2025/08/20

TCFD Report 2025

TAKENAKA

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Based on our Group Growth Strategy launched in 2014, the Takenaka Group has been working toward the realization of a sustainable society. However, in order to respond to the dramatic changes currently occurring that are pushing the Earth beyond its limits, it is essential to designedly create a more positive impact. Going forward, it is necessary to adopt a "regenerative" mindset and attitude, aiming to pass on a healthier and more prosperous earth to future generations. We have therefore established a new Management Vision for the Takenaka Group as shown in Figure 1. This outlines the goals and direction each of our group's businesses should aspire to.

The Takenaka Group Management Vison

The Takenaka Group aims to provide high quality works and services while continuing to take on the challenge of improving the global environment.

TAKENAKA Regenerative Challenge
Beyond sustainability

Figure 1 Takenaka Group Management Vision

In 2019, Takenaka Corporation identified its major objectives (materiality). Subsequent reviews in 2022 and 2024 according to changes in the business environment resulted in consolidation into five groups of major objectives and 13 major objectives as shown in Table 1. Three groups are related to sustainability, which include climate change, as follows: "Sustainable urban creation," "Harmonization with the environment," and "Steady operation processes." Among these, the one directly related to climate change is "Harmonization with the environment," which is outlined in red in Table 1. Its three major objectives are comprised of "Taking up the challenge of life-cycle CO_2-zero buildings (decarbonization)," "Urban creation in harmony with nature (coexistence with nature)," and Urban creation that circulates resources (resource circulation).".

Table 1 List of Major Objectives (after review in 2024)

Major Objective Groups	Major Objectives (materialities)
Sustainable urban creation	Fostering culture through urban creation that stimulates the senses and by developing our services
Harmony with the environment	Taking up the Challenge of life-cycle CO_2–zero buildings
	Urban creation in harmony with nature
	Urban creatiob that recycles resources
Work style and productivity reform	Pursuing processes that are sustainable and highly productive
	Reforming business through digitalization
	Realizing healthy and rewarding workplace environment with a diversity of people
	Securing, developing, and retaining human resources (employees)
	Guaranteeing appropriate working conditions, such as work hours (employees)
Steady operation processes	Providing safe operations and high-quality services
	Realizing workplaces without accidents or public disasters
	Realizing sustainable supply chains
Respect for human rights	Respect for human rights

We have formulated a Medium-Term Management Plan 2030 as a strategy to realize our newly established Group Management Vision. The five major objectives mentioned above were carried over into the Medium-Term Management Plan 2030, and our response to "harmony with the environment" has been summarized and incorporated into our Environmental Strategy 2050. As shown in Figure 2, we are specifically working to provide environmentally friendly buildings and services, reduce our environmental impact, and outline measures to comprehensively promote decarbonization, resource circulation, and coexistence with nature. Through these measures, we aim to realize a sustainable society with the road ahead being a future society of regeneration and well-being.

Regarding climate change response, we began analyzing business impacts, risks, and opportunities related to climate change, and reflecting these in our strategy in 2019. In January 2021, we endorsed the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and began disclosing information in line with these recommendations, which we have continued to update. We have now updated our disclosure report in line with TCFD recommendations, reflecting the risk and opportunity analysis revised in 2024. Our initiatives related to nature co-existence are separately disclosed in a report aligned with TNFD recommendations.

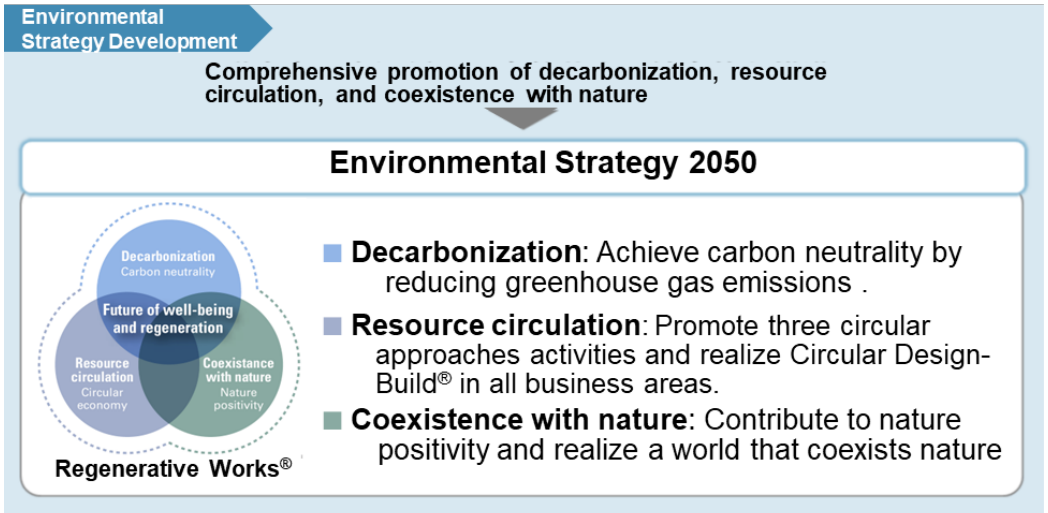


Figure 2 Overview of Environmental Strategy 2050

Our efforts toward "harmonization with the environment" are proceeding under a governance organization for responding to climate change as shown in Figure 3. Of these, the risk management system is explained in "3. Risk Management."

Our group has positioned global environmental issues as an important management task, and we have established Environmental Strategy 2050 as the foundation of for our Medium-Term Management Plan 2030. Therefore, our Board of Directors deliberates on proposals submitted by the Sustainability Exective Committee concerning global environmental issues, makes decisions on important matters related to the management plan, and delegates their execution to our president.

The Sustainability Exective Committee, which is chaired by our president, meets four times a year and is composed of senior management, including relevant executive officers, heads of Head Office divisions and business divisions, as well as executive officers of major group companies. This committee deliberates and approves reports and proposals submitted by the Global Environment Committee concerning matters related to sustainability in general, including the global environment. Based on these, we formulate strategies for the entire group, reflect them in group policies and business strategies, and in response to global environmental issues, submit important matters related to our management plan to our Board of Directors. Items to be included in the management plan are submitted to the Board of Directors after deliberation by the Management Plan Exective Committee.

