Scenario Analysis of the Solar Power Generation Business

Detailed Scenario Analysis (by Process)

Risk Severity Assessment

Risks and opportunities in the Environment and Energy Business (Solar Power Generation)

Only items that were assessed as “Large” in terms of impact from a long-term perspective from 2030 to 2041 on the business related to risks and opportunities have been listed.

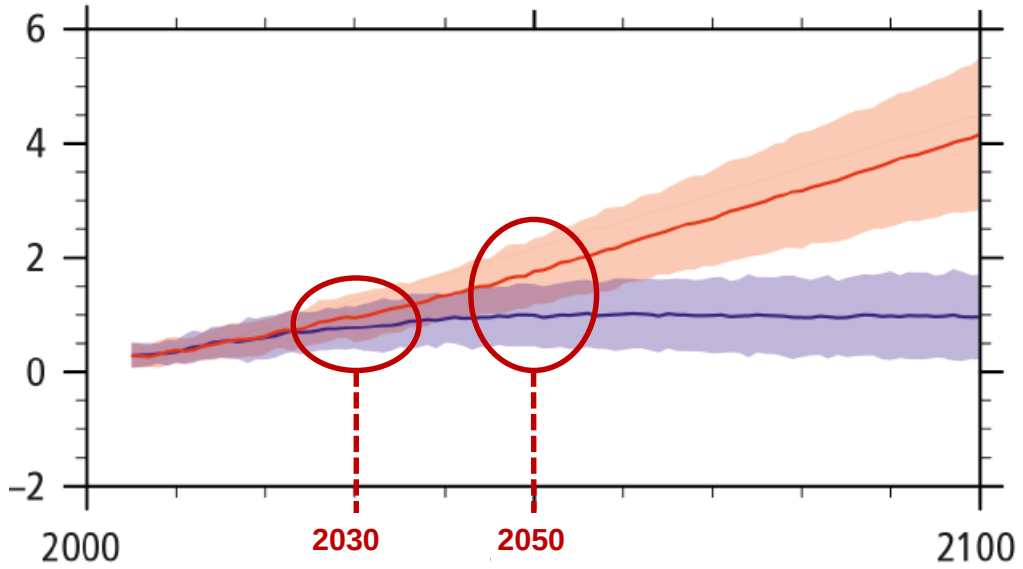
Item		Business Impact		
Risk	Sub category	Indicator	Risk	Opportunity
Transition Risk	**Carbon price**	Expenditure	N/A	The introduction of a carbon price for electricity will increase the cost of generating electricity from fossil fuels. Consumers will be more likely to choose renewable energy sources that are more competitive in carbon pricing.
	Recycling regulations	Revenue, expenditure	Laws and regulations regarding the collection and recycling of solar panels may have a financial impact and may tarnish our medium- to long-term reputation.	Panel recycling and hazardous material recycling technologies and services will be developed ahead of competitors and introduced to, and ultimately expand, the market.
	Subsidy policy for renewable energy, etc.	Revenue	The profitability of a business operated under the FIT program may deteriorate if grid parity is not achieved before the program ends.	A stricter CO2 emission reduction policy will be adopted, and the FIT program will provide opportunities for business expansion for a long time to come.
	Changes in the energy mix (including energy demand trends)	Revenue	Due to changes in the energy mix, the number of renewable energy power generation companies will increase, and the competitive environment will become increasingly severe. Sales prices may fall.	Japan has stipulated that the share of non-fossil electricity in electricity sales should be 44% by 2030, and opportunities for renewable energy generation will expand.
	Spread of renewable energy and energy-saving technologies	Revenue, assets	Competition with other companies may intensify due to declines in the value of equipment and power generation costs of power generation facilities as a result of the spread of renewable energy technologies.	Business opportunities for solar and biomass power generation will expand as the use of renewable energy increases.
Physical Risk	**More severe abnormal weather**	Revenue, expenditure	Damage to employees and power plants caused by torrential rains, floods, and typhoons will result in shutdowns, lower operating rates, and additional investment to restore facilities. In addition, insurance premiums and other costs will increase for assets located in high-risk areas, which may affect the PL/BS.	Developing resilient equipment by accumulating knowledge may lead to new opportunities by providing it to the outside world.

