5 Green Products and Innovation

Simplo Technology complies with international norms and meets customer green product requirements. We are fully committed to manufacturing products that meet environmental standards and reduce greenhouse gas and wastewater emissions, waste generation and chemical use to improve our ecological benefits and protect the environment. Simplo Technology's R&D expenditure in 2023 is 1,946,085 thousand yuan, accounting for 2.29% of revenue, an increase of 35% compared to 2021.

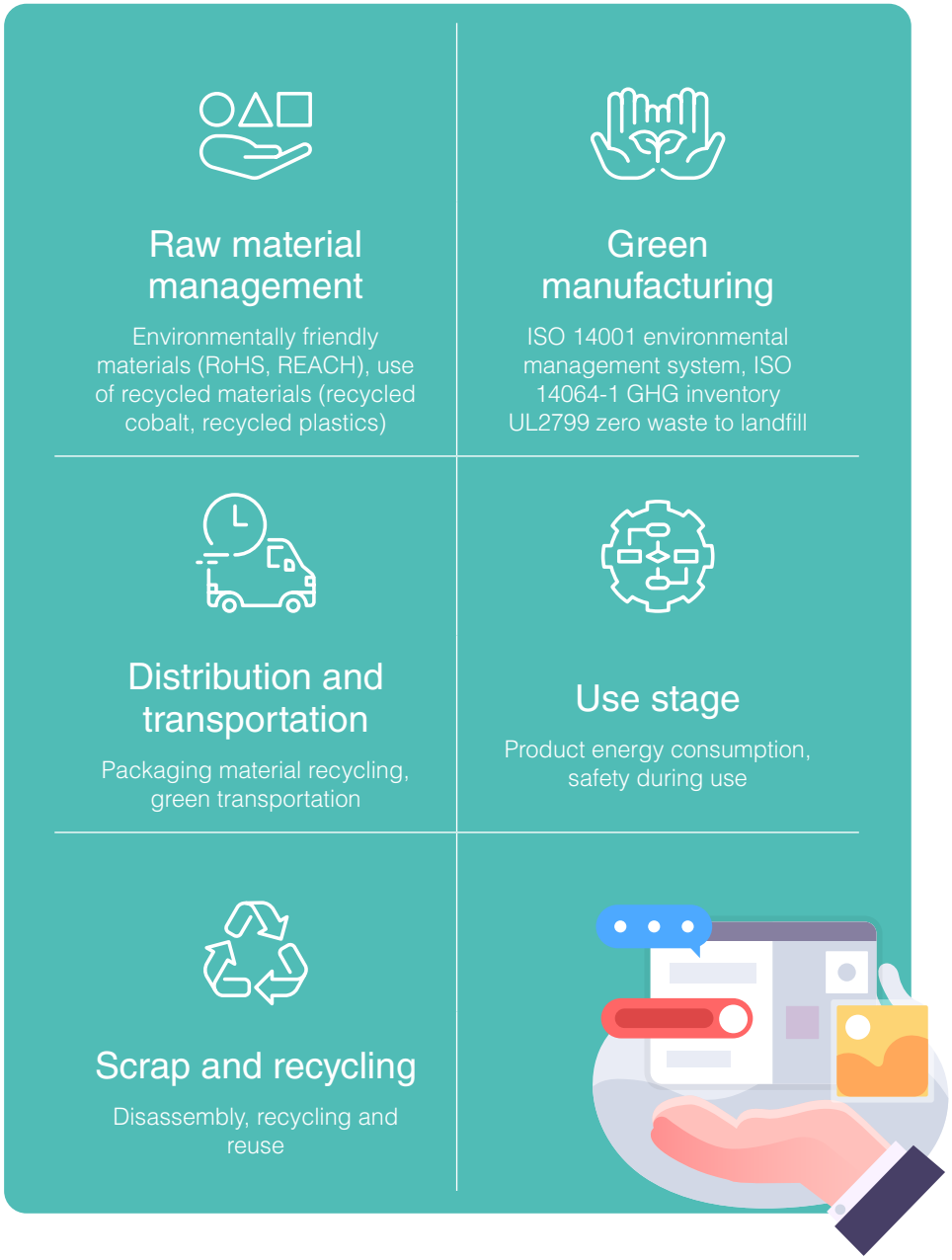
◎ R&D expenditure and results over the past three years

