

# Commitment to Net Zero Carbon Emissions by 2050 by Local Governments in the Kyushu Region of Japan

## - Background, Current Situation, and Challenges -



### Key Messages

This publication aims to promote local climate actions by disseminating information on the announcement by 31 local governments (prefectures, cities, towns and villages) in the Kyushu region of Japan on their commitment to be “Zero Carbon Cities” by 2050. It surveys the relevant background, current situation and challenges, along with domestic and international trends on a net zero carbon society.

Many of these local governments in Kyushu announced their commitment to net zero emissions by 2050 based on their own decision, even though it was encouraged by an initiative of the Ministry of the Environment, Japan.

Following their announcements, most of these local governments are moving forward with putting these measures into action through formulating or revising local action plans, while starting activities to raise awareness among stakeholders in the region.

The interviews conducted for this publication revealed that local governments in Kyushu are facing various challenges and uncertainties in terms of building implementation structure, securing the technical capacity for quantification, and developing a long-term roadmap toward 2050.

**Junko Ota**

IGES Kitakyushu Urban Centre  
Policy Researcher  
j-ota@iges.or.jp

**Junko Akagi, Ph.D.**

IGES Kitakyushu Urban Centre  
Research Manager  
akagi@iges.or.jp

**IGES**  
Institute for Global  
Environmental Strategies

# 1 Zero Carbon Cities in the Kyushu Region of Japan

## A total of 31 local governments in Kyushu announced their commitment to carbon neutrality by 2050

A total of 31 local governments in the Kyushu region announced their commitment to “Zero Carbon Cities”, and aim to achieve net zero emissions of greenhouse gases (GHG) by the year 2050 (as of 22 January, 2021, Figure 1).

In Kyushu, this initiative was started in December 2019 by Kumamoto Prefecture, Oki Town (Fukuoka Prefecture), and Kagoshima City, and in 2020 was followed by the “Ku-

mamoto Cooperation Center Urban Area” (a joint collaborative entity of 18 local governments centered in Kumamoto City), Fukuoka City, Takeo City (Saga Prefecture), Hirado City (Nagasaki Prefecture), Oita Prefecture, China Town (Kagoshima Prefecture), Saga City, Kitakyushu City, Kushima City (Miyazaki Prefecture), Kagoshima Prefecture, and Goto City (Nagasaki Prefecture) in 2020.

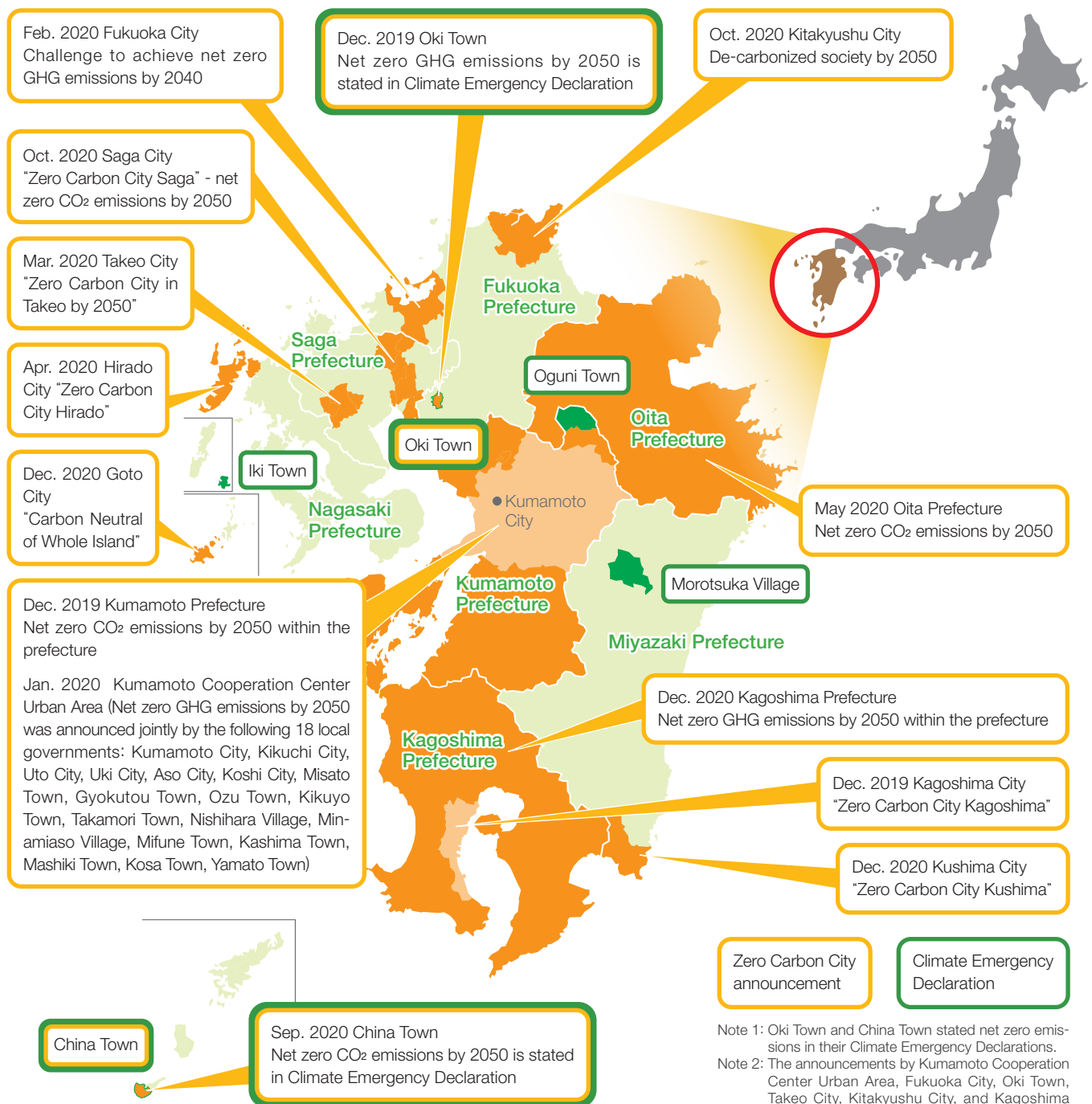


Figure 1: Announcement of “Zero Carbon City” and/or “Climate Emergency Declaration” by local governments in Kyushu

## What is a Zero Carbon City?

The Ministry of the Environment, Japan has provided information on Zero Carbon City announcements in Japan. The ministry defines a Zero Carbon City as a “local government in which the head of the municipality or the local government itself has announced a goal to achieve net zero\* CO<sub>2</sub> emissions by 2050”. These local governments are also encouraged to reflect their intentions to reach “net zero CO<sub>2</sub> emissions by 2050” in their own action plans (area-wide policies).

\* : Achieving equilibrium between anthropogenic GHG emissions from sources and removals by sinks, such as forests.

