

Sendai City Earthquake Disaster Reconstruction Plan

Digest Version

The Sendai City Earthquake Disaster Reconstruction Plan identifies systematic measures that the municipal government and citizens should jointly implement in an organized manner for the earliest possible restoration and recovery from the Great East Japan Earthquake.

Interplay between Sendai City's Plans

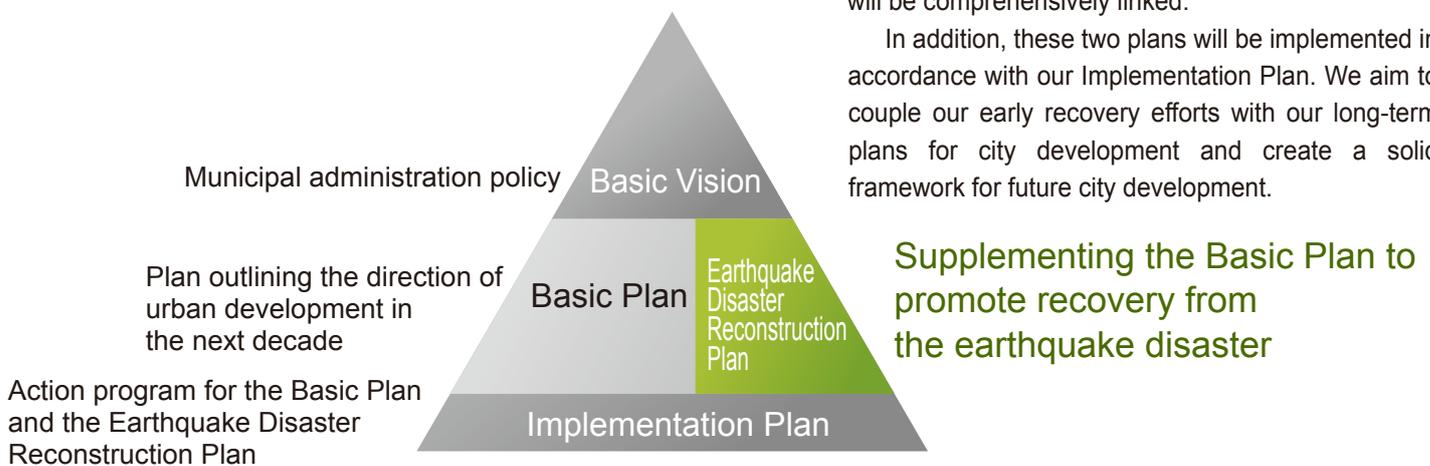
The Sendai Basic Plan lays the groundwork for implementing improvements within the city for the next 10 years. The plan reflects the values and ideas outlined in the Sendai City Basic Vision, which sets goals and envisions and provides potential solutions to problems that may arise over the next 50 years.

The Sendai City Basic Vision recognizes the importance of the power of individual citizens. The importance of individual citizens working together was shown clearly through the efforts of the people after the Great East Japan Earthquake. The importance of the individual in shaping the Sendai of the future will be invaluable in all of our recovery efforts.

The City of Sendai will do its best to overcome this disaster along with the people, and we will continue our efforts in order to actualize the city envisioned in the Sendai City Basic Vision.

It will be vital for us in our recovery and reconstruction efforts, namely the scope of said efforts, and the influence on the city, to implement measures that are inline with our long term goals and plans. In order to make sure that we are able to act accordingly, we have created a Disaster Reconstruction Plan which will complement our Basic Plan. The two plans will be comprehensively linked.

In addition, these two plans will be implemented in accordance with our Implementation Plan. We aim to couple our early recovery efforts with our long-term plans for city development and create a solid framework for future city development.



Basic Philosophy for Reconstruction

While the Great East Japan Earthquake has left us with many complex problems that have adversely influenced a wide area, at the same time our bonds, our willingness to help ourselves and to help others, in other words the “power of the people”, has been instrumental in overcoming all of our difficulties following the earthquake.

Our strong desire behind our reconstruction efforts can be clearly seen in the precious experiences of all one million of our citizens, and in the collective wisdom that supported us through our difficult times. “Moving forward as one” is a phrase that we keep in mind during this recovery process.

