TCFD Scenario Analysis

Scope of Scenario Analysis

Analyzed OJR's portfolio(as of FY2019) on all 111 owned and managed properties.

OJR Value Chain and Key Parameters

Finance
- Change in assessment or aspirations from investors and lenders, etc.

Property acquisition
- Meet GHG emission regulations
- Comply with carbon taxes and prices
- Adapt to changes in demand and behavior from tenants and users

Ownership · Management

Intensification of extreme weather conditions
- Increase in average temperature
- Meet GHG emission regulations
- Comply with carbon taxes and prices
- Adapt to changes in demand and behavior from tenants and users
- Sea-level rise
- Dissemination of renewable and energy-saving technologies
- Changes in energy mix
- Changes in trends in energy demand

Finance

Property disposition
- Meet GHG emission regulations
- Comply with carbon taxes and prices
- Adapt to changes in demand and behavior from tenants and users

Main target for this review

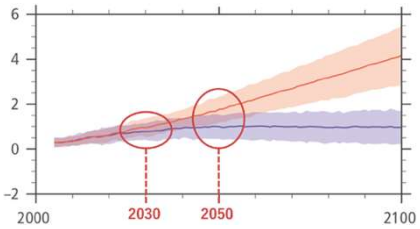
Business Impact of Climate Change (Risks and Opportunities)

	Category		Thoughts on business impact	Impact
Transition risk	Policies/ regulation	Carbon tax and price	Price hike in procurement cost of materials, etc., fuel cost and electric power charge due to increase in global warming countermeasure tax, etc.	Large
			Relative value appreciation on existing properties due to cost increase for new developments	
			A higher electricity cost for high CO_2 emissions should incentivize the usage of lower CO_2 emissions	
	Policies/ regulations	GHG emission regulations	Increase in operating costs from tighter GHG emission regulations and expansion of cap & trade system, etc.	Large
			Increase in operating costs due to stricter energy efficiency regulations for buildings, achieving energy saving standards and enhancing reporting for owned properties	
	Markets	Changes in customer behavior (Customers and Tenants)	Shift in customer demand towards higher environmental performance for buildings	Large
	Reputations	Change in attitude from investors and lenders, etc. (Assessment and Orientation)	Revisions in corporate evaluation from investors and strengthening fund-raising capacity through expansion of ESG investors	Large
			Diversifying fund-raising channels through green bonds and green loans, etc.	
	Technologies, markets, etc.	Other	Changes in energy mix, transitions in energy demand, spread of renewable energy and energy-saving technologies and transformation in job competition environment	Mid to Small
Physical risk	Chronic	Increase in the average temperature	Increase in operating costs due to HVAC load and measures necessary to ensure comfort for owned properties	Large
			Decline in work efficiency from employees and workers, etc., restrictions on employee attendance and construction work difficulties during summer season	
	Acute	Intensification of extreme weather conditions	Occurrence of flooding and power outage damage to owned properties, increase in restoration costs and advance countermeasure costs	Large
			Occurrence of restrictions for business days and usage restraints	
			Decrease in asset value of properties in areas with risks of floods and high tides	
			Secure competitive advantage, revenue growth from rent and increase of customer utilization by strengthening disaster countermeasures	
			Increase in property insurance premium	
	Chronic	Other	Changes in precipitation and weather patterns, and sea-level rise	Mid to Small
Opportunity	Products/ services		A shift of customers' needs to buildings with high environmental performance	Large

Applied Scenario

Two scenarios were selected; "4°C scenario" and "1.5 - 2°C scenario"
(Transition risk is assumed as of 2030 and Physical risk is assumed as of 2050.)

