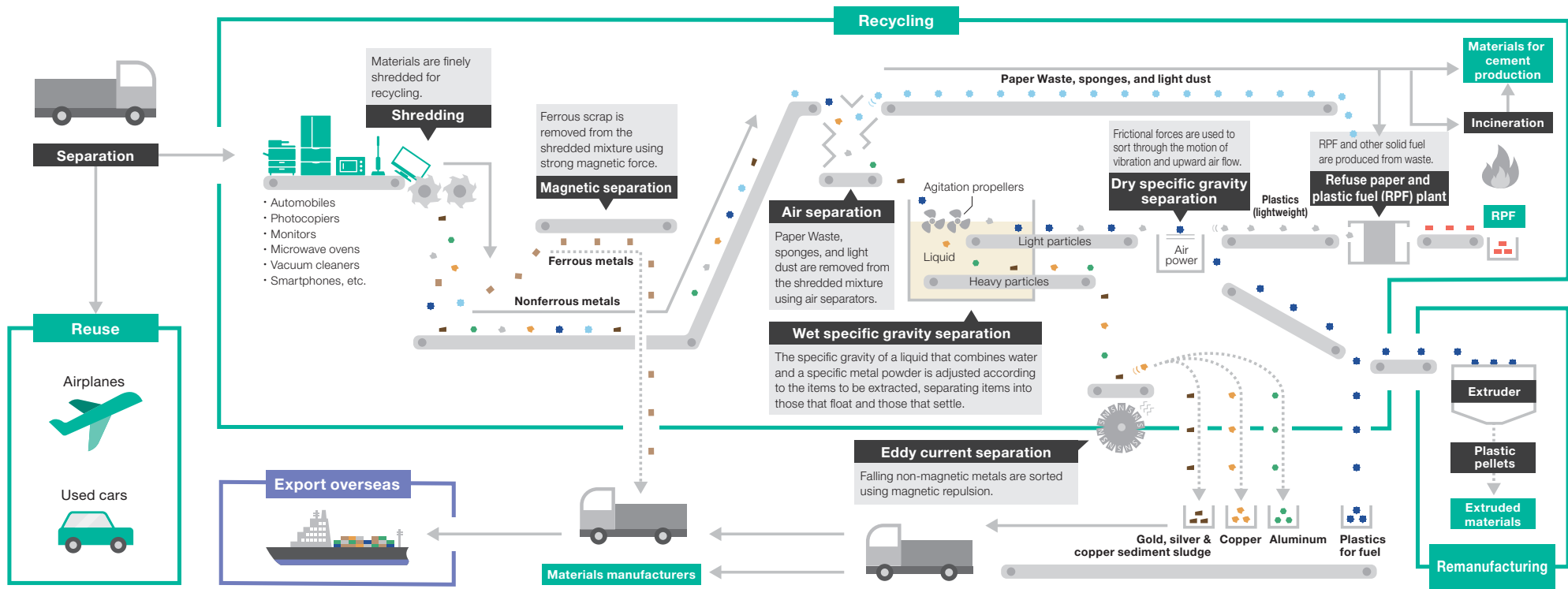
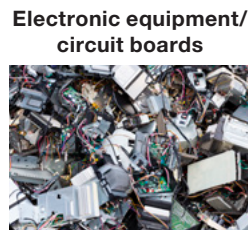


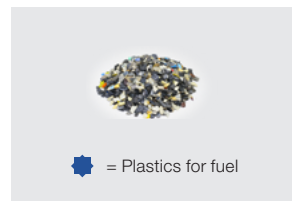
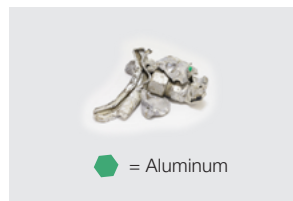
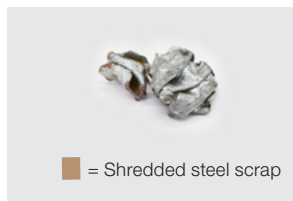
Resource Circulation Business

# Treatment/processing flow in the Resource Circulation Business

**Input**  
Above ground resources (wastes)



**Output**  
Recreating resource value



Resource Circulation Business



# Promoting the recycling of diverse wastes

Engaging in the reproduction, processing, and sales of materials derived from above ground resources, particularly recycling of metal resources



## 02 Collection of gold, silver & copper sediment sludge from waste incineration ash

eCONeCOL has engaged in years of research into technology and plant design for utilizing differences in the material properties of wastes, etc. to perform physical sorting into ferrous and nonferrous metals, gold, silver & copper sediment sludge, plastics, and other materials. Through the accumulation of these technologies and knowledge, the company has further evolved its sorting technology and has established technologies to concentrate and recover fine gold, silver & copper sediment sludge even from waste incineration ash seemingly free of precious metals, obtaining a patent in January 2019. Many local governments have disposed of waste incineration ash in landfills, but an increasing number are working to recover gold, silver & copper sediment sludge from the ash, for the purpose of recycling as well as reducing the volume of landfill. The company is actively developing business with local governments, aiming to expand its business to a 30% share among local governments nationwide by 2028.