The Great East Japan Earthquake shook all of our Disaster Prevention methods and our City Energy methods and procedures to their cores. In recovering from this disaster we cannot just rely on methods that have been in place; flexibility and new ideas will be extremely importing in overcoming problems as they surface.

Based our need to implement flexible plans for a multiple defense system to reduce the risk of damage suffered at the hands of natural disasters, we have plans for new construction that would assist in the prevention of disasters and the implementation of energy plans. At the same time, we are aiming to become a city that is known for having next-level disaster prevention plans, and also one that is known as a city that cares about the environment. With the cooperation of the people of Sendai, we want to strongly move forward with our recovery efforts.

I Overview

1 Outline of the plan

(1) Objective of creating this plan: To define systematic measures that the municipal government and the citizens should jointly implement in an organized manner for the earliest possible restoration and recovery from the Great East Japan Earthquake

(2) Position of the plan:

Basic Vision (presenting the ideal vision of Sendai City)

Basic Plan (ten-year plan for the development of the vision)

Earthquake Disaster Reconstruction Plan

(3) Period of the plan:

Fiscal 2011-2015 (5 years)

Long-term issues to be addressed (psychological care for the victims, disaster-prevention education, etc.)

2 Review of the Great East Japan Earthquake — 3 For reconstruction

- (1) Complex damage and issues
- (2) Warnings about energy supply
- (3) Encouraging self-help, independence and ties, and cooperation
- (4) Starting reconstruction of the Tohoku region



II Reconstruction projects for the one million citizen's of Sendai

- 1 Tsunami reduction and housing reconstruction project to “protect lives from a tsunami”
- 2 Residential area rebuilding project to “build the foundation for safe homes”
- 3 Life recovery project to “support individual livelihoods”
- 4 Agricultural and food frontier project to “strongly revitalize agriculture”
- 5 Seaside exchange and revitalization project to “restore the beautiful coast”
- 6 Model development project for a disaster-proof Sendai to “learn from the past disasters for the future”
- 7 Energy-saving and new energy projects for a “sustainable energy supply”
- 8 Sendai economy development project to “improve urban vitality and the quality of life”
- 9 Exchange promotion project to “promote the features of the city and its reconstruction efforts”
- 10 Earthquake disaster memorial project to “convey the memory of the earthquake disaster to future generations”

III Revitalizing life and local communities

- 1 Supporting disaster victims in rebuilding their life
- 2 Revitalizing agriculture
- 3 Ensuring the safety of residential land and supporting its restoration
- 4 Supporting local businesses
- 5 Responding to the nuclear power plant accident

IV Urban development through reconstruction

- 1 Developing a disaster-resistant city that protects its citizens' lives and livelihoods
- 2 Developing a city powered by energy-saving/new energy
- 3 Developing a city of independence and cooperation where its citizens support each other
- 4 Developing a city of exchange and vitality to drive the restoration of the Tohoku region

V Implementing the Reconstruction Plan

- (1) Implementing the plan in a creative and flexible manner based on ties and cooperation
- (2) Roles that each entity should play
- (3) Ensuring consistency with sustainable fiscal administration
- (4) Using the special reconstruction zone system
- (5) Systematic implementation based on the implementation plan

Reconstruction Projects for the One Million Citizen's of Sendai

1 Tsunami reduction and housing reconstruction project to "protect lives from a tsunami"

In order to rebuild the eastern part of Sendai which was severely damaged by the tsunami, we will implement several preventative measures to reduce potential damage caused by future tsunami. These measures include, raising the height of the Shiogama-Watari Line prefectural road, and other roads by using properly treated rubble and other materials which will act as a breakwater, and utilizing coastal disaster-prevention forests.

For areas that are at high risk for tsunami, we will take measures to secure safe houses, primarily by promoting relocation to the safer western part of Sendai.

Specific initiatives

- Reducing tsunami damage by raising the height of prefectural roads
 - We will raise the height of the Shiogama-Watari line prefectural road and other roads, these heightened roads will act as a breakwater. We will also reinforce sea and river embankments. In order to reduce the damage resulting from a tsunami, we will actively restore our disaster prevention forests that are unlikely to be washed away.
 - We will use properly treated rubble and deposit sand where possible in raising the height of prefectural roads and in building hills.
 - We will implement measures in and around Sendai Port to reduce damage caused by flooding and objects that have been washed away, without disrupting the daily functioning of the port, we will achieve this through cooperation with the prefectural government and other related organizations.

