



# **Kajima Environmental Vision 2050plus**

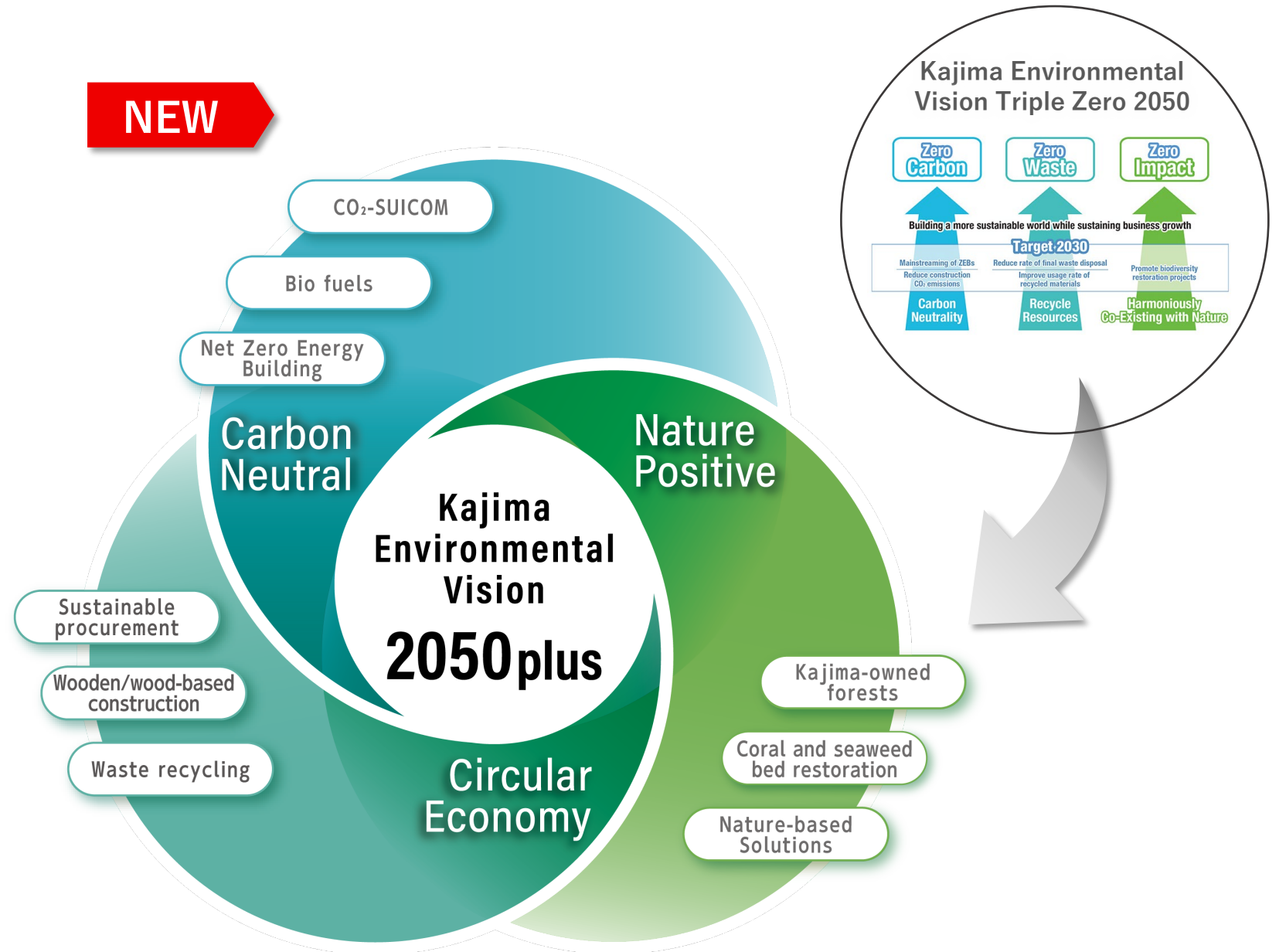
**May 14, 2024**

# Kajima Environmental Vision 2050plus

The previous environmental vision, established in 2013, was the Kajima Environmental Vision: Triple Zero 2050. It set out carbon neutrality, resource recycling and harmoniously co-existing with nature as the key aspects of a sustainable society and set three goals for Kajima to achieve by 2050: Zero Carbon, Zero Waste, and Zero Impact. This was our vision for the future, and the entire company has been working to achieve these goals.

Recently, however, we have updated the environmental vision, titling it the Kajima Environmental Vision 2050plus. With a new appreciation that the three initiative areas of carbon neutrality, circular economy, and nature positivity are interconnected, involving both synergistic effects and trade-offs, we have reset the Group's goals and action plans.

Knowing that we cannot fully implement the necessary initiatives alone, we have added the word “plus” to the name of the new environmental vision. This signifies our intention to work together with customers and society, and to remain persistent, so that the vision goals can be achieved by 2050. Based on the new vision, Kajima will continue to promote initiatives to help build a sustainable world where economic activity is balanced with environmental conservation.



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# 1. KPIs and Targets for 2050

	Carbon Neutrality	Circular Economy	Nature Positivity
FY2050 targets	<p><b>Achieve carbon neutrality</b></p> <p>Reduce the Kajima Group's greenhouse gas emissions (Scopes 1, 2, and 3) to net zero</p>	<p><b>Build a circular economy</b> (Recycling rate of 100%)</p> <p>Update infrastructure using sustainable resources to create high-quality assets</p>	<p><b>Promote nature positivity</b></p> <p>Promote nature positivity throughout the supply chain and help build a society where ecosystem services can be enjoyed in a sustainable way</p>
FY2030 targets	<p>■ <b>Emissions (compared to FY2021)</b>  <b>Scopes 1 &amp; 2: -42%</b>  <b>Scope 3: -25%</b></p> <ul style="list-style-type: none"> <li>• 100% green electricity use</li> <li>• 65% biofuel adoption rate<sup>2</sup></li> <li>• 40% usage rate for low carbon concrete<sup>2</sup></li> <li>• 20% usage rate for steel framework produced by electric furnaces<sup>2</sup></li> <li>• 100% ZEB achievement<sup>2</sup></li> </ul>	<p>■ <b>60% recycled material usage rate for main materials<sup>1</sup></b></p> <p>■ <b>99% recycling rate<sup>1</sup></b></p> <p>■ <b>Full-scale adoption of wooden/wood-based buildings</b></p> <p>■ <b>Social adoption of waste recycling technology<sup>1</sup></b></p>	<p>■ <b>Cumulative total of nature-based solutions (NbS) to be provided to customers and society (environmental certification, etc.): 100<sup>1</sup></b></p> <p>■ <b>Expansion of nature positive initiatives on Kajima-owned land<sup>1</sup></b></p>
FY2026 targets	<p>■ <b>Emissions (compared to FY2021)</b>  <b>Scopes 1 &amp; 2: -23%</b>  <b>Scope 3: -10%</b></p> <ul style="list-style-type: none"> <li>• Adoption of green electricity</li> <li>• Use of biofuels<sup>2</sup></li> <li>• Use of low carbon concrete<sup>2</sup></li> <li>• Use of steel framework produced by electric furnaces<sup>2</sup></li> <li>• 40% energy saving rate using ZEB<sup>2</sup></li> </ul>	<p>■ <b>40% recycled material usage rate for main materials<sup>1</sup></b></p> <p>■ <b>97% recycling rate<sup>1</sup></b></p> <p>■ <b>Expansion of wooden/wood-based buildings</b></p> <p>■ <b>Development of waste recycling technology<sup>1</sup></b></p>	<p>■ <b>Number of NbS to be provided to customers and society (environmental certification, etc.): 10 / year<sup>1</sup></b></p> <p>■ <b>Nature positive initiatives starting on Kajima-owned land<sup>1</sup></b></p>

1.Targets for businesses by Kajima (non-consolidated) and its domestic group companies

