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Environmental Protection

CHAPTER 3

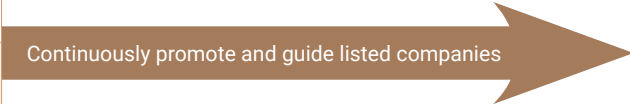
3.1 Climate Change Governance

Given the intensifying impact of climate change, the international community is paying increasing attention to climate-related risks. While facing negative climate impacts, enterprises may also identify climate-related opportunities. As such, exchanges have gradually formed a consensus on the importance of promoting climate change-related disclosures and strategies. In October 2020, TPEX formally supported the Task Force on Climate-related Financial Disclosures (TCFD) and will continue to introduce the TCFD structure in the future. After preliminary assessment, the environmental “risks” and “opportunities” caused by climate-related factors, and the relevant impacts and response strategies of TPEX are as follows:

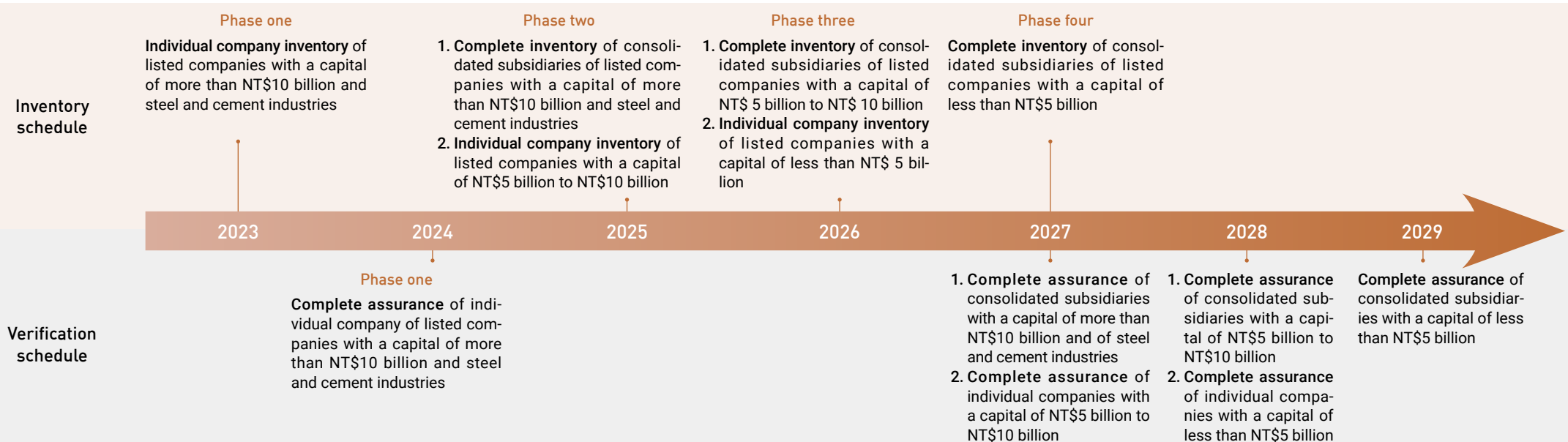
	Climate-related factors	Impact description	Possible financial effects	Response strategies
Environment-related risks	The disclosure requirements of Carbon emissions (short-term risk)	Policies and regulations drive the disclosure of greenhouse gas emissions and proposal of carbon reduction goals, and increase operating costs	Increase in operating costs	<ul style="list-style-type: none"> In August 2022, TPEX implemented the greenhouse gas inventory and issued the 2022 greenhouse gas inventory report in June 2023. The future direction of greenhouse gas reduction will be planned according to the results of the greenhouse gas inventory and with reference to the international major exchanges' own carbon reduction goals and climate change risk response measures. Promote energy conservation programs and set annual energy conservation targets.
	The government strengthens the requirements and supervisions of TPEX market enterprises (short-term risk)	Strengthen the supervision of energy-intensive or climate change-related industries, impacting industry structure by policies and regulations and raise the threshold for entering the capital market	Increase in operating costs	<ul style="list-style-type: none"> Revise relevant laws and regulations such as the Taipei Exchange Rules Governing the Preparation and Filing of Sustainability Reports by TPEX Listed Companies to promote and assist companies in introducing climate change risks and opportunities.
	Extreme weather events strike operating sites and disrupt operations (short-term risk)	Extreme weather events affect operating sites as well as facilities and systems, the most severe of which may cause operation disruption	Decrease in operating income/ Increase in operating costs	<ul style="list-style-type: none"> Regularly track and report climate change trends, establish a notification mechanism for major events, and conduct regular drills. Regularly conduct drills in the remote backup center and review the current ISO 22301 and Business Continuity Plan (BCP) to strengthen the timeliness of key system recovery.
Environment-related opportunities	Development of products and services related to sustainable finance (mid-term opportunities)	<ul style="list-style-type: none"> In response to government policies and regulations to promote sustainable development, guide the investment and development in green energy technology and renewable energy industries Increased market demand for paperless, digital, and mobilized services and products 	Increase in operating income/ Decrease in operating costs	<ul style="list-style-type: none"> Assist green finance and climate change adjustment-related industries to enter the capital market. Develop and promote sustainable financial products and digital financial services to invigorate trading. Continue to simplify internal processes and promote paperless and digital service.
	Promote green procurement and evaluate carbon reduction plans (short-term opportunities)	<ul style="list-style-type: none"> Become a benchmark for promoting energy saving and renewable energy to enhance potential reputation and increase market opportunities Improve operational resilience in response to future carbon emissions disclosure and carbon reduction plans 	Decrease in operating costs	<ul style="list-style-type: none"> Evaluate the renewable energy or purchase the renewable energy certificates. Implement the greenhouse gas inventory, and then plan the direction of greenhouse gas reduction in the future based on the results of the greenhouse gas inventory, with reference to the international major exchanges' carbon reduction goals and climate change risk response measures.

