

5 Green Products and Innovation

5.1 Green Design

5.2 Product Carbon Footprint

5.3 Circular Economy

5.4 Product Quality and Responsibility

Performance Results

R&D expenditure in the past three years **NTD 5.9 billion**

Conducted **26** products life cycle inventories (LCI)

Completed carbon footprint calculations for **7** products (cradle to gate)

PET film material recycling has been **100%** implemented

Copper pole pieces were be mass-produced in 2024 and used **100%** recycled materials



Continuing to inject innovative energy

Simplo Technology complies with international standards and meets customer requirements for green products. 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 2024 is 1,823,985 thousand dollars, accounting for 2.28% of revenue, continue to invest in the research and development of new technologies and products to maintain our competitiveness in the market.

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

Year	R&D Expenses (NT\$ thousands)	Sales (%)	Major Achievements
2022	2,130,944	2.23	1. High accuracy reusable battery lifespan and functional testing machines 2. Optimize inertial rotating unmanned vehicle 3. AOI visual identification
2023	1,946,085	2.29	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
2024	1,823,985	2.28	1. Development of Online Automatic Calibration Device and Method for Energy Storage Container Systems 2. Development of Energy Storage Knowledge Base AI Expert System 3. High-Speed Sampling Current Detection Board

Source: 2024 Annual Report, Simplo Technology Co., Ltd.

■ Future R&D plans and expected R&D investment

Item	Products and technologies under development	Current progress (%)	Estimated time for the completion of mass production	Estimated amount to be reinvestment	Key factors affecting the success of R&D in the future	
1	233KWH Industrial and Commercial Energy Storage System (Cnl233) Advanced Version:	50	2025 Q2	20,000	1. Provides 233KWH power 2. Provides 860V voltage	3. Multiple industrial and commercial energy storage units can be connected in parallel for use 4. Uses liquid cooling circulation for heat dissipation
2	EMS Energy Management System	30	2025 Q3	50,000	1. BMS energy storage system and peripheral information monitoring and collection 2. Energy Management and Dispatch of BMS Energy Storage System	3. Equipment control and protection of the BMS energy storage system 4. Status assessment and diagnosis of the BMS energy storage system 5. Emergency response and event management for the energy storage system
3	AI Smart Energy Storage Operation and Anomaly Detection System	10	2025 Q4	80,000	1. Quality management of site data and cloud transmission stability 2. Maintenance and management of the local database 3. Computational performance and stability of the local server	

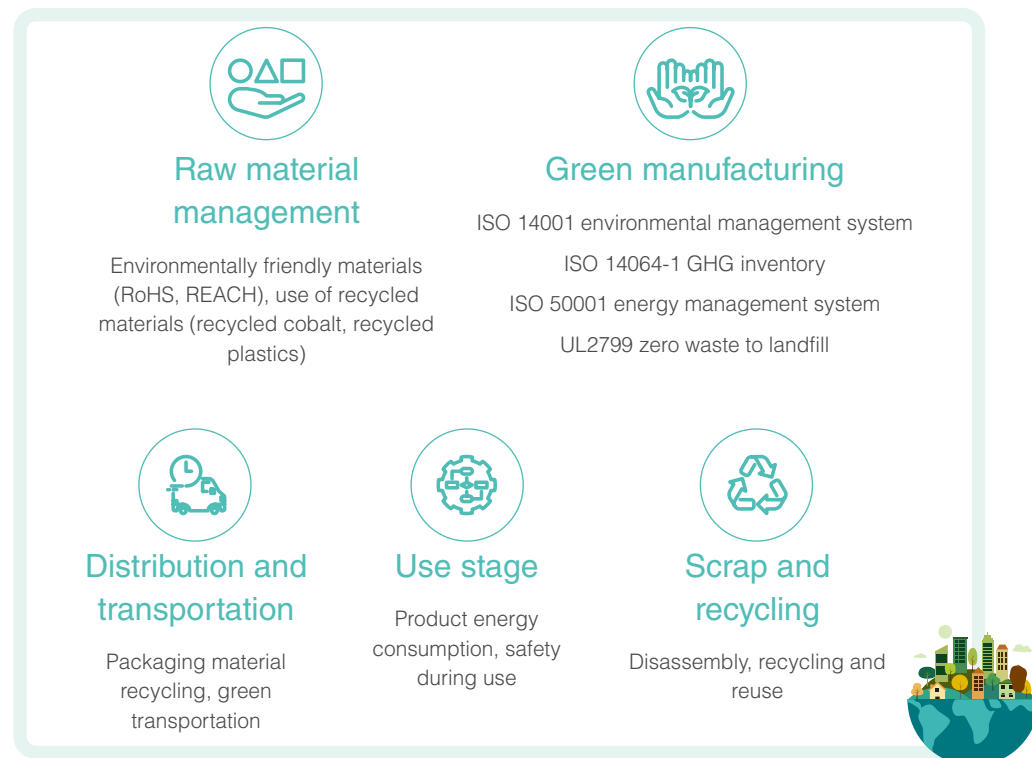
Source: 2024 Annual Report, Simplo Technology Co., Ltd.