## Examples of “2050 Zero Carbon City” commitments presented by the Ministry of the Environment

- 1 Statement by the head of a local government aiming to achieve “net zero greenhouse gas (CO<sub>2</sub>) emissions by 2050” at press conferences and events
- 2 Statement by the head of a local government aiming to achieve “net zero greenhouse gas (CO<sub>2</sub>) emissions by 2050” at the municipal assembly
- 3 Statement by the head of a local government aiming to achieve “net zero greenhouse gas (CO<sub>2</sub>) emissions by 2050” in press releases to the media
- 4 Statement aiming to achieve “net zero greenhouse gas (CO<sub>2</sub>) emissions by 2050” posted on a local government’s website

## Kyushu’s potential

One of Japan’s four main islands, Kyushu is located in the southwestern part of the Japanese archipelago and is home to seven prefectures (Fig. 1). According to government statistics, the Kyushu region comprises an area spanning approximately 37,000 km<sup>2</sup> (2020), a population of about 12.8 million (2019) and a gross regional product (GRP) of JPY 47 trillion (FY 2017), which accounts for approximately 10% of Japan’s total. The region is known for its strong potential for renewable energy, with installation rates for solar and geothermal power exceeding the national average. With forests accounting for nearly 70% of the entire area, Kyushu’s distinctive characteristics also shape a favourable environment for the creation of Zero Carbon

Cities through the region’s intensive promotion of energy efficiency, proactive introduction of renewable energy, and forest carbon sinks. In light of the fact that priorities for the region include revitalising local economies, improving welfare services and preventing disasters, and that governmental resources (funding, human resources, etc.) are limited, it is equally essential to promote Zero Carbon Cities and solutions to regional issues in an integrated manner. Since individual local governments are constrained by the measures available to them, inter-regional cooperation must be taken into consideration to move forward. The development of a model case in Kyushu may also contribute to the creation of Zero Carbon Cities in other parts of Japan and abroad.

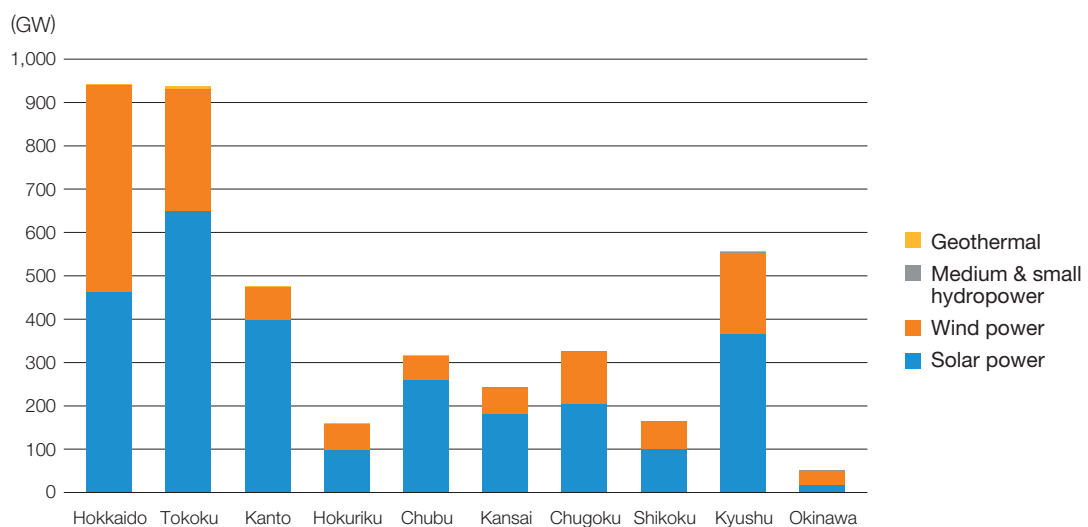


Figure 2: Renewable energy potential by regions in Japan

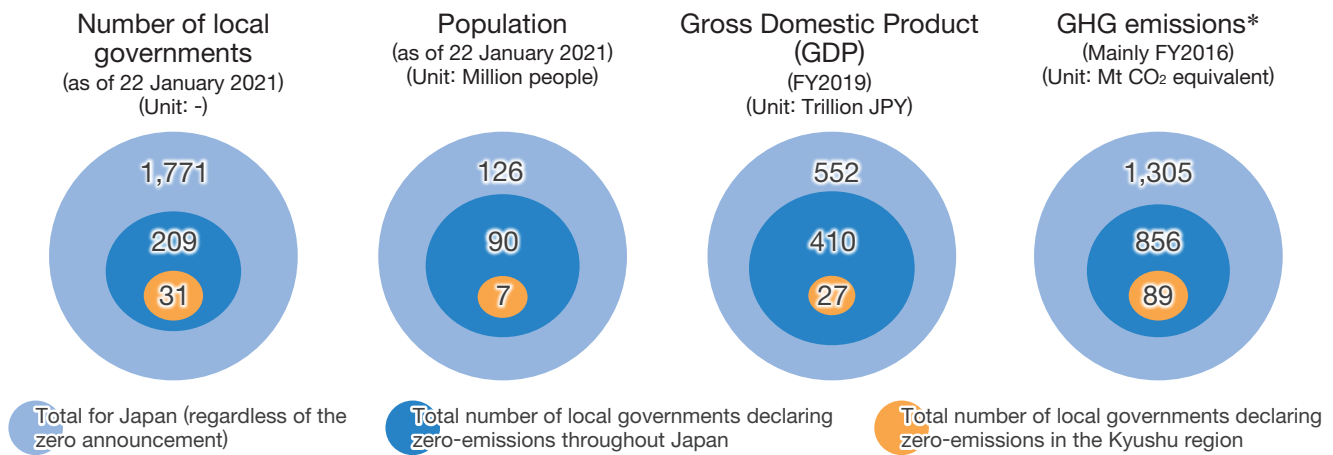
Note: Graph developed by author based on Renewable Energy Potential System (REPOS) of the Ministry of the Environment, Japan (data access as of Oct. 2020) <http://www.renewable-energy-potential.env.go.jp/RenewableEnergy/index.html>

## 2 What is Driving the Spread of Zero Carbon Cities?

### Fast-growing number of Zero Carbon Cities in Japan

The number of Zero Carbon City commitments is rising at a rapid clip throughout Japan. In 2009, Yamanashi Prefecture set out a long-term vision for zero CO<sub>2</sub> emissions by 2050 within the prefecture's global warming action plan. This statement by Yamanashi Prefecture was followed by announcements by the Tokyo Metropolitan Government and the cities of Kyoto and Yokohama in May and June 2019, with these four local governments launching the start of the Zero Carbon City movement.

With the appointment of Shinjiro Koizumi to the post of Environment Minister in September 2019, the number of local governments that have announced zero carbon commitments has risen to a total of 209 (28 prefectures, 119 cities, 2 special wards, 49 towns and 11 villages, as of January 22, 2021) as a result of the Minister's initiatives. The total population of these areas is roughly 90.46 million, with a gross domestic product (GDP) of about JPY 410 trillion. Fig. 3 illustrates the percentage of the Kyushu region in this total.



**Figure 3: Proportion of Zero Carbon Cities in Kyushu and throughout Japan by key indicators**

\* For local governments that are obliged to formulate a local government action plan of area-wide policies (see Table 1 on p.6), the values published by each local government are used, and for other local governments, the values of the local government emission chart (carte) by the Ministry of the Environment are used. If there is no published value for 2016, the value of the closest year was used. (Source: Ministry of Internal Affairs and Communications, Ministry of the Environment)

### Extreme weather is the “climate crisis” for local governments

Many of the statements by Zero Carbon Cities reference the extreme weather events and their accompanying devastation in recent years, the United Nation's Paris Agreement and the Intergovernmental Panel on Climate Change (IPCC)'s Special Report on Global Warming of 1.5 °C, as well as their roles as members of the global community.

