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The 9th Hokkaido Comprehensive Development Plan

March 12, 2024

Cabinet Decision

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Preface

"For postwar Japan, whose territory has been confined to four main islands, the development of Hokkaido, with its vast land and abundant unexploited resources, is an absolute necessity to achieve economic independence, address the nation's population problems, and boost the morale of its people."

This was the stated purpose of the 1st Hokkaido Comprehensive Development Plan formulated in 1951. In the more than 70 years since then, Hokkaido through a series of plans and projects has become a region that greatly contributes to the stability and development of the nation.

During the most recent years, Japan and the world have faced unprecedented crises and changes, including

- Russia's invasion of Ukraine and its impacts highlighting food and other security issues;
- COVID-19 restricting the flow of people around the world and illustrating Japan's vulnerability as a tourism nation; and
- Achieving carbon neutrality by 2050 as one of the world's most urgent missions.

Solutions to these challenges require a bountiful food supply, attractive tourism resources, and abundant renewable energy. Japan will not be able to overcome these issues without exploiting the enormous potential of Hokkaido. Hence, the words of the 1st Plan, that the development of Hokkaido is an "an absolute necessity," continue to resonate. This 9th Plan defines the areas of Hokkaido that deliver its notable value as "production spaces," and focuses on their "production potential." It is the activities of people living in these production spaces that maintain and realize their production potential. Thus, maintaining the conditions that enable residents to live in the production spaces constitutes the most important foundation for Hokkaido to continue providing value.

On the other hand, many issues specific to Hokkaido tackled in previous development plans remain unsolved.

Macroscopically, production spaces are widely distributed across the vast landscape of Hokkaido, an island comprising roughly one-fifth of the national territory. Microscopically, dispersed settlement patterns in Hokkaido's production spaces contrast the nucleated patterns in other regions of Japan. In other words, production spaces in Hokkaido present a "sparse" environment in a dual sense. To overcome the difficulties attributable to the "dual sparseness" of the production spaces and maintain the conditions for settlements amid Hokkaido's demographic challenges, it is essential to enhance the transportation networks to shorten the time and distance between areas and to utilize digital technologies to bridge physical distances.

Another threat to the production spaces is the increasingly severe and frequent natural disasters. In addition to the region's cold and snowy climate, new threats of a megaquake along or in the vicinity of the Japan Trench or Chishima (Kuril) Trench have emerged as an impending danger. In this respect, the task of building national resilience has never been more urgent than it is today.

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Last but not least, the promotion of the Ainu culture and the development of the areas adjacent to the Northern Territories continue to characterize the development of Hokkaido in relation to the production spaces due to their historical and geographical uniqueness.

Visions and measures to address these issues will be presented in the following sections.

The irreplaceable value of Hokkaido stems from the simple fact that people live and visit there. To overcome Hokkaido's rapidly declining population, contracting 10 years faster than the rest of Japan, its widely dispersed society, and the need to maximize its value, it is crucial to involve various players to "create the future of Hokkaido together" looking ahead to 2050.

These are the main messages of the current 9th Plan finalized in collaboration with many stakeholders.

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Chapter 1. Significance of the 9th Plan

§1. Background of Hokkaido Development

1. History of Hokkaido Development

Since the establishment of the Hokkaido Colonization Commission (*Kaitakushi*) in 1869, the Japanese government has developed Hokkaido under its special development policy, utilizing Hokkaido's abundant resources and vast land area for the purpose of contributing to the stability and development of the nation as a whole. With the enactment of the Hokkaido Development Law (Law No. 126 of 1950) after World War II, the national government has systematically promoted Hokkaido development through the formulation of the Hokkaido Comprehensive Development Plan over eight terms based on the law. The main focus of Hokkaido development has changed over time, from the revitalization of the economy and addressing its population problems at the time when the law was enacted, to balancing the distribution patterns of industries, energy, food supply, and tourism. However, the primary objective has consistently been to contribute to solving the national problems of the time.

Hokkaido development has seen the prefecture's population increase from approximately 58,000 in 1869 to more than 5 million, with its gross prefectural domestic product rising to approximately 20 trillion yen. As a major food supply source and tourism and recreation base, Hokkaido continues to contribute to the stability and development of the nation.

2. History of the 8th Hokkaido Comprehensive Development Plan

The 8th Hokkaido Comprehensive Development Plan (approved by the Cabinet on March 29, 2016; hereinafter the "8th Plan") was formulated against the backdrop of a society facing serious demographic challenges and a changing international environment.

When the 8th Plan was formulated, there were concerns about Hokkaido's rapidly declining and aging population, which could impede the maintenance of the "production spaces[1]" that account for Hokkaido's strengths, such as food production and its natural environment, and contribute to the entire country. Hence, the 8th Plan positioned "food" and "tourism" as strategic industries for the region, and aimed to develop a "world-class creative region that would deliver globally appreciated value," while supporting the production spaces that play an important role in food and tourism. In this respect, the 8th Plan promoted three primary measures: "establishment of a regional society where individuals shine," "promotion of industries from a global perspective," and "formation of a resilient and sustainable region."

In addition, based on the regional characteristics of Hokkaido, where production spaces are located mainly in rural areas and people live in dispersed settlement patterns, the 8th Plan focused on forming "basic regions" where urban and human service functions are provided at sufficient levels

[1] Production spaces refer mainly to areas/places (especially in non-urban regions) where agricultural and fishery production activities take place. Production spaces create the value of Hokkaido by providing multifaceted public benefits, other than agricultural and fishery production, including tourism, forest resources, and abundant potential for renewable energy that can contribute to decarbonization.

for residents' daily lives, envisioning the establishment of a "Hokkaido model of regional structures" able to ameliorate the natural and social decline of its population while supporting the lives of residents in the production spaces, and promote active interaction of people inside and outside the basic regions.

During the period of the 8th Plan, innovations in agricultural, forestry, and fisheries industries, including the expansion of farmland partitions, were promoted. Along with efficient and stable production mainly by specialized agricultural management entities, agricultural output in Hokkaido rose from 1,111.0 billion yen in 2014 to 1,266.7 billion yen in 2020.

The number of foreign visitors to Hokkaido also increased approximately 1.6 times, from 1.9 million in 2015 to 3.01 million in 2019, as a result of efforts to improve the hospitality environment for inbound tourists and promote driving tourism, contributing to the rise in foreign visitors to Japan as a whole.

With regard to the formation of a resilient and sustainable region, steady progress has been made in establishing safe and secure infrastructures by enhancing the functions of critical infrastructures, such as flood control and river management facilities, roads, ports and fishing ports, coastal protection facilities, and agricultural water use facilities, as well as preserving Hokkaido's rich nature and habitats for wild flora and fauna, including restoration of the once meandering river channel of the Kushiro Wetlands.

In 2020, the COVID-19 global pandemic severely affected socioeconomic activities in Japan. In Hokkaido, passenger transportation demand decreased sharply due to restrictions on movement. In particular, inbound tourism demand as a major driver of tourism virtually disappeared and profoundly impacted Hokkaido's economy.

The Interim Review of the 8th Hokkaido Comprehensive Development Plan (hereinafter the "Interim Review") conducted in FY2020 stated that, despite the impact of COVID-19, the philosophy of the 8th Plan to position "food" and "tourism" as strategic industries, aiming to develop "Hokkaido as a major region in the world" based on its rich nature and culture, remained unchanged. The Interim Review also called for a revaluation of Hokkaido's value revealed during the pandemic, with the region leading the "new normal" after the COVID-19 pandemic with accelerated DX (Digital Transformation).

§2. Significance of the 9th Hokkaido Comprehensive Development Plan

The fundamental significance of Hokkaido development is to contribute to solving national issues of the time, and to promote vigorous development of the region by taking advantage of Hokkaido's resources and characteristics.

Since the Interim Review, rapid and substantial changes have occurred in the circumstances surrounding Hokkaido development.

The COVID-19 pandemic renewed the awareness of the risks associated with the overconcentration of population and industry in Tokyo as well as the need to undertake corrective measures. The way people live and work also changed considerably with the introduction of remote work and other new ways of working.

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With extreme weather events occurring more frequently around the globe, Japan has set the goal to achieve "net-zero by 2050," aiming to reduce its greenhouse gas (GHG) emissions to net zero by 2050 in order to contribute to mitigating the global issue of climate change.

The use of digital technology is also advancing in many fields. The national government is promoting its vision for a Digital Garden City Nation to accelerate regional revitalization as a way to address regional social issues and achieve breakthroughs in utilizing regional characteristics to improve the attractiveness of rural areas.

In contrast, against the backdrop of the situation in Ukraine and the sharp depreciation of the yen, rising energy and food prices exacerbated by international supply concerns have reaffirmed the importance and difficulty of ensuring stable supplies of energy and food. In addition to security issues in East Asia, such as the provocative moves of China and North Korea, socioeconomic changes, including the progress in globalization, developments in science and technology, and the digitization and advancement of industrial infrastructures, have revealed vulnerabilities in the supply chain of digital industries.

Hokkaido faces an environment of "dual sparseness" with a widely distributed society marked by dispersed settlement patterns, but this "dual sparseness" can also be understood as a "blessed sparseness" that highlights Hokkaido's value, with its abundant food supply capacity, attractive tourism resources, and high potential for renewable energy. In response to the changing circumstances surrounding Japan, Hokkaido must employ its resources and characteristics to play a leading role in the development of the national economy and society.

On the other hand, the population in Hokkaido is aging 10 years faster than the rest of Japan, and the outlook for the decline in its working-age population and other social conditions is bleak, and poses the greater challenge of sustaining its production spaces. If Hokkaido fails to adapt to innovation through digital technology, the region will no longer be able to contribute to solving national issues, and the very survival of the region itself may be at risk.

Under such circumstances, the promotion of Hokkaido development will require all relevant players, including the national government, local governments, citizens, NPOs, businesses, and educational institutions, to cooperate and collaborate in swiftly formulating measures to address various issues using digital technologies.

It would be difficult today for the national government alone to solve the numerous issues. Hence it is important for every relevant player to share the vision and goals for the future based on Hokkaido's regional characteristics, and to pursue whatever they can do moving in the same direction. In this light, the Japanese government has formulated the 9th Hokkaido Comprehensive Development Plan to indicate the future direction of Hokkaido development, and outlined a package of measures to be employed, with a long-term view to 2050.

Chapter 2. Goals of the 9th Plan

§1. Situation surrounding Japan

1. Declining and aging population and demographic shifts

Japan's population is rapidly declining and aging, with the total population expected to fall to approximately 100 million by 2050, and the population aged 65 and over rising to roughly 38%.

Hokkaido's population is expected to decline even faster than the rest of Japan, falling to just under 4 million by 2050. It is also aging faster with people aged 65 and over expected to exceed 40% by 2040.

As the population decline progresses, the size of the economy could contract due to the decreasing working-age population and shrinking domestic consumer markets. There are concerns that an accelerated population decline and lower population density, particularly in rural areas, could reduce regional vitality and make it difficult to maintain urban and human service functions, such as medical care, welfare, nursing care, education, and commerce.

On the other hand, municipalities across Japan in recent years have seen the number of residents moving in from Tokyo and other metropolitan areas exceed those people moving out. In addition, the risk of an overconcentration of population and industry in Tokyo was recognized once again after the COVID-19 pandemic, causing greater interest in moving to and working in rural areas, especially among younger generations.

The pandemic also triggered the prevalence of remote work, creating an environment that allows diverse ways of living and working. There are even indications that such shifts might alleviate the issue of overconcentration in Tokyo and promote regional revitalization.

2. Climate change and intensifying, frequent natural disasters

Climate change is regarded as the main cause of extreme high temperatures and increased frequency and intensity of heavy rainfall events, and has become a top-priority issue of countries around the world. It has already shown a wide range of impacts, including impaired growth and quality of agricultural crops, redistribution of marine species, and frequent water shortages; there are also concerns that these impacts will become much more severe in the future.

To address climate change, Japan has announced its goal of achieving carbon neutrality by 2050, aiming to reduce its greenhouse gas emissions by 46% in FY2030 from FY2013 levels, while continuing its strenuous efforts to meet the lofty goal of cutting emissions by 50%.[2]

To realize "Zero Carbon Hokkaido,[3]" national government agencies have established a support

[2] This goal was expressed in the statement by then Prime Minister Suga at the US-hosted Climate Summit held in April 2021. The "G7 Hiroshima Leaders' Communiqué" (May 2023) stated: "We emphasize our strong concern, amplified by the latest finding of the Intergovernmental Panel on Climate Change (IPCC) and its Sixth Assessment Report (AR6), at the accelerating and intensifying impacts of climate change and highlight the increased urgency to reduce global GHG emissions by around 43 percent by 2030 and 60 percent by 2035, relative to the 2019 level, in light of its latest findings."

[3] Zero Carbon Hokkaido: In March 2020, the Hokkaido regional government declared, ahead of the national government, its goal of achieving net-zero GHG emissions by 2050, aiming to achieve "Zero Carbon Hokkaido" with its

framework and initiated efforts to lead the nation's decarbonization in cooperation with the Hokkaido prefectural government and its municipalities.

Throughout the ages, Japan has suffered massive damage from natural disasters, such as typhoons, torrential rains and heavy snowfalls, earthquakes, and volcanic eruptions, due to its topographical, geological, meteorological, and other natural conditions. In recent years, rainfalls have become more localized and concentrated, and record-breaking snowfalls have occurred. There are concerns that flooding and landslides will become more frequent and severe in the future due to climate change. In particular, Hokkaido would likely experience increasingly intensified rainfalls in the future than other regions in Japan.