The Taipei Exchange Rules Governing the Preparation and Filing of Sustainability Reports by TPEX Listed Companies requires listed companies to strengthen the governance of climate-related risks and opportunities disclosures in the Sustainability Report. TPEX is now mulling over the international standard TCFD examples to promote enhanced disclosure of climate risks and links of climate risks to corporate governance with reference to international standards. TPEX guides the companies to attach importance to climate change issues so that their ability to respond to climate change can be enhanced.

In line with the government's 2050 net-zero emission target, TPEX has established a schedule for the disclosure of greenhouse gas inventory of listed companies, so that companies can follow and set carbon reduction targets, and cooperate with the government's carbon reduction plan, through connecting the supply chain of listed companies.

The matters		2022 Q2	2022 Q4	2023 Q1 ----- 2029
Securities and Futures Bureau	Announce the guidelines for the parent company's greenhouse gas inventory and verification operations	Announce the guidelines for the subsidiary's greenhouse gas inventory and verification operations	Continuously promote and guide listed companies 	
TWSE TPEX	Inventory of the number, distribution, and greenhouse gas inventory status of listed subsidiaries in phase one	Inventory of the number, distribution, and greenhouse gas inventory status of listed subsidiaries in other phases		
TWSE / TPEX listed companies	The Board of Directors completes the parent company's greenhouse gas inventory and verification scheduling, and controls it on a quarterly basis		The Board of Directors completes the greenhouse gas inventory and verification scheduling of the group (including subsidiaries), and controls it on a quarterly basis	

Schedule for the disclosure of greenhouse gas inventory



TPEX mainly engages in securities trading and information services and has been no instance of violations against environmental regulations or complaints received to date. However, TPEX still shoulders the mission of operating sustainably and integrating environmental values into business policies at all levels. These initiatives include digitalized administrative processes, selection of environmentally friendly materials for office equipment, promotion of energy conservation, and reduction of paper consumption and have been integrated into daily operations. In addition, TPEX has completed the contract for procurement of solar photovoltaic power, and the first green electricity supply has been completed in January 2022. In 2022, 296 renewable energy certificates issued by the Ministry of Economic Affairs have been obtained. TPEX actively implements low-carbon operations at different levels and implements the concept of environmental sustainability.