Climate change is no longer a lingering doubt; it has become a “climate crisis” risk for local governments. In Kyushu in particular, there has been a pronounced rise in the number and severity of torrential rains and typhoons, which have emerged as a threat to both the economy and human lives.

As a reflection of this, more than 40 local governments in Japan have announced “climate emergency declarations”. The first local government to do so was Iki City in Nagasaki Prefecture (September 2019), followed by Oki Town in Fukuoka Prefecture (December 2019), Morotsuka Village

**Climate Emergency Declaration**  
OKI TOWN Fukuoka Prefecture, Japan

In recent years, weather disasters caused most likely by anthropogenic global warming have become increasingly violent. Disasters directly affected by extreme weather such as strong typhoons, localized torrential rains, droughts and heat waves, have occurred in many places around the world, causing extensive loss and damage including a large number of human death. According to the IPCC, the average global temperature has already risen by 1 °C since before the Industrial Revolution. In its Special Report on 1.5 °C published in 2018, it reiterated the enormous negative impacts of climate change to the world and consequently the urgency of countermeasures. Furthermore, it warned that 1.5 °C would reach in 10 years from now at the earliest case until the temperature rise stopping within minimum impacts. In the future, if we would keep going as usual, global warming would definitely become more serious, and also the impacts on the next generation would be deeply worried.

In light of the severe effects of global warming, our town Oki machi had published the “Oki machi Mottainai Declaration (Zero Waste Declaration)” in 2008, aiming to create a sustainable town in cooperation with residents. However, the impacts of climate change caused by global warming over these years are truly critical and pose a threat to human society and the natural ecological system. Considering these current situation, our town declare herewith a climate emergency and express our determination to make every effort to address global warming measures listed below, with the aim of realizing a society with virtually zero greenhouse gas emissions by 2050, as proposed by the IPCC.

1. We will share with residents by inheritance of the spirit of “the Mottainai Declaration”, that climate change is in a state of emergency, and challenge to a sustainable community development in which the environment, the society and the economy coexist harmoniously.
2. We will promote adaptation measures against climate change, so as to minimize impacts on health hazards and the agriculture caused by natural disasters and extreme heat waves getting serious.
3. By 2030, we will replace all the electricity used by public facilities in our town with renewable energy. Furthermore in cooperation with residents, we will strengthen our efforts to realize a decarbonized society.
4. We will join hands with people from all over the world who share the same aspirations and widely work with the Japanese government and other local governments to cooperate toward “realizing a virtually zero greenhouse gas emitting society.”

12th December, 2019  
 Mayor of Oki Town

Climate Emergency Declaration of Oki Town that includes declaration on net zero GHG emissions (Source: Oki Town, Climate Emergency Declaration, Dec. 2019)

in Miyazaki Prefecture and Oguni Town (Aso-gun) in Kumamoto Prefecture (March 2020), and China Town in Kagoshima Prefecture (September 2020), all located in Kyushu. In November 2020, the National Diet (both upper and lower houses) passed a resolution to declare a state of climate emergency (as of November 2020).

The torrential rains in July 2020 recorded the heaviest rainfall in history in many parts of Kyushu; in Kumamoto Prefecture, the banks of the Kuma River collapsed, claiming the lives of 65 people. In September 2020, Typhoon

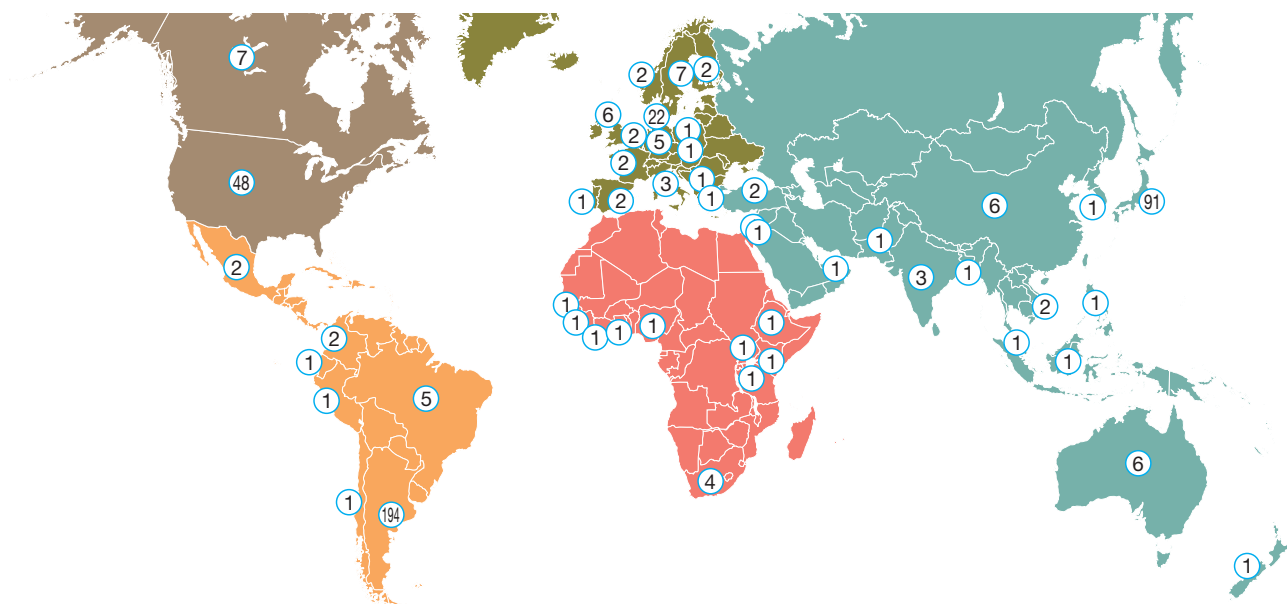
Haishen was predicted to hit Kyushu with a record rainfall and wind speeds at unprecedented levels. Perhaps in part due to the region's experience with the heavy rain in July, changes were seen in people's behaviour, with many evacuating in advance of the approaching storm and stocking up on essentials. The occurrence of natural disasters as local governments implemented countermeasures to curb the spread of COVID-19 has, together with climate change, resulted in the emergence of new challenges to regional vulnerability and resilience.

### Agreement to limit global warming to 1.5 °C, far beyond the 2.0 °C mandatory target of the Paris Agreement

The Paris Agreement, an accord signed in 2015 by nations around the world, including the Japanese government, stipulates the need for continued efforts to limit the average global temperature rise to well below 2 °C and preferably to 1.5 °C compared to pre-industrial levels. In 2018, the Intergovernmental Panel on Climate Change (IPCC) released its Special Report on Global Warming of 1.5 °C, which advocates the need to control temperature rise to 1.5 °C to better mitigate damage and would require the achievement of net zero global GHG emissions by 2050.

The Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), the parent body of the Paris Agreement, launched the "Race to Zero" campaign

in June 2020. This campaign is a global alliance of various actors committed to achieving net zero CO<sub>2</sub> emissions by 2050. The campaign currently includes the participation of 452 cities, 22 regions, 1,101 companies, 45 investors, and 549 universities and other organisations from 120 countries around the world. The total amount of CO<sub>2</sub> emissions from these participating bodies account for nearly 25% of the world's CO<sub>2</sub> emissions and 50% of GDP (as of October 2020, Fig. 4). ICLEI – Local Governments for Sustainability is a partner in this campaign, and the participation of 91 local governments from Japan is the second largest number after Argentina.