Furthermore, a massive earthquake in the vicinity of the Japan Trench or Chishima Trench, a Nankai Trough earthquake, or an earthquake directly beneath the Tokyo metropolitan area are considered imminent, each of which could cause catastrophic damage in areas of concentrated population and functions. In Hokkaido, emergency and recovery efforts after a large-scale natural disaster during the winter would be hindered by low temperatures below -20℃, cold winds, accumulated snow and drifting ice, making the evacuation of residents extremely difficult with much severer damage.

3. Digital technology to change society

In recent years, the rapid evolution of information and communications technology (ICT) has given rise to new businesses and markets, bringing significant changes to people's lives. The use of advanced technologies, such as robots, artificial intelligence (AI), and the Internet of things (IoT), in agriculture, forestry, and fisheries, pilot studies of automated driving in cold, snowy environments, and the use of digital technology in infrastructure have been progressing. Further use of digital technology is expected to help solve social issues and facilitate innovation.

4. Changes in the international situation

Japan's economy has suffered a prolonged slump since the 1990s, and its position in the world economy has been in relative decline. On the other hand, the GDPs of major Asian countries have risen significantly, and world trade has expanded mainly in Asia and is expected to continue growing in the future. Prior to the COVID-19 pandemic, the number of foreign visitors to Japan showed a significant upward trend, especially from Asian countries.

Japan is highly dependent on imports of wheat, soybeans, and other grains, feedstuffs, and fertilizer materials. Supply disruptions caused by soaring raw material prices would greatly affect people's lives and the nation's economy. The global food supply also faces many risks, such as large-scale natural disasters, abnormal weather conditions, and water supply shortages. In particular, the COVID-19 pandemic led some major wheat exporting countries to restrict food exports, revealing risks in the global supply chain.

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economy and society continuing to grow in harmony with the environment. ("Zero carbon" in this context is defined as the state of equilibrium between the amount of GHG emissions generated by human activities and the amount of GHGs absorbed through maintained and enhanced GHG absorption capacities.)

Furthermore, soaring energy prices and international supply concerns after Russia's invasion of Ukraine have reinforced the importance of stable domestic supplies of energy and food.

§2. Hokkaido's resources and characteristics

As mentioned in the previous section, the situation surrounding Japan is rapidly and drastically changing. In this light, Hokkaido, blessed with abundant resources, has the potential to address these challenges and to solve various problems.

1. Vast landscape

Hokkaido is one of the four main islands of the Japanese archipelago; it occupies about one-fifth of the country's total land area, and is comparable in size to the combined areas of the Kinki, Chugoku, and Shikoku regions. Its population density is roughly one-fifth of the national average. Cities and towns are sparsely distributed across the region with long distances between cities, and urban functions concentrated in each area's hub city are also used by people living in the expansive surrounding areas.

2. Food supply capacity

Hokkaido's agricultural output accounts for about 15% of the national total, and the prefecture is the nation's largest production region for many agricultural and livestock products, including wheat, potatoes, onions, and raw milk. It plays an important role as a national food supply base, producing about a quarter of Japan's food on a calorie basis. Farmland in Hokkaido accounts for approximately 26% of the nation's total, and its cultivated acreage remains stable due to the low incidence of abandoned farmland. Its farmland is being expanded and consolidated into larger partitions, and is operated on a scale about 14 times larger than in other prefectures of Japan, with highly productive farming operations by specialized management entities.

As for the fisheries industry, Hokkaido has about 13% of the nation's coastline, and its marine fisheries and aquaculture production accounts for about 25% of the national total in volume and about 20% in value terms. Hokkaido is Japan's largest marine product supply base, boasting the highest production of many marine products, including scallops, cod, salmon, trout, Atka mackerel, and kelp.

3. Energy and resources

Hokkaido is rich in renewable energy sources, such as wind, solar, and geothermal power, as well as water resources. It ranks first among Japanese prefectures in unexploited reserves of renewable energy, including onshore wind power (roughly 51% of the nation's total), offshore wind power (29%), and solar power (25%). For offshore wind power, in particular, Hokkaido is expected to account for approximately one-third of the nation's introduction target by 2040.[4]

[4] Introduction Target: The national introduction target for offshore wind power by 2040, set in the "Vision for Offshore Wind Power Industry (1st)" (December 2020) by the Public-Private Council on Enhancement of Industrial Competitiveness for Offshore Wind Power Generation. The Vision also presents the possible allocation of the national target by region under certain conditions.

Forests in Hokkaido represent about 22% of the nation's total forestland and play an important role as carbon sinks. Blue carbon ecosystems[5] in Hokkaido's coastal areas are also expected to serve as new carbon sinks.

4. Natural environment and culture

Hokkaido is blessed with some of the most magnificent nature and beautiful, unique landscapes in Japan, including Shiretoko selected as a World Natural Heritage Site and the Kushiro Wetlands registered under the Ramsar Convention. The prefecture is home to a wide variety of precious plants and animals.

Hokkaido also has its own unique history and culture, including the Ainu culture, the Jomon Prehistoric Sites in Northern Japan registered as a World Heritage Site, the Okhotsk and Satsumon cultures,[6] and a northern lifestyle with people well-accustomed to snowy and icy weather.

The natural environment, natural and rural landscapes, and unique history and culture of Hokkaido have been recognized as distinctive and attractive tourism resources in Asia, and Hokkaido has become a highly popular destination for Asian travelers. The number of foreign visitors to Hokkaido increased by 1.64 million in the five years before the COVID-19 pandemic. Foreigners visiting Hokkaido have high expectations for adventure travel[7] and other activities that take advantage of its magnificent nature, history and culture. Hokkaido is one of the leading regions in Japan that provides experience-based tourism throughout the four seasons and world-class snow activities, including sports activities that take advantage of its pleasant weather in summer and powder snow in winter.

5. Geographical characteristics and cold climate technology

Hokkaido is situated in the northernmost part of the Japanese archipelago, adjacent to the Russian Far East. It occupies a strategic location linking North America, Europe, and East Asia, and serves as the country's northern gateway.

In addition, Hokkaido is expected to serve as a frontier and pioneering center for research on snowy and cold climate technologies, thanks to its accumulation of technological developments and R&D efforts to overcome the severe weather and soil conditions peculiar to snowy, cold regions.

§3. Future vision of Hokkaido in 2050

Amid rapid and significant changes in the circumstances surrounding Japan, it is important for Hokkaido development to contribute to solving national issues by responding flexibly to the changing

[5] Blue carbon ecosystem: Blue carbon is carbon captured by marine ecosystems such as seagrass beds, seaweed beds, marshes, and tidal flats. Ecosystems which capture and store blue carbon are called "blue carbon ecosystems."

[6] Okhotsk and Satsumon cultures: From the 5th to 9th centuries, the Okhotsk culture spread from Sakhalin (Karafuto) to the Okhotsk Sea coast of Hokkaido and the Chishima (Kuril) Islands; from the 7th to 12th centuries, the Satsumon culture, unique to Hokkaido, spread under the influence of the Honshu culture.

[7] Adventure travel refers to travel consisting of two or more of the three elements of "nature," "activities," and "cultural experiences." Hokkaido is attracting worldwide attention as a qualified destination for adventure travel, and the world's largest adventure travel event, ATWS (Adventure Travel World Summit), was held in Hokkaido in 2021 and 2023.

times. In order to effectively promote Hokkaido development and realize vibrant regional development, the players relevant to the implementation of the Plan must share the same basic direction from a long-term perspective.

To this end, this section will summarize the roles that Hokkaido can play in solving national issues, outline a future vision of Hokkaido in 2050, and point the way to realizing this vision, from which new goals of development will be set later.

1. Hokkaido's role in solving national issues

Considering the situation surrounding Japan as well as Hokkaido's resources and characteristics, Hokkaido can play the following roles in solving national issues, looking ahead to 2050.

① Leading regional revitalization to support the creation of a decentralized nation

As lifestyles and values diversify, more people are shifting their focus to the richness of mind and a relaxed lifestyle, and the COVID-19 pandemic sparked people's interest in moving to rural areas and pursuing different ways of living and working. In this regard, Hokkaido has attractive and inclusive factors inviting to people seeking new ways of living and working, such as its widely dispersed regional structure where people live less densely with ample space surrounded by a rich natural environment. Thus Hokkaido is expected to lead the way in regional revitalization to support the creation of a decentralized nation.

② Supporting Japan's food security by taking advantage of its rich land and water resources

Due to the increasing global demand for food and rapid changes in the international situation, there are growing concerns about tight food supplies in the future and the feasibility of securing stable supplies. In this respect, Hokkaido, as the nation's food supply base, contributes to the stable supply of food for the nation's people, and its importance continues to grow.

③ Leading the decarbonization of Japan by taking advantage of its abundant local resources

Achieving carbon neutrality by 2050 is a goal that cannot be met unless countries worldwide work together beyond their own self-interests. In this respect, Hokkaido is rich in renewable energy resources, such as wind, solar, and geothermal power, and vast forest areas that account for 22% of the nation's total. Hokkaido is expected to take the lead in Japan's decarbonization efforts by taking advantage of its abundant local resources.

④ Inheriting Hokkaido's natural environment and culture as common national assets

Hokkaido's distinct history and culture, including the Ainu culture, as well as its unique natural environment, are being revalued with Hokkaido's natural environment and culture inherited as common national assets.

⑤ Protecting the production spaces and creating a resilient land that allows people

to continue to live safely and securely

There are concerns about large-scale natural disasters, such as more frequent, intensifying water-related disasters and earthquakes in the area of the Japan Trench or Chishima Trench. In addition, protecting the production spaces playing a crucial role in ensuring Hokkaido's "food," "tourism," and "decarbonization" will contribute to sustainable socioeconomic activities in Japan. Thus it is essential to protect the production spaces and create a resilient land where people can live safely and securely.

⑥ Contributing to Japan's economic growth by fostering competitive industries

Japan's economy has experienced low growth for a long time, and further decline of international status remains a concern. In this regard, Hokkaido boasts a variety of promising industries, for example, renewable energy-related industries whose markets are expected to expand, the semiconductor industry which contributes to Japan's economic security, and space-related industries with such companies as a rocket launching company emerging. It is imperative to foster competitive industries that can contribute to Japan's economic growth.

In addition, Hokkaido, with its unique natural environment, culture, and abundant tourism resources, is popular not only among Japanese travelers but foreign visitors to Japan as well, especially from Asia. Hokkaido needs to revitalize the tourist attractions and tourism industry damaged by the COVID-19 pandemic through expanded domestic exchanges and the recovery of inbound tourism, leading to the realization of a tourism-oriented country.

2. Future vision

Based on the "Situation surrounding Japan" in Section 1, "Hokkaido's resources and characteristics" in Section 2, and the aforementioned "Hokkaido's role in solving national issues," we will outline a future vision of Hokkaido in 2050 to effectively promote Hokkaido development.

- The industries that take advantage of Hokkaido's strengths, such as food, tourism, and decarbonization, will operate nationally and globally to help establish a prosperous Hokkaido and contribute to Japan's economic security.
- The implementation of digital technologies will sustain the environment for settlement and exchanges in rural areas of Hokkaido, attracting people from Japan and abroad to realize diverse ways of living.

3. Social infrastructure to support the future vision

The essential social infrastructures developed to underpin the future vision of Hokkaido in 2050 are as follows: the Hokkaido Shinkansen line (between Shin-Hakodate-Hokuto and Sapporo); high-standard highways and other transportation networks and hubs, including ports and airports, connecting Hokkaido and other parts of Japan; watershed flood control in case of a 2℃ rise in global temperatures caused by climate change; agricultural production infrastructure, including the expansion of farmland partitions; forestlands; important fishing ports; advanced digital infrastructure; and power grids connecting Hokkaido to the rest of the country.

4. Directions to realize the future vision

① Developing agriculture, forestry, fisheries, and food-related industries with a high food production capacity

The aim is to contribute to Japan's food security by ensuring a stable supply of agricultural, forestry, and fishery products from Hokkaido, and to improve the food production capacity and income of the entire region by developing a wide range of agriculture, forestry, fisheries, and food-related industries using digital technology and other means.

② Realizing a decarbonized society and developing an energy base

The aim is to realize a decarbonized society by fully utilizing Hokkaido's abundant renewable energy resources, supplying energy not only within Hokkaido but to the entire nation, and at the same time introducing new energy sources such as hydrogen and utilizing Hokkaido's abundant forest resources.

③ Developing "food," "tourism," and "renewable energy" industries with an eye to global markets

The aim is to establish the "Hokkaido brand" in the global market by promoting the development of world-class tourism destinations through the creation of high-value-added tourism resources that incorporate Hokkaido's magnificent nature, history, and culture.

In addition to Hokkaido's strengths in "food" and "tourism," we also aim to develop new industries such as "renewable energy," semiconductor, and space-related industries that can become key drivers in Hokkaido, expanding across Japan and overseas and creating new jobs in the region.

④ Building a self-sufficient, circular local economy that utilizes abundant resources

The aim is to create a virtuous cycle between the environment and economy by promoting local production of locally consumed energy and foods and creating new jobs in the region.

⑤ Creating a sustainable society in harmony with a rich natural environment

The aim is to create a sustainable society by conserving the rich natural environment and landscapes characteristic of Hokkaido, securing biodiversity, and actively utilizing various functions of the natural environment for infrastructure development.

⑥ Preserving and passing down Hokkaido's unique culture

The aim is to realize a society in which the pride of the Ainu people is respected through efforts to promote the Ainu culture. We also aim to preserve and pass down Hokkaido's rich cultural resources, such as the Jomon Prehistoric Sites in Hokkaido[8] and other archaeological sites across the region, as well as Hokkaido's food culture nurtured by its unique history and climate.

