

# For the Environment

## Medium-Term Environmental Plan

As part of our effort for realizing a recycling-oriented and low-carbon society, we are following goals to take actions towards them.

### 5<sup>th</sup> Medium-Term Environmental Plan (from fiscal 2017-2019)

Theme and content			Goal	Result
			Fiscal 2019 (Indicator BM: Fiscal 2015)	Fiscal 2017
<b>Eco-friendly products</b>	Contribution for achieving sales targets in the final year of the medium-term plan (fiscal 2019) by expanding eco-friendly products and their sales.	Development of eco-friendly products that contribute to reducing the environmental burden	Number of new products five items/year	6 items
<b>Contribution for building a low-carbon society</b>	Introduce carbon fixation by using wood.	Fixation through the supply of recycled wood boards	Volume of carbon fixation (CO <sub>2</sub> equivalent) 800,000 t-CO <sub>2</sub> /year  BM: 794,000 t-CO <sub>2</sub> /year (breakdown) MDF: 630,000 t-CO <sub>2</sub> /year IB: 164,000 t-CO <sub>2</sub> /year	777,000 t-CO <sub>2</sub> /year (breakdown) MDF: 633,000 t-CO <sub>2</sub> /year IB: 144,000 t-CO <sub>2</sub> /year
	Reduce CO <sub>2</sub> * emissions from energy sources. * CO <sub>2</sub> : emitted by the combustion of fuels or the use of electricity or heat supplied by a third party	Reduction of emissions by the domestic production sites	Discharge rate 62.5 (t-CO <sub>2</sub> /¥100 million) or below BM:69.7 (t-CO <sub>2</sub> /¥100 million)	62.2 (t-CO <sub>2</sub> /¥100 million)
		Promotion of energy savings through the introduction of energy-saving equipment and improvement of efficiency in equipment operation	Total emissions 110,000 t-CO <sub>2</sub> or below/year (CO <sub>2</sub> emission factor for electric power is fixed at the value of fiscal 2014) BM: 125,700 t-CO <sub>2</sub> /year (BM is the result in fiscal 2014)	105,100t-CO <sub>2</sub> (CO <sub>2</sub> emission factor for electric power is fixed at the value of fiscal 2014)
		Reduction of emissions from logistics and transport divisions	Unit of energy use 44.7 kJ/1 million ton-kilo or below (reduction by more than 1% in annual average) BM: 46.6 kJ/million ton-kilo (Reference: CO <sub>2</sub> emissions 23,700t-CO <sub>2</sub> /year)	48.4 kJ/million ton-kilo
	Reduction of emissions from sales and administrative divisions Thorough implementation of energy-saving measures	CO <sub>2</sub> emissions 1,500 t-CO <sub>2</sub> or below (reduction by 10%) BM: 1,690 t-CO <sub>2</sub>	1,600 t-CO <sub>2</sub>	
<b>Contribution for creating a recycling-oriented society</b>	Promote the 3Rs* to reduce the volume of waste destined for final disposal. *Reduce, Reuse, and Recycle	Promotion of recycle and conversion of waste into valuables	Final disposal rate (ratio of volume disposed of in landfill outside the company) 5% or below BM: 8.2%	7.2%
	Introduce the cascading use of wood	Material recycle of construction waste wood	Ratio of old material/virgin material: 90% (Ratio of old material/virgin material BM: 86%)	92%
		Use of wood biomass energy (internal use)	Input amount of wood biomass energy 1,350TJ (116% compared to fiscal 2015) BM: 1,162TJ Use of fuel chip 95,000 t/year BM: 82,000 t/year	1,370TJ (118% compared to fiscal 2015)  97,000 t/year
	Promotion of shift to biomass energy and other eco-friendly energy from heavy oil, LNG, etc.	Reduction of heavy oil (heat quantity equivalent) 35,000 kl/year BM: 30,000 kl/year	35,000 kl/year	
<b>Contribution for biodiversity</b>	Procure wood in a biodiversity friendly way	Improvement in the rate of use of certified wood, domestically produced wood, planted trees, and recycled board, etc.	Use rate of non-certified natural plywood: 15% or below BM: 18.2%	15.1%
	Strengthen cooperation with supply chains	Dissemination and proper management of green procurement in the supply chain	Coverage of applicable companies (consent acquisition rate) 100%	99%
<b>Strengthen environmental risk management</b>	Identify, prevent, and minimize environmental risks	Operation and continuous improvement of environment management system  Environmental education	Environmental accident/violation 0	0
	Improve our ability to satisfy regulations governing chemical substances	Establishment and operation of a system for appropriate management of chemical substances (also considering introduction of a management system)	System operation	Introduced a management system and started operation with a new system.