**Figure 4: Distribution of local governments that joined UNFCCC's "Race to Zero" campaign**  
 (Source: UNFCCC HP <https://unfccc.int/climate-action/race-to-zero-campaign>)

## 3 Japan's National Policy Framework

### Climate change measures of local governments

Climate change measures in Japan are implemented under the Act on Promotion of Global Warming Countermeasures (hereinafter referred to as the "Global Warming Countermeasures Act") enacted in 1998. Under Article 21 of the Act, local governments are required to formulate and implement comprehensive and systematic measures to control GHG emissions in line with the natural and social conditions of each area pursuant to the Plan for Global Warming Countermeasures. There are two types of action plans formulated by local governments: plans to promote emission reductions arising from the local government's own administrative operations (referred to as "administrative operations") and plans to promote emission reductions in areas under their jurisdiction

(referred to as "area-wide policies"); and as such, their targets differ (Table 1). Sixty three percent of local governments have formulated action plans of administrative operations at least once, while all the local governments that are obliged to develop action plans of area-wide policies (account for 26.6% of the total local governments) have done so.

The Ministry of the Environment provides a variety of manuals, tools and related information in a uniform format through a site set up to support the formulation of action plans by local governments. After a statement is issued by a local government, Zero Carbon Cities are requested to consider the inclusion of the aim to "achieve net zero GHG (CO<sub>2</sub>) emissions by 2050" when revising their action plans of area-wide policies.

**Table 1: Outline of action plans by local governments**

Plan	Outline	Target	Formulation status
Action plan of administrative operations	A limited plan to promote the reduction of GHG emissions associated with office work and operation of local governments.	All local governments are obliged to formulate a plan. (3,349 organisations)	63%
Action plan of area-wide policies	A comprehensive plan to promote GHG emissions control according to the natural and social conditions of the area. Measures include the promotion of renewable energy, energy conservation, convenience of public transportation for user, greening, sound material-cycle society such as reduction of waste generation, etc.	Prefectural governments, ordinance-designated cities, and core cities (Chukaku-shi: more than 200,000 population) are obliged to formulate a plan (152 organizations)  Cities that are smaller than the core city (Chukaku-shi), such as wards, towns and villages are encouraged to formulate a plan (no obligation).	100% of 152 organisations  26.6% of a whole (1,788 organisations)

\* The above status is from the results of a FY2019 survey by the Ministry of the Environment. The survey was conducted targeting a total of 3,349 organisations, including 1,788 prefectures and municipalities (including special wards) and 1,561 local public organisations (including unions).

### Bottom-up approaches and support framework

Article 4 of the Global Warming Countermeasures Act stipulates that local governments are responsible for promoting measures to control GHG emissions in line with the natural and social conditions of their areas. In this respect, several local governments have adopted a proactive stance, including the enactment of ordinances and the development of related projects and measures. For example, the Tokyo Metropolitan Government's cap-and-trade system (since 2010) has become globally renowned as a system that can steadily reduce emissions in the region. Yokohama City signed an agreement with 12 municipalities in the Tohoku region in February 2018 to promote the formation of a Regional Circular and Ecological Sphere through renewable energy. The cities of Kitakyushu, Osaka and several other local governments are promoting the reduction of GHG emissions through international city-to-city collaboration. These initiatives are being promoted not only with the aim to

reduce local GHG emissions, but to also produce positive socio-economic impacts to the region.

Frameworks have also been set up to support these types of bottom-up, advanced approaches. For example, The Cabinet Office's "FutureCity" Initiative (since 2008) was initially launched to support low-carbon development by recognising the efforts of Eco-Model Cities (23 municipalities); subsequently, the scope of this initiative was expanded to Future Cities (11 municipalities) to support the integrated development of the three dimensions of the environment, economy and society. Since FY2018, this initiative has been used to reach out to an even broader range of municipalities as SDGs Future Cities (94 municipalities as of July 2020). The Ministry of the Environment and Ministry of Land, Infrastructure, Transport and Tourism are also engaged in developing projects to support the local initiatives of municipalities and expand activities overseas.

## Progress of national climate change measures and Zero-Carbon commitments

Since the UNFCCC entered into force in 1994, Japan has driven forward mitigation measures that aim to reduce GHG emissions under international frameworks. The “6% reduction commitment compared to the base year”, once a target under the Kyoto Protocol, is now Japan’s resolution to “continue to aim at a 26% reduction by 2030 compared to 2013 levels and to strive to achieve a decarbonised society as close as possible to 2050”, as indicated in the country’s Nationally Determined Contribution (NDC) submitted to the UNFCCC secretariat in March 2020 under the Paris Agreement.

In FY2018, GHG emissions totalled 1.24 billion tonnes (Fig. 5). This downward trend has remained steady since FY2013, falling by 12%, which is also lower than FY1990, the base year of the UNFCCC. Decoupling of GDP and emissions is also discernible as a result of the promotion of energy conservation and other measures (Fig. 6). Japan accounts for 3.4% of total global emissions (as of 2017), positioning the nation as the world’s sixth largest emitter, an indication that that steady efforts by Japan will have a significant impact on achieving global targets.

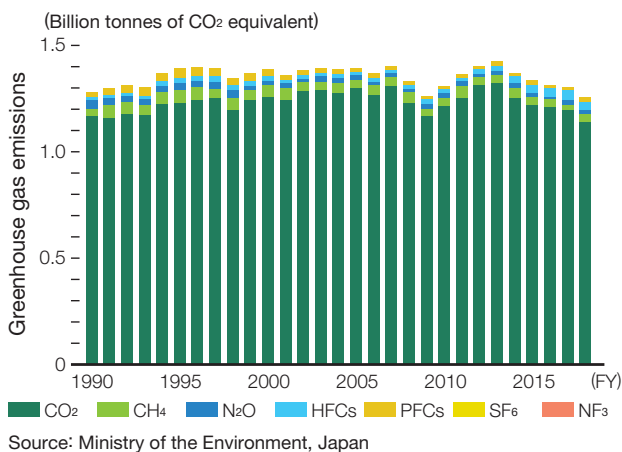
Even as more local governments committed to becoming Zero Carbon Cities, the national government did not adopt a proactive stance, shelving the decision to raise reduction targets when the NDC was revised in March 2020.

However, in October 2020, Prime Minister Suga at last announced that Japan would reduce GHG emissions to net zero by 2050 in his first policy speech after taking office, and Keidanren (Japan Business Federation) announced its New Growth Strategy in November in response. With a diverse segment of stakeholders arriving at a shared vision for decarbonisation, there will be a need to build and strengthen mechanisms to further accelerate the speed of bottom-up actions in the future.