⑦ Realizing the promotion of the Region neighboring the Northern Territories

The aim is to form stable local communities in the Region neighboring the Northern Territories[9] by promoting key industries and strengthening regional disaster prevention capabilities, as well as

[8] "Jomon Prehistoric Sites in Hokkaido" refers to a group of Jomon prehistoric sites that are components of the "Jomon Prehistoric Sites in Northern Japan."

[9] Region neighboring the Northern Territories includes Nemuro City, Betsukai Town, Nakashibetsu Town, Shibetsu Town, and Rausu Town. (Translator's Note: The Northern Territories, consisting of the four islands of Etorofu, Kunashiri,

forming local communities in other areas near the national border to ensure the safe and secure lives of residents.

⑧ Creating a society where people can continue to live in their own communities comfortably

The aim is to realize a comfortable rural lifestyle in Hokkaido where people can continue to live in their own communities by ensuring access to necessary human services through digital technologies, such as remote medical care and remote/online education, and securing comfortable and easy mobility in daily life.

⑨ Realizing lifestyles that attract people across Japan and abroad

The aim is to realize lifestyles that attract people across Japan and abroad by enabling diverse ways of living and working in Hokkaido, such as dual habitation,[10] workcation/remote work through digital technology, and the efficient use of local resources.

⑩ Establishing transportation networks to support the economy and society

The aim is to build sustainable, highly convenient passenger and freight transportation networks with roads, ports, airports, and railroads, as well as strengthen the linkage with networks in Honshu, supporting people living in rural areas, and delivering Hokkaido's value created in its production spaces to Japan and abroad.

In addition, we aim to dramatically revitalize the flow of people and goods within Hokkaido by extending the Hokkaido Shinkansen to Sapporo, and improving Soseigawa-dori (city center access road) and the Sapporo Station Bus Terminal to form a transportation hub in the city center, integrated with high-standard highways and railroad networks radiating out to various parts of Hokkaido.

⑪ Protecting lives and property from large-scale disasters and maintaining key social functions

The aim is to build safe and secure local communities by mobilizing the collective efforts of all players in the event of a large-scale natural disaster, including more frequent, intensifying water-related disasters due to climate change and massive earthquakes. We also aim to realize a society where passenger and freight transportation networks and essential utilities are secured and rapidly recovered or reconstructed in the aftermath of a disaster.

⑫ Diversifying disaster risks in response to impending large-scale disasters

The aim is for Hokkaido to provide backup functions, including food and energy supplies, in the event of a large-scale disaster, and to become a destination for firms seeking to mitigate risk by relocating their corporate head office functions and production bases to Hokkaido.

§4. Goals of the 9th Hokkaido Comprehensive Development Plan

To realize the future vision of Hokkaido in 2050, it is necessary to set goals that can be widely shared with the citizenry of Japan, and with Hokkaido in particular, and to implement measures in a

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Shikotan, and Habomai, are inherent territory of Japan, but have been occupied illegally by the Soviet Union, and then Russia, since the end of World War II.)

[10] Dual habitation refers to a way of living that establishes one's living base in a specific area separate from one's main living base.

phased and strategic way. As the first step toward realizing the future vision of Hokkaido in 2050, the current Plan lays down the groundwork for a prosperous Hokkaido and its contribution to the nation.

To contribute to solving the country's many challenges, it is necessary to reinforce Hokkaido's existing strengths in "food" and "tourism," and to take full advantage of Hokkaido's resources and characteristics, including its "decarbonization" potential.

Production spaces in Hokkaido produce the greatest value in food, tourism, and decarbonization. Hokkaido's expected population decline could make it difficult to secure settlement conditions in rural areas, which in turn would make it impossible to maintain its production spaces, resulting in a great loss for the country as a whole. In this regard, for Hokkaido to continue contributing to Japan, it is necessary to create and preserve the "Hokkaido model of regional structures" by maintaining and developing the production spaces as a source of Hokkaido's value.

As the groundwork for Hokkaido's contribution to Japan while enhancing its value, the 9th Plan sets forth the following two goals:

Goal 1: "Hokkaido supporting the prosperous life of Japan
- Food Security, Tourism Nation, and Zero Carbon Hokkaido"

Goal 2: "Hokkaido model of regional structures creating Hokkaido's value
- Maintaining and developing the production spaces and forming a resilient national land"

Chapter 3. Fundamental Principles for Implementing the 9th Plan

§1. Period of the Plan

The period of the 9th Plan is approximately 10 years from FY2024.

§2. Primary measures in the Plan

The primary measures to achieve and comprehensively promote the goals of the Plan are as follows.

Primary measures related to Goal 1: "Hokkaido supporting the prosperous life of Japan - Food Security, Tourism Nation, and Zero Carbon Hokkaido"

For Hokkaido to contribute to solving the challenges facing Japan through its resources and characteristics, it is necessary to reinforce Hokkaido's greatest strengths of "food" and "tourism."

To this end, the primary measures of "Realizing the sustainable development of agriculture, forestry, fisheries, and food-related industries that support food security" and "Creating world-class tourism regions that lead a tourism nation" should be implemented.

Hokkaido is expected to demonstrate its "decarbonization" potential and lead Japan's efforts to combat climate change by enhancing the CO_2 absorption capacity of its forests and other resources. In this respect, it is important not only for Hokkaido to contribute to the nation through decarbonization and renewable energy, but to ensure that these benefit the local economy and revitalize the region. Hokkaido is also expected to foster new industries such as renewable energy and space-related industries that can utilize its regional advantages. To this end, the primary measures of "Realizing Zero Carbon Hokkaido that leads in climate change countermeasures" and "Fostering growth industries that utilize regional advantages" should be implemented.

It is essential to maintain and utilize Hokkaido's strengths for the region to contribute to Japan, such as its magnificent nature and diverse culture, and to promote regional development based on Hokkaido's geographical features. To this end, the primary measures of "Establishing a society in harmony with nature and a sound material-cycle society," "Revitalizing the Region neighboring the Northern Territories and the border areas," and "Promoting the Ainu culture" should be implemented.

Primary measures related to Goal 2: "Hokkaido model of regional structures creating Hokkaido's value - Maintaining and developing the production spaces and forming a resilient national land"

For Hokkaido to contribute to Japan, it is necessary to maintain and develop its production spaces as a source of Hokkaido's value. With its population widely dispersed across the region with long distances between cities, digital technology can be effectively used to overcome time and space

constraints, allowing people to access necessary services and continue to live comfortably in their own communities. To this end, the primary measure of "Maintaining and developing the production spaces by utilizing digital technologies" should be implemented.

To maintain local communities in rural areas, it is necessary to promote the participation of diverse people of all generations in local activities, as well as improve the attractiveness of the production spaces and their environments for settlement and exchanges. To this end, the primary measure of "Creating diverse and prosperous local communities" should be implemented.

To maximize the attractiveness of the production spaces by utilizing their resources, it is crucial to develop transportation networks connecting cities, urban areas, and production spaces, ensuring access to daily life services, and improving the transportation systems that support tourism and wide-area passenger and freight transportation networks required to transport agricultural, forestry, and fishery products, food products, and necessary raw materials. To this end, the primary measure of "Creating passenger and freight transportation networks that support the Hokkaido model of regional structures with global perspectives" should be implemented.

Ensuring safety and security is the foundation of all social and economic activities. In addition to protecting the production spaces and local livelihoods, Hokkaido's potential must be utilized to contribute to the resilience of the nation. To this end, the primary measure of "Building a resilient national land that protects the production spaces and allows people to continue to live safely and securely" should be implemented.

§3. Methods of promoting the Plan

1. Developing and maintaining the Hokkaido model of regional structures based on a hybrid of real and digital

The Hokkaido model of regional structures is viewed as the ideal form of regional structures in the medium to long term to cope with the current state of a widely dispersed population, with primary industries operating in rural areas with low population densities. The model comprises the following three layers, focusing on currently provided urban and human service functions, in relation to present land use and surrounding areas.

- "Production spaces" supporting production mainly related to agriculture and fisheries in rural areas of Hokkaido and providing tourism resources.
- "Cities and towns" with a certain degree of population concentration functioning as surrounding area hubs for daily living.
- "Central cities in the basic regions" providing higher level urban and human service functions such as medical care.

The previous 8th Plan positioned the maintenance and development of production spaces that play a crucial role in "food" and "tourism" as a central issue necessary for Hokkaido to contribute to Japan. It placed developing and maintaining the Hokkaido model of regional structures that support its production spaces as a priority measure.

Japan is working toward carbon neutrality by 2050, and Hokkaido is expected to lead the nation's decarbonization efforts with the 9th Plan calling for the realization of Zero Carbon Hokkaido.

In this regard, since the potential for renewable energy, such as wind power and biomass, exists mainly in rural areas of Hokkaido, the importance of production spaces that also produce renewable energy, in addition to “food” and “tourism,” is increasing ever more.

Hokkaido’s population is declining ahead of the rest of Japan, especially in its rural areas. By 2050, approximately 43% of the currently inhabited areas may be uninhabited. In general, urban and human service functions that support people’s lives, such as medical care, welfare, nursing care, education, and commerce, require a certain number of users, and access to essential services may become more difficult in rural areas with rapidly declining populations. On the other hand, some municipalities have been making efforts to revitalize their production spaces, including settlement promotion measures for migration and childcare support, along with the extension of high-standard highway networks, and are achieving positive population growth among the younger generations.

Most production spaces are represented by scattered settlements. It should be noted that food production ultimately depends upon people actually living on-site, and that tourism ultimately depends upon people actually visiting. Therefore, infrastructure development such as transportation networks to support these realities is absolutely essential.

In addition, in order to maintain the living environment of dispersed settlement patterns, effective use of digital technology will allow users to overcome time and space constraints, permitting people to receive medical care, higher education, social education, and other services without having to relocate. Digital technology can also connect people in Hokkaido and beyond for work and education, making it possible to develop and secure human resources to support various activities.

To this end, the core concept for promoting various measures will be the use of digital technology to reinforce and complement the production spaces that support people’s activities. Measures will also be employed to develop and maintain the production spaces that embody Hokkaido’s strengths.

2. Measures to enhance the Plan’s effectiveness

The vast island of Hokkaido consists of diverse and unique regions characterized by different climates, histories, cultures, and industries. It is important for each region to utilize its own individuality and resources to solve issues and follow a unique path of development.

The 5th and subsequent terms of the Hokkaido Comprehensive Development Plan divided Hokkaido into six regions (Southern Hokkaido, Central Hokkaido, Northern Hokkaido, Okhotsk, Tokachi, and Kushiro/Nemuro), and promoted regional development efforts in each region. The 9th Plan will continue to promote the wide-area collaboration system and projects for each region. In addition, a collaborative system will be established among the Development and Construction Departments of the Hokkaido Regional Development Bureau, local governments, NPOs, businesses, and educational institutions to promote public-private co-creation efforts and enhance the value of Hokkaido.

Plan promotion should be coordinated with the National Spatial Strategy (National Plan) and take into account the following national strategies: Grand Design and Action Plan for a New Form of Capitalism; Digital Lifeline Development Plan based on the Basic Policy on the Vision for a Digital

Garden City Nation; Fundamental Plan for National Resilience; Basic Act on Food, Agriculture and Rural Areas; Tourism Nation Promotion Basic Plan; Plan for Global Warming Countermeasures; Priority Plan for Social Infrastructure Development; and Basic Plan on Transportation Policy. In addition, the following efforts should be made to enhance the Plan's effectiveness, including the use of rapidly advancing digital technologies and the co-creation efforts of various players.

(1) "Co-creation" across public and private sectors

To enhance the value of Hokkaido and address various issues that communities face, it is important to mobilize all of the energy of the various players to promote initiatives that create new value through cooperation and collaboration across disciplines and fields.

To this end, investment in human resource development should be promoted, including efforts for related players to convey Hokkaido's attractiveness and potential to children, upon whom the future of the country rests, while deepening their understanding of Hokkaido's value through dialogue and promoting efforts to develop human resources who can adapt to social change and boldly undertake new challenges through reskilling and upskilling. In addition, cooperation and collaboration among the national government, local governments, citizens, NPOs, businesses, and educational institutions will be promoted, including the establishment of public-private coordination platforms among various policy implementation players and the promotion of local collaborative efforts in landscape development.

In rural areas with rapidly declining and aging populations, it is difficult for the government alone to solve all of the many social issues. It is therefore important to establish a society in which local issues can be solved through co-creation efforts across public and private sectors, for example, by supporting initiatives to solve local issues with the participation of citizens and initiatives in which private companies play a public role.

(2) Promotion of DX/GX as the key to social change

Solving social issues involving population decline, a low birthrate, an aging society, and climate change requires socioeconomic reform, and the promotion of DX (Digital Transformation) and GX (Green Transformation) is the key to bringing about the necessary social change.

The active introduction of digital technologies can achieve labor-savings, automation, and efficiency, drive major changes to overcome time and space constraints that are major disadvantages in Hokkaido's vast landscape, and create new value in response to an ever-changing society.

Promoting GX is also essential to realize carbon neutrality and a stable energy supply. To make the most of the abundant renewable energy potential in Hokkaido and attract ESG investment[11] and other domestic and foreign investments in growing GX-related industries, efforts will be promoted though a consortium of industry-academia-government-financial cooperation.

[11] ESG investment: Investments in which non-financial factors such as ESG (Environmental, Social, and Governance) are considered in addition to financial factors.

(3) Reinvigoration of the "frontier spirit"

Since the Meiji era (1868-1912), the course of the history of Hokkaido's development has been marked by its "frontier spirit" that encouraged the undertaking of new challenges. Looking at the post-World War II period, we see how people in Hokkaido worked tirelessly to achieve higher coal and food production and crop improvements. In recent years, Hokkaido has earned a strong reputation overseas as an international tourist destination. With socioeconomic conditions in Japan at a major turning point, Hokkaido, blessed with the resources and characteristics to pave the way for a new era, is expected once again to demonstrate its frontier spirit and contribute to the creation of a prosperous economy and society of the nation.