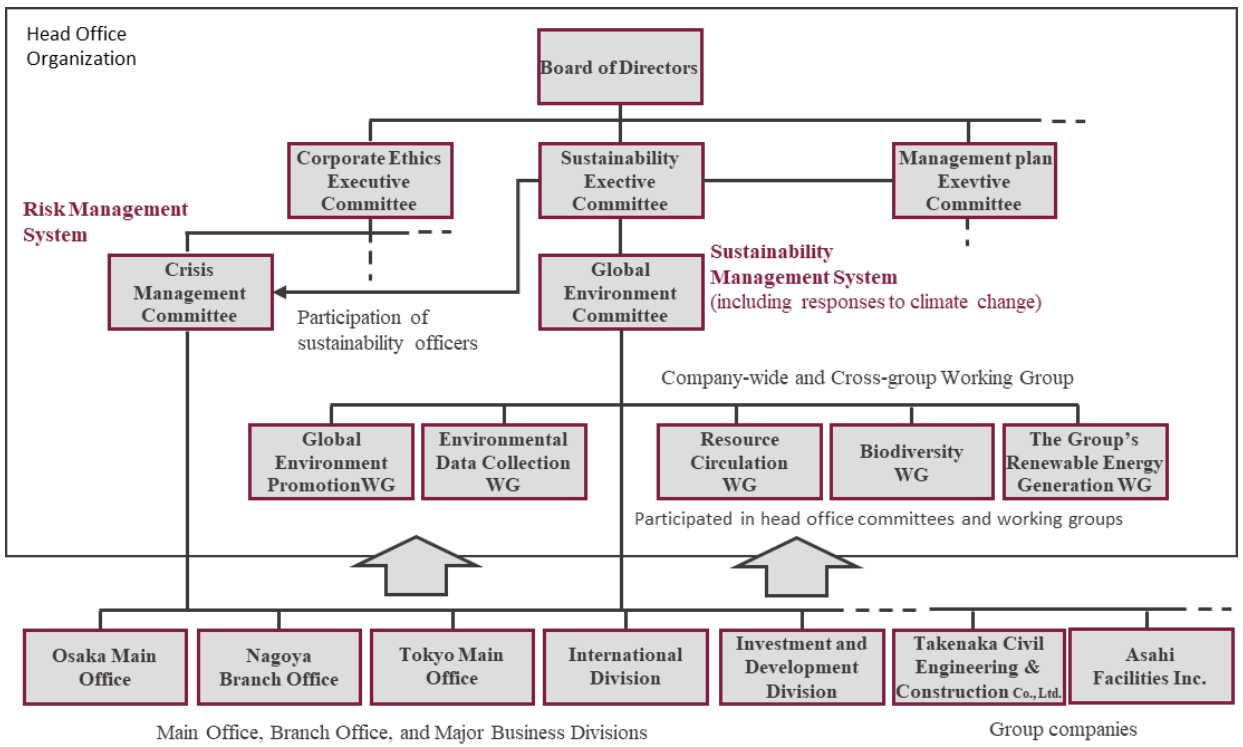


Figure 3 Governance and risk management organization for the group's climate change response

The Global Environment Committee, which is chaired by the executive officer in charge of sustainability, meets four times a year and is composed of heads of Head Office divisions and business divisions, officers from major branches, as well as officers of ajor group companies. This committee deliberates reports and proposals submitted by subsidiary company-wide and cross-group working groups (WGs), identifies climate-related risks and opportunities, approves strategies and countemeasures, and monitors implementation status. These matters are then reported to the Sustainability Executive Committee.

To comprehensively consider all aspects of sustainability, we have established company-wide and cross-group working groups (WGs) organized by field under the Global Environment Committee. Here, major branch offices, business divisions, and group companies participate by field to analyze the impact of climate change on their operations. Risks and opportunities are identified, countermeasures and strategies are formulated, and progress is reported to the Global Environment Committee.

Decisions and instructions made by the Board of Directors and each committee are communicated to each main and branch office, business division, and group company via each WG. These are then reflected in each department's plans.

An overview of the committees and WGs related to our group's climate change response are shown in Table 2. The Corporate Sustainability Department of the Corporate Strategic Planning Division consistently serves as the secretariat for these committees and WGs, striving to ensure their smooth operation.

Table 2 List of climate change response committees and working groups in our group

Name of committee/WG	role	remarks
Management Plan Executive Committee	Lead the development and implementation of the management plan and address any issues	Secretariat is the Corporate Strategic Planning Division
Sustainability Executive Committee	Deliberation, planning, and promotion of important policies and plans related to sustainability in general, including the global environment, and sustainability activities	Secretariat is the Corporate Sustainability Department
Global Environment Committee	Study on promotion of global environmental activities	
Global Environment Promotion WG	Formulate and promote company-wide and cross-group plans related to the global environment and performance management	Leader and Secretariat is the Corporate Sustainability Department
Environmental Data Collection WG	Formulation of calculation rules, collection and analysis of environmental data (GHG emissions, etc.)	
Resource Circulation WG	Establishment and promotion of company-wide and cross-group plans related to resource circulation and performance management	
Biodiversity WG	Formulate and promote company-wide and cross-group biodiversity-related plans and performance management	
The Group’s Renewable Energy Generation WG	Planning, promotion, and performance management of the Group's renewable energy power generation business	

2.1 Basic Awareness of the Impact of Climate Change

In recent years, Japan has experienced large typhoons and heavy rainfall almost every year due to abnormal weather patterns caused by climate change. The Takenaka Group is involved in the construction of many high-rise buildings and civil engineering structures that are highly susceptible to typhoon, as well as large buildings with basements that are vulnerable to flooding from torrential rain. We therefore recognize the significant risk of climate change impact on these projects. Rising temperatures and intensifying natural disasters are expected to increase health risks such as heatstroke at construction sites and lead to schedule delays due to disruptions to transportation networks.

At the same time, reducing CO_2 emissions in residential and commercial sectors is an urgent issue in Japan. Amendments to the Building Energy Efficiency Act have expanded the scope of mandatory compliance and called for further improvements in the energy-saving performance of buildings. A building's energy-saving performance has a significant impact on the customer's greenhouse gas emissions during its operation and throughout its service life. We also recognize that primary materials procured in building construction, such as steel and concrete, emit large amounts of greenhouse gases during their manufacturing process, and that this has a significant impact on a customer's business in terms of greenhouse gas emissions throughout the entire life cycle of a building. In our own business, furthermore, fuel for heavy machinery used at construction sites and electricity used in the business as a whole are major sources of greenhouse gas emissions, so we must reduce these emissions.

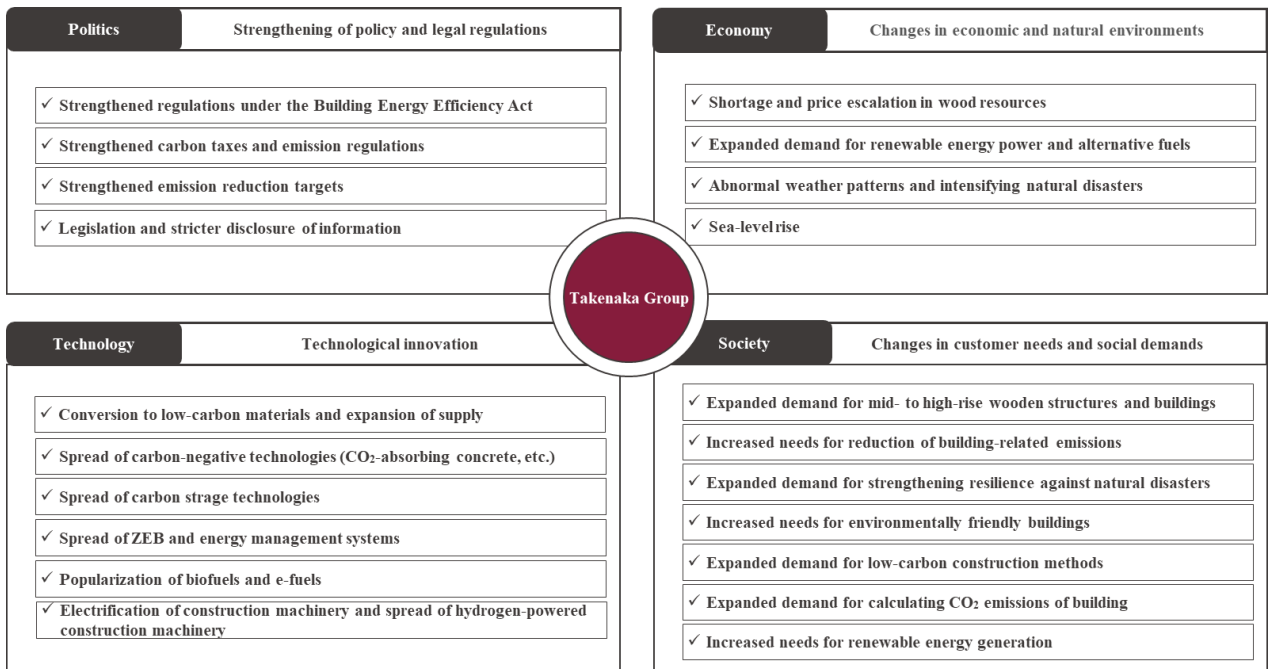


Figure 4 Anticipated social and environmental changes from events that may occur due to the effects of climate change

2.2 Policies and Processes for Scenario Analysis

Based on these circumstances, in 2019 the Takenaka Group conducted a cross-departmental review within its Global Environmental Promotion Working Group to examine the risks and opportunities of climate change affecting our business. Scenario analysis was performed while drawing on the opinions of external experts. We are also considering the relationship with the 2015 Paris Agreement and the SDGs (Sustainable Development Goals). In 2024, members of our Global Environment Promotion Working Group took changes in the business environment into account to reexamine the environmental impacts, risks, and opportunities of our group's businesses. In this analysis, we considered 21 potential social and environmental changes shown in Figure 4 as possible consequences of climate change from four perspectives: policy and legal regulations, economic and natural environments, technological innovation, and customer needs and societal demands.