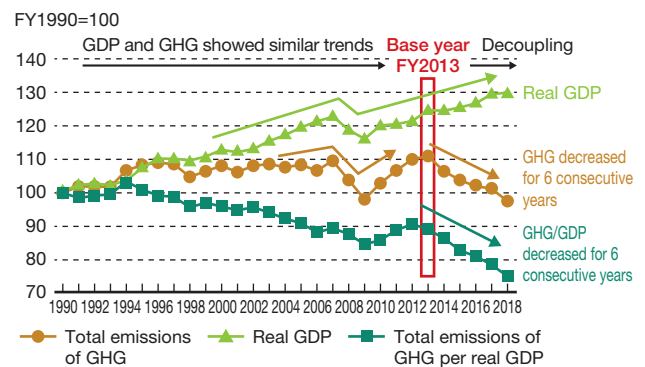
Japan’s announcement on carbon neutral by Prime Minister Suga (26 October, 2020)

(Source: Prime Minister’s Office HP)



**Figure 5: Status of GHG emissions in Japan (FY1990-2018)**

(Source: Ministry of the Environment, Annual Report on the Environment, the Sound Material-cycle Society and Biodiversity in Japan 2020)



Source of real GDP: Cabinet Office “National Accounts” expenditure, Real, Chain method (2011 base)  
 FY1990-1993 value: Simple retroactive value announced in January 2018  
 FY1994-2018 value: Value as of 26 December, 2019  
 Source: the Ministry of the Environment, the Cabinet Office

**Figure 6: Changes in Japan's real GDP and GHG emissions**

(Source: same as figure 5)

# The Background and Current Status of Zero Carbon City Declarations in Kyushu

## Background of declarations

Between October and November 2020, visits were made to eight local governments in Kyushu (Fukuoka City, Oki Town, Takeo City, Hirado City, Oita Prefecture, Kumamoto Prefecture and Kumamoto City (representing the Kumamoto Cooperation Center Urban Area), and Kagoshima City) that had made zero-carbon statements (as of 20 September 2020) to survey them on the background of these statements, post-statement actions and challenges. This section provides an overview of the results of that survey.

First is the backdrop against which these statements have been framed. A common denominator for all local governments was a sense of impending crisis about abnormal weather conditions and the subsequent disasters caused by torrential rains that have occurred frequently in Kyushu in recent years, coupled with a desire to control the GHG emissions that are considered to be the cause.

## Post-statement actions

As outlined in Table 2, the Zero Carbon Cities in this survey vary in scale, socio-economic status and GHG emissions. Different types of local governments differ in terms of plans, scope of ascertaining GHG emissions, as required by the Global Warming Countermeasures Act, and even the number of employees, number of employees. This means that even though these statements were issued at about the same time, the actions of local governments may have started at different levels. Nonetheless, these Zero Carbon declarations can be seen as having created an environment in which municipalities can move forward in the same direction and take action.

At the time of this survey, the approach adopted by local governments was for the head of the municipality to first express a commitment, and then to take concrete actions for 2050 by formulating or revising action plans, rather than presenting a clear concept before a Zero Carbon statement was made. In fact, many municipalities formulated and revised plans after a statement was made. Eighteen municipalities, such as the Kumamoto Cooperation Center Urban Area (column 1), collaborated together to formulate new plans, while other local governments that did not have action plans for area-wide policies in place considered using this opportunity to formulate plans. Awareness-raising activities had also begun to take shape for businesses and

The recent series of Zero Carbon City declarations in Kyushu has largely been due to the creation of a national framework for Zero Carbon statements by the Ministry of the Environment ahead of the 25th Conference of the Parties (COP25) to the United Nations Framework Convention on Climate Change held in November 2019. In addition, three other approaches were used: (1) internal actions by each local government with an eye on the timing for revising action plans, (2) top-down approaches encouraged by the national government (Ministry of the Environment), and (3) bottom-up movements, such as petitions from civic groups, and city/prefectural environmental councils. Different municipalities used different combinations of these approaches, and there was a tendency for many of the municipalities in this survey to use (1) as a basis for their activities.

residents in the region. Unfortunately, the COVID-19 pandemic has prevented the implementation of large-scale public awareness campaigns. However, Oki Town (column 2) organised an event to share awareness of the climate crisis with residents, and Kagoshima City has been developing awareness-raising activities through a public-private partnership approach (column 3).

A number of local governments are reportedly taking additional steps to become carbon neutral beyond their past actions by promoting energy efficiency, introducing renewable energy and implementing measures for forest carbon sinks for offsetting emissions that cannot be reduced. Local governments that are implementing new approaches, such as the Kumamoto Cooperation Center Urban Area, are striving to identify measures and develop a foundation for collaboration based on the distinctive characteristics of individual municipalities.

While the local governments in this survey had not yet developed specific measures, they were considering promoting the integration of Zero Carbon Cities with their own original initiatives, such as zero-waste, SDGs, and disaster prevention and mitigation. These municipalities viewed the concept of a Zero Carbon City not only as a way to achieve net zero GHG emissions, but also as a mandate to protect the lives of residents and improve their quality of life.



**Table 2: Outline of local governments' efforts following the zero-carbon announcement**

	Fukuoka City	Oki Town	Takeo City	Hirado City	Oita Prefecture	Kumamoto Prefecture	Kumamoto Cooperation Center Urban Area	Kagoshima City
Population (1,000)	1,600	14	49	32	1,170	1,790	1,170	600
Area (km <sup>2</sup> )	343	18	195	235	6,340	7,410	2,838	548
GDP (Trillion Yen)	7	0.03	0.2	0.08	4	6	3.5	2
GHG emissions*1 (kt CO <sub>2</sub> ) [Changes after FY2013]	6,434 [28.9% decrease]	83 [25.8% decrease]	347 [14.4% decrease]	181 [18.3% decrease]	42,271 [9.9% decrease]	12,851 [17.0% decrease]	8,162 [18.1% decrease]	4,055 [13.8% decrease]
Major emission sources	Commercial (27%), Residential (24%), Transport (36%) (Only CO <sub>2</sub> )	Industry (37%), Transport (32%), Commercial (17%)	Transport (30%), Industry (25%), Commercial (22%)	Transport (41%), Residential (22%), Commercial (21%)	Industry (78%), Transport (7%), Industrial process (5%)	Industry (36%), Transport (20%), Residential (19%)	Commercial (28%), Transport (26%), Industry (13%) (Only Kumamoto City)	Transport (43%), Commercial (21%), Residential (21%)
Plan prior to the zero-carbon announcement*2	Comprehensive plan◎ Limited plan◎	Comprehensive plan○ Limited plan◎	Comprehensive plan× Limited plan◎	Comprehensive plan○ Limited plan◎	Comprehensive plan◎ Limited plan◎	Comprehensive plan◎ Limited plan◎	Comprehensive plan◎ Limited plan◎ (Only Kumamoto City)	Comprehensive plan◎ Limited plan◎
Plan following the zero-carbon announcement	Under revision	Developing a roadmap	Under formulation	Under revision	Under revision	Under revision	Under formulation	Under revision
Measures toward carbon neutral	Measures include initiatives at City Hall, creation of innovation, changing the behaviour of citizens and businesses, and contributing to the world with technologies in Fukuoka City.	Aiming to manage both environment and economy, and zero CO <sub>2</sub> emissions from public facilities. Energy saving measures in the consumer sector, promotion of renewable energy, CO <sub>2</sub> reduction measures from agriculture	Raising awareness of city staff, collecting ideas from city staff and citizens regarding global warming countermeasures	Measures include introducing renewable energy, implementing energy-saving measures, and forest carbon sinks.	Promotion of measures for GHG emissions reduction, introduction and utilisation of renewable energy, and forest carbon sinks.	Promotion of energy saving, energy shift, renewable energy, forest carbon sinks.	Development of various measures to foster a carbon-free society more effectively based on concept of Regional Circular and Ecological Sphere	Local production for local consumption of energy, creation of renewable energy, promotion of electric vehicles, etc., conversion to eco-style at homes and businesses
What can be achieved along with carbon neutral	Urban growth, sustainable city development	Development of sustainable city, promotion of adaptation	Responding to population decline and disasters, and strengthening of fields related to education and child-rearing	Promotion of city-wide efforts	Raising awareness of prefectural citizens on global warming countermeasures, and promotion of adaptation measures	Disaster-resistant urban development	Promotion of SDGs, disaster prevention/mitigation, regional ties, resource recycling within the region	Promotion of SDGs, adaptation measures, and improving the image of the city
Section in charge [Number of staff]	Climate Change & Energy Policy Section, Environmental Bureau [17]	Planning Division [-]	Environment Section, Environment Division [3]	Citizens' life and Environment Division [4]	Utsukushi Operation Promotion Division, Planning and Global Warming Countermeasures Group [5]	Environment Promotion Division [5]	Kumamoto City, and others [9]	Environment Policy Division [-]
Collaboration with stakeholders	Eco Wave Fukuoka, Fukuoka City Citizens' Council on Measures against Global Warming	Town Council, Miya-Sma Smart Energy	Citizens' meeting on formulation of Takeo City's zero carbon action plan (Planned in Apr. 2021)	Regional council on global warming measures	Oita Prefectural Global Warming Countermeasures Regional Council, Oita Utsukushi Operation Prefectural Conference, Oita Prefectural Global Warming Prevention Activity Promotion Centers	Kumamoto City (Kumamoto Cooperation Center Urban Area)	Kumamoto City Council on Low-carbon urban development strategy, Council on Future City, Kumamoto Prefecture, etc.	Environmental Council, Zero Carbon City Kagoshima Partners

