

# JAPAN

CIRCULAR ECONOMY 2-PAGER, 11 JUNE 2021



## POLICY LANDSCAPE

Japan is well known for its exporting power of products such as cars, electronics, computers and semiconductors. With very low natural resources at its disposal, Japan's economy is reliant on importing raw materials - making Japan one of the world's top importers of for instance oil, coal and LNG. This creates a need to keep materials in the loop as long as possible at their highest possible value and offers great circular opportunities like reuse, remanufacturing or recycling.

## BEYOND ZERO CARBON

Under the United Nations Climate Change Convention Japan has committed to reduce greenhouse gas (GHG) emissions by 26% from 2013 levels by 2030. In addition, Prime Minister Suga has pledged to reduce greenhouse gas emissions in Japan to net zero by 2050, with a **roadmap** towards 'Beyond-Zero' Carbon targeting 14 priority areas.

## REDUCING NATURAL RESOURCE CONSUMPTION AND WASTE

After the Fukushima nuclear accident in 2011, Japan's energy fuel mix shifted. Natural gas, oil, and renewable energy shares of total energy consumption have increased to replace some of the nuclear energy share. The country's Industry Minister Hiroshi Kajiyama stated that it plans to **install up to 45 GW of offshore wind power by 2040**.

Policies to reduce natural resource consumption and minimize waste have been created. Such as the Act on the Promotion of Effective Utilization of Resources, Green Purchasing Act, Waste Management and Public Cleansing Act, and Food Recycling Law.

Energy	Transport/Manufacturing	Home/ Office
<b>Offshore wind power</b> Wind turbines, parts, floating wind turbines	<b>Mobility and battery</b> EV (electric vehicle), FCV (fuel cell vehicle), next generation batteries	<b>Housing and building, Next generation PV</b> (perovskite solar cell)
<b>Fuel ammonia</b> Combustion burner (as fuel in transition period to hydrogen-powered society)	<b>Semiconductor and ICT</b> Data centers, energy-saving semiconductors (demand-side efficiency)	<b>Resource circulation</b> Biomaterials, recycled materials, waste power generation
<b>Hydrogen</b> Turbines for power generation, hydrogen reduction steel-making, carrier ships, water electrolyzers	<b>Maritime</b> Fuel-cell ships, electric propulsion ships, gas-fueled ships	<b>Lifestyle-related industry</b> Local decarbonization business
<b>Nuclear power</b> SMR (Small Modular Reactor), nuclear power for hydrogen production	<b>Logistics, people flow and infrastructure</b> Smart transportation, drones for logistics, fuel-cell construction machinery	
	<b>Foods, agriculture, forestry and fisheries</b> Smart-agriculture, wooden skyscrapers, blue carbon	
	<b>Aviation</b> Hybrid electric, Hydrogen-powered Aircraft	
	<b>Carbon Recycling</b> Concrete, biofuel, plastic materials	

FIGURE 1: 14 PRIORITY AREAS TARGETED FOR REDUCING GAS EMISSIONS BY 2050

## FACTS & FIGURES

### ECONOMIC INDICATORS

- Total Population: 126 million (2019)
- GDP (nominal + ranking): \$5,082 trillion USD, World Ranking: 3rd
- GDP Per Capita: \$40,246 USD
- Purchasing power : \$43,593 (2019)
- Import from the NL (€): 7.7 billion (2019)
- Export to the NL (€): 8.7 billion
- Economic growth: -4.8% (2020)
- Ease of doing business: 29 (2020)
- Corruption perception Index: 19/180 (2020)
- Unemployment rate: 2.97% (2020)
- Currency and exchange rate euro: 1 € = 130.18 Yen (2021)
- Time difference with NL: +7/+8 hrs

### CE INDICATORS

- Innovation Index rank: 16th / 131 (2020)
- Recycling rate of municipal solid waste: 20% (2019)
- Incineration Rate: 70% (municipal solid waste)
- Effective utilization of plastic waste: 84% (2018)
- Circular material use rate: 15.4% (2016)
- Renewable energy consumption (% of total final energy consumption) (2019): 5.89%
- Material productivity (€/kg): 3.9 (2017)

## THE JAPAN 2020 CIRCULAR ECONOMY VISION

The Japan 2020 Circular Economy Vision was updated from the 1999 vision and focuses on shifting to circular business models, implementing evaluation indicators, and early establishment of resilient resource circulation. For the latter, the focus is in particular on the establishment of domestic recycling systems and development in the key areas: plastics, textile, Carbon Fiber Reinforced Polymers (CFRP), batteries and PV panels.