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.

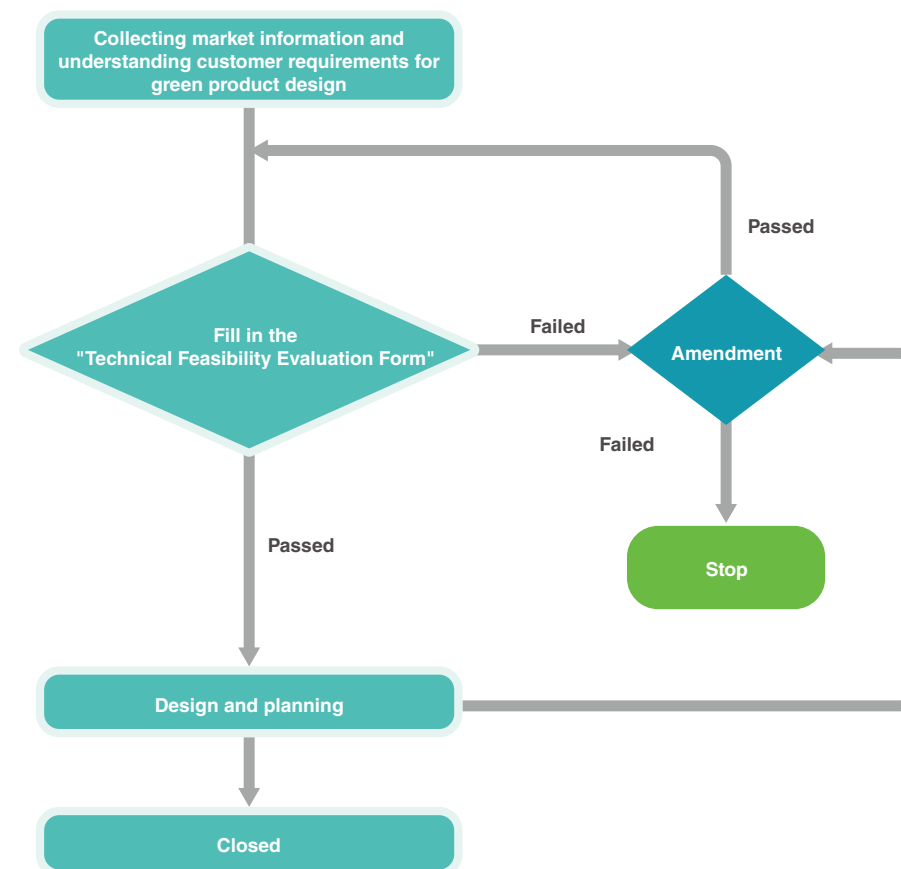
In response to the EU Batteries Regulation

The new EU battery regulation will ensure that future batteries have a low carbon footprint, use the least amount of hazardous substances, support the transition to a circular economy, and enhance the security of raw materials and energy supplies. Simplo Technology has already started the process of identifying and responding to the regulation in detail, and has set up a working group to respond to customer requests.