2.Targets for Kajima non-consolidated business

## 2. Synergies and Trade-Offs for the Three Initiative Areas

- Since initiatives for achieving carbon neutrality, circular economy, and nature positivity span multiple fields, some can be expected to have synergistic effects while others involve trade-offs
- We will especially emphasize initiatives that will likely have synergistic effects
- We will implement well-matched initiatives while considering trade-offs

### Synergy example

- Employing efficient design to reuse the underground structure of an existing building without alteration when constructing a new building on the site, thereby reducing the amount of building materials needed

#### Carbon Neutrality

Reduced construction work



#### Circular Economy

Reduction in building materials



#### Nature Positivity

Less land alteration (environmental degradation)

- Developing and using environmentally friendly concrete

#### Carbon Neutrality

Cement use reduction



#### Circular Economy

Efficient use of industrial by-products



#### Nature Positivity

Less land alteration (environmental degradation) due to raw material extraction

### Trade-off example

- Energy input needed for recycling hinders decarbonization

Promotes the circular economy

Recycling

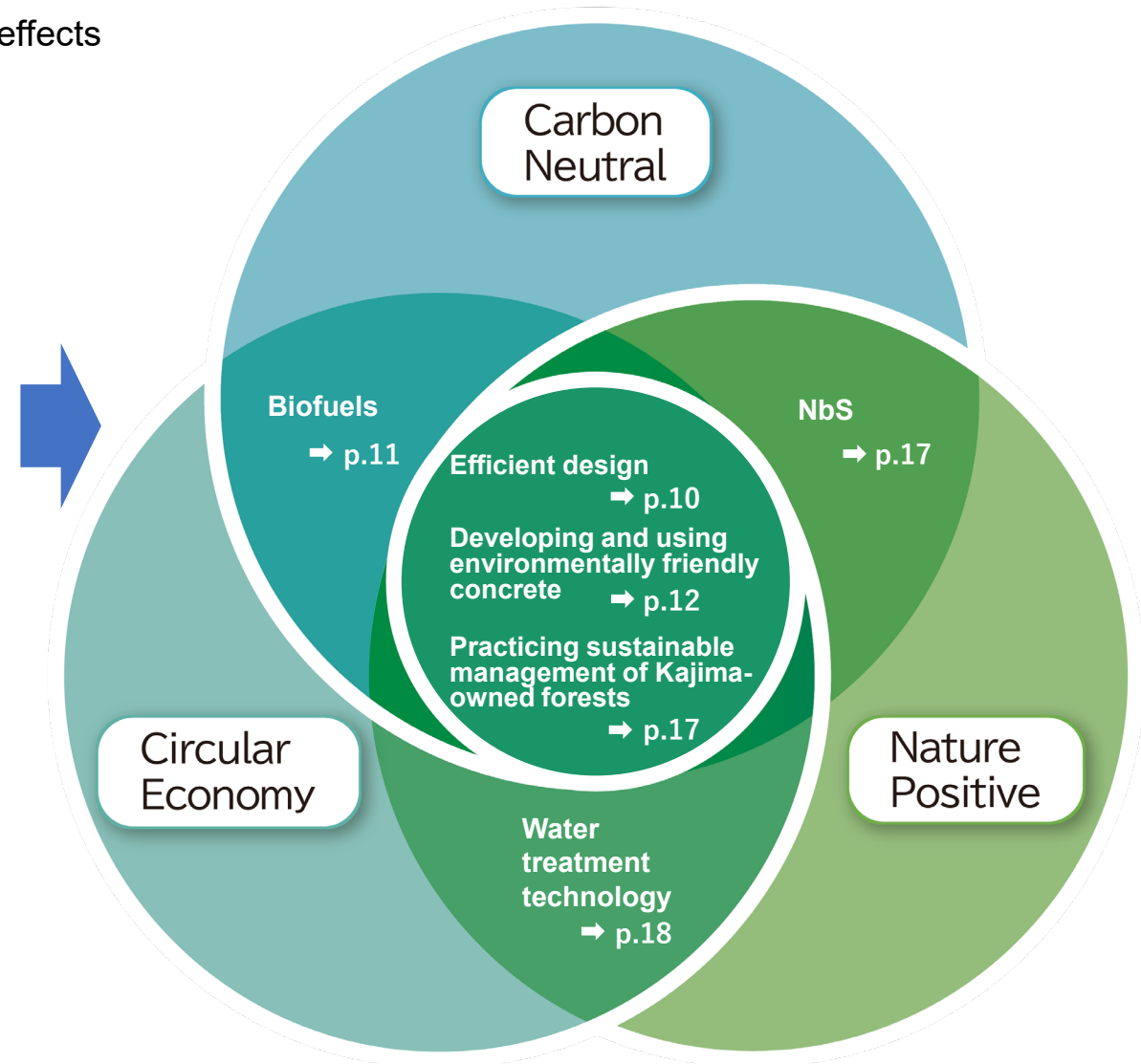


Hinders decarbonization

Energy input

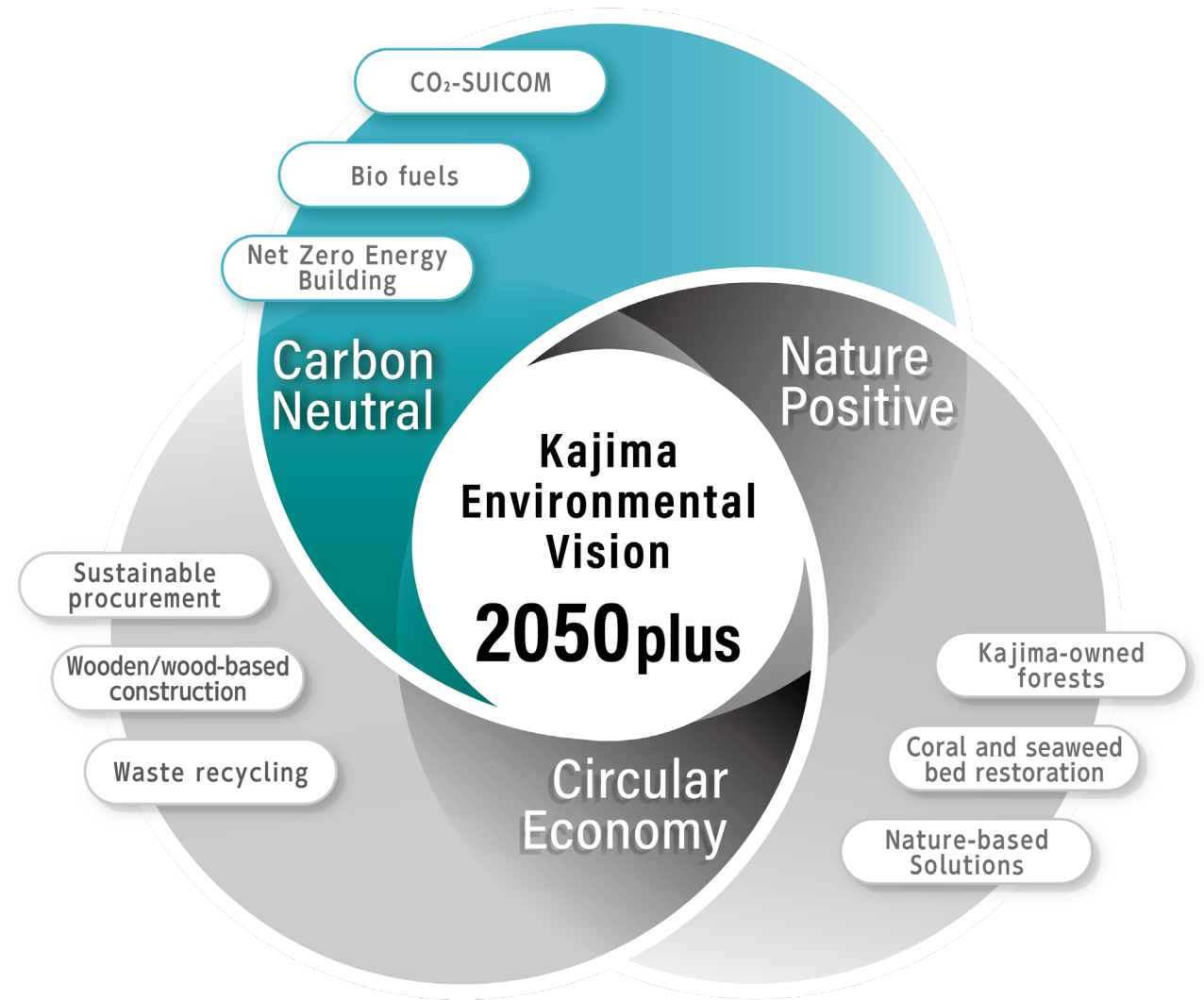


Targeting materials that require less energy for recycling



# 3. Carbon Neutrality

The Kajima Group's roadmap and initiatives for achieving carbon neutrality



