

Information disclosure based on TCFD recommendations

The Nankai Group recognizes that measures for climate change are important management issues for business continuity, and makes efforts to monitor the various risks and opportunities that arise from

*The "Task Force on Climate-related Financial Disclosures (TCFD)" was established in 2015 by the Financial Stability Board (FSB) at the request of G20, to consider how information disclosure and response by financial institutions should be conducted for climate-related issues.

climate change based on the "Task Force on Climate-related Financial Disclosures (TCFD)*" and to integrate them into our business strategies.



Governance

We have established the "Sustainability Promotion Committee" as an organization to drive sustainability measures across the Group, including response to climate change based on TCFD recommendations (held four times a year, in principle). The Committee has been playing a central role in having discussions about setting CO₂ emission targets, monitoring results, promoting the evaluation of the level of achievement (PDCA cycle), identifying climate change risks and how to respond, while having been cooperating with business divisions.

From those matters among those discussed by this Committee, important matters are reported to the Board of Directors twice a year.

Strategies

Strategically, we have considered various possibilities such as advancing climate change and change in the economy and society in the future, and identified risks and opportunities emerging from climate change that can impact our individual railway business and real estate/distribution business, the domains we are covering in this report, evaluating their significance.

In view of the level of impact to business, we have evaluated "carbon pricing, carbon emission targets and policies in each country" and "change in power/fuel prices and energy mix" as significant risks and opportunities to consider as we shift toward a decarbonized

Nankai Group to promote the Sustainability Policy

Head of the committee:
The President
Committee members:
Corporate Officers with board titles, etc.



society, and "intensification of abnormal weather" as significant physical risks and opportunities from climate change. (The analysis was performed for the 1.5–2 degrees Celsius scenario and the 4 degree Celsius scenario.)

We have been working on these risks and opportunities within the risk management system of each core businesses.

Going forward, we will aim to the increase of value as a sustainable company and the realization of a sustainable society, by taking appropriate measures for the identified risks and opportunities.

Details of risks and opportunities arising from climate change and the direction of measures taken

Businesses subject to the evaluation of risk and opportunity priority:
(Non-consolidated) Railway business and real estate and distribution business

* Those marked (Shared) for risks and opportunities arise in both our railway business and real estate/distribution business

* Period when items will happen Short-term: 1 year; medium-term: 2–4 years; long-term: 5–15 years
* The directions for the response measures include those whose feasibility is currently being evaluated

Risks associated with the shift

Risks		Risks for our company	Occurrence	Assessment	Direction for response measures	
Risks associated with the transition to a decarbonized society (risks associated with the shift)	Government Policies/ regulations	Carbon pricing, carbon emission targets and policies in each country (Shared) More taxes through the introduction of carbon tax (Shared) Increase in electricity bills from changing to renewable energy to achieve carbon emission targets (Real estate and distribution) Increasing cost of purchasing carbon emission rights for aged properties	Long term	Medium to Significant	- Promotion of saving in energy by investing in vehicle and facility updates - Introduction of renewable energy - Utilizing carbon offsetting	
	Compliance with ZEB, ZEH, and other regulations	(Real estate and distribution) Increasing construction costs and renovation costs to comply with regulations	Medium term	Medium	- Savings in construction and renovation costs by reviewing facility specifications and procurement methods, through utilizing grant systems	
	Industries/ markets	Changes in power/fuel prices and energy mix (Railway) Rise in electricity unit price for steady power supply due to the spread of renewable energy (Real estate and distribution) Increasing cost of running facilities due to higher use of renewable energy as a fraction of total power use	Medium term	Short to Significant	- Promotion of saving in energy by investing in vehicle and facility updates - Promoting use within the Company of internally generated power	
	Technologies	Spread of low-carbon technology (Railway) Decrease in customer numbers and drop in revenue due to the spread of eco cars	Long term	Medium	- Evolving as a total mobility business, capitalizing on our strength as a railway company capable of mass transport and punctuality	
	Reputation	Spread of renewable energy and energy-saving technologies	(Shared) Increase of construction costs due to the introduction of energy-saving and renewable energy technologies	Medium term	Medium	- Saving in construction costs through reviewing facility specifications and procurement methods, utilizing public support such as grant systems
		Changes in customer reputation	(Shared) Decrease in customers due to our environmental measures being viewed as being passive	Medium term	Medium	- Active promotion of environmental measures, including energy-saving measures, and dissemination of information
	Changes in investor reputation	(Shared) Passive environmental measures negatively impacts share price, increase capital procurement costs and result in divestment	Medium term	Medium	- Actively promoting environmental measures, and disclosing information about climate-change measures through integrated reports and our website, based on TCFD recommendations	