Conceptual image of tsunami-prevention facilities (cross-section view)



Conceptual image of disaster-prevention facilities against a tsunami (plan view)



● Securing evacuation facilities

- We will secure multiple facilities, taking into consideration the needs of specific locations, for protecting the lives of citizens' from a tsunami. We will construct hills and buildings to be used as an evacuation sites, and developing roads that facilitate evacuation by car, and using the Sendai Tobu Road as an emergency evacuation site.

● Secure safe housing

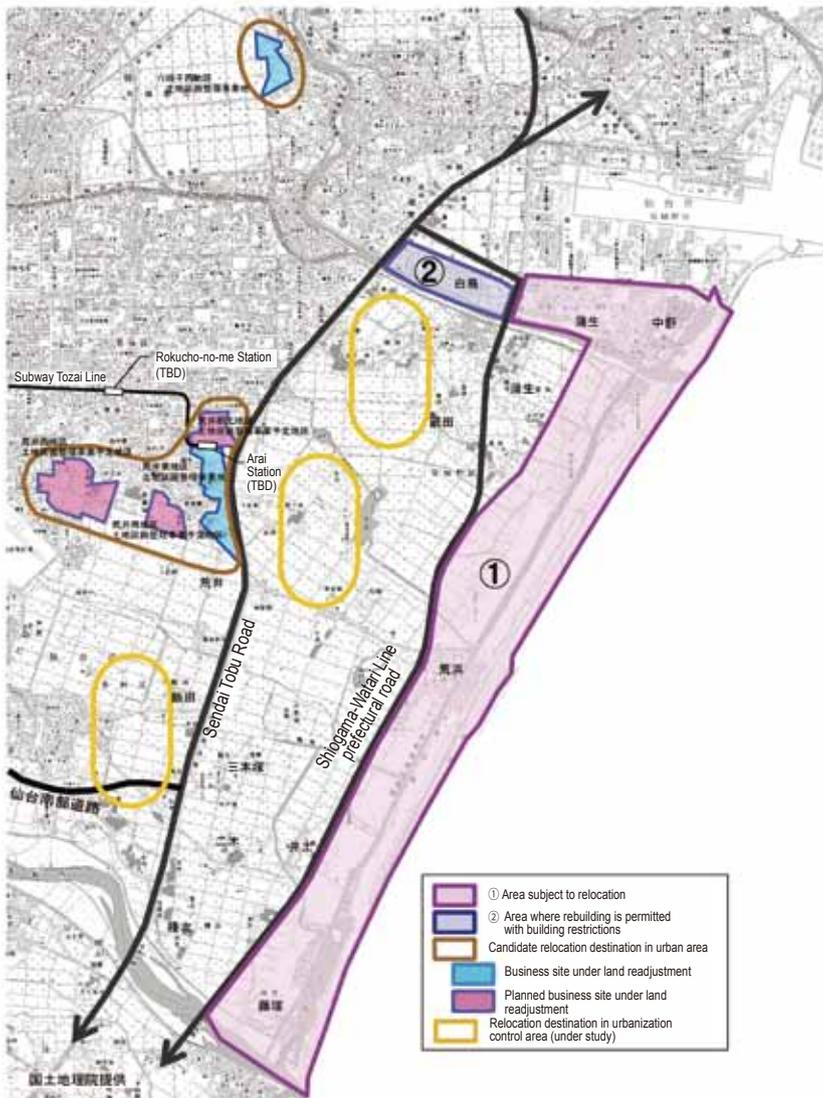
(Relationship between depth of flooding and danger to housing)

- According to academic research, the number of houses that are at risk for being washed away in a tsunami increases as the depth of the water exceeds two meters. A survey conducted by Sendai City following the recent earthquake disaster produced similar findings. In light of these findings, areas where water levels are expected to exceed two meters are considered as areas that are at high risk for tsunami damage.

(Areas subject to relocation)

- In areas at high risk of damage, where the expected depth of waters produced by a tsunami exceed two meters, even after the development of various disaster-prevention, the construction of new houses and new extensions to existing houses will be prohibited. In these areas, we will encourage relocation to the western part of Sendai.
- Current candidate areas for relocation are business sites under land readjustment in the Western Tago and eastern Arai areas, and already developed land near Sendai Tobu Road where safety has already been improved through the use of embankments. Any decisions regarding relocation will take into account the opinions of the residents who relocate.
- While using the central government's project for promoting collective relocation, in principle, the City will strive to reduce the burden of relocation with Sendai's unique support system.
- The City will cooperate with residents in developing the relocation destinations by taking account of residents' opinions, for example, on the direction of urban development.