Year	R&D Expenses (NT$ thousands)	Sales (%)	Major Achievements
2021	1,628,540	1.70	1. High accuracy reusable battery lifespan and functional testing machines 2. Optimize inertial rotating unmanned vehicle 3. AOI visual identification
2022	2,130,944	2.23	1. Panel migration and recognition automation equipment 2. High inertia tray rotary AGV 3. High load capacity of fork type of unmanned transportation vehicles for warehouses
2023	1,946,085	2.29	1. Grid-connected frequency modulation auxiliary backup (AFC) service outdoor energy storage container system demonstration case was built and on-site certification completed (CNS62933-5-2) 2. Research on dynamic battery capacity estimation algorithm for energy storage systems 3. Research on static battery capacity calibration algorithm for energy storage systems

Source: 2023 Annual Report, Simplo Technology Co., Ltd.

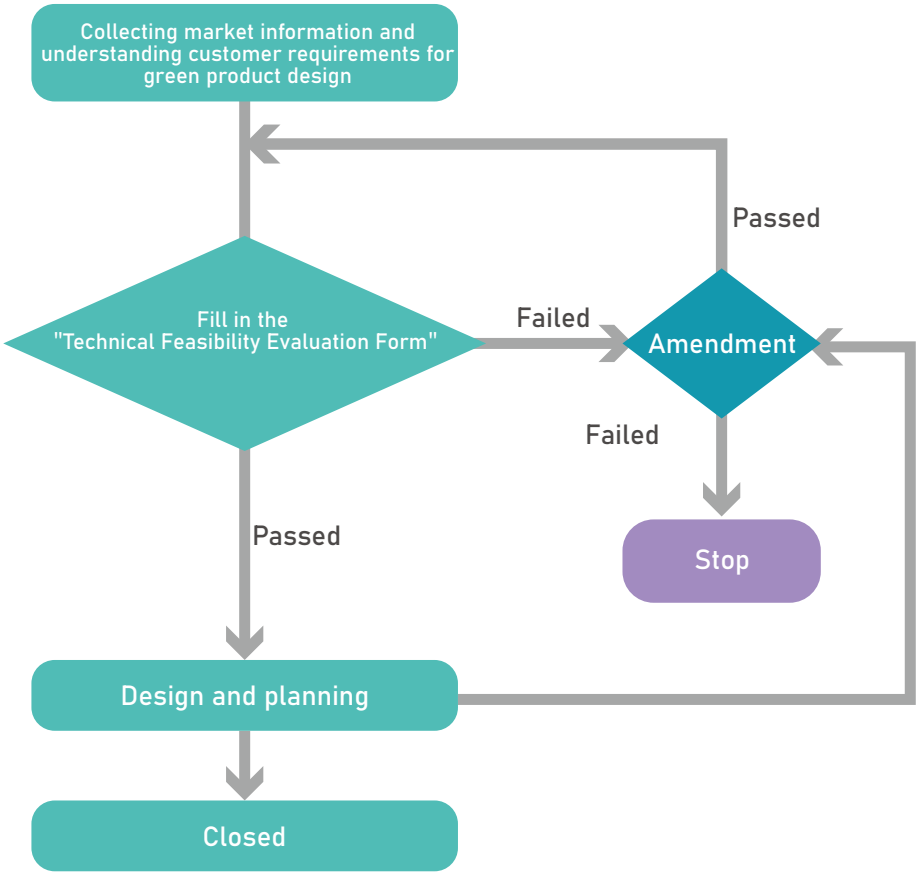
5.1 Green Design

Definition of "Design for Environment (DfE)": "Systematically considering the design performance in environmental, health, and safety objectives throughout the entire product and process lifecycle". Also known as green design and environmental design, Simplo Technology employs product lifecycle thinking to constantly enhance product value during the R&D phase. Simultaneously aiming to reduce resource waste and environmental impact, the Company enhances green competitiveness through the development of green products.