Physical risks

Risks		Risks for our company	Occurrence	Assessment	Direction for response measures	
Risks associated with physical changes in climate change (physical risks)	Chronic	Change of rainfall and climate patterns	(Railway) Increase of transportation costs due to an increase in rain and gales (Real estate and distribution) Decrease of asset values due to deterioration of construction materials from UV rays and storms	Medium term	Medium	- Scheduled implementation of hardware measures for railway facilities - Preventive maintenance through use of digital technologies
		Increase in average temperature	(Shared) Decrease in passenger and visitor numbers due to intense heat, increase of costs due to the need to take measures against heat stroke and to declining productivity (Railway) Increase of costs due to the need for air conditioning (Real estate and distribution) Increase of construction costs because of the need to enhance air conditioning capacity and so forth			- Designing and constructing facilities with consideration to intense heat
	Sea level rise	(Railway) Damage to facilities and vehicles due to flooding along our coastal lines	Long term	Less significant	- Railway facilities made stronger through measures to prevent flooding - Organizing evacuation plans from railway vehicles	
	Acute	Intensification of abnormal weather	(Shared) Decrease of income due to suspension of train operations, temporary closure and shorter business hours for shopping centers (Shared) Increase of damage to our railway and real estate assets due to factors such as flooding, erosion and bridge scours, increase of non-life insurance payments, decrease of asset values (Shared) Disruption in sales due to supply chain disruption	Short to medium term	Significant	- Enhancement in construction, measures to prevent flooding, measures to prevent landslides on slopes, and cutting down hazardous trees, at railway facilities and real estate/distribution facilities - Taking measures to prevent bridge scours - Alleviating regulation levels by enhancing hardware measures at railway facilities - Enhancing BCP response capability at railway facilities and real estate/distribution facilities, through measures such as securing inventory - Implementation of evacuation from vehicles during severe weather - Organizing disaster response manuals, including diversification of supply chains

Opportunities

Opportunities		Opportunities for our company	Occurrence	Assessment	Direction for response measures	
Opportunities associated with the shift toward a decarbonized society	Government policies/regulations	Carbon pricing, carbon emission targets and policies in each country	(Railway) Transportation shifting from delivery by road to railway, due to introduction of carbon tax (Shared) Decrease of operational costs, increase of public grants, and possibility of lower taxes due to energy-saving investments	Medium to long term	Significant	- Promotion of saving in energy by investing in vehicle and facility updates - Promoting use within the Company of internally generated power
		Compliance with ZEB, ZEH, and other regulations	(Real estate and distribution) Decrease of operational costs and increase of competitiveness due to enhanced environmental performance	Medium term	Medium	- Introduction of energy-saving facilities for ZEB/ZEH and active use of grant systems
	Industries/markets	Changes in power/fuel prices and energy mix	(Real estate and distribution) Increase of rent and asset values due to rising needs for new environmentally-friendly buildings	Short to medium term	Significant	- Increasing the portfolio of environmentally certified buildings, active facility updates for better environmental performance
		Spread of low-carbon technology	(Shared) Decrease of renewable energy prices and costs (Railway) Decrease of environmentally friendly vehicle prices, durability achieved for long-distance traveling	Long term	Medium	- Introduction of renewable energy - Promoting the introduction of high-performance vehicles and facilities through the spread of new technologies and use of new grant systems
	Spread of renewable energy and energy-saving technologies	(Shared) Decrease of power costs and operational costs due to new energy-saving technologies	Medium term	Medium		
Reputation	Changes in customer reputation	(Railway) Modal shift in customers switching from using private cars to using railways as they become more environmentally aware (Real estate and distribution) Increase of income by successful differentiation in response to rising customer needs for environmental performance	Medium term	Medium	- Evolving as a total mobility business, encouraging people to switch from using private cars to public transport - Developing environmental high-performance buildings, ZEB/ZEH and so forth	
	Changes in investor reputation	(Shared) More active funding associated with increasing ESG investments			- Securing funding through green investments to actively promote environmental response	
Opportunities related to physical changes	Chronic	Increase in average temperature	(Shared) Lower heating costs during winter	Medium term	Medium	- Saving facility investments into heating features by simplifying specifications
		Intensification of abnormal weather	(Real estate and distribution) Increased competitiveness and income by answering people's needs to live in disaster-resilient homes, through measures such as BCP response and for people for whom it is difficult to return home following disasters	Short to medium term	Significant	- Enhancing disaster-response capabilities of real estate and distribution facilities in the Namba area - Organizing disaster-response manuals and disclosing information on BCP responses

Quantifying business impact projected through these risks and opportunities

We quantitatively calculated our business impact in 2030 regarding our railway business and real estate/distribution business on the basis of objective forecast data disclosed for the scenarios of the temperature rise considered that were evaluated as significant in the evaluation of identified risks and opportunities.