### Main business activities of eCONeCOL Inc.

01 Resource recovery from urban mines

02 Collection of gold, silver & copper sediment sludge from waste incineration ash

03 RPF production

04 Reuse and recycling of aircraft

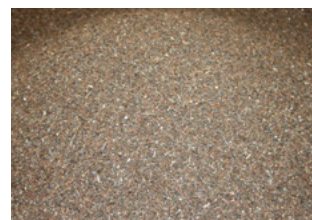
05 Shredding and a recycling of mattresses

### Value & Vision

Reproduction of materials derived from above ground resources through low-carbon processes. Contribution to the achievement of a sustainable decarbonized society by circulating high-quality, low-carbon raw materials and fuels through society.

## 01 Resource recovery from urban mines

The precious metals and other metals contained in scrapped automobiles and household appliances, known as "urban mines," provide many useful resources. However, advanced and complex technologies for shredding and sorting are required to recycle such composite materials. eCONeCOL Inc. shreds these "urban mine" materials and applies combinations of magnetic force, air power, wet specific gravity, dry specific gravity, color, and other separation technologies to separate and concentrate individual materials and achieve higher levels of resource recovery. In recycling, the company also engages in production using low-carbon processes that significantly reduce CO<sub>2</sub> emissions, and supplies high-quality raw materials and fuels derived from above ground resources.



Gold, silver & copper sediment sludge





## Evolution of technology and expansion into new business domains

03

### RPF production

Refuse paper and plastic fuel (RPF) is a solid fuel created by compressing waste plastics and paper waste materials that are difficult to recycle, into a primary raw material. This environmentally friendly fuel features stable quality and can significantly reduce CO<sub>2</sub> emissions compared with fuels such as coal. ECONECOL Inc. produces about 25,000 tons of RPF annually, continuously supplying this material primarily to paper manufacturers as boiler fuel. The plant currently runs at full capacity 24 hours a day, with plans to expand the number of purchasing companies and to further expand the production system in the future.

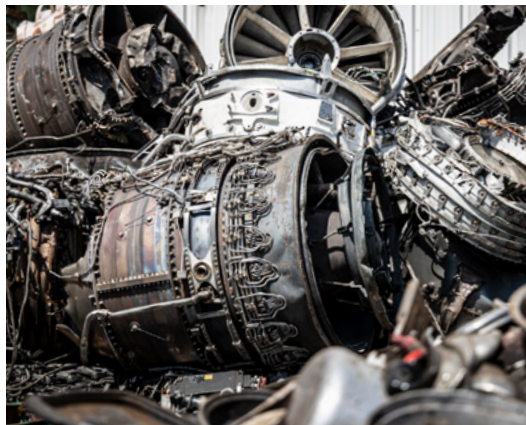


RPF (solid fuel)

04

### Reuse and recycling of aircraft

In May 2019, ECONECOL won a tender for two sold-off government aircraft, and sold the craft as reuse and recycling resources to a buyer in the U.S. for parts supply. From this start, the company made a full-scale launch of the only aircraft reuse and recycling business in Japan. The reuse and recycling market for aircraft currently exists primarily in Europe and the U.S. However, reuse and recycling are generally separated overseas as well, and transactions for used aircraft, and recycling from waste materials, are normally handled by different companies. Unlike the matter of simply selling the planes as used aircraft, know-how is required to determine the proper resource value of craft and their parts. The know-how that the company cultivated through years of evaluating and appraising metals and other composite materials has enabled one-stop support that spans asset evaluation and appraisal to recycling of unneeded waste materials. The company currently aims to expand its business as a pioneer in aircraft reuse and recycling, through actions such as launching the Aircraft Recycling Park Concept in alliance with airlines, leasing companies, and other partners in Japan.

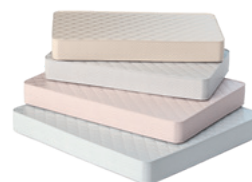


Aircraft reuse and recycling resources

05

### Shredding and recycling of mattresses

From August 2021, ECONECOL began the breakdown and recycling of mattresses, which are designated as items difficult to dispose of properly. Its high-performance shredders enable processing with minimum human workload. The company also plans to develop dedicated shredders in collaboration with a shredder manufacturer. In this way, the company is working to create means of working in a new business domain, including fully accepting work spanning the collection and disposal of waste associated with hotel relocation and closure, to building demolition.



