The platform is capable of automatically detecting the threshold of chemicals storage as well, and can send out early warnings to relevant personnel, so that they can proactively prevent from the excess of regulatory guidelines.



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Green Business

We promote carbon footprint verification (CFV) to evaluate the use of energy, materials, and carbon emissions throughout all stages of production. This allows us to systematically and strategically establish short, medium, and long-term carbon reduction goals that will serve as the foundation for our business decisions and propel LCY toward carbon neutrality. The company continues to promote sustainable manufacturing to increase energy usage efficiency. LCY factories are required to increase the use of renewable energy and have integrated the use of ISO 50001 energy management systems. We also collect and analyze all factory production metrics using an AI monitoring system to find the most optimal parameters and models to reduce energy consumption by 3-8%.

▼ **1.34%**

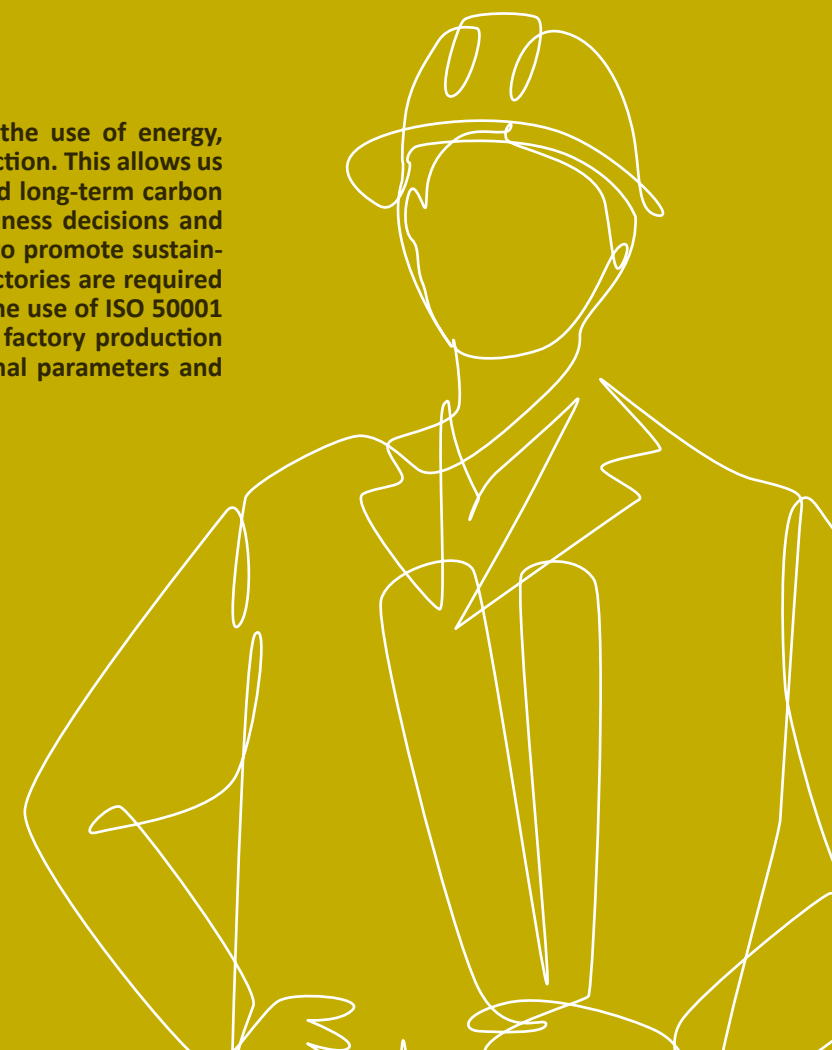
Energy intensity level decreased by 1.34% compared to the previous year while the overall energy usage decreased by 0.22%

▼ **2.36%**

Unit water intake quantity decreased by 2.36% compared to the previous year

▼ **3-8%**

AI monitoring system decreases energy consumption by 3-8%



SDGs



- # Air quality
- # Energy Management
- # Greenhouse gas emissions
- # Toxic waste management
- # Water management

Category	Metrics	Long-term 2030 Targets	Short-term 2020-2022 Targets	2021 Achievements
Greenhouse gas emissions	GHG emissions reduction against the base year in Taiwan's plants	5%	1%	The carbon intensity of GHG in Taiwan's operating sites in 2021 was 0.67 metric tons of CO ₂ e/ton (0.56 metric tons of CO ₂ e/ton in the base year)
	VOCs reduction against the base year	15%	5%	The average unit capacity VOCs emission was 167.43 tons/million tons, an 8.42% increase compared to the base year
Air quality management	NOx reduction against the base year (concentration of broiler emissions)	60%	30%	Dashe Plant had a 23% reduction compared to the base year
	Taiwan plants' unit energy use reduction against the previous year	▼ Annual reduction of 1.5%	1%	Unit energy use was 5.24GJ/ton, a 1.23% reduction against 2020.
Energy management	Use an indicated percentage of renewable energy	19%	N/A	Dashe Plant and the R&D Center used 162GJ and 122GJ of renewable energy respectively, totaling 284GJ - an equivalent of 0.0034% of total energy consumption.
	Identify water shortage risks and formulate contingency SOP	N/A	Formulate water shortage contingency SOP	Continue with water shortage contingency SOP
Water management	Reclaimed water ratio	20%	10%	The ratio for reclaimed water is 5.14%
	Enhance resource efficiency	Set up a hazardous waste management team that is responsible for the formulation of hazardous waste reduction strategy. The goal is to have 80% of the hazardous waste recycled locally in Taiwan to increase resource use efficiency.	Crease a hazardous waste inventory (quantity, category, disposal method) and replace the traditional incineration and burial disposal methods with recycling and reclaiming.	23.82% of hazardous waste was recycled

Note: The base year takes the average value of 2016-2018

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3.4 Air Quality Management

3.5 Water Management

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3.1 Management Approaches to the Environment

3.1.1 Environmental Protection Policies

LCY has established an Environmental Risk Management Division which is a dedicated level-one management unit that reports directly to the employer. The division oversees the Department of Industrial Safety and Environmental Protection and the Department of Loss Prevention Engineering. The two departments are responsible for environmental risk management planning and relevant technical engineering matters respectively, as well as the supervision of the plants' industrial safety and environmental protection offices. All industrial safety and environmental protection offices are responsible for the formulation, planning, supervision, and promotion of health and safety management. Environmental protection is the top priority for the environmental management system. Our company's management goal is to implement all relevant environmental protection measures, as this is the highest level of respect and protection our company can show to the people, the ecosystem, and facilities' lifetime. LCY is committed to promoting a responsible care system for the continuous improvement to meet all standards. In addition, all activities within the plants must continue to be regulatory compliant to promote sustainable operation. Our company has incorporated an effective environmental management system. Our plants in Taiwan and China have begun to use the ISO14001 environmental management system (EMS) and have successfully obtained third-party verification. All plants conduct daily environmental management operations according to the standards of ISO14001 to ensure environmental compliance. As the chemical industry has a significant impact on the environment, LCY has set management targets and goals for major environmental issues, including carbon management, energy management, air quality management, water management, responsible chemical management, and waste management.

Environmental Protection Policies

Respect For Human Life

Observe Regulations

Prevention of Pollution





Continuous Improvement

Sustainable Operations

3.1.2 Environmental Regulations Compliance

Four violations of environmental policies by LCY Chemical Corp. were found in 2021, with a total fine of US\$9,333 (NT\$280,000). Violations were mainly in the waste and air pollution categories. All violations have been thoroughly reviewed with enhanced employee training and improved protocol. No material environmental violations were found. LCY will continue to work towards the goal of zero violation.

LCY Chemical Corp.'s violations of environmental policies in 2021

Type	No. of violations	Fine (NTD)
 Waste pollution	▲▲▲▲	180,000 NTD
 Air pollution	▲	100,000 NTD
 Water pollution	-	0
 Toxic chemicals pollution	-	0
Total	▲▲▲▲▲	280,000 NTD



3.2 Climate Strategy

3.2.1 Governance & Strategy

LCY Chemical Corp.'s ESG Sustainability Committee established the Green Transformation Team that is responsible for climate change risk control & opportunity evaluation and organizes the plants' daily management activities related to climate change and energy issues. The team presents climate issues to the Green Operation Team, who evaluates and approves the relevant mitigation and adaptation solutions. The issues are periodically presented to the board of directors for supervision and recommendation. In terms of climate change strategy, our company has mapped out the risks and opportunities that climate change has on its operations, employees, customers, suppliers, products, services, and reputation in its operations in Taiwan and China. LCY has set up risk assessments for different regulatory policy scenarios such as GHG emissions control and carbon pricing system. Furthermore, the company became a supporter of the Task Force on Climate-related Financial Disclosures (TCFD) in 2020 to show support for external initiatives.

Climate risks and opportunities management



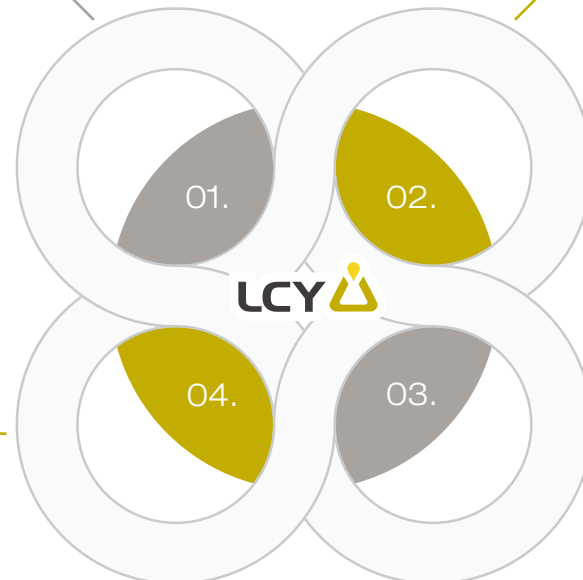
Governance

- Establish a climate change team that is responsible for climate risk control and opportunity evaluation
- Organize the plants' daily management activities related to climate and energy issues. Regularly present climate issues to the climate change team according to the company's risk management system
- The team evaluates and approves the mitigation and adaptation solutions and periodically reports to the board for supervision and recommendation



Metrics & targets

- Unit emissions average between 2016-2018 from our Taiwan plants is used as the benchmark
- Establish short (2020-2022), mid (2025), and long (2030) term goals based on the following metrics:
 - 1 GHG emission reduction in Taiwan's plants
 - 2 Unit energy consumption reduction from the previous year in Taiwan's plants
 - 3 Percentage of renewable energy use



Strategy



- Map out climate risks and opportunities in terms of operation, employees, clients, suppliers, products, services, and reputation
- Identify 5 risks and 3 opportunities through risk matrix analysis
- Quantify and evaluate possible climate-related supply chain or production disruption and an increase in operational cost based on risk scenario analysis, potential occurrence time, and impact level metrics. Adjust response measures accordingly.

Risk management



- Reference relevant climate change information and TCFD framework to identify short, mid, and long-term climate risks and opportunities
- Generate a risk matrix based on the level and probability of impact, followed by the initiation of response measures
- Continue to evaluate and review potential climate risk-related impact to adjust the mitigation and adaptation measures to lower the impact, while taking advantage of potential opportunities to increase production capacity and develop new products.

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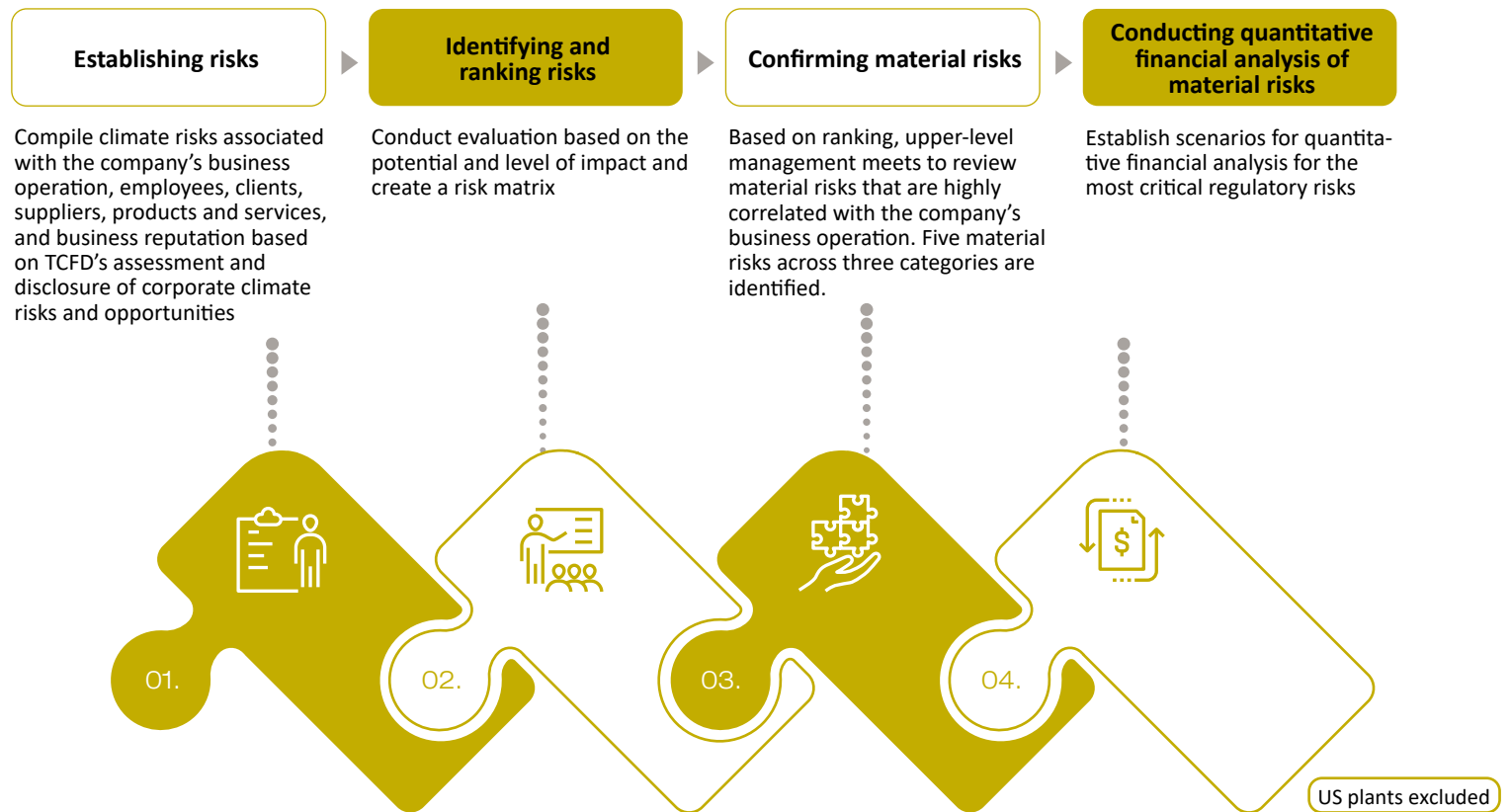
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3.2 Climate Strategy

3.2.2 Climate Risks and Responses

In response to the increase in climate risks, LCY refers to relevant climate change data and TCFD framework to identify short, mid, and long-term climate risks and opportunities for our plants in Taiwan and China. A risk matrix is also generated based on the impact level and probability. Upper-level management convenes to adjust risk priority and initiate response measures based on the relevance between the risks and LCY's sales and operation. The top three risks identified in 2020 are (a) policy and regulatory risks – general environmental regulations and an increase in the cost of GHG emissions, (b) transition risk – the cost associated with products and services being replaced by low-carbon technology, and (c) physical risks – extreme weather events and shifts in severe weather patterns. In response to the identified risks, LCY has formulated corresponding management measures. We will continue to thoroughly evaluate the level of impact climate risks have on our company's operation. In addition to response measure strategies to reduce climate risk impact, LCY also focuses on increasing efficiency and product development based on the identified opportunities. We have also established relevant carbon-reduction metrics and targets. Please see 3.3 Carbon and Energy Management for details.

Procedures for climate risk identification



3.2 Climate Strategy

Risk Matrix

Initial identification of potential impact pathways is conducted based on TCFD's recommended risk disclosures and risk pathways. Actual impact, scenario, and quantification methods are also verified through internal interviews and surveys with the relevant departments. Risks are ranked according to the level of probability (= impact level × probability) to map out LCY's assessment of material corporate climate risks and opportunities.



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3.2 Climate Strategy

Result from climate risk identification

Risk category	Risk issues	Operational impact	Financial impact	Mitigation & Adaptation
 Regulatory Risk	More stringent environmental regulations	Imposing water conservation charge	Increase in operational cost	<ol style="list-style-type: none"> LCY's plants in Taiwan join the effort with Kaohsiung City Government's water recycling facility planning. We purchase water recycled from domestic wastewater to reduce water consumption. Strive for zero liquid discharge
	An increase in GHG emissions cost	The necessary cost incurred during GHG emissions control (e.g., renewable energy certificate purchases, carbon credit purchases, investment in carbon-reduction technology, vouchers, carbon fee)	Increase in operational cost	Incorporate ISO 50001 energy management system together with a digital energy monitoring system to gain insight into energy usage. Conduct annual GHG inspection to obtain GHG emissions data. Promote energy-saving and carbon-reduction projects to reduce energy usage and GHG emissions. Purchase exhaust waste steam from other companies to make use of energy recycling.
 Transition Risk	Products and services replaced by low-carbon technology	A decrease in sales due to limited low-carbon or environmental products options not meeting customer demand	Decrease in revenue	Actively develop low-carbon products while comprehensively mapping out products' carbon footprint to increase carbon competitiveness.
 Physical Risk	Extreme weather events	<ol style="list-style-type: none"> Flood, disruption of factory operation, damages to plants Blackout or energy rationing at plants 	Increase in operational cost	<ol style="list-style-type: none"> During the construction phase, all plants have incorporated raised foundations and the appropriate drainage facilities to prevent possible damages from floods. For future expansions, LCY has added natural disaster evaluation as one of the considerations for location selection and will incorporate flood control facilities to enhance resilience against disasters. All business units have business contingency plans (BCP) in place. In addition to inventory planning to ensure uninterrupted supplies, LCY also has production sites and logistics facilities around the globe that can help during potential blackouts or energy rationing events.
	Shift in weather pattern	Water shortage, increase in production cost	Increase in operational cost	Establish water shortage response measures to prevent disruption to the operation. Promote water-saving projects and increase water usage efficiency to reduce consumption.