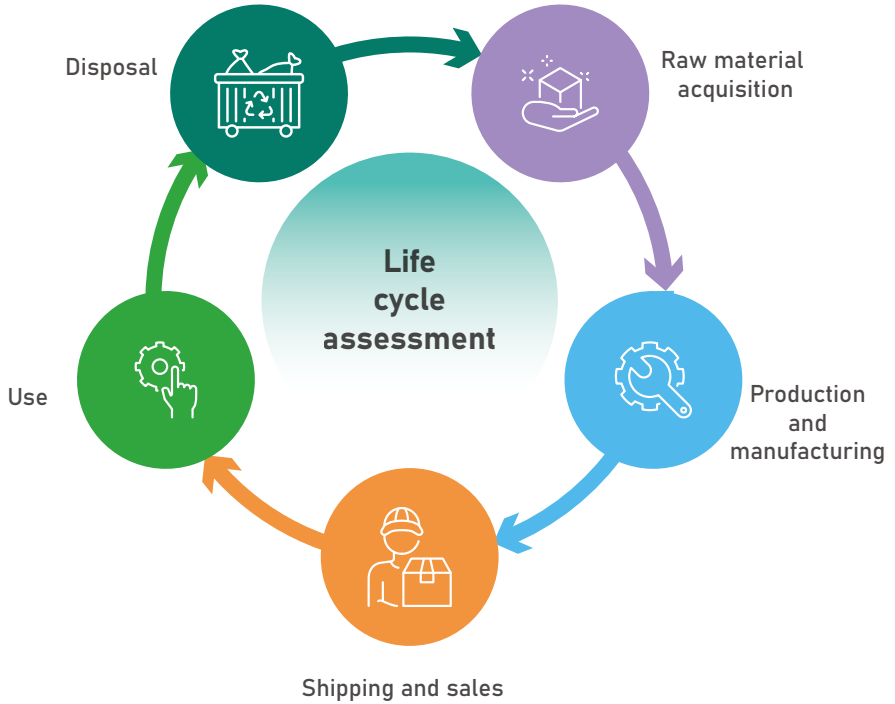
Standardized process

Simplo Technology introduces the concept of environmental design into its "New Product Development Management Procedure", evaluating the potential environmental impacts of designs at each stage of the lifecycle and proactively addressing them. During the product development process, minimizing negative environmental impacts, continuously researching and incorporating environmentally friendly materials, and innovating to develop low-carbon products, aiming to create products that meet environmental standards.



5.2 Product Carbon Footprint

Life cycle assessment (LCA) describes the environmental considerations and potential impacts throughout the entire lifecycle of a product or service, from raw material acquisition to production, use, scrap handling including disposal, recycling, and final disposal (from cradle to grave). This includes aspects such as energy use, resource consumption, and pollution.



Simplo Technology completed the carbon footprint verification of two NB battery modules in 2022 following the ISO 14067 standards. The quantified results from carbon footprint not only provide customers with product carbon footprint information but also help assess and implement reduction measures across various stages of the product lifecycle to minimize environmental impacts.

Product carbon footprint

Carbon footprint verification statement

Carbon footprint refers to the direct and indirect GHG emissions generated throughout the lifecycle of a product or service (functional unit).

Quantification	Reduction	Communication
Calculate the carbon footprint of each stage to identify emission hot spots	Establish hotspot carbon reduction plans and set goals	Information disclosure Meet customer requirements

Introduce a systematic carbon footprint management system

Based on the experience of implementing product carbon footprint ISO 14067 in the past, Simplo Technology has developed its own Product Carbon Footprint System (PCF System). The purpose is to achieve systematic management for disclosing and monitoring the effectiveness of carbon footprint reduction. This system serves as a reference for future reduction efforts and identifies hot spots for reduction.

Simplo PFC tool

one product ▶ three steps ▶ five checks ▶ calculation completed

Synergistic effect

Simplo Technology utilized its self-developed PCF system to calculate the carbon footprints (cradle to gate) of 6 products. Depending on the Bill of Materials (BOM) variations among the products, the carbon footprints ranged approximately from 4 to 7 kg CO_2e. Analyzing product emission hotspots, the raw material stage accounts for the majority of carbon emissions. The main sources of emissions are PCBs, battery cells, and ICs, which are the top three contributors to total carbon emissions. The carbon emissions are also significantly influenced by difference in PCB weight.