In this scenario analysis, we took into account SDGs, which have a target year of 2030 to establish a time frame whereby 2030 is the target year for our group's "long-term target for CO_2 reduction" while our long-term goal is carbon neutrality by 2050.

In 2024, furthermore, after reviewing impacts, risks, and opportunities, we defined a three-year period from 2024, which is the business planning cycle, as the short term, and the period from 2027 to 2030 as the medium term (top of Figure 5). When the study began in 2019, the three years from 2019 to 2021 were defined as the short term, and the period from 2022 to 2030 as the medium term (bottom of Figure 5). The long-term time frame, from 2031 to 2050, is the same for both 2019 and 2024.

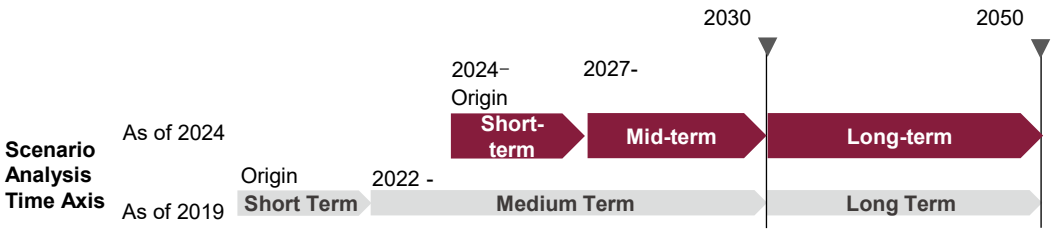


Figure 5 Establishing a time axis for scenario analysis

Two scenarios were set up to identify risks and opportunities, and the impact levels and countermeasures were examined. The worldview depicted by each scenario is illustrated in Figure 6a and 6b.

1.5 ℃ Scenario (reference scenario: IEA(International Energy Agency) NZE)

In analyzing business transition risks and opportunities and examining strategies, we referred to the IEA NZE (2050 Net Zero Emissions Scenario) as a climate change-related scenario in which all policies aimed at achieving the 1.5℃ target of the Paris Agreement are implemented and the transition risk is greatest. The IEA NZE assumes wide-ranging changes in the energy system necessary to achieve net zero by 2050.

In this scenario, policy and legal trends, such as strengthened energy efficiency regulations for buildings and heightened social demands, will drive increased demand for ZEBs (Zero Energy Buildings) and similar solutions, alongside growing needs for low-carbon materials and construction methods. We also anticipate a business environment in which the market will demand significant improvements in energy efficiency (pursuing initiatives that promote efficient design, operation, and recycling) that will contribute to CO_2 reductions, and this will then drive investment in technological development toward realization. In the energy industry, there are concerns about rising prices due to a widespread shift to biofuels and renewable energy. Meanwhile, we anticipate a market environment in which demand for mid- to high-rise wooden structures and buildings will expand, along with a growing need for environmentally friendly buildings among customers and the real estate industry.

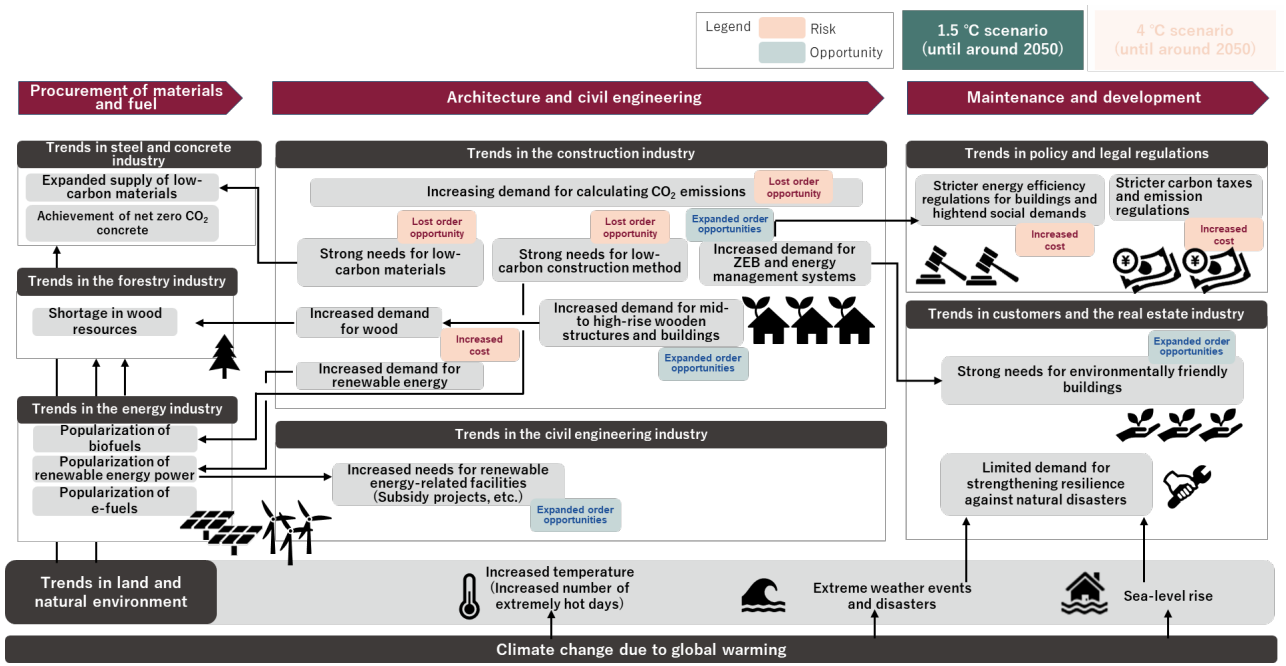


Figure 6a A worldview depicted in two scenarios established in the scenario analysis, 1.5 ℃ Scenario

4 ℃ Scenario (reference scenario: IPCC (International Panel on Climate Change) SSP5-8.5)

In order to assess the physical risks that become apparent from climate change, we referenced IPCC SSP5-8.5, which is the most conservative scenario for climate change countermeasures out of the five scenarios envisaged in the IPCC Sixth Assessment Report (AR6). IPCC SSP5-8.5 assumes that economic growth will be prioritized, fossil fuel use will continue, and greenhouse gas emissions will transition to extremely high levels.

