

Summary Version

# The Second Okinawa Prefecture Global Warming Countermeasures Implementation Plan

## Okinawa Prefecture Climate Change Adaptation Plan

Revised Edition

—Planning Period: Fiscal Year 2021~2030—

 Okinawa Prefecture Government

# 1 Background of the Plan Revision

In March 2021, Okinawa Prefecture Government formulated the “Second Okinawa Prefecture Global Warming Countermeasures Implementation Plan” (hereinafter referred to as the “Second Implementation Plan”), with a planning period extending through fiscal year 2030. Subsequently, in March 2023, the Second Implementation Plan was revised in light of amendments to the Act on the Promotion of Measures to Cope with Global Warming and the raising of the mid-term targets in the national Global Warming Countermeasures Plan. In February 2025, the national Global Warming Countermeasures Plan was revised, setting targets to reduce greenhouse gases by 60% and 73% by fiscal year 2035 and fiscal year 2040, respectively, compared to fiscal year 2013. Furthermore, as five years have passed since the formulation of the Okinawa Prefecture Climate Change Adaptation Plan, we have now revised both the Prefecture’s Second Implementation Plan and the Okinawa Prefecture Climate Change Adaptation Plan.

## 2 What is global warming? What is climate change?

### ●What is global warming?

The atmosphere surrounding Earth contains greenhouse gases such as carbon dioxide (CO<sub>2</sub>), which absorb heat radiating from Earth into space and maintain temperatures suitable for human and many other living creatures to survive.

However, when greenhouse gases increase excessively, much of the heat is trapped in the atmosphere instead of escaping into space, causing global temperatures to rise. This phenomenon is called “global warming.”

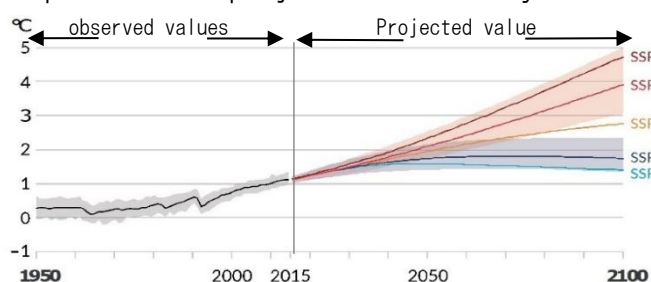
### ●What is climate change?

Climate refers to the overall atmospheric conditions of a specific region. It can mean the average temperature or precipitation for a given season, but it can also refer to empirical, qualitative impressions—such as winter being rainy or spring being windy. Changes in this climate are called “climate change,” which is understood to be a phenomenon resulting from the combined effects of human-induced global warming and natural variability.

## 3 Projected impacts of global warming

### ●Future predictions of global warming

According to IPCC (Intergovernmental Panel on Climate Change) predictions, under the scenario corresponding to the maximum greenhouse gas emissions by 2100 (SSP5-8.5), the global average temperature is projected to rise by 3.3° C to 5.7° C. Even under the lowest scenario (SSP1-1.9), which aims to limit future temperature increases to below 2° C, the temperature is projected to rise by 1.0° C to 1.8° C.



“SSP5-8.5” If CO<sub>2</sub> and other emissions are not reduced beyond current measures, temperature increases will be significant.

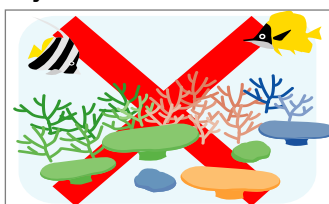
“SSP1-1.9” When limiting emissions of CO<sub>2</sub> and other gases, the temperature increase is smaller.

Source: IPCC Sixth Assessment Report  
Report of the First Working Group with  
Additions by Okinawa Prefecture Government

Projected Changes in Global Average Temperature

### ●Impact of Climate Change

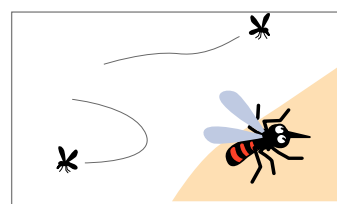
Climate change is raising concerns about its various impacts on natural ecosystems and our daily lives.



- Changes in natural ecosystems
  - Coral bleaching due to high water temperatures
  - Changes in plant flowering periods, etc.



- Natural disaster
  - Typhoon Intensification
  - Increase in torrential rains, etc.



