



# PERVASIVE DISPLAYS

## 2024 Sustainability Report

Dedicated to driving innovation and sustainable development in e-paper technology.  
As a member of VusionGroup, a global leader in electronic shelf-labeling solutions.  
Committed to delivering low-power, environmentally responsible display solutions.

# Company Overview

**Basic Information** : Company was founded in Y2010 and is headquartered in Tainan Science Park, with 71 employees and a total capital of NT\$250 million

**Products and Service** : Design and Sales of E-Paper Display Modules and Application System

**Global Leadership and Sustainable Commitment:**

- 1. First global company(VusionGroup) to ship over 200 million EPDs (E-Paper Displays).
- 2. Most experienced industrial-grade EPD designer and manufacture globally.
- 3. The ONLY EPD company with 100% design and quality control in Taiwan.
- 4. Continuously supporting retail and industrial customers in achieving sustainability through low-power, eco-friendly display technologies.

## History of company

**2006 | The Smart Journey Begins** - Founding members were employees of Chilin Technology Co., Ltd. and participated in the global "One Laptop per Child (OLPC)" initiative, focusing on low-power display technology, laying the groundwork for e-paper innovation.

**2007 | E-Paper Project Launched** - Chilin Technology initiated an internal e-paper R&D project and developed the first 2-inch e-ink screen, expanding into the ESL market.

**2008 | Business Unit Established** - Established a dedicated e-paper business unit focused on low-power display technologies. Its scope included module design, hardware/software development, equipment setup, and quality management. Mass production began the same year.

**2010 | Pervasive Displays Inc. Established** - To support market growth and new applications, the e-paper unit was spin off as Pervasive Displays Inc., focusing on low-power electronic labels and smart retail/industrial upgrades.

**2016 | Joined VusionGroup S.A. (formerly SES-imagotag, renamed VusionGroup in 2023.)** - Joined the global leader in Electronic Shelf Labels (ESL), uniting technical expertise to accelerate digital retail transformation and ESG initiatives.



## Milestones

**2023 |** Winner of the Smart Display Application Award – Smart Retail Category, for the Engage Rail multimedia shelf display, enhancing in-store promotions and digital experiences

**2022 |** Winner of the Smart Display Application Award – Smart Retail Category, for the CAPTANA shelf out-of-stock management solution

**2016 |** Transferred key production technologies to BOE for building the world’s first fully automated EPD production facility in Chongqing, now the largest of its kind globally

**2014 |** Launched the world’s first ESL operable in frozen environments. Formed strategic alliance with Imagotag to promote tri-color ESLs, implemented in Media Mart

**2013 |** Partnered with Ishida Trading to develop the Japanese ESL market

**2012 |** Recognized as "Best Innovation Company of the Year" by Lux Research, and Awarded Red Herring Global Top 100.

# Sustainability Report Overview

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## Reporting Period

January 1 to December 31, 2024 (aligned with the company's fiscal year)

2

## Publication Frequency

Annually. First edition published June 2025. Next for July 2026

3

## About This Report

Chinese and English versions are available for download on the official website. All monetary values are expressed in NTD, unless otherwise stated.

This Sustainability Report provides a comprehensive overview of Pervasive Displays' key actions and performance in corporate governance, sustainable innovation, green operations, responsible supply chain practices, and social impact.

Pervasive Displays welcomes all inquiries or suggestions related to this report or our sustainability initiatives. We sincerely invite you to connect with us.

[sustainability@pervasivedisplays.com](mailto:sustainability@pervasivedisplays.com)





## Message from the General Manager



A handwritten signature in white ink, appearing to read "Atsushi Wajima". The signature is stylized and fluid.

Pervasive Displays Inc.

As the global movement toward sustainability accelerates, Pervasive Displays is firmly committed to leading this transition. We believe that innovation is not only a driver of industrial progress but also a powerful tool for creating positive environmental and social impact.

Our focus on developing low-power e-paper display technology is a reflection of this commitment. These solutions not only enhance energy efficiency and reduce paper waste but also align with our responsibility to contribute to global decarbonization efforts. Sustainability is embedded in our innovation.