Securing safe housing



Area where building restrictions are imposed:

- In areas where the expected depth of flooding produced by a tsunami exceeds two meters, but the risk for wash-away and other damage is small, construction of new homes and the extension of existing houses will not be prohibited. However, some restrictions will be implemented to improve safety.
- The city will consider evacuation facilities and establish a unique support system promoting relocation to safer areas, and also improving the ability of existing locations to withstand disasters.

Area where the expected depth of inundation is less than two meters

- Restrictions on buildings will not be imposed due to the low probability of wash-away and other damage, although inundation by a tsunami is expected.
- The city will consider evacuation facilities and establish a unique support system promoting relocation to safer areas, and also improving the ability of existing locations to withstand disasters.
- Future urban development will be promoted with special consideration paid to improving disaster-prevention measures and maintaining local communities.

Building public reconstruction housing

- Secure permanent houses for the disaster victims as early as possible by building public reconstruction housing, to be available by fiscal year 2013.

Land use in the eastern part of Sendai

- **Port area special reconstruction zone**

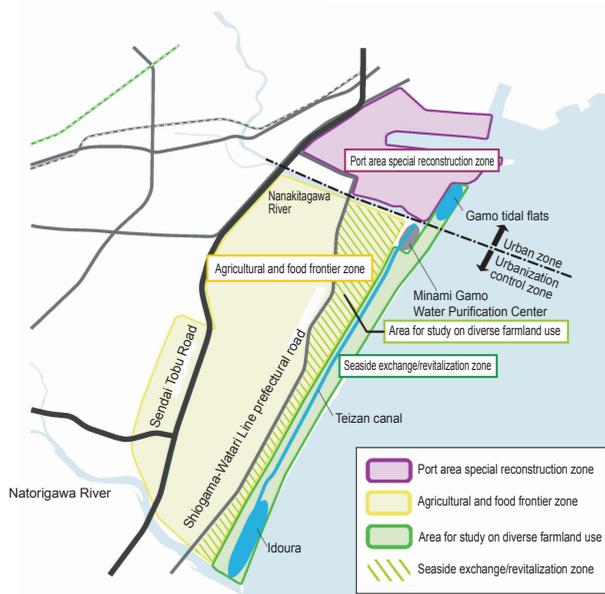
- The implementation of a special reconstruction zone system will assist in the reconstruction efforts of disaster-affected companies in the port area and will also aid in attracting new growth industries.

- **Agricultural and food frontier zone**

- This area will encourage farmers to review the way they manage farms, (consolidation and advanced use of farmland, incorporation), converting to competitive crops, and enter into the sixth industry.
 - We will implement an agricultural and food frontier project with the aim of “strongly revitalizing agriculture”
 - In areas to the east of the Shiogama-Watari Line prefectural road, and other roads that will be heightened, there are concerns that farmers will be less motivated to farm due to land subsidence and salt damage, in response to this diversification of farmland for rebuilding livelihoods will be studied, farmers intentions will also be taken into consideration.

- **Seaside exchange/revitalization zone**

- The revitalization of the Gamo tidal flats and Idoura, which are part of Sendai's precious natural environments, along with coastal parks which create beautiful landscapes, together with coastal disaster-prevention forests, will all come together to create an attractive zone which will allow citizens to experience coastal nature.



- We will implement a seaside exchange and revitalization to “restore the beautiful coast”.
 - We will take into consideration the development of hills and roads for evacuation, as well as potentially establishing memorial facilities that will convey the memory of the earthquake disaster to future generations.

- **Sites left after collective relocation**

- Urban infrastructure will be redeveloped north of the Nanakitagawa river after new uses for the land are considered as a part of the port area special reconstruction zone.
 - The area south of the Nanakitagawa river, which is part of the agricultural and food frontier zone and also part of the seaside exchange/revitalization zone, will be studied for potential new uses for this land, and the area will be reorganized with farmland comprehensively.

