



renato lab

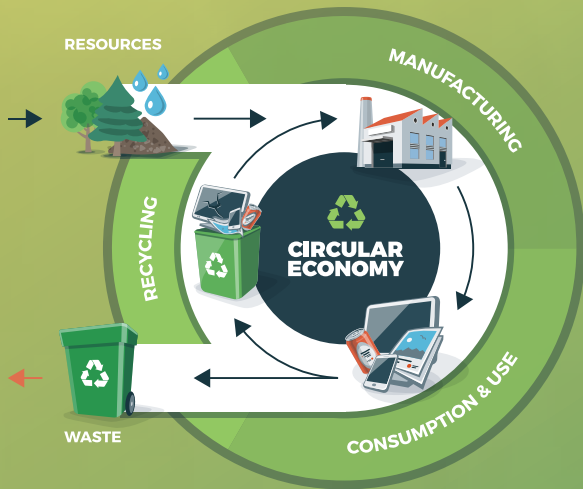
An introduction to Circular Design Guidebook

A material selection method for the Electronic, Electrical,
and Appliance industries

From linear to circular

Climate change, resource constraints, waste problems... We're faced with big global challenges and the only way to effectively solve resource and environmental problems is by moving away from a linear "take-make-dispose" economy towards a circular economy.

However, we are still depleting the earth's natural resources at an unsustainable rate. According to a report by the International Telecommunication Union, the electronic waste produced globally in 2019 was estimated to be 53.6 million metric tons, only 17.4% of which was recycled, and the amount of e-waste is expected to exceed 74.7 million metric tons by 2030, leaving many new challenges for the recycling industry.



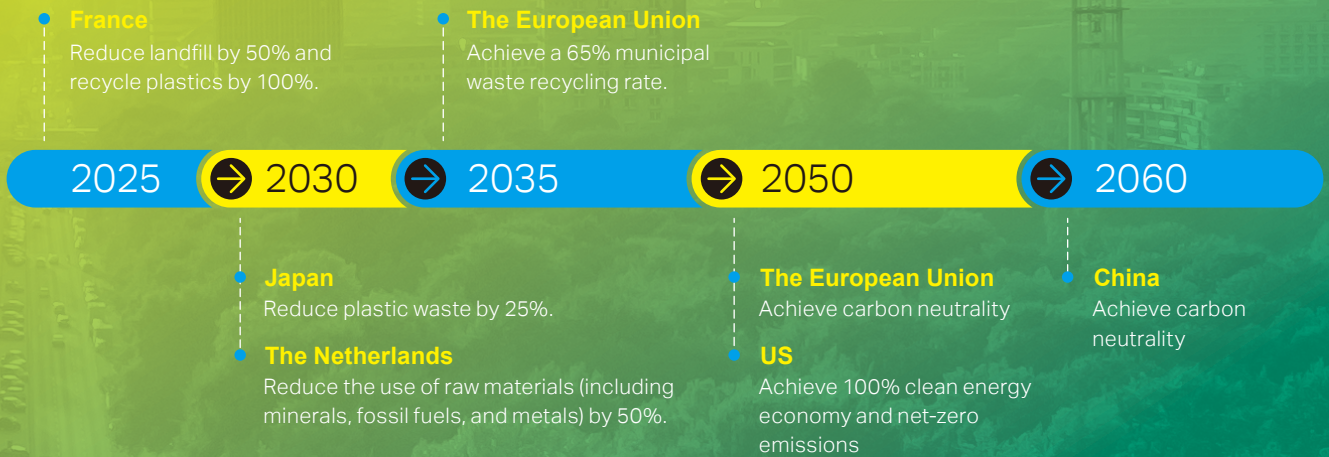
17.4% of e-waste is documented as being collected and properly recycled



▲ Global E-waste Generated by year

Regulatory and business pressure is mounting.

Governments around the world have been setting ambitious goals on recycling and carbon emission reduction. These new goals are having a direct impact on the electrical and electronics industry. Leading brands are moving towards circular economy business models like designing for disassembly and using recycled materials, extending the life cycles of their products, and enabling take-back systems to properly collect and recycle used products.