For the scenarios that serve as premises to these assumptions, we have used a 1.5–2 degrees Celsius scenario for the risks and opportunities associated with the shift, for which active response will be taken in society for climate change, and a 1.5–2 degree Celsius and 4 degree Celsius scenario for physical risks, for the calculations.

Scenario configuration: The range of temperature increase by the end of this century

<p>1.5–2 degrees Celsius scenario (The world successfully achieves decarbonization)</p> <p>Countries across the globe achieve decarbonization to suppress climate change.</p> <p style="text-align: center;">▼</p> <p>Transition to a society that is not dependent on fossil fuels with the incorporation of bold policies for sustainable development.</p>	<p>4 degree Celsius scenario (Letting the world take its course)</p> <p>Measures to achieve decarbonization are not taken due to countries prioritizing economic activity.</p> <p style="text-align: center;">▼</p> <p>Climate change due to rising temperatures will have a physical impact on various businesses.</p>
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Calculation of business impact (five risks and opportunities)

- (1) Decrease of operating profit due to imposition of carbon tax
- (2) Decrease of operating profit due to surging power bills
- (3) Decrease of operating profit from physical damage from torrential rain
- (4) Decrease of operating profits from suspension of operation of railways and temporary closure of facilities due to torrential rain
- (5) Increase of rent for existing buildings through obtaining environmental certification

Two scenarios × Five important risks and opportunities × Our businesses

Initiatives for Major Sustainability Themes (Materiality)

Prerequisite for calculating business impact estimations

*1:Yamato River and Kinokawa River areas as assumed areas
*2:Namba CITY and Namba Parks as assumed areas

Items	Risks and opportunities	Forecast data used for the calculations	Assumption of the impact in 2030	
			1.5–2 degrees Celsius scenario	4 degree Celsius scenario
Risks associated with the shift	Decrease of operating profit due to imposition of carbon tax	IEA "World Energy Outlook 2021"	130\$/t-CO ₂ (2030, developed countries) Calculated using a currency rate of 1\$ = 110 yen	-
	Decrease of operating profit due to surging power bills	IEA "World Energy Outlook 2018"	An approximate 5% rise from the current level	-
Physical risks	Decrease of operating profit from physical damage (floods ^{*1} , landslides and bridge scours) from torrential rain	Meeting to evaluate technologies concerning water management in time of climate change "Water management proposals in time of climate change" A-PLAT "Climate Change Adaptation Information Platform"	The frequency of flooding doubles the current level Frequency of landslides and bridge scours increases by 2%	The frequency of flooding increases four-fold from the current level Frequency of landslides and bridge scours increases by 2%
	Decrease of operating profits from suspension of operation of railways and temporary closure of facilities ^{*2} due to torrential rain	Japan Meteorological Agency "Climate Change in Japan 2020—Reports on Assessment of Observed/Projected Climate Change Relating to the Atmosphere, Land and Oceans (detailed edition)" Ministry of the Environment and Japan Meteorological Agency "Japan's Climate at the End of the 21st Century (2015)"	Days of torrential rain per year increases by 0.6 days from the current level	Days of torrential rain per year increases by 1.2 days from the current level
Opportunities	Increase of rent for existing buildings through obtaining environmental certification	Japan Real Estate Institute "The 44th Real Estate Investor Survey Special Questionnaire II"	An approximate 3% rise from the current level	-

Presumed business impact (financial impact)

Items	Risks and opportunities	Assumption of the impact in 2030	
		1.5–2 degrees Celsius scenario	4 degree Celsius scenario
Risks associated with the shift	Decrease of operating profit due to imposition of carbon tax	-1.1 billion yen / year	-
	Decrease of operating profit due to surging power bills	-200 million yen/year	-
Physical risks	Decrease of operating profit from physical damages (floods, landslides and bridge scours) from torrential rain	-100 million yen/year	-200 million yen/year
	Decrease of operating profit from suspension of operation of railways and temporary closure of facilities due to torrential rain	-100 million yen/year	-200 million yen/year
Opportunities	Increase of rent for existing buildings through obtaining environmental certification	200 million yen/year	-

As these calculations showed, for the projected impact from climate change, we found business impacts such as increased costs and income associated with the risks and opportunities from the shift to a decarbonized society. Also we found that the business impact from physical risks in the 4 degree Celsius scenario was double that of the 1.5–2 degree Celsius scenario.

Either scenario brings limited business impact. However, to minimize the risks and maximize opportunities from climate change in the future, we would like to remain an organization that is resilient against climate change through initiatives for a decarbonized society, such as by advancing CO₂ reduction measures, including updates of our railway vehicles.