In order to continuously reduce the carbon footprints of our products, Simplo Technology integrates environmental design thinking into the product R&D stage, using environmentally friendly materials, improving energy efficiency, and extending the lifecycle, aiming for the development of low-carbon products. (Refer to 5.1 Green Design for details)

Green transportation

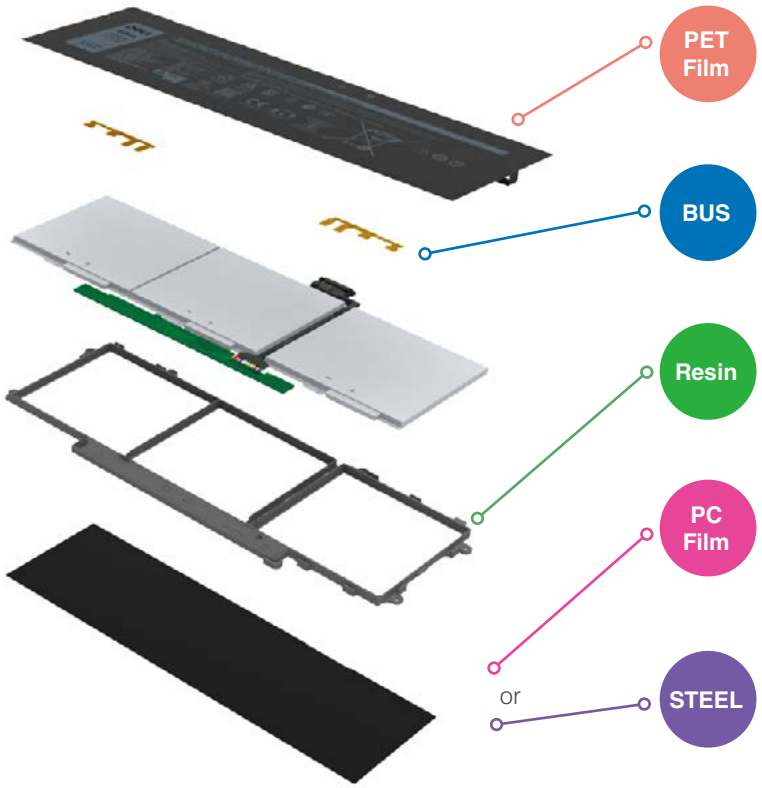
Simplo's current transportation modes include land, air, and sea, among which land transportation accounts for the largest volume. To improve the efficiency of land transportation and reduce transportation carbon emissions, the delivery time has been adjusted based on the production schedules and customer needs, increasing the load factor for long-distance transportation. For smaller shipments, products are consolidated with those from other industries. The load factor for land transportation increased from an average of 78% in 2018 to an average of 96% in 2023.

5.3 Circular Economy

Introduce recycled plastic

In the past three years, Simplo Technology has collaborated with suppliers on recycled plastics, verifying post-consumer recycle material (PCR) from as many as 14 suppliers. The products have UL yellow card flame retardant certification and international authoritative recycled material content certification to ensure the quality and reliability of the plastic materials. In 2023, the number of battery modules containing PCR materials was 21,521,866 pcs, accounting for 13% of the total shipment volume. Subsequently, the carbon reduction benefits will be quantified in collaboration with suppliers.

According to the life-cycle assessment (LCA) data provided by suppliers in 2023, using 90 to 98% PCR plastic pellets is expected to reduce 49 to 90% of carbon emissions compared to using non-recycled plastic materials. Using recycled materials not only decreases the consumption of natural resources but also brings significant environmental benefits and contributes to the circular economy.



- For the use of PET film in batteries, the material recycling ratio is 100%. All verifications have been successfully passed, and it has been mass-produced and incorporated into customer products.
- For the use of copper pole pieces in batteries, due to the conductivity requirements, the purity of the copper pole pieces used must be high (over 99.9%). Currently, the supplier's electrolytic equipment has been upgraded in 2023 and can provide materials with a 100% recycling rate.
- Using PCR plastic pellets at 90 to 98%, compared to non-recycled plastics, is expected to reduce carbon emissions by 49 to 90%. This has been introduced in mass production and integrated into customer products.
- For the use of PC film in batteries, current industry technological capabilities for material recycling range from 30 to 90%. Recently, 60% of products have been mass-produced and integrated into customer products. Future products aim to achieve higher recycling rates, targeting 90%.
- For stainless steel use, the material recycling ratio is 90%. All verifications have been successfully passed, and the product has been certified by the Science Certified System Global Services (SCS) to ensure the quality and reliability of recycled materials.