## Reducing waste and recycling

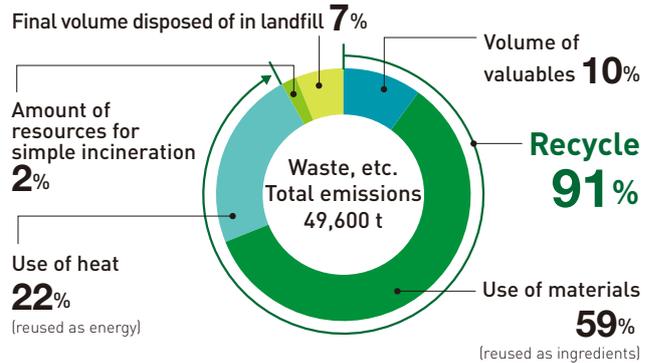
### Current rate of recycling waste 91%

Daiken Group is striving to reduce and recycle waste in an effort to realize a sustainable society.

The waste emissions in the Daiken Group were 49,600 tons in fiscal 2017, and its recycling rate\*1 was 91.1%. We continue to improve the recycling rate.

\*1 Recycling rate = Amount of recycled resources/Total emission of waste x 100(%),  
Amount of recycled resources = Valuable + Use of materials + Use of heat

#### Breakdown of waste processing



## Contribution for realization of low-carbon society

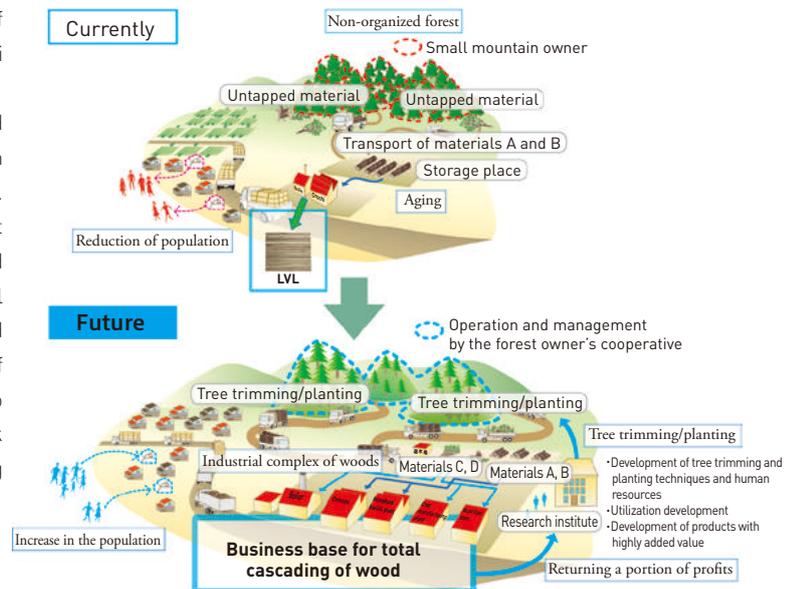
### Launched a project of total cascading of woods

In November 2016, we launched a project of total cascading of woods and started detailed discussion with Nichinan-cho in Tottori Prefecture, a forest owner's cooperative, and local companies.

This project is a new initiative for fully using local wood resources. It is part of an effort to realize total use of woods, which is one of the key measures of the Medium-Term Management Plan.

As the first business project, we developed a soil improvement additive DW fiber in collaboration with JCE Co., Ltd., and started making proposals since May 2017. The DW fiber is a soil improvement additive created by spreading domestically produced wood chips and adding fulvic acid\*, which facilitates the growth of plants. We will propose the product at a nationwide level to municipalities and contractors engaging in civil engineering work for additional soil needed for forming windbreak forest or greening slopes by spraying work.

\*Fulvic acid: A humic acid existing in forests and soils. It activates and promotes photosynthesis of plants. JCE Co., Ltd. is the owner of patents for technology to artificially generate fulvic acid.