Risk management

For risks concerning the Nankai Group's business and so forth, we are ensuring comprehensive, central risk management for the entire group, by measures such as establishing a Risk Management Committee, to avoid and minimize risks that could significantly impact the management of our Group.

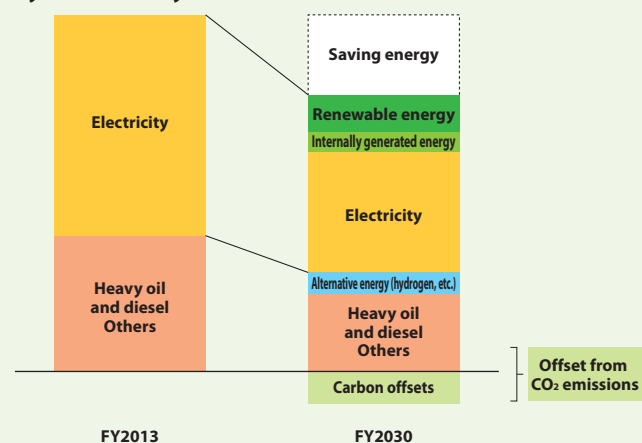
As for climate change risks, with our Sustainability Promotion Committee playing the central role, we have a system to devise policies and strategies to minimize risks and gain opportunities, and oversee monitoring of initiatives. Together with the Risk Management Committee, we will periodically review climate-change risks and opportunities.

Metrics and targets

Our Group has implemented initiatives to decarbonize our business activities to alleviate climate change and be ready for the risks associated with the shift, therefore we have set as targets "46% or more carbon emission reduction by FY2030 from FY2013," and "practically zero carbon emissions in 2050." In the individual railway business division, we are hoping to have turned 84.8% of our vehicles into energy-saving vehicles by FY2030.

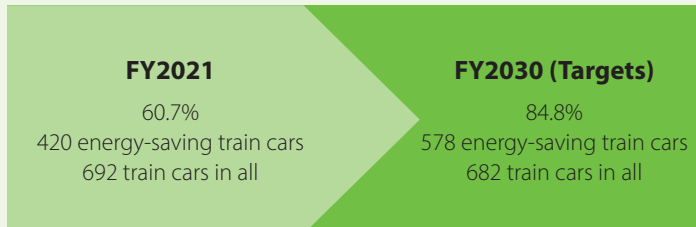
Our Group will contribute to the realization of a sustainable society through our carbon-reduction initiatives such as updating our railway vehicles and use of renewable energy.

The image of the Nankai Group's energy use portfolio toward the goal of saving CO₂ emissions by over 46% by FY2030, from FY2013



Ongoing initiatives to mitigate climate change (measures to reduce CO₂ emissions)

Ratio of energy-saving vehicles adopted (non-consolidated)



New train for replacement The 8300 series

Measures that have already been implemented to adapt to climate change (hard measures)

Measures against flooding at railway facilities

In the railway business, various measures to counter the flood damage caused by torrential rainfall and other factors are being strategically promoted. Watertight doors and tide embankments are being installed for all equipment rooms at railway facilities as measures against flooding damage. For soft measures, disaster response manuals are being developed along with evacuation plans for rolling stock held in the depot, in the event of stormy weather.



Watertight door (left) and a tide embankment (right)
(Tamade General Office)

Landslide prevention measures for slopes

In the railway business, various measures are being strategically promoted to prevent slopes within railway properties from collapsing due to torrential rainfall and disrupting train operation.

Reinforcements such as slope frame construction and anchor construction are being promoted within railway properties as measures against landslide. Furthermore, for areas along our railway lines that carry the risk of falling trees, an arborist will conduct tree health assessments for the strategic removal of trees determined to be dangerous, especially in the area between Hashimoto Station and Gokurakubashi Station.



Construction to prevent landslides (within Kamikosawa Station)

Safety measures for bridges

Scouring prevention measures (see pages 48 to 49 for details)

In the railway business, we will identify bridges affected with scouring from results of regular inspections, etc., and proceed with scouring prevention measures for river bridges based on those results. In FY2021, construction of one bridge was completed, and designs for three others were created.

Installation of the Bridge Abnormality Detection System

In the railway business, a system that has measuring instruments to detect anomalies on bridges and automatically activate special signals that are immediately sent to notify train crews of anomalies has been installed on the Onosato River bridge and Kinokawa River bridge (on the Nankai Line and Koya Line). We are now making efforts to install the same system on the Yamatogawa River bridge on the Koya Line.



Bridge Abnormality Detection System
(Kinokawa River bridge on the Koya Line)