Definition of Scenario Groups

The Reason for the Scenario Selection

We used the Sustainable Development Scenario (“well below 2°C” scenario including 1.5℃) and the New Policy Scenario (4°C scenario) published by the International Energy Agency (IEA), which are widely used in various assessments.

Projected Changes in Global Average Surface Temperature
(Differences from the 1986–2005 Average)



Before 2030, <u>similar temperature changes</u> will occur under the 2°C and 4°C scenarios. After 2030, <u>the difference between the scenarios will increase</u>

Under the 4°C (2.7–4.0°C) Scenario

4°C Scenario:
If climate change measures are not strengthened, the temperature will increase by 3.2 to 5.4°C above pre-industrial levels

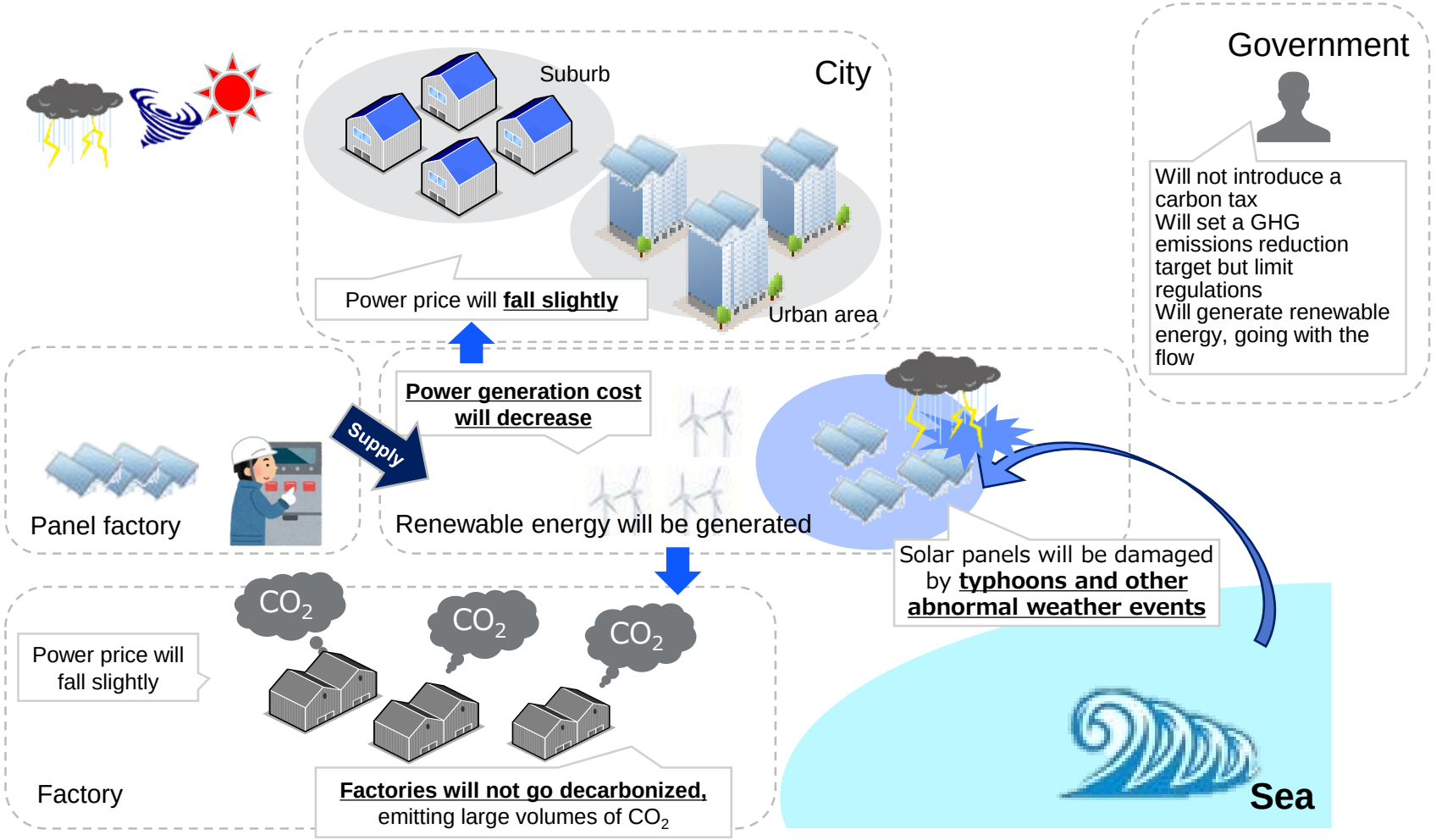
2°C or above (2.7–4°C) Scenario:
If climate change measures are not strengthened, the temperature will increase by 2.7 to 4°C above pre-industrial levels