Conceptual image of commercializing total cascading of woods



Wood chip



Soil improvement additive DW fiber



Formation of additional soil



Aerial greening work



Conceptual image of greening



Greening by spraying work

# For the Environment **E**



## Effective utilization of recycled resources

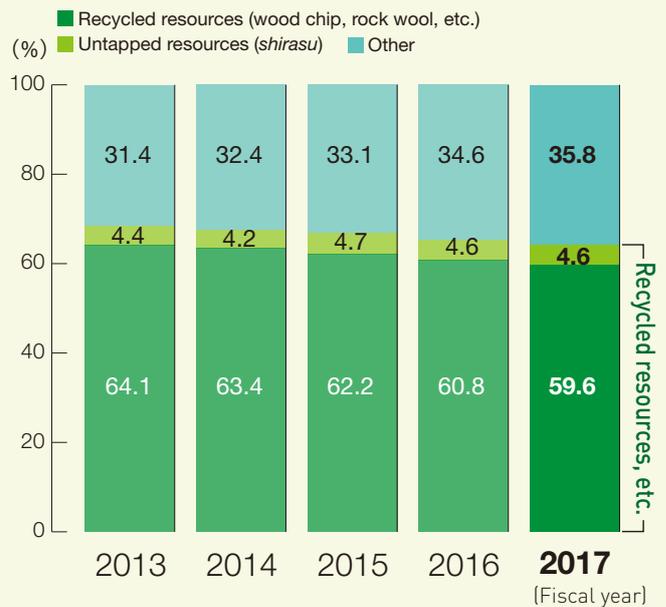
Current rate of using recycled resources on products **64.2%**

The Daiken Group is committed to the effective use of wood resources and untapped resources in developing and producing its products, as part of its efforts to realize a recycle-oriented society,

In fiscal 2017, the Daiken Group's total resource input was 323,000 tons with the ratio of recycled resources used standing at 64.2%.\*

We will continue to maintain and improve this ratio.

\*Ratio of recycled resources = Recycled resources used in producing products / total resources used x 100(%), recycled resources used in producing products = Recycled resources + unused resources



## 1. Recycle of woods

### Fully using wood resources by refining its manufacturing technologies

The Daiken Group promotes the recycling of woods by promoting wood planting, appropriate use of forest trees, and recycling products that have been used once.

In particular, we have been working on the effective use of wood resources for more than 50 years. As a result, we developed manufacturing technologies to use chips and residual wood offcuts generated by demolishing buildings, which had been wasted before. The recycling rate of insulation board was increased to 90%. The product is lightweight and superior in heat insulation, moisture absorption-desorption, and cushioning properties, and its quality is also highly evaluated by the market.

#### Insulation board

Wood fiberboard uses waste wood generated from the demolition of buildings as ingredients, which is a procurement item specified in the Green Purchasing Law.



#### MDF

Wood fiberboard uses residual wood offcuts generated from the demolition of buildings as ingredients, which is a procurement item specified in the Act on Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities.