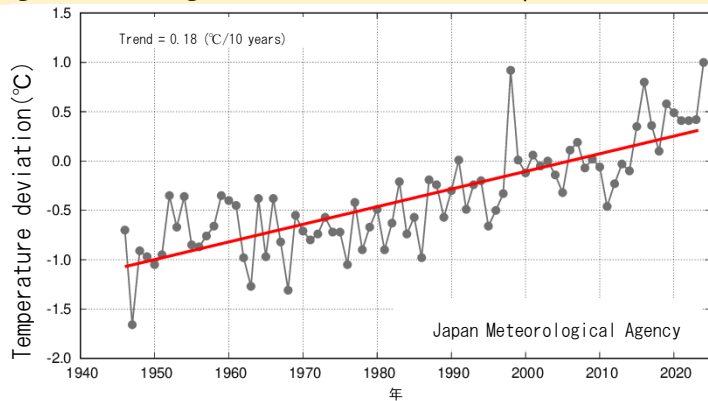
- Threat to residents’ health
  - Establishment of disease-transmitting mosquitoes in tropical regions
  - Increased risk of heatstroke, etc.

# 4 Climate Change Situation in Okinawa Prefecture

## ● Temperature change

The annual average temperature in the Okinawa region has been rising while undergoing various fluctuations.

Long-term changes in annual mean temperature anomalies



Source: Created by Okinawa Prefecture based on Climate Change in the Okinawa Region (Okinawa Meteorological Observatory, as of August 2025)

If temperatures continue to rise like this, we are concerned about heatstroke and the impact on crops.



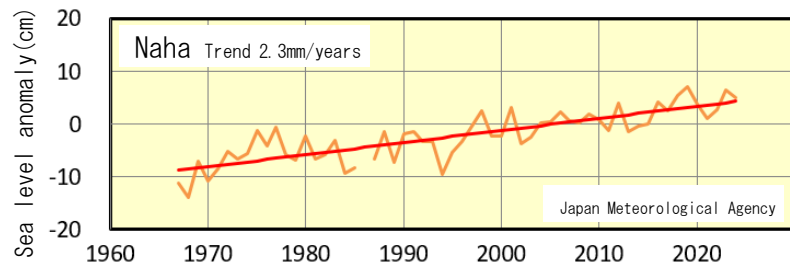
## ● Sea level change

Sea level in Naha has been rising at a rate of 2.3 mm per year since records began in 1967.

If sea levels continue to rise, sandy beaches may decrease.



Long-Term Variation in Mean Sea Level Difference at Naha



Source: Climate Change in the Okinawa Region (Okinawa Meteorological Observatory, as of August 2025)

# 5 Mitigation measures and adaptation measures

Measures to reduce greenhouse gases are called “mitigation measures,” while measures to prevent or mitigate damage caused by climate change impacts are called “adaptation measures.” It is necessary to advance both of these measures in a balanced manner, like the two wheels of a car.

### Mitigation measures

#### curbing greenhouse gas emissions

【Examples】

- Introduction of renewable energy sources such as solar power generation.
- Practicing an Energy-Saving Lifestyle.
- Transition to Low-Carbon Transportation Systems, etc.

### Adaptation measures

#### Preventing and mitigating damage caused by climate change impacts

【Examples】

- Introduction of heat-tolerant crop varieties in preparation for rising temperatures
- Disaster prevention measures in preparation for the strengthening of the typhoon
- Heatstroke prevention and infection control measures, etc.

Mitigation measures alone are not enough.