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

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.

Introduction of a systematic carbon footprint management system

Based on past experience implementing ISO 14067, Simplo Technology has developed its own Product Footprint Calculation Tool. This tool aims to systematically disclose product carbon footprints and monitor reduction results, serving as a reference for future reductions and identifying key areas for reduction.

Project origin and benefits

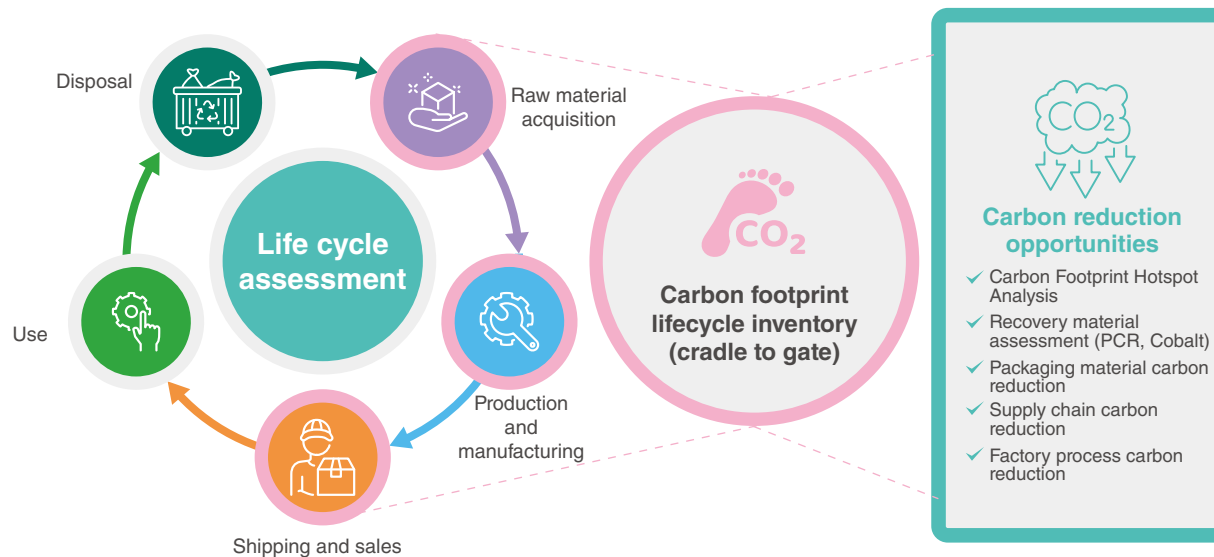
Major international laptop manufacturers are launching "carbon neutrality" laptops. As a battery module supplier, Simplo Technology collaborates with customers on carbon footprint projects. 2023 to 2024, life cycle inventory (LCI) was conducted on a total of 26 products. The internal Product Carbon Footprint Risk Management Task Force has developed relevant skills to meet the customers' product carbon footprint requirements.

Synergistic effect

Simplo Technology utilized its self-developed PCF system to calculate the carbon footprints (cradle to gate) of 5 products. Depending on the Bill of Materials (BOM) variations among the products, the carbon footprints ranged approximately from 4 to 7 kg CO₂e. 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)

Carbon reduction opportunities

- Raw material management
Environmentally friendly materials (RoHS, REACH), use of recycled materials (recycled cobalt, recycled plastics)
- Green manufacturing
ISO 14001 environmental management system, ISO 14064-1 GHG inventory, ISO 50001 energy management system, UL2799 zero waste to landfill
- Distribution and transportation
Packaging material recycling, green transportation
- Use stage
Product energy consumption, safety during use
- Scrap and recycling
Disassembly, recycling and reuse



5.3 Circular Economy

Introduce recycled plastic

In the past three years, Simpo Technology has collaborated with suppliers on recycled plastics, verifying post-consumer recycle material (PCR) from as many as 14 suppliers. Our products are certified with UL Yellow Card for fire protection and international authority for recycled content to ensure the quality and reliability of plastic materials. We will continue to cooperate with our customers and suppliers in the future to maximize the benefits of the circular economy.