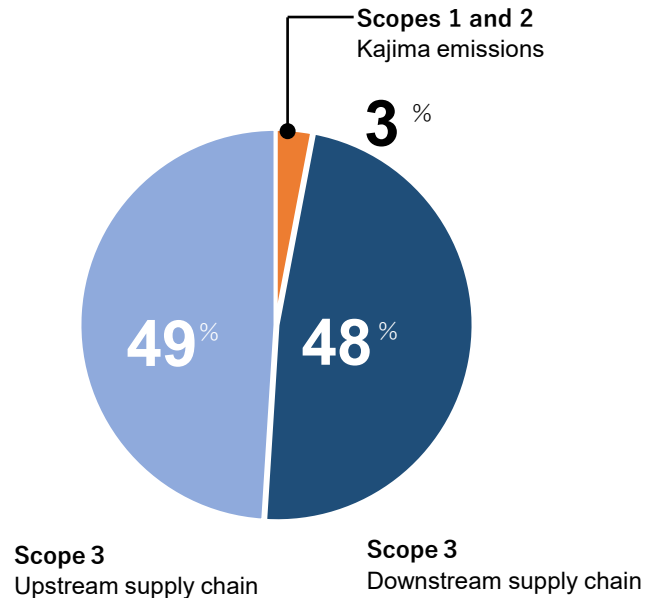
### 3. Overview of CO<sub>2</sub> Emissions from the Kajima Group's Supply Chain

Carbon  
Neutrality

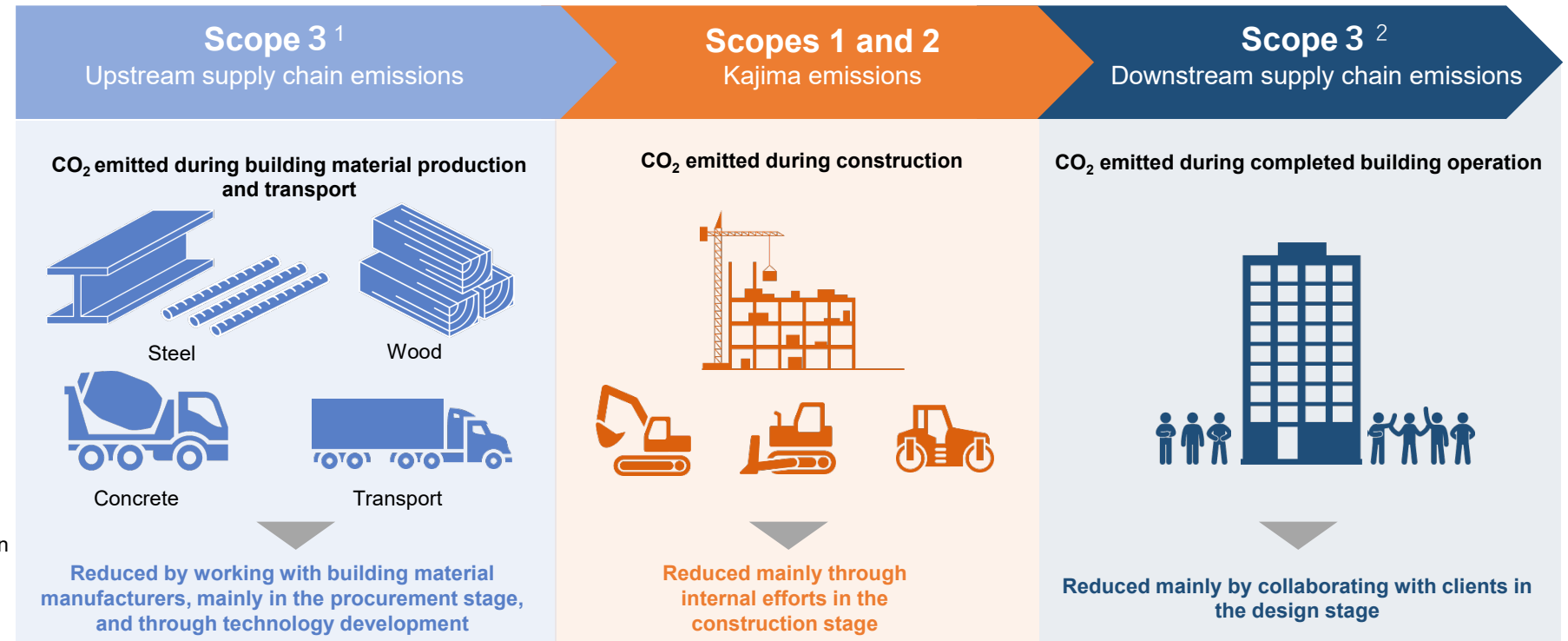


- Our Scope 1 and 2 emissions (those from construction activities and Kajima facility operation) are approximately 3% of the total
- We are proactively implementing reduction activities for Scope 1 and 2 emissions, focusing on construction sites
- Reducing Scope 3 emissions (those from the manufacture of building materials and the operation of completed buildings) requires collaboration with the companies concerned

CO<sub>2</sub> Emissions Breakdown



Emissions from Construction



1. Main emissions are Category 1 (those arising from purchased goods and services)

2. Main emissions are Category 11 (expected lifetime emissions from relevant products)

Note: For construction work outside Japan, CO<sub>2</sub> emitted by subcontractors during construction is included in Scope 3.



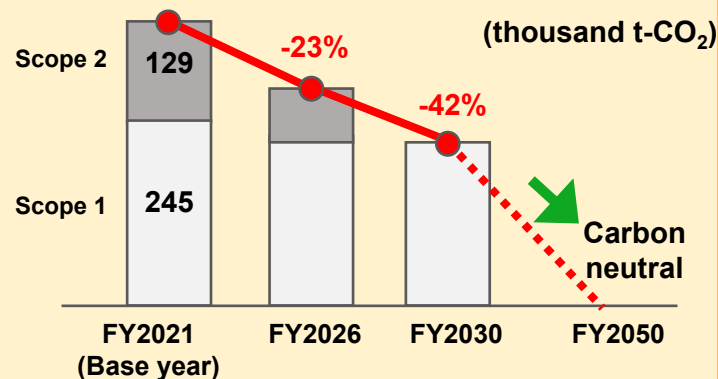
### 3. KPIs and Targets

- We have set emissions reduction targets to be achieved by FY2026 and FY2030, with the goal of carbon neutrality by FY2050
- By FY2026, we will quantify and disclose avoided CO<sub>2</sub> emissions, based on the provision of solutions for the reduction of emissions not included in Scopes 1, 2, and 3. These include emissions avoided by extending the lifespan of buildings and other structures, and by performing energy-saving renovations of buildings.