The previous 8th Plan promoted "Hokkaido as a major region in the world," stating that for Hokkaido to attain both regional development and contribution to Japan as a whole, it was necessary that it play a key role in undertaking the challenges of global competition and collaboration, with the spirit of leading the way as a global frontier.

As one of Hokkaido's strengths, the agricultural sector has faced numerous challenges, none less than the lack of prospective farmers; but today new agricultural management methods are being established and advanced technologies being incorporated. In other fields, new value originating in Hokkaido is being created through the use of digital contents and other cutting-edge technologies. In recent years, space-related, food tech,[12] and other pioneering industries have emerged by taking advantage of Hokkaido's geographical and climatic characteristics.

The development of cutting-edge industries requires an environment where younger generations are encouraged to put forward their own perspectives and exhibit originality and ability. In this respect, Hokkaido presents a frontier spirit and culture in which people are quick to adopt cutting-edge technologies, with the prefecture expected to become a center of research and human resource development that fosters and recruits human resources who can deliver added value.

To this end, we will encourage Hokkaido's residents to participate in various activities and promote the creation of new business models and start-ups through collaboration among industry, academia, government, and finance. We will also promote Hokkaido's value such as renewable energy to attract companies.

Some municipalities have already begun pioneering initiatives, such as local production of energy for local consumption. Impressive challenges by small towns are expected to lead the way in revitalizing the region facing a declining and aging population.

Severe winters and snow in Hokkaido have been major handicaps for its residents and must be overcome or adapted to in a positive manner. In this regard, with strengthened cooperation among the national government, the National Research and Development Agencies, universities, and the private sector, we will work on technological research and development for cold, snowy regions, and actively promote advanced and experimental approaches that utilize new technologies and Hokkaido's characteristics, aiming to enhance Hokkaido's role as a pioneer in technological research for regions affected by severe climate conditions.

[12] Food tech is a term that combines the words "food" and "technology," and refers to the use of cutting-edge technologies to expand the possibilities of food.

In addition, we will promote community development that can respond to heavy snowfalls, such as the introduction of more efficient and labor-saving snow removal and disposal methods using ICT and renewable energy and the use of snow as an energy resource.

Furthermore, unique undertakings will be promoted to tackle issues inherent in Hokkaido by introducing local standards ("Hokkaido Standards") different from national standards, based on the excellent resources and characteristics of the region.

(4) Strategic and systematic infrastructure development

To achieve sustainable infrastructure development under severe fiscal conditions, it is necessary to prioritize and improve the efficiency of public investment projects as well as maximize the socioeconomic impact of infrastructure assets by conducting well-planned infrastructure development with an eye on the later phases of maintenance, renewal, and utilization.

With production spaces creating Hokkaido's value widely distributed across rural areas, well-planned strategic infrastructure development should be promoted by devising ways to expedite the development process and realize project effects at an early stage.

In promoting watershed flood control in response to more frequent, intensifying natural disasters, we will promote infrastructure development that makes the most of Hokkaido's natural and regional characteristics, including the introduction of the concept of green infrastructure.[13] Infrastructure development projects that enhance Hokkaido's value should also be promoted and prioritized, such as strengthening food production infrastructure that contributes to food security and developing transportation networks that facilitate tourism. To effectively promote this Plan, coordination between "hard" (tangible) infrastructure development and "soft" (intangible) measures will be promoted. Flexible, agile, and focused responses are required, taking into account changing circumstances.

Furthermore, it is important to draw out the potential of infrastructure in cooperation with such players as local governments, businesses, and citizens, not only at the development stage but at the maintenance and utilization stages as well.

Much of Hokkaido's infrastructure was developed during or soon after Japan's high economic growth period (mid-1950s to early 1970s), and the proportion of facilities over 50 years old is increasing rapidly. Given the numerous facilities requiring immediate repair and other measures, a full-scale conversion into "preventive infrastructure maintenance" should be made by promoting strategic wide-area infrastructure management. In addition, maintenance based on the unique weather and structural characteristics of a cold, snowy region is necessary in Hokkaido.

3. Management of the Plan

In promoting the Plan, the PDCA cycle should be implemented efficiently and effectively, and the progress of various indicators and measures related to population, the economy, and society

[13] Green infrastructure refers to the creation of sustainable and attractive national land, cities, and regions by utilizing the diverse functions of the natural environment in tangible and intangible aspects of social infrastructure development and land use.

requires monitoring. The major policies and period of the 9th Development Plan should be flexibly handled and reviewed whenever necessary.

Chapter 4. Primary Measures in the Plan

§1. Primary measures related to "Hokkaido supporting the prosperous life of Japan: Food Security, Tourism Nation, and Zero Carbon Hokkaido"

1. Realizing the sustainable development of agriculture, forestry, fisheries, and food-related industries that support food security

Measures will be developed in line with the following basic directions for the sustainable development of agriculture, forestry, fisheries, and food-related industries that support food security.

Basic directions to achieve the primary measures:

(1) Increasing the production capacity of agriculture, forestry, and fisheries that lead Japan
(2) Establishing value chains that meet domestic and overseas market demands
(3) Developing sustainable agriculture, forestry, and fisheries
(4) Developing rural areas that support the sustainability of agriculture, forestry, and fisheries

(1) Increasing the production capacity of agriculture, forestry, and fisheries that lead Japan

(Strengthening the production capacity of agriculture that leads Japan)

Japan's food self-sufficiency ratio on a calorie supply basis has been around 40% in recent years, with the supply of wheat, soybeans, and feedstuffs heavily dependent on imports. Recent soaring prices of food and production materials, export restrictions around the world, and future prospects of food supply shortages are raising concerns over Japan's food security. While Hokkaido's food self-sufficiency ratio already exceeds 200% on a calorie supply basis, its target in FY2030 is set at 268%.[14] Each region of Hokkaido produces a wide variety of agricultural products, such as rice and field crops, vegetables, fruits, flowers, dairy, beef cattle, racehorses, and other livestock, based on their regional characteristics, and this abundance of products plays a major role in securing Japan's stable food supply. Yet there are concerns about the weakening of agricultural production systems due to the decline and aging of farmers. Therefore, the following measures should be prioritized to strengthen the production capacity of agriculture.

Priority measures

- Expansion of the production and use of crops that are highly dependent on imports
  - Expanding the production and use of wheat and soybeans to meet demand
  - Expanding the production and use of feed crops matching the characteristics of Hokkaido

[14] 268%: The target set in the "6th Hokkaido Agriculture and Rural Area Development Promotion Plan" (March 2021) formulated by Hokkaido Prefecture. The plan seeks to demonstrate that Hokkaido is playing an even greater role as Japan's largest food supply region by sustainably supporting the entire nation's food supply through its stable supply of safe, secure, and high-quality agricultural products.

- Innovation to lead agriculture in Japan
  - Accelerating the implementation of smart agriculture, including the operation of agricultural machines by sensors and remote control
  - Introducing new farming techniques and crop varieties through collaboration with research institutions
- Development and securement of production infrastructure to strengthen Hokkaido's agricultural production capacity
  - Developing agricultural production infrastructure and digital infrastructure to enable high-efficiency and high-quality production based on regional characteristics
  - Developing and strategically managing agricultural irrigation facilities through greenization and digitalization
  - Developing disaster-proof agricultural production infrastructure through quakeproofing and drainage improvement measures
- Reinforcement of the business base of farmers as the foundation of agricultural production
  - Accelerating the consolidation of farmland and securing prime farmland for business farmers
  - Promoting diversified agricultural business for more efficient production and sophisticated business management
  - Promoting the strategic use of external support organizations
  - Securing various human resources according to the characteristics of agriculture in each region

(Strengthening the production capacity of forestry that leads Japan)

Hokkaido's forest area accounts for about 22% of the nation's total, and efforts have been made to recycle its forest resources. About 80% of the planted forests, mainly Sakhalin fir and Japanese larch planted after World War II, are entering their period of use, while younger forests as future resources are relatively few, resulting in an imbalanced age structure of forest resources. In addition, while the amount of logging and reforestation is on the rise, a labor shortage in forestry operations is becoming apparent, and productivity remains low due to the lack of mechanization in reforestation and tending processes, which imposes a heavy workload and cost burden. Therefore, the following measures should be prioritized to strengthen the production capacity of forestry.

Priority measures

- Creation of rich northern forests through the sustainable use of forest resources
  - Systematically developing forests through thinning and replanting after harvesting
  - Preparing countermeasures against increasing mountain disasters by building erosion control dams
- Innovation to lead forestry in Japan
  - Accelerating the implementation of smart forestry, including understanding and using advanced forest-related information through remote sensing technology

- Developing and disseminating new forestry technologies such as the introduction of elite trees[15]

• Reinforcement of the business base of forestry management entities as the foundation of timber production
  - Introducing high-performance forestry machines and heavy-duty vehicles in conjunction with the improvement of forest road networks
  - Strengthening the management capability of forestry management entities through the integration and consolidation of businesses
  - Developing and securing human resources through collaboration with local communities and related organizations

(Strengthening the production capacity of fisheries that lead Japan)

Hokkaido's marine fishery and aquaculture production accounts for about 25% of the nation's total, and the region is the nation's largest producer of many marine products. With changes in the marine environment and declining fishery resources, catches of major fishery species such as Pacific saury, Japanese common squid, and salmon have shown a long-term downward trend in fishery production. Additionally, red tide damage off the Pacific coast of Hokkaido in 2021 had a significant impact on fishery production. There are also concerns about the fragility of fishery production systems, such as the decline and aging of fishery workers. Therefore, the following measures should be prioritized to strengthen the production capacity of fisheries.

Priority measures

• Management of fishery resources to protect the bounty of the rich northern seas
  - Promoting TAC (Total Allowable Catch)[16] and IQ (Individual Quota) management[17] based on MSY (Maximum Sustainable Yield)[18] resource evaluation as well as voluntary resource management by fishery managers based on resource control agreements
  - Developing the fish farming industry based on the characteristics of the sea areas

• Innovation to lead fisheries in Japan
  - Accelerating the implementation of smart fisheries, such as advanced resource control using catch and marine environment data

• Improvement of fishery infrastructure to support the production capacity of the fisheries industry
  - Reinforcing the production and distribution functions of major fishing ports through

[15] Elite trees: Trees selected for their superior growth from the artificial crossing of trees with good growth and material quality characteristics by the Forestry Research and Management Organization.

[16] TAC (Total Allowable Catch) management: A method to properly conserve and manage fishery resources by setting annual catch limits for each fish species.

[17] IQ (Individual Quota) management: A method of managing TACs through their allocation to individual fishery managers or ships and prohibiting catches that exceed the quota.

[18] MSY (Maximum Sustainable Yield): The maximum catch that can be gathered or caught sustainably under current conditions.

the development of distribution facilities with high-level sanitary control
- Effectively utilizing fishing ports, including the expansion of areas suitable for aquaculture
- Improving the fishery environment in consideration of the life cycles of aquatic organisms
- Improving the resilience of fishing port facilities

• Promotion of fisheries as a growth industry
- Promoting structural reform of the fisheries industry by fishing vessels through conversion to diversified fisheries
- Promoting aquaculture as a growth industry to expand domestic production
- Developing and securing human resources

(2) Establishing value chains that meet domestic and overseas market demands

The majority of production by Hokkaido's agriculture, forestry, fisheries, and food-related industries is characterized by the supply of materials and their value-added ratio is generally low. A supply system ranging from production to processing and distribution to meet various needs and a system for acquiring expanding overseas markets have yet to be established. To grow these industries into highly profitable ones, it is important to promote "sixth-sector industrialization"[19] and the Hokkaido brand's power to create added value. Therefore, the following measures should be prioritized to establish value chains[20] that meet domestic and overseas market demands.

Priority measures

• Establishment of a production and supply system that maximizes added value
- Integrating the efforts of related industries from upstream to downstream, including production, processing, and distribution
- Forming an efficient regional distribution system through data linkage and utilization from production to consumption as well as utilization of ICT

• Supply of agricultural, forestry, and fishery products that meet various needs
- Expanding production in response to changes in demand such as the externalization of diet[21]
- Generating new demand and developing a stable supply system through technological development of CLT (Cross-Laminated Timber)[22] and fire-resistant materials using lumber from Hokkaido

[19] Sixth-sector industrialization: Efforts to comprehensively integrate business activities among agriculture, forestry, and fisheries (primary sector of the economy), manufacturing (secondary sector), and retail and service industries (tertiary sector), and create new added value by utilizing local resources.

[20] Value chain refers to creating a chain of added value by connecting and enhancing added value at each stage, from production to manufacturing/processing, distribution, and consumption.

[21] Externalization of diet: A situation in which cooking and dining done previously in the home are now dependent on outside the home, against a backdrop of increasing dual-income households and single-person households, an aging population, and diversifying lifestyles.

[22] CLT (Cross-Laminated Timber): Panels made by laminating and gluing layers of sawn lumber so that the fiber orientation of each layer of board is perpendicular to the adjacent layer.

  - Expanding production and sales channels in response to changes in fishery species
- Expansion of exports of agricultural, forestry, and fishery products as well as food products to acquire global markets
  - Developing facilities necessary for fostering and developing export-intensive regions
  - Initiating high-level sanitary control measures in conjunction with the development of facilities such as roofed wharves and other measures in response to the regulations and needs of export destination countries by obtaining certifications and conforming to such standards as HACCP, Marine Eco-Label, and GAP
  - Promoting and expanding the Hokkaido brand market through the use of GI (Geographical Indication)[23]

(3) Developing sustainable agriculture, forestry, and fisheries

All agriculture, forestry, and fisheries industries and food-related production exploit the potential of nature and ecosystems. For the sustainable development of those production activities, it is essential to reduce their environmental impacts by recycling resources, maximizing the use of local resources, reducing the use of chemical pesticides, chemical fertilizers, and fossil fuels, and maintaining a rich environment, while maintaining and preserving production infrastructure according to local conditions. The establishment of production systems responsive to climate change affecting a wide range of areas is also required. Therefore, the following measures should be prioritized to develop sustainable agriculture, forestry, and fisheries.