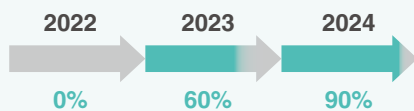
According to the life-cycle assessment (LCA) data provided by suppliers, using 90 to 98% PCR plastic pellets is expected to reduce 49 to 90% of carbon emissions compared to using non-recycled plastic materials. Using recycled materials not only decreases the consumption of natural resources but also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

Simpo Technology is practicing the circular economy and actively researching recycled battery module materials. Our suppliers have obtained GRS (Global Recycled Standard) recycling certification for their materials. In recent years, we have collaborated with customers and suppliers to achieve significant results, including the following:

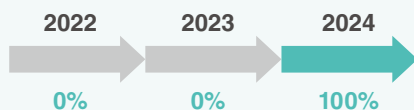
- PET Film: The proportion of recycled materials used is currently 100%, and has been fully introduced into the mass production of customer products.



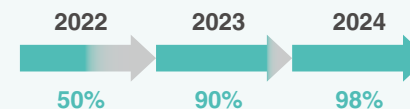
- PC Film: Introduced into mass production in 2024 with 90% recycled content.



- Copper: Initially, research will be conducted with a recycled content of 50%, and mass production will be introduced in 2024 with a recycled content of 100%.



- Resin: Initially, research will be conducted on materials with a recycled content of 50%, and mass production will be introduced in 2024 with a recycled content of 98%. In the future, we will continue to research, develop, and test materials with high recycled specific gravity that meet the requirements of the future PFAS (Per- and polyfluoroalkyl substances, PFAS) regulations.



- Cell_Cobalt: By 2024, we were introduced products with 50% and 100% recycled content into mass production. Because cobalt accounts for approximately 21-27% of the total weight of a battery module, the use of recycled cobalt in calculating the overall battery recycling rate is a major milestone. Using 50% recycled cobalt, combined with contributions from other recycled materials, the overall recycled content of battery modules can reach 19-26%. Using 100% recycled cobalt, the recycled content of battery modules can reach as high as 38%.



Note: PC plastic (Polycarbonate, PC), recycled polyethylene terephthalate (PET) film material, recycled polycarbonate (PC) film material

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, 17,058,550 PCS in 2023, and 16,704,847 PCS in 2024. 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 2024, a total of 252,000 PCS have been put into recycling, gradually implementing circular economy.

Amount of Pack Tray recycling

Year	PCS
2022	22,441,060
2023	17,058,550
2024	16,704,847

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

Amount of Frame Tray recycling

Year	PCS
2022	39,469
2023	12,000
2024	252,000

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 2024, 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 2024, a total of 7,186,894 PCS battery modules containing recycled cobalt were shipped, using a total of 216,133 kg of recycled cobalt.

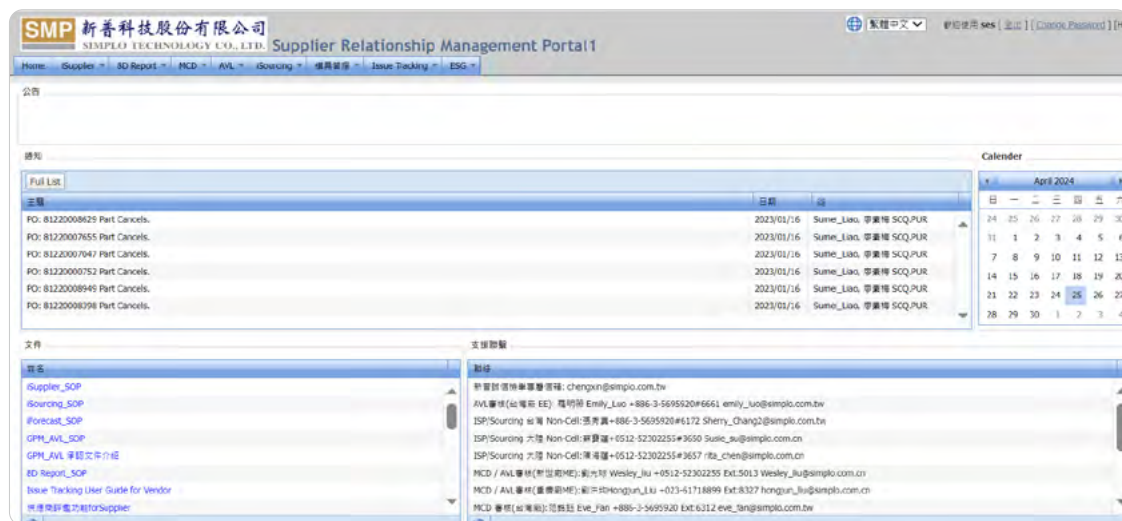
The main sources of recycled cobalt currently include production waste and market recycled batteries. There are primarily two methods (thermal treatment and chemical treatment) to extract cobalt compounds from these sources, which are then reused in positive electrode materials.