## PLASTIC RESOURCE CIRCULATION STRATEGY

- Cumulative 25% reduction in single-use plastics emissions by 2030
- Reusable/recyclable design by 2025
- 60% rate of recycling/reusing for containers and packaging by 2030
- 100% effective utilization of used plastics by 2035
- Doubled use of recycled plastic by 2030
- Approximate 2 million ton introduction of biomass plastics by 2030

## SELECTED PRIORITY AREAS

### CIRCULAR MANUFACTURING INDUSTRY

Japan has a leading industrial and exporting position in a.o. automotive and electronics. Together with its dependency on raw materials, a shift to a circular economy is a necessity considering the possibilities for value retention and take-back. This shift is accelerated by global initiatives such as **The Circular Cars Initiative**. With Japan's burgeoning car industry shifting to electric vehicles and an estimated 3 million end-of-life vehicles (ELVs) generated each year, there are **increasing opportunities to recover materials for production**.

In addition, Japan has the largest aerospace industrial market in Asia and is a manufacturer and supplier for various aircrafts. There is potential to advance material recovery and cost efficiency through collaborative R&D projects to reuse aerospace materials.

Japan is a front-runner in developing **hydrogen powered vehicles**. Beyond material recovery, manufacturers are looking for innovative manufacturing processes, new materials to lightweight vehicles and new technologies such as hydrogen-powered cars. Japanese companies like Hitachi show Japan is ready to implement refurbishing and remanufacturing strategies. Opportunities for The Netherlands and Japan to collaborate in circular manufacturing lies in refurbishing and remanufacturing of capital equipment goods.

### REPORTS & LINKS

#### REPORTS

- [Circular Economy Vision 2020](#)
- [Waste Management and Recycling in Japan - Opportunities for European Companies \(SMEs focus\)](#)
- [Japan's Circularity](#)
- [Aviation and Aerospace to Japan](#)

#### LINKS

- [Netherlands Enterprise Agency \(RVO\)](#)

As **Japan aims to be the third largest producer in offshore wind power** before 2040, Dutch knowledge and experience is a valuable asset in collaboration. Circular offshore wind is a key research area in the Netherlands with broad knowledge ranging from circular tender criteria, modular design of the structural elements and environmental specific foundation design and usage, retaining data (e.g. on modules, components and material levels) for decommissioning, to EoL strategies, Rare earth elements (REE) refinery strategies and circular partner networks.

### PLASTICS

Although Japan is renowned for its approach to waste management and recycling, with one of the world's highest rates of recycling plastic bottles (85%, compared to Europe's 41%), the country was also the second-largest generator of plastic packaging waste per capita in the world (2015). Public awareness is increasing, according to a recent survey that showed 70% of consumers in Japan indicate moving away from plastic. Ambitious goals to curb plastic are set out in The Plastic Resource Circulation Strategy.

With limited landfill availability, there is a great opportunity for both mechanical and chemical recycling. In 2020 Suntory launched a joint venture to develop chemical recycling technique, but also waste-to-energy is a solution adopted by companies like **Nippon Steel**. Mitsubishi Heavy Industries Environmental & Chemical Engineering Co is developing cutting-edge research and new technology in the sector with their **waste-to-energy facilities**, where even the incineration bottom-ash byproduct is utilised as a raw material for cement.

With 18,000 miles of coastline, Japan is especially dependent on marine resources, and initiatives to tackle marine litter are considered important. Platforms like the Japan **Clean Ocean Material Alliance** have been established to advance cross-sectoral innovation - from the collection, sorting, recycling, refining, manufacturing and retailing. Opportunities for collaboration are in design (eliminating plastics or design for reuse, refurbishment or recycling), new circular or biobased materials, advanced mechanical recycling and chemical recycling technologies as well in system approaches involving public and private actors. Packaging and WEEE plastics and Ocean Plastics in general seem topics with momentum for Japan.

## RELEVANT NETWORKS

### BUSINESS NETWORKS

- [Japan Clean Ocean Material Alliance \(CLOMA\)](#)
- [Japan Climate Initiative](#)
- [Japan External Trade Organization \(JETRO\)](#)
- [Keidanren, Japan Business Federation](#)
- [The Netherlands Chamber of Commerce in Japan](#)
- [Netherlands Enterprise Agency, Japan](#)
- [NLinBusiness page of Cities of Opportunities Tokio](#)

### CIRCULAR ECONOMY NETWORKS IN JAPAN

- [PACE](#)
- [The Institute for Global Environmental Strategies](#)
- [CE Hub](#)
- [Zero Waste Japan](#)

### EMBASSIES

- [Embassy of Japan in the Netherlands](#)
- [Netherlands' Embassy in Japan](#)