Looking ahead, we are executing a clear roadmap toward net-zero emissions by 2050. This journey is built on deep collaboration—with our suppliers, partners, and stakeholders—grounded in fairness, transparency, and mutual accountability. At the same time, we continue to strengthen our internal governance to ensure alignment with international ESG standards.

As we drive digital transformation in smart retail and industrial applications, we remain focused on creating enduring value—for the planet, for our customers, and for society. Every step forward is made possible by the dedication of our people and the trust of our partners. Together, we are shaping a more sustainable, resilient, and innovative future.



# ISO 9001:2015 Quality Management System

# 勞動部勞動力發展署

## 人才發展品質管理系統評核等級證書

Certificate of Talent Quality-management System (TTQS)

單位名稱

Name of Institution

龍亨新科技股份有限公司

立案地址

Address

臺南市新市區創業路28號4F

評核範圍

Certified Range

(如未限定評定範圍，本項得免載)

評核等級

Certified Level

企業機構版 銅牌  
Enterprise Version, Bronze

效期

Expiry

115 年 10 月 24 日止

署長 蔡孟良

Director General Tsai, Meng Liang

中華民國

113 年

10 月

25 日

依據人才發展品質管理系統評核第17點第1項發證  
發證字號：發給字第1130349385B號



Reflects our investment in employee training and development, and our commitment to building a learning-driven and competitive organization.



## Sustainable Procurement

### Sustainable Procurement and Purchasing Policy **2024 : No violations or incidents were recorded**

Procurement practices are guided by environmental, social, and governance (ESG) principles, with a focus on delivering sustainable value across the supply chain through the following approaches.

- Ensure all raw materials comply with international environmental regulations such as REACH, RoHS, and WEEE
- Promote low-carbon product design, resource recycling, and pollution prevention
- Require suppliers to uphold human rights, legal labor practices, occupational safety, and fair treatment
- Prohibit the use of 3TG conflict minerals that may finance armed conflict, with a focus on supply chain transparency
- Follow OECD Due Diligence Guidelines and the principles of the UN Global Compact to fulfill corporate social responsibility
- Conduct supplier risk control through self-assessments, internal audits, and third-party evaluations (e.g., EcoVadis)
- Monitor supplier performance to drive full supply chain sustainability



## Supplier Conduct

### Supplier Code of Conduct

### **2024 : No violations or incidents were recorded**

We expect all suppliers to uphold the following principles to ensure responsible and sustainable business conduct

- Implement environmental protection measures to reduce emissions, pollution, and hazardous substances
- Disclose conflict mineral sources via CMRT reporting to maintain transparency
- Prohibit child labor and forced labor, and ensure safe, fair, and non-discriminatory workplaces
- Ensure employees receive lawful wages, reasonable work hours, and statutory leave
- Respect freedom of association and collective bargaining; prohibit retaliation
- Maintain occupational health and safety measures, including PPE and emergency protocols
- Prohibit all forms of bribery, corruption, and conflicts of interest
- Comply with data privacy and intellectual property regulations
- Begin ESG self-assessments and provide compliance documentation
- Report any major violations promptly



## Code of Conduct

## Code of Ethics

A strong ethical foundation is essential to responsible business practices.

The following principles guide operations and interactions across the organization:

- Uphold the highest standards of integrity, transparency, and ethical behavior
- Enforce zero tolerance for bribery and corruption
- Require all employees to comply with laws, internal policies, and ethical principles
- Prevent conflicts of interest, bribery, and undue influence
- Regulate gifts, hospitality, sponsorships, and donations to avoid improper conduct
- Comply with anti-money laundering, international trade, and data privacy regulations
- Promote respect for human rights, non-discrimination, and anti-harassment in the workplace
- Ensure occupational health and safety and support environmental stewardship
- Protect confidential information and promote transparency
- Provide secure channels for employees to report misconduct or unethical behavior



## Environmental Responsibility

## Conflict Minerals Policy

We support responsible sourcing of 3TG minerals (tin, tungsten, tantalum, and gold) through the following actions to promote conflict-free supply chains:

- Comply with applicable conflict minerals regulations and international standards
- Require suppliers to conduct due diligence on mineral sourcing and traceability
- Ensure suppliers cascade the same standards through their own supply chains
- Include conflict minerals declarations in supplier audits and self-assessments
- Impose corrective measures on non-compliant suppliers and monitor progress

## 2024 Performance

- **100% of suppliers were compliant with conflict minerals requirements**
- **All suppliers submitted CMRT (Conflict Minerals Reporting Template) declarations**





## Environmental Responsibility

### Environmental Commitments

- Reduce absolute emissions and carbon intensity
- Develop low-impact, eco-friendly products
- Target a 20–25% reduction in electricity use by 2035 (compared to 2024 baseline), with partial adoption of renewable energy

### Vision & Mission

- Drive environmental responsibility through innovation, leveraging technology to foster positive social and environmental change
- Establish a sustainability management system aligned with international standards
- Commit to reducing greenhouse gas emissions, energy consumption, waste, and hazardous substances
- Promote recycling and the development of a circular economy

### Policy Pillars

- Low-Carbon Applications : Combine low-power display technology with low-carbon applications to support IoT and industrial devices, advancing toward green assets and sustainable development
- Low-Carbon Business : Promote low-carbon and sustainable digital transformation of business operations
- Align with group policies and drive the achievement of sustainability goals



## **RoHS and REACH Policy**    **2024 : No violations or incidents were recorded**

- All products are compliant with REACH, RoHS, and WEEE directives.
- Committed to reducing substances that are harmful to human health and the environment
- Require all supplier components and raw materials to comply with REACH and RoHS regulations and meet WEEE requirements
- Pursue the goals of low-waste, low-carbon, and digital transformation, working with customers to create a sustainable environment



## **Environmental Responsibility**

### **Office-Level Initiatives**

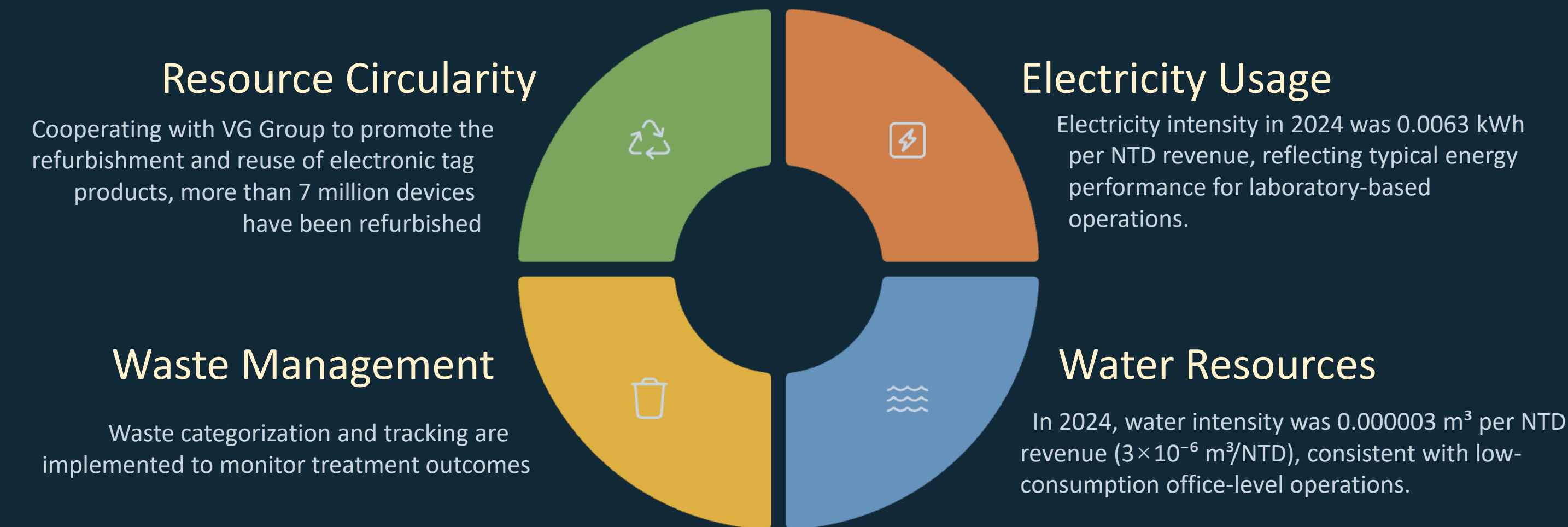
- Use energy-efficient equipment and reduce single-use items
- Encourage reduced business travel and promote the use of digital communication methods such as online meetings
- Promote circular usage (e.g., reusable bottles, cups, and eco bags)