Tray recycling

In order to reduce the amount of waste produced during the manufacturing process, we start from Tray recycling, including Pack and Frame Tray recycling. Battery modules are provided to customers in Pack Tray. After receiving the battery module, the customer recycles the battery Tray to the entrusted recycling plant; the recycling plant inspects the recycled Pack Tray and then transports the reusable battery Tray. Simplo Technology put 28,524,870 PCS into recycling in 2021, 22,441,060 PCS in 2022, and 17,058,550 PCS in 2023. When the Pack Tray is inspected at the recycling plant and does not meet the usage requirements, it is entrusted to the recycling plant for scrapping and use as secondary materials.

After the upstream supply chain receives the Frame, it recycles the Frame Tray and sells it to a recycling plant; after the recycling plant inspects the recycled Frame Tray, the supplier purchases reusable Frame Tray packaging products and ships them for recycling. In 2023, a total of 12,000 PCS have been put into recycling, gradually implementing circular economy.

◎ Amount of Pack Tray recycling

Year	PCS
2021	28,524,870
2022	22,441,060
2023	17,058,550

Note: Data covers Simplo (Chongqing) and Simplo (Changshu)

Pack Tray

Frame Tray

Cobalt recycling

Cobalt is one of the elements used as a positive electrode material in lithium-ion batteries, accounting for approximately a quarter of the total battery cell weight (varying depending on the specific positive electrode materials). Simplo Technology considers cobalt recycling as a long-term plan, with most customers viewing it as an important issue. Cobalt is sourced not only from mining but also partly from recycling. Current recycling technologies can achieve approximately 90% efficiency in cobalt recovery.

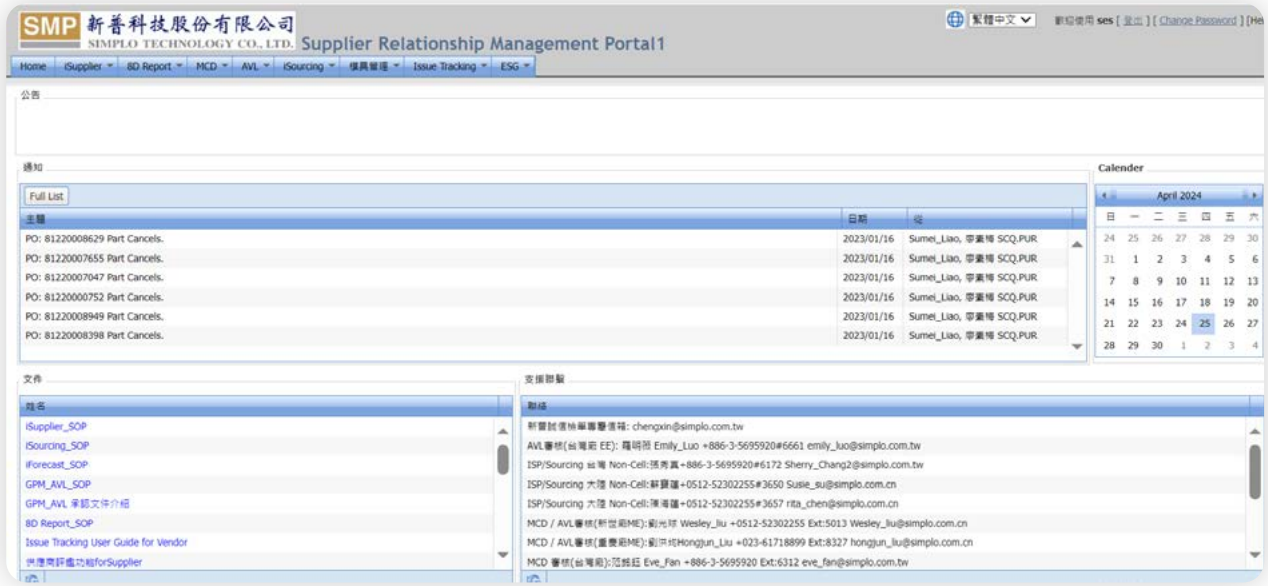
In 2023, Simplo Technology collaborated with 3 battery cell suppliers to pass the UL 2809 Environmental Claim Validation Procedure (ECVP) for Recycled Content. They verified that battery cells contained 50% and 100% post-consumer recycled cobalt content, used in laptop battery products, demonstrating commitment to the circular economy. In 2023, a total of 446,520 PCS battery modules containing recycled cobalt were shipped, using a total of 10,834 kg of recycled cobalt.