2 Residential area rebuilding project to “build a foundation for safe homes”

This project will promote the restoration of residential land in the hilly urban districts that suffered severe damage, including landslides and collapsed retaining walls, through post-disaster restoration projects. In cases where residential land is ineligible for national support, this project will establish a system where Sendai City provides support through subsidies for restoration costs in efforts to promote early rehabilitation.

Specific initiatives

Rebuilding residential land for safe living

- Promotion of restoration efforts through land restoration projects, while also reducing the burden on land owners in areas where residential land suffered from extensive landslides or collapses occurred at man-made hills and retaining walls. Collective relocation and other measures will be considered on a case by case basis.
- With regards to residential land ineligible for national support, we will establish a unique Sendai support system that will provide subsidies to land owners when they rehabilitate their land.
- **Residential land security for the future**
 - We will proactively provide information on residential land disasters to the national government. We will also collect information on the disaster history of residential land in Sendai and on man-made land structures with embankments. Based on local data and national trends, we will consider how information on residential land should be provided.

3 Life recovery project to “support individual livelihoods”

This project, through cooperation with related organizations, will provide comprehensive support to disaster victims to help them rebuild their lives, including establishing an economic base such as employment, and securing permanent residence.

The project will tailor its support to ensure individual victims’ mental and physical health so they can get their life back in order with a sense of security.

Specific initiatives

- **Diverse support for independence**
 - Secure employment by creating emergency employment and other means.
 - Support the securing of permanent residences by building public reconstruction housing.
 - Provide individuals with tailored support to rebuild their lives, through cooperation with related organizations.
- **Fine-tuned care to reassure everyone**
 - Provide health support tailored to individual situations.
 - Promote comprehensive local care systems in conjunction with new urban development in the eastern part of Sendai.
- **Enhancing information provision**
 - Conduct public relations by using the Sendai City Newsletter and website and through cooperation with related organizations.
 - Send out a periodic reconstruction newsletter.
 - Provide information through cooperation with a wide variety of entities.



Comprehensive support

Individuals’ efforts to rebuild their lives

Improve mental and physical health
(Psychological care/observation)

Establish an economic base
(Job creation/work support)

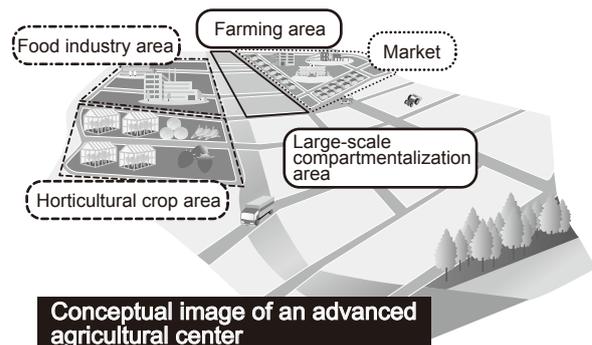
Secure housing
(Develop public reconstruction housing)

4 Agricultural and food frontier project to “strongly revitalize agriculture”

While accelerating initiatives to resume farming, such as agricultural facility restoration and salt removal, this project will encourage farmers to review their management (e.g., consolidation and advanced use of farmland, incorporation), convert to competitive crops, and enter into the sixth industry, with the aim of rebuilding the eastern part of Sendai as an agricultural and food frontier.

Specific initiatives

- **Building an agricultural and food frontier**
 - Build an agricultural and food frontier that allows leaders in agriculture to propose new ways of producing and consuming food with future prospects
- **Restoring and recovering farmland**
 - Promote the removal of rubble from farmland, restoration of irrigation drainage canals and drainage pumping stations, and salt removal from farmland.
- **Supporting farmers in enhancing their management base**
 - Enhance the production base (e.g., supporting the development of systems that nurture diverse leaders and produce a wide variety of farm products, and developing large-scale farmland) and support incorporation and tie-up with private capital.
- **Launching suburban agriculture**
 - Conduct studies on agriculture as a service industry (e.g., provision of technical guidance on vegetable gardens by farmers, pick-your-own farms), and provide support to farmers who enter such businesses.
- **Promoting the sixth industry**
 - Create added value to agriculture, and support farmers who enter the food processing, distribution and sales business to raise the level of agriculture.