### **Education and Stakeholder Engagement**

- Foster a sustainability culture through employee training and ESG newsletters
- Enhance environmental awareness among suppliers and partners

# Energy and Water Resource Efficiency

Pervasive Displays operations primarily focus on design and product development, including laboratory-based activities. Manufacturing is outsourced to qualified partners, and as such, no production lines are housed within Pervasive Displays’ operational facilities. This results in relatively low direct resource consumption.





# Integrity

0

## Disputes

There are no controversies involving anti-competition, monopoly or corruption.

100%

## Ethics Training

All employees complete ethical conduct training and sign a letter of commitment

85%

## Customer Satisfaction

Reflects ongoing improvements in customer experience and service quality

## Corporate Governance – 2024 Performance Summary



### Education

Promoted CSR and ESG training via 360Learning platform



### IT and Office Decarbonization Measures

Employee-centered office upgrade with sustainability and wellness design  
Extended PC life cycle to 5 years, and implemented reuse and refurbishment programs  
Introduced office energy-saving measures (e.g., monitor sleep mode, efficient meeting space usage)  
Eliminated disposable plastic utensils; provided reusable cups, bottles, and bags



### Resource Circularity

Introduced “Scrap Cost as % of Operating Cost” as a resource efficiency indicator, 2024 result: 0.0026%, it used to track R&D and inventory-related waste;  
Future plans include implementing preventive scrap management.



# E-Paper Technology and Sustainable Development

## Core Technical Features of e-Paper

### Bistable display

EPDs support bistable display, enabling 100% power cut-off after image update

### Reflective display

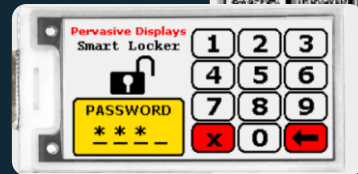
No backlight is required for display, with extremely low power consumption and long-term visibility

### Eye-friendly

Reduces exposure to high-energy visible light (HEV), providing an eye-friendly, non-emissive display alternative.

## Patent Portfolio

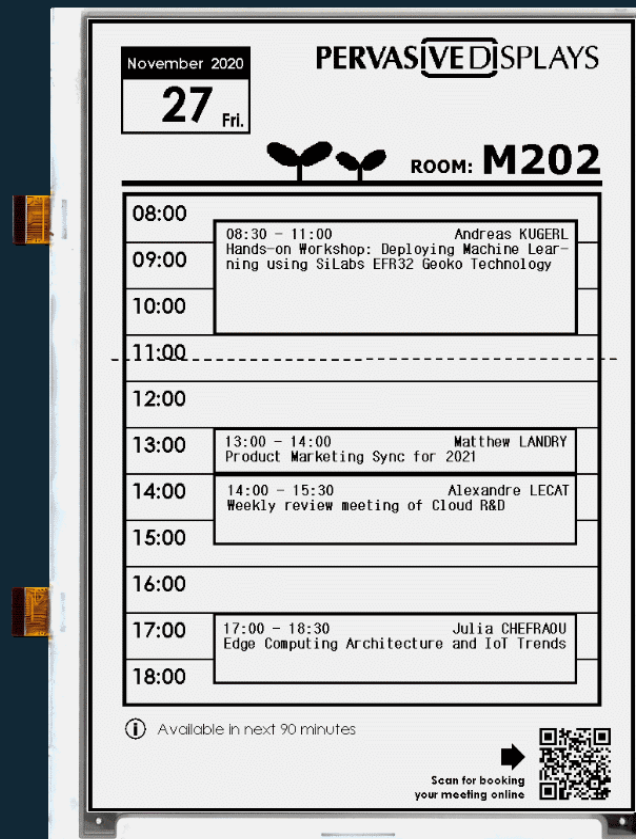
As of 2024, Pervasive Displays holds 19 active patents related to e-paper innovations