For precious metal cobalt in batteries, in 2024, products with a recycling rate of 50% and 100% was mass-produced and introduced. Recycled cobalt materials had all obtained Underwriter Laboratories Inc's (UL) recycling certification. As cobalt accounts for approximately 21-27% of the overall weight of the battery module, the adoption of recycled cobalt represents a significant milestone in calculating the overall battery recycling rate. Using 50% recycled cobalt, along with contributions from other recycled materials, the overall recycling rate of the battery module product can reach 19-26%. Using 100% recycled cobalt, the overall recycling rate of the battery module product can reach as high as 38%.

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 Product Quality and Responsibility

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- and polyfluoroalkyl substances (PFAS)

In response to the US "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 (e.g. CNCA, GB, GBT, CQC, CCC).
- The safety regulations of Taiwan, Japan, Korea, India and the ASEAN countries.
- 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.

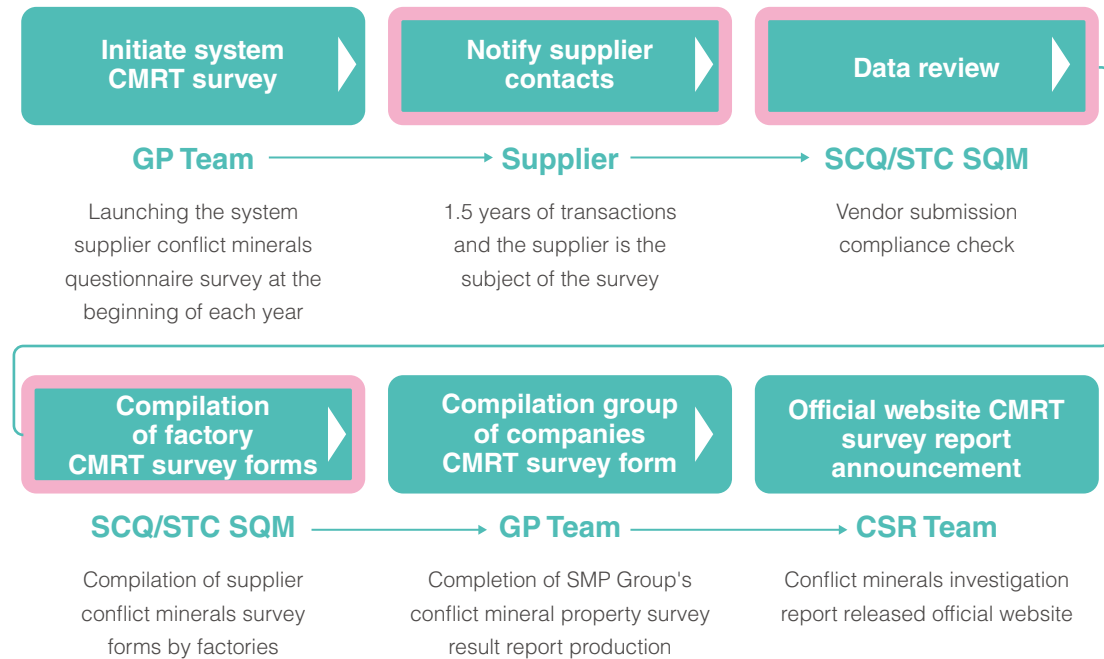
- Assessment of the impact of battery regulations

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.