#### Scopes 1 and 2 Reduction of Kajima emissions

##### Targets

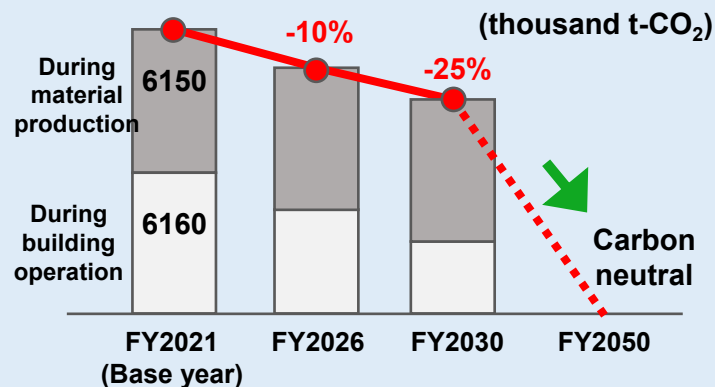
**23% reduction by FY2026**  
**42% reduction by FY2030**  
Carbon neutral by 2050



#### Scope 3 Reduction of supply chain emissions

##### Targets

**10% reduction by FY2026**  
**25% reduction by FY2030**  
Carbon neutral in all categories by 2050



+

#### Avoided emissions<sup>1</sup>

Reduction of emissions not included in Scopes 1, 2, and 3

##### Target

Quantify and disclose by FY2026

- Extended lifespans for buildings and structures
- Energy-saving renovations of buildings

1. CO<sub>2</sub> emission reductions from initiatives whose effects cannot be measured based on the GHG Protocol

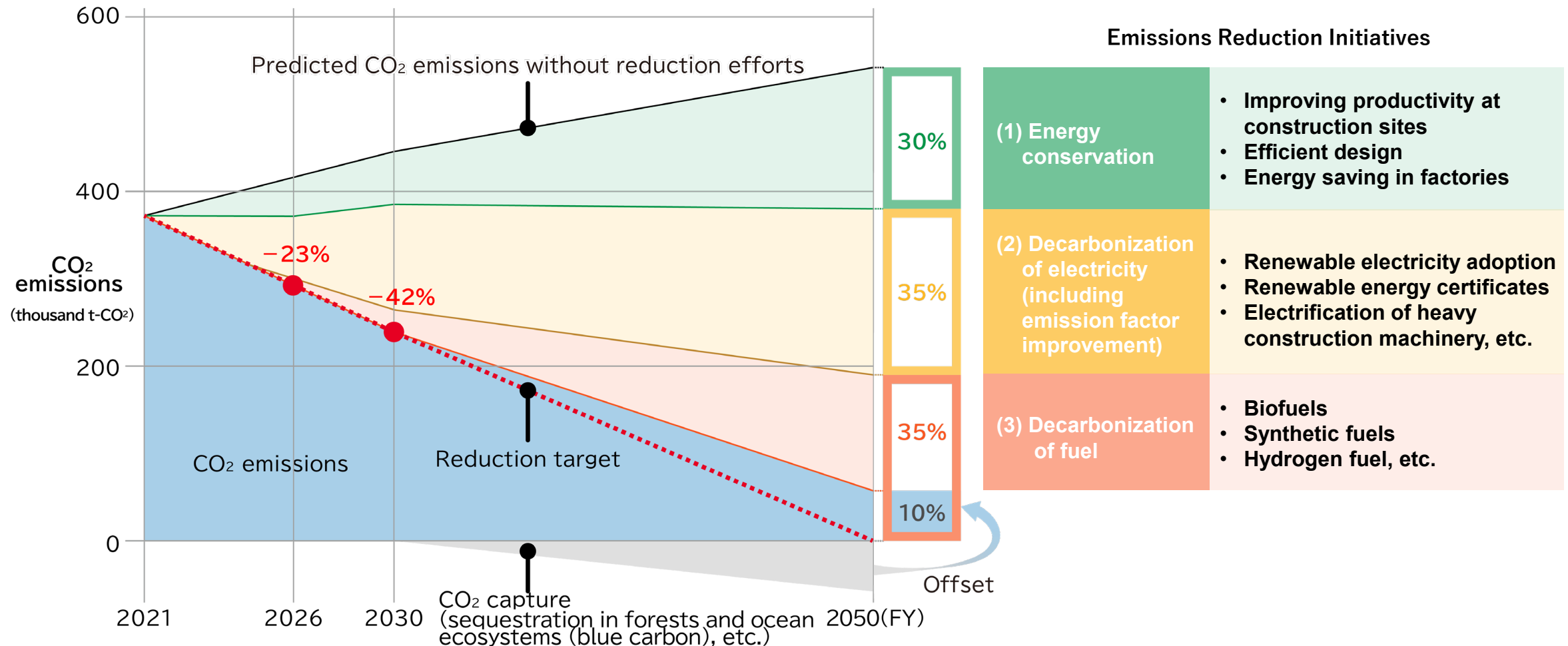
(Reference) Kajima's response measures for climate change physical risks are described on the company's website below.

[Disclosure of information under the TCFD](#) | [Sustainability](#) | [Kajima Corporation](#)



### 3. Roadmap for Reduction of Scope 1 and 2 (Kajima) Emissions

- With the aim of carbon neutrality by 2050, we are promoting initiatives for energy conservation, as well as decarbonization of the electricity and fuel we use
- Initially, we will prioritize electricity decarbonization and energy saving measures, which are relatively easy to implement, while gradually promoting fuel decarbonization
- We predict that some fuel use will be difficult to decarbonize by 2050, and carbon offsets will be needed as a result



### 3. Initiatives to Reduce Scope 1 and 2 (Kajima) Emissions: (1) Energy Saving



- After first implementing energy conservation (energy saving) initiatives, we will take further efforts, namely decarbonization of electricity and fuel use
- We will promote the development and application of technology aimed at improving operational efficiency in both the civil engineering and building construction areas, with the aim of improving productivity
- We will newly promote energy conservation (energy efficient operation and equipment upgrading) at facilities such as the asphalt plant owned by Kajima Road

#### CO<sub>2</sub> reduction effect from productivity improvement



##### **A<sup>4</sup>CSEL: Construction production system centered on autonomous operation of construction machinery**

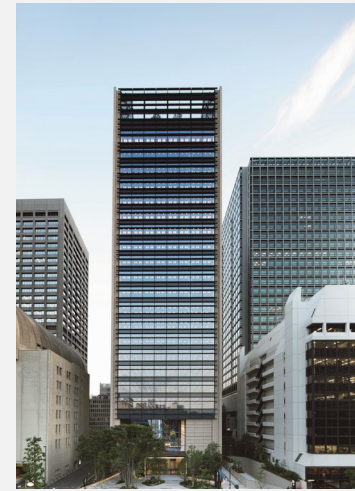
Using optimized autonomous operation technology to reduce fuel use by 40–50% compared to manned operation



##### **Digital twinning provides a virtual representation of a building design, construction process, or building operations using real-time data**

Reducing CO<sub>2</sub> emissions by improving operational efficiency to prevent rework, etc.

#### Efficient design that reduces the amount of construction work and building material input



**For Hibiya Parkfront, the existing underground structure was used with practically no modification for constructing the new building**

#### Energy saving at asphalt plants



##### **By reducing combustion temperature during asphalt production, less fuel is needed (Kajima Road)**

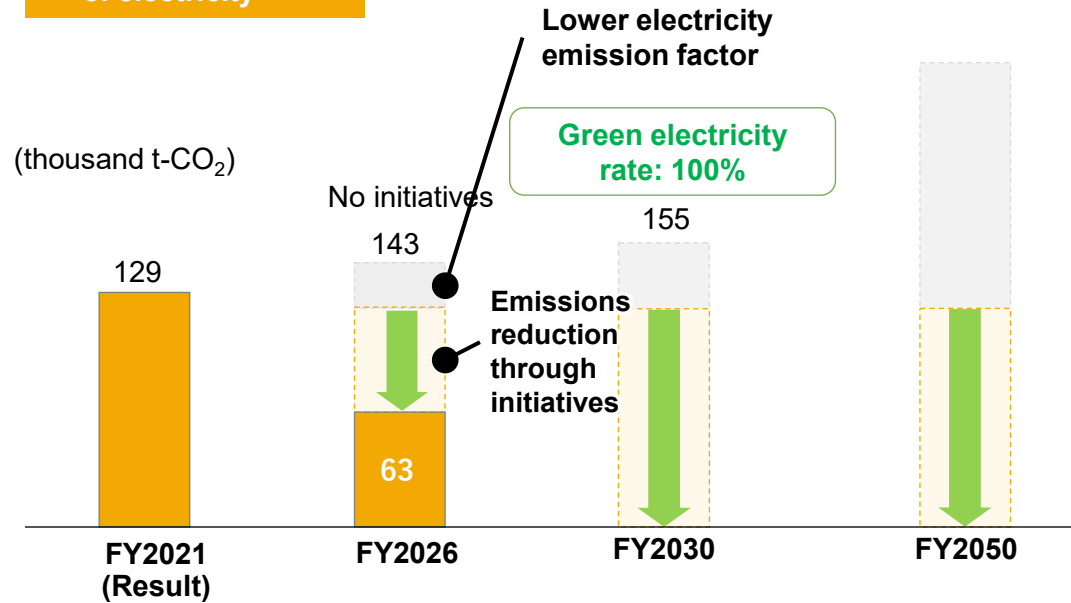
As Kajima Road accounts for approximately a fourth of the Group's CO<sub>2</sub> emissions, we will start new reduction measures (energy efficient operation and equipment upgrading).