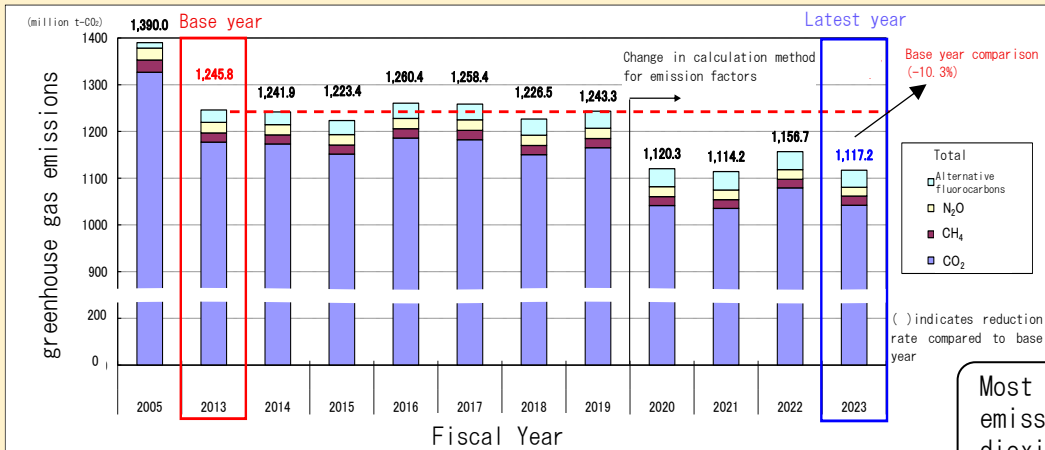
Adaptation measures to prepare for climate change are also important.

# 6 Greenhouse Gas Emissions in Okinawa Prefecture

## ● Greenhouse gas emissions

Okinawa Prefecture's total greenhouse gas emissions remained stable through fiscal year 2019, but decreased significantly in fiscal year 2020 due to the impact of the Covid-19. Comparing the base year of fiscal year 2013 with the most recent fiscal year 2023, emissions decreased by 1.286 million tons, a 10.3% reduction.

Trends in Greenhouse Gas Emissions in Okinawa Prefecture



Most greenhouse gases emissions are carbon dioxide.

## ● Characteristics of Carbon Dioxide Emissions by Energy Source and Sector in Okinawa Prefecture

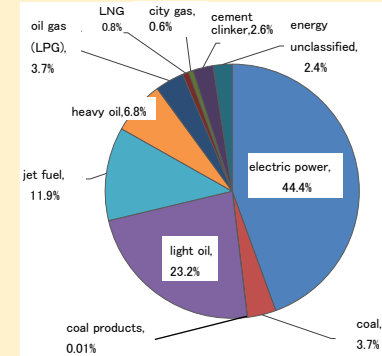
Looking at carbon dioxide emissions by energy source in Okinawa Prefecture, electricity accounts for the highest share at 44.4%, followed by light oil (gasoline, diesel fuel).



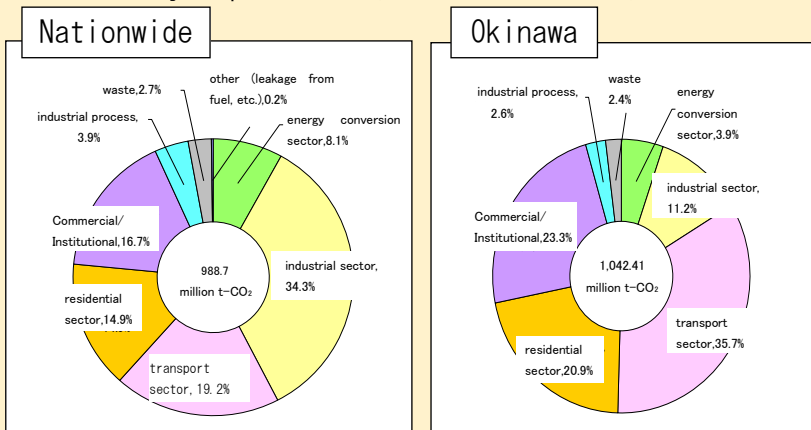
We consume a lot of electricity and automotive fuel.

Comparing the composition of carbon dioxide emissions by sector between the national level and Okinawa Prefecture reveals that manufacturing accounts for a smaller proportion in Okinawa than nationally. Consequently, the industrial sector's share is smaller in Okinawa, while the transport sector and the residential sector (residential sector and Commercial/Institutional) account for a relatively higher proportion compared to the national average.

Carbon Dioxide Emissions Composition by Energy Source in Okinawa Prefecture (FY 2023)



Breakdown of Carbon Dioxide Emissions by Department (Fiscal Year 2023)



The combined total of residential sector and Commercial/Institutional in Okinawa Prefecture is 44.2%, higher than the national average of 31.6%.

# 7 Basic Planning Considerations

## ● Positioning of the Plan

This plan integrates the “Okinawa Prefecture Global Warming Implementation Plan (Regional Measures Edition)” based on the Act on Promotion of Measures to Cope with Global Warming and the “Okinawa Prefecture Climate Change Adaptation Plan” based on the Climate Change Adaptation Act into a single framework. It promotes “mitigation measures” and “adaptation measures” comprehensively and systematically as two equally important pillars.