3.2.1 Energy/Greenhouse Gas Emissions Management

In the face of extreme changes in global climate, environmental issues have become a common topic for global citizens, and ESG has become an important indicator of corporate competitiveness. In order to achieve net-zero transformation, TPEX conducted the 2022 greenhouse gas inventory in accordance with ISO 14061-1: 2018, handled the greenhouse gas emissions through international standards, and carried out follow-up carbon reduction plans based on it. In addition, in order to improve the credibility of the inventory information and reports, third-party assurance organizations were arranged to carry out assurance operations for Category 1 (direct greenhouse gas emissions) and Category 2 (indirect greenhouse gas emissions from imported energy).

In 2022, TPEX sets the organizational boundary according to the operational control approach. The identified organizational boundary includes Guting Office, Banqiao Office, Banqiao Server Room, and Taichung Remote Backup Server Room. The source of energy consumption is mainly purchased electricity (including 77.59% of general energy and 22.41% of renewable energy), followed by gasoline for official vehicles. The increase in 2022 compared with the previous two years is due to the combined calculation of the power consumption of the Banqiao server room in New Taipei City and the public power consumption of each location.

2022 Energy consumption

Category 1		Vehicle gasoline (liter)	5,397.01
		Vehicle gasoline (GJ)	176.25
Category 2	Purchased electricity	Non-renewable (kWh)	1,049,427.53
		Non-renewable (GJ)	3,777.94
		Renewable (kWh)	303,031.00
		Renewable (GJ)	1,090.91
Total energy consumption (GJ)			5,045.10
Energy consumption per unit (GJ/person)			17.58

Note 1: All data of this report for 2022 cover Guting Office in Taipei City, Banqiao Office in New Taipei City, Banqiao server room in New Taipei City and the remote backup server room in Taichung City. All data from 2020 to 2021 only cover Guting Office in Taipei City, Banqiao Office in New Taipei City and the remote backup server room in Taichung City, excluding the Banqiao server room in New Taipei City. The total energy consumption in 2020 and 2021 were 3,442.13 GJ and 3,449.09 GJ, respectively.

Note 2: Vehicle gasoline, purchased electricity, total energy consumption, and energy intensity calculations are all rounded to two decimal places.

Note 3: Purchased electricity includes the use of renewable energy. The electricity purchased by Guting Office in Taipei City is based on the metered number specified on Taiwan Power Company's utility bills; those of other locations are based on the metered numbers stated on respective property management service providers' statements.

Note 4: The heating value coefficient is based on the GHG Emission Factor Management Table Version 6.0.4 issued by the Environmental Protection Administration, according to which vehicle gasoline is 7,800 kcal/ liter.

Note 5: 1 gigajoule (GJ) = 10⁹ joules (J); 1 kilocalorie (Kcal) = 4,186.8 joules (J); 1 kilowatt-hour (kWh) = 3.6 megajoules (MJ).

Note 6: Energy intensity was calculated based on the number of employees on December 31, 2022, namely 287.

2022 Greenhouse gas emissions

Greenhouse gas emissions	Location based	Market based
Category 1 (tCO _{2e})	13.95	13.95
Category 2 (tCO _{2e})	688.40	534.16
Gross emissions (tCO _{2e})	702.35	548.11
Emission intensity (tCO _{2e} /person)	2.45	1.91

Note 1: All data of this report for 2022 cover Guting Office in Taipei City, Banqiao Office in New Taipei City, Banqiao server room in New Taipei City and the remote backup server room in Taichung City. All data from 2020 to 2021 only cover Guting Office in Taipei City, Banqiao Office in New Taipei City and the remote backup server room in Taichung City, excluding the Banqiao server room in New Taipei City. The emissions of Category 1 in 2020 and 2021 were 14.91 tCO_{2e} and 13.29 tCO_{2e}, respectively; the emissions of Category 2 were 457.44 tCO_{2e} and 456.30 tCO_{2e}, respectively; the calculations are all rounded to two decimal places.