### 3. Initiatives to Reduce Scope 1 and 2 (Kajima) Emissions: (2) Decarbonization of Electricity (3) Decarbonization of Fuel



#### (2) Decarbonization of electricity

Reduction plan for Scope 2 emissions (from electricity)



#### ● 100% green electricity use by FY2030

Purchasing renewable electricity from power companies  
Using renewable energy certificates for purchased electricity  
⇒ For the future, using our own renewable energy certificates, and making direct use of renewable electricity generated by Kajima's own equipment

#### ● Investing in renewable electricity sources to cover internal power consumption in Japan

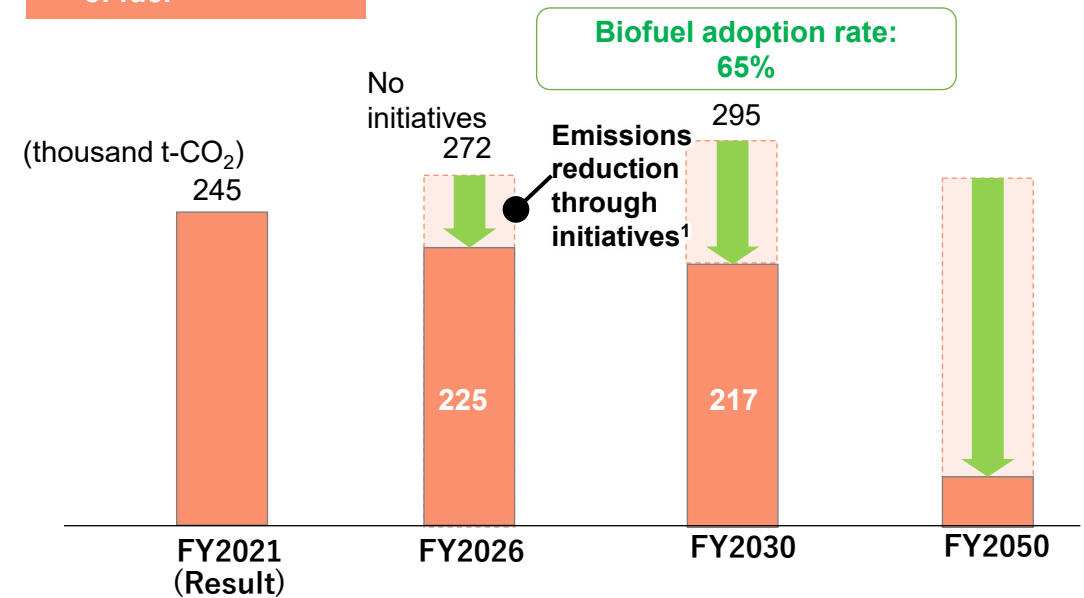
Continuing to invest with the aim of securing renewable electricity generation capacity that exceeds power requirements in Japan by FY2030



Wind turbines of Oga Wind Power Co., Ltd., in which Kajima has a financial stake

#### (3) Decarbonization of fuel

Reduction plan for Scope 1 emissions (from fuel)



#### ● Biofuel adoption rate of 65% by FY2030<sup>2</sup>

##### Fuel to generate power

Using light fuel oil mixed with biofuel

⇒ Gradually increasing the biofuel rate

⇒ Plan to use synthetic fuel and hydrogen in the future

Adoption of an internal carbon pricing system

##### Fuel to generate heat

Plan to switch from Type A heavy oil to LNG with its low emission coefficient, and to utilize biofuel co-combustion

⇒ Hydrogen fuel adoption in the future

1. Includes fuel use efficiencies such as productivity improvement and energy saving in factories

2. Non-consolidated Kajima target



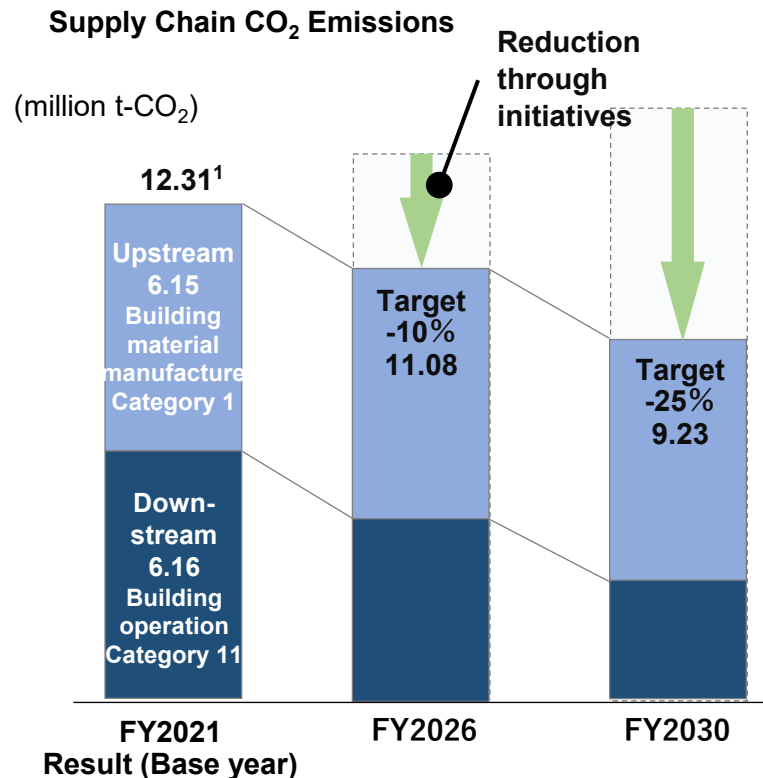
Kajima Group company Toshi Kankyo Engineering produces biofuel from waste cooking oil for use at Group construction sites, etc.





### 3. Initiatives to Reduce Scope 3 (Supply Chain) Emissions

- As the reduction of Scope 3 (supply chain) emissions requires collaboration with other participants, focusing first on internal measures
- To reduce Scope 3 Category 1 emissions, developing and using low-carbon building materials (i.e., concrete and concrete/steel, respectively), while promoting ZEBs to reduce Category 11 emissions



1. Scope 3 total: 13.45 million t-CO<sub>2</sub>

#### Upstream: Category 1 (CO<sub>2</sub> from material manufacture)

Main Materials	(1) Concrete <ul style="list-style-type: none"> <li>Low-carbon concrete <b>Focus</b> Usage rate <b>40%</b><sup>2</sup> (Eco-Crete, blast furnace slag concrete, etc.)</li> <li>CO<sub>2</sub>-absorbing concrete (CO<sub>2</sub>-SUICOM), etc.</li> </ul>
	(2) Steel products <ul style="list-style-type: none"> <li>Use of steel framework produced by electric furnaces <b>Focus</b> Usage rate <b>20%</b><sup>2</sup></li> <li>Adoption of steel materials produced with low CO<sub>2</sub> emissions</li> </ul>
	(3) Other (wood frames, etc.)
Other materials	(4) Efforts by material manufacturers to reduce their own emissions and the adoption of products with low CO <sub>2</sub> emissions

#### Downstream: Category 11 (CO<sub>2</sub> from building operation × 60 years)

Energy saving design	(5) Reduction of building energy consumption <b>Focus</b> Design target <b>-50%</b> <sup>2</sup> (Compared to FY2013 level)
Green electricity	(6) Improvement of electricity emission factor

2. Targets for Kajima non-consolidated business

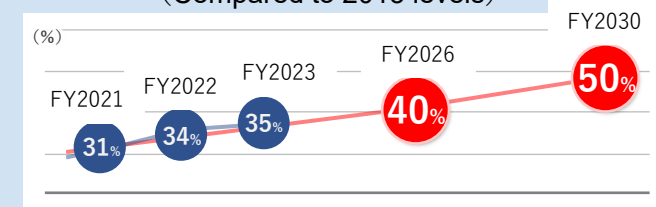
#### Development and use of low-carbon building materials



- Planned for Expo 2025 Osaka, Kansai, Japan, the CUCO®-SUICOM Dome will be made from environmentally friendly COCO-SUICOM Shot concrete. This concrete absorbs and fixes a large amount of CO<sub>2</sub> during the curing process, so the CO<sub>2</sub> generated across all production stages is negative.