## ● The Future We Should Aim For

To ensure consistency with Okinawa Prefecture’s basic concepts, the “Okinawa 21st Century Vision” and the “Third Okinawa Prefecture Environmental Basic Plan,” the future vision to be pursued for realizing a decarbonized society is as follows.

### Future Vision to Aim For (Fiscal Year 2050)

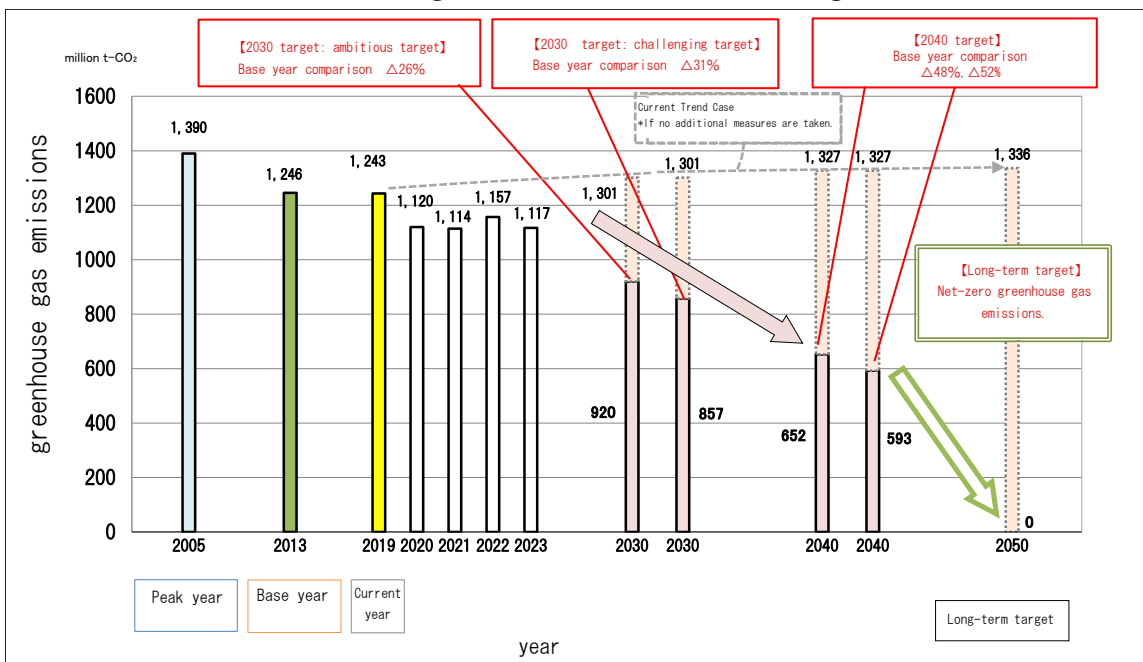
A decarbonized island society realized, adapted to climate change, and blessed with a rich natural environment—a sustainable Okinawa Prefecture.

# 8 Greenhouse gas emissions reduction targets

Greenhouse gas emissions are projected to increase in the future if no additional measures are implemented (business-as-usual scenario). Therefore, it is necessary to advance the required actions (mitigation measures) to achieve the reduction targets.

Target Year	Greenhouse gas emissions reduction targets
Fiscal Year 2030	Ambitious target: 26% reduction from the base year (FY 2013) (32% reduction from FY 2005) Challenging Target: 31% reduction from the base year (FY 2013) (37% reduction from FY 2005)
Fiscal Year 2040	Low-end target: 48% reduction compared to the base year (fiscal year 2013) High-end target: 52% reduction compared to the base year (fiscal year 2013)
【Long-term target】 Fiscal Year 2050	Aiming for net-zero greenhouse gas emissions. (Realizing a decarbonized society)

Greenhouse gas emission reduction targets



# 9 Mitigation measures

## ● Approach to Policy Implementation

In addition to ensuring the achievement of our mid-term targets for fiscal year 2030, we will promote and strengthen initiatives feasible with current technologies while accelerating efforts to implement innovative technologies in society, from a long-term perspective toward realizing a decarbonized society.