(Note) The above information is correct at the time of the survey (Nov. 2020). The survey was conducted targeting eight local governments that announced Zero Carbon statements as of 20 September, 2020.

\*1 Values for FY2017. Values for FY2016 were used for Kumamoto Cooperation Center Urban Area, and Kagoshima City.

\*2 "Comprehensive plan" is the action plan of administrative operations; while "Limited plan" is the action plan of area-wide policies indicated in Table 1.

The symbols indicate: "◎" Local governments (LGs) have obligation to formulate a plan, and made a plan; "○" LGs have no obligation to formulate a plan, but made a plan; "×" LGs have no obligation to formulate a plan, thus no plan.

**Column 1**

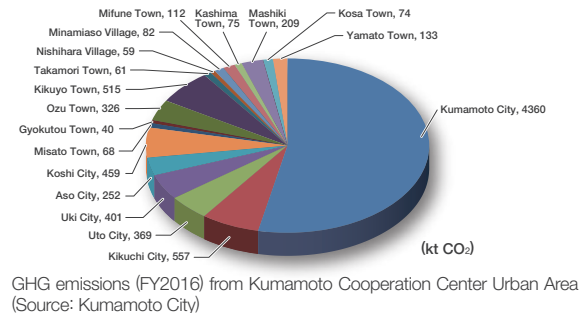
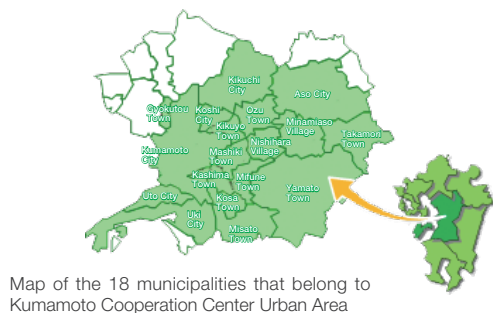
**Wide-area collaborative approach of the Kumamoto Cooperation Center Urban Area and Kumamoto Prefecture**

In January 2020, the Kumamoto Cooperation Center Urban Area (hereinafter referred to as the "urban area"), consisting of 18 municipalities including Kumamoto City, created a joint declaration aiming at "net zero GHG emissions by 2050". In FY2016, GHG emissions from the urban area totalled approximately 8.16 million t-CO<sub>2</sub>, with emissions from Kumamoto City accounting for 54% of the total. The declaration aims to create a decarbonised, sustainable and prosperous urban area by fully utilising and circulating renewable energy within the region and focusses on strengthening disaster-prevention capabilities by securing stable sources of electricity in the event of a disaster.

Today, as this group jointly formulates Japan's very first action plan of area-wide policies as an urban area, they expect to achieve three effects through the development of these measures, namely, (1)

complementary effects (to compliment the strong and weak points of each municipality), (2) ripple effects (sharing expertise), and (3) joint promotion effects (progress management by the urban area).

Kumamoto Prefecture was one of the very first local governments in Japan to announce that it would aim to "reduce CO<sub>2</sub> emissions in the prefecture to net zero by 2050" in December 2019. A team of experts on preventing global warming in Kumamoto Prefecture was formed composed of 10 members from Kumamoto City, academia (including IGES), the industrial and business sector, household sector; transportation sector, NPOs, consumers and observers. These experts first met in December 2020, and the team has started working on drafting targets for FY2030 based on future projection scenarios for emissions, as well as a roadmap aiming at zero carbon based on the ideal state of emissions in 2050.



## Column 2

### Ok! Town in its role as a member of the global community

Ok! Town, located in the southern part of Fukuoka Prefecture with a population of about 14,000 (as of December 2020), was the second local government in Kyushu to pass a resolution on creating a climate emergency declaration in December 2019. This declaration concurs with the goal recommended in the IPCC's Special Report of limiting the average global temperature increase to 1.5 °C above pre-industrial levels and expresses the town's determination to achieve net zero GHG emissions by 2050. The declaration states that Ok! Town will share with residents the fact that there is a climate emergency, promote adaptation measures, convert all electricity used in public facilities to renewable energy by 2030, and collaborate with like-minded people around the world, the Japanese government and other local governments to achieve this goal. The town also aims to deepen collaboration with neighbouring Miyama City and other cities.

In 2008, Ok! Town became the second local government in Japan to issue a "Zero Waste Declaration" (Mottainai declaration), which sounded the alarm on the risks facing the future of its children and illustrated its determination to build a town that would not leave future generations with additional "bills". Ok! Town has succeeded in sharply reducing the amount of combustible waste by launching a recycling project to separate and collect household food waste, produce biogas and

organic liquid fertiliser, and return them to farms.

The Mayor of Ok! Town, Kimio Sakai, has been actively involved in environmental issues for many years as an employee in the town before taking office. His motto is "thinking together with the residents of Ok! Town", and he is passionate about actions being not only for the earth, but also for the next generation. He says that zero carbon is an extension of zero waste and that it all leads to sustainable urban development. Mayor Sakai added his signature to the Covenant of Mayors for Climate and Energy Japan in November 2020, a pledge to contribute to the climate and energy sectors.