This scenario assumes that rising temperatures will lead to abnormal weather and disasters greatly intensifying. There is a very high possibility that the average temperatures will rise by more than 1.5℃ between 2030 and 2040, and they could rise by more than 4℃ by the end of the 21st century. Over the medium to long term, we expect heavy rain and typhoons to become even stronger, resulting in increased impact on urban infrastructure from natural disasters such as floods. Furthermore, the impact of sea level rise can no longer be ignored. Along with these developments, demand for enhancing resilience against natural disasters is growing in industries such as real estate, and we anticipate a need to respond to deterioration of work environments and delays in construction work, as well as extreme weather disasters during construction.

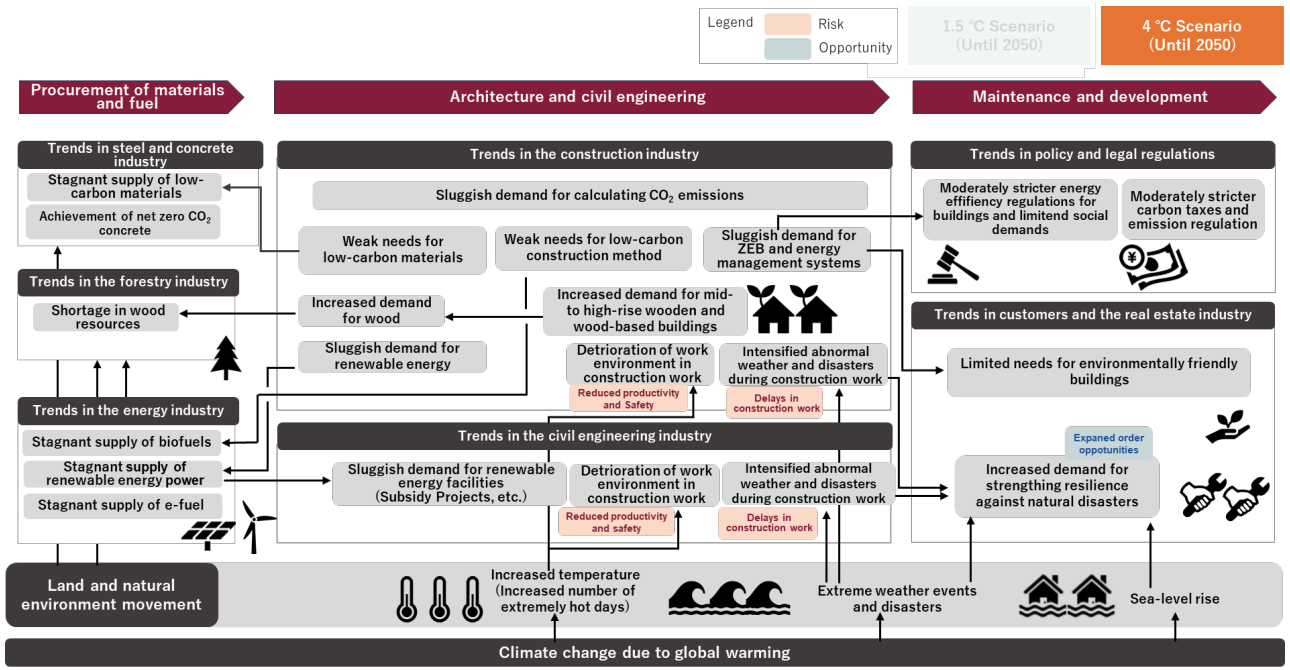


Figure 6b A worldview depicted in two scenarios established in the scenario analysis, 4 ℃ Scenario

2.3 Risks, Opportunities, and Countermeasures

As a result of scenario analysis, seven risks and five opportunities were idensified. We analyzed their financial impact from the perspectives of timing and level, and we examined countermeasures.

Table 3 lists the identified risks and opportunity items, their financial impacts (timing and level), and countermeasures currently being implemented (some are being planned).

Table 3 List of risk and opportunity identified as a result of scenario analysis, the timing and level of their financial impact, and countermeasures, continuing

Classification		Risks and opportunities	Financial impact			Countermeasures
			Timing #	Level *		
				1.5℃ Scenario	4℃ Scenario	
Transition	Policy and legal	Risk of increased construction costs due to stricter regulations under the Building Energy Conservation Act	Short to medium term	I	-	• Development and deployment of universal type ZEB • Acquisition of ESG investment by building owners (construction of finance scheme) • Development of advanced energy conservation technologies
		Risk of increased costs due to carbon taxes and emissions regulations	Medium term	III	-	• Introduction of renewable diesel (RD) fuels and e-fuels • Adoption of electric and hydrogen-powered construction machinery • Transition of electricity use to renewable energy
	Market	Risk of declining competitiveness in receiving orders due to lack of low-carbon construction methods	Medium term	III	-	• Development, dissemination and deployment of low-carbon construction methods
		Risk of increased costs due to tight demand for renewable energy electricity and alternative fuels	Medium to long term	III	-	• Expansion of renewable energy plan • Promotion of renewable energy private power generation business • Expansion of introduction of corporate PPA
		Risk of declining competitiveness in receiving orders due to a delay with CO_2 emissions calculation systems for designed buildings	Short term	II	-	• Development of whole life carbon calculation system
		Expanding order opportunities for ZEBs and energy management systems	Short to medium term	A	-	• Expansion of ZEB/ZEH application, shift to higher performance classifications of ZEB, and improvement of ZEB design efficiency • Apprication of ZEB and development of energy management technology
		Expanding order opportunities, such as subsidized projects, in response to growing renewable energy needs (civil engineering construction)	Medium to long term	B	-	• Proposals for the use of renewable electricity, biofuels, etc. to obtain technical evaluation points • Promotion of total engineering of wind energy and development of future wind power generation business
		Expanding order opportunities for mid- to high-rise wooden structures and buildings	Medium term	A	-	• Development of fire-resistant wood structures and wood hybrid members • Promotion of the use of wood and wood materials in mid- to high-rise buildings (replacement of steel and RC structures)
		Increased order opportunities due to a growing need for environmentally friendly buildings (construction work, development projects, building management projects)	Medium to long term	B	-	• Expansion of introduction of low-carbon materials (low-carbon concrete, electric furnace steel, recycling of steel materials and glass, etc.) • Realization, dissemination, and expansion of zero-carbon buildings • Development and expansion of introduction of CO_2-absorbing concrete • Development of technologies to improve the environmental performance of buildings • Building management and operation technologies to reduce greenhouse gas emissions

Table 3 List of risk and opportunity identified as a result of scenario analysis, the timing and level of their financial impact, and countermeasures, continued

Classification		Risks and opportunities	Financial impact			Countermeasures
			Timing #	Level *		
				1.5℃ Scenario	4℃ Scenario	
Physical	Chronic	Risk of reduced productivity and safety due to heatstroke at construction sites	Medium term	-	II	• Advance prediction and development of devices to prevent heat stroke
	Acute	Risk of construction schedule delays due to large-scale natural disasters	Short term	-	III	• Strengthening construction sites and supply chains
		Increased order opportunities due to growing demand for strengthening resilience against natural disasters	Medium term	-	B	• Building and community resilience against disasters (e.g., utilizing disaster simulation technology) • Development of building climate change adaptation technology (e.g., wind forecasting technology) • Development and deployment of greening and green infrastructure technology (e.g., rainwater storage infiltration technology)

***financial risk impact levels are defined as I: ¥10 billion or more, II: ¥3 billion to less than ¥10 billion, and III: less then ¥3 billion. Opportunities impact levels are defined as A: ¥5 billion or more, B: less than ¥5 billion.**
 # Impact periods are defined as: Short-term 2024-2026, medium-term 2027-2030, and long-term 2031 to 2050.

The following page provides details on each of the risks and opportunities that were identified.