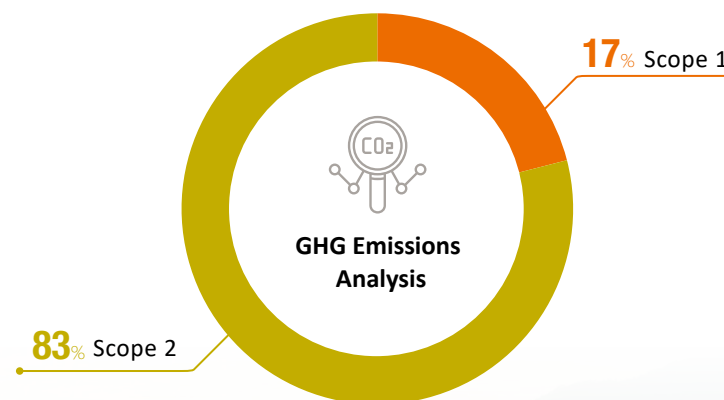
3.3 Carbon & Energy Management

3.3.1 Carbon Management

Due to product types and services, our GHG emissions predominantly fall under indirect GHG emissions (scope 2), which differs from the traditional petrochemical industry's direct GHG emissions (scope 1). Scope 2 emissions make up roughly 80% of total emissions. Therefore, energy and steam saving are our main carbon reduction approaches. In addition, our sites implement a smart management system to identify the optimal operating parameters and potential energy-saving hotspots. Energy-saving approaches include switching to energy-saving inverter motors and recycling waste heat to reduce steam usage. In terms of scope 1 emissions, energy-saving approaches include adjusting manufacturing processes and reducing exhaust emissions and fuel usage. LCY continues to enhance and expand production sites' carbon reduction measures and results as we strive for a successful low-carbon transition.

The sites started implementing the quantification and reporting of GHG emissions in 2004. Through third-party verification of ISO 14064, we track GHG emissions data across all locations to continue our effort for carbon reduction and net zero transition. All sites in Taiwan follow the recommended GHG verification method in ISO 14064-1. We conduct annual verifications to obtain third-party verifications; meanwhile, GHG emissions verification for the production plants in China is conducted in accordance with the GHG emissions accounting methods prescribed by the Chinese government. In the future, we plan to introduce ISO 14064 to our sites in China to standardize the verification process.

After the establishment of the GHG emissions quantification and reporting system, the sites take a step further to conduct carbon footprint verification (CFV). Including GHG emissions as an operational consideration can enhance management effectiveness. In addition to the verification process, LCY has also formulated a renewable energy usage strategy and an internal energy-saving & carbon-reduction project, which were officially incorporated into the company management concept in 2019 as energy and GHG management goals for our sites in Taiwan.



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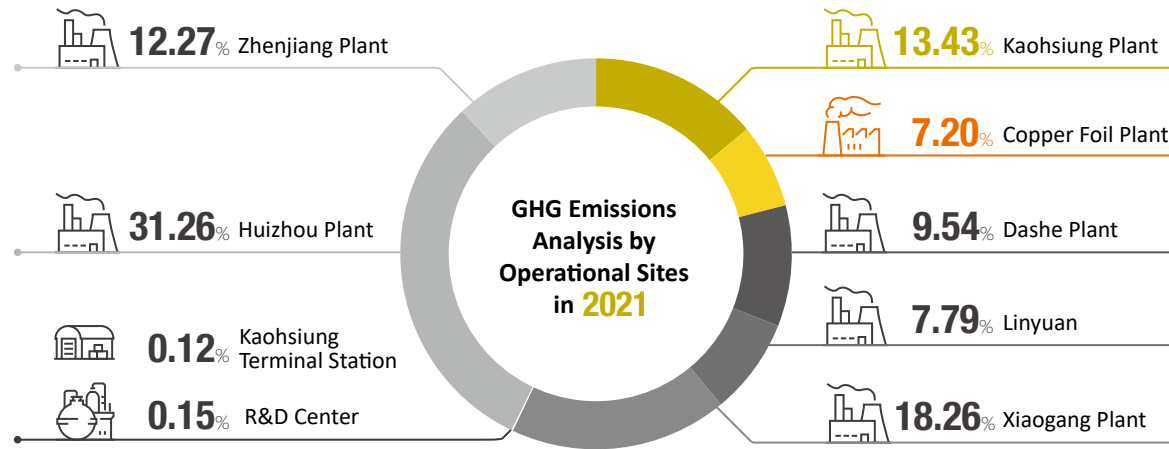
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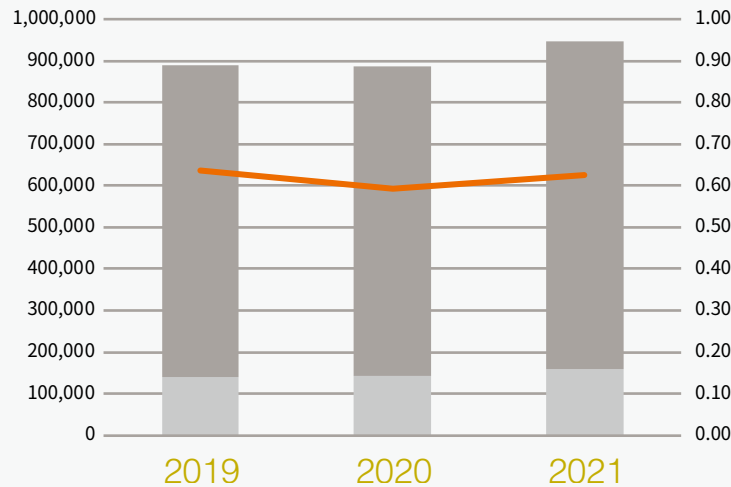
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Note: Emissions quantification and reporting for US Baytown Plant was conducted per 40 CFR PART 93.30. Only scope 1 emissions verification was performed. Due to differences in benchmark and verification methodology, Baytown Plant was not included in this analysis. In 2021, GHG emissions from operations in Taiwan and China totaled 947,778 metric tons of CO₂e, with a carbon intensity of 0.63 metric tons of CO₂e/ton of production. The overall emissions saw an increase of 6.8% compared to 2020, primarily due to an increase in production output. In 2021, GHG emissions from operations in Taiwan totaled 535,212 metric tons, with a carbon intensity of 0.67 metric tons of CO₂e/ton. To reduce GHG emissions...



	Total	2019	2020	2021
● Scope 1 (US plant excluded)		139,146	143,713	159,600
● Scope 2		751,186	743,379	788,178
Total		890,332	887,092	947,778
— Carbon Intensity (Scope 1 & Scope 2)		0.64	0.59	0.63

Note:

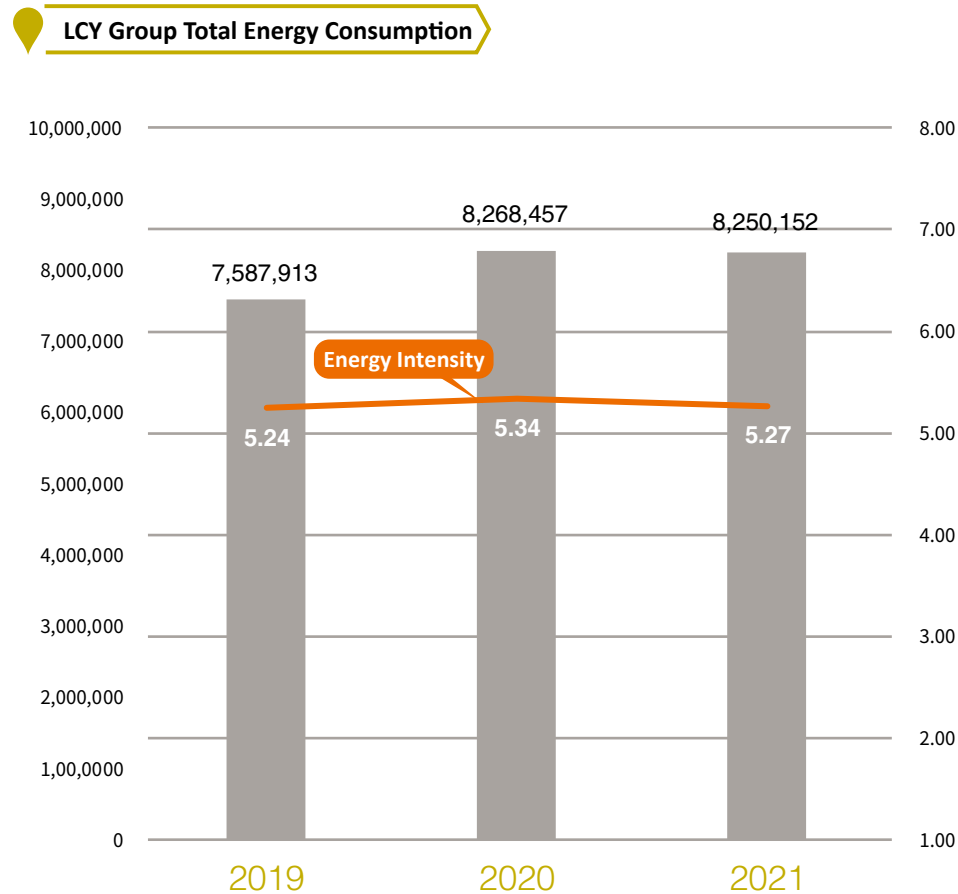
- Total emissions include GHG emissions from scopes 1 and 2 (excluding scope 1 emissions from the US plant). Our sites in Taiwan follow ISO 14064's guidelines on operational control, include Kaohsiung Plant, Copper Foil Plant, Dashe Plant, Linyuan Plant, Xiaogang Plant, Kaohsiung Terminal Station, and R&D Center. Our sites in China follow the guidelines from Accounting and Reporting Greenhouse Gas Emissions from China Chemical Production Enterprises (Trial), including Huizhou Plant and Zhenjiang Plant. US Baytown Plant follows guidelines from 40 CFR PART 93.30, with only scope 1 emissions verification performed.
- Carbon intensity = total carbon emissions from production sites (scope 1 + scope 2)/total production (metric tons). Production sites include five plants in Taiwan (Kaohsiung Plant, Copper Foil Plant, Dashe Plant, Linyuan Plant, Xiaogang Plant), two plants in China (Huizhou Plant and Zhenjiang Plant), and US Baytown Plant. However, verification was only conducted on scope 1 emissions for Baytown, it is not included in the carbon intensity calculation.
- GHG emission factors: in Taiwan, the latest EPA data is used as the basis for calculation. In China, emission factors are based on the local grid, all other emission factors are calculated based on the guidelines from Accounting and Reporting Greenhouse Gas Emissions from China Chemical Production Enterprises (Trial). Baytown Plant follows 40 CFR PART 93.30 per regulatory guidelines.

3.3 Carbon & Energy Management

3.3.2 Energy Management

Dashe Plant was the pilot plant that first started using the ISO 50001 energy management system in 2021, which has since extended to other production sites. By the end of 2021, all manufacturing sites in Taiwan and China (accounting for more than 90% of the company's revenue in 2021) have implemented the energy management system, with regular system maintenance to upkeep its effectiveness. A smart platform management system is used to monitor the equipment's energy usage. We continue to review and optimize the production process to improve energy efficiency based on data analysis provided by the system.

The total energy consumption in 2021 was 8,250,152 GJ (including plants in Taiwan, China, and the U.S.), a 0.22% decrease from 2020, and a 1.3% decrease in energy intensity. In Taiwan, unit energy consumption in 2021 was 5.24 GJ/metric ton, roughly a 1.23% decrease compared to 2020. The top two categories of energy usage were steam at 54% and electricity at 26%. To reduce the potential cost and environmental impact of self-generated steam, we became the first company to purchase and reuse exhaust steam from China Steel Corporation in 1994, leading companies in the Linhai Industrial Park to become pioneers of a circular economy.



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3.3 Carbon & Energy Management

LCY Chemical Corp.'s Energy Consumption from 2019-2021 (unit: GJ)

Type	2019	2020	2021
 Natural gas	1,538,142	1,623,278	1,613,843
 Liquefied Petroleum Gas	4,408	951	40,157
 Steam (purchased externally)	4,042,186	4,508,901	4,432,613
 Diesel	8,280	7,411	6,743
 Gasoline	312	302	279
 Purchased electricity	1,994,372	2,127,307	2,156,233
 Renewable energy produced (renewable energy certificate)	214	307	284
Total energy consumption	7,587,913	8,268,457	8,250,152

3.3.3 Promotion of Renewable Energy

In light of the international community's shift toward renewable energy and the policy promotion by the government of Taiwan, we also actively seek to expand renewable energy-related facilities. Currently, only Dashe Plant in Taiwan is equipped with solar power generation equipment, with a capacity of over 45,000 kWh in 2021. Dashe Plant successfully obtained Taiwan Renewable Energy Certification (T-REC) in 2020. Dashe Plant self-generated 162GJ of renewable energy while the R&D Center generated 122 GJ of solar energy in 2021, totaling 284GJ, roughly 0.00344% of the total energy consumption. This is the beginning of our energy transition. In the future, we will expand the use of renewable energy, not only to reduce reliance on fossil fuels but also to mitigate the impact of energy use on climate change issues. Furthermore, in response to the Renewable Energy Development Act, responsible units in the Taiwan plants will conduct reviews per guidelines and standardize the Group's renewable energy planning and budget.



3.4 Air Quality Management

3.4.1 Management Approaches to Air Quality

LCY continues to optimize air quality management. Our business units present air quality status and improvement actions to upper management during the monthly KPI meetings. Business units also review air pollutant emissions data trends and the plants' improvement status. The Environmental Risk Management Division, together with Industrial Safety and Environmental Protection Offices and external experts, promotes air pollution prevention through cross-site human resource consolidation and audits. The main management approaches include regular monitoring, equipment optimization, and information transparency. We continue to monitor and quantify through a space & time dual management process. In terms of space, fourier-transform infrared spectroscopy (FTIR) is placed around the plant's perimeter for automatic detection of air pollutants' fingerprints (absorption spectrum). The continued identification of pollutant fingerprints through OP-FTIR allows us to track and improve. Whenever there is an abnormal occurrence, the system activates source tracking and conducts immediate scientific data analysis. In terms of time/frequency, we conduct daily self-inspections, weekly infrared gas imaging by the EYE-C-GAS team, quarterly external inspections, and flue inspections at least once a year to ensure air pollutants emissions are compliant.

The Industrial Safety Team and Environmental Team at each operation site are responsible for the collection and evaluation of relevant regulations, as well as conducting training and promotion to ensure air pollutant emissions stay within range. The air pollution regulation stipulates:

The air pollution regulation stipulates



▼ Taiwan

All production sites have implemented the regulatory identification process of total emissions control for the Kaohsiung and Pingtung region

▼ China

Planning to use the EPA'S approved emissions level as the intensity target



Regular Monitoring

We monitor and establish the pollutants' fingerprints for the plant's perimeter through the space & time dual management process. Whenever there is an abnormal occurrence, the system activates source identification and tracking.

- AI Factory allows for immediate status update
- Regular inspections: daily self-inspections/weekly EYE-C-GAS infrared gas imaging/quarterly external inspections
- Plant perimeter self-inspection using FTIR system.



Optimize for Reduction

Strict air pollution prevention and reduction management are performed in the U.S., China, and Taiwan per local regulations.

- Phasing out equipment components
- Optimization/addition of advanced control equipment
- Management by walking around (MBWA)
- Regular review of reduction performance



Information Transparency

We offer truthful and transparent emissions disclosure. Our company enhances internal improvements through external oversight, as well as following regulatory changes to conduct compliance assessments to ensure regulatory compliance.