Mattresses

06

### Wide-ranging one-stop services

The company offers one-stop services that range from collection, transport, and disposal of waste to dismantling of buildings. Normally, each process requires separate outsourcing to multiple contractors capable of performing the work. ECONECOL is able to offer one-stop services that span waste removal and disposal, dismantling of structures, and remediation of contaminated soil after dismantling. This not only contributes to increasing the recycling rate but also reduces burden and costs on the customer.

▼ One-stop service



07

### Collaboration with shredder businesses nationwide

To meet customers' demands for metal scrap purchase, waste disposal, and construction demolition projects, ECONECOL works through nearby shredder businesses that possess the same level of management and processing capacity as our company, and serves as a contact desk that lets customers engage in proper disposal with peace of mind even in geographically distant areas. Collaborating and gaining mutual trust also leads to approaches to new business partners.

08

### Promoting responsible recycling

ECONECOL has obtained certification under the "R2 Standard", a program managed by the U.S. Environmental Protection Agency. It assesses responsible behavior by electrical and electronic equipment recyclers, and mandates strict security measures. The company sets up booths at barricades to perform strict inspection of entry and exit by related parties. As foreign-affiliated companies preferentially deal with businesses that have obtained this certification, we will continue to tackle proper recycling and its promotion in accordance with R2 certification.



Certificate of R2 Standard certification



## Aiming for local revitalization through recycling

### Developing a community-based recycling business focused on Hakodate City in southern Hokkaido



#### Main business activities of Kuroda Recycle Co., Ltd.

**01 Comfortable Life Support Business**

**02 Wood scrap recycling**

**03 Acceptance of dismantled wind power generation equipment**

**04 ASR Recycling Business**



#### Value & Vision

One-stop handling of removal, treatment, and recycling of unneeded goods. Contributing to the promoting of regional resource recycling and revitalization of the local economy.

### 01 Expanding the Comfortable Life Support Business

Kuroda Recycle Co., Ltd. launched its Comfortable Life Support Business in 2017, serving the area of Hakodate City and its environs in southern Hokkaido, to make contributions to the community. In the first year, the main focus was on issues in people's personal environments, such as clean-up work targeting general individuals. From the following year, the company has been expanding the work by offering one-stop support for dismantling fishing boats, buildings, and other structures for business establishments, local governments, hospitals, property receiver cases, and so on.



Before clean-up



After clean-up

### 02 Contributing to the global environment by recycling wood scrap

Wooden houses are commonly built in Hokkaido, and a large amount of wood scrap is generated from demolition. Kuroda Recycle installed shredding facilities in 2020 to reuse this wood scrap. The shredded wood scrap is mainly reused as cement raw fuel and a boiler fuel, helping to extend life of limited resources.

### 03 Acceptance of dismantled wind power generation equipment

Hokkaido has many locations suited to wind power generation. The service life of wind power generators is generally about 20 years, meaning that removal of aging equipment built around the year 2000 is gradually increasing. Kuroda Recycle is able to shred and dismantle large wind power generators using equipment that includes a 1,250-ton scrap shear. As the number of wind power generators that have reached the end of their service life continues its upward trend, the company will broaden its horizons and accept equipment throughout Hokkaido.

### 04 ASR Recycling Business

Kuroda Recycle engages in the business of recycling the automobile shredder residue (ASR) that remains after used automobiles are shredded. ASR contains metals that cannot be fully recovered in the shredding and sorting processes. Fine metal scrap is recovered through sorting equipment using specific gravity differences and air power (sorting by air table), among other equipment. The company will continue its focus on research into advanced sorting technology and process efficiency to contribute to improved recycling rates for scrapped vehicles.

#### ▼ Separation using an air table

Nonferrous metals and plastics are sorted by specific gravity through the actions of vibration and upward air flow.



**Resource Circulation Business**



# Regional circular and ecological economy through recycling

## Developing a regional circular and ecological economy-oriented recycling business centered on Matsumoto City and Azumino City in Nagano Prefecture



### 02 Achieving high-quality intermediate treatment through large shredders

The head office plant, which has been operating on an RE100 basis since April 2021, performs shredding and separation of metals and waste plastics using the only large shredder in Nagano Prefecture. The company carried out a major renewal project to expand its business partners and to process composite materials. Metals shredded and recycled by the company are sent directly to manufacturers to be reborn as new products, while mixed metals and nonferrous metals generated by the shredding process are recycled by group companies through re-sorting and other means, maximizing synergies and economies of scale in the group. From the perspective of regional resource recycling and decarbonization, the company will bear a role in "contributing to the region".