Note 2: According to ISO 14064-1:2018, the use of electricity should be quantified by region, and the market segment should be increased to present the benefits of carbon reduction in the use of green electricity (decrease of 154.24 tCO_{2e} in 2022).

Note 3: This report adopted the operational control approach for greenhouse gas emissions inventory check. The calculation goes: activity data * emission factor* GWP (the emission factor based on the GHG Emission Factor Management Table Version 6.0.4 issued by the Environmental Protection Administration and the GWP is quoted from the IPCC Sixth Assessment Report in 2021. If the sixth assessment report is not updated, the calculation is based on the IPCC Fifth Assessment Report in 2013.)

Note 4: The calculation of greenhouse gas emission intensity includes Category 1 and Category 2 greenhouse gas emissions; Category 2 GHG emissions are mainly purchased electricity. 2022 electricity emission factor adopted 2021 carbon emission factor of electricity from the Bureau of Energy of the Economic Ministry, 0.509 kg CO_{2e}/kWh; 2021 electricity emission factor adopted 2021 carbon emission factor of electricity of the Bureau of Energy, Ministry of Economic Affairs, R.O.C., 0.509 kg CO_{2e}/kWh; 2020 electricity emission factor adopted 2020 carbon emission factor of electricity from the Bureau of Energy, Ministry of Economic Affairs, R.O.C., 0.502 kg CO_{2e}/kWh.

Note 5: Energy intensity was calculated based on the number of employees on December 31, 2022, namely 287.

Note 6: After assessing the factors such as expected users, proportion of emissions, degree of impact, data quality and employee participation, the 2022 greenhouse gas inventory determines to quantify the “indirect greenhouse gas emissions from the use of products” in Category 4, with emissions of 119.29 tCO_{2e}.

Note 7: Greenhouse gasses include Carbon Dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur Hexafluoride (SF₆), Nitrogen Trifluoride (NF₃).

In terms of electricity management, TPEX practices division of responsibility and regular tracking, using energy-saving lamps, and maintaining air-conditioning facilities regularly to improve efficiency. In addition, colleagues are reminded to practice energy conservation from time to time, including turning off air-conditioning in unused spaces, using only necessary lighting, and shutting doors to avoid air-conditioning leakage. Before leaving the office, colleagues are asked to turn off the power of all electrical equipment and remove unnecessary plugs. The last person in each department leaving the office should check whether the power has been turned off. Before the consecutive holidays, colleagues are also reminded to turn off all unused electrical appliances and unplug power supplies. In addition, TPEX has actively purchased green electricity. In 2022, the utilization rate of green electricity in Guting office is about 33.13%, and TPEX is also planning and negotiating for the use of green electricity in the rest offices.

In terms of fuel management, all TPEX departments provide employees with official-use EasyCards to encourage taking public transportation. Private use of official vehicles is strictly forbidden, and rides are shared in principle. Maintenance and inspection are also carried out regularly to maintain fuel efficiency.