Risks:

- **Increased construction costs due to stricter regulations under the Building Energy Conservation Act:** In order to reduce CO_2 emissions from residential and commercial sectors, which is considered to be an urgent issue in Japan, the Building Energy Conservation Act is expanding the scope of regulations and making them mandatory, and significant increases in standards are progressing. Then increased costs are anticipated due to R&D investments aimed at improving insulation and energy efficiency performance, as well as revisions to specifications.
- **Increased costs due to carbon taxes and emissions regulations**: The government plans to fully implement an emissions trading system from 2026, and to introduce a carbon surcharge on fossil fuel importers from 2028. Meanwhile, the details of the emissions trading system are currently being considered within the government, and depending on future developments in the system, it is possible that our group may become subject to mandatory participation. In such case, failure to meet greenhouse gas emission reduction targets could become a new cost-increasing factor, and emissions reduction is expected to become a key requirement in competitive bidding for contracts.
- **Declining competitiveness in receiving orders due to lack of low-carbon construction methods**: In construction work, there is a high risk of missing order opportunities if the company does not have low-carbon construction technology to meet customer needs. In civil engineering work, furthermore, obtaining climate change certification is currently a requirement for receiving orders from the Ministry of Land, Infrastructure, Transport and Tourism.
- **Increased costs due to tight demand for renewable energy electricity and alternative fuels**: With the rapid expansion of demand for renewable energy electricity and alternative fuels, these prices are expected to rise due to supply shortages. As a result, costs required to reduce our Scope 1 and Scope 2 emissions may increase.
- **Declining competitiveness in receiving orders due to a delay with CO_2 emissions calculation systems for designed buildings**: There is a growing demand for building life cycle carbon calculations, particularly in the real estate industry. If we delay in establishing a system to respond to these changing market demands, our competitiveness in receiving orders may decline.
- **Reduced productivity and safety due to heatstroke at construction sites**: In our core domestic urban construction projects, work frequently takes place in environments prone to heatstroke, such as outdoors or in indoor spaces without air-conditioning. The risk of decreased productivity increases due to rising heatstroke incidents and project delays caused by work restrictions.
- **Construction schedule delays due to large-scale natural disasters**: An increase in large-scale natural disasters such as sudden heavy rains and typhoons increases the possibility of delays in the supply of construction materials, which will cause construction delays.

Opportunities:

- **Expanding order opportunities for ZEBs and energy management systems**: Japan's mid-term greenhouse gas reduction target (reduce greenhouse gas emissions 23% by 2030 compared to 2013 levels.), which was established in 2015 in accordance with the Paris Agreement, was revised in 2021 to a more ambitious 46% reduction. Then, in 2025, targets of a 60% reduction by 2035 and a 73% reduction by 2040 were set. As a result, the trend toward decarbonization in buildings and cities both in Japan and overseas is expected to accelerate further, which will lead to a rapid increase in demand for ZEBs (zero energy buildings). We expect to enlarge our order opportunities by providing further decarbonization solutions, such as advanced energy-saving technologies necessary not only to meet stricter energy-saving regulations but also to realize ZEBs.
- **Expanding order opportunities, such as subsidized projects, in response to growing renewable energy needs (civil engineering construction)**: In order to expand renewable energy generation capacity, an expansion of public subsidy programs related to its generation, including wind power generation, is anticipated. Then increased order opportunities are expected to accompany this.
- **Expanding order opportunities for mid- to high-rise wooden structures and buildings**: Products from harvested timber are expected to have a carbon storage effect, and market demand for mid- to high-rise wooden structures and buildings is expected to increase as such architecture has low greenhouse gas emissions.
- **Increased order opportunities due to a growing need for environmentally friendly buildings (construction work, development projects, building management projects)**: Demand for environmentally friendly buildings is expected to grow due to requests from customers, including the real estate industry. We anticipate that our technological developments, such as low-carbon concrete and CO_2-absorbing concrete, which have been undertaken in anticipation of new environmental performance needs, will lead to increased order opportunities. This is also closely related to the expansion of electric furnace steelmaking and the progress of resource circulation for steel, glass, and other materials.
- **Increased order opportunities due to growing demand for strengthening resilience against natural disasters**: With an increasing demand for disaster prevention, mitigation, and national resilience, we anticipate an expansion in order opportunities stemming from related technologies that we have been working on in research and development.

2.4 Implementation Status of Countermeasures

Seven risks and five opportunities, which have been identified, have been categorized into major items A to F as shown in Table 4. Five of these, A to E, correspond to mitigation measures, and F corresponds to adaptation measures.

The five mitigation measures primarily correspond to the decarbonization efforts within the Environmental Strategy 2050, which is described below, and this fits into the decarbonization transition plan toward net-zero greenhouse gas emissions by 2050.

The request for decarbonized operations in A relates to reducing emissions in Scopes 1 and 2, and the corresponding measures are those for the same reductions in Scopes 1 and 2, respectively.

For details on representative examples of these measures, please see the link below.

Table 4 List of countermeasures to address risks and opportunities and their implementation, continuing

Classification		Risk and opportunities	Overview of implementation of countermeasures	Example of countermeasures currently being implemented	Reference	
Mitigation	Reduction of Scope1 and 2 Emissions	**A. Requirement for decarbonized operations** • Risk of increased costs due to carbon taxes and emissions regulations • Risk of declining competitiveness in receiving orders due to lack of low-carbon construction methods • Risk of increased costs due to tight demand for renewable energy electricity and alternative fuels	Scope1: Use of light oil will be reduced by introducing biofuels and synthetic fuels, as well as replacing heavy machinery used at construction sites with electric and hydrogen-powered equipment. In addition, construction methods will shift into low-carbon methods, such as the low-sludge retaining wall method, which significantly reduces the amount of sludge mixed with cement that is emitted during the construction of soil cement retaining walls.	• Demonstration experiment for use of renewable diesel fuel as an alternative to light oil (in Japanese) • Automatic monitoring of CO_2 emissions from construction machinery (in Japanese) • Development of the low-sludge retaining wall method TSP-ZERO (in Japanese)	Emission reduction roadmap (Figure 7)	Technology development and business investment (Table 5)
			Scope2: We plan to use renewable electricity for all of our domestic business by 2040 through 3 countermeasures: expanding the introduction of renewable energy power menu, promoting renewable energy private power generation, and expanding the introduction of corporate PPA. Regarding renewable energy private power generation, we have started to invest in geothermal power generation and biomass power generation.	• Introduction of renewable energy power at our company office (in Japanese) • Uchiko Ryuo Biomass Power Plant starts operation (in Japanese) • TAKENAKA Okuhida Geothermal Power Plant starts operation (in Japanese)		

Then, B through E all relate to reducing Scope 3 emissions, and the main countermeasures are the development of technologies, products, and services to meet market and societal demands. For C (environmental performance needs for buildings) in particular, we are implementing measures that take resource circulation into consideration.