SMP Conflict Minerals' Procurement Policy

Simplo Technology is committed to conducting due diligence across its supply chain in accordance with the Organization for Economic Cooperation and Development (OECD) Guidelines for the responsible sourcing of minerals. This applies to ten specific minerals contained in our products: Tantalum (Ta), Tin (Sn), Tungsten (W), and Gold (Au) — collectively known as 3TGs — as well as Cobalt (Co), Mica, Copper (Cu), Natural Graphite (Gr), Lithium (Li), and Nickel (Ni). We have formally communicated to our suppliers that the procurement of the above 10 minerals must be exclusively sourced from conflict-free smelters and refiners that have been certified by internationally recognized third-party organizations, such as the Responsible Business Alliance (RBA) through the Responsible Minerals Initiative (RMI), formerly known as the Conflict-Free Sourcing Initiative. In alignment with our responsible sourcing strategy, Simplo Technology will also assist and encourage suppliers to actively engage with smelters and refiners not yet recognized by RMI to undergo verification under the Responsible Minerals Assurance Process (RMAP). This initiative reflects our long-term commitment to ethical sourcing, risk management, and building a sustainable, transparent, and accountable supply chain ecosystem.

Conflict minerals investigation process





Requirements for Suppliers

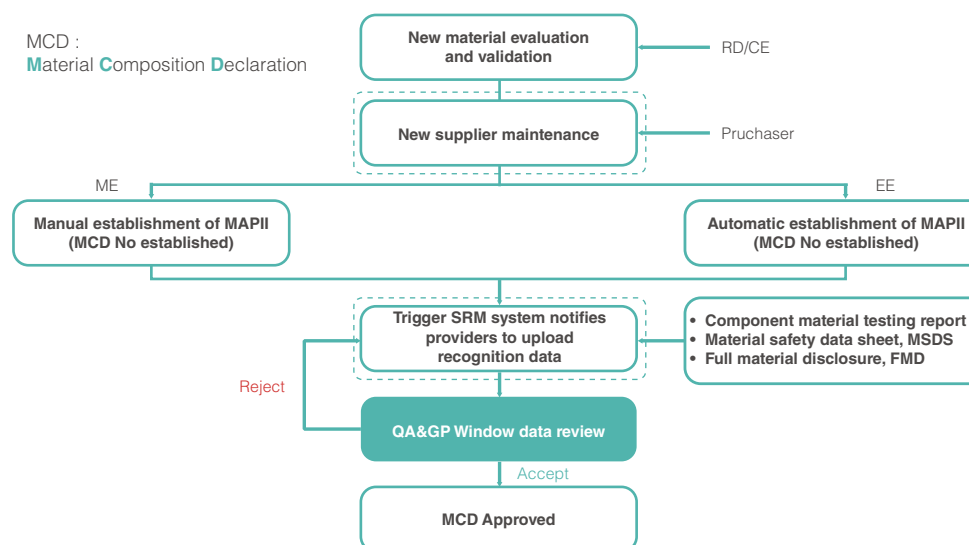
1. Suppliers should conduct due diligence on tungsten, tantalum, tin, gold, cobalt, mica, and their derivatives within the supply chain.
2. Suppliers should establish due diligence policies and management systems to identify relevant risks and take appropriate measures to mitigate such risks.
3. Suppliers should achieve 100% completion of supply chain due diligence.
4. Suppliers should submit due diligence reports (CMRT & EMRT) within the specified deadline.
5. Suppliers' due diligence report should 100% disclose the due diligence results, and the contents must be completely true, comprehensive, with no falsification or omissions.
6. The tungsten, tantalum, tin, gold, and cobalt smelters/refiners disclosed by suppliers should be validated by RMI or LBMA.
7. The template version for supplier due diligence reports (CMRT, EMRT) should be the latest version released by RMI.
8. The supplier due diligence reports should cover all products/components supplied to Simplo.
9. Supplier due diligence reports should not contain duplicate smelters or refiners, nor entities that do not meet the definition of a smelter or refiner.
10. New suppliers must sign the Conflict Mineral Declaration.
11. When introducing new products or changing smelters, a conflict minerals survey report must be proactively submitted.
12. When receiving system notifications of smelter update information, suppliers must promptly update CMRT/EMRT information and submit it to Simplo.
13. Smelters or refineries are subject to change and may sometimes be removed from the qualified list. Please stay updated with the official website.