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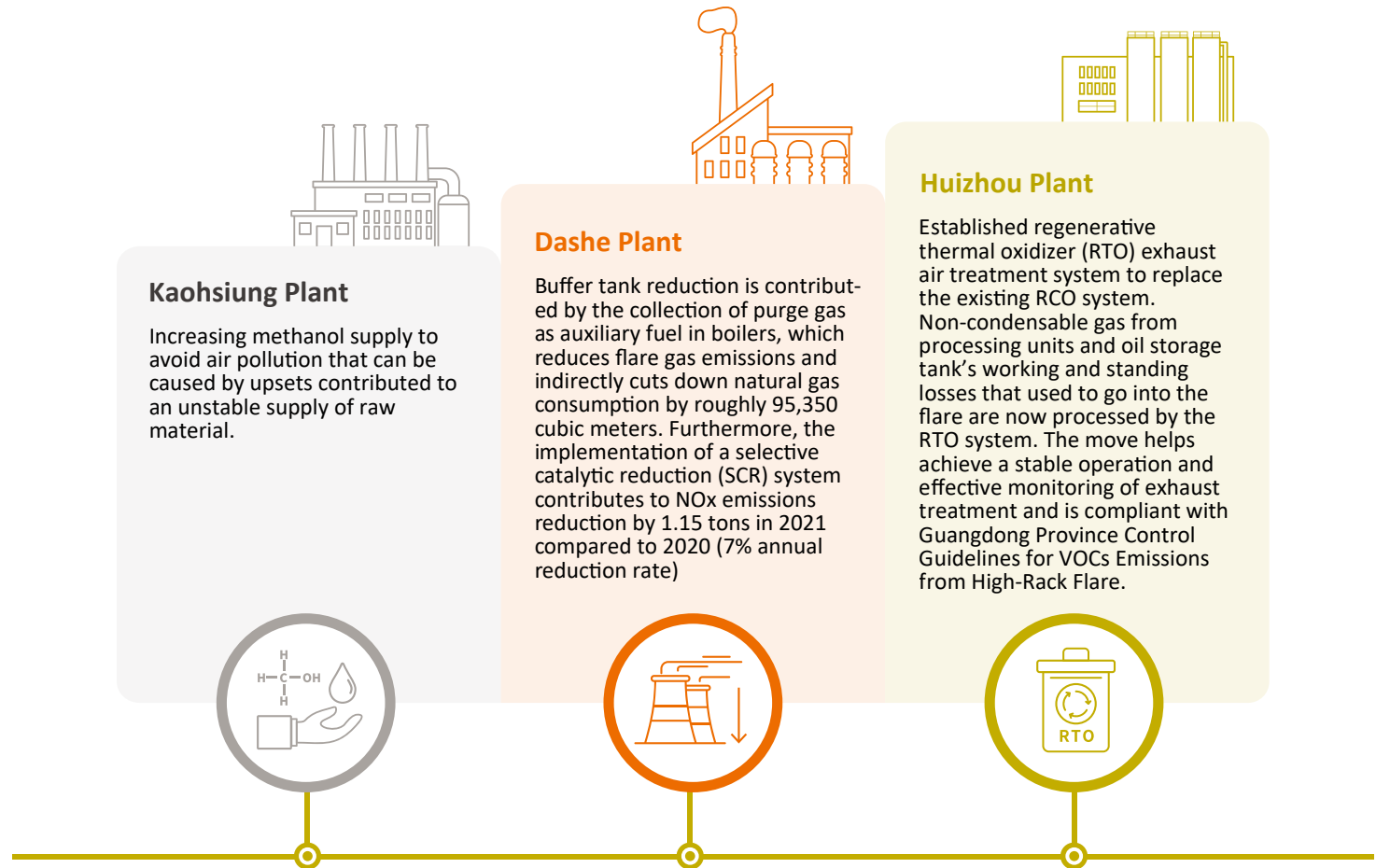
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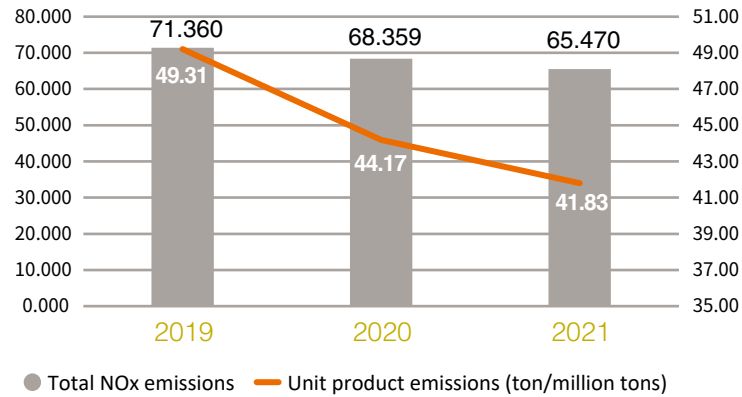
3.4.2 Air Pollution Reduction Measures

To reduce VOCs and NOx, our sites implement measures such as phasing out equipment components, adding SCR facilities, optimizing manufacturing process equipment, and establishing exhaust gas collection and treatment facilities, etc. The company convenes regular internal meetings to review emissions data and the sites' improvement status. Furthermore, we strengthen equipment inspection management and training to reduce the risks and negative impact air pollutants have on the environment. In 2021, NOx, Sox, and PM emissions were reduced by 4%, 9%, and 14% respectively compared to the year before.

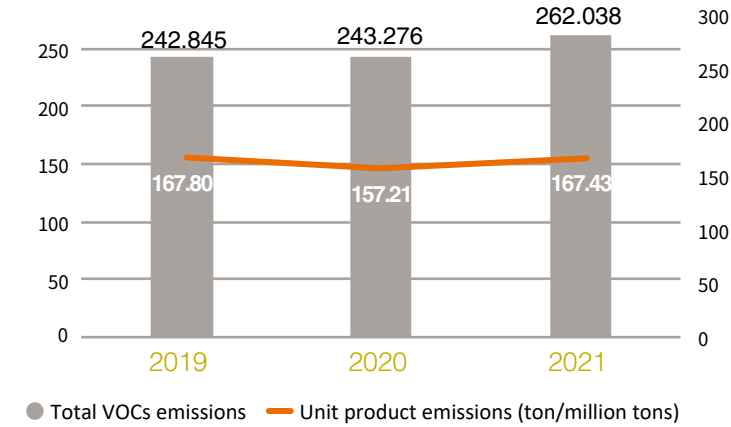


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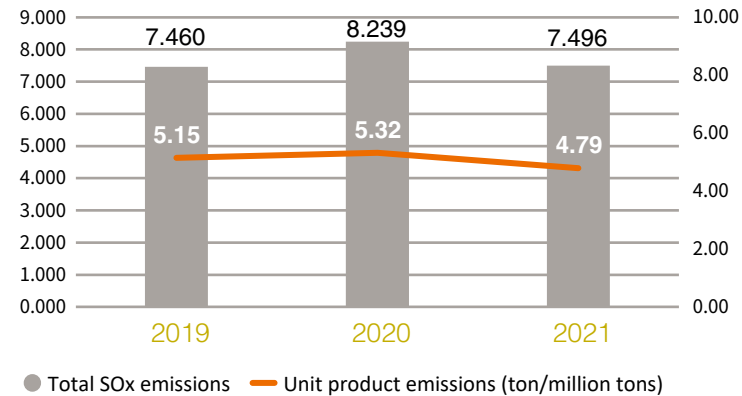
NOx Emissions & Unit Product Emissions



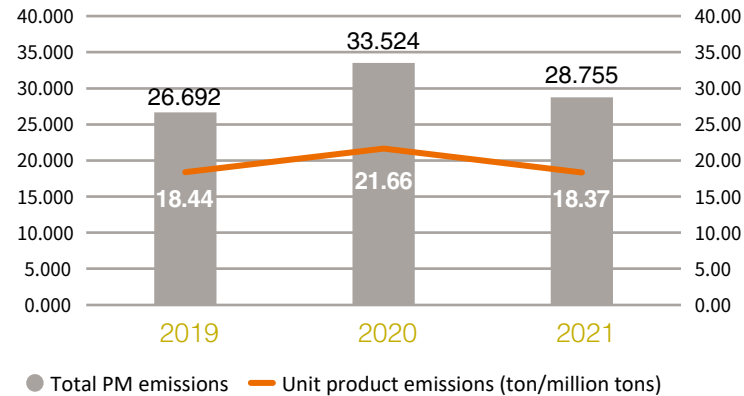
VOCs Emissions & Unit Product Emissions



SOx Emissions & Unit Product Emissions



PM Emissions & Unit Product Emissions



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3.4 Air Quality Management

LCY Chemical Corp. Air Pollutant Emissions Data (Unit: ton/year)

Region	Unit: ton	NOx	SOx	VOCs	PM	Hazardous Air Pollutants (HAPs)
Taiwan	Kaohsiung Plant	7.376	0.859	39.365	1.367	0.287
	Copper Foil Plant	0.000	0.000	4.63	7.830	0
	Dashe Plant	17.112	0.497	13.151	3.743	0.909
	Linyuan Plant	7.066	0.000	30.772	0.330	0.295
	Xiaogang Plant	4.009	2.583	84.330	1.211	31.625
	Kaohsiung Terminal Station	0.000	0.000	19.220	0.000	0
	R&D Center	0.000	0.000	0.000	0.000	0
	Average product emissions	0.000045	0.000005	0.000241	0.000018	-
China	Huizhou Plant	3.997	2.717	59.160	3.214	-
	Zhenjiang Plant	5.700	0.600	0.600	1.450	-
	Average product emissions	0.000014	0.000005	0.000083	0.000007	-
US	Baytown Plant	20.210	0.240	10.810	9.610	-
	Average product emissions	0.000383	0.000005	0.000205	0.000182	-
Total		65.470	7.496	262.038	28.755	33.117

Note:

- Hazardous air pollutants (HAPs) are reported in 13 different categories. HAPs data from China and Baytown are not yet available for disclosure.
- The amount of air pollutant emissions at operational sites are converted from the collected data (Huizhou Plant implemented online monitoring in Nov 2021. The annual emissions data for 2021 was extrapolated from the two months' online monitoring data)
- Air pollutant emissions only take into account the production process and not the mobile source.

3.5 Water Management

3.5.1 Management Approaches to Water Resources

LCY uses the Aqueduct Water Risk Atlas published by the World Resources Institute to identify water risks associated with our production sites. Among them, Kaohsiung Plant in Taiwan, Huizhou and Zhenjiang Plants in China all have a low risk of water shortage during the base period, while Baytown Plant in the US has a low-medium risk. None of LCY's sites present high or extremely high baseline water stress. Given the above, all sites continue their water conservation effort through internal water management and external partnership strategies to prevent the possible impact of water shortages.

As pointed out by the 2020 UNESCO World Water Assessment Programme, water's impact is multi-disciplinary. Therefore, in addition to our effort, we have also signed the "Use of Reclaimed Water from Kaohsiung Linhai Wastewater Treatment Plant" with the Industrial Development Bureau, Ministry of Economic Affairs. LCY started sourcing 2000 metric tons of domestic wastewater every day as industrial water supply. The project takes full advantage of the resources from both the wastewater treatment plant and water reclamation plants. It integrates the domestic, public, and business sectors to reclaim domestic wastewater. Five companies, including LCY, joined the project to optimize water usage efficiency by facilitating resources, manpower, and technology from partners. Furthermore, Taiwan's geography contributes to a drastic difference in water reservoir supply between the dry and wet seasons. In response to the potential water shortage crisis during the dry season, we will negotiate a long-term agreement with external service providers to transport water to our plants using hydraulic wheels during the dry seasons.

▼ Taiwan

Sites in Taiwan are primarily governed by the Effluent Standards. We tightly monitor the factories' effluent quality to ensure adherence to local effluent standards for the industrial parks.

▼ China

Sites in China are governed by the Water Law of the People's Republic of China and strictly comply with class 3 discharge standards to reduce pollutants' impact on the environment.

▼ US

The US sites are governed by the Environmental Protection Agency (EPA) and Texas Commission on Environmental Quality (TCEQ) regulations.

Water is critical to chemical manufacturing. It is used in cooling, creating steam, and processing raw materials. As such, water is categorized as a material risk. The company has proactive management measures in place to elevate the priority of water issues. The measures are implemented in terms of governance, strategy, and technology. The governances include enhancing water management levels and establishing water conservation targets. The strategy aspect includes increasing water circularity within our plants through steam collection, condensate recovery, and wastewater treatment with MRB technology. The company is also committed to establishing conservation equipment to reduce water intake. We also work with external partners to implement a reclaimed water project. Finally, the technical aspect includes R&D and optimization of MBR and other water efficiency enhancement technology. In 2021, LCY's unit water intake and discharge reduced by 2% and 4.65% respectively compared to the year before. The company used 297,826 tons of reclaimed water, 5.14% of the total water usage.

The Industrial Safety and Environmental Protection teams at each site are responsible for the compilation, evaluation, and promotion of the relevant regulations. We continue to monitor water quality at the plant's water discharge outlets. Our company also reduces hazardous substances in the discharged water through R&D in water treatment equipment, equipment performance optimization, and filter sand installation. We aim to improve the water quality to ensure effluent discharge meets or exceeds regulatory standards.

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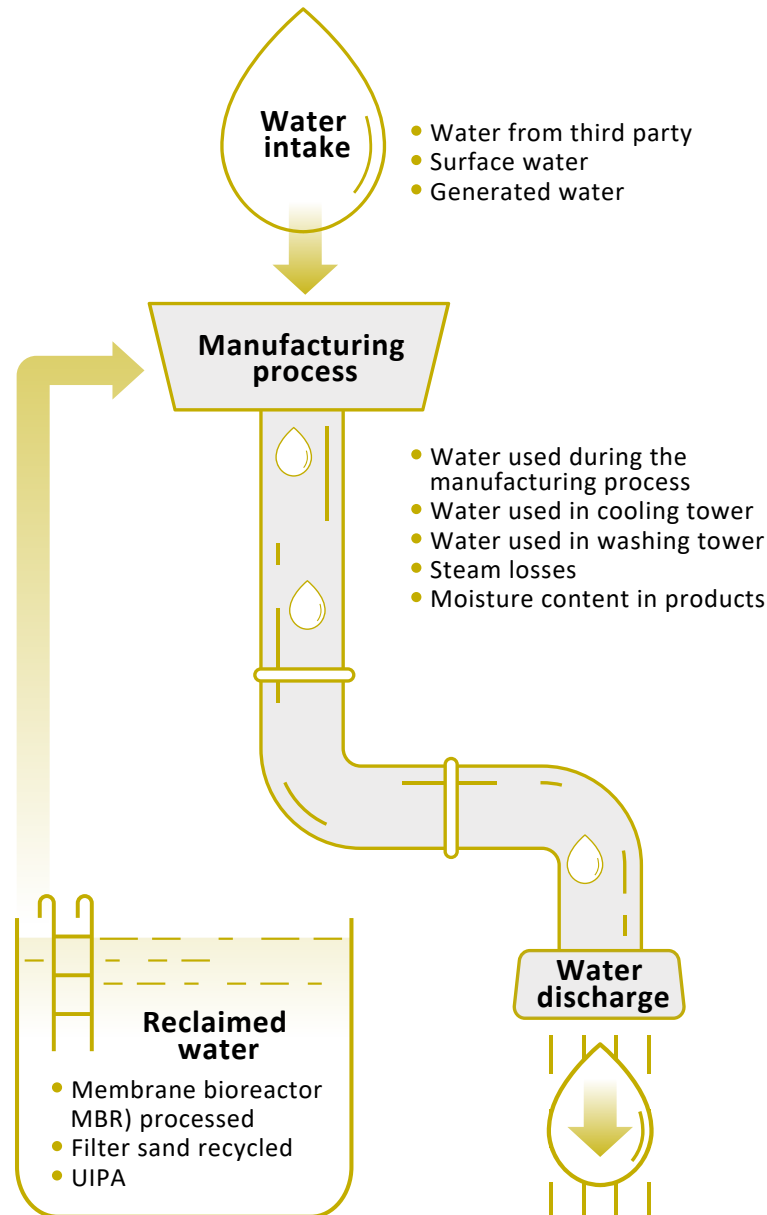
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Governance

Water management raised to higher levels of management and setting water conservation targets

- Reclaimed water usage makes up 20% of total water usage by 2030
- Establish an energy & water conservation committee that conducts cross-departmental collaboration with plant managers and business units
- Establish a water-shortage contingency plan



Strategy

Enhance water cycle to reduce water intake

- ▲ Water cycle enhancement: internal management (recycle water from the manufacturing process, including steam, condensate, and wastewater); external partnership for water recycling, and reclaimed domestic wastewater
- ▼ Water intake reduction: establish conservation equipment, storm-water overflow interception, summer sprinkler water collection, change out the pump to increase water volume, reuse washing tower discharge
- Optimize water processing equipment utilizing MBR technology



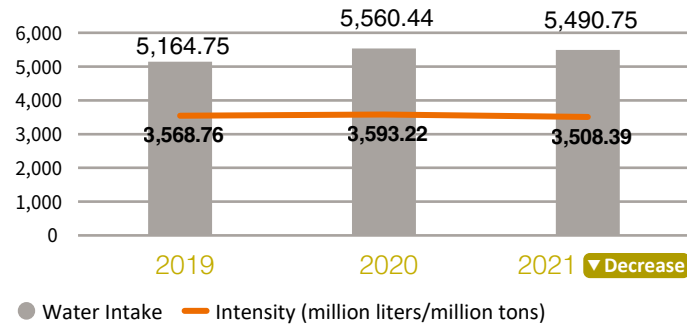
Technology

Develop climate mitigation technology, reduce pollution, streamline management

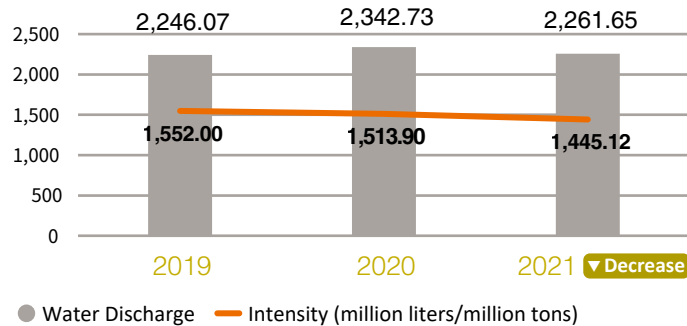
- Develop LCY nano-grade MBR 3.0
- ▲ Increase industrial water usage efficiency
- ▲ Enhance the efficiency of the centralized water processing system

3.5 Water Management

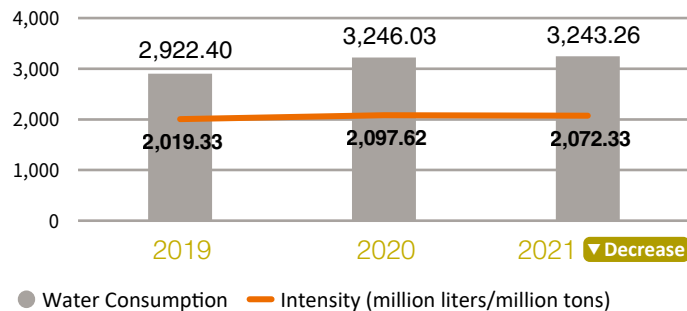
Water Intake and Unit Water Intake



Water Discharge and Unit Water Discharge



Water Consumption and Unit Water Consumption



Total Water Intake (Categorized by source)

Categorized by Source	Water Intake in 2021
Surface water	1,164,493
Water from third party – tap water	2,637,595
Water from third party – purchased reclaimed water	43,892
Generated water	1,644,768
Total water intake	5,490,747

Note:

1. Data scope includes plants in Taiwan (Kaohsiung Plant, Copper Foil Plant, Dashe Plant, Linyuan Plant, Xiaogang Plant, Kaohsiung Terminal Station, R&D Center, and Taipei Office), Huizhou Plant and Zhenjiang Plant in China, Baytown Plant in the US. Data provided according to water bills.
2. LCY's water intake project does not include seawater; intake water is freshwater with total dissolved solids $\leq 1,000$ mg/L.
3. Generated water includes condensate from purchased steam (roughly 1 ton of condensate is generated from 1 ton of steam) and cooling water from UIPA distillation

Water Discharge in 2021	Total of all Sites (Unit: metric ton)
Destination	
Surface water	0
Water to third party	2,003,760
Groundwater	0
Sea water	257,895
Freshwater or others	
Freshwater ($\leq 1,000$ mg/L total dissolved solids)	2,261,655
Others	0
Total water discharge	2,261,655
Total water consumption	3,243,265

Note:

1. Total water consumption = total intake – total discharge
2. Data scope includes plants in Taiwan (Kaohsiung Plant, Copper Foil Plant, Dashe Plant, Linyuan Plant, Xiaogang Plant, Kaohsiung Terminal Station, R&D Center, and Taipei Office), Huizhou Plant and Zhenjiang Plant in China, and Baytown Plant in the US.