[Forecast in change of global average surface temperature]
(Difference from 1986 to 2005 average)



2°C and 4°C scenarios will have similar temperature changes until 2030.
The divergence expands from 2030.
Adopted from AR5 SYR figure SPM.6, IEA, "ETP2017," UNEP,
"The Emission Gap Report 2015," Global Warming of 1.5°C (IPCC)

Defined as 4°C (2.7°C -) scenario

4°C Scenario :
3.2 - 5.4°C will rise from pre-industrial levels without additional global warming measures

2°C (2.7°C - 4°C) Scenario :
2.7 - 4.0°C will rise from pre-industrial levels without additional global warming measures

Defined as 1.5 - 2°C scenario

2°C scenario :
0.9 - 2.3°C will rise from the pre-industrial levels with stringent measures

1.5°C scenario :
High probability of a rise of less than 1.5°C from pre-industrial levels when drastic system transition is achieved

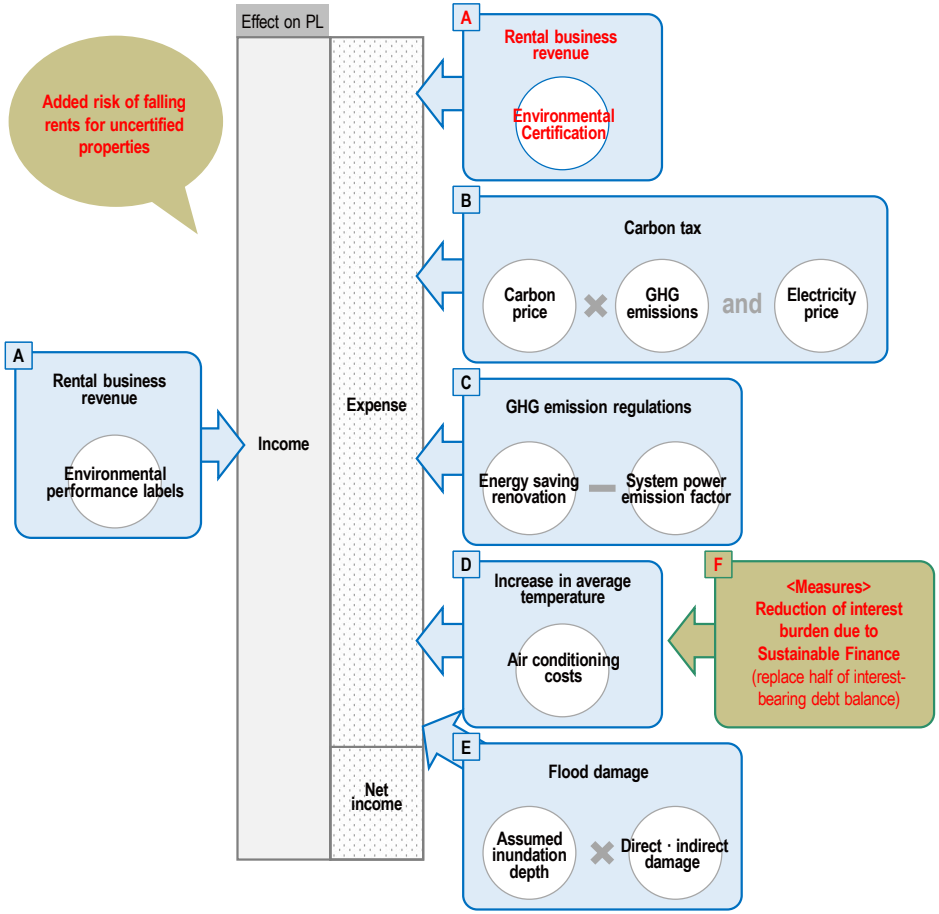
The scenario analysis in TCFD proposal selects multiple temperature range scenarios including 2 °C or less.

Parameters used

* Exchange rate: 1 USD = 105 yen (based on November 12, 2020)
* Table features only parameters used in impact assessment