Table 4 List of countermeasures to address risks and opportunities and their implementation, continued and continuing

Classification		Risk and opportunities	Overview of implementation of countermeasures	Example of countermeasures currently being implemented	Reference	
Mitigation	Reduction of Scope3 Emissions	**B. Trends in the wooden structures and buildings market** • Expanding order opportunities for mid- to high-rise wooden structures and buildings	We are promoting the development of fire-resistant wood structures and wood hybrid materials, as well as expanding their application into projects.	• Fire-resistant laminated wood - Moenwood ® Series - • Mid- to High-rise Wooden Hybrid Structure System -KiPLUS® Series (in Japanese) • Seismic Reinforcement Technology Using Wood -T-FoRest® Series – (in Japanese)	Emission reduction roadmap (Figure 7)	Technology development and business investment (Table 5)
		C. Higher environmental performance needs for buildings • Increased order opportunities due to a growing need for environmentally friendly buildings (construction work, development projects, building management projects) • Risk of declining competitiveness in receiving orders due to a delay with CO_2 emissions calculation systems for designed buildings	We are jointly developing CO_2-absorbing concrete (CUCO) with funding from the Green Innovation Fund. We are also developing technologies to improve the environmental performance of buildings, such as the use of low-carbon concrete and electric furnace steel, the promotion of resource recycling for steel and glass, and tools to evaluate whole-life carbon emissions, which are the CO_2 emissions over the life cycle of a building.	• Reducing CO_2 through Concrete. CUCO • Environmentally Conscious Concrete -ECM Concrete ®- • Promoting Circular Design Build ® from Electric Furnace Steel • Continuing to use building materials (glass to glass recycling, etc.) • Reducing waste transport by generating renewable energy from kitchen waste - Metapharm ®- • Renovating existing office buildings into smart buildings - Takenaka Central Building South (in Japanese) • Z-CARBO system for evaluating life cycle CO_2 emissions (in Japanese)		
		D. Regulations on energy conservation • Risk of increased construction costs due to stricter regulations under the Building Energy Conservation Act	We are developing advanced energy conservation technologies such as efficient use of heat and energy and high-efficiency heat exchangers, as well as realizing compact exterior walls of high-rise buildings with high energy conservation effects.	• Natural ventilation integrated compact double skin (in Japanese) • Highly efficient deciccant outdoor air handling unit (in Japanese)		
		E. Trends in the ZEB and renewable energy markets • Expanding order opportunities for ZEBs and energy management systems • Expanding order opportunities, such as subsidized projects, in response to growing renewable energy needs (civil engineering construction)	In the construction field, we are developing energy management technologies and technologies that contribute to the expansion of the application of ZEB. In the civil engineering field, we are also planning to respond to wind power and other renewable energy power generation projects.	• ZEB Design Tool -ZEBIA®- (in Japanese) • Megasolar Power Generation and Heat Storage System (in Japanese) • Widespread type of ZEB (in Japanese) • Distributed Power Supply Integrated System for Energy Management -I.SEM® - (in Japanese)		

In response to the intensifying climate and natural disasters in F, we are implementing measures to optimize design conditions and strengthen resilience.

Table 4 List of countermeasures to address risks and opportunities and their implementation, continued

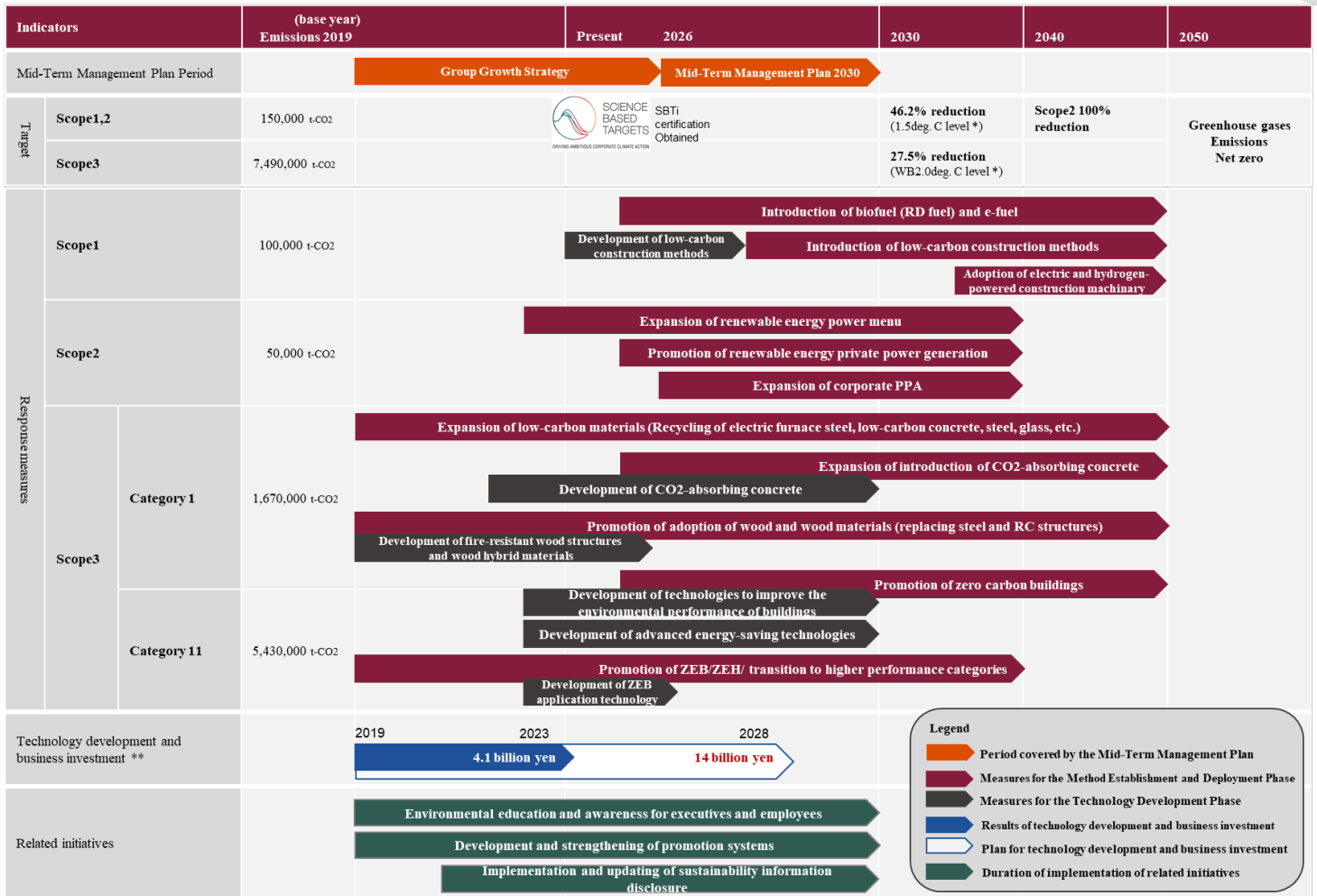
Classification	Risk and opportunities	Overview of implementation of countermeasures	Example of countermeasures currently being implemented	Reference
Adaptation	**F. Increasing severity of climate and natural disasters** • Risk of reduced productivity and safety due to heatstroke at construction sites • Risk of onstruction schedule delays due to large-scale natural disasters • Increased order opportunities due to growing demand for strengthening resilience against natural disasters	We are expanding and developing wind prediction technologies and developing climate change adaptation technologies for buildings such as resilient buildings. We are also promoting the development and deployment of greening and green infrastructure-related technologies from the perspective of coexistence with nature.	• Wind condition data solutions using Doppler lidar (in Japanese) • Numerical Wind Tunnel Kazamidori® (in Japanese) • Future Weather Data for Building Planning Based on Climate Change Scenarios “Met.box” (in Japanese) • Becoming a Partner for Realizing Resilience -BCP Comprehensive Support – (in Japanese) • Reducing Flood Risk and Improving Biodiversity - Rainscape ®- (in Japanese) • Green Space Planning Support Technology that Takes Urban-Birds into Consideration -Avitat® (in Japanese) • Forest Development in Seiwadai (in Japanese)	Technology development and business investment (Table 5)

The road map for reducing emissions, which is shown in Figure 7, outlines the transition plan that the Takenaka Group is implementing to achieve net-zero greenhouse gas emissions by 2050.