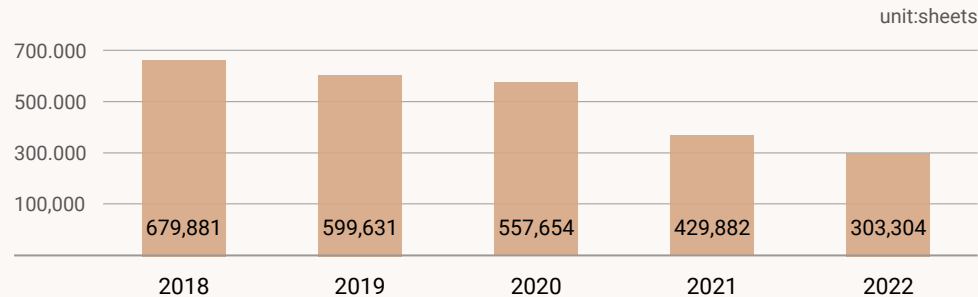
3.2.2 Resource Management

Paper resources management

TPEX's main consumables are photocopy papers. Over the past few years, we have been actively promoting digitalized and paperless processes. In addition to improving productivity, these efforts have also enabled us to achieve resource efficiency.

Internally, TPEX requires colleagues to process official documents electronically. The usage rate of electronic official documents increased by 74% in 2022 with 48,916 signed off. In addition, meeting materials shall be transmitted electronically as much as possible; necessary photocopying or printing should also be double-sided. In 2022, the number of papers used by photocopiers reduced by 29% compared to 2021. Since 2022, 100% of the paper purchased by TPEX is recycled paper.

Photocopier Paper Consumption



Externally, TPEX has been continuing to promote various electronic reporting services since 2015. To this end, it has successively digitalized declaration operations in place of paper-based. The listed / registered companies or intermediary agencies can now download the necessary information from the TPEX website, and complete relevant online declarations in the electronic certification and declaration system of the Market Observation Post System (MOPS).



Document download section for listed and registered companies

- The list of the matters to be handled by the listed / registered companies, registration form for press conferences regarding material information of companies, registration statements for listing of new shares for capital increase, registration statements for capital reduction, various Checklists, and Q & A, etc., are available online



The electronic certification and declaration system of MOPS

- Listed / registered companies' stock listings, such as new shares from capital increase, cancellation of treasury shares, restricted stock awards, private placement of common shares, and over-the-counter trading of renamed new shares, etc.
- Securities firms joining midway and resigning from recommending Emerging Stock Market stocks
- Bond online listing

TPEX advocates listed/registered companies and the issuing companies before registration on the Emerging Stock Market to join the electronic official document exchange system to reduce the transmission of hard-copy documents. As of December 31, 2022, the proportion of listed/registered companies that have accessed the electronic official document exchange system reached 96.75%.

Waste Management

TPEX mainly engages in securities trading and information services and is therefore not associated with concerns over pollution or waste. At present, resource recycling bins are set up on each floor to enable the sorting of recyclables, and colleagues are required to practice resource recycling. Moreover, environmentally friendly toner is used throughout our offices, and 100% of the used toner cartridges are handed over to the original manufacturer for recycling to avoid causing pollution and resource wastage.

Water Management

Taiwan Water Corporation provided all the water used at TPEX, while no groundwater or other water sources are used. TPEX's operating activities have not affected water sources, and the sewage after use is discharged into the sewerage system. In addition to reminding colleagues to practice various water-saving measures, TPEX has installed water-saving devices, cleaned the buildings' water towers regularly, conducted water quality testing at the same time, and inspected water equipment from time to time.

3.3 Building Environmental Sustainability

Plant the seeds of sustainability



TPEX has been paying close attention to environmental sustainability issues for a long time, and responding to the “United Nations Sustainable Development Goals SDG 13 Climate Action and SDG15 Life on Land” with practical actions. By planting trees to protect forests and promote forest conservation, TPEX has achieved the effect of carbon dioxide absorption and storage. On April 9, 2022, Edith Lee, Managing Director & CEO of TPEX, led colleagues and their families to plant trees in Keelung Chaojing Park in an effort to coastal afforestation and environment protection. Through tree planting activities, TPEX hopes to cultivate a sustainable culture and plant sustainable seeds into the hearts of the next generation through parent-child interaction.

In light of implementing environmental protection, TPEX has planted over 6,700 saplings in coastal and mountain areas in Keelung, Yilan, Taichung, Hualien, and Kaohsiung in 2022.