Major risks/ opportunities		Parameters	Current	Transition risk: 2030, Physical risks: 2050		Source
				4°C (over 2°C)	Less than 2°C (1.5- 2°C)	
Transition risk	**Carbon cost**	Carbon tax	2.8 USD/t (289 yen/t)	2.8 USD/t (289 yen/t)	130 USD/t	•4°C: assumed to be equal to current level •Less than 2°C: IEA WEO2021 NZE scenario
		[additional] Price of electricity	90.0 USD/MWh	86.4 USD/MWh	118.8 USD/MWh	•4°C: NGFS Current Policies scenario •Less than 2°C: NGFS Net Zero 2050 scenario
	Compliance with GHG emissions standards	Building energy intensity	Global forecast (compared to 2014)	▲13.5%	▲20.5%	•4°C: IEA ETP2017 RTS scenario •Less than 2°C: IEA ETP2017 2DS scenario
		Grid electricity emission factor	0.45kg-CO2/kWh (2020)	0.27kg-CO_2/kWh	0.2kg-CO_2/kWh	•4°C: IEA WEO2021 STEPS scenario •Less than 2°C: IEA WEO2021 SDS scenario
		Mandatory ZEB/ ZEH installation (government target)	Domestic target	–	100% ZEB new buildings 100% ZEH new residential properties	•Less than 2°C: Basic Energy Plan, the Agency for Natural Resources and Energy at the Ministry of Economy, Trade and Industry (July 2018)
	Change in customer behavior	Rent change by environmental performance	+4.98%	+4.98%	+7.98%	•Less than 2°C: Smart Wellness Office Research Committee, xymax, Japan Real Estate Institute, DBJ
Physical risk	**Increase in average temperature**	[additional] Air conditioning cost	19 USD/person	61 USD/person	35 USD/person	IEA "The Future of Cooling" (2018) •4°C: Baseline Scenario •Less than 2°C: Efficient Cooling Scenario
	Intensification of extreme weather	Change in domestic rainfall/flow and frequency of occurrence of floods	Flood frequency (compared to 2018)	approx. x4 (2100)	approx.x2 (2100)	•4°C, less than 2°C: "Proposed recommendations on climate change-based flood control planning," the Technical Review Committee on Climate Change Based Flood Control Planning (2019)

Impact of Risks and Opportunities on Earnings



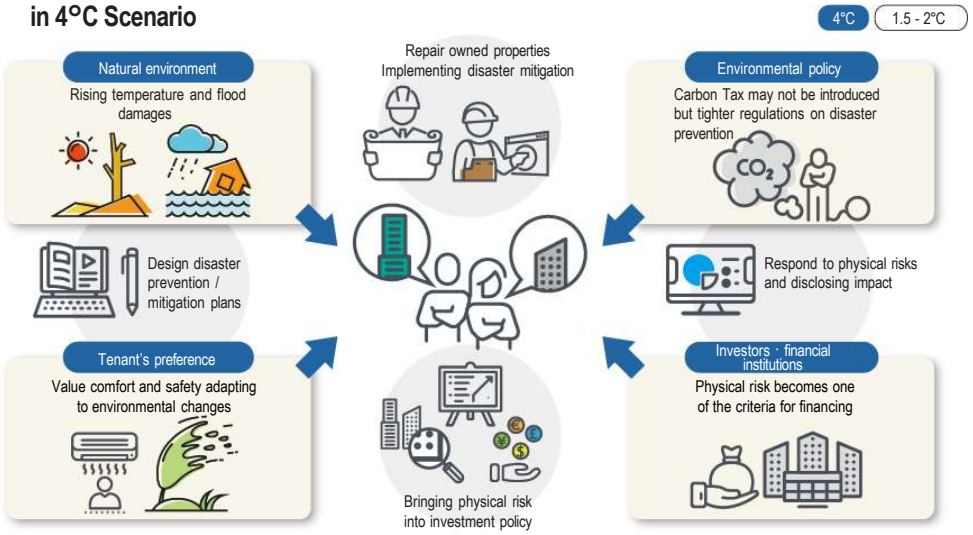
Estimated Results of Risks and Opportunities