RMI website link: <https://www.responsiblemineralsinitiative.org/smelters-refiners-lists/>

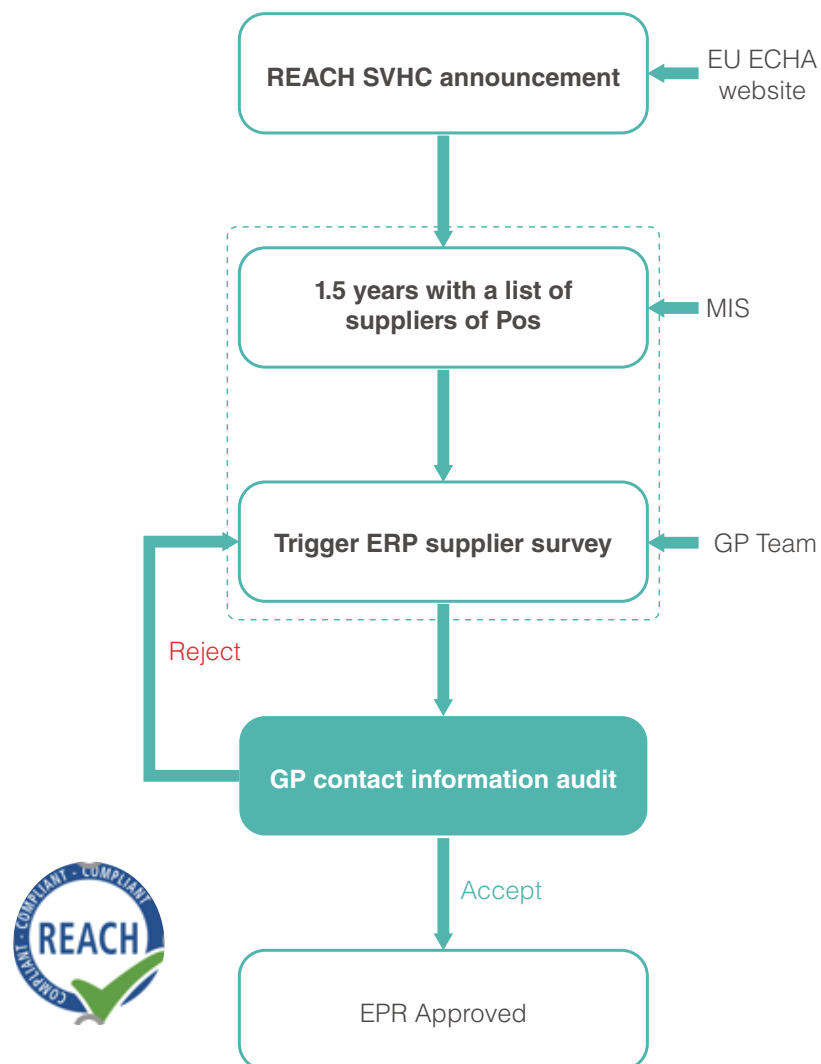
- Suppliers were required to complete a conflict minerals questionnaire

[illegible]

- SMP RoHS & REACH control MCD material approval



▪ SMP RoHS & REACH control: REACH supplier survey



Chemical management strategy

Simple Technology ensures compliance with regulations and the spirit of REACH, regularly collects information on major international environmental regulations, stays abreast of the latest trends, and continuously promotes hazardous raw material (chemical) substitution programs.