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3.5.2 Water Conservation Measures



Reclaimed water project

In support of the Kaohsiung Linhai Wastewater Treatment Plant Project, beginning in 2018, LCY's Kaohsiung Plant has been using reclaimed water from domestic wastewater for industrial use. The project takes full advantage of the resources from both the wastewater treatment plant and water reclamation plants. It integrates efforts from the domestic, public, and business sectors to reclaim domestic wastewater. The project is made possible by facilitating resources, manpower, and technology from participating partners. For example, the Kaohsiung Plant uses reclaimed water as recirculating water for the cooling tower. The cleaner water quality contributes to savings of 50-100 tons of discharge water from the cooling water tower per day, roughly an annual saving of 18,000~36,000 tons.



Plant water recycling

To reduce water consumption, we actively incorporate water conservation measures and use the plant's reclaimed water. The water usage enhancement measures include steam and condensate collection, utilization of MBR technology in some plants, tracking water usage, and R&D of recycling equipment. In 2021, Kaohsiung Plant optimized the wastewater treatment facilities which enabled the use of SBR-treated wastewater as incinerator greywater after applying for water pollution control measures. This contributes to a daily water consumption reduction of 50-100 tons, roughly 18,000-36,000 tons per year.



MBR Water Recycling

Membrane bioreactor (MBR) is a water recycling technology developed by LCY. The Kaohsiung plant started building the MBR equipment in 2016. After collecting all of the wastewater generated during the manufacturing process, the system combines big data smart bio-treatment and a waste reduction system to recycle more than 90% of the wastewater. The system can treat up to 1,000 tons of wastewater a day, which significantly reduces the potential for pollution. The water quality is superior to externally-purchased industrial water and can be directly used to refill cooling towers and wash flares. MBR allows us to expand reclaimed water resources and enhances water-sourcing flexibility.

3.5.3 Water Pollution Prevention Measures

The Industrial Safety and Environmental Protection teams at each site are responsible for the compilation, evaluation, and promotion of the relevant regulations. We monitor water quality at the plant's water discharge outlets to prevent water pollution. LCY reduces hazardous substances in the discharged water through R&D in water treatment equipment, equipment performance optimization, and filter sand installation. We aim to improve the water quality to ensure effluent discharge meets or exceeds regulatory standards. Zero water discharge-related violations by LCY were found in 2021.

Effluent Standards

▼ Taiwan

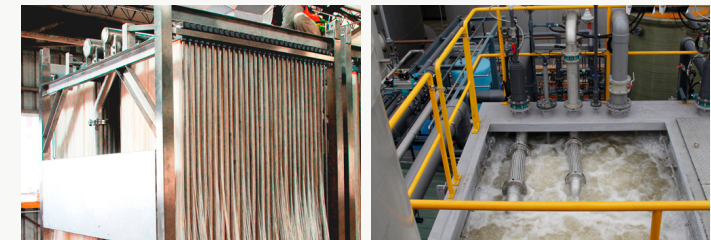
Primarily governed by the Effluent Standards, factories also adhere to local effluent quality standards where the industrial parks are located

▼ China

Primarily governed by the Water Law of the People's Republic of China and comply with class 3 discharge standards

▼ US

Governed by the Environmental Protection Agency (EPA) and Texas Commission on Environmental Quality (TCEQ) regulations



3.6 Waste Management

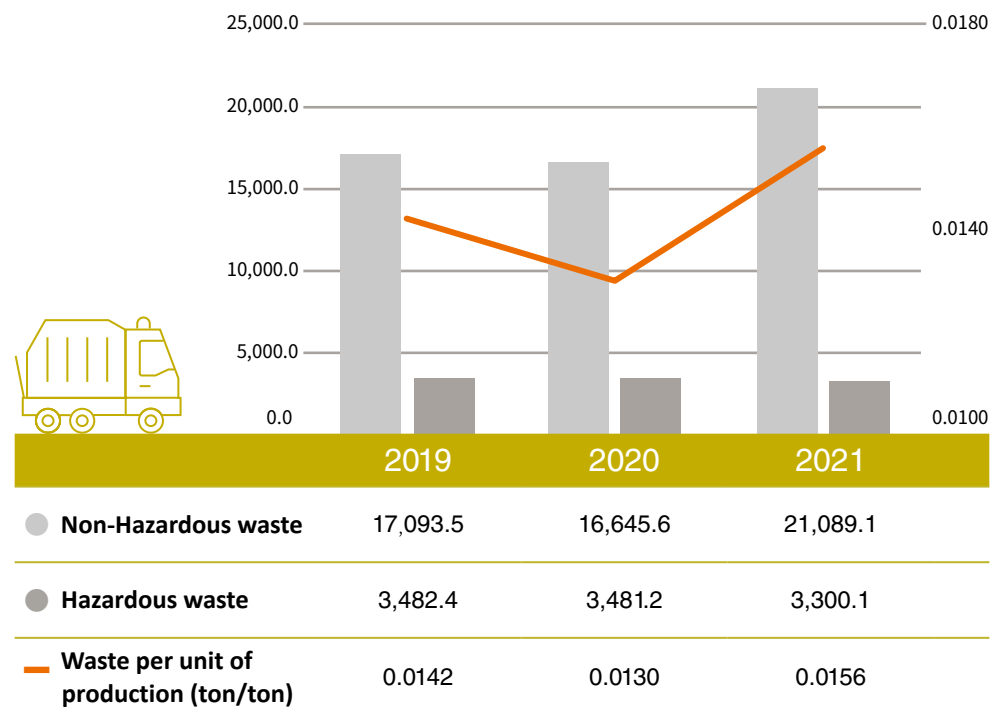
3.6.1 Waste Management

Product quality is dependent on the quality of upstream raw material; poor quality upstream raw material can lead to poor yield rate, which can in turn impact the company's business operation and cause the use of additional energy and resources. Similarly, internally-produced waste has a corresponding disposal cost that has the potential to increase. Industrial waste is typically handled by qualified contractors; if the contractors fail to properly dispose of the waste per environmental regulations, or if manufacturing waste disposal is not contracted out to qualified organizations, the improper disposal can lead to additional environmental issues that can hurt company's reputation. Therefore, all waste disposal should be regulatory compliant, including the proper waste storage area, dedicated hazardous waste storage sites, application for discharge or treatment permits, and truthful declaration with the competent authorities. All plants must establish the relevant responsible units, including the factory office and EHS divisions that are responsible for the organization of waste storage, declaration, removal, and inspection. Currently, LCY's waste disposal is primarily handled by qualified contractors. LCY examines the qualifications of waste treatment and recycling companies by visiting the companies' locations to verify permit documents and facilities to examine the disposal procedure. After waste removal, LCY also dispatches staff for unscheduled checks and waste removal/transportation status to ensure compliant disposal; for proper removal, we also conduct EHS training for the cleaning staff before on-site operation. LCY is committed to fulfilling our responsibility and protecting the safety of our workers during the waste removal process.

Furthermore, the plants have established an internal waste inspection & audit procedure and an external waste disposal management company's inspection & audit procedure. The procedures aim to regularly inspect the total waste output. The plants propose a review and improvement plan whenever an unusual occurrence is detected to reduce the environmental impact. As the waste produced by the plants varies in nature due to the differences in the manufacturing process, we focus on source reduction, efficiency enhancement, and recycling as the three main strategies across all plants. The plants regularly convene for review meetings and continue to enhance the effectiveness of our equipment and facilities to increase resource efficiency and reduce waste.

In 2021, the company generated 24,389.2 tons of waste, including 21,089.1 tons of general business waste and 3,300.1 tons of hazardous waste. Hazardous waste saw a 5.2% reduction compared to 2020, of which 23.82% was recycled (recycling process contracted to recycle management companies).

Total waste produced by LCY Chemical Corp.



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Appendix

Promoting Co-prosperity in Society

We believe that "talents" and "safety" are critical for sustainable development and operations in both society and corporations. As such, we strive to provide robust and competitive incomes and benefits, including better-than-regulatory annual leave policies and benefits, group insurance, employee trust funds, health checks, diverse club activities, etc. We are also staunchly opposed to any acts of discrimination, believing firmly in a workplace that fosters mutual respect and trust. We are happy to share the fruits of our shared labor with employees, providing a performance-based pay system that incentivizes employees and ensures that all employees can unleash their full potential to build a happy and friendly workplace.

> **50,000**

LCY provided over 50,000 hours of employee training

100%

In 2021, 100% of employees underwent health checks
100% employees reinstatement rate after parental leave

25%

25% of employees have a master's or higher degree, which increased by 1% from the previous year.

SDGs



- # Occupational Safety & Health
- # Training & Education
- # Management/Labor Relations



Aspect	Indicators	Long-term 2030 Targets	Short-term 2020-2022 Targets	2021 Achievements
Employee Health & Safety	Reduce risks to employee health and safety	<ul style="list-style-type: none"> Maintain 0 turnovers from health-related factors Ensure lower CO₂ levels than national standards in LCY workplaces 	Gather data based on incidence rates of critical illnesses in Taiwan to provide a basis for improving workplace environment and eliminating risks to employee health and safety	<ol style="list-style-type: none"> A total of 122 flu vaccines were administered to LCY employees for free (funded by the company). During the COVID-19 pandemic, we adopted measures that were better than regulatory standards, including working from home (via applications) and easing workplace attendance rules and conditions for unpaid family care leave so that employees can take care work and family with peace of mind during the epidemic prevention period.
	Implement employee health management	Reduce the number of claims to group insurance by 10% from 2019	Provide comprehensive health checks to employees based on their workplace environments	<ol style="list-style-type: none"> 100% of employees are covered by company insurance. In addition, employees can add additional items to their insurance for themselves with discounted rates and for their spouses by paying out of pocket so that employees can extend coverage to their families and receive benefits overseas, which provide comprehensive protection. In 2021, 100% of employees underwent health checks.
Talent Cultivation & Diverse Culture	Increase employee satisfaction	95% employee satisfaction	Conduct another employee satisfaction survey using the Net Promoter Score (NPS)	Currently, we conduct employee satisfaction surveys every two years. The last survey was conducted in 2020, and employee satisfaction was at 76%. The 2022 survey showed that employee satisfaction has increased to 81%.
	Increase employee performance in the workplace	>50% EAP coverage	Help employees overcome psychological or behavioral problems and increase employee performance in the workplace	<ol style="list-style-type: none"> We provide free professional counseling. Employees can make reservations on their own. In 2021, a total of 106 consultations were conducted. Short-term support in the form of resources is provided to employees suffering from major family events or have family members suffering from health problems to help them transition through difficult times.
	Strengthen the company's competitiveness	Increase the percentage of employees with master's degrees or higher to 34% by increasing, on average, 1% each year	Increase the percentage of employees with master's degrees or higher	The percentage of employees with master's degrees or higher increased by 24% in 2020 to 25% in 2021, which is a 1% YoY increase.
	Strengthen equality	Outperform peers in number of female executives	Ensure equal pay for equal work among men and women	LCY will not define or classify promotions, benefits, or profit-sharing based on sex or race for policies on pay and benefits. We value all employees and believe our employees are critical to sustainable growth and operations.
Community Relations Management	Caring for local communities	Galvanize employees to care for local communities by referring to KKR's employee volunteer program - 40 for 40	Understand local needs and promote our company's sustainable ideals through open-house events	Organized 13 Open House events.
	Strengthen communication with stakeholders	Continue to communicate carbon neutrality and value chain actions so that we can share outcomes with our industry	Increase public awareness of sustainable development in the materials industry by working with academia and the government to engage in marketing campaigns for industry topics	Joined conferences and meetings related to net zero emissions organized by the Taiwan Chemical Industry Association and industry associations to engage in discussions.
	Build a circular economy & innovative ecosystem	Promote eco-friendly products, the circular economy, green chemistry innovation, and talent cultivation	Leverage global corporate resources and networks in research to facilitate technical breakthroughs in the circular economy and expand our employee's vision	Interact with related startup teams and discuss opportunities for possible collaboration.

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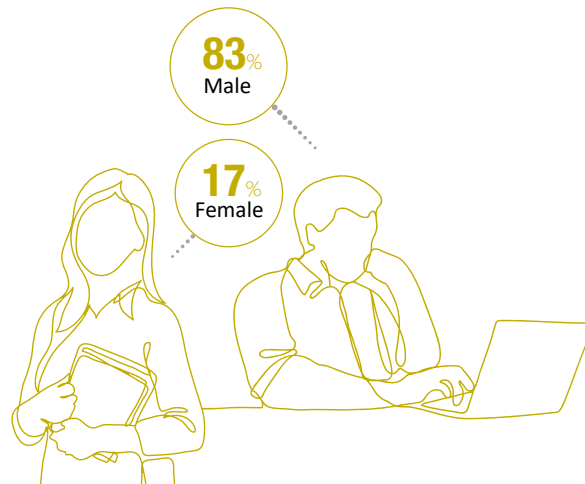
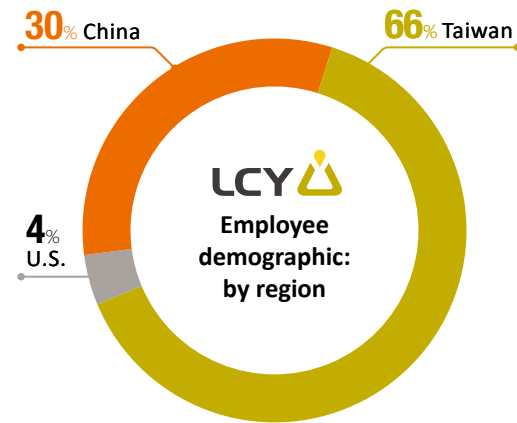
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4.1 Employee Demographics & Management

Employees are the drivers for continuous corporate growth and the cornerstone for sustainable development. LCY treats all employees based on their functions solely and our hiring policies value equality and diversity. In 2021, we had 2,125 employees and all were full-time employees. Due to the nature of our industry, we have more male employees than female, with male employees accounting for 83% and female employees accounting for 17%. LCY employees include those employed in Taiwan (66%), China (30%), and the U.S. (4%). Locations in Taiwan include the Taipei office, plants (Kaohsiung, Copper Foil, Dashe, Linyuan, and Xiaogang), the logistics station, and the R&D center; in China include the Zhenjiang Plant and Huizhou Plant; and in the U.S., include the Baytown Plant. In 2021, we welcomed 233 new employees and had a turnover of 221 employees, which is a turnover rate of 10.37%.



Employee demographic: by region & labor contracts

	Region	Others (Not Management)		Management	Total
		Direct Labor	Indirect Labor		
Full-time Employees	Taiwan	647	547	198	1,392
	China	394	197	55	646
	U.S.	72	0	15	87
Part-time Employees	Taiwan	0	0	0	0
	China	0	0	0	0
	U.S.	0	0	0	0

Note:

1. Direct Labor include technical engineers and duty supervisor
2. Indirect Labor include other employees that are not direct labor
3. Management includes all employees with division head, group leader, or higher titles.

By gender & labor contracts

	Male (ppl)	Female (ppl)	Total (ppl)
Full-time Employees	1,758	367	2,125
Part-time Employees	0	0	0
Total	1,758	367	2,125
Percentage	83%	17%	100%

4.1 Employee Demographics & Management

Composition of New Employees in 2021

Age	Region	Male (ppl)	Female (ppl)	Total (ppl)
≤30 years old	Taiwan	62	22	84
	China	41	6	47
	U.S.	5	2	7
31-50 years old	Taiwan	55	10	65
	China	16	5	21
	U.S.	2	3	5
≥51 years old	Taiwan	4	1	5
	China	1	0	1
	U.S.	2	0	2
Total		188	49	237
New Employees (%)		8.85%	2.31%	11.15%

Note: New Employees (%) = Number of New Employees/ Total Number of Employees

Composition of Turnovers in 2021

Age	Region	Male (ppl)	Female (ppl)	Total (ppl)
≤30 years old	Taiwan	37	8	45
	China	31	6	37
	U.S.	2	0	2
31-50 years old	Taiwan	36	10	46
	China	28	0	28
	U.S.	6	0	6
≥51 years old	Taiwan	8	4	33
	China	2	1	3
	U.S.	9	0	9
Total		159	29	209
Turnover Rate (%)		7.48%	1.36%	9.84%

Note: Turnover Rate (%) = No. of Employee Turnovers / Total No. of Employees.

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4.2 Employee Benefits

We believe that "talents" and "safety" are critical for sustainable development and operations in both society and corporations. As such, we strive to provide robust and competitive incomes and benefits, including better-than-regulatory annual leave policies and benefits, group insurance, employee trust funds, health checks, diverse club activities, etc. We are also staunchly opposed to any acts of discrimination, believing firmly in a workplace that fosters mutual respect and trust. We are happy to share the fruits of our shared labor with employees, providing a performance-based pay system that incentivizes employees and ensures that all employees can unleash their full potential to build a happy and friendly workplace. In 2021, LCY invested NT\$3,470,397,000 into employee payroll and benefits.