		Risk items	Current analysis 4°C	Current analysis 1.5–2°C	Explanation of calculation/Difference from previous analysis
Opportunity	A1	Changes in customer behavior (Rent increases for properties with higher environmental performance level)	0 bn yen	0.2 bn yen	Positive effects decrease significantly from the previous analysis because conditions for raising the rent are raised to the level of EU taxonomy.
Transition risk	A2	Changes in customer behavior (Decreased rent revenue of properties for which environmental certification is not acquired)	0 bn yen	-1.26 bn yen	The assumption is added that the rent of not certified properties falls.
	A3	Changes in customer behavior (Partial avoidance of rent revenue fall due to increased certification acquisition rate)	0 bn yen	0.21 bn yen	The fall in rent/occupancy rate is partially avoided and the rent revenue decline is compressed due to increased certification rate planning and running.
	B1	Carbon Price (Carbon tax)	0 bn yen	-0.61 bn yen	The carbon tax burden significantly increases in the 1.5-2° C scenario, where the amount of carbon tax substantially increases.
	B6	Carbon Price (Avoidance of carbon tax due to achieving reduction targets)	0 bn yen	0.26 bn yen	The amount of carbon tax to be avoided by the 35% reduction target per unit of production.
	B2	Electricity price (Changes in electricity price)	0.02 bn yen	-0.17 bn yen	Costs increase due to updated electricity price parameters (estimates), etc.
	C1	Response to GHG emission regulations (Energy-saving repairs cost and return of electricity bills by green lease)	-0.4 bn yen	-1.01 bn yen	While the burden decreases due to including the return of electricity bills by green lease, the cost increase in energy-saving repairs required in the 1.5-2° C scenario due to the updated reduction target per unit of production.
	C2	Response to GHG emission regulations	0.25 bn yen	0.64 bn yen	Utility costs decrease by achieving the 35% reduction target per production unit.
Physical risk	D	Increase in average temperature (Air conditioning costs)	-0.52 bn yen	-0.36 bn yen	While air conditioning costs decrease due to updated electricity price parameters, the risk increases because the scope is expanded to energy management authority.
	E1	Intensification of extreme weather (Flood Damage)	-0.13 bn yen	-0.04 bn yen	The amount of flood damage increases due to increased occurrence frequency.
	E2	Intensification of extreme weather (Typhoon Damage)	-0.01 bn yen	-0.01 bn yen	No change
	E3	Intensification of extreme weather (Damages compensated by insurance)	0.07 bn yen	0.03 bn yen	Compensation by insurance for flood damage increases due to increased occurrence frequency.

*This estimation is a prediction of future impact based on OJR's actual performance and uses parameters set by OAM in reference to several scenarios presented by major institutions. It does not guarantee the accuracy of the numerical values used. The predicted measures are assumptions informed by the calculations and are not measures that have been planned or decided upon.