# Environmental Benefits of E-Paper Labels

A 12-inch industrial e-paper display generates about 0.0011 kgCO<sub>2</sub>e per day, achieving nearly 280 times lower emissions than conventional TFT-LCD signage, demonstrating clear sustainability and energy-efficiency advantages.

*\*Assumes image refresh every 40 seconds (with 20-second display duration), totaling ~1,440 updates per day*



## 12-Inch Industrial E-Paper Display for a day

CO<sub>2</sub>  
emissions

0.0011 Kg

E-paper Display  
Daily energy  
consumption

0.1340 Kg

TFT-LCD electronic signage  
Daily energy  
consumption

### Key Emission Calculations (Detailed Explanation)

- E-Paper Calculation:

Daily energy consumption = 0.0024 kWh

Taiwan Emission Factor (2024) = 0.4740 kgCO<sub>2</sub>e / kWh

CO<sub>2</sub>e Emissions = 0.0024 × 0.4740 = 0.0011 kgCO<sub>2</sub>e/day

- TFT-LCD Calculation:

Daily energy consumption = 0.6600 kWh

Taiwan Emission Factor = 0.4740 kgCO<sub>2</sub>e / kWh

CO<sub>2</sub>e Emissions = 0.6600 × 0.4740 = 0.3128 kgCO<sub>2</sub>e/day

# E-Paper Applications Showcase - Advanced Technologies

1

## Fast Update

By optimizing waveform driving technology, Pervasive Displays enables rapid screen updates with minimal ghosting. This improves user experience and supports real-time information displays across various scenarios.

2

## Wide Temperature

With enhanced waveform control, the operational temperature range of the display materials has been extended from -15°C to +60°C. This significantly expands the use cases for EPDs and improves product durability in challenging environments.

3

## Graphic Library

Pervasive Displays provides a comprehensive and user-friendly graphic library that allows developers to easily create templates, switch layouts, and build interactive interfaces via simple parameter settings. This reduces development time and cost while accelerating innovation and conceptual deployment.

4

## Total Solution

Pervasive Displays offers system-level integration services tailored to customer needs, including front lighting, touch panel solutions, and reinforced cover designs. These value-added services enhance the functionality and versatility of EPDs across product lines.

5

## Panel Breakage Detection (Patented)

Combines TFT circuit with COG signal to detect microfractures before image update. Enhances system protection and detects structural issues invisible to the naked eye. Fully implemented across all product sizes



# Application Showcase

## Smart Retail

- Electronics



- Grocery



## Smart Industrial

- Smart scale label



- Milking automation



# Global Human Rights Policy

This policy applies to all Pervasive Displays employees, suppliers, partners, and contractors.

Reference Standards :

United Nations Universal Declaration of Human Rights; International Covenant on Economic; Social and Cultural Rights; International Covenant on Civil and Political Rights; Core Conventions of the International Labour Organization (ILO); Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy;

United Nations Guiding Principles on Business and Human Rights (UNGPs)

Supported Initiatives:

United Nations Global Compact (UNGC); Sustainable Development Goals (SDGs); Women’s Empowerment Principles (WEPs)

## Fundamental Human Rights Protections

- Prohibit forced labor and child labor
- Zero tolerance for discrimination, harassment, or any form of abuse
- Protect vulnerable and minority populations
- Support freedom of association and the right to collective bargaining

## Anti-Discrimination and Anti-Harassment

Explicitly prohibit discrimination based on gender, age, race, sexual orientation, religion, and other characteristics. All employees are required to sign the Code of Ethical Conduct and complete interactive ethics training. Anonymous reporting mechanisms are available via the MyLily platform and [ethics@vusion.com](mailto:ethics@vusion.com)

## Diversity, Equity, and Inclusion (DEI)

- Promote gender equality, cultural diversity, and inclusiveness across ethnicity and age.
- Pervasive Displays team of approximately 70 employees spans five nationalities across three continents and four oceans.
- Encourage a safe, respectful, and inclusive workplace culture.