Priority measures

- Establishment of a sustainable production system
  - Reducing environmental impacts through the use of smart technologies and new production techniques
  - Utilizing local resources such as livestock manure and sewage sludge as fertilizer and fuel
  - Converting to greener cultivation systems, including the promotion of sustainable agriculture
  - Preserving agricultural land through optimal land use such as grazing based on local conditions and measures to prevent damage by wild birds and animals
- Responses to climate change
  - Developing and disseminating new varieties and cultivation techniques adapted to the impacts of climate change
  - Developing and disseminating technologies to reduce GHG emissions
  - Promoting responses to changes in fishery species as a result of the changing marine environment

[23] GI (Geographical Indication): The name of a product corresponding to a specific geographical location and legally protected as regional intellectual property based on its quality and social reputation nurtured over many years in the natural, humanistic, and social environment unique to the region.

- Introducing measures to improve production infrastructure and forest conservation to manage intensifying and more frequent water-related disasters
- Introducing new crops to make the best of opportunities presented by climate change

(4) Developing rural areas that support the sustainability of agriculture, forestry, and fisheries

Agriculture, forestry, and fisheries are the core industries of most rural communities, with production bases of farmland, forest land, fishing grounds, and abundant local resources that include agricultural, forestry, and fishery products, nature, and landscape. Although these communities play an important role with multifaceted functions, there are concerns about their sustainability due to their shrinking size and aging population. Therefore, the following measures should be prioritized to develop rural areas that support the sustainability of agriculture, forestry, and fisheries.

Priority measures

- Securement of income and employment opportunities in rural areas
  - Strengthening Hokkaido's brand power by taking advantage of the local climates and distinctive agricultural, forestry, and fishery products and foods
  - Promoting "Hokkaido Marine Vision"[24] through collaboration between agriculture, forestry, fisheries, and other industries utilizing the abundant local resources; innovation initiatives originating from rural areas such as sixth-sector industrialization, agriculture and welfare cooperation, and farmstays; and the forest service industry[25] and UMIGYO (projects that utilize the value and attractiveness of local resources in the sea and fishing villages)
- Maintenance and strengthening of the community functions of rural communities
  - Creating a system for sustainable management of rural communities
  - Expanding the population with strong ties to the areas, and developing and securing human resources who can play a role in regional development
  - Improving settlement conditions by securing housing and information infrastructure
- Preservation and inheritance of the natural environment, landscape, and culture of rural areas
  - Developing local activities such as the "Making Our Village Beautiful – Hokkaido" campaign[26] and food and wood education, and fostering a better understanding of rural areas
  - Maintaining and fulfilling the multifaceted functions of rural areas and agriculture,

[24] Hokkaido Marine Vision: A long-term vision to realize vibrant fisheries and fishing villages in Hokkaido through cooperation and collaboration among various players, while utilizing local resources to protect and nurture Hokkaido's role as Japan's marine food supply base for the future.

[25] Forest service industry: A new service industry that utilizes forest space in such fields as health, tourism, and education to create and expand the population with strong ties to the areas and revitalize mountain villages.

[26] The "Making Our Village Beautiful – Hokkaido" Campaign: An initiative to support activities led by local residents to build attractive and vibrant communities by utilizing the resources of Hokkaido's rural areas, with "landscape," "local specialties," and "human interaction" as the three main pillars.

forestry, and fisheries

2. Creating world-class tourism regions that lead a tourism nation

Measures will be developed in line with the following basic directions for creating world-class tourism regions that lead a tourism nation.

Basic directions to achieve the primary measures:

(1) Creating and enriching new tourism content for the global market and enhancing the industry's earning power

(2) Developing a safe and secure reception environment to attract a wide range of travelers to rural areas

(3) Creating sustainable tourism regions where tourism is compatible with the preservation of the natural environment and culture

(1) Creating and enriching new tourism content for the global market and enhancing the industry's earning power

Hokkaido features tourism content that takes advantage of its rich natural environment and scenery, but seasonal variations in travel demand present the challenge of creating demand during off-season periods.

In addition, people's lifestyles have changed dramatically with the spread of remote work since the COVID-19 pandemic, making it necessary to respond to the new needs of travelers.

On the other hand, to revitalize tourist destinations and the tourism industry affected by the pandemic, it is important to realize a sustainable tourism industry with stable employment assured. To this end, it is necessary to improve the tourism industry's "earning power" by promoting high value-added tourism, which can lead to a virtuous cycle of improving employee working conditions and services.

To promote high value-added tourism, it is necessary to establish a distinct Hokkaido brand by creating a new image of Hokkaido as a travel destination and improving CX (Customer Experience). It is also important to exploit potential tourism content such as Hokkaido's natural, historical, and cultural resources, and to create and enrich new tourism content by linking the contents together. Therefore, the following measures should be prioritized to create and enrich new tourism content for the global market and to enhance the industry's earning power.

Priority measures

- Creation and enrichment of new tourism content utilizing Hokkaido's resources and characteristics
  - Creating tourism content using attractive public areas in production spaces such as "Kawatabi Hokkaido"[27]

[27] Kawatabi Hokkaido: Activities related to rivers in Hokkaido, aiming to revitalize and develop regions and to maximize their appeal.

- Promoting sports tourism[28] by creating sports content throughout the four seasons and developing related facilities
- Creating year-round tourism content involving food, culture, and infrastructure tourism[29]
- Creating tourism content for educational tours targeting young people from overseas
- Creating tourism content linked to medical care and health promotion

• Promotion of high value-added tourism that contributes to greater tourism consumption and tourism consumption per unit
- Attracting high value-added travelers through world-class cycling tourism
- Attracting long-term visitors through adventure travel
- Developing a reception environment to accommodate long-term visitors, such as separation of lodging and meals

• Development of a reception environment to accommodate new tourism styles
- Creating tourism regions through collaboration with agriculture, forestry, and fisheries, such as farmstays in production spaces
- Creating resilient tourism regions by expanding the population with strong ties to the areas through attracting VFR[30] travelers

• Promotion of MICE[31] events utilizing the advantages of Hokkaido
- Utilizing MICE events to create travel demand during Hokkaido's off-seasons in cooperation with related organizations
- Attracting and holding MICE events in rural areas

(2) Developing a safe and secure reception environment to attract a wide range of travelers to rural areas

Although Hokkaido's tourism resources are scattered throughout the region, most foreign visitors to Hokkaido stay in the central Hokkaido area due to the lack of convenient secondary transportation from airports and ports to tourist destinations. To distribute the economic benefits of the Hokkaido Shinkansen extension and inbound tourism across rural areas, it is necessary to create a safe and secure environment for diverse tourists, foreigners in particular, improve transportation access to rural areas and tourist attractions in tangible aspects, and improve the efficiency of tourist services by utilizing digital technologies in intangible aspects. Therefore, the following measures should be prioritized to develop a safe and secure reception environment to attract a wide range of travelers to rural areas.

Priority measures

• Reinforcement of gateway functions and improvement of transportation access to rural areas

[28] Sports tourism involves interactions with people who "watch," "play," and "support" sports.
[29] Infrastructure tourism involves site visits to infrastructure facilities such as dams, bridges, harbors, and historical sites.
[30] VFR: Abbreviation for Visiting Friends and Relatives.
[31] MICE: General term for Meeting, Incentive, Convention, and Exhibition/Event.

- Enhancing the convenience of travel in cooperation with transportation and tourism businesses, together with enhancing the reception functions at airports and ports, developing high-standard highways and the Hokkaido Shinkansen line, and improving the connectivity of transportation services
- Revitalizing travel tours in cooperation with the seven airports whose operations are outsourced[32] and their surrounding areas, reducing travel time through improved accessibility, and developing a safe and secure travel environment
- Improving transportation convenience for tourists and other visitors in rural areas with low transportation demand

• Creation of a safe and secure environment for a wide range of travelers
  - Improving safety management, including multilingual traffic information, medical service information, and guide training
  - Promoting universal tourism[33]

• Implementation of digital technologies in tourism
  - Analyzing and utilizing dynamic data of driving tourists, and digitalizing tourist reception systems such as MaaS[34]

(3) Creating sustainable tourism regions where tourism is compatible with the preservation of the natural environment and culture

Hokkaido's abundant tourism resources include the natural environment, natural and rural landscapes, abundant hot springs, geoparks, Ainu culture, Jomon Prehistoric Sites, and the history of development in modern times. In addition, there is a high demand for tourism styles that incorporate cultural resources, such as the National Ainu Museum and Park (Upopoy), and historical resources that include districts with important traditional buildings in Hakodate and historical buildings in Otaru.

On the other hand, with tourism resources widely dispersed across Hokkaido, CO_2 emissions from increased transportation could become an issue in the future. The significant increase in tourists has already raised such concerns as traffic congestion and the impact on the natural environment and local residents' lives. It is necessary to address these issues through the creation of sustainable tourism regions.

To promote the creation of sustainable tourism regions, it is important to develop and secure diverse human resources in communities involved in tourism. It is also necessary to enhance and preserve the local values, culture and natural environment protected in the past, and to pass them on to the next generation so that tourism can contribute to the sustainable development of the local economy and society, and local residents can actually feel the benefits of tourism.

For Hokkaido to play a leading role in developing sustainable tourism regions in Japan, it is important to improve its brand image of sustainable tourism by acquiring the relevant international

[32] The seven airports whose operations are outsourced to the private sector as part of the Hokkaido Bundled 7 Airport Concession Project: New Chitose, Asahikawa, Wakkanai, Kushiro, Hakodate, Obihiro, and Memanbetsu airports.

[33] Universal tourism is designed to be enjoyed by everyone, regardless of age, disability, or other disadvantages.

[34] MaaS (Mobility as a Service): A service that optimally combines multiple public transportation modes and other mobility-related services, enabling searches, bookings, payments, etc., on a single platform.

certifications.[35] Therefore, the following measures should be prioritized to create sustainable tourism regions where tourism is compatible with the preservation of the rich natural environment and culture, and where the promotion of tourism actually contributes to the local economy and society.

Priority measures

- Promotion of sustainable tourism[36]
  - Promoting environmentally friendly driving tourism
  - Preparing countermeasures against overtourism,[37] such as traffic management in tourist destinations in cooperation with DMOs[38]
- Promotion of sustainable tourism regions utilizing local resources in cooperation with various players
  - Creating sustainable tourism regions in collaboration with local communities where tourism is compatible with the natural environment, culture, and landscape, such as "Scenic Byway 'Splendid Roads'"[39] and "Minato Oasis"[40]
  - Creating sustainable tourism regions by attracting diverse players and introducing financial resources
- Creation of tourism regions utilizing local resources by preserving and inheriting Hokkaido's world-class cultural resources
  - Creating tourism regions utilizing historical sites in Hokkaido, such as the Jomon Prehistoric Sites in Northern Japan, geoparks, Japan Heritage sites including "Powering Japan's Industrial Revolution" (involving coal, steel, railways, and port-related facilities in Sorachi, Otaru, and Muroran), and Hokkaido Heritage contents like Hokkaido Horse Culture
  - Creating tourism regions utilizing the northern lifestyle in which people are accustomed to and enjoy the snowy and icy conditions of Hokkaido
- Development and securement of leaders to support tourism
  - Developing and securing local community leaders through cooperative activities

[35] International Certifications include Certification of Green Destinations (GD) and Best Tourism Village (BTV) certification by the United Nations World Tourism Organization (UN Tourism). GD is an international certification body accredited by the Global Sustainable Tourism Council and sets the criteria for sustainable tourism destinations. BTV is an area which UN Tourism has identified as committed to promoting and preserving its cultural heritage and advancing sustainable development through tourism, in line with the Sustainable Development Goals (SDGs).

[36] Sustainable tourism takes into full account its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities.

[37] Overtourism: A situation where a significant increase in the number of visitors to a particular tourist destination has unacceptable negative impacts on residents' lives, the natural environment or landscape, or significantly reduces the level of satisfaction for tourists.

[38] DMOs (Destination Management Organizations) are organizations that promote the creation of tourism regions through regional initiatives, creating an integrated brand for tourism destinations by combining various regional resources, disseminating information and implementing promotional activities using the Web and social networking services, conducting effective marketing, and formulating strategies.

[39] Scenic Byway 'Splendid Roads' are roads with the most attractive scenery among the routes of the Scenic Byway Hokkaido.

[40] Minato Oasis: Registered port facilities where continuous community development activities by local residents promote community development centered around "Minato (ports)," contributing to the revitalization of communities through the promotion of interactions among local residents and tourists.

within regions
- Securing coordinators of activities by local community leaders

3. Realizing Zero Carbon Hokkaido that leads in climate change countermeasures

Measures will be developed in line with the following basic directions for the realization of Zero Carbon Hokkaido that leads in climate change countermeasures.

Basic directions to achieve the primary measures:

(1) Creating a sustainable decarbonized society by taking advantage of Hokkaido's regional characteristics
(2) Developing energy bases
(3) Demonstrating Hokkaido's CO_2 absorption capacity

(1) Creating a sustainable decarbonized society by taking advantage of Hokkaido's regional characteristics

Hokkaido has abundant renewable energy sources such as wind, solar and geothermal power. To contribute to the realization of a decarbonized society, it is required to accelerate the use of renewable energy sources, ensuring stable energy supplies through the use of nuclear and hydraulic power and the use of existing power plants by promoting initiatives to reduce CO_2 emissions from thermal power plants.