The top row shows the decarbonization targets outlined in the "Environmental Strategy 2050," which has been incorporated into the Medium-Term Management Plan 2030. With the goal of achieving net-zero greenhouse gas emissions by 2050, we have set long-term CO_2 reduction targets for the entire Takenaka Group. Our 2030 targets for Scopes 1 and 2, which we set as our long-term goals, acquired SBTi certification in March 2024. For Scope 3, we aim to reduce emissions 27.5% by 2030.

The middle section shows plans for countermeasures corresponding to each Scope of greenhouse gas emissions. Regarding Scope 3 emissions, since emissions from Category 1 (purchased goods and services) and Category 11 (use of sold products) account for the majority of Scope 3 emissions, we are planning with a focus on measures related to these two categories.

The bottom section shows a rough estimate of the technological development and business investment required to implement these measures. The current plan for the 10 years from 2019 to 2028 is ¥14 billion, of which the cumulative total for the five years up to 2023 is approximately ¥4.1 billion. We plan to invest ¥9.9 billion over the five years from 2024, which will be more than double the amount invested in the five years up to 2023. Additionally, initiatives expected to have an indirect effect on reducing greenhouse gas emissions are also shown.



* The WB 2.0°C level corresponds to “2.5% per year” or greater emissions reductions while the 1.5°C level corresponds to “4.2% per year” or greater emissions reductions, and this is consistent with the Paris Agreement's goal of "Holding the increase in the global average temperature to well below 2°C above preindustrial levels and pursuing efforts to limit the temperature increase to 1.5°C above preindustrial levels."

** Actual investment amounts are as of the end of 2023, and plans include actual results. All investment amounts include direct labor costs.

Figure 7 Emission reduction roadmap to achieve net-zero greenhouse gas emissions by 2050

Table 5 shows investment in technological development and business necessary to implement countermeasures along with the 10-year plan from 2019 to 2028 and the actual results up to the end of 2023 for each implementation item.

The plan shows the amount of funding expected to be secured as of 2024, and it is subject to change depending on future progress and other factors. The phase of each measure is also shown on the right side of the table. In particular, we plan to make additional investments for a1. Promotion of renewable energy self-generation projects, and f2. Development and deployment of technologies related to greening and green infrastructure.

As shown in the "Phase" column, the countermeasures that the Takenaka Group is undertaking to address risks and opportunities are being developed in three phases: investment and fundraising (Phase I), technological development (Phase II), and establishment and deployment of methods (Phase III). Through these efforts, we are building a system that can respond if the climate change assumed in the scenario analysis occurs.

Table 5: Investing in technological development and business to address risks and opportunities, continuing

Investment Plan Period and Budget Amount

Of which, the implementation period and actual amount up to 2023

Risk and opportunity items	Technology development/business investment items	Amount of investment (Actual/Plan, Billions of yen)* 2019 – 2023 – 2028	Phase of countermeasures I Investment & financing	II Technology development	III. Deployment
A. Risks and opportunities related to requirement for decarbonized operations • Risk of increased costs due to carbon taxes and emissions regulations • Risk of declining competitiveness in receiving orders due to lack of low-carbon construction methods • Risk of increased costs due to tight demand for renewable energy electricity and alternative fuels	**a1. Promotion of renewable energy private power generation** **a2. Development of low-carbon construction methods** • Automatic CO_2 Emissions Monitoring System for Construction Machinary • Decarbonization Technology for Construction Heavy Machinary		●○ ●	– ●	● ●
B. Risks and opportunities related to Trends in the wood structures and building market • Expanding order opportunities for mid- to high-rise wooden structures and buildings	**b. Development of fire-resistant wood structures and wood-based hybrid materials** • Fire-resistant structural materials "Moen-Wood®" • Development and deployment of wood-based hybrid materials		●	●	●
C. Risks and opportunities related to higher environmental performance needs for buildings • Increased order opportunities due to a growing need for environmentally friendly buildings (construction work, development projects, building management projects) • Declining competitiveness in receiving orders due to a delay with CO_2 emissions calculation systems for designed buildings	**c1. Development of CO_2-absorbing concrete** **c2. Development of technologies to improve the environmental performance of buildings** • Reducing carbon and weight of building materials (including adoption of low-carbon concrete and recycling of steel and glass resources) • Biogasification and recycling system for food waste • Recycling system for waste materials • Energy saving building management system • Development of whole life carbon calculation system		● ●	● ●	

*Actual investment amounts are as of the end of 2023, and plans include actual results. All investment amounts include direct labor costs.
** This refers to the construction of large-scale facilities, consisting of three phases: engineering, procurement, and construction. Measures are indicated by their phases as follows: ●: Completed or underway; ○: Additional investment planned;
-: No technological development investment required.

Table 5: Investing in technological development and business to address risks and opportunities, continued

Investment Plan Period and Budget Amount

Of which, the implementation period and actual amount up to 2023

Risk and opportunity items	Technology development/business investment items	Amount of investment (Actual/Plan, Billions of yen)* 2019	2023	2028	Phase of countermeasures I Investment & financing	II Technology development	III. Deployment
D. Risks and opportunities related to regulations on energy conservation • Risk of increased construction costs due to stricter regulations under the Building Energy Conservation Act	**d. Development of advanced energy-saving technologies** • Effective use of heat and energy • High-efficiency heat exchanger • Improvement of environmental performance of exterior walls (High insulation, high airtightness, shielding of solar radiation, etc.)				●	●	●
E. Risks and opportunities related to trends in the ZEB and renewable energy markets • Expanding order opportunities for ZEBs and energy management systems • Expanding order opportunities, such as subsidized projects, in response to growing renewable energy needs (civil engineering construction)	**e1. Development of ZEB application and energy management technology** • ZEB design system (ZEBIA) • Development and deployment of widespread type of ZEB • DC building energy management system (I.SEM, etc.)				●	●	●
	e2. Development of future renewable energy power generation business (Career recruitment with an eye toward EPC* *)				●		
F. Risks and opportunities related to increasing severity of climate and natural disasters • Risk of reduced productivity and safety due to heatstroke at construction sites • Risk of Construction schedule delays due to large-scale natural disasters • Increased order opportunities due to growing demand for strengthening resilience against natural disaster	**f1. Development of Climate Change Adaptation Technology for Buildings** • Expansion and development of wind condition prediction technology (Use of doppler lidar, numerical wind tunnel, etc.) • Resilient Building				●	●	
	f2. Development and Development of Greening and Green Infrastructure-Related Technologies • Green infrastructure-related technologies • Urban greening technologies • Development and deployment of forestation methods				●○	●	●

*Actual investment amounts are as of the end of 2023, and plans include actual results. All investment amounts include direct labor costs.
** This refers to the construction of large-scale facilities, consisting of three phases: engineering, procurement, and construction. Measures are indicated by their phases as follows: ●: Completed or underway; ○: Additional investment planned;
-: No technological development investment required.

3.1 Assessment Processes for Risks and Opportunities

Climate-related risks are identified and assessed through the decision-making process described in "1. Governance" within the governance and risk organization shown in Figure 8.

As a specific example, in 2023, we formulated Environmental Strategy 2050 by using the target values and specific measures for the three major objectives (materiality) of decarbonization, resource circulation, and coexistence with nature, which comprised one of the major objective groups, "Harmony with the Environment. We have since revised these in light of societal trends. The Sustainability Exective Committee deliberates on this strategy, and then the Board of Directors makes decisions through deliberations by the Management Plan Exective Committee.

Additionally, we have established various policies, including an Environmental Policy, under our Corporate Code of Conduct. In conjunction with establishment of the Takenaka Group Management Vision, we have revised various policies as group policies. The Environmental Policy indicates the basic thinking behind implementing Environmental Strategy 2050, and it is closely related to responding to climate change. The environmental policy was revised in conjunction with the 2025 update to the Environmental Strategy, and after deliberations by the Sustainability Exective Committee, it was approved by the Board of Directors.