4.2.1 Pay & Benefits

Competitive Salary

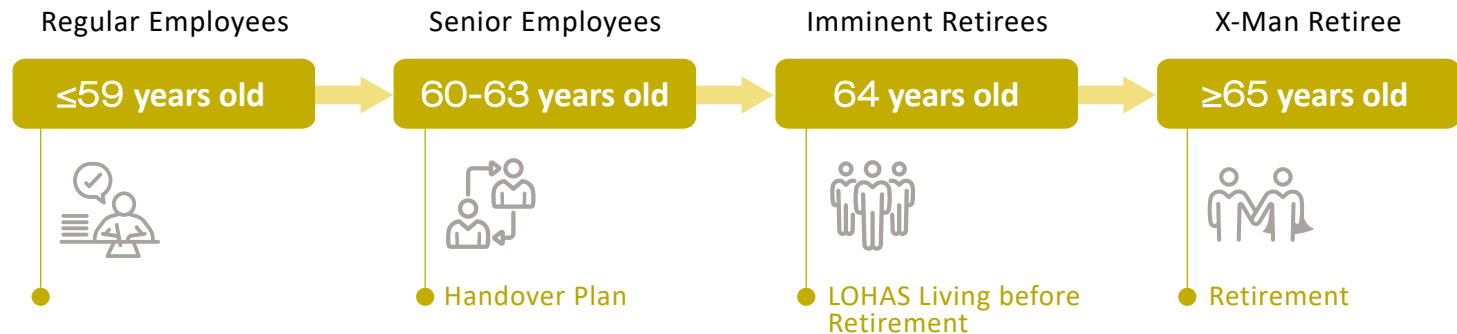
We regularly review employee pay and how competitive their pays are, participating in peer income surveys both globally and locally to learn more about the status of different regions, leading companies, regulatory standards, and consumer price indices to quickly adjust pay policies in all LCY locations and maintain competitive salaries.

Diverse Incentives & Career Development Pathways

In addition to quarterly and annual bonuses, we have put in place diverse incentive programs based on projects and demands to reward and recognize employee efforts and performances and reinforce core values of safety, integrity, innovation, teamwork, and accountable leadership. We regularly convene HR evaluation meetings to help plan and formulate career development paths and targets for employees based on their function, competency, seniority, etc.

LOHAS Project for Imminent Retirees

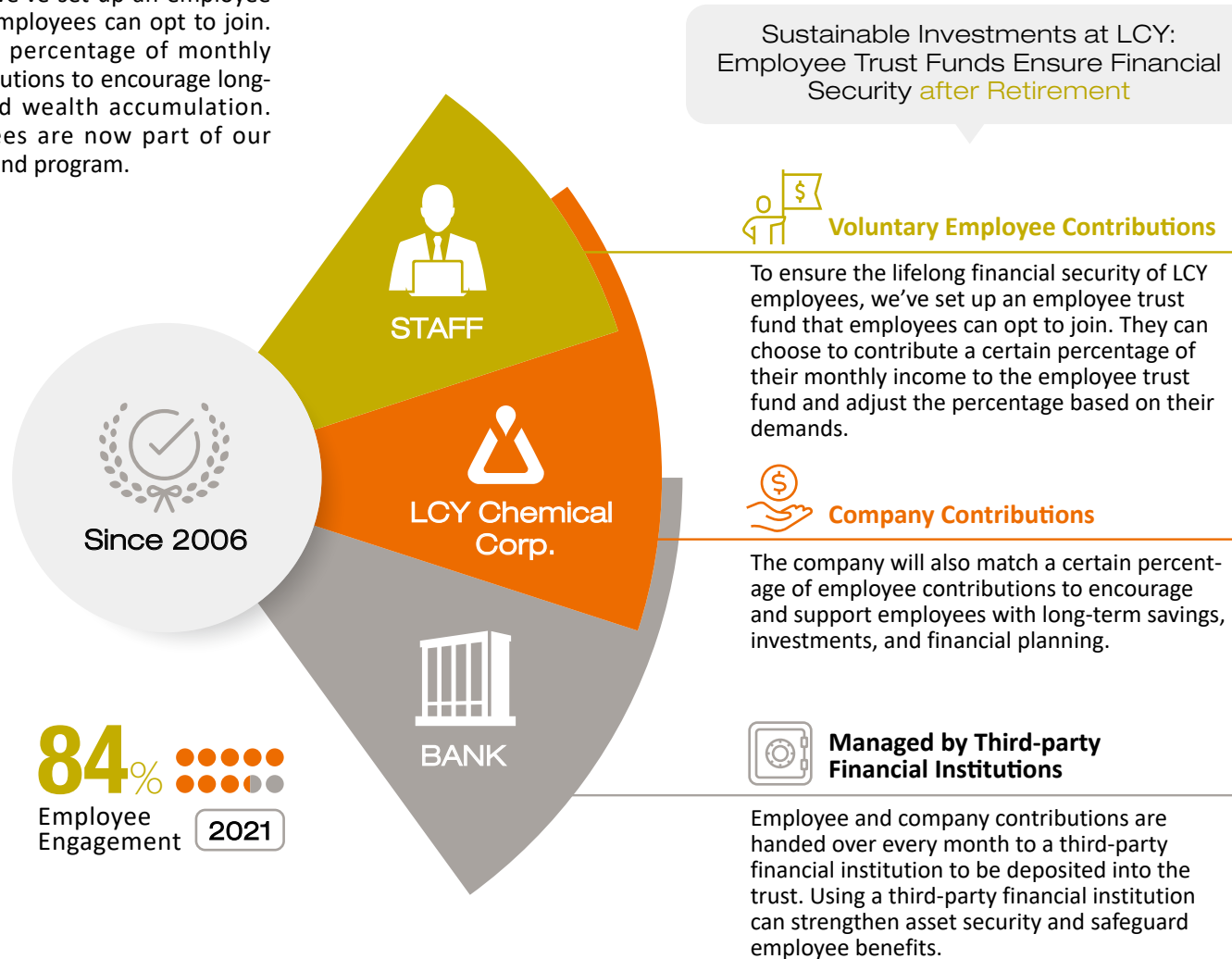
We value and cherish all of our senior employees and so we've designed a LOHAS Project targeting imminent retirees. In 2021, we started organizing sessions introducing the LOHAS Project, first starting in Taipei and moving our way down to plants in Southern Taiwan. In these sessions, we helped imminent retirees learn more about life after retirement, inspiring them to cultivate diverse interests before retiring and encouraging them to return to LCY as lecturers or consultants to pass on their experiences. We hope that the LOHAS Project can be a pioneer and paradigm for Taiwan corporations, encouraging companies to value and cherish senior employees in their organizations and guiding them into the next stage of their lives.



4.2 Employee Benefits

Robust Financial Planning & Practices for Employees

To ensure the lifelong financial security of LCY employees, we've set up an employee trust fund that employees can opt to join. We will match a percentage of monthly employee contributions to encourage long-term savings and wealth accumulation. 80% of employees are now part of our employee trust fund program.



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4.2.2 Employee Health & Safety

Employee Welfare Committee & Diverse Activities and Grants

To practice employee care, the Employee Welfare Committee hands out holiday bonuses during the three most important holidays in Taiwan (Chinese New Year, Dragon Boat Festival, and Mid-autumn Festival), birthday gift bonuses for employee birthdays, other subsidies for gatherings/ childbirth/ marriage/ traveling/ language learning/ retirement/ injuries & illnesses/ death in the family/ children education, and other club activities and benefits.

Flexible Working Hours & Better-than-Regulation Annual Leave Policies

We are committed to protecting our employees' rights to take leave and attach great value to them taking breaks for their physical and mental health. For employees in Taiwan, we provide better-than-regulation paid leaves for pregnancy, illnesses, and flexible make-up days, employing a partial flex hour policy to help employees avoid traffic congestion during peak hours, thereby reducing emotional stress and accidents.



Maternity leave

- According to the Labor Standards Act, female employees working in a company for less than 6 months are not eligible for paid maternity leave. At LCY, we want to do better; all female employees, even if they have worked for us for less than 6 months, are eligible for paid maternity leave.
- In the event of miscarriage between the second and third month of pregnancy, the female worker shall be permitted to discontinue her work and shall be granted a one-week paid maternity leave.
- In the event of miscarriage before the second month, the female worker shall be permitted to discontinue her work and shall be granted a five-day paid maternity leave to give our female colleagues time to rest.



Sick Leave

- We provide 80 hours of paid sick leave each year to colleagues that have received surgery as treatment so that they can have enough time to rest.



Flexible Makeup Days

- Employees are exempt from working makeup days for paid typhoon days and flexible holidays, effectively giving employees additional holidays.

4.2 Employee Benefits

Encourage Childbirth and Child-rearing, Protecting Related Benefits, and Helping Employees Return to the Workplace

Due to the nature of our industry, most of our employees are men, but more female employees apply for parental leave. In 2021, a total of 7 employees applied for parental leave and 75% of these employees returned. We were also able to successfully retain 100% of returning employees.

	Female	Male	Total
Employees eligible for parental leave in 2021 (a)	38	184	222
Employees on parental leave in 2021 (b)	6	1	7
Employees expected to return to work (in 2021) after parental leave (c)	2	2	4
Employees that returned to work in 2021 (d)	2	1	3
Return Rate (d/c)	100%	50%	75%
Employees that returned in the last reporting period (2020) (e)	3	0	3
Employees that returned to work from parental leave in 2020 and have been in service for one full year (f)	3	0	3
Retention Rate (F/E)	100%	0%	100%

Note: For the U.S. plant, we comply with U.S. laws, providing paid maternity leave and 12 weeks of family care leave to female employees that have been employed at LCY for a full year and 12-week family care leaves (to care for their family, newborns, and medical conditions) to other employees that have been employed at LCY for a full year. As the definition for parental leave in the U.S. is different from that of Taiwan and China, U.S. data is not included in this table.

Professional Therapy Services, Massage from Blind Masseurs, Comprehensive Health Checks, and Vaccinations

We care about the physical and mental health of our employees. As such, we provide 1-on-1 professional therapy services and massage from blind masseurs for employees in Taiwan to relieve stress from life and work and provide employees with further support. In 2021, we provided a total of 106 free therapy sessions. We also work with designated medical centers to provide better-than-regulation health checks to employees based on their work and control banding to give employees insight into their physical conditions. Furthermore, we re-evaluate employee work based on previous accidents and medical histories to reduce diseases from occurring. In 2021, 100% of employees underwent health checks. In addition, for employees wishing to receive out-of-pocket flu vaccines (GSK-Quadrivalent), we provide full funding and work with medical centers to send medical workers to the company to administer flu vaccines for employees. In 2021, a total of 122 employees received flu vaccines as we attempted to safeguard employee health through preventative medical care.

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4.2 Employee Benefits

Group Insurance and Business Travel Insurance Coverage Extended to Family Members and Overseas

All employees receive group insurance covering term life insurance, critical illness insurance, accident insurance, and hospitalization insurance. Spouses and children also receive hospitalization insurance. In addition, employees' cancer medical insurance is fully covered by the company. Business travel insurance is also provided to strengthen protection for employees on business trips and expatriate assignments. We also provide insurance items with preferential premium rates for employees and dependents, so that the coverage from employees extend to their families and overseas, providing comprehensive protection to ensure the wellbeing of our staff.

Prioritizing Emergency Response Measures & Employee Care Campaigns - COVID-19

During the COVID-19 pandemic, we continued to raise awareness of epidemic prevention measures by distributing epidemic prevention resources, strengthening workplace disinfection, and upgrading software/ hardware required for remote working so that employees can take turns coming to the office, thereby reducing health risks. We also adopted measures that were better than regulatory standards, including working from home (via applications) and easing workplace attendance rules and conditions for unpaid family care leave so that employees can take care of their work and families if they are quarantined at home or required to care for children below the ages of 12 due to delayed school years or family members in quarantine.

To inject positivity, we also launched a card-sharing event to circulate four types of cards: thank you cards, well wishes cards, good job cards, and booster cards so that employees can share positivity through these cards during this difficult time and experience camaraderie and encouragement from fellow employees to combat COVID-19.

Improving Sleep Quality in Employees

The Group Chairman of LCY Group spoke at Sleeping Salon, to share various tools and theories that could help employees sleep better. For example, avoiding caffeine and rigorous workouts before bed, can lead to a better sleeping quality and enhance physical and mental health. The Sleeping Salon was helpful to employees suffering from sleep disorders.

Incentives to Increase Commute Safety

Employees working in Taiwan Plants have access to free shuttle buses to and from metro stations. We also subsidize employees that commute using public transportation (buses, trains, metros) to reduce the risks of riding motorcycles or driving and decrease carbon emissions to promote a friendlier environment.



4.3 Talent Cultivation

4.3.1 Management Approach of Talent Cultivate

LCY is dedicated to pursuing outstanding talents and expanding the scale of our organization. We institute robust HR policies to provide diverse job opportunities, establish comprehensive pay and benefit systems, and uphold gender equality and equal pay for equal work during hiring processes. At LCY, we spotlight talent cultivation and care about our employee's career development. More importantly, we care about instilling our core values of safety, accountable leadership, innovation, teamwork, and integrity into the DNA of our employees through education and training, empowering our employees to become our strategic partners, and building a culture of sustainable operations to achieve sustainability.



Commitment

- Include talent development into our "fair and rigorous internal/ external screening process" to fulfill corporate sustainability goals.
- Value and comply with gender equity laws to ensure equal opportunities for employment and promotions.
- Value our employee's career development and provide diverse education and training.



Policies

- Integrity, Innovation, Teamwork, Accountable Leadership, and Safety, our core values, underpin our hiring standards and we adopt a fair and rigorous internal/ external screening process.
- Provide equal employment opportunities and promote an inclusive and diverse workplace environment. Hiring, education and training, pay and benefits, retirement, layoffs, resignations, and firings at LCY will not discriminate against any race, class, language, religion, political affiliation, ancestry, gender, sexual orientation, age, or marital status.
- LCY policies clearly state that the company is prohibited from hiring any individuals below the age of 15 and that the company and plants are prohibited from hiring workers below the age of 16. In addition, we've formulated a code of conduct and guidelines to prevent and handle sexual harassment, publicly declared that we are staunchly opposed to any forms of discrimination or harassment, and established reporting channels.
- We provide comprehensive education and training for employees to help new employees learn more about our company culture, strengthen employee loyalty and cohesiveness, and, more importantly, facilitate professional development.



Communication Channels

- In compliance with labor laws, we regularly convene Labor and Management Council Meetings to facilitate communication. The Taipei office and Kaohsiung plants all convene quarterly Labor and Management Council Meetings to facilitate collaboration, promote stronger working relationships, improve labor conditions, and map out benefits for laborers.
- We've also established a mailbox (gm@lcygroup.com) so employees send in suggestions or opinions.
- In 2021, there were no cases of discrimination, violations of rights to freedom of association or collective bargaining, child labor, or forced labor.

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4.3 Talent Cultivation

4.3.2 Talent Cultivation Measures

To achieve corporate development goals and meet labor demands as the company grows rapidly, LCY has established a comprehensive education and training framework to organize onboarding training, professional development, management training for different levels, EHS training, and corporate mission classes both offline and online so that employees can grow holistically, develop professionally, and find the best positions for themselves. We strive to work with employees to map out their mid- and long-term functions and career paths. In 2021, we provided over 50,000 hours of training. On average, employees trained for 26.47 hours and all full-time employees received performance reviews.

Annual Training (Hours)	Others (Not Management)		Management	Total	Average Hours
	Direct Labor	Indirect Labor			
Female	1,709	5,649.1	1,271.5	8,629.6	24.94
Male	26,649	10,637.5	8,039	45,325.5	26.79
Total Hours	28,358	16,286.6	9,310.5	53,955.1	
Average Hours/Employee	13.81	7.66	4.41	26.47	

Note:

1. Data on education and training does not include the Baytown Plant in the U.S. When calculating "Average Hours/ Employee," employees from the Baytown Plant are excluded from the denominator.
2. Direct Labor include technical engineers and duty supervisor
3. Administrative & R&D Employees include non-shift workers and non-management employees that do not work in plants.
4. Management includes all employees with division head, group leader, or higher titles.

Employees Receiving Regular Performance Reviews

Full-time Employees	Others (Not Management)		Management	Total
	Direct Labor	Administrative & R&D Employees		
Female	61	254	52	367
Male	1,052	490	216	1,758
Total	1,113	744	268	2,125
Percentage	52%	35%	13%	100%

Note:

1. LCY only conducts performance reviews for full-time employees, not part-time (temporary) employees.
2. Direct Labor include technical engineers and duty supervisor
3. Administrative & R&D Employees include non-shift workers and non-management employees that do not work in plants.
4. Management includes all employees with division head, group leader, or higher titles.

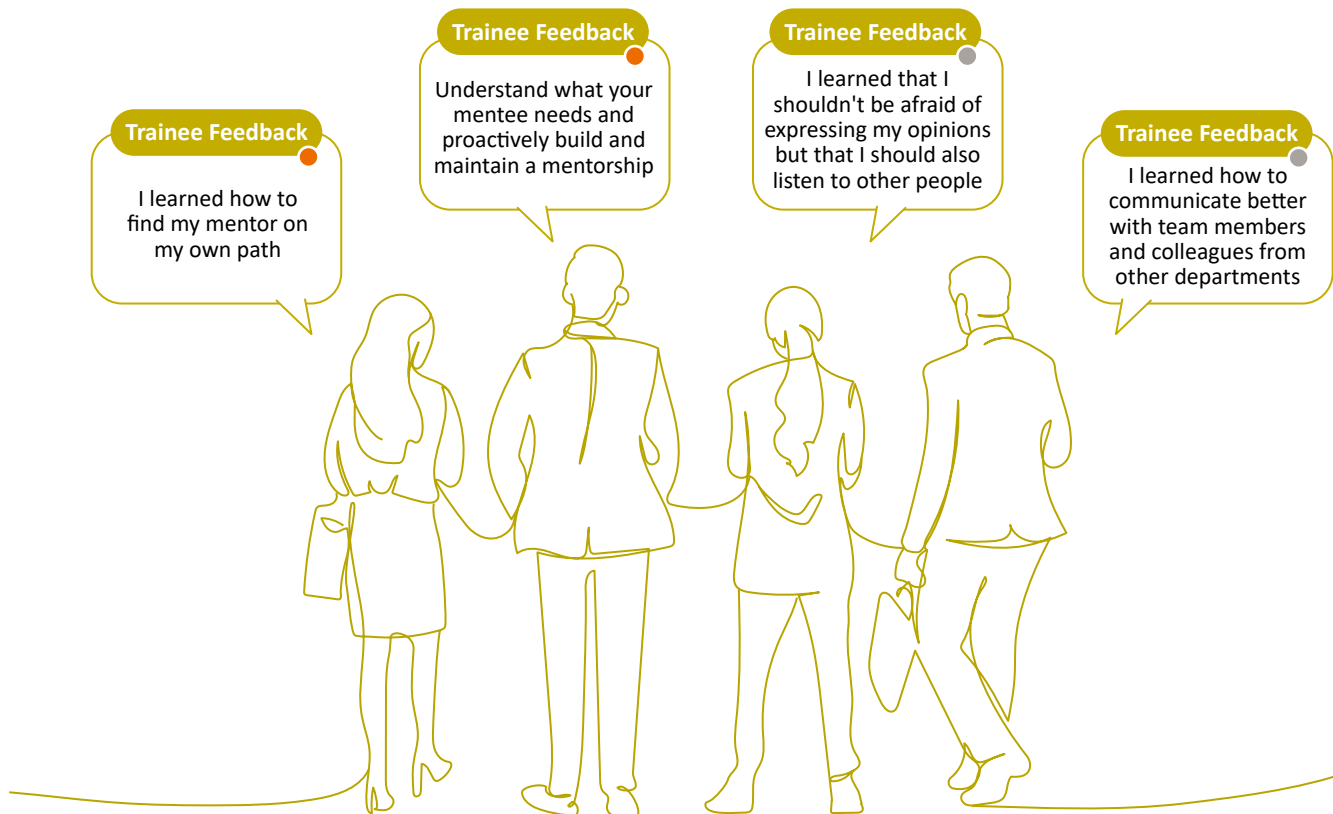
4.3 Talent Cultivation

1-on-1 Mentorship Program ●

Mentorship is a one-on-one guidance method in which mentors share life experiences, wisdom, and perspective to provide support and inspiration to mentees, thereby exerting positive influence and encouraging self-improvement and development. In 2021, we organized and hosted a Mentorship Workshop for new employees to help them build a mentor and support network so that they can continue to grow and progress in their careers and lives.