It should be noted that some renewable energy projects have aroused concerns about the impacts on the landscape and environment, and their compatibility with local communities has become a key issue. In accelerating the introduction of these technologies, it is important for each project to give special consideration to harmony with the surrounding natural environment and landscape and its compatibility with the local community, leading to the effective use of local resources and the local production of locally consumed energy. It is also essential for such projects to contribute to ensuring an independent energy supply in the event of a disaster, based on the lessons learned from the blackout caused by the 2018 Hokkaido Eastern Iburi Earthquake.

On the other hand, Hokkaido is also noted for its high demand for heating during the winter months and for its reliance on automobile transportation necessitated by its widely dispersed regional structure, resulting in high fossil fuel use and higher CO_2 emissions per household than the rest of Japan, and requiring thorough efforts for energy saving, electrification, and energy conversion.

To realize Zero Carbon Hokkaido, national government agencies have established a support framework, and efforts to lead the nation's decarbonization have been initiated in cooperation with the Hokkaido prefectural government and municipalities. In addition, academic, business, governmental, and financial circles have collaboratively formed a consortium to promote investment in growth industry sectors for the realization of GX. With these efforts accelerating, the following measures should be prioritized to create a sustainable decarbonized society by taking advantage of Hokkaido's regional characteristics.

Tentative translation

Priority measures

- Acceleration in renewable energy use and enhancement of power grid systems
  - Accelerating the use of renewable energies that take advantage of regional characteristics, such as wind power, solar power, geothermal power, and biomass
  - Accelerating the use of renewable energies in the public sector, such as small-scale hydropower
  - Developing power grids to connect renewable energy generation facilities and effectively use existing power grids
  - Utilizing grid-scale batteries and hydrogen formation as a frequency controller for output fluctuations of wind power plants
  - Utilizing demand response that controls demand using digital technologies, and VPP (Virtual Power Plant) that integrates and operates multiple power generation facilities, storage facilities, and demand facilities
  - Establishing distributed energy systems, including microgrids that can provide power even in times of disaster
  - Securing energy demand in response to expanding renewable energy supplies, such as attracting data centers
- Effective utilization of local resources and local production of locally consumed energy
  - Using forest resources, biogas derived from livestock manure, and weeds along embankments for biomass power generation and boiler fuels
  - Effectively using stored snow and ice as a cold energy source
  - Effectively using residual hot water from geothermal power plants as a heat source
- Thorough efforts for energy saving and energy conversion
  - Promoting sustainable regional development through the concentration of urban functions
  - Promoting energy efficient housing and buildings (LCCM housing,[41] ZEB,[42] ZEH[43])
  - Promoting EVs through the spread of fast EV charging stations
  - Promoting energy saving, electrification, and hydrogenation in the construction, transportation, agriculture, forestry, and fisheries industries through the development of new technologies

[41] LCCM housing (Life Cycle Carbon Minus housing): A type of housing seeking to achieve a net negative balance of life cycle GHG emissions by maximizing the reduction of GHG emissions throughout its life cycle (construction, operation, and disposal) while generating renewable energy using solar power generation.

[42] ZEB (Net Zero Energy Building): A type of building that saves 50% or more of its energy consumption (compared to conventional buildings) and further reduces energy consumption by introducing renewable energy, etc. The following status is granted depending on the total amount of energy reduction: (1) "ZEB" (reduced 100% or more), (2) "Nearly ZEB" (reduced 75% to less than 100%), or (3) "ZEB Ready" (no introduction of renewable energy). In addition, for a building 10,000 m^2 or larger, the status (4) "ZEB Oriented" is granted if it saves 30% to 40% or more energy and introduces technologies expected to save energy but whose effects have yet to be evaluated in the energy efficiency calculation program, based on the Act on the Improvement of Energy Consumption Performance of Buildings.

[43] ZEH (Net Zero Energy House): A type of house that saves 20% or more of its energy consumption (compared to conventional houses) and further reduces energy consumption by introducing renewable energy, etc. The following status is granted depending on the total amount of energy reduction: (1) "ZEH" (reduced 100% or more), (2) "Nearly ZEH" (reduced 75% to less than 100%), or (3) ZEH Oriented (no introduction of renewable energy).

- Promoting infrastructure development to smooth transportation and logistics, which will contribute to reducing the environmental burden, and promoting energy saving at airport, roadside and other facilities
- Promoting electrification and hydrogenation on the energy demand side, in response to decarbonization on the energy supply side
- Promoting technological development of coal utilization with consideration for decarbonization
- Supporting local governments that work to create decarbonized areas through horizontal collaboration among local branch bureaus and departments of the national government
- Promoting environmental education for decarbonization

(2) Developing energy bases

From the perspective of achieving net-zero GHG emissions by 2050 and ensuring energy security, it is necessary to exploit the abundant renewable energy potential within Hokkaido and to make this energy available for use outside the prefecture. Therefore, the following measures should be prioritized to develop energy bases in Japan.

Priority measures

- Development of infrastructure to introduce and transfer renewable energy
  - Promoting the introduction of offshore wind power generation by designating promotion zones based on the Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities (Act No. 89 of 2018)
  - Developing power transmission infrastructure connecting Hokkaido with large energy consumption areas in Honshu
  - Promoting the Carbon Neutral Port (CNP) initiative that aims to enhance decarbonized port terminal operations and develop facilities for receiving hydrogen
  - Developing and utilizing ports that contribute to the introduction of renewable energy such as biomass fuel imports
- Realization of a hydrogen society
  - Building a supply chain from production to storage, transportation, and utilization of hydrogen
  - Promoting initiatives that contribute to expanding the introduction of fuel cell vehicles in cold regions
  - Promoting and raising awareness of hydrogen through a platform of industry-academic-government-financial cooperation

(3) Demonstrating Hokkaido's CO_2 absorption capacity

Hokkaido's forests account for about 22% of all forestlands in Japan and play an important role

as carbon sinks. Hokkaido's arable land area, which can store carbon in the soil, also accounts for about 26% of the nation's total. In addition, Hokkaido has about 13% of Japan's total coastline, nurturing blue carbon ecosystems that have attracted attention as new carbon sinks in recent years. Therefore, to achieve net-zero GHG emissions by 2050, the following measures should be prioritized to fully utilize Hokkaido's carbon sinks and demonstrate its CO_2 absorption capacity.

Priority measures

- Sustainably using forest resources and systematic forest management
- Creating blue carbon ecosystems through infrastructure projects
- Utilizing compost, green manure, and biochar for agricultural and grassland soils
- Promoting the construction of wooden buildings
- Promoting new decarbonization technologies such as CCUS[44] and synthetic fuels

4. Fostering growth industries that utilize regional advantages

Measures will be developed in line with the following basic directions to foster growth industries that utilize regional advantages.

Basic directions to achieve the primary measures:

(1) Promoting industrial development that utilizes renewable energy
(2) Creating advanced industrial bases that contribute to national economic security
(3) Promoting industrial development that utilizes geographical and climatic advantages

(1) Promoting industrial development that utilizes renewable energy

To achieve net-zero GHG emissions by 2050, it is necessary to make maximum use of Hokkaido's abundant renewable energy resources and to promote decarbonization efforts. In this respect, it is important for these efforts not only to contribute to decarbonization of the nation as a whole, but also to enrich the region through job creation and other means. In recent years, large-scale solar power generation facilities and other energy-related industries have been concentrating in the eastern Tomakomai industrial area, based on which industrial development through effective energy use is expected. Therefore, the following measures should be prioritized to promote industries that utilize renewable energy.

Priority measures

- Promoting the establishment of renewable-energy-related industries that utilize regional advantages
- Promoting decarbonization in the eastern Tomakomai industrial area and establishing environmental and energy industries and hydrogen-related industries

[44] CCUS (Carbon Dioxide Capture, Utilization, and Storage): Technology for separating and collecting CO_2 emitted from power plants, chemical plants, etc. from other gases, storing and injecting it deep underground, and utilizing the separated and stored CO_2. The only large-scale CCUS demonstration test site in Japan is located in Tomakomai City, Hokkaido.

- Promoting the establishment of electricity intensive industries in the Ishikari Bay New Port Area
- Promoting technological development that contributes to the growth of industries related to renewable energy, such as large storage batteries, hydrogen, and biomass

(2) Creating advanced industrial bases that contribute to national economic security

The environment surrounding the digital industry and semiconductors is changing dramatically, including the progress of digitization in response to the COVID-19 pandemic, the growing need for DX, the development of new information and communication technologies and infrastructure such as 5G, the global semiconductor supply crunch, trade issues surrounding advanced technologies such as semiconductors and digital-related technologies, and national economic security issues. To realize sustainable socioeconomic growth in the future, it is necessary to accurately grasp the changing times while enhancing the competitiveness of the semiconductor and digital industries, which are deeply related to a broad range of socioeconomic activities.

In particular, semiconductors are an important foundation of the digital society and a strategic technology directly linked to Japan's national economic security. In this regard, a company aiming to domestically produce next-generation semiconductors recently chose Hokkaido as its planned site for a new plant. It is important to take this opportunity to concentrate the digital industry in Hokkaido and establish a domestic manufacturing base.

Hokkaido also features certain geographical advantages in terms of physical proximity to North America and connectivity to Europe via the Arctic Ocean, as well as high potential for utilizing decarbonized power sources, making the region an attractive location for data centers. It is important to strengthen Japan's function as an international data distribution hub by developing Hokkaido as the nation's third or fourth concentrated area of data centers that can complement or serve as a substitute for the Tokyo and Osaka areas. Therefore, the following measures should be prioritized to create advanced industrial bases that contribute to Japan's national economic security. As a stable supply of energy is indispensable for establishing advanced industries, utilization of all types of energy should be considered, including renewable energy such as solar power, wind power, hydraulic power, geothermal power, and biomass, along with nuclear, thermal and hydrogen power, under the principle of S+3E.[45]

Priority measures

- Promoting efforts to establish manufacturing infrastructure, research, and human resource development for next-generation semiconductors
- Promoting the establishment of data centers as the foundation of the digital industry, and developing high-speed, high-capacity telecommunications infrastructure
- Creating a reception environment that includes medical care, education and housing

[45] S+3E: A basic energy policy concept that seeks to simultaneously achieve Energy Security, Economic Efficiency, and Environment, with Safety as its fundamental premise.

for advanced industries to shift their operations to Hokkaido

(3) Promoting industrial development that utilizes geographical and climatic advantages

To contribute to the national economy and realize prosperous local communities, it is important to achieve sustainable economic growth by fostering and promoting industries that utilize Hokkaido's regional characteristics, such as its vast landscape and cold and snowy climate, in addition to its core agriculture, forestry, fisheries, food-related, and tourism industries. Currently, space-related and other new industries are locating in Hokkaido, taking advantage of its geographical advantages. It is necessary to make the most of these strengths and to develop them further.

On the other hand, there are growing concerns about worsening labor shortages with a declining and aging population. To secure a diverse workforce, including young people, women, the elderly, people with disabilities, and foreigners, it is necessary to improve the work environment from the perspective of DEI (Diversity, Equity and Inclusion).

Therefore, the following measures should be prioritized to promote industries that utilize Hokkaido's geographical and climatic advantages.

Priority measures

- Creating and developing new industries such as space-related industries and industries utilizing Food Tech
- Improving the environment for securing human resources for industries
- Creating an environment that helps small and medium-sized enterprises to branch out into new businesses
- Promoting manufacturing industries through support for business advancement, technological improvements and DX/GX
- Strengthening industrial competitiveness through enhanced transportation and logistics networks
- Promoting the establishment of businesses that seek to relocate or decentralize their head office functions and/or production bases to Hokkaido
- Establishing satellite offices and remote work spaces
- Collaborating and cooperating with local businesses that lead their fields

5. Establishing a society in harmony with nature and a sound material-cycle society

Measures will be developed in line with the following basic directions to establish a society in harmony with nature and a sound material-cycle society.

Basic directions to achieve the primary measures:

(1) Establishing a society in harmony with nature by utilizing Hokkaido's characteristics

(2) Establishing a sound material-cycle society that maximizes efficient resource use

(1) Establishing a society in harmony with nature by utilizing Hokkaido's characteristics

Hokkaido offers a rich and invaluable natural environment, including Shiretoko selected as a World Natural Heritage Site, and the Kushiro Wetlands registered under the Ramsar Convention. It is necessary to conserve the natural environment and to promote the development of an attractive and sustainable region utilizing the diverse functions of nature. In addition, efforts to realize "Nature Positive"[46] and carbon neutrality are becoming major trends in the accelerating global push toward biodiversity and the climate change crisis. Thus, it is important to promote green infrastructure and other initiatives in cooperation with various public and private organizations. On the other hand, specific species of wildlife, for example, the Yezo deer and brown bears, are causing serious damage to tourism, agriculture, forestry, fisheries, and residents' living environment, making it increasingly necessary to protect the rich environment while appropriately managing the region's diverse wildlife.

Therefore, the following measures should be prioritized to establish a society in harmony with nature by utilizing Hokkaido's characteristics. With regard to the use and management of land, measures should be taken in light of the changing domestic and international situations regarding national security.