▲ Stated goals of various Governments



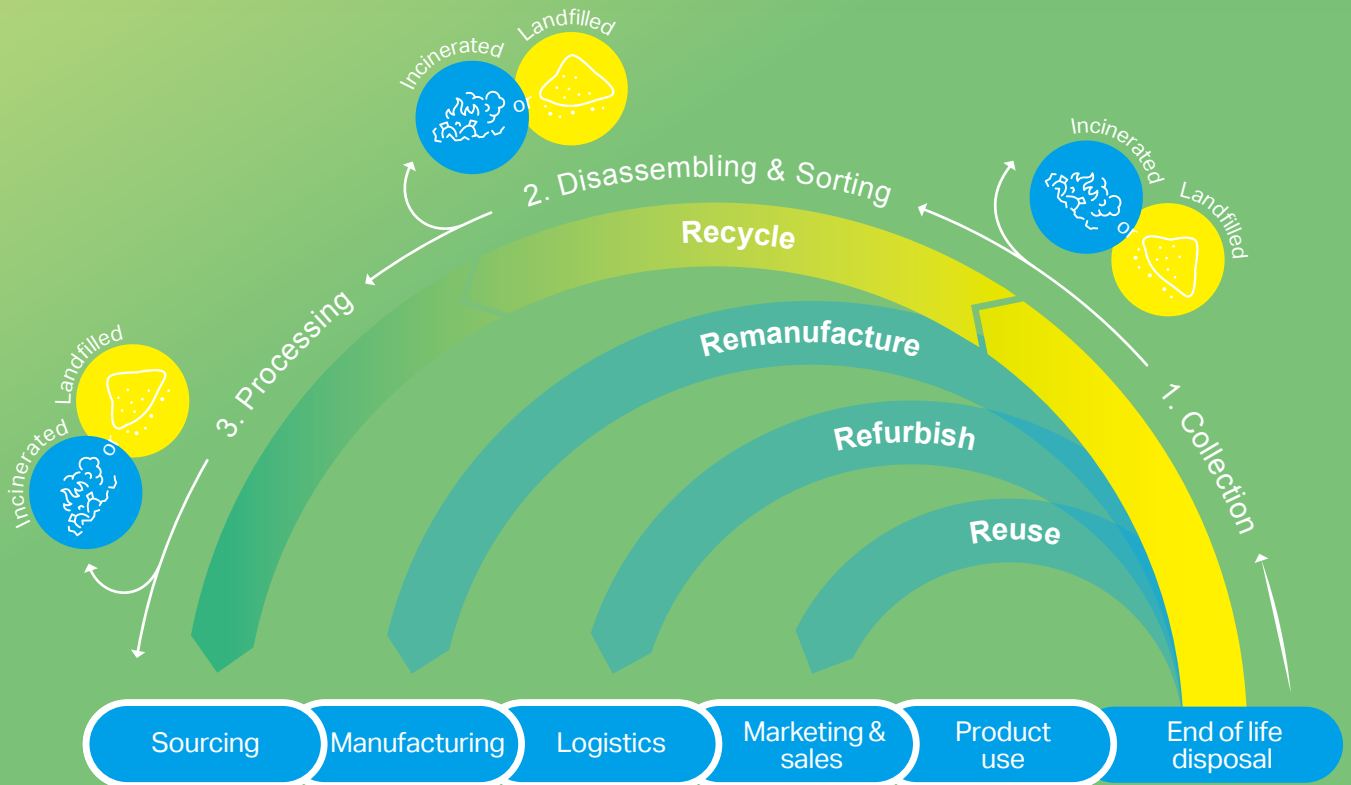
Product Cycle

Material Cycle

▲ Commitment totals, out of 14 leading electrical and electronics brands, according to their CSR reports

Design will play a key role

Design will play a critical role in the transition from a linear to circular economy, a role that impacts all stages of production, use, and recycling. Designing longer-lasting products, and enabling re-use, repair or remanufacturing of components and products are necessary to reduce waste, optimize recycling and keep materials in the loop. Circular thinking needs to be incorporated into every stage of the products' life cycle and every aspect of the supply chain.





“The key to solving the problem of material waste is to consider the end of product life in the initial design phase to facilitate recycling.”

Lily Wang
Senior Vice President and Global Head of Electronics, Electrical and Appliances Business Unit Polycarbonates
Covestro

Introduce Circular Design Strategies

Covestro recognizes the importance of design and actively engages designers with circular design concepts combining our multi-disciplinary expertise together. Produced in collaboration with REnato lab, a circular economy consultancy focused on resource efficiency, our Circular Design Guidebook proposes five circular design strategies to help designers and developers in electronics, electrical and appliances industry make their next-generation products more circular, taking a lifecycle approach within the context of a circular economy.

Circular design based on sustainable material selection

The implementation of circular design strategies requires a good match between design and material selection. Covestro introduces a practical methodology for a systematic material selection process and design guidance to help designers quickly open the door to circularity and sustainability.

Covestro's material and sustainability experts are available to support you through the material selection and product design process through guided workshops. Talk to us if you're interested in exploring the circular design strategies to make your next-generation products more circular.

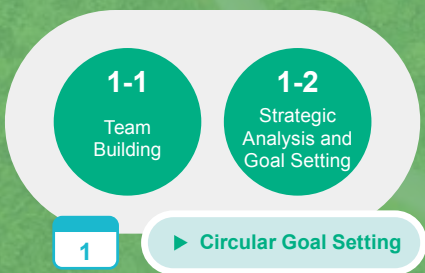
“Material selection is the foundation for circular design to optimize resource efficiency. Through the partnership with Covestro, we have completed the first design guide on material selection for the EEA industry.”

Jackie Wang
Founder and CEO, REnato lab

Material Selection Process – Overview

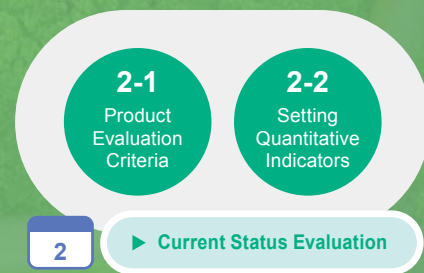
1 Preparation

Build a cross-departmental project team, then work together to conduct a strategic analysis, and set product goals using worksheet 1.



2 Setting Indicators for Evaluation

With worksheet 2, the team will choose product evaluation criteria and quantitative indicators, then complete a current status evaluation.



3 New Material Evaluation

Combining the use of worksheet 3 and worksheet 4, the team will select a target component, search for materials, collect information, and then make a new evaluation to compare to the current status evaluation completed previously.