Build a Workplace Culture of Trust & Respect ●

To guide employees and underscore the importance of trusting and respecting each other, building up a team consensus, and shaping a corporate culture of trust and respect, we organize 4-5 hour workshops on trust and respect. After workshop training, employees become more aware of the causes of unsuccessful communication and understand that they need to change their mindsets and beliefs to change their relationships with others. Throughout the session, they also learn ways to approach and treat other members of the organization. In addition to building a team consensus, the workshop also provides a shared language and camaraderie for employees when collaborating and communicating with each other, making teams more effective.



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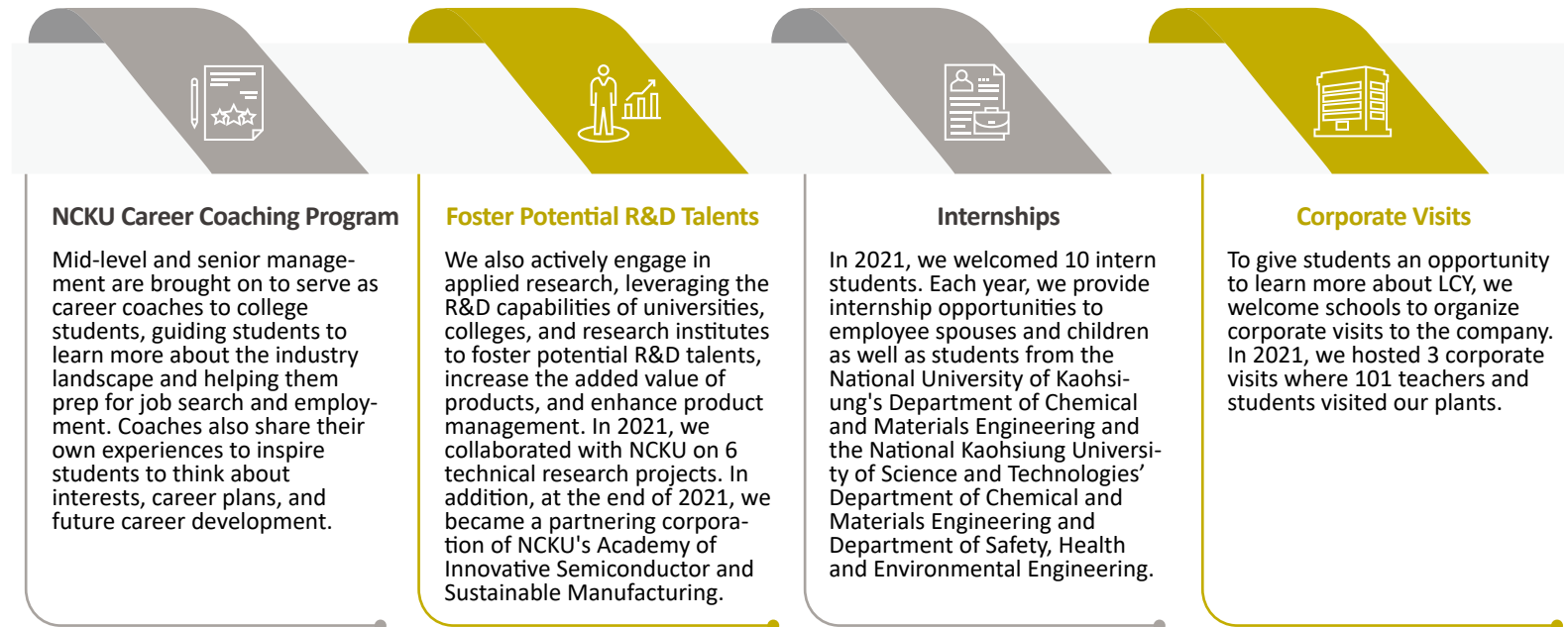
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4.3 Talent Cultivation

Campus Engagement & Youth Programs

In addition to cultivating talents internally, LCY also works with universities and colleges in Taiwan. We hope to inspire, encourage, and foster talents for the next generation through internship programs and hope that our efforts can contribute to and have an impact on society. Senior executives, managers, and colleagues from R&D and engineering departments are mobilized for campus recruitments. During these campus recruitment events, we use a Q&A format to introduce LCY to our youths. We also actively engage in applied research, leveraging the R&D capabilities of universities, colleges, and academic research institutes to foster potential R&D talents, increase the added value of products, and enhance product management. In 2021, we collaborated with NCKU for technical developments.



4.4 Occupational Safety



4.4.1 Occupational Safety Management

Safety is the license to operate and the cornerstone for building corporate sustainability in the chemical sector. Health Safety Environment (HSE) and Process Safety Management (PSM) are the two most important pillars to ensure safety. We care about the health and safety of our employees and contractors. To ensure workplace safety, build a safe, healthy, and comfortable workplace environment, and reduce occupational disasters, we've introduced the "ISO 45001 Occupational Health and Safety (OH&S) Management System" to locations in Taiwan and China. In the Baytown Plant in the U.S., we've formulated management guidelines and processes in compliance with local regulations to carry out regular internal/ external audits that can effectively prevent incidents. In the event that workplace risks emerge or accidents occur, tasks may be temporarily halted depending on the situation and reported according to internal SOPs. Investigations, employing root cause analysis, will then be conducted to prevent similar accidents in the future. The focus is not on blaming our workers but on committing to zero accidents to build a culture of health and safety in our workplace.

In addition to caring about the safety of workplace environments in our plants, we also promote campaigns to ensure the safety of our employees during commutes. LCY plants advocate and continue to encourage employees to use public transportation. We've long organized safe driving classes to prevent potential accidents in commutes by teaching defensive driving techniques. We've also adopted defensive measures to advocate for safe driving.

In 2021, LCY had 6 social and economic violations, resulting in fines of NT\$280,000. Violations were mainly against occupational safety laws and building laws. All violations have been reviewed and amended and we've also strengthened education, training, and processes. None of the violations were considered to be material and we will continue to strive for zero violations in the future.

Social & Economic Violations in 2021

Violation	Cases	Amount (NT\$)
 Occupational Safety	▲▲▲▲	NT\$250,000
 Building Act	▲▲	NT\$30,000
Total	▲▲▲▲▲▲	NT\$280,000

Establishment of the Occupational Safety and Health Committee

All plants in Taiwan have an Occupational Safety & Health Committee (OSH Committee) that is comprised of labor and management representatives in compliance with regulations. Labor representatives in all OSH Committees account for more than 1/3 of the committee, which convenes quarterly. China plants and the Baytown plant also regularly convene safety management meetings that are attended by both labor and management representatives. In meetings, committee members formulate management guidelines in compliance with the plant's health and safety policies, review the workplace environment and various proposals on health and safety, and regularly check any updates to local regulations. Plant managers, the division of industrial safety, the division of environmental risk management, the chairman, the general manager, and the highest executives of all BUs regularly review matters relating to health and safety in all plants and coordinate control over health and safety management topics to control and manage material risks, ensure employee health management, occupational disease prevention, and promote health as part of efforts to value and carry out practices promoting employee health and safety.

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4.4 Occupational Safety

Occupational Safety Management Measures



Plants determine potential work-related hazards, including physical and chemical hazards, related to daily operations based on the characteristics of their process.



Identify high-risk work environments in plants, such as ionizing radiation, noise, and hazardous chemicals. Risks are classified into low, medium, higher, high, and extremely high levels based on assessment items such as frequency of operations, probability of occurrence, and level of severity. The risk classification can help us evaluate potential risks and hazards throughout daily operations.



All plants should comply with the company's "Incident Investigation & Reporting Guideline." When plants uncover occupational hazards or dangerous situations, employees uncovering the risk or responsible department heads may choose to temporarily halt the specific task depending on the situation and file an "Inspection & Corrective Action Report" in the system when necessary, preventing accidents from reoccurring by reviewing and investigating accidents.



Provide occupational safety training to employees and contractors and hazard or safety training to relevant operators. Education and training topics include health and training, how to operate special equipment, and chemical safety. In 2021, employees and contractors received a total of 24,500 and 8,137.5 hours of training, respectively.





Organize emergency response and drills for compound disasters simulating various emergency scenarios to perfect disaster response measures. Organize fire drills, work safety drills, and work safety drills to enhance our employee's emergency response capabilities. Drills include underground pipe leak drills, evacuation for chemical and toxic substance leaks, sandbox drills using emergency response equipment, emergency response and prevention of heat strokes in high temperatures, emergency response, chemicals, and toxic substance leak drills, hazard communication training, PPE usage, earthquake evacuation drill, CO₂ evacuation, fire drills, and others.



4.4 Occupational Safety

Work-related Injuries

There were 11 work-related injuries, 0 fatalities, and 0 cases of work-related ill health in 2021. Work accidents in plants were primarily from falls, collisions, or improper use of machinery. The work accidents have now been included in management references to serve as a basis for optimization and strengthening education and training.

Severity of Work-related Injuries		Direct Employees	Contract Employees
 Recordable Work-related Injuries	No. of People	7	4
	Percentage	0.37	0.78
 Work-related Ill Health	No. of People	0	0
	Percentage	0	0
Total No. of Hours Worked (Hours)		3,775,124	1,022,474

Note:

- In 2021, there were no fatalities or high-consequence work-related injuries, thus the report only presents the number and rate of recordable work-related injuries.
- Data mainly derived from monthly reports of work-related injuries
- Rate of fatalities as a result of work-related injury = Number of fatalities as a result of work-related injury × [200,000 working hours] / Number of hours worked
- Rate of recordable work-related injuries = Number of recordable work-related injuries × [200,000 working hours] / Number of hours worked
- Rate of work-related ill health = Number of work-related ill health × [200,000 working hours] / Number of hours worked; [Work-related ill health are those that arise from exposure to hazards at work (requires a medical diagnosis).]
- Contract employees include temp workers, interns, security, cleaning services, equipment maintenance, long-term contractors, etc.

Process Safety

To optimize and roll out Process Safety Management (PSM), the Corporate Environmental Risk Management Division established the PSM Promotion Committee based on the foundations of line management. BUs then establish executive committees to roll out PSM activities through smaller subcommittees with both felt leadership and HR matrix. All plants have established executive subcommittees for the seven elements of Process Hazard Analysis (PHA), Process Safety Information (PSI), Management of Change (MOC), Standard Operating Procedures (SOP), Pre-Startup Safety Review (PSSR), Mechanical Integrity (MI), and Incident Investigation (II) to roll out relevant PSM activities. Outcomes achieved by subcommittees, such as PSM activities, operational discipline, and full worker engagement, are then effectively integrated into the plant's daily risk management through quarterly reporting and reviews by the PSM Promotion Committee.

In 2021, we experienced 5 Tier 2 process safety incidents, which was an incidence rate of 0.3. Incidents were mainly caused by chemical leaks and fire disasters, but no one was injured in these incidents. All incidents have been assessed and managed to provide improvement measures.

Process Safety Indicators	
Tier 2 Process Safety Events	▲▲▲▲▲
Rate of Tier 2 Process Safety Event	0.277

Note:

- Process Safety Management primarily targets production locations: the five plants in Taiwan (Kaohsiung, Copper Foil, Dashe, Linyuan, and Xiaogang), the two plants in China (Huizhou and Zhenjiang), and the U.S. Baytown plant.
- Tier 2 Process Safety Events are Tier 2 Events as defined in ANSI/ API RP 75.
- Process Safety Incidents Count (PSIC) tallies incidents that meet the four following conditions: (1) process-related; (2) chemical leaks exceeding the minimum requirement for reporting and that result in fatalities or injuries in employees, contractors, or hospitalization of third parties (non-employees or contractors); formal announcements of community evacuation or shelter-in-place; fire disasters or explosions that result in direct losses of US\$25,000 for the company; any of the above scenarios shall be immediately reported; (3) site of the incident is a production, logistic, storage, public, or testing facility; (4) any serious leakages that result in leakages exceeding the threshold limit value (TLV) within 1 hour.
- Process Safety Total Incident Rate (PSTIR) = Total Tier 2 PSE Count × [200,000 working hours] / Number of hours worked

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4.4 Occupational Safety

Transportation Safety

We care about transportation safety. Our Procurement & Transportation Department is responsible for managing and auditing third-party transportation contractors, while plants are responsible for internal industrial safety, plant inspections, and organizing emergency response drills. In 2021, there were no major transportation incidents. For transportation contractor management, please refer to 1.4.2 Supply Chain Management Procedures.

- Provide regular and comprehensive health checks and cancer screening for employees of all levels based on their work environments.
- Provide health checks and control banding for special tasks to ensure employees do not come in contact with harmful and hazardous substances that subsequently impact their health.
- Test all plant employees for musculo-skeletal symptoms and reassess existing work arrangements to reduce incidence rate based on employee's incidence rate and medical history.
- Bring in therapists to focus on our employee's emotional health for preventative care and a more robust health check system.



Comprehensive Health Checks



Safety & Protection Measures in Plants

- Plants are equipped with toxic and chemical substance detectors and we are preparing to connect machines with the PI system's toxic and chemical substance detectors to monitor stored toxic substances and potential leaks to prevent harm to human health and safety.
- The main course of action is to provide employees with appropriate protective equipment.
- Plants shall conduct internal audits at random to ensure that employees are safe while performing their tasks.

4.4.2 Occupational Health Services

In terms of employee health management, LCY prioritizes comprehensive health checks, safety and protective facilities in plants, and rigorous chemical management and control. In response to the pandemic, employees in the Taipei Office and Nanzi R&D Center that did not have to work on-site enjoyed flex hours to prevent traffic congestion during peak hours and reduce potential accidents and emotional stress from being late. In addition, to prevent employees from catching the flu, which may lead to more serious complications, we provide free flu vaccinations for all employees and arrange for medical centers to come on-site for flu vaccine administration.

Our contractors are required to comply with plant regulations before working at LCY plants, including hazard training to inform contractors of all identified hazards in the plant, especially hazards from harmful chemicals used in plants and their emergency response measures. We aim to eliminate all potential hazards and minimize risks.

All plants have formulated chemical management procedures to reduce potential hazards from employees being exposed to chemicals through three major approaches:

- Before purchasing materials, we check for toxicity levels and regulatory restrictions and collect the information. Our database is also regularly reviewed to ensure the quality of chemicals.
- We also conduct chemical incompatibility tests for our processes to ensure production safety in all plants.
- Through education and training on chemical substances, we increase our employee's understanding of chemicals used in their plants and how to properly handle the chemicals, such as our chemical stain remover session at the Linyuan Plant.



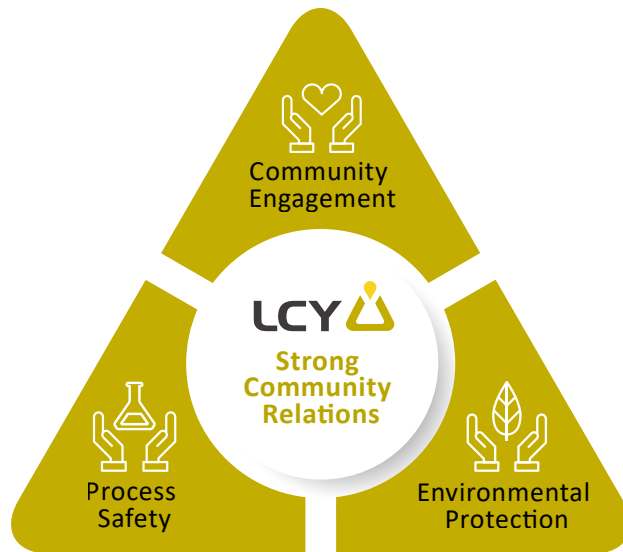
Rigorous Chemical Control Systems

4.5 Community Relations

4.5.1 Management Approaches to Community Relations

Community engagement, process safety, and environmental protection are the three pillars of community relations at LCY. As we continue to grow our business, we also care about developing the communities around us. We strive to help local communities and expand our influence to support the demands of our society and industries as well as economic development. We show that we care about social responsibility through actions we've taken to care for local regions, strengthen communication with stakeholders, and build a circular economy ecosystem to ensure prosperity for all.

Three Pillars of Strong Community Relations



Community Risk Assessment

LCY locations are mainly centralized in industrial parks, so the closest communities are generally 3~4 km away from our plants. Still, underground pipelines or suppliers transport raw materials used by the plants and our business activities may impact a more widespread area. As such, we care about industrial safety, environmental risk assessments, and response measures in surrounding communities. Plant operations may impact process safety, air pollution, employment, and transport safety for surrounding communities. In Taiwan, We've established a direct communication channel with local village chiefs to ensure immediate communication and feedback. In other regions, plant employees conduct community visits and report any assistance or improvements required by the communities back to the plant and LCY to give us more insight and ensure that change is being implemented.