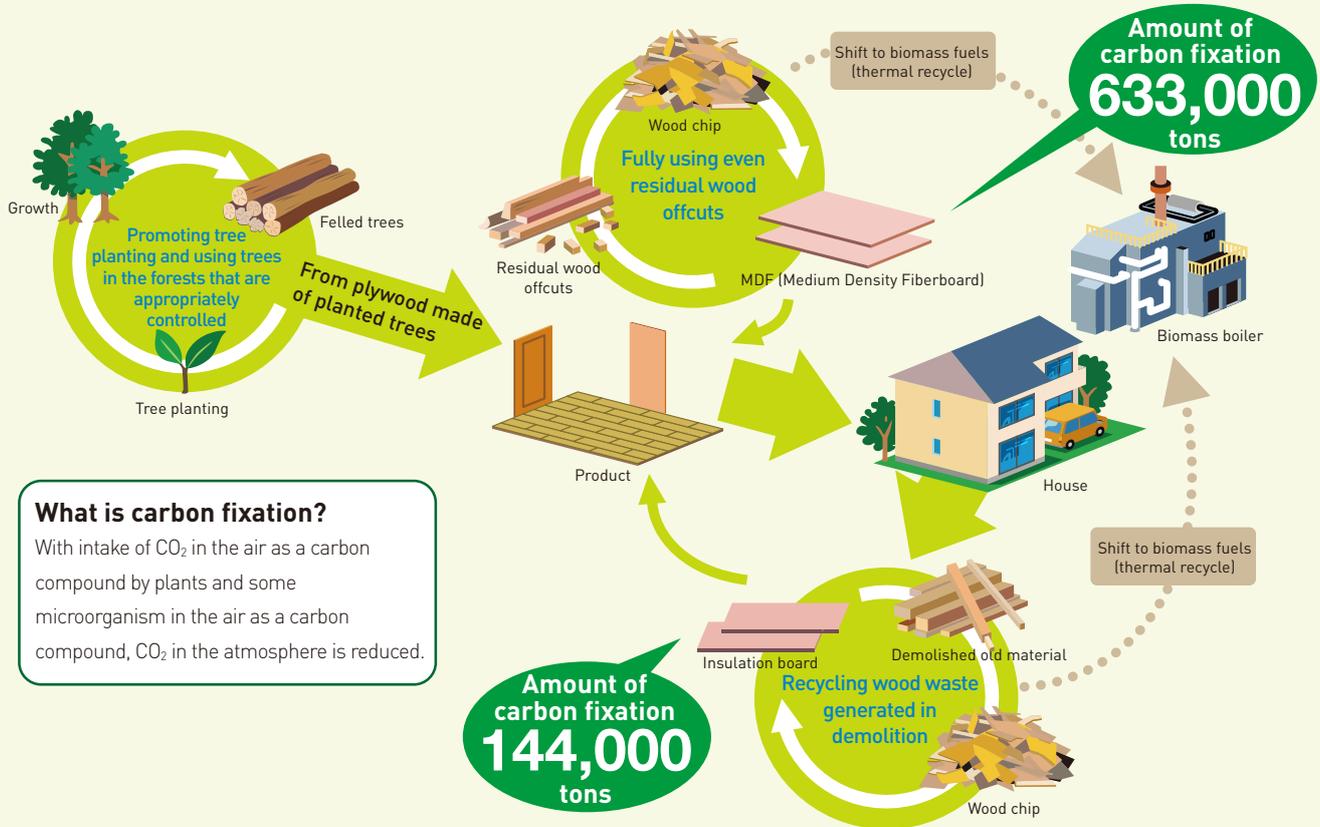


### Shifting the energy source in the manufacturing process to a wood biomass boiler

Daiken Corporation additionally installed a wood biomass boiler, which uses wood chips generated from construction wood waste, in its Okayama factory, which started operation from July 2016.

In the Okayama factory, there was a problem where the energy consumption of boiler used for generating heating steam

in the drying process was high. To address the problem, measures included the installation of a wood biomass boiler in 2007, and energy sources used for drying process using steam are now fully shifted to biomass energy. This will reduce annual CO<sub>2</sub> emissions by approximately 40,000 tons compared to that of 2006.



## 2. Effective use of untapped resources

### Commercializing mineral resources that were not used before with unique technologies

The Daiken Group commercializes byproducts produced in ironmaking, such as slag and *shirasu* (volcanic ash), which were not used before, with special processing to use them as ingredients. We are working towards a recyclable society by suppressing consumption of natural resources.

Further research is conducted to enable the product to demonstrate superior performance not only from an environmental perspective but also from a functional perspective, including non-combustibility and durability. It offers wide applications from the home domain to the industry domain, thereby contributing to society even more.

#### Dai-Lotone

The rock wool sound-absorbing board is manufactured using slag wool (fibered slag, which is a by-product produced in ironmaking) as raw material.



#### Dai-Lite

The inorganic panel is manufactured by making effective use of slag wool, a recycled material, and *shirasu* (volcanic soil), an untapped resource.



### Contribution for the promotion of earthquake resistance and local revitalization by ecological based materials

Daiken Corporation released Dai-Lite, the world's first material using *shirasu* as the main raw material, in 1997. It has grown and come to be renowned as a leading brand of inorganic bearing surface members intended for wooden houses and promoted anti-seismic houses.

Increasing the share of products using *shirasu* not only suppresses the consumption of natural resources but also contributes to local revitalization. For example, in the area in Kyushu where we collected *shirasu*, which is also a cause of debris flow, soil was improved, and now the area is filled with paddy fields. This is how we help revitalize local areas.