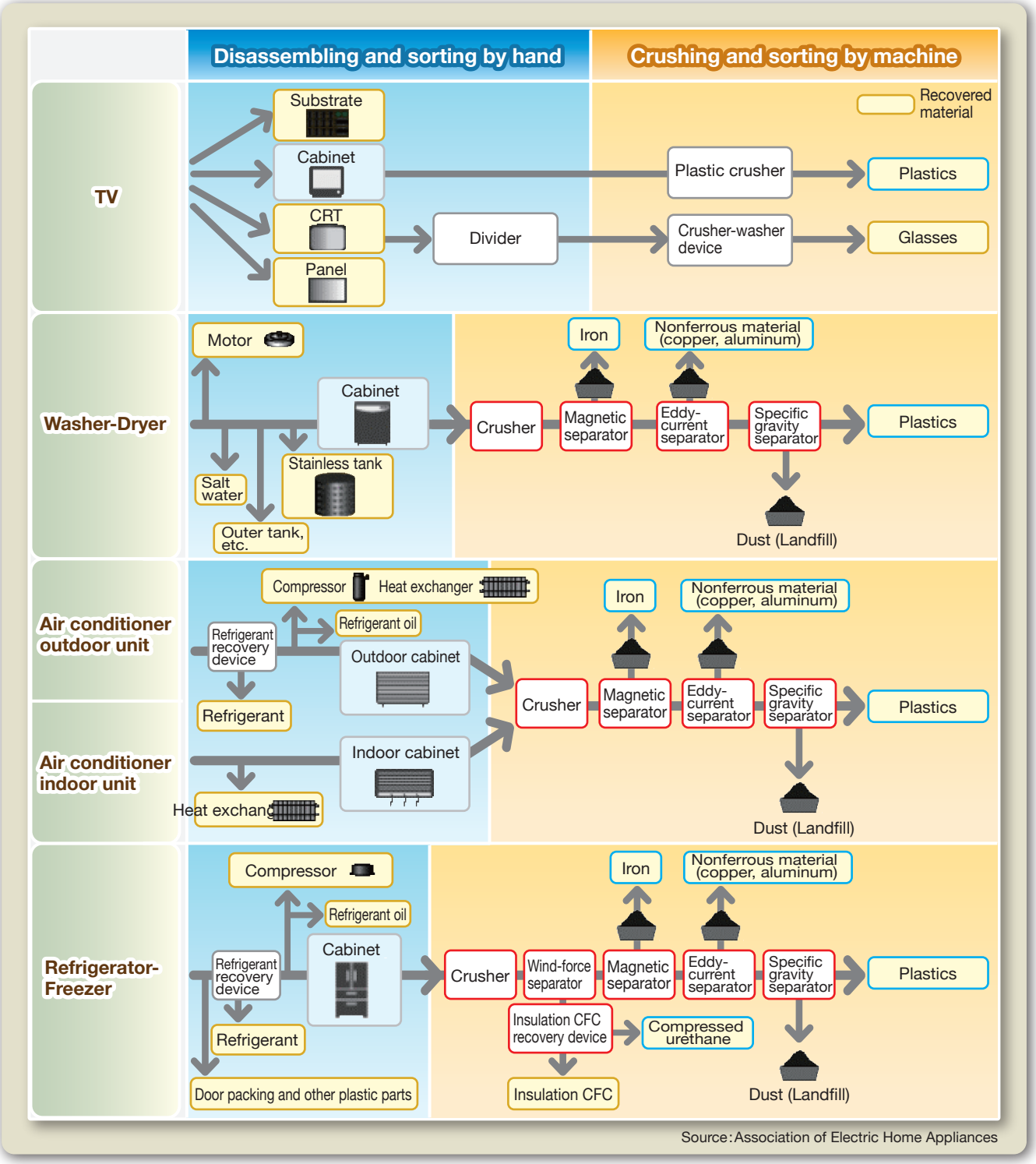
Home appliance recycling technology in Japan

Home appliance recycling technologies in Japan focus on the effective utilization of resources and the safe treatment of hazardous material, and methods and operations becoming more and more sophisticated. Japan has many outstanding recycling achievements and many recycling facilities are operating stably.