### 03 Launching a specified home appliance recycling business

In January 2021, SYN ECO began accepting specified home appliances (general waste) generated in Nagano City. This had its start in the acceptance and recycling of specified home appliances damaged by a natural disaster in the Hokushin area of Nagano Prefecture in 2019. The activity has been praised as an effective initiative for regional resource recycling. In FY2020, acceptance reached 6,500 units (including those from disaster damage in Nagano City).

### Main business activities of SYN ECO Inc.

**01 Collecting and recycling of local resources**

**02 Intermediate treatment of waste**

**03 Recycling of specified home appliances**

**04 Local club team collaborative projects**

### Value & Vision

Promoting the effective use of regional resources while promoting advanced efforts for the local production and consumption of resources, through activities aimed at creating "a regional circular and ecological economic zone".

### 01 Collection of local resources with Mottainai BOX

SYN ECO Inc. has set up Mottainai BOX Stations as resource collection sites at 21 locations in the Chushin district of Nagano Prefecture. This includes four new locations added from the previous year, bringing the amount of resources collected in fiscal 2020 to 5,300 tons. Each station collects local resources (metals, waste paper, aluminum cans, and used clothes) to create an environment that makes use by locals and collection of containers easy. Collected resources undergo sorting, processing, and shipment at plants, to be reused as resources. Another feature of the company is that people with disabilities and general employees work together at plants. The company also donates a portion of profits to the local J2 League Matsumoto Yamaga Football Club and Nagano Children's Hospital, as it tackles local production and local consumption by returning locally generated resource value and profits to the region.



### 04 From PET bottles to uniforms

In January 2022, SYN ECO will begin a project to create uniforms for match volunteers from PET bottles collected at home games of the Matsumoto Yamaga Football Club. This multi-year initiative marks an evolution of the YELL Project launched in 2013 to eliminate disposal costs for wastes from the stadium, and will form a part of projects to recycle local resources. Looking ahead, the company will collaborate with materials manufacturers, final goods manufacturers, and other partners as it works toward the construction of "a regional circular and ecological economy zone" that recycles wastes generated in the prefecture and returns these to local communities.

**Resource Circulation Business**

株式会社東洋ゴムチップ  
Toyo Rubber Chip Co., Ltd.

# From waste materials to high-quality recycled materials

## Manufacturing rubber chips from recycled materials and developing wide-ranging of products used in public facilities



### Main business activities of Toyo Rubber Chip Co., Ltd.

- 01** Manufacturing black rubber mulch from waste rubber
- 02** Manufacturing color rubber chips from synthetic rubber
- 03** Making rubber finished goods used at public facilities, etc.



### Value & Vision

Achieving a circular economy that converts rubber offcuts into products through low-carbon processes at RE100 plants.

## 01

### Toward the achievement of a safe society

Toyo Rubber Chip Co., Ltd. manufactures color rubber chips from synthetic rubber, offering a wide range of colors that accommodate buildings and structures of diverse design. At the parks, school grounds, kindergartens, and other places where children play, color rubber chips serve as cushioning material that reduces the risks of fatal injuries from falls. The company's Omni Pedestrian Rubber Panels, used as a material at railroad crossings, feature outstanding elasticity and durability, prevent slips, and resist corrosion, assisting safety at pedestrian passageways. The Vehicular Clearing Posts launched this year use color rubber chip molded products to indicate clearances between railway cars. They ensure good visibility over a long period with little weathering-related fading, contributing to safety in railway operation.



Omni Pedestrian Rubber Panels

## 02

### Contribution to a circular society

Toyo Rubber Chip has been active in the development of rubber recycling for about 80 years. Rubber chips, made from waste tires and products generated from rubber manufacturing processes in plants, are used as cushioning material for filling artificial turf at sports grounds, as well as paving material for parks and sidewalks. Rubber powder, made from finely shredded waste tires, is used in industrial finished goods such as a tire filler and automobile brake linings. In this way, recycled rubber processed by our company is used in many fields. Utilizing technologies that we have built up over many years, our company will continue to actively develop recycling-related finished goods. In collaboration with suppliers, we are currently advancing initiatives to establish a circular model that collects and remanufactures rubber waste material in a closed loop.

### ▼ Rubber recycling process



### TOPIC

#### Low-carbon products manufactured at RE100 plants

From May 2019, Toyo Rubber Chip has operated an RE100 plant, switching to 100% renewable energy sources for electricity supplied to the plant. This has enabled the reduction of CO<sub>2</sub> emissions from manufacturing processes and the manufacturing of products with low environmental impact.