#### Promotion of ZEB adoption

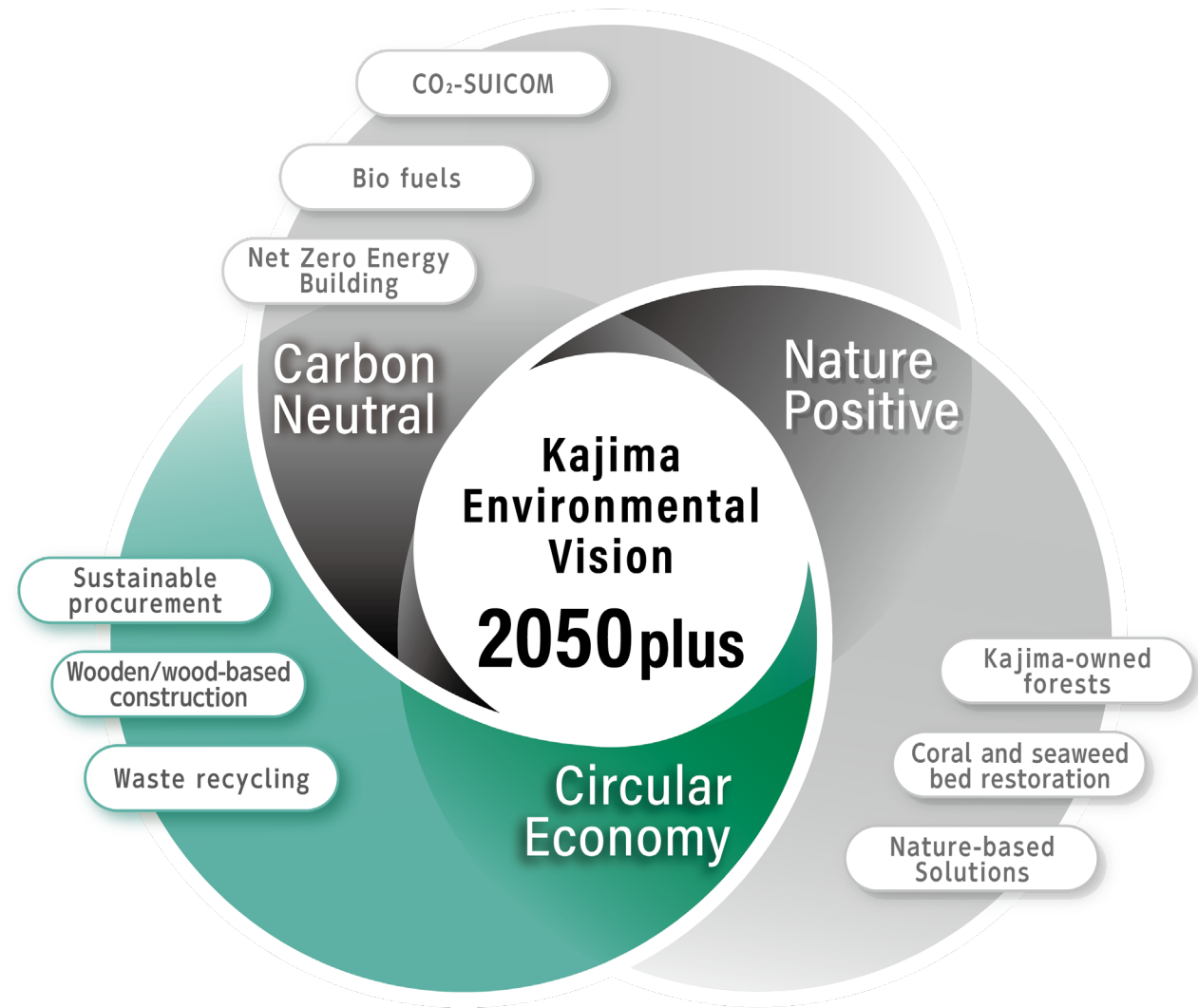
CO<sub>2</sub> reduction rate during building design, construction and operation stages (Compared to 2013 levels)



- Aiming to halve CO<sub>2</sub> at the stage of building operation by making all buildings designed by Kajima ZEB level (ZEB, Nearly ZEB, ZEB Ready, ZEB Oriented) by FY2030

# 4. Circular Economy

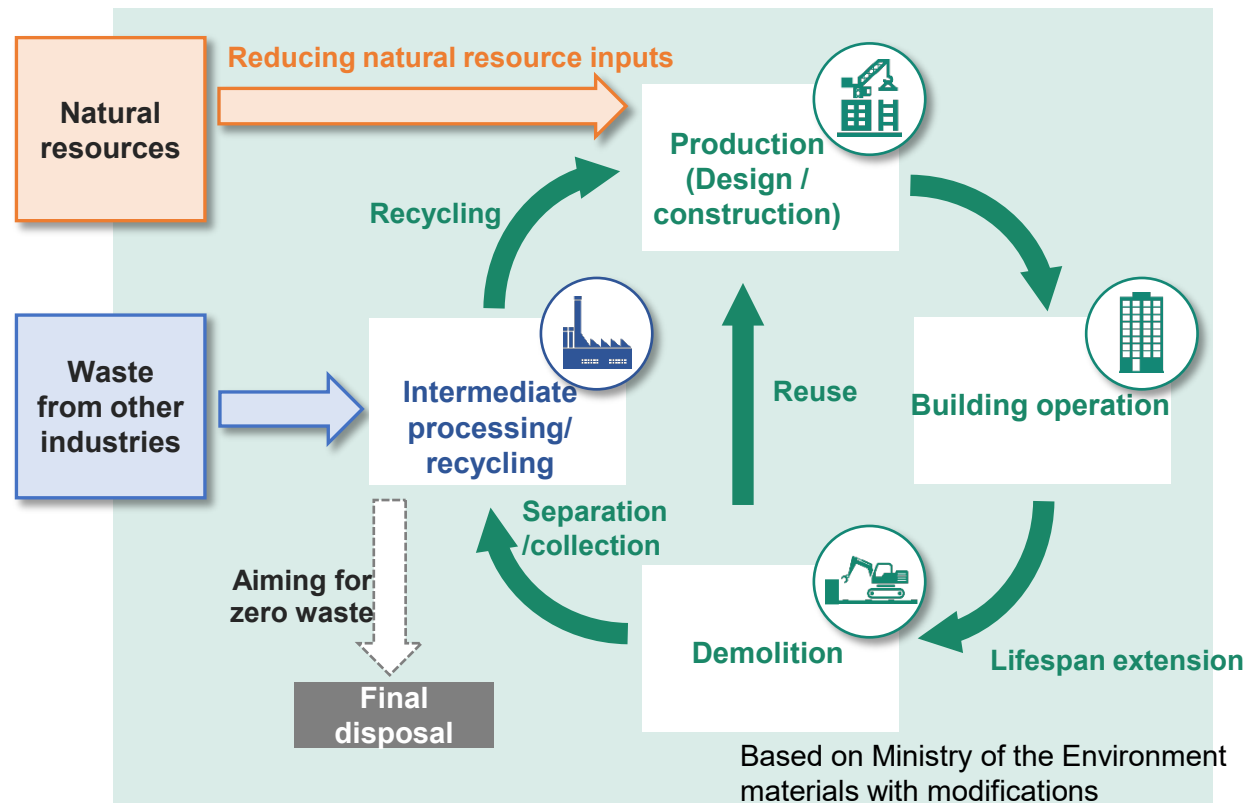
Kajima roadmap and initiatives for circular economy realization



## 4. Aiming to Build a Circular Economy

- Our efforts to contribute to a circular economy have been based on the aim of ultimately achieving zero waste by thoroughly implementing 3R<sup>1</sup> activities in pursuit of zero emissions
- Going forward, our circular economy efforts will go beyond conventional 3R initiatives to include economic activities that create added value by effectively utilizing existing resources while reducing resource input and consumption
- We aim to reuse and recycle more materials and to limit natural resource inputs, while taking into account the trade-offs involved in trying to achieve both carbon neutrality and nature positivity.