The prevailing method of handling used home appliances in the past was to first break them apart with a simple machine and then sort out the recyclable parts using magnets. Today, recycling has become more sophisticated. To improve the purity of recovered resources, appliances are first taken apart and sorted manually, then compacted. The operation is efficient in that not only metallic material but also plastic parts are recovered for recycling.

Refrigerators and air conditioners contain chlorofluorocarbons that damage the earth's ozone layer. These hazardous liquid chlorofluorocarbon and chlorofluorocarbon in insulating material are recovered for proper disposal. Furthermore, consideration is given for the safety of workers and protection of the environment of surrounding areas.

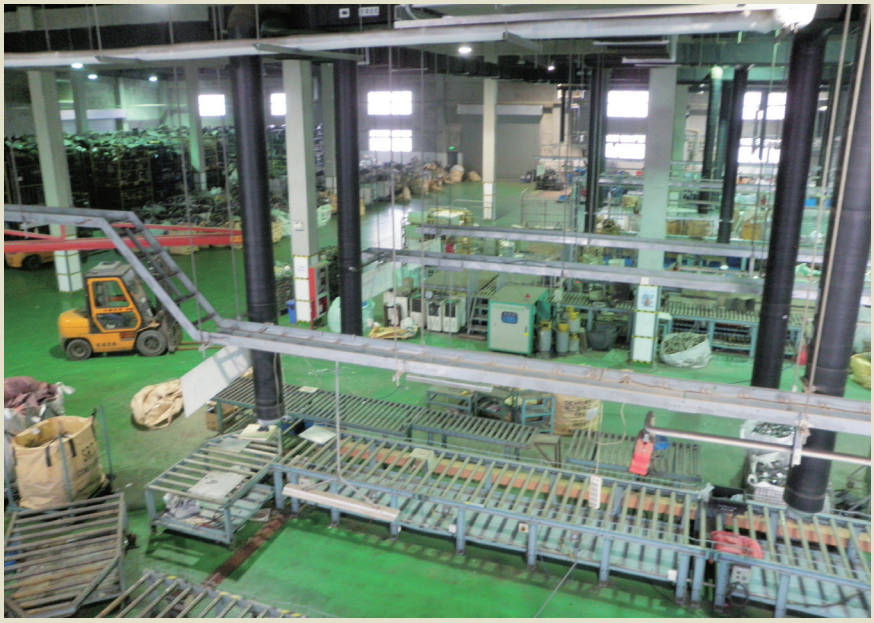


Source: Association of Electric Home Appliances

Japanese Corporations Advancing Overseas

Japanese Corporations are already advancing into China and other countries with home appliance recycling businesses.

A home appliance recycling plant constructed as a joint venture between Japanese and local company (Suzhou, China)

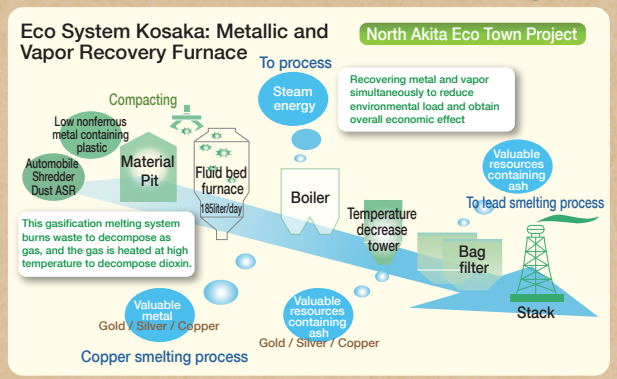


Japanese home appliance recycling plants are operating in China and other countries.

Source: DOWA Eco-System Co., Ltd.

Column

Collaboration with the nonferrous refining industry



Valuable metals are recovered through heat and chemical treatment.

Diverse recycling materials

In collaboration with the nonferrous refining industry, heat and chemical treatments recover useful metals of high purity. Research is also conducted to develop technology to recover and use rare metal in the future.