## ● Key Mitigation Measures

We will pursue initiatives across five categories: “Promotion of Renewable Energy Use,” “Use of Low-Carbon Products and Services,” “Regional Environmental Improvement,” “Formation of a Recycling-Oriented Society,” and “Methane and Nitrous Oxide Countermeasures.” Additionally, we will undertake cross-cutting initiatives (such as awareness campaigns and early adoption of innovative technologies) that support each field from the ground up.

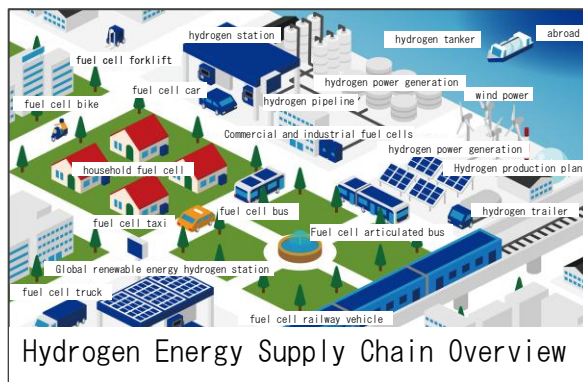
Policy Classification	Mitigation measures
Promotion of Renewable Energy Use	<ul style="list-style-type: none"> <li>○Promoting the adoption of renewable energy sources such as solar, wind, and biomass</li> <li>○Advancing the decarbonization of energy</li> </ul>
Use of Low-Carbon Products and Services	<ul style="list-style-type: none"> <li>○Promoting awareness and adoption of next-generation vehicles</li> <li>○Advancing energy-saving measures in buildings</li> </ul>
Regional Environmental Improvement	<ul style="list-style-type: none"> <li>○Promoting the use of public transportation</li> <li>○Realizing compact, low-carbon urban structures</li> <li>○Advancing sink measures such as forest management</li> </ul>
Formation of a Circular Economy	<ul style="list-style-type: none"> <li>○Promoting the 3Rs (Reduce, Reuse, Recycle)</li> <li>○Promoting proper handling of fluorocarbons</li> </ul>
Methane and Nitrous Oxide Countermeasures	<ul style="list-style-type: none"> <li>○Promoting reduction of methane and nitrous oxide emissions from livestock</li> <li>○Promoting efficient fertilization and the spread of smart agricultural technologies</li> </ul>
Cross-Sectoral Initiatives	<ul style="list-style-type: none"> <li>○Environmental education and awareness-raising to promote global warming countermeasures</li> <li>○Formulation and steady implementation of local government implementation plans</li> <li>○Promoting the early introduction of technologies for a decarbonized society</li> </ul>

## ● Initiatives for the Social Implementation of Innovative Technologies

We will advance initiatives to implement innovative technologies in society, aiming to realize a decarbonized society.

### Examples of Innovative Technologies

- Hydrogen Energy
- Ocean Renewable Energy (Ocean Thermal Energy Conversion, Wave Energy, etc.)
- CO<sub>2</sub> Capture, Storage, and Utilization Technologies
- Next-Generation Storage Batteries
- Urban Management Using Big Data, AI, etc.



Source: Created by Okinawa Prefecture Government based on the Ministry of the Environment website

# 10 Adaptation measures

## ● Policy for Promoting Adaptation Measures

We will work toward realizing a “climate-resilient society,” our vision for the future, based on the following principles.

### Okinawa Prefecture Climate Change Adaptation Promotion Policy

- ◎ Integrating climate change adaptation into various policies
- ◎ Promoting adaptation measures tailored to the prefecture’s specific circumstances
- ◎ Sharing climate change information among government, residents, and businesses
- ◎ Compiling and providing scientific findings



Realizing a society capable of adapting to climate change

## ● Primary Adaptation Measures

Adaptation measures will be implemented in specific sectors such as “agriculture, forestry, and fisheries” and “water environment and water resources.” Additionally, awareness-raising activities will promote understanding of the concept of adaptation measures and encourage voluntary initiatives.