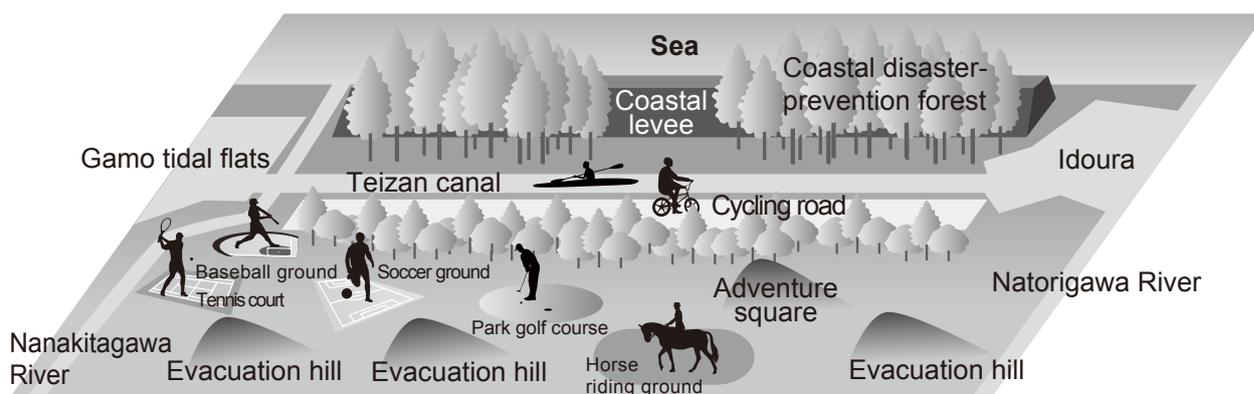
Conceptual image of an advanced agricultural center

5 Seaside exchange and revitalization project to “restore the beautiful coast”

This project will restore the beautiful coastal landscape by improving coastal disaster-prevention forests, which may also reduce tsunami damage. It will also work to restore Sendai’s east coast, including the Gamo tidal flats and Idoura, which are Sendai’s precious natural environment, as an attractive zone that allows citizens to come in contact with coastal nature, through cooperation with central and prefectural governments and other related organizations.

Specific initiatives

- Restore coastal disaster-prevention forests, Gamo tidal flats, etc.
- Re-develop sports/recreation facilities
- Secure the safety of citizens visiting the coast



6 Model development project for a disaster-proof Sendai to “learn from past disasters for the future”

As a city that experienced an unprecedented disaster, Sendai will develop a “Sendai model” for disaster prevention based on the lessons learned, and accumulate knowledge on disaster prevention through cooperation with intellectual resources in Sendai, the City of Education, to publicize the knowledge, both in Japan and abroad.

This project will review the operations and functions of evacuation centers by considering the issues faced in the event of a disaster, raise awareness about self-help and cooperation, develop local disaster-prevention leaders, and promote new disaster-prevention education at schools.

Specific initiatives

- **Reviewing the operations and functions of evacuation centers**
 - Consider the use of facilities other than municipal schools of Sendai, and develop operation manuals.
 - Enhance disaster-prevention functions (e.g., reviewing stockpiles, securing emergency power sources)
 - Promote cooperation between local communities, schools and the government even in time of peace.
- **Educating people on disaster prevention**
 - Encourage Sendai citizens to acquire knowledge about disaster prevention and spread awareness. Raise awareness to promote individual self-help initiatives.
 - Develop local disaster-prevention leaders.
 - Promote new disaster-prevention education at schools.
- **Developing ties beyond community borders**
 - Promote cooperation with diverse entities beyond community borders.
- **Accumulating and disseminating knowledge on disaster prevention**
 - Accumulate and disseminate research results on the earthquake disaster and knowledge on restoration and reconstruction, through cooperation with intellectual resources in Sendai, the City of Education.



7 Energy-saving and new energy projects for a “sustain energy supply”

An eco model town project will be launched, through cooperation with private capital, in areas where new urban development is planned, with the aim of developing a disaster-proof city that is highly energy-efficient and does not excessively depend on a specific type of energy.

This energy project will also develop a next-generation energy center by attracting large-scale solar power generation projects, etc., to secure diverse energy sources.