6 Biomass utilization technology

Technology to efficiently recover electricity and fuel from biomass waste

Active use of biomass

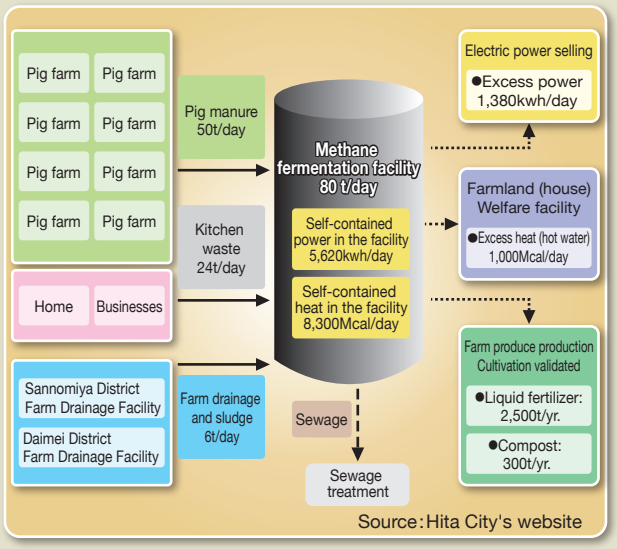
Waste generated in cities and villages includes combustible waste with low moisture content, such as paper, plastic, and wood debris; and waste with high moisture content, such as food production waste, kitchen waste, manure, sewage sludge, biomass and other organic sludge. Waste with high moisture content will generate methane gas and hydrogen sulfide when buried without treatment, causing environmental pollution. Incineration of high moisture waste requires sub-material to assist with the incineration. Cooking oil waste with low moisture content may be effectively recycled as BDF, and energy can be recovered from wood debris incineration. Waste treatment, such as composting, methane fermentation, and use as animal feed, that best suit the features of the locale is selected.

Aiming for the structuring of a recycling society, food production waste and kitchen waste from homes, barn animal manure, sludge and other biomass are treated independently or in combination with incineration. Below are examples of leading biomass technology.

Hita City, Oita (High moisture content biomass use)

An operator commissioned by pig farms collects hog manure, kitchen waste from homes and businesses, and sludge from an effluent treatment facility and treats it in an integrated manner at a methane fermentation facility.

(1) Treatment capacity: 80t/day (kitchen waste - 24t/day; swine excrement - 50t/day; farming settlement discharge sludge - 6t/day)
(2) Methane fermentation facility: wet-type mesophilic fermentation
(3) Power generator: gas engine 170kWx2units (generates 7,070kWh/day)
(4) Liquid fertilizer facility: Annual production of 2,500tons
(5) Composting facility: Annual production of approx. 290tons
(6) Water treatment facility: Active sludge + sludge solubilization

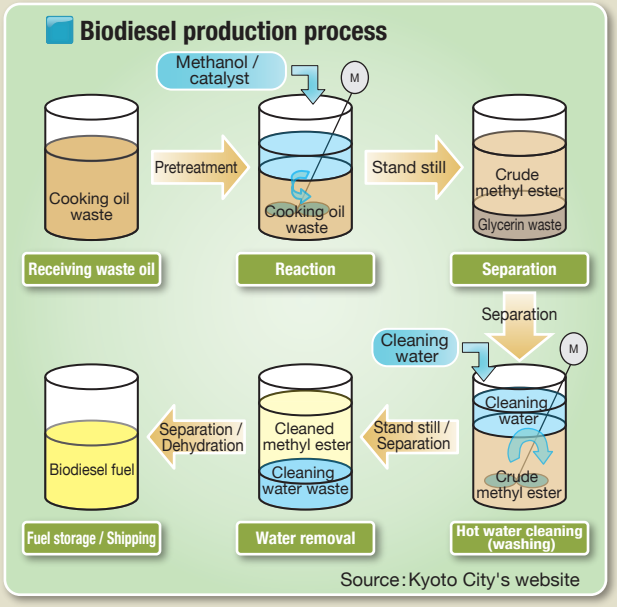


Source: Hita City's website

Kyoto City (production of fuel oil (BDF) from oil waste)

Cooking oil waste recovery system is structured to manufacture BDF, which is used as fuel for city-operated buses and garbage collection trucks.

(1) Treatment capacity: Vegetable oil waste - approx. 5t/day
(2) Treatment method: Fatty acid methyl ester
(3) Biodiesel fuel production: 5,000liter/day



Source: Kyoto City's website