Fields	Examples of Impact	Adaptation measures
Agriculture, Forestry, and Fisheries	Rising temperatures, changing rainfall patterns, rising sea temperatures	<ul style="list-style-type: none"> <li>○ Cultivation of heat-tolerant rice, vegetables, and fruit trees</li> <li>○ Guidance on irrigation and shading as high-temperature countermeasures</li> <li>○ Development of aquaculture techniques adapted to rising seawater temperatures</li> </ul>
Water Environment Water Resources	Deteriorating water quality, increased risk of drought	<ul style="list-style-type: none"> <li>○ Monitoring sedimentation of red soil and other materials in marine areas, and tracking changes in runoff conditions</li> <li>○ Raising awareness about water conservation</li> </ul>
Natural Ecosystems	Impact on coastal ecosystems due to high water temperatures, establishment of invasive species	<ul style="list-style-type: none"> <li>○ Elucidating coral bleaching phenomena, collecting information on genetic analysis of corals and impacts of ocean acidification, developing bleaching mitigation technologies, etc.</li> <li>○ Collecting information through surveys on invasive species’ entry and establishment status, etc.</li> </ul>
Natural Disasters	Increased flooding damage due to heavier rainfall, intensified typhoons, increased risk of high waves due to rising sea levels	<ul style="list-style-type: none"> <li>○ Promoting river improvement and dredging, and developing disaster prevention action plans</li> <li>○ Developing infrastructure to withstand typhoons and torrential rains</li> <li>○ Establishing tsunami and storm surge inundation predictions and designating tsunami and storm surge disaster warning zones</li> </ul>
Health	Increased risk of heatstroke and infectious diseases	<ul style="list-style-type: none"> <li>○ Dissemination of information and awareness campaigns regarding heatstroke countermeasures,</li> <li>○ Investigation of mosquito-borne infectious disease outbreaks and risk assessment</li> </ul>
Industry Economic Activities	Impact on tourism, review of design conditions in the construction industry	<ul style="list-style-type: none"> <li>○ Strengthening information provision systems for travelers</li> <li>○ Compiling research cases and scientific findings on the impacts of climate change in the construction industry</li> </ul>
National Life Urban Life	Short-duration heavy rain, drought, and heat-related impacts on daily life	<ul style="list-style-type: none"> <li>○ Measures to prevent slope failures caused by heavy rain, countermeasures against storm surges and river flooding</li> <li>○ Environmental greening and nature conservation, creation of green spaces for relaxation and interaction with nature</li> </ul>

# 11 Roles of Stakeholders

To reduce greenhouse gases and build a society resilient to climate change, it is essential that all stakeholders—government, residents, and businesses—work together while fulfilling their respective roles.

## The Role and Initiatives of the Administration

- We will formulate and promote measures to comprehensively and systematically advance efforts to prevent global warming and adapt to climate change.
- We will raise awareness and promote initiatives among residents, businesses, tourists, and others to prevent global warming and adapt to climate change.
- We will assess and evaluate the impacts of climate change, conduct surveys and research, and reliably and promptly provide diverse information related to climate change.

It is important for everyone to work together.



## Roles and Initiatives of Prefectural Residents

- Develop an interest in issues like global warming and deepen your understanding of how they relate to daily life.
- Consider installing self-consumption solar power systems and storage batteries that provide electricity even during power outages.
- Actively purchase and use energy-saving devices like LED lighting and energy-efficient appliances. Transition to next-generation vehicles, practice eco-driving, reduce, reuse, and recycle waste (3Rs), adopt sustainable fashion, support local production for local consumption, and implement telework to shift toward a decarbonized lifestyle.
- Break free from past experiences and engage in climate-resilient actions, such as gathering and verifying disaster prevention information and preventing heatstroke.

Instead of enduring or forcing yourself, let's work on things wisely and creatively.



## Role and Initiatives of Businesses

- We will develop and produce products that are friendly to the global environment, people, and society, taking a long-term perspective.
- We will implement actions aimed at energy and resource conservation.
- We will conduct business operations incorporating disaster risk adaptation perspectives, anticipating future climate change impacts.

## Regarding the Okinawa Prefecture Climate Emergency Declaration

Okinawa Prefecture has issued the “Okinawa Prefecture Climate Emergency Declaration” to share the current status and understanding of climate change across the entire prefecture and to resolve that the administration, residents, and businesses will unite to work on climate change measures.

Let us all act together as one and work toward sustainable development of the environment, economy, and society in response to climate change.

### 【Key Points of the Declaration】

1. Government, residents, and businesses will collaborate to implement mitigation and adaptation measures.
2. We will achieve net-zero greenhouse gas emissions by fiscal year 2050.
3. We will pass on the beautiful island of Okinawa to future generations.

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※For more details, please visit the Okinawa Prefecture Government  
Environmental Restoration Division website.