Mayor Sakai (left) at signing ceremony of the Covenant of Mayors Japan (Photo: Ok! Town)

## Column 3

### Promoting public-private partnerships and public awareness in Kagoshima City



Kagoshima City is promoting zero-carbon actions together with its residents and businesses using an approach involving a diverse set of stakeholders, in line with the SDGs. The city has designed a logo under the concept of creating an "OK-good" future, where the "O" represents "zero" and "K" stands for "Kagoshima", and is actively developing multifaceted events and educational activities by taking full advantage of ingenuity. The "Zero Carbon City Kagoshima", a streetcar featuring the logo design and QR code for disseminating information, is in service to promote public transportation as a "live, walking textbook".

The "Kagoshima Zero Carbon Lab", a workshop for people 25 and under, who will be the future leaders in 2050, offers participatory programmes that allow attendees to brainstorm what they can do and plan, and then organise events. The

Lab also disseminates information on zero carbon initiatives through Facebook, Instagram, Twitter and other SNS accounts.

Companies in the industrial sector are registered as "Zero Carbon City Kagoshima Partners", and this sector serves as platform to promote public-private partnerships with local businesses (18 companies as of December 2020) that are engaged in activities to reduce CO<sub>2</sub> emissions and disseminate information.



Zero Carbon City Kagoshima Tram



Kagoshima Zero Carbon Lab for youth (Sep. 2020) (Photo: Kagoshima City)



Zero Carbon City Kagoshima Partners platform by industry and city

## 5 Challenges and Realisation of Zero Carbon Cities in Kyushu

### Challenges facing Zero Carbon Cities

CO<sub>2</sub> or GHG emissions in all Zero Carbon Cities in Kyushu have followed a downward trajectory since 2013 (Table 2). However, simply extending the current decline in emissions (forecasting) will not mean that net zero will be achieved by 2050. Interviews with eight local Zero Carbon City governments in Kyushu highlighted three common challenges: (1) implementation systems, (2) quantification, and (3) creation of roadmaps. The challenge with implementation is that cross-sectional and inter-departmental cooperation systems within local governments are insufficient, and climate actions may not be a priority for the entire local government beyond the scope of the division in charge. Local governments often lack the specialised skills, expertise and staff to examine policies using quantitative data, and it is difficult to accumulate knowledge in situations where frequent personnel reshuffle is customary. In many cases, collaboration with stakeholders, such as businesses, academia and civil society, has started or is just beginning. There are also no clear policies, especially for smaller local governments, since there are no opportunities to exchange information or network with other municipalities.

Local governments face significant challenges in quantifying emissions data from the region in an accurate and timely manner. Under the current system, it is difficult to estimate emissions from individual offices, small- and medium-sized enterprises and the restaurant industry, although it is possible to calculate the GHG emissions from individual

companies of a certain size (total emissions of regional branches and factories around the country). Therefore, proportional estimates are made based on national- and regional-level statistics to understand the GHG emissions of an area, so the data does not provide an entirely accurate reflection of the actual situation. GHG emissions and statistics published by the national government are also based on figures from two or three years ago, and as such, may not be a good basis for timely policy planning, especially under the rapidly-changing socio-economic conditions that have resulted from COVID-19 in the spring of 2020 and beyond. Kyushu shows great potential for the introduction of renewable energy, and many local governments have included that as a pillar for mitigation measures. However, under the current system, it is difficult to quantitatively attribute the amount of renewable energy to individual local governments, even though it is possible to understand the amount of energy introduced throughout Japan.

Backcasting (roadmap) must be used to develop long-term scenarios and achieve net zero emissions by 2050. However, the challenge lies not only in the issue of quantifying emissions, but also in the issue of uncertainty for the future. It is difficult to predict at the local government level when technological innovation, energy conversion and social change will occur and how drastically emissions will decrease, as several factors depend on national and global initiatives that are far beyond the authority of local governments.

### Vision for the realisation of Zero Carbon Cities

The achievement of net zero emissions by 2050 is an ambitious goal with a long-term timeline and unprecedented changes in various sectors. Achieving this will require different approaches and broader, more long-term views. It is also necessary for the national government to present a continuous line of support, from planning to implementation, with the first step to link economic and social issues that go beyond the environmental sector, and to share this vision with all stakeholders. Opportunities for information exchange and mutual (peer) learning among Zero Carbon Cities will also be useful.

Relationships must be deepened in terms of vertical connections with the national government and international community. Policies must be organised at two levels: what local governments can do (including the different roles of municipalities and prefectures), and what is required from the national government in terms of developing systems and providing support. Understanding and connecting with global trends will also motivate local governments to understand the ultimate goal of zero carbon and raise ambitions. There is hope that Kyushu will demonstrate good practice models for Japan and around the world.

Kyushu has a number of unique elements and diverse possibilities, including the integration of disaster prevention/mitigation and zero

carbon, high potential of renewable energy, wide-area collaboration as seen in the Kumamoto Cooperation Center Urban Area, and climate emergency declarations by small local governments. Pressure is building to shift to a cross-sectoral and long-term approach that incorporates the SDGs, the Regional Circular and Ecological Sphere and green recovery from the recent COVID-19 pandemic.

Since individual local governments are limited in what they can do, the national government is encouraged to provide seamless support from planning to implementation; local stakeholders should also be ready to come together and work with a common understanding of the climate crisis.

Kyushu's Zero Carbon City initiative has only just begun, and the number of local governments declaring their commitment to achieving net zero emissions is continuing to grow. As one of its missions, the IGES Kitakyushu Urban Centre supports and collaborates with local governments and stakeholders in Kyushu on global issues, such as climate change and the SDGs. By keeping a close eye on the future development of these local governments that have expressed their commitment to achieving net zero emissions, IGES intends to contribute to the development of a carbon-free Kyushu through research, collaboration and dissemination of information in its quest for optimal solutions for the region.