County/City	Number of plants	Type of plants	Main functions
Keelung City	1,000	Pittosporum tobira, Ligustrum japonicum, Rhapsiolepis umbellata, Pongamia pinnata, Cerbera manghas	Wind-proof, sand-setting, greening, and beautification
Yilan County	2,000	Calophyllum inophyllum, Palaquium formosanum Hayata, Hibiscus tiliaceus, Bischofia polycarpa, Cerbera manghas, Melia azedarach, Ficus microcarpa	Maintain the biodiversity of the native coastal forests and prevent sand from flying of shelter forest
Taichung City	1,700	Acer morrisonense, Picea asperata, Platycladus orientalis	Protection of reservoir catchment areas and increasing climate resilience
Kaohsiung City	150	Scaevola taccada, Hibiscus tiliaceus, Vitex negundo	Ecological Construction and Preserving the Qie ding Wetland
Hualien County	1,905	Taiwan juniper, Taiwan cedar, Taiwan alder, Fagaceae	Sustainable production of forestry



TPEX led colleagues and their families plant tree saplings in Keelung Chaojing Park in an effort to coastal afforestation

Guandu Nature Park Adoption Plan



The “Guandu Nature Park” has a diversified ecological environment with a relatively rich range of animals, plants, and species, not only the breeding land of local birds and Xiahou birds, but also a major winter area for many migratory birds. In response to the National Nature Park Adoption Plan, TPEX expects to have sound maintenance management for the trees and green-belts and paddy fields in the park, and create an environment suitable for birds and other biological reproduction.

Clean water source plan of Tse-Xin Organic Agriculture Foundation



The Tse-Xin Organic Agriculture Foundation is aware that the Pinglin Tea District is located in the catchment area of the Feicui Reservoir. The conventional agricultural method of spraying pesticides, chemical fertilizers and herbicides not only poses threats to the ecological environment, but also poses hidden concerns to the water safety of the public in the Greater Taipei area. It has decided to promote organic farming in the water conservation area and help farmers to understand the ecological conservation of farmland. In addition to reducing the ecological threats of pesticides, chemical fertilizers, and herbicides, the clean water source plan has also found that the Tea Plantation has gradually built a healthy biodiversity and restored a complete ecosystem, which also echoes the achievements of the United Nations Environmental Sustainable Development Goals in conserving land ecology, water purification and sanitation. In response to the clean water source plan, TPEX is expected to help farmers to overcome the difficulties of reducing tea production at the early stage of the Tea Plantation. It will also allow more mountains in Pinglin to restore natural vitality and protect the clean water of the Feicui Reservoir!

Adoption of the Organic Field of Xingjian Village and donation to social welfare organizations



Xingjian Village, Sanxing Township, Yilan County insists on adopting the organic agricultural law that is non-toxic, pesticide-free and chemical-free, and voluntarily forms the “Responsibility Guarantee for Production Cooperative of Xingjian Village, Yilan County Organic Agricultural” to promote 100% of the local organic food ingredients in Taiwan through joint marketing. Being aware of the importance of ecological environment conservation and identifying with the concept of residents in Xingjian Village, since 2016, TPEX has been purchasing organic rice produced in Xingjian Village, Sanxing Township, Yilan County, and donating it to disadvantaged families through social welfare agencies, thus extending TPEX's love for the land to those in need. In 2022, 3,600 kilograms of organic rice were purchased by TPEX, which were then donated to 19 social welfare organizations.

Green Energy Charity Plan



TPEX joined hands with Taiwan Green Energy for Charity Association, a juridical association, and Sunnyfounder to cooperate in the “Green Energy Charity Plan” . By donating solar panels to help build power generation facilities, the green energy generated can contribute to the reduction of environmental carbon, and the income from the wholesale of green energy can be donated to the aspects in need of help. It can also bring 20 years of stable resources to disadvantaged units with insufficient resources, so that Green Energy can no longer be just a heartless technology, and it can help the disadvantaged in society and bring more “energy benefits” through “love donation” .