## Gender Equality and Women’s Empowerment

Support women’s career development through mentorship, leadership training, and individualized development plans.

## Health and Safety

Provide a safe, healthy, and productive work environment for all employees

## Career Development and Equal Opportunity

Adopt a merit-based approach to recruitment and promotion company-wide

## Data Privacy and Protection

All employees receive training on data protection and information security



# Global Human Rights Policy – 2024 Performance



- Talent Development Initiatives
- Structured Mentorship & Leadership Training
- A formal mentorship program and leadership development framework have been established to support managerial growth.



- Grievance and Reporting Mechanisms
- Internal whistleblower platforms and anonymous reporting channels are in place to support employee feedback and issue escalation.



- Employee Learning Resources
- Access to LinkedIn Learning and 360Learning platforms is available for continuous learning on topics such as unconscious bias and DEI.



- Parental Leave and Family Support
- Family Day activities and flexible work arrangements are provided to support parenting and work-life balance.



Employee Net Promoter Score  
Target: >50   Pervasive Displays: 88



# Labor Rights Policy

Purpose : To supplement the Global Human Rights Policy by clearly defining the fundamental labor rights to which all workers are entitled and ensuring a fair, safe, and respectful work environment.

Scope : Applicable to all employees, suppliers, partners, and contractors of Pervasive Displays.

Reference Standards

- Core Conventions of the International Labour Organization (ILO)
- Principles of the United Nations Global Compact
- Taiwan Labor Standards Act

- **Freedom of Association and Collective Bargaining**

Respect the right to organize and participate in labor unions  
Prohibit retaliation, dismissal, or harassment related to union activity

- **Prohibition of Forced Labor**

Strictly prohibit human trafficking, debt bondage, involuntary prison labor, and all forms of forced labor

- **Prohibition of Child Labor**

Comply with ILO Conventions No. 138 and 182  
Do not employ individuals under the age of 18 in hazardous work

- **Anti-Discrimination and Anti-Harassment**

Recruitment, promotion, and termination decisions must not be based on gender, age, race, religion, or other discriminatory factors

- **Working Hours, Compensation, and Benefits**

Comply with local labor laws and collective agreements

- **Gender Equality and Women's Empowerment**

Support women's career advancement  
Provide paid maternity and paternity leave beyond legal requirement

- **Health and Safety**

Implement the Health and Safety Policy to ensure a safe working environment  
Recognized as a critical component of employee retention and corporate sustainability

- **Flexible and Family Leave**

Paid maternity leave (per legal standards) 、 Additional 3 days of paid parental leave and 1 day for school-related family care

- **Supplier Responsibility and Audits**

Require suppliers to comply with all applicable labor laws and ethical standards

# Rewards and Benefits

- Holiday bonuses, occasional afternoon gatherings, and employee outings
- Annual health check-ups for all employees, with advanced screenings provided for employees with six or more years of service
- Group insurance coverage extended to employees’ spouses and children.
- Monthly allowance for vending machine purchases.
- Retirement benefits are provided in accordance with the Labor Standards Act and the Labor Pension Act, with monthly contributions to pension funds to secure employees’ post-retirement livelihood.
- Compensation and benefits exceed the statutory minimum wage, with bonuses determined based on annual performance evaluations.
- Paid leave beyond legal requirements, including holiday, family care, school return, maternity, prenatal checkup, and paternity leave, with additional support for pregnant employees and their partners.