## References

- Ministry of the Environment, Japan web page on 2050 Zero Carbon Cities in Japan (Access Jan. 22, 2021)  
[http://www.env.go.jp/en/earth/cc/2050\\_zero\\_carbon\\_cities\\_in\\_japan.html](http://www.env.go.jp/en/earth/cc/2050_zero_carbon_cities_in_japan.html)
- Institute for Global Environmental Strategies, A Net-Zero World- 2050: Insight into essential changes for a sustainable future, 2019  
<https://www.iges.or.jp/jp/pub/net-zero-2050en/en>
- Portal Site of Official Statistics of Japan (e-Stat) (Access Sep. 2020)  
<https://www.e-stat.go.jp/>
- Kyushu Bureau of Economy, Trade and Industry, Economy and Industry related data of Kyushu (Access Dec. 2020)  
[https://www.kyushu.meti.go.jp/keizai-db/db\\_top.html](https://www.kyushu.meti.go.jp/keizai-db/db_top.html)
- Nippon Omni-Management Association, the 2nd survey report on management challenges and status of the local governments, Mar. 2018  
[http://www.noma.or.jp/Portals/0/999\\_noma/pdf/result201804.pdf](http://www.noma.or.jp/Portals/0/999_noma/pdf/result201804.pdf)
- Ministry of Environment Japan, Annual Report on the Environment, the Sound Material-Cycle Society and Biodiversity in Japan, June 2020  
<http://www.env.go.jp/policy/hakusyo/>
- Ministry of the Environment, Japan Renewable Energy Potential System (REPOS), (Access Nov. 2020)  
<http://www.renewable-energy-potential.env.go.jp/RenewableEnergy/index.html>
- Ministry of the Environment, Japan Emission charts of local government FY2016 Abridged edition (Jichitai Carte) (Access Jan. 2021)  
[https://www.env.go.jp/policy/local\\_keikaku/tools/karte.html](https://www.env.go.jp/policy/local_keikaku/tools/karte.html)
- Ministry of the Environment, Japan Web portal for Low Carbon Development in Asia, City-to-City Collaboration Programme (Access Jan. 2021)  
<https://www.env.go.jp/earth/coop/lowcarbon-asia/project/index.html>
- Geospatial Information Authority of Japan, Survey on areas of municipalities in Japan 2020 (as of Oct.1), Dec. 2020  
<https://www.gsi.go.jp/KOKUJYOHO/MENCHO/backnumber/GSI-menseki20201001.pdf>
- United Nations Environment Programme, Emission Gap Report 2019 (Executive summary), Japanese translation version by Institute for Global Environmental Strategies, Dec. 2019  
<https://www.iges.or.jp/jp/pub/unep-emissions-gap-report-2019/ja>
- Nomura Research Institute, Survey on the enforcement of the law concerning the promotion of global warming countermeasures in local governments in 2019, Mar. 2020  
<https://www.env.go.jp/earth/dantai/r011001/mat01-1.pdf>
- United Nations Framework Convention on Climate Change, web site for Race to Zero Campaign (Access Dec. 2020)  
<https://unfccc.int/climate-action/race-to-zero-campaign#eq-3>
- Cabinet Office, Japan Prefectural accounts (FY2006-FY2017) (2008SNA, FY2011 Reference counting), Gross domestic product in the prefecture (production side, nominal)  
[https://www.esri.cao.go.jp/jp/sna/data/data\\_list/kenmin/files/contents/main\\_h28.html](https://www.esri.cao.go.jp/jp/sna/data/data_list/kenmin/files/contents/main_h28.html)
- Cabinet Office, Japan Press release on the damage situation due to heavy rain in July 2020  
[http://www.bousai.go.jp/updates/r2\\_07ooame/pdf/r20703\\_ooame\\_35.pdf](http://www.bousai.go.jp/updates/r2_07ooame/pdf/r20703_ooame_35.pdf)
- Iki City, Announcement of Climate Emergency Declaration, Sep. 25, 2019  
<https://www.city.iki.nagasaki.jp/pickup/6265.html>
- Oita Prefecture, the 3rd Environment Basic Plan of Oita Prefecture, May 2020  
<https://www.pref.oita.jp/soshiki/13060/dai3jikankyoukikonkeikaku.html>
- Oku Town, Climate Emergency Declaration of Oku Town, Dec. 12, 2019  
<https://www.town.ooki.lg.jp/kankyo/4818.html>
- Oguni Town, Climate Emergency Declaration, Mar. 18, 2020  
<https://www.town.kumamoto-oguni.lg.jp/q/aview/296/1249.html>
- Kagoshima Prefecture, Progress management of Kagoshima Prefecture Global Warming Countermeasures Implementation Plan, Update as of Sep. 2020  
<http://www.pref.kagoshima.jp/ad02/kurashi-kankyo/kankyo/ondanka/bijyon/ontajikoukeikaku-shintyoku.html>
- Kagoshima City, web page on Zero Carbon Kagoshima, update as of Feb. 2020  
<https://www.city.kagoshima.lg.jp/kankyo/kankyo/kanseisaku/zerocarboncitykagoshima.html>
- Kitakyushu City, web page on press briefing of Mayor, Oct. 29, 2020  
<https://www.city.kitakyushu.lg.jp/kouhou/k8400392.html>
- Kushima City, web on Zero Carbon City announcement, Dec. 11, 2020  
<http://www.city.kushima.lg.jp/main/news/post-518.html>
- Kumamoto Prefecture, web on 2050 net zero CO<sub>2</sub> emission, update as of Oct. 2020  
<https://www.pref.kumamoto.jp/soshiki/49/51575.html>
- Goto City, web on 2050 Carbon neutral forum, Dec. 2020  
<https://www.city.goto.nagasaki.jp/index.html>
- Kumamoto City, press release on Kumamoto Cooperation Center Urban Area aims net zero GHG emission by 2050, Jan. 2020  
[https://www.city.kumamoto.jp/hpKiji/pub/detail.aspx?c\\_id=5&id=26596&class\\_set\\_id=3&class\\_id=535](https://www.city.kumamoto.jp/hpKiji/pub/detail.aspx?c_id=5&id=26596&class_set_id=3&class_id=535)
- Saga City, Announcement of Zero Carbon City Saga, Oct. 20, 2020  
<https://www.city.saga.lg.jp/main/63908.html>
- Takeo City, Announcement of Zero Carbon City in Takeo, Mar 24, 2020  
<http://www.city.takeo.lg.jp/information/2020/03/007692.html>
- China Town, Climate Emergency Declaration of China Town, Sep 29, 2020  
[http://www.town.china.lg.jp/kikakushinkou/kurasu/gomi/20201007\\_kikouhizyoutaisennngenn.html](http://www.town.china.lg.jp/kikakushinkou/kurasu/gomi/20201007_kikouhizyoutaisennngenn.html)
- Hirado City, Announcement of Zero Carbon City Hirado, Apr. 1, 2020  
<https://www.city.hirado.nagasaki.jp/kurashi/life/eco/kankyo/zerocarbon.html>
- Fukuoka City, Announcement of Zero Carbon City, web page updated as of Dec. 2020  
<https://www.city.fukuoka.lg.jp/kankyo/ondan/genre/zerocarbon.html>
- Morotsuka Village, Climate Emergency Declaration, Mar. 13, 2020  
<https://www.vill.morotsuka.miyazaki.jp/hijojitai/>

### Acknowledgements

The authors would like to express sincere gratitude to the officials of local governments in Kyushu, who kindly cooperated for the interview including Kumamoto Prefecture, Kumamoto City, Oita Prefecture, Kagoshima City, Fukuoka City, Oku Town, Takeo City, and Hirado City. We would also like to express our deep appreciation to Mr. Yuki Izumi, Director of Environmental Measures Division, Kyushu Regional Environmental Office of Ministry of the Environment, Mr. Togo Uchida, Director of Japan Office of Local Governments for Sustainability (ICLEI), and Mr. Seiya Tominaga, visiting researcher of Kitakyushu Urban Centre, and all relevant colleagues of IGES for insightful advisory and comments.

Although every effort is made to ensure objectivity and balance, the publication of research results or translation does not imply IGES endorsement or acquiescence with its conclusions or the endorsement of IGES funders. IGES maintains a position of neutrality at all times on issues concerning public policy. Hence conclusions that are reached in IGES publications should be understood to be those of the authors and not attributed to staff-members, officers, directors, trustees, funders, or to IGES itself.

© 2021 Institute for Global Environmental Strategies. All rights reserved.

**IGES** Institute for Global  
Environmental Strategies

**IGES Kitakyushu Urban Centre**

International Village Center 3F, 1-1-1, Hirano,  
Yahatahigashi-ku, Kitakyushu, Fukuoka,  
805-0062, Japan  
Tel: +81-93-681-1563  
Fax: +81-93-681-1564  
<https://www.iges.or.jp/en>  
E-mail: [kitakyushu-info@iges.or.jp](mailto:kitakyushu-info@iges.or.jp)