### Circular Economy Efforts in the Construction Business



1. Reduce, reuse, and recycle

### Expanding the use of recycled materials



Kajima × Tohoku University Co-creation Research Center established

### Expansion of wooden/wood-based buildings



Jutec headquarters building constructed using FR Wood, a laminated pure-wood fire-resistant structural lumber developed by Kajima

### Waste separation and collection



Thorough separation and collection of various types of waste at a construction site sorting area

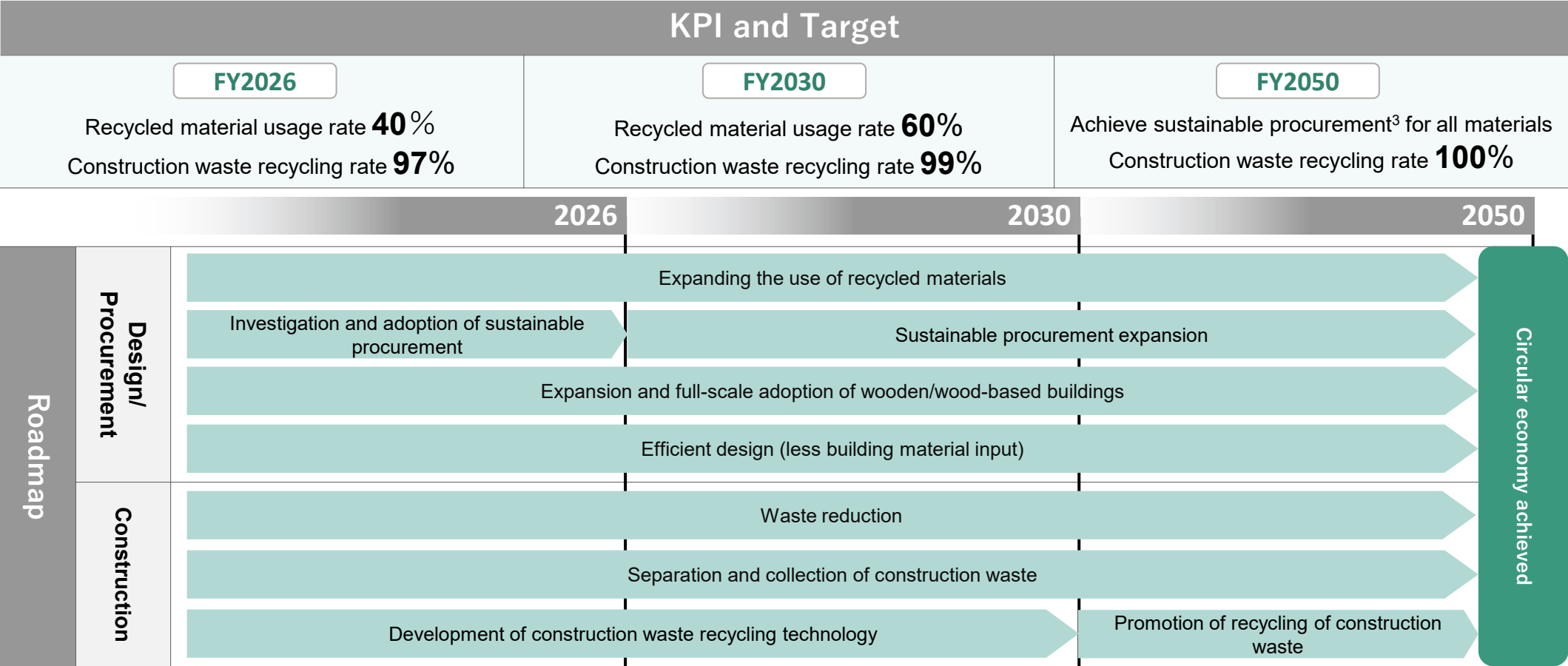
### Concrete waste recycle



Concrete debris is reused as roadbed materials and asphalt debris is reused as a raw material for new asphalt

# 4. KPIs, Targets, and Roadmap

- With the aim of helping to build a circular economy by FY2050, Kajima has adopted relevant KPIs, namely for recycled material usage rate<sup>1</sup> and construction waste recycling rate<sup>2</sup>, and will increase these targets in phases
- Initiatives are being planned for each operational stage of design, procurement, and construction, and the measures will be steadily implemented