The main sources of recycled cobalt currently include production waste and market-recycled batteries. There are primarily two methods (thermal treatment and chemical treatment) to extract cobalt compounds from these sources, which are them reused in positive electrode materials.

Stage	1	2	3	4	5
Method I: Thermal treatment	Pretreatment (rough decomposition, metal separation)	High temperature treatment	Raw cobalt material	Precursor synthesis	Positive electrode material synthesis
Method II: Chemical treatment		Dissolve and extract precipitation			

5.4 Chemicals and Hazardous Substance

Simplo Technology has established a Green Supplier Relationship Management (SRM) platform to implement the source management of raw materials in the supply chain, and integrated the ERP Portal to form a complete management information system.



Full Material Disclosure (FMD)

Since 2016, Simplo Technology has been moving towards proactive material management and adopting the Full Material Disclosure (FMD) action. FMD helps to build trust, promote industry standards, and address consumer concerns about sustainability and health issues, which are part of corporate social responsibility and sustainable development.

EU Chemical Policy (REACH)

REACH stands for Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH). As the name suggests, this directive requires chemical products entering the European market need to undergo registration, evaluation, authorization, and restriction based on their import status.

Simplo Technology has established management and control procedures, conducted supply chain risk assessment, and participated in supplier conferences organized by customers to ensure that the flow of value chain information meets relevant requirements.

EU RoHS Directive

Simplo Technology's main manufacturing plant has implemented the IECQ QC080000 hazardous substance process management system since 2012 and obtained international certification. In addition to controlling raw material input according to RoHS processes, we occasionally conduct RoHS compliance testing on finished products. All products meet RoHS directive requirements, and to date, there have been no RoHS violations or customer complaints.

Per/Poly fluoro alkyl substances (PFAS)

In response to the US "Per/Poly Fluoro Alkyl Substances (PFAS) Management Action Plan" and the EU REACH-related requirements, Simplo Technology has incorporated these regulations into the Hazardous Substance Management Regulations for material control. Regarding the PFAS-related information of our products, we also work with manufacturers to seek fluorine-free alternative materials or improve process technology, striving to achieve green products with consistent regulations and quality, and reduce risks to the environment and human health.

Product safety

All products of Simplo Technology have been certified according to the mandatory or voluntary safety regulations of various countries and have undergone multiple safety tests and verifications before they are put on the market. The safety verifications include:

- International safety regulations (e.g. IEC 62133-2, IEC 62619, ISO 6469-1).
- European safety regulations such as EN 62133-2, 2014/35/EU LVD Directive, (EU) 2023/988 General Product Safety Regulation (GPSR), EN 62619.
- Important safety regulations of the U.S. and Canada (e.g. UL 2054, UL 62133-2, ANSI/CAN/UL 1973, ANSI/CAN/UL 9540(A)).
- China safety regulations (such as CNCA, GB, GBT, CQC, CCC).
- The safety regulations of Taiwan, Japan, Korea, India and the ASEAN countries, and
- International transport regulations UN 38.3, etc.

Simplo Technology has a dedicated safety regulatory compliance department and a laboratory that has passed the ISO/IEC 17025 (CNS 17025) certification of the Taiwan Accreditation Foundation (TAF). We plan to gradually increase our verification capabilities and expand our certification scope in the future to enhance product safety.

- Assessment of the impact of battery regulations

The EU Battery Regulation (EU) 2023/1542 was published in July 2023 to replace the original battery directive 2006/66/EC. Introducing new requirements for the sustainability and safety of batteries, including hazardous substances, QR codes, and design for removable batteries. The design of batteries in electronic products should be easy for end users to disassemble and replace, impacting Simplo's product verification process. Verification will shift from component-level (Recognized) to product-level (Listed), increasing the number of verification items and enhancing consumer safety.