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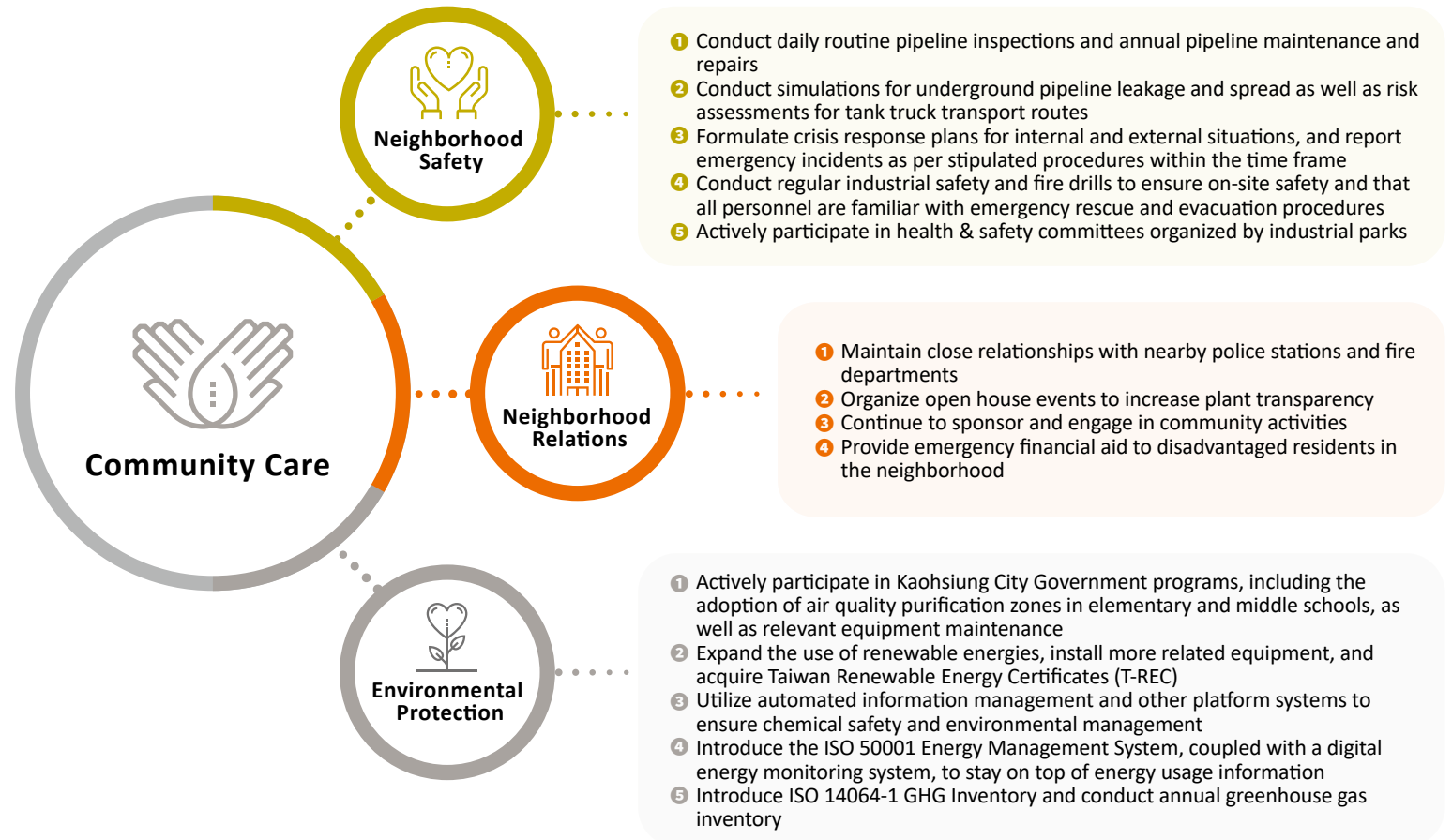
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4.5.2 Promoting Community Care

Operations at various LCY plants may impact surrounding communities. As such, we are proactive about caring for our communities, including safeguarding communities, protecting neighborhood relations, and protecting environments. To build mutual understanding with community residents, we've established a direct line of communication to maintain strong community relations. All plants around the world organize Open House events to give employee families, local residents, schools, government agencies, and other important stakeholders better insight into what we do at our plants and what our plants look like. We believe that open houses can build a stronger foundation for mutual trust.



4.5 Community Relations

Open House Events

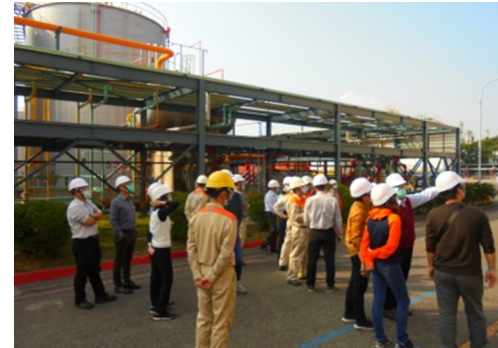
In 2021, LCY organized 13 Open House events, inviting schools, local authorities, and other businesses in the area to visit our plants. During Open House events, we introduce our beliefs and measures to help manage safety and the environment internally. We also talk about corporate social responsibility, the circular economy, technologies for recycling wastewater, and PI systems (real-time information systems).



▲ NCKU Vice President visiting the Nanzi R&D Center with 36 NCKU teachers and students. Executives from the HR and R&D divisions introduced NCKU visitors to our plant.



▲ Professors and graduate students from NKUST's Department of Safety, Health and Environmental Engineering and Department of Mechatronics Engineering visit our Logistics Station in Qianzhen to learn more about plant EHS and how to maintain machines.



▲ Local authorities and scholars visiting the Linyuan Plant to interact and engage

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4.5.3 Sustainable Community Empowerment

LCY is a long-time sponsor of the LCY Education Foundation, which focuses on fostering innovative talents in the fields of materials and chemicals. The LCY Education Foundation aims to encourage outstanding talents to dedicate themselves to learning about chemical engineering technologies and practices, enhance chemical engineering literacy and technologies, and welcome more outstanding talents to strive for sustainability through scholarships and international forums to empower a community of sustainability. The LCY Education Foundation provides scholarships to third-year college students all the way to doctoral students and young professors. Our talent cultivation programs targeting students in tertiary education continues to evolve with the times and we encourage more outstanding talents to join the ranks of sustainable chemicals. In 2021, we provided 78 scholarships. In addition, we organize a biennial Bowei Research Conference (BRC), inviting biomedical, materials, and chemistry students to interact with world-class scholars and build a sustainable ecosystem. The BRC in 2021 was canceled due to the pandemic but we are expecting to host the next BRC in 2023.

Since 2010, our scholarship camps have attracted thousands of applications and reached hundreds of universities and colleges, 449 departments, and over 1,500 professors around Taiwan. Each year, nearly 60 students in departments of materials, chemistry, and chemical engineering are awarded scholarships. Scholarship camps inspire new ideas through teamwork and give students an opportunity to interact with senior LCY executives to learn more about their careers and work experiences. The 2021 scholarship camp was titled "Infinite Gamers" to encourage students to grow and be a better version of themselves every single day. In the future, we will continue to organize scholarship events that are innovative and encourages students to think outside the box. We will continue to expand projects on talent cultivation and industry-academia cooperation to attract more outstanding young talents. We hope that every scholarship event can inject new blood into Taiwan and foster more outstanding talents that future industries require.

Scholarships & Awards	No. of People
Outstanding Student Award	56
Doctoral Student Scholarship Award	13
Master's Student Scholarship Award	5
Outstanding Young Professor in Academic Research Award	4
Total	78



▲ 10th Scholarship Camp: Encouraging new talents to think outside the box and grow every single day



▲ Representatives from each group select a designated element for their writing mission



▲ Chairman Bowei Lee of the LCY Education Foundation presenting the "Infinite Gamers Award"

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Appendix I – Participation in Industry Associations

Industry Associations	Roles
Taiwan Chemical Industry Association	Chairman Hong as the Vice Chairman of the Seventh Board of Directors
Chinese International Economic Cooperation Association (CIECA), Taiwan	LCY Group Vice Chairman sits on the Board of Directors
CommonWealth Sustainability League (CWS)	Member
Taiwan Alliance for Sustainable Supply (TASS)	Member
Circular Taiwan Network	Member
Taiwan Safety Council	Member
Taiwan Responsible Care Association (TRCA)	Member
The Polymer Society, Taipei	Member
TwICHE	Member
Chemical Society Located in Taipei	Member
Chinese Petroleum Institute	Member
Petrochemical Industry Association of Taiwan	Member
Taiwan Synthetic Resins Manufacturers Association	Member

Industry Associations	Roles
Catalysis Society of Taiwan	Seminar sponsorship
The Corrosion Engineering Association of ROC	Member
Chinese Industrial Machinery Association	Member
International Association of Arson Investigators Taiwan Chapter	Member
Taiwan Flat Panel Display Materials & Devices Association (TDMDA)	Member
Industrial Safety and Health Association (ISHA) of the R.O.C.	Member
Association of Occupational Safety and Health	Member
Kaohsiung Industrial Association	Member
Dashe Petrochemical Industrial Association	Member
China National Pharmaceutical Packaging Association	Member
ROC-USA Business Council	Member
AmCham Taiwan	Member

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• General Disclosure

GRI Standards	Disclosures	Corresponding Chapters	Page
	Core		
	102-1 Name of the organization	About this report	003
	102-2 Activities, brands, products, and services	1.1.1 About Us	014
	102-3 Location of headquarters	About this report	004
	102-4 Location of operations	About this report	004
	102-5 Ownership and legal form	1.2.1 Corporate Governance	017
	102-6 Markets served	1.1.1 About Us	014
	102-7 Scale of the organization	About this report 4.1 Employee Demographics & Management 1.1.2 Company Performance	017 067 016
	102-8 Information on employees and other workers	4.1 Employee Demographics & Management	067
GRI 102: General Disclosure 2016	102-9 Supply chain	1.4 Supply Chain Management	024
	102-10 Significant changes to the organization and its supply chain	About this report	003
	102-11 Precautionary principle or approach	1.3.2 Risk Management	021
	102-12 External initiatives	3.2.1 Governance & Strategy	048
	102-13 Membership of associations	Appendix I - Participation in Industry Associations	087
	102-14 Statement from senior decision-maker	Message from the Chairman	005
	102-16 Values, principles, standards and norms of behavior	Message from the Chairman	005
	102-18 Governance structure	1.2.1 Corporate Governance	017
	102-40 List of stakeholder groups	Identifying Stakeholders & Material Topics	007

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	102-41 Collective bargaining agreements	LCY Chemical Corp has not established a labor union	
	102-42 Identifying and selecting stakeholders	Identifying Stakeholders & Material Topics	007
	102-43 Approach to stakeholder engagement	Identifying Stakeholders & Material Topics	010
	102-44 Key topics and concerns raised	Identifying Stakeholders & Material Topics	010
	102-45 Entities included in the consolidated financial statement	About this report	--
	102-46 Defining report content and topic boundaries	Identifying Stakeholders & Material Topics	010
	102-47 List of material topics	Identifying Stakeholders & Material Topics	010
GRI 102: General Disclosure 2016	102-48 Restatements of information	No restatements of information for this reporting period	--
	102-49 Changes in reporting	No material changes on material topics and its boundary for this reporting period	--
	102-50 Reporting period	About this report	003
	102-51 Date of most recent report	About this report	003
	102-52 Reporting cycle	About this report	003
	102-53 Contact points for questions regarding the report	About this report	004
	102-54 Claims of reporting in accordance with the GRI standards	About this report	003
	102-55 GRI content index	Appendix II GRI Standards Reference Table	088
	102-56 External Assurance	About this report	003

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Occupational Health and Safety			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	Identifying Stakeholders & Material Topics	010
	103-2 The management approach and its components	4.4.1 Occupational Safety Management	078
	103-3 Evaluation of the management approach	4.4.1 Occupational Safety Management	078
GRI 403: Occupational health and safety 2018	403-1 Occupational health and safety management system	4.4.1 Occupational Safety Management	078
	403-2 Workers with high incidence or high risk of diseases related to their occupation	4.4.1 Occupational Safety Management	079
	403-3 Occupational health services	4.4.1 Occupational Health Services	081
	403-4 Worker participation, consultation, and communication on occupational health and safety	4.4.1 Occupational Safety Management	078
	403-5 Worker training on occupational health and safety	4.4.1 Occupational Safety Management	078
	403-6 Promotion of worker health	4.4.2 Occupational Health Services	081
	403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationship	4.4.1 Occupational Safety Management	078
	403-8 Workers covered by an occupational health and safety management system	4.4.1 Occupational Safety Management	078
	403-9 Work-related injuries	4.4.1 Occupational Safety Management	078
	403-10 Work-related ill health	4.4.1 Occupational Safety Management	078

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Air Quality			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	Identifying Stakeholders & Material Topics	010
	103-2 The management approach and its components	3.4.1. Management Approaches to Air Quality	056
	103-3 Evaluation of the management approach	3 Green Business 3.4.1 Management Approaches to Air Quality	045 056
GRI 305: Emissions 2016	305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	3.4.2 Air Pollution Reduction Measures	057
Energy Management			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	Identifying Stakeholders & Material Topics	010
	103-2 The management approach and its components	3.3.2 Energy Management	054
	103-3 Evaluation of the management approach	3 Green Business 3.3.2 Energy Management	045 054
GRI 302: Energy 2016	302-1 Energy consumption within the organization	3.3.2 Energy Management	054
	302-3 Energy intensity	3.3.2 Energy Management	054
GHG Emissions			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	Identifying Stakeholders & Material Topics	010
	103-2 The management approach and its components	3.3.1 Carbon Management	052
	103-3 Evaluation of the management approach	3 Green Business	045
GRI 305: Emissions 2016	305-1 Direct (Scope1) GHG emissions	3.3.1 Carbon Management	052
	305-2 Energy indirect (Scope2) GHG emissions	3.3.1 Carbon Management	052
	305-4 GHG emissions intensity	3.3.1 Carbon Management	052

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Waste Management			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	Identifying Stakeholders & Material Topics	010
	103-2 The management approach and its components	3.6.1 Waste Management	064
	103-3 Evaluation of the management approach	3 Green Business 3.6.1 Waste Management	045 064
GRI: 306 Waste 2020	306-1 Water discharge by quality and destination	3.6.1 Waste Management	064
	306-2 Waste by type and disposal method	3.6.1 Waste Management	064
	306-3 Significant spills	3.6.1 Waste Management	064
Water Management			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	Identifying Stakeholders & Material Topics	010
	103-2 The management approach and its components	3.5.1 Management Approaches to Water Resources	060
	103-3 Evaluation of the management approach	3 Green Business 3.5.1 Management Approaches to Water Resources	045 060
GRI 303: Water and Effluents 2018	303-1 Interactions with water as a shared resource	3.5.1 Management Approaches to Water Resources	060
	303-2 Management of water discharge related impact	3.5.1 Management Approaches to Water Resources	060
	303-3 Water withdrawal	3.5.1 Management Approaches to Water Resources	060
	303-4 Water discharge	3.5.1 Management Approaches to Water Resources	060
	303-5 Water consumption	3.5.1 Management Approaches to Water Resources	060

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Appendix II – GRI Standards Reference Table

• Material topics

GRI Standards	Disclosures	Corresponding Chapters	Page
Safety and Environmental Management of chemicals			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	Identifying Stakeholders & Material Topics	010
	103-2 The management approach and its components	2.3.1 Chemical Management Procedures 2.3.2 Responsible Chemical Research	040 041
	103-3 Evaluation of the management approach	2.3.1 Chemical Management Procedures	040
GRI 416: Customer Health and Safety 2016	416-1 Assessment of the health and safety impacts of product and service categories	2.3.1 Chemical Management Procedures	040
Green Products			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	Identifying Stakeholders & Material Topics	010
	103-2 The management approach and its components	2.1.1 Innovative Management 2.2.1 LCY's 6R Sustainability Strategy	030 031
	103-3 Evaluation of the management approach	2.1.1 Innovative Management	030
Employment			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	Identifying Stakeholders & Material Topics	010
	103-2 The management approach and its components	4.2 Employee Benefits 4.2.1 Promoting Employee Welfare	069
	103-3 Evaluation of the management approach	4.1 Talent Breakdown and Management 4 Promoting Co-prosperity in Society	067 065
GRI 401: Employment 2016	401-1 New employee hires and employee turnover	4.1 Talent Breakdown and Management	067
	401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	4.2.1 Promoting Employee Welfare 4.2.2 Employee Health and Safety	069 071
	401-3 Parental leave	4.2.2 Employee Health and Safety	071

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GRI Standards	Disclosures	Corresponding Chapters	Page
Management of the Legal & Regulatory Environment			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	Identifying Stakeholders & Material Topics	010
	103-2 The management approach and its components	1.3.1 Compliance Culture	020
	103-3 Evaluation of the management approach	1.3.1 Compliance Culture	020
GRI 307: Environmental Compliance 2016	307-1 Non-compliance with environmental laws and regulations	1.3.1 Compliance Culture 3.1.1 Environmental Protection Policies	020 047
GRI 419: Socioeconomic Compliance 2016	419-1 Non-compliance with laws and regulations in the social and economic area	1.3.1 Compliance Culture 4.4.1 Occupational Safety Management	020 078
Training and Education			
GRI 103: Management approach 2016	103-1 Explanation of the material topic and its boundary	Identifying Stakeholders & Material Topics	010
	103-2 The management approach and its components	4.3.1 Management Approaches to Talent Cultivation	074
	103-3 Evaluation of the management approach	4.3.1 Management Approaches to Talent Cultivation 4 Promoting Co-prosperity in Society	074 065
GRI 404: Training and education 2016	404-1 Average hours of training per year per employee	4.3.2 Talent Cultivation Measures	075
	404-2 Programs for upgrading employee skills and transition assistance programs	4.3.2 Talent Cultivation Measures 4.2.1 Promoting Employee Welfare	075 069
	404-3 Percentage of employees receiving regular performance and career development reviews	4.3.2 Talent Cultivation Measures	075

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Appendix II – GRI Standards Reference Table