Leave Type	Description
Holiday Leave	5 additional paid days annually, supporting work-life balance.
Family Care Leave	5 days of paid family care leave per year.
School Return Day Leave	1 paid day of leave for employees with children under 7 years old.
Maternity Leave	A total of 10 weeks of paid maternity leave, exceeding statutory requirements.
Prenatal Checkup Leave	10 days of paid prenatal checkup leave, above the legal minimum.
Paternity & Accompaniment Leave	20 days of paid paternity leave and 10 days of paid prenatal accompaniment leave, both exceeding statutory requirements
Female employees receive 3 additional paid days during pregnancy; partners receive 1 additional paid day.	

# Social Engagement

- Holiday charity donations and participation in community care initiatives.
- ESG-themed events such as Green Living Day, Family Day, and Sports Day.
- Health promotion programs:  
In 2024, a six-month company-wide walking challenge was organized with outstanding results.  
(Carbon reduction calculated based on an average of 0.2 kg CO<sub>2</sub>e per kilometer of vehicle travel).

65 employees

Participated in the walking challenge

88M+

Steps

12.3 tons CO<sub>2</sub>e

Emissions reduced



# Diversity and Inclusion (D&I) Policy

## Individual Level

- Leadership development
- Personalized development

## Collective Level

- Management actively promotes female participation in tasks and decision-making
- Bias and gender discrimination are addressed through awareness and action

## Family Support

- Flexible working hours during pregnancy
- Postpartum return-to-work interviews and mental wellness support
- Dedicated lactation rooms
- Annual “Kids’ Day” event held

## 2024 Performance

- Female managers (supervising at least one employee): 26%
- Gender ratio: Female 43.8% / Male 56.2%
- Completion rate of high-potential talent development program: 100%
- Retention rate of mid-to-high performing employees: 100%



# Appendix – Alignment with Sustainability Disclosure Frameworks

## GRI Standards and UN SDGs Cross-Reference Matrix

GRI	Corresponding Section / Page	Relevant SDGs
<b>GRI 1: Foundation 2021</b>	This report has been prepared with reference to the GRI Standards	—
<b>GRI 2: General Disclosures 2021</b>		
2-1 Organizational details and reporting practices	Company Overview / 2	SDG 12
2-2 Entities included in the sustainability reporting	Company Overview / 2	SDG 12
2-6 Activities, value chain, and other business relationships	Product Innovation / 12	SDG 9, SDG 12
	E-Paper Applications Showcase / 14	
2-7 Employees	Diversity and Inclusion Policy / 20	SDG 5, SDG 8
2-23 Policy commitments	Corporate Governance / 5	SDG 16
2-27 Compliance with laws and regulations	Conflict Minerals Policy / 7	SDG 12, SDG 17
	Restricted Substances Policy / 9	SDG 12, SDG 17
	Code of Ethical Conduct / 7	SDG 12, SDG 17
	Global Human Rights Policy / 16	SDG 12, SDG 17
	Labor Rights Policy / 18	SDG 12, SDG 17
2-29 Stakeholder engagement approach	Code of Ethical Conduct / 7	SDG 16, SDG 17
	Labor Rights Policy / 28	SDG 16, SDG 17

# Appendix – Alignment with Sustainability Disclosure Frameworks

## GRI Standards and UN SDGs Cross-Reference Matrix

GRI	Corresponding Section / Page	SDGs
<b>GRI 205: Anti-corruption 2016</b>		
205-2 Communication and training about anti-corruption policies and procedures	Code of Ethical Conduct / 7	SDG 16
<b>GRI 302: Energy 2016</b>		
302-1 Energy consumption within the organization	Energy and Water Resource Efficiency / 10	SDG 7, SDG 12, SDG 13
<b>GRI 401: Employment 2016</b>		
401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	Rewards and Benefits / 19	SDG 8
<b>GRI 403: Occupational Health and Safety 2018</b>		
403-6 Promotion of worker health	Social Engagement / 19	SDG 3
<b>GRI 404: Training and Education 2016</b>		
404-1 Average hours of training per year per employee	Global Human Rights Policy – 2024 Performance / 17	SDG 4, SDG 8
<b>GRI 405: Diversity and Equal Opportunity 2016</b>		
405-1 Diversity of governance bodies and employees	Diversity and Inclusion Policy / 20	SDG 5, SDG 10

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