3.2 Risk Management Process

The decided measures and target values are incorporated into each department's three-year plan. Once decided on, measures and targets that are deployed in the three-year plans for each division, and the progress of these efforts is monitored and evaluated by the Global Environment Committee through the activities of its subsidiary company-wide and cross-group working groups. Any newly identified risks are deliberated on by the Global Environment Committee, which formulates countermeasures. These are then deliberated on and approved by the Sustainability Exective Committee. Thus, the PDCA cycle is implemented.

3.3 Integration into a Companywide Risk Management System

For companywide risk management, a Risk Control Committee has been established under the Corporate Ethics Exective Committee as shown in Figure 8. Regular meetings are held twice a year, with additional meetings convened as needed, such as when significant risks arise. The executive officer in charge of sustainability participates in this process. This committee deliberates focusing on understanding risks related to quality, safety and other aspects of business, including those related to climate change, before being reported to the Board of Directors for decision-making. Decisions are communicated to relevant office/division managers, department heads, etc.

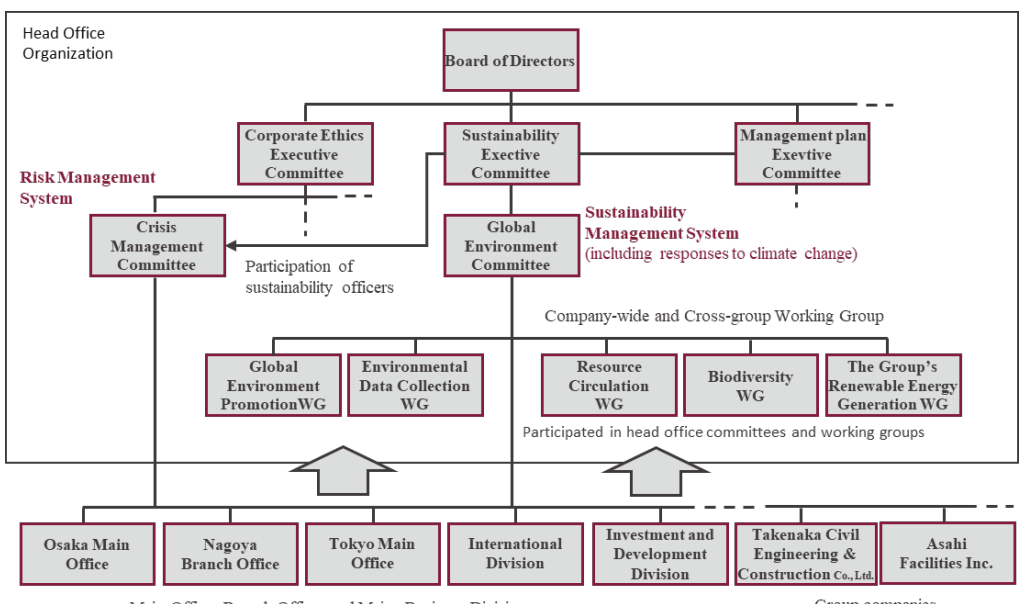


Figure 8 Governance and risk management organization for the group's climate change response

4.1 Metrics

The Takenaka Group uses greenhouse gas emission reduction rates for Scopes 1, 2, and 3 as metrics with 2019 as the base year. In December 2022, we expanded coverage to the entire Takenaka Group for consolidated reporting.

4.2 Targets

The long-term CO_2 reduction targets, which were expanded to the entire Takenaka Group in December 2022, set the reduction rates shown below for two items in Scopes 1 and 2 as well as Scope 3 (the base year for all being 2019). Setting a long-term CO_2 reduction target in December 2019, and raising it in March 2021, we are aiming to achieve net-zero greenhouse gas emissions (a 100% reduction in CO2 emissions) by 2050. Our 2030 targets for Scopes 1 and 2 were certified by SBTi in March 2024.

- Scope 1, 2: 46.2% reduction by 2030, 100% reduction by 2050
- Scope 3: 27.5% reduction by 2030, 100% reduction by 2050

4.3 Performance

The Takenaka Group's greenhouse gas emissions performance and trends are shown in Table 6. In addition, a breakdown of the most recent performance figures for 2024 by Scope and by category for Scope 3 are shown in Figure 9.

For Scope 3, we calculate Categories 1 (Purchased goods and services), Category 2 (Capital goods), Category 3 (Fuel and energy-related activities not included in Scope 1 or 2), Category 4 (Upstream transportation and distribution), Category 5 (Waste generated in operations), Category 6 (Business travel), Category 7 (Employee commuting), Category 11 (Use of sold products), Category 12 (End-of-life treatment of sold products), Category 13 (Downstream leased assets), and Category 15 (Investments) (Categories 8-10, 14 are not calculated as they are not related to our business). Of these, Categories 1 and Category 11 emissitons account for the majority.

Table 6 Actual figures and trends for the Takenaka Group's greenhouse gas emissions

Unit: t-CO2

	2019 (base year)	2020	2021	2022	2023	2024
Scope1,2	149,460	153,097	139,944	144,207	212,742	142,139
Scope1	100,990	105,990	96,990	107,595	165,791	94,015
Scope2	48,471	47,421	42,954	36,612	46,951	48,115
Scope3	7,489,605	6,168,139	4,359,310	5,544,767	4,812,865	4,659,608

The scope of calculations covers the entire Takenaka Group, including consolidated group companies. For Scope 3 Categories 1, 4, 5, 11, and 12, however, overseas construction projects are excluded from the calculation due to their small proportion of the total and large calculation burden.
A CO_2 emissions monitoring system has been introduced to all new construction work begun after February 2023, and these construction projects were included in the estimated sampling for calculating Scope 1 emissions. The fact that there were many early-stage construction projects that required a lot of heavy machinery for foundation work and so on is thought to be the reason why Scope 1 results for 2023 increased compared to the previous year.

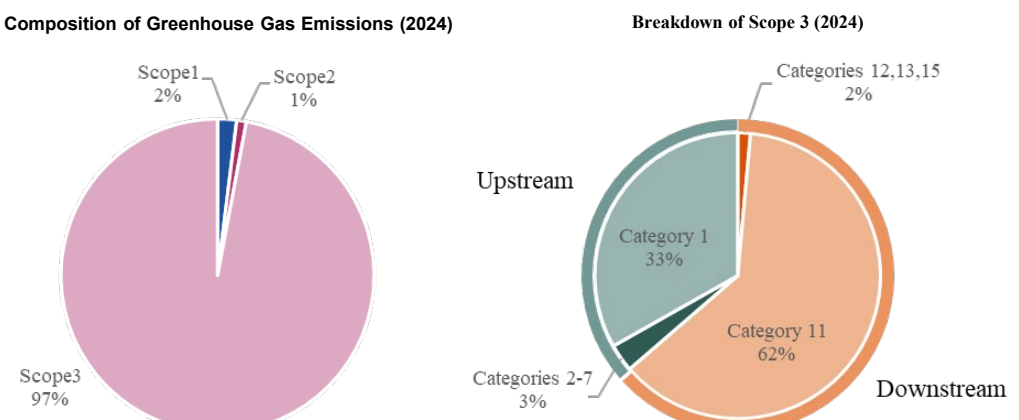


Figure 9 Breakdown of the Takenaka Group's greenhouse gas emissions (2024 results) and from this Scope 3 breakdown

Update History

2025.04.23	Initial Publication
2025.08.20	p13：Addition of 2024 greenhouse gas emissions data（Table 6 and Figure 9）