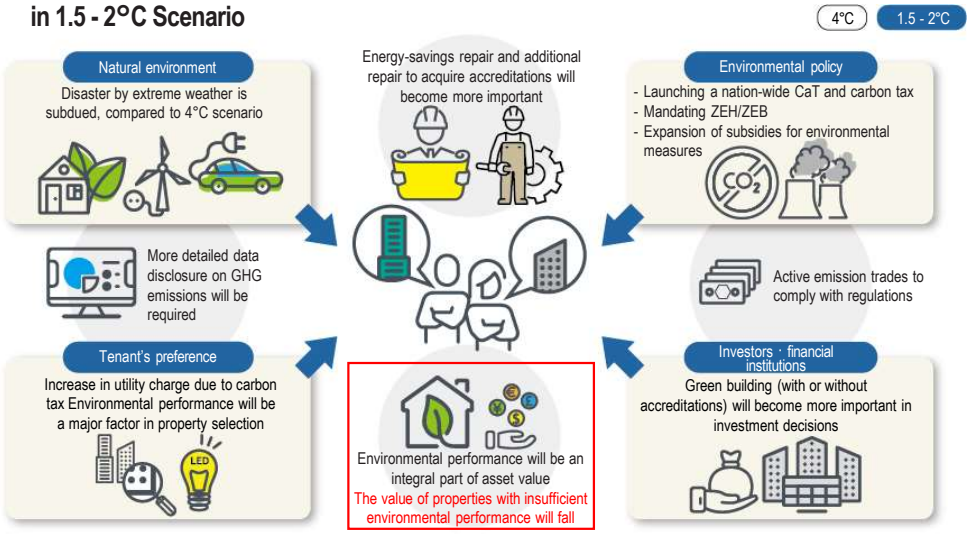
World-view Assumed in 4°C Scenario

Further reduction of disaster risks in asset portfolio will be required



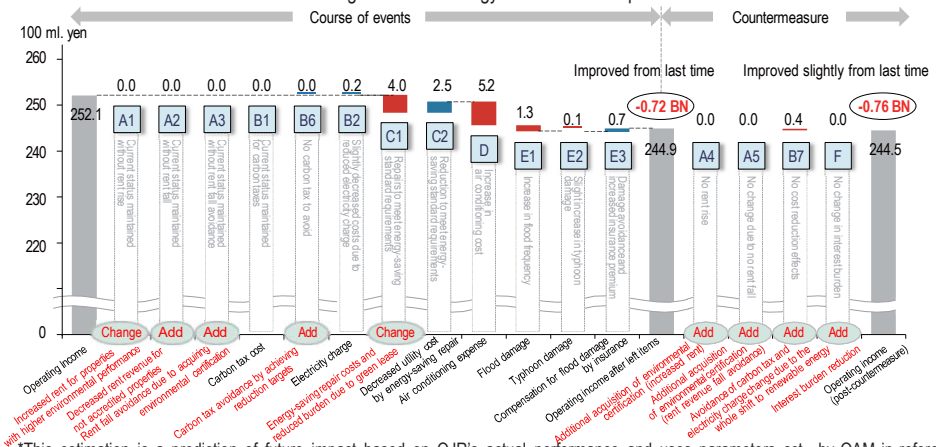
World-view Assumed in 1.5 - 2°C Scenario

The challenge of improving portfolio energy conservation performance



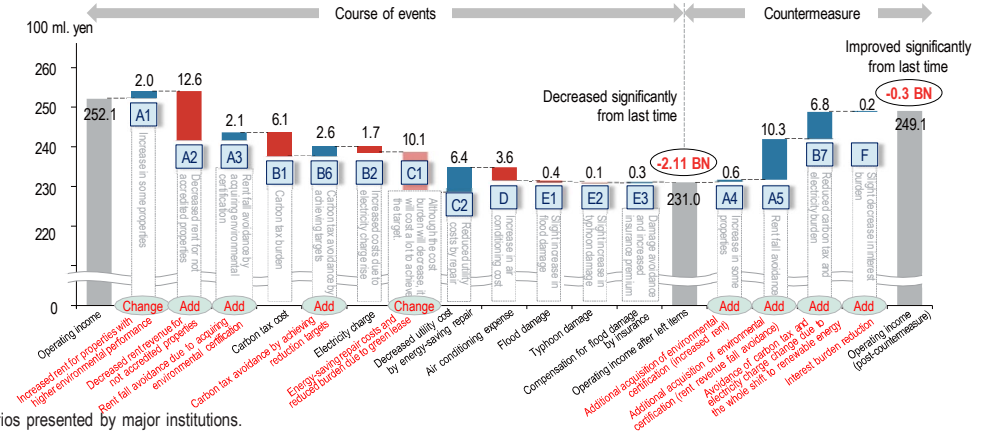
4°C Scenario

Decrease in earnings due to rising temperatures driving an increase in air conditioning costs and energy conservation improvement costs



1.5 - 2°C Scenario

Carbon tax and fall in rents had a significant impact, but rent incomes recovered due to the acquisition of environmental certification and renewable energy measures, thereby reducing the decline in earnings