2°C Scenario:
If strict measures are taken, the temperature will increase by 0.9 to 2.3°C above pre-industrial levels

The scenario analysis in TCFD recommendations suggests the selection of multiple temperature range scenarios, including one with 2°C or lower

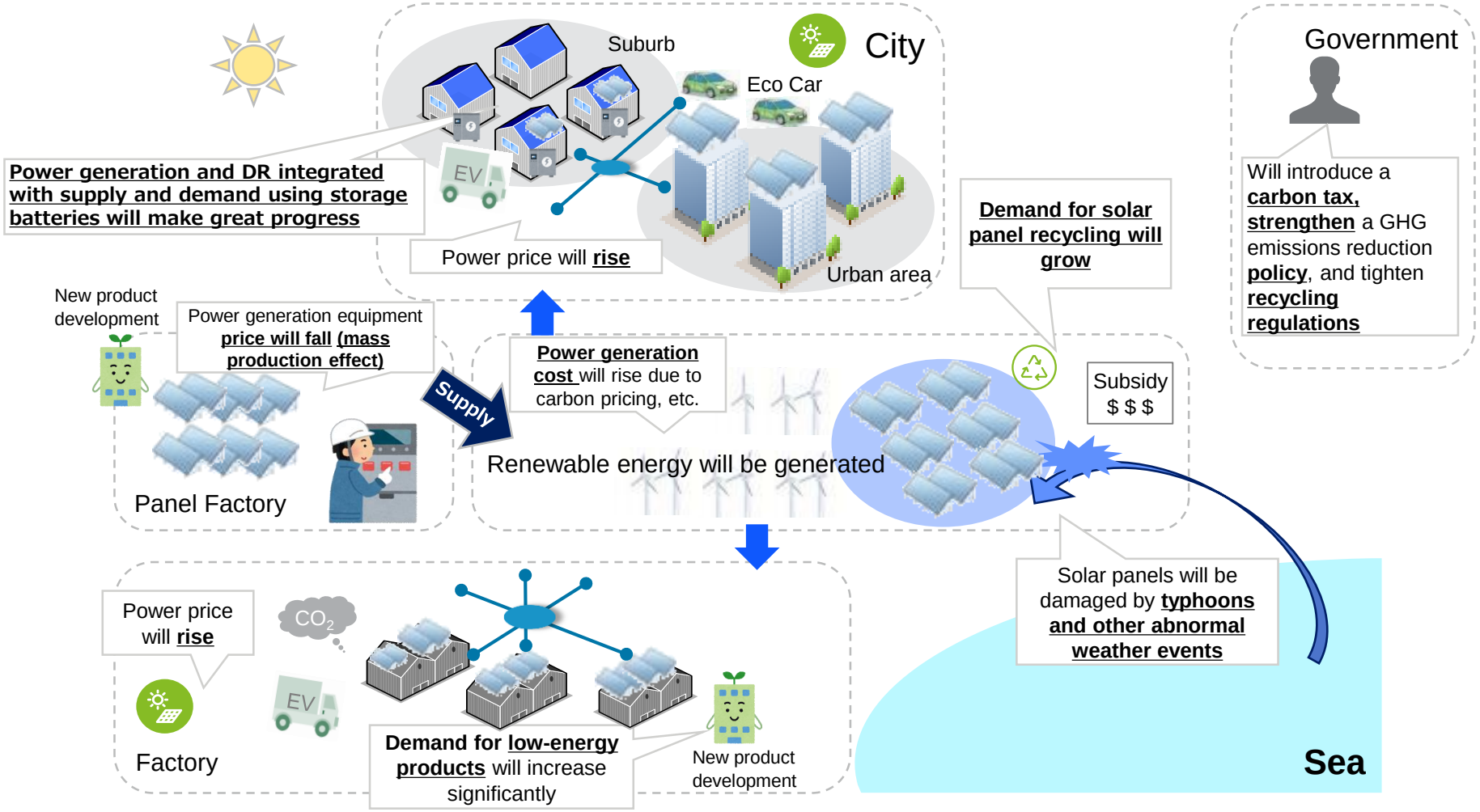
Future Society under the 4°C Scenario

Renewable energy generation such as solar power will expand as a result, but there are concerns about the impact of physical risks from severe disasters



Future Society under the “well below 2°C” Scenario including 1.5°C

Solar power and other renewable energy generation will be strongly promoted, leading to the realization of a decarbonized society in all aspects



Business Impact Assessment

In order to evaluate the impact of climate change on the environment and energy business (solar power generation), which is the subject of our scenario analysis, we projected various parameters as estimates up to 2030. As a result, we assumed under the 4°C scenario that non-life insurance costs would increase by approximately ¥400 million as costs of physical risks. Furthermore, we estimated the impact in 2041, after the end of the Feed-in Tariff (FIT) program, and found that the business will continue to be profitable even if the purchase price drops to ¥7/kWh (Agency for Natural Resources and Energy, “Price Target”: Fundamental Review of FIT Program and Renewable Energy Policy Reconstruction, April 2019).

We assumed under the “well below 2°C” Scenario including 1.5℃ that non-life insurance costs would increase by approximately ¥300 million as a cost burden due to physical risks. Although the purchase price will be affected after the end of the FIT program, the estimated impact in 2041 shows that the business continues to be profitable. The results of analysis under the “well below 2°C” Scenario including 1.5℃ show a high expectation for profit growth through the capture of opportunities due to expected increases in non-fossil value and opportunities in the renewable energy business, including solar power generation.

The impact of both physical and transition risks on the overall portfolio of Tokyo Century Group was limited in this scenario analysis. Based on the results of these scenario analyses, however, we will continue to strive for sustainable growth by strengthening our resilience to climate change and taking advantage of business opportunities.