• **Mid-tier Topics**

GRI Standards	Disclosures	Corresponding Chapters	Page
Economic Performance			
GRI 201: Economic performance 2016	201-1 Direct economic value generated and distributed	1.1.2 Company Performance	016
	201-2 Financial implications and other risks and opportunities due to climate change	3.2.2 Climate Risks and Responses	049
Community Engagement			
GRI 413: Local communities 2016	413-1 Operations with local community engagement, impact assessments, and development programs	4.5.1 Management Approaches to Community Relations	082
	413-2 Operations with significant actual and potential negative impacts on local communities	4.5.1 Management Approaches to Community Relations	082
Supplier Screening Based on Environmental Criteria			
GRI 308: Supplier environmental assessment 2016	308-1 New suppliers that were screened using environmental criteria	1.4.2 Supply Chain Management Procedures 1.4.3 Supply Chain Audits	025 028
	GRI 414: Supplier social assessment 2016	414-1 New suppliers that were screened using social criteria	1.4.2 Supply Chain Management Procedures 1.4.3. Supply Chain Audits



Appendix III – SASB Index - Chemical Sector

Topic	Code	Accounting Metric (Note)	2021 Amount	Related Chapters	Pages
	RT CH 110a.1	Gross global Scope 1 emissions (Metric tons (t) CO ₂ e)	159,600tCO ₂ e, accounting for 17% of total emissions (Scope 1 + Scope 2)	3.3.1 Carbon Management	052
		Percentage of Scope 1 emissions covered under emissions-limiting regulations (%)	Carbon fees and trading systems are still in the legislative process in Taiwan. No Scope 1 emissions are limited by regulations but we will continue to keep a pulse on domestic carbon regulations.		
GHG Emissions	RT CH 110a.2	Discussion of strategy to manage Scope 1 emissions, emission reduction targets, and an analysis of performance against those targets.	Due to the type and characteristics of the products we offer at LCY, our emissions are primarily indirect GHG emissions (Scope 2), which accounted for 83% of our total emissions, rather than direct GHG emissions (Scope 1), which are more common in traditional petrochemical industries. As such, carbon reduction measures focused on two areas: energy and steam conservation. We also utilized smart management systems at the plant to uncover optimum operating parameters and potential hotspots for energy conservation. New practices implemented included replacing variable-frequency drives, recycling waste heat, and reducing steam usage.	3.3.1 Carbon Management	052
Air Quality	RT CH 120a.1	Air emissions of the following pollutants: ① Nitrogen oxides (NO _x)	65.470 metric tons(t)	3.4.2 Air Pollution Reduction Measures	057
		② Sulfur oxides (SO _x)	7.496 metric tons(t)	3.4.2 Air Pollution Reduction Measures	057
		③ Volatile organic compounds (VOC)	262.038 metric tons(t)	3.4.2 Air Pollution Reduction Measures	057
		④ Hazardous air pollutants (HAPs)	33.117 metric tons(t)	3.4.2 Air Pollution Reduction Measures	057
Energy Management	RT CH 130a.1	① Total energy consumed (GJ)	8,250,152 GJ	3.3.2 Energy Management 2.2.3 Promoting Renewable Energies	054 055
		② Percentage grid electricity (%)	26%	--	--
		③ Percentage renewable (%)	0.00344%	--	--
		④ Total self-generated energy (GJ)	284 GJ	--	--

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Topic	Code	Accounting Metric (Note)	2021 Amount	Related Chapters	Pages
Water Stewardship	RT CH 140a.1	1 Total water withdrawn	5,490,747 Metric tons(t)	2.4.1 Management Approaches to Water Resources	060
		2 Percentage of total water withdrawn in regions of High or Extremely High Baseline Water Stress	0% We have identified water resource risks in our main production locations with WRI's water assessment tool, Aqueduct Water Risk Atlas. Plants in Kaohsiung (Taiwan), Huizhou (China), and Zhenjiang (China) are in regions of low baseline water stress; and Baytown (U.S.) has low-to-medium baseline water stress.	--	--
		3 Total water consumed	5,311,077 Metric tons(t) According to SASB RT-CH-140a.1.3.1.3, effluents discharged to different drainage basins should be considered as consumed water.	--	--
		4 Percentage of the total water consumed in regions of High or Extremely High Baseline Water Stress	0% We have identified water resource risks in our main production locations with WRI's water assessment tool, Aqueduct Water Risk Atlas. Plants in Kaohsiung (Taiwan), Huizhou (China), and Zhenjiang (China) are in regions of low baseline water stress; and Baytown (U.S.) has low-to-medium baseline water stress.	--	--
Hazardous Waste Management	RT CH 140a.2	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	0	3.5.3 Water Pollution Prevention Measures	063
	RT CH 140a.3	Description of water management risks and strategies to mitigate those risks	At LCY, we manage water resources from three sides: governance, strategic, and technical. <ul style="list-style-type: none"> • Governance includes elevating the importance of water governance, establishing a committee for energy and water conservation, and setting forth water conservation targets; • Strategic includes 1) increasing water recycled in plants through recycling steam and condensation, using MBR technology to process wastewater in Taiwan plants and 2) installing water conservation facilities to reduce water withdrawal and collaborate with outside parties to introduce a water reclamation program; • Technical includes plants in Taiwan developing and optimizing MBR technologies and other technologies that increase water use efficiency. 	3.5.1 Management Approaches to Water Resources	060
	RT CH 150a.1	Amount of hazardous waste generated	3300.1 Metric tons (t)	3.6.1 Waste Management	064
	RT CH 150a.1	Percentage of hazardous waste recycled	23.82% (outsourced to recycling plant)	3.6.1 Waste Management	064

Appendix III – SASB Index - Chemical Sector

Topic	Code	Accounting Metric (Note)	2021 Amount	Related Chapters	Pages															
Community Relations	RT CH 210a.1	Discussion of engagement processes to manage risks and opportunities associated with community interests	<p>LCY upholds three principles for community relations: community engagement, process safety, and environmental protection.</p> <ul style="list-style-type: none"> Plant operations may impact process safety, air pollution, employment, and transport safety for surrounding communities. We've established a direct communication channel with local village chiefs to ensure immediate communication and feedback. Plant employees conduct community visits and report any assistance or improvements required by the communities back to the plant and LCY to give us more insight and ensure that change is being implemented. 	4.5.1 Management Approaches to Community Relations	082															
Workforce Health & Safety	RT CH 320a.1	<p>Employee Type</p> <hr/> <p>Direct employees</p> <hr/> <p>Contract employees (Contract employees include temp workers, interns, security, cleaning services, equipment maintenance, long-term contractors, etc.)</p>	<p>Severity of Occupational Injury</p> <table border="1"> <thead> <tr> <th></th> <th>Direct employees</th> <th>Contract employees</th> </tr> </thead> <tbody> <tr> <td>Occupational injury</td> <td>No. 7</td> <td>4</td> </tr> <tr> <td></td> <td>Percentage 0.37</td> <td>0.78</td> </tr> <tr> <td>Occupational Disease</td> <td>No. 0</td> <td>0</td> </tr> <tr> <td></td> <td>Percentage 0</td> <td>0</td> </tr> </tbody> </table>		Direct employees	Contract employees	Occupational injury	No. 7	4		Percentage 0.37	0.78	Occupational Disease	No. 0	0		Percentage 0	0	4.4.1 Occupational Safety Management	078
				Direct employees	Contract employees															
			Occupational injury	No. 7	4															
				Percentage 0.37	0.78															
Occupational Disease	No. 0	0																		
	Percentage 0	0																		
	RT CH 320a.2	<p>Description of efforts to assess, monitor, and reduce exposure of employees and contract workers to long-term (chronic) health risks.</p>	<ul style="list-style-type: none"> Provide regular and comprehensive health checks and cancer screening for employees of all levels based on their work environments. Provide health checks and control banding for special tasks to ensure employees do not come in contact with harmful and hazardous substances that could subsequently impact their health. Test all plant employees for musculoskeletal symptoms and reassess existing work arrangements to reduce incidence rates based on employee's past incidence rate and medical history. 	4.4.1 Occupational Safety Management	078															
Product Design for Use-phase Efficiency	RT CH 410a.1	Revenue from products designed for use-phase resource efficiency	In 2021, green products generated NT\$2,811,907,000 in revenue, accounting for 5% of total revenue.	2.2.1 LCY's 6R Sustainability Strategy	031															
Safety & Environmental Stewardship of Chemicals	RT CH 410b.1	Percentage of products that contain Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Category 1 and 2 Health and Environmental Hazardous Substances	18.83%	2.3.1 Chemical Management Procedures	040															
		Percentage of products that contain GHS Category 1 and 2 substances that have undergone a hazard assessment.	100%	2.3.1 Chemical Management Procedures	040															

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Topic	Code	Accounting Metric (Note)	2021 Amount	Related Chapters	Pages
Safety & Environmental Stewardship of Chemicals	RT CH 410b.2	Discussion of strategy to manage chemicals of concern and develop alternatives with reduced human and/or environmental impact.	<p>Chemical management at LCY is controlled over two stages: Product R&D and Plant Management</p> <ul style="list-style-type: none"> • Product R&D stage: Evaluate alternatives and reduction of high-risk/hazardous substances. Meet with industrial safety and environmental protection units in plants to conduct environmental and health hazard and safety evaluations for the production process. • Plant management stage: The Division of Environmental Risk at HQ and industrial safety and environmental protection units in plants formulate chemical management guidelines for each stage of the chemical's life cycle, including application, incoming inspection, procurement labeling, storage & usage, and disposal. We stay on top of any amendments to chemical regulations from competent authorities, clarify the impact on our plants, and discuss response measures to ensure that chemical use and management in all plants comply with local laws and regulations. 	2.3.1 Chemical Management Procedures	040
				2.3.2 Responsible Chemical Research	041
Genetically Modified Organisms	RT-CH-410c.1	Percentage of products by revenue that contain genetically modified organisms (GMOs)	LCY does not use any GMOs.	--	--
Management of the Legal & Regulatory Environment	RT CH 530a.1	Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry	To track, assess, and manage changes to related regulations, responsible local units and industrial safety and environmental protection units in plants are instructed to pay close attention to regulatory changes, coordinate support and roll out, and ensure employee understanding and compliance through regular information sharing, education, training, advocacy, and announcements. Our goal is to achieve zero non-compliance.	1.3.1 Compliance Culture	020
Emergency Preparedness & Response for Occupational Safety	RT CH 540a.1	Process Safety Incidents Count (PSIC)	5	4.4.1 Occupational Safety Management	078
		Process Safety Total Incident Rate (PSTIR)	0.3		
		Process Safety Incident Severity Rate (PSISR)	0.3		
	RT CH 540a.2	Number of transport incidents	0		
Production	RT-CH-000.A	Annual production by reportable segment	<p>Total production: 1,565,033 metric tons (t), including:</p> <p>Performance Plastics BU: 430,038 metric tons (t)</p> <p>Solvents BU: 626,651 metric tons (t)</p> <p>Electronic Materials BU: 136,707 metric tons (t)</p> <p>Performance Materials BU: 360,327 metric tons (t)</p> <p>Copper Foil (LCY Technology Corp.): 11,310 metric tons (t)</p> <p>* Reporting boundary does not include the AR Plant in Huizhou or Sarnia Plant in Canada.</p>	--	--

Appendix IV – TCFD Index

TCFD Core Elements & Required Information		Related Chapters	Pages
<p>Governance</p>	<p>A Describe the board’s oversight of climate-related risks and opportunities.</p>	3.2.1 Governance & Strategy	048
	<p>B Describe management’s role in assessing and managing climate-related risks and opportunities.</p>		
<p>Strategy</p>	<p>A Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.</p>	3.2.2 Climate Risks & Responses	049
	<p>B Describe the impact of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning.</p>	3.2.1 Governance & Strategy	048
	<p>C Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario</p>	3.2.2 Climate Risks & Responses	049
<p>Risk Management</p>	<p>A Describe the organization’s processes for identifying and assessing climate-related risks.</p>	3.2.2 Climate Risks & Responses	049
	<p>B Describe the organization’s processes for managing climate-related risks.</p>		
	<p>C Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization’s overall risk management.</p>		
<p>Metrics and Targets</p>	<p>A Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.</p>	3.3 Carbon & Energy Management	052
	<p>B Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 greenhouse gas (GHG) emissions and the related risks.</p>		
	<p>C Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.</p>		

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Independent Assurance Statement

Scope and Approach

LCY Chemical Corp. ("LCY" or "the Company") commissioned **DNV Business Assurance Co., Ltd.** ("DNV" or "we") to undertake independent assurance over the 2021 ESG Report ("the Report") for the year ended 31 December 2021.

We performed our work using DNV's assurance methodology VeriSustain™¹, which is based on our professional experience and international assurance best practices, including International Standard on Assurance Engagements 3000 (ISAE 3000) and the Global Reporting Initiative (GRI) Sustainability Reporting Standards.

The Report also incorporated disclosures with reference to relevant sustainability reporting guidelines, such as the Sustainability Accounting Standards Board (SASB) Sustainability Accounting Standard for the Chemicals industry (version 2018-10) and the Recommendations of the Task Force on Climate-related Financial Disclosures.

We understand that the reported financial data and information are based on the data from the Company's Annual Report and Accounts, which are subject to a separate independent audit process. The review of financial data taken from the Annual Report and Accounts is not within the scope of our work.

We planned and performed our work to obtain the evidence we considered necessary to provide a basis for our assurance opinion. We are providing the evaluation of reporting principles with a Moderate level of assurance, according to the DNV VeriSustain™ Protocol.

Responsibilities of the Directors of LCY and of the Assurance Providers

The Directors of LCY have sole responsibility for the preparation of the Report. In performing our assurance work, our responsibility is to the management of LCY; however, our statement represents our independent opinion and is intended to inform all of LCY's stakeholders. DNV was not involved in the preparation of any statements or data included in the Report except for this Assurance Statement.

DNV provides further services to the Company, none of which constitutes a conflict of interest with the current assurance engagement.

DNV's assurance engagements are based on the assumption that the data and information provided by the client to us as part of our review have been provided in good faith. DNV expressly disclaims any liability or co-responsibility for any decision a person or an entity may make based on this Assurance Statement.

Basis of Our Opinion

A multi-disciplinary team of sustainability and assurance specialists performed work at LCY's Headquarters in Taipei City and the site level. We undertook the following activities:

- Review of the current sustainability issues that could affect LCY and are of interest to stakeholders.
- Review of LCY's stakeholder engagement approach and recent outputs.
- Review of information provided to us by LCY on its reporting and management processes relating to the Principles.
- Interviews with selected senior executives responsible for the management of sustainability issues and review of selected evidence to support the issues discussed.
- Site visits to LCY's Headquarters in Taipei City and data checks on two selected production sites in Dashe Dist., Kaohsiung City and in Huizhou, China to review processes and systems for preparing site-level sustainability data and the implementation of sustainability strategies.
- Review of supporting evidence for key claims and 2021 data in the Report, as reported information beyond 2021 is not within the scope of the current engagement. Our checking processes were prioritised according to materiality, and we based our prioritisation on the materiality of issues at the consolidated corporate level.
- Review of the processes for gathering and consolidating the specified performance data and, for a sample, checking the data consolidation. Where data of financial performance and of greenhouse gas emissions had been checked by another third party, we tested the transposition from these sources to the Report.
- An independent assessment of LCY's reporting according to the Core option of Global Reporting Initiative (GRI) Sustainability Reporting Standards.
- The verification was conducted based only on the Chinese version Report.

¹ The VeriSustain™ Protocol is available on dnv.com



Opinion

On the basis of the work undertaken, nothing came to our attention to suggest that the Report does not properly describe LCY's adherence to the Principles. In terms of reliability of the performance data, in accordance with Moderate level assurance requirements, nothing came to our attention to suggest that these data have not been properly collated from the information reported at the operational level nor that the assumptions used were inappropriate.

Observations

Without affecting our assurance opinion, we also provide the following observations.

- The continual development of stakeholder engagement approaches is encouraged to consider the potentially changing materiality of sustainability issues.
- The management approaches of the Company's material topics can be further structured to comprehensively address sustainability strategies and potential impacts.
- The harmonisation of data collection and management rules is encouraged to support comparability and reliability at the consolidated level.
- The continual evaluation of progress on sustainability objectives and appropriate updates can help to ensure practical validity for the longer term.

Stakeholder Inclusiveness

The Company has identified the expectations of stakeholders through internal mechanisms in dialogue with different groups of stakeholders. The stakeholder concerns are well identified and documented. The significant sustainability issues identified through this process are reflected in the Report.

Sustainability Context

The Report provides an accurate and fair representation of the level of implementation of related corporate sustainability policies and meets the content requirements of the GRI Standards.

Materiality

The process developed internally has not missed out any significant, known material issues, and these issues are fairly covered in the Report. A methodology has been developed to evaluate the priority of these issues.

Completeness

The Report covers performance data against the GRI Standards core indicators that are material within the Company's reporting boundary. The information in the Report includes the Company's most significant initiatives or events that occurred in the reporting period.

Accuracy and Reliability

The Company has developed the data flow for capturing and reporting its sustainability performance. In accordance with Moderate level assurance requirements, we conclude that no systematic errors were detected which causes us to believe that the specified sustainability data and information presented in the Report are not reliable.

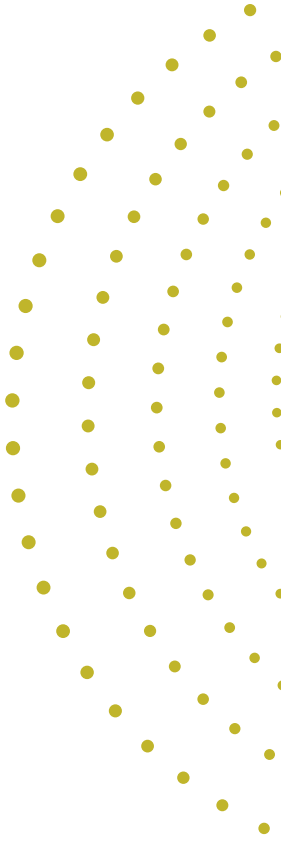
For and on behalf of DNV Taiwan

Date: 18 November, 2022

Yu Chung Chen
Lead Verifier
Business Assurance
DNV Taiwan

David Hsieh
District Manager,
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Statement Number: C567741-2021-CSR-TWN-DNV



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