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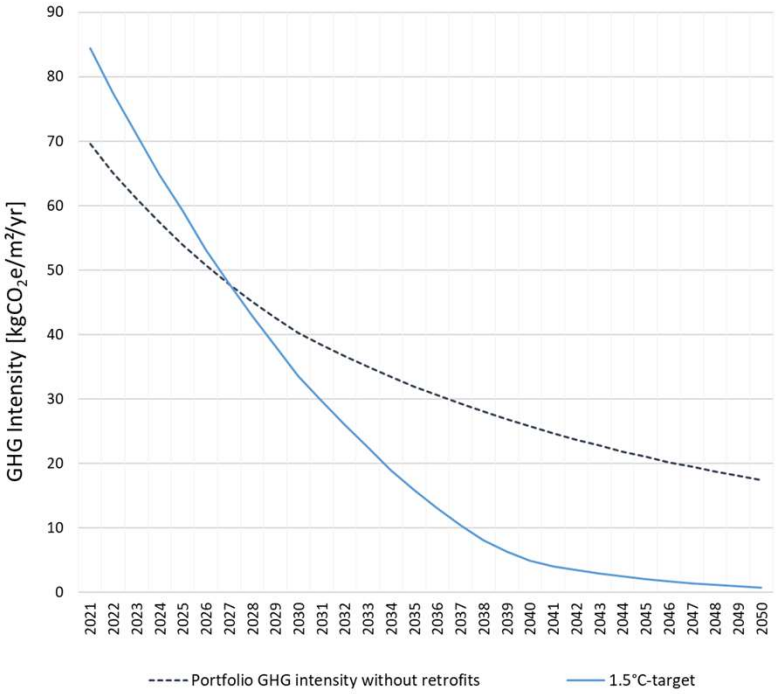
Climate Change Risk Analysis (New CRREM Pathways)

CRREM sets CO_2 emission intensity of real estate as an indicator, establishes a "decarbonization pathway" by purpose and region in line with the goal of net zero by 2050, and reflects the status of owned assets to create an anticipated decarbonization pathway (shown as the blue lines in the following figures) for each company. If a company's decarbonization pathway exceeds the anticipated pathway, it is assumed that risks such as carbon taxes on the deviating portion (stranded assets) will be incurred.

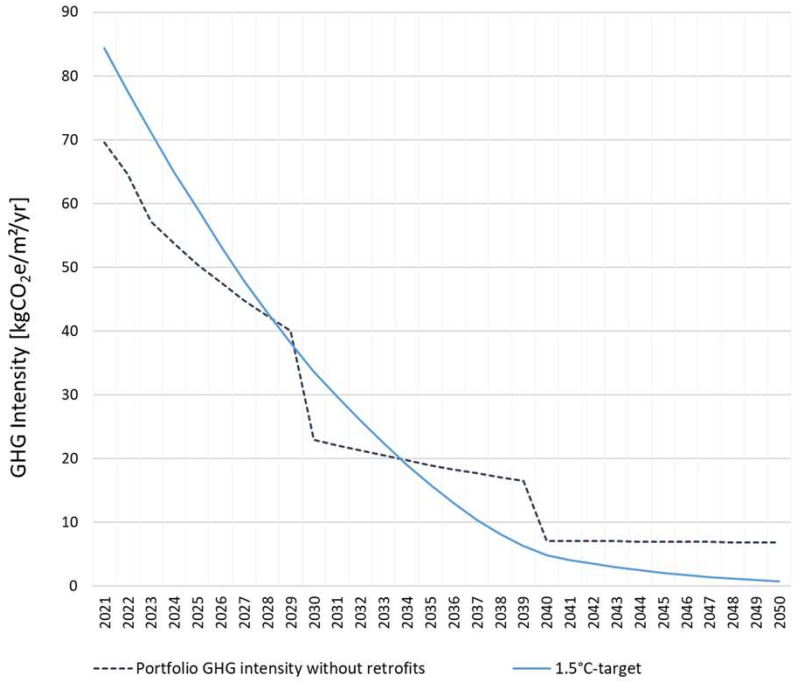
In the Energy-Saving Scenario

Taking energy-saving measures alone will create a deviation from the 1.5°C pathway around 2027 (the dotted line [the company's decarbonization pathway] will go above the blue line [the pathway]).



In the Renewable Energy Scenario

If, in addition to energy-saving measures, 50% renewable energy is adopted by 2030 and 100% by 2040, there will be a deviation from the 1.5°C pathway around the time renewable energy is adopted. Even after renewable energy is adopted, there will be another deviation around 2034.



Possible responses to these pathway deviations include adopting renewable energy at an earlier stage and strengthening energy-saving measures. GHG emissions from gas fuels and district heating and cooling (DHC) are expected to continue decreasing in the future as both industries have set a target of carbon neutrality by 2050. As mentioned in the section on the transition plan, the goal is to combine these proactive measures and external factors in an effort to achieve net zero by 2050.