Definition of Countermeasures

As a result of the scenario analysis, the following countermeasures have been defined to mitigate risks and capture opportunities from climate change.

	Corresponding Item	Corresponding Item
Environment and Energy Business **Solar Power Generation**	Profitability improvement	**Increasing profitability by improving facility efficiency** - Strengthening asset management (AM) - Maximizing power generation efficiency through accumulated asset management expertise
	Countermeasures against a sales decline after FIT ends	**Expanding into non-FIT businesses** - Developing new businesses such as corporate power purchase agreement (PPA), self-wheeling model, and virtual power plant (VPP)
	Capturing new opportunities	**Considering renewable energy businesses other than solar power generation** - Expanding business into renewable energy businesses other than solar (e.g., hydro, biomass, wind power) - Entering the VPP business, supply and demand adjustment market, capacity market, etc., using storage batteries - Expanding business by investing in companies that provide new technologies and business models - Discovering new needs through the use of reused solar panels, for example, by entering the recycling business

The scenario analysis related to the environment and energy business (solar power generation), considered to be significantly affected by climate change, found no significant impact on the current business strategy. Other business activities are also affected by climate change, but we currently believe that risks in individual business activities have a limited impact on the overall performance of the Group.

Going forward, we plan to prepare a scenario analysis from the perspectives of both risks and opportunities, prioritize businesses with a significant business impact, and consider specific policies while monitoring the impact of climate change on our business as a whole.

Toward realizing a decarbonized society, we will work on businesses related to new environment-related technologies along with customers in pursuit of their growth to reduce climate-related risks and will contribute to the creation of an environmentally sound, sustainable economy and society.