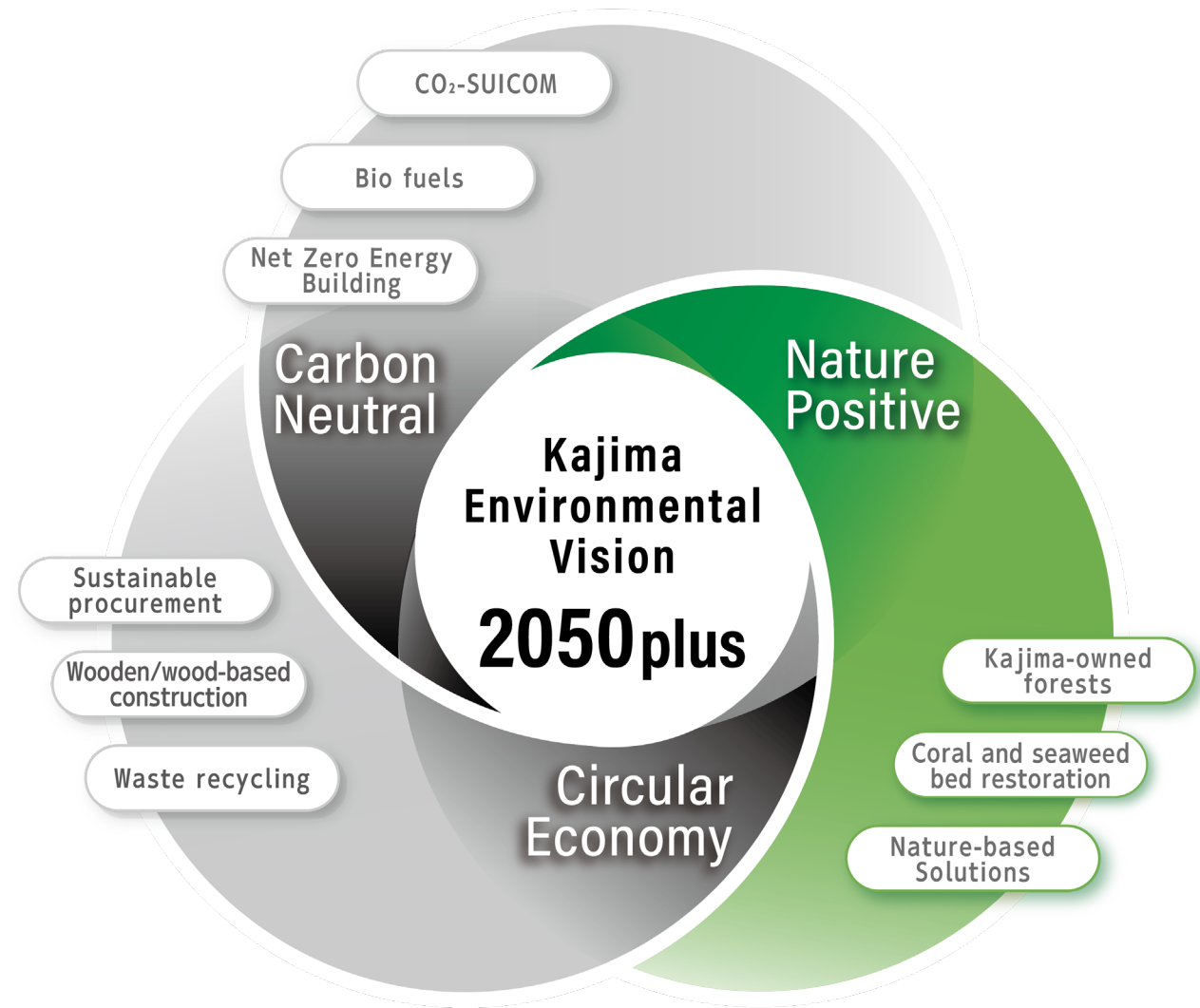


1. Recycled material usage rate = Percentage of recycled materials used  
2. Construction waste recycling rate = Percentage of construction waste sent for material, chemical, or thermal recycling  
3. Sustainable procurement means procurement of environmentally and socially friendly building materials throughout the supply chain



# 5. Nature Positivity

Kajima roadmap and initiatives for becoming nature positive



## 5. Promoting Nature Positivity



- Until now, Kajima has tackled the goal of harmoniously co-existing with nature by focusing on biodiversity conservation activities such as the conservation of rare species
- From now on, we will base our efforts on the concept of nature positivity, which involves striving both to halt and reverse biodiversity loss
- What are Kajima's nature positivity goals?
  - (1) Eliminate negative impact on the environment (implement measures to reduce negative impact)
    - Proper onsite handling of hazardous materials, and thorough water management
  - (2) Help revive and regenerate the natural environment (biodiversity, etc.) by implementing initiatives to increase positive impact
    - Providing NbS to customers/society (including the acquisition of third-party environmental certification and awards, etc.)
    - Environmental restoration on Kajima-owned land (registration of company-owned forests as effective area-based conservation measure (OECM) sites, etc.)

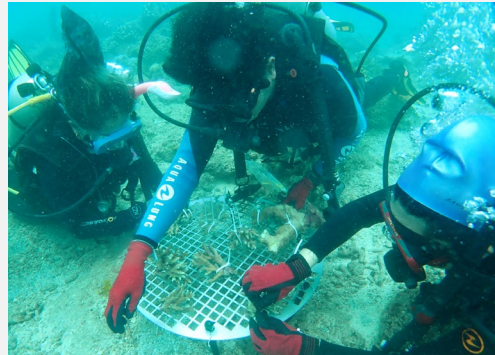
### Initiatives to increase positive impacts



Obtained ABINC environmental certification for the Tokyo Portcity Takeshiba office tower



The Hayama Eelgrass Council is using Kajima technology for large-scale seaweed bed restoration off the Hayama coast, thereby earning J Blue Credits



Coral reef restoration project InCORE™ launched in the Philippines



Mt. Hikage and Bonari Forest in Fukushima Prefecture have been certified by the Ministry of the Environment as OECM sites

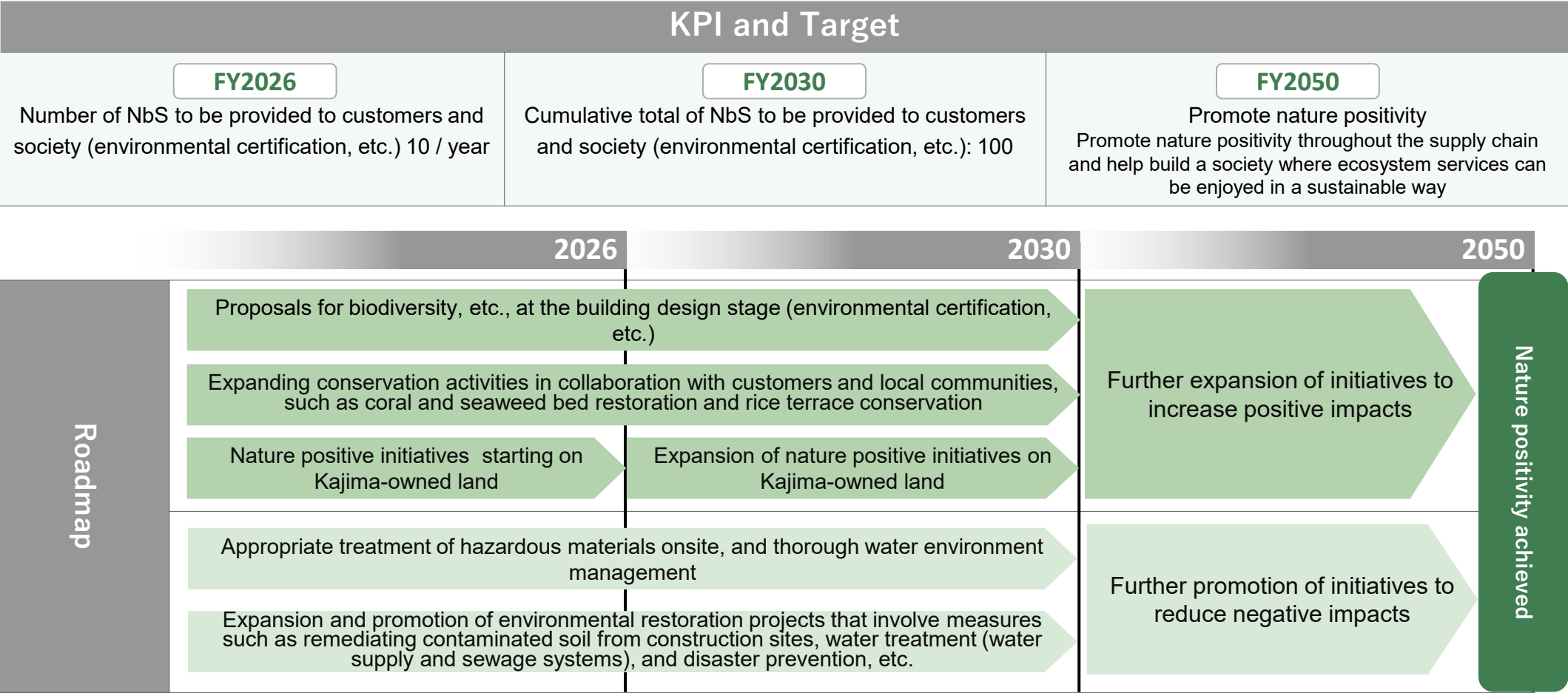
### Initiatives to reduce negative impacts



Emergency waste treatment with quick and appropriate processing and disposal

# 5. KPIs, Targets, and Roadmap

- As part of Kajima's change of emphasis from harmoniously co-existing with nature to nature positivity, we have set new types of KPIs and targets
- Since initiatives for carbon neutrality and circular economy not included in this nature positivity roadmap can also help promote nature positivity, it is important to pursue initiatives in all three areas



# 6. Implementation Structure for the Kajima Environmental Vision 2050plus

- Kajima Environmental Vision 2050plus is being implemented by the Environment Committee, which is a specialized body under the Sustainability Committee. In addition to Group companies, the Environment Committee has six divisions, namely, Civil Engineering, Building Construction, Environmental Engineering, Engineering, R&D, and Real Estate Development. To handle cross-division issues, there are four subcommittees (Environmental Management, Construction Environments, Circular Economy, and Nature Positivity), and working groups are also created as necessary to deal with issues such as compliance with energy conservation laws.
- The role of the Environmental Engineering Division is to proactively promote participation in renewable energy projects, etc.
- The progress status of relevant initiatives is regularly reported to the Board of Directors through the Sustainability Committee.