Priority measures

- Promotion of green infrastructure initiatives through cooperation between public and private sectors
  - Utilizing various functions of wetlands and flood control basins such as water retention, purification, and flood control
  - Creating an ecosystem network utilizing flood control basins
  - Undertaking environmental improvements to create a region in harmony with nature, such as Kawamachi-zukuri (creation of lively, pleasant spaces that integrate "river space" and "town space")
  - Developing and maintaining road systems that consider Hokkaido's regional characteristics, such as landscape-friendly snow-break forests in collaboration with local communities
- Conservation of biodiversity
  - Promoting public-private partnerships to achieve the 30by30 target[47] based on the Nature Positive approach (30by30 Alliance)
  - Controlling designated invasive alien species
  - Promoting nature-friendly river improvements, nature restoration projects, agricultural production, and forestry operations that consider the conservation of biodiversity
- Comprehensive measures against damage by wildlife
  - Improving damage prevention facilities such as protective fences and reinforcing

[46] Nature Positive: A concept to halt the declining trend of biodiversity and move toward recovery.

[47] 30by30 target: A target to effectively conserve at least 30% of the land and sea as healthy ecosystems by 2030 (20.5% of land area and 13.3% of sea area as of 2021).

capture operations
  - Using captured wildlife for gibier (wildlife meat)
- Environmental education to protect and nurture a rich environment for the future
  - Promoting environmental education such as “Children’s Waterside” in cooperation with local communities
- Stable supply of water resources
  - Recovering and maintaining a sound water cycle
  - Systematically developing water supply facilities

(2) Establishing a sound material-cycle society that maximizes efficient resource use

The generation of evermore waste is becoming a serious problem worldwide, and the global trend is shifting to a circular economy that encourages sustainable resource use. In Japan, the Plan for Global Warming Countermeasures (approved by the Cabinet on October 22, 2021) has been revised, with the promotion of the 3Rs (Reducing the amount of waste, Reusing and Recycling of recyclable resources) + Renewable (biomass conversion, using recycled materials, etc.) positioned as the plan’s basic concept. Hokkaido has a higher recycling rate for general waste than the rest of Japan, and most livestock manure, which accounts for half the industrial waste produced in Hokkaido, is recycled as compost and other uses; but the amount of waste generated in Hokkaido is also higher than the rest of Japan. Therefore, the following measures should be prioritized to establish a sound material-cycle society that maximizes efficient resource use.

Priority measures

- Development of waste management facilities
  - Developing waste management and recycling facilities to establish a sound material-cycle society
  - Effectively utilizing sewage resources and promoting the Breakthrough by Dynamic Approach in Sewage High Technology Project (B-DASH Project)
- Effective utilization of waste
  - Establishing circulation systems according to the type of circulating resources in rural areas and urban suburbs
  - Promoting cascade use/advanced use of biomass such as forest resources and livestock manure for maximum and multistage use as resources
  - Promoting and raising awareness of the effective use of soil from construction sites
  - Improving the quality of construction material recycling by recycling construction byproducts into high value-added recycled materials
- Greening of industries and lifestyles
  - Promoting research, development, and dissemination of new wood-based materials as a substitute for plastics

- Raising awareness about ethical consumption[48]

6. Revitalizing the Region neighboring the Northern Territories and the border areas

Measures will be developed in line with the following basic directions to revitalize the Region neighboring the Northern Territories and the border areas.

Basic directions to achieve the primary measures:

(1) Stabilizing and revitalizing the Region neighboring the Northern Territories

(2) Revitalizing the border areas

(1) Stabilizing and revitalizing the Region neighboring the Northern Territories

An inherent territory of Japan, the Northern Territories have remained under illegal occupation by the Soviet Union and now by Russia for more than 78 years since the end of World War II. The Region neighboring the Northern Territories was formerly established as a socioeconomic zone integrated with the Northern Territories both administratively and economically. Since the end of World War II, however, the region has been placed under special circumstances, with the development of prosperous local communities prevented by the unresolved Northern Territories issue. The region is also important for the many former residents of the Northern Territories who live there, and it serves as a campaign base for the return of the Northern Territories. The national and regional governments have been implementing relevant measures based on the Act on Special Measures Concerning Advancement of the Resolution of the Northern Territories Issue (Act No. 85 of 1982). However, the situation of the local economy remains precarious, with the stagnation of local industries due to a declining and aging population and decreasing fish catches and visitors. Therefore, the following measures should be prioritized to stabilize and revitalize the Region neighboring the Northern Territories.

Priority measures

- Promotion of comprehensive measures to revitalize the Region neighboring the Northern Territories and stabilize the residents' lives in the region
  - Developing a vibrant regional economy through the promotion of agriculture, forestry, fisheries, and other key industries
  - Expanding the population participating in exchanges and the population with strong ties to the areas by utilizing local resources through the promotion of experiential and long-stay tourism
  - Forming local communities where people feel comfortable and secure by ensuring sustainable local medical care
  - Establishing the foundation for stable socioeconomic development by improving transportation infrastructure, and enhancing and strengthening disaster prevention and

[48] Ethical consumption: Consumption behavior that considers people, society, region, and the environment, including local revitalization and employment.

mitigation measures
  - Realizing a society in harmony with the rich nature of the region through decarbonization and other initiatives
- Improvement of circumstances for realizing an early return of the Northern Territories
  - Creating the circumstances necessary to resolve the Northern Territories issue by enhancing public awareness activities and fostering successors to the campaign for their return

(2) Revitalizing the border areas

Hokkaido, as a northern border region with a long coastline, plays an important role in defending the territorial integrity of Japan. In an increasingly tense international situation with security issues surrounding Japan becoming more serious, it is necessary to develop infrastructure to support the region's socioeconomic activities from the perspective of national economic security.

With regard to the border areas that include remote islands and the northern Hokkaido region, it is necessary to promote agriculture, forestry, fisheries, tourism, and other industries, and to encourage people to settle in these areas by improving the living conditions based on the remote island development plan and other initiatives. It should be noted that the population of the remote islands is rapidly dwindling compared with mainland Hokkaido, and even though marine and air transportation between the mainland and remote islands supports the residents' daily needs, such as shopping and hospital visits, transportation operators are facing severe business conditions due to the decreasing number of passengers. In contrast, the northern Hokkaido region has high potential for renewable energy sources such as wind power, but the region's power grids have limited capacity and the renewable energy potential has yet to be utilized effectively. Therefore, the following measures should be prioritized to revitalize the border areas.

Priority measures

- Securement of stable access from the remote islands to the mainland
  - Maintaining shipping routes and air routes and improving the ports
- Creation of sustainable settlements in the border areas
  - Improving and enhancing safe and secure settlement conditions
  - Strengthening wide-area transportation networks such as roads and ports
  - Forming vibrant local communities through the promotion of key industries
- Utilization of abundant renewable energy
  - Creating an energy supply base in the north utilizing renewable energy from a medium- to long-term perspective

7. Promoting the Ainu culture

Measures will be developed in line with the following basic directions to promote the Ainu culture.

Basic directions to achieve the primary measures:

Promoting the Ainu culture

Based on the Act on Promoting Measures to Achieve a Society in which the Pride of the Ainu People is Respected (Law No. 16, 2019), it is necessary to comprehensively and effectively promote measures that include regional, industrial, and tourism development, in addition to advancing the Ainu culture, disseminating knowledge and raising awareness about Ainu traditions. In particular, a network for the promotion and creation of Ainu culture, the promotion of public understanding, and the revival of Ainu culture should be established, using the National Ainu Museum and Park (Upopoy) opened in July 2020 as a hub.

Priority measures

- Comprehensive and effective implementation of Ainu policies
  - Promoting the Ainu culture, disseminating knowledge and raising awareness about Ainu traditions
  - Advancing efforts to create an environment that supports the Ainu culture for the Ainu people to live with pride as a people
- Revival and development of the Ainu culture using Upopoy as a hub
  - Supporting exhibitions and research on Ainu history and culture, transmission of Ainu culture and human resource development, experience exchanges, and information dissemination for these purposes
  - Enhancing content and strategic public relations activities in cooperation with neighboring tourist attractions
- Establishment of a network for the revival of Ainu culture
  - Encouraging cooperation between Upopoy and other regions where Ainu cultural transmission activities are thriving

§2. Primary measures related to the "Hokkaido model of regional structures creating Hokkaido's value: Maintaining and developing the production spaces and forming a resilient national land"

1. Maintaining and developing the production spaces by utilizing digital technologies

Measures will be developed in line with the following basic directions to maintain and develop the production spaces by utilizing digital technologies.

Basic directions to achieve the primary measures:

(1) Developing digital infrastructure suitable for the vast region of Hokkaido

(2) Forming a society where necessary services can be accessed through digital technologies

(1) Developing digital infrastructure suitable for the vast region of Hokkaido

Hokkaido is a widely dispersed society that lacks the digital infrastructure development

necessary for high-speed, large-capacity wireless communications such as 5G in rural and mountainous areas. If rural infrastructure development fails to progress more quickly in the near future, not only will the regional gap between urban and rural areas widen, but access to services essential to support residents' lives will suffer. Therefore, the following measures should be prioritized to develop digital infrastructure suitable for the vast region of Hokkaido.

Priority measures

- Developing 5G base stations necessary to maintain and create industries and provide human services
- Researching and developing next-generation information and communications infrastructure suitable for Hokkaido's vast landscape
- Opening up national and local government data to the public to contribute to improved human services and create new industries using digital technologies (Open data[49])
- Ensuring the education and training of digital talents in higher education institutions, government agencies, and companies

(2) Forming a society where necessary services can be accessed through digital technologies

To lead a prosperous life in Hokkaido's widely dispersed, low population rural areas, it is necessary for people to access medical, education, and other services essential for daily life, as well as cultural and artistic services that tend to be concentrated in urban areas. However, the number of facilities providing these services has been decreasing with the declining population and shortage of human resources. If facilities continue to decrease and the level of services deteriorates, the functions of the production spaces will become even more difficult to maintain. Therefore, the following measures should be prioritized to form a society where essential services can be enjoyed through digital technologies.

Priority measures

- Promoting logistics DX, including social implementation of drone logistics
- Promoting digitalization and cross-sectoral coordination among administration, healthcare, education, nursing care, etc. to provide high-quality services even in remote areas

2. Creating diverse and prosperous local communities

Measures will be developed in line with the following basic directions to create diverse and prosperous local communities.

[49] Open data: Public and private sector data held by national and local governments and companies, and available for secondary use, suitable for machine-reading, and released in a form that any citizen can easily use free of charge (for processing, editing, redistribution, etc.) via the internet. Under the Basic Act on the Advancement of Public and Private Sector Data Utilization (Act No. 103 of 2016), national and local governments are obligated to work on open data.

Basic directions to achieve the primary measures:

(1) Investing in people and co-creating with diverse talents and players

(2) Realizing diverse lifestyles and work styles

(3) Forming city centers that support people's lives in the production spaces and creating lively places

(1) Investing in people and co-creating with diverse talents and players

Hokkaido's population is declining faster than the rest of Japan, and there are growing concerns that it will become difficult to revitalize the local economies and maintain the vitality of local communities with only the current population. In this respect, it is important to realize vibrant local communities by creating opportunities for people to continue leading healthy and active lives throughout their lifetime, and by promoting and expanding the population with strong ties to the areas. Therefore, the following measures should be prioritized for investment in people and co-creating with diverse talents and players.

Priority measures

- Expanding the population with strong ties to the areas through digital technologies by creating opportunities for online exchanges and matching with regional needs
- Fostering the younger generation who can contribute to the community through "Hokkaido-gaku[50]"
- Encouraging the participation and collaboration of diverse talents and players beyond generations and nationalities in local activities through the establishment of public-private collaboration platforms
- Boosting the attractiveness and revitalization of the region through "Scenic Byway Hokkaido" and other initiatives
- Promoting initiatives for businesses to support local communities
- Creating start-ups through industry-academic-government-financial cooperation

(2) Realizing diverse lifestyles and work styles

The COVID-19 pandemic has led to a diversification of lifestyles and work styles, including the spread of remote work, and has increased the public's interest in dual habitation, migration to rural areas, and multiple jobs and side jobs. It is important to respond to these diverse needs and improve the well-being[51] of individuals and society as a whole. With the rapidly declining birth rate, an environment where people can have and raise children with peace of mind is also becoming more important. In this regard, Hokkaido's rich nature and abundant space can serve as a "promised land" to meet the needs of people hoping to move to a region where children are easier to raise. Therefore, the following measures should be prioritized to realize diverse lifestyles and work styles.

[50] Hokkaido-gaku: Initiatives to learn about a wide range of Hokkaido's attractiveness and uniqueness, including its geography, history, culture, and industry, in order to create opportunities for more people, from children to adults, to take an interest in regional development.

[51] Well-being is a concept that refers to being in good physical, mental, and social condition, with individual rights and self-realization guaranteed.

Priority measures

- Promoting remote work to enable diverse lifestyles and work styles, including migration without changing jobs
- Promoting initiatives for migration, dual habitation, U-turn (moving back to one's hometown), and I-turn (moving to another local city) to Hokkaido
- Efficiently utilizing regional resources such as wide-area joint use of public facilities and equipment
- Encouraging the use of vacant houses for dual habitation and for families with small children
- Utilizing public housing with an excellent child-rearing environment

(3) Forming city centers that support people's lives in the production spaces and creating lively places

Cities and towns in rural areas play an important role in maintaining human service functions, while central cities in the basic regions play a role in maintaining high-level urban and human service functions. For residents to continue living in the production spaces that generate Hokkaido's strengths in food, tourism, and decarbonization, it is necessary for the central cities in the basic regions and the cities and towns in rural areas to fulfill their functions, support people's lives and activities in the production spaces, and create sustainable regions that make the most of regional characteristics. In particular, Hakodate, Asahikawa, Kushiro, Obihiro, Kitami, and other central cities in the basic regions are expected to follow Sapporo and play a role in leading other parts of Hokkaido.

The centers of many of these central cities have been hollowing out in recent years, and there are concerns that the vitality of these areas will further erode in the future due to the declining population. Therefore, the following measures should be prioritized to form city centers that support people's lives in the production spaces and create lively places.

Priority measures

- Developing urban infrastructure to enable the central cities in the basic regions to fulfill high-level urban and human service functions
- Concentrating and upgrading urban and human service functions such as medical care, welfare, and commerce in city centers
- Creating lively places by utilizing open spaces such as roads, rivers, and port spaces, as well as existing facilities such as "roadside stations"
- Concentrating and creating bases to provide human service functions at "roadside stations" and other facilities in rural areas

3. Creating passenger and freight transportation networks that support the Hokkaido model of regional structures with global perspectives

Measures will be developed in line with the following basic directions to create passenger and

freight transportation networks that support the Hokkaido model of regional structures with global perspectives.

Basic directions to achieve the primary measures:

(1) Creating transportation networks that support a widely dispersed society
(2) Developing logistics infrastructure to support industry while maintaining logistics systems and improving their efficiency
(3) Ensuring a safe and secure transportation environment
(4) Strengthening urban and transportation hub functions in Sapporo

(1) Creating transportation networks that support a widely dispersed society

Hokkaido's widely dispersed society makes the formation of transportation networks essential to support people's lives in the production spaces that create Hokkaido's value. The long distances between cities and the cold and snowy winter environment make transportation in Hokkaido challenging in terms of reliability, speed, and timeliness. Without transportation networks from the production spaces to cities, it will be difficult for people to continue living there without access to high-level urban and human service functions. Therefore, the following measures should be prioritized to create transportation networks that support a widely dispersed society.

Priority measures

- Developing transportation networks such as high-standard highways to connect cities and rural areas, including filling in the missing links, port and airport facilities, and the Hokkaido Shinkansen
- Establishing a sustainable transportation system by strengthening transportation hub functions, including between transportation modes, connecting cities, and ensuring multiple modes of transportation and routes from the production spaces to cities
- Promoting the integrated development of high-standard highways and transportation hub functions in rural areas, and introducing and maintaining passenger and freight transportation systems suited to local conditions

(2) Developing logistics infrastructure to support industry while maintaining logistics systems and improving their efficiency

With regard to logistics in Hokkaido, challenging issues encompass quality and freshness control of cargo, including agricultural and fishery products transported over long distances and periods of time, and one-way load transportation necessitated by seasonal fluctuations in cargo volume from rural areas. In addition, continued decline in transportation capacity in the future due to the shortage of transportation operators and drivers will make it more difficult to secure regional logistics and food supplies from the production spaces. Thus, it is important to establish seamless and sustainable logistics networks. Furthermore, to realize seamless freight transportation throughout the country, it is important to strengthen links with networks in Honshu that transport agricultural and

fishery products from Hokkaido and carry back daily necessities to Hokkaido. In addition, it is also important to strengthen international logistics for feedstuff imports from overseas. Therefore, the following measures should be prioritized to develop and maintain the logistics infrastructure that support industry and improve their efficiency.

Priority measures

- Developing high-standard highways to support the transportation of agricultural and fishery products
- Developing airport and port facilities that serve as hubs for imports, exports, and transfers, and maintaining and enhancing intermodal transportation functions for ferries and roll-on/roll-off (RORO) vessels
- Securing access routes from high-standard highways to logistics bases, including airports, ports, and railroad stations
- Establishing sustainable supply chains that enable people to continue living in the production spaces by making the most of the logistics operators' resources, including the realization of combined passenger and cargo transportation, relay transportation, and cooperative joint distribution, and the development of logistics bases, including improved storage facilities and hub functions
- Establishing a variety of complementary transportation systems based on the characteristics of trucks, railroads, airplanes, and ships within Hokkaido and between Hokkaido and Honshu
- Building resilient transportation systems by securing multiple routes in preparation for disasters

(3) Ensuring a safe and secure transportation environment

Ensuring daily life mobility in the widely dispersed rural areas of Hokkaido is essential for creating the conditions for people to continue living in the production spaces and for smooth movement for tourism and other purposes. On the other hand, local public transportation has faced difficulties in maintaining and securing services under a severe business environment due to shrinking transportation demand and driver shortages caused by a declining population. If areas without local public transportation services expand in the future, securing mobility[52] for children, the elderly, and other vulnerable members of society will become an urgent issue. Therefore, the following measures should be prioritized to ensure a safe and secure transportation environment.

Priority measures

- Building sustainable transportation services that make the most of transportation resources
- Promoting mobility for all generations to improve the quality of life and movement
- Researching and developing automated driving technologies in snowy and cold

[52] Mobility refers to the movement of people and goods and the means and methods of movement.

environments, and utilizing road spaces for automated driving
- Implementing MaaS to maintain and revitalize public transportation
- Establishing safe and secure transportation systems that links various transportation modes and are integrated with town planning

(4) Strengthening urban and transportation hub functions in Sapporo

The Sapporo metropolitan area can be viewed as a "dam" that controls the outflow of people from Hokkaido, and at the same time has central administrative and economic functions and high-level urban functions that take in the entire Hokkaido region. These functions are indispensable to the prefecture's development. To develop global industries in Hokkaido, it is important for Sapporo, as the center of Hokkaido, to attract people, goods, and information from both inside and outside Japan, to develop urban functions suitable for an international center of activities, and to distribute the benefits of providing these functions to other parts of Hokkaido. Furthermore, in view of extending the Hokkaido Shinkansen to Sapporo, it is necessary to strengthen the transportation hub functions around Sapporo Station and the Sosei East district, as well as the access between high-standard highways connecting various parts of Hokkaido and central Sapporo, and to enhance the high-level urban functions. Therefore, the following measures should be prioritized to strengthen the urban functions in Sapporo.

Priority measures

- Enhancing the wide-area transportation hub functions and other transportation services through the construction of the Sapporo Station Bus Terminal directly connected to the Shinkansen station and Soseigawa-dori (city center access road)
- Promoting efforts to realize a zero-carbon city[53] and smart city,[54] and developing transportation and urban infrastructure incorporating disaster prevention, disaster resilience, and snow control measures
- Creating a sustainable city using new technologies such as ICT
- Developing urban infrastructure for high-level urban functions, including culture, education, and specialized medical care

4. Building a resilient national land that protects the production spaces and allows people to continue to live safely and securely

Measures will be developed in line with the following basic directions to build a resilient national land that protects the production spaces and allows people to continue to live safely and securely.

[53] Zero carbon city: A local government that has declared its goal of achieving net-zero by 2050, either under the name of the local government head or the local government itself.

[54] Smart city: A sustainable city or region that seeks to solve various urban and regional problems, and continues to create new value through advanced management (planning, development, management and operation), the use of new technologies such as ICT, and is a leading place for the realization of Society 5.0.

Basic directions to achieve the primary measures:

(1) Promoting watershed flood control based on Hokkaido's regional characteristics in response to water-related disasters intensifying with climate change

(2) Strengthening the resilience of production and social infrastructure against large-scale disasters such as a trench-type earthquake in the Japan Trench or Chishima Trench areas

(3) Strengthening disaster prevention capabilities against winter disasters and complex disasters

(4) Promoting infrastructure maintenance and technological development using digital technologies

(5) Strengthening disaster resistance and redundancy and decentralizing facilities to ensure the functions of lifelines in the event of a disaster

(6) Diversifying risk in the event of a national-scale disaster

(1) Promoting watershed flood control based on Hokkaido's regional characteristics in response to water-related disasters intensifying with climate change

In recent years, heavy rains and other water-related disasters have occurred in many parts of Japan, causing enormous damage to human lives and the economy. In particular, the impacts of climate change are expected to be greater in Hokkaido than other regions of Japan, and there are concerns about intensifying and frequent flooding and landslides, as well as frequent, prolonged, and severe droughts. In preparation for the increased risk of water-related disasters due to climate change, the following measures should be prioritized to promote watershed flood control in collaboration with all stakeholders living in river basin areas.

In promoting watershed flood control, attention should be paid to the active conservation or restoration of ecosystem functions that contribute to disaster risk reduction, for example, by incorporating the concept of green infrastructure based on Hokkaido's regional characteristics.

Priority measures

- Reviewing flood control plans in light of climate change
- Maintaining levees, flood control basins, and dams on rivers
- Improving coastal protection facilities, port facilities, erosion control facilities, forest conservation facilities, and rainwater storage and infiltration facilities
- Preparing disaster prevention measures against floods, landslides, and storm surges by integrating tangible and intangible measures, including measures for housing

(2) Strengthening the resilience of production and social infrastructure against large-scale disasters such as a trench-type earthquake in the Japan Trench or Chishima Trench areas

A massive earthquake in the areas of the Japan Trench or Chishima Trench is considered imminent, and such an earthquake would cause extensive damage in Hokkaido, which makes preparing for a massive earthquake and tsunami an urgent necessity. Hokkaido is also home to several active volcanoes that erupt at regular intervals, and a major eruption would risk loss of life and

property as well as extensive damage to local economic activities. Therefore, the following measures should be prioritized to strengthen the resilience of production and social infrastructure against large-scale disasters such as a trench-type earthquake in the Japan Trench or Chishima Trench areas.

Priority measures

- Developing and enhancing disaster resistance of various infrastructure facilities in preparation for large-scale disasters such as earthquakes, tsunamis, and volcanic eruptions
- Strengthening wide-area transportation networks such as roads and ports
- Supporting tsunami evacuation measures by local governments designated as "Areas to Be Especially Strengthened for Evacuation from Tsunamis"
- Promoting pre-disaster recovery planning
- Cooperative clearing of roads, ports, fishing ports, shipping routes, and airports
- Enhancing and strengthening disaster preparedness through disaster management education and disaster reduction drills in cooperation with related organizations
- Offering technical assistance by TEC-FORCE[55] and others

(3) Strengthening disaster prevention capabilities against winter disasters and complex disasters

In recent years, winter disasters such as snowstorms and heavy snowfalls have become more frequent and intensified. Hokkaido's widely dispersed regional structure and low road network density raise concerns about major social impacts such as passenger and freight transportation disruptions due to road closures and other factors. In addition, when a large-scale disaster occurs in winter, low temperatures and snowfalls can make evacuation and emergency response/recovery activities difficult, which is a problem unique to snowy and cold regions. Therefore, the following measures should be prioritized to strengthen disaster prevention capabilities against winter disasters and complex disasters.

Priority measures

- Strengthening systematic and preventive traffic regulations and intensive snow removal, and disseminating information in cooperation with relevant organizations
- Promoting sustainable snow removal on arterial and residential roads
- Developing high-standard highways and reinforcing the major arterial road network to ensure redundancy in the event of a disaster
- Promoting measures against snow to ensure safety and security in winter
- Preparing evacuation measures that address the issues unique to snowy and cold regions

[55] TEC-FORCE: Technical Emergency Control FORCE of the Ministry of Land, Infrastructure, Transport and Tourism. This force provides smooth and prompt technical support to affected local governments in the event of a large-scale natural disaster by examining the disaster situation, preventing the spread of damage, and quickly recovering the affected area.

(4) Promoting infrastructure maintenance and technological development using digital technologies

Infrastructures intensively developed since Japan's high economic growth period are now deteriorating at an accelerated pace. In Hokkaido, in particular, infrastructure maintenance and management must consider severe weather conditions of snow and cold as well as soil conditions. However, the declining working-age population has led to fewer young people entering the construction industry, an aging workforce, and the shortage of future skilled workers, all of which will affect not only infrastructure maintenance and management but also emergency recovery activities in the event of a disaster. Therefore, the following measures should be prioritized to promote infrastructure maintenance and technological development using digital technologies.

Priority measures

- Converting full-scale to preventive infrastructure maintenance through the use of new technologies such as AI and IoT, wide-area and strategic infrastructure management, and developing and securing human resources and technical support
- Improving on-site productivity and safety by DX in such infrastructure fields as i-Snow[56] and SMART-Grass[57]
- Researching and developing technologies for heavy rainfall under climate change and snowy and cold environments

(5) Strengthening disaster resistance and redundancy and decentralizing facilities to ensure the functions of lifelines in the event of a disaster

Ensuring the functions of lifelines in the event of a disaster is extremely important for prompt and appropriate emergency disaster control measures, ensuring the livelihood of disaster victims, and continuing and resuming industrial activities. Therefore, the following measures should be prioritized to strengthen disaster resistance and redundancy and decentralize facilities to ensure the functions of lifelines in the event of a disaster.

Priority measures

- Strengthening the disaster resistance of lifeline facilities
- Ensuring redundancy and decentralization of lifelines

(6) Diversifying risk in the event of a national-scale disaster

As disasters become more frequent and intensified, stable supplies of food and energy to afflicted areas are required in the event of a national-scale disaster occurring throughout Japan, including Hokkaido. In addition, a large-scale disaster occurring in the Tokyo metropolitan area could

[56] i-Snow is the common name of the platform for initiatives to improve productivity and safety through labor saving measures at snow removal sites.

[57] SMART-Grass: Initiatives to automate weeding operations using ICT to improve the productivity of levee weeding.

have an enormous impact on the nation, with potential paralysis of the capital's many central functions. Therefore, the following measures should be prioritized to diversify risk in the event of a national-scale disaster.

Priority measures

- Strengthening the disaster resilience of infrastructure facilities to make food production infrastructure and supply chains more resilient
- Developing digital infrastructure and reinforcing power grids
- Promoting the transfer of corporate head office functions to Hokkaido
- Enhancing transportation networks and their disaster resilience for rapid delivery of relief goods and personnel from Hokkaido to afflicted areas

Addendum

The policies and measures in this Plan should be implemented in a flexible manner, according to changes in domestic and international circumstances.

In particular, in the event of a change in the situation surrounding the special circumstances of the Northern Territories, a new basic development policy for those regions should be formulated.