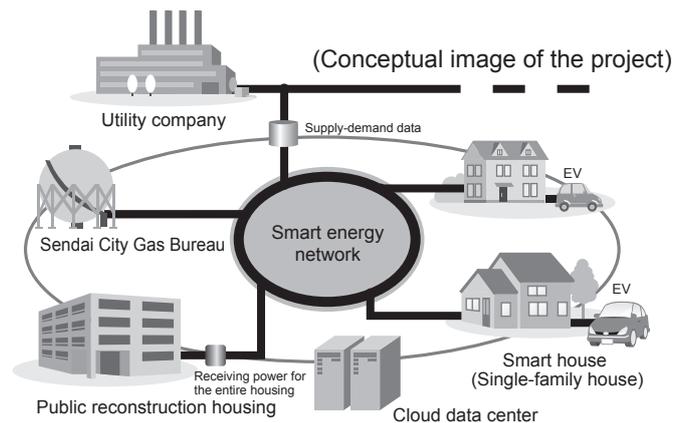
Specific initiatives

● Eco model town

- Optimize the energy portfolio to include renewable energy and natural gas.
- Promote model initiatives that strike a balance between high energy efficiency and economy.
- Promote the use of smart power meters and development of services using ICT.

● Developing next-generation energy R&D center

- Develop an R&D center by attracting large-scale solar power generation projects, etc., and supporting R&D on algal biomass.



8 Sendai economy development project to “improve urban vitality and the quality of life”

With the momentum of new demands and pioneering projects that are emerging in the reconstruction process, this project will expand dealings with local businesses and enhance their competitiveness. It will also attract businesses with the potential to generate employment.

Specific initiatives

● Reconstructing and further revitalizing the local economy

- Provide support to small- and medium-sized companies. Provide support to tourism and shopping districts to restore the lively atmosphere of Sendai.

● Creating new industries related to the earthquake disaster by using the special reconstruction zone system

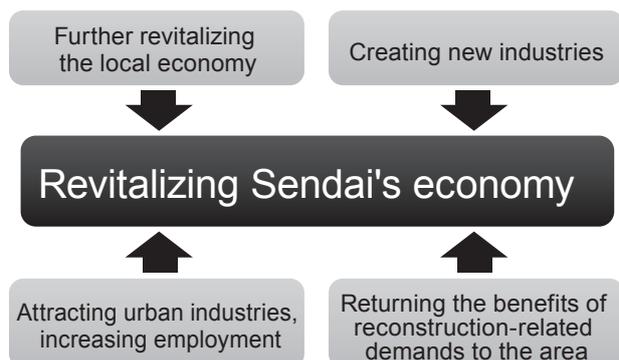
- Actively support reconstruction-related projects by various entities through effective use of the special reconstruction zone system, etc. to expand business opportunities for local businesses and enhance their competitiveness.
- Promote research and development on disaster prevention, environment, new energy, etc. to create and attract related industries.

● Attracting urban industries and increasing employment

- Increase employment by attracting urban industries, such as IT businesses and call centers. Develop human resources and provide career training to resolve job mismatches.

● Returning the benefits of reconstruction-related demands to the Sendai area

- Place orders for reconstruction-related projects with local businesses to facilitate the flow of money and increase employment within the Sendai area.



9 Exchange promotion project to “promote the features of the city and its reconstruction efforts”

This project will attract conventions and various international conferences to actively publicize the progress of reconstruction in Sendai and the Tohoku region, both domestically and internationally. It will also launch a large-scale tourism campaign to attract many visitors to the Tohoku region.

The project will also actively attract the private sector by offering as much support as possible, including deregulation and preferential treatment, to attract facilities that make Sendai more appealing.

Specific initiatives

- **Attracting international conferences and conventions, such as the United Nations World Conference on Disaster Reduction**
 - Attract various international conferences and conventions with the expectation of economic ripple effects on tourism and other local industries, and take these opportunities to publicize the progress of reconstruction in Sendai and the Tohoku region, both domestically and internationally.
- **Conducting a large-scale tourism campaign, etc.**
 - Conduct a large-scale tourism campaign to proactively disseminate accurate information to dispel uncertainties, and to allow many people to experience the attractiveness of Sendai and the Tohoku region.
- **Inviting facilities to make Sendai more attractive and vital**
 - Invite large-scale cultural facilities and convention facilities in conjunction with urban development along the Subway Tozai Line, etc.
 - Improve the environment for private investment by effectively using unused land, support measures using the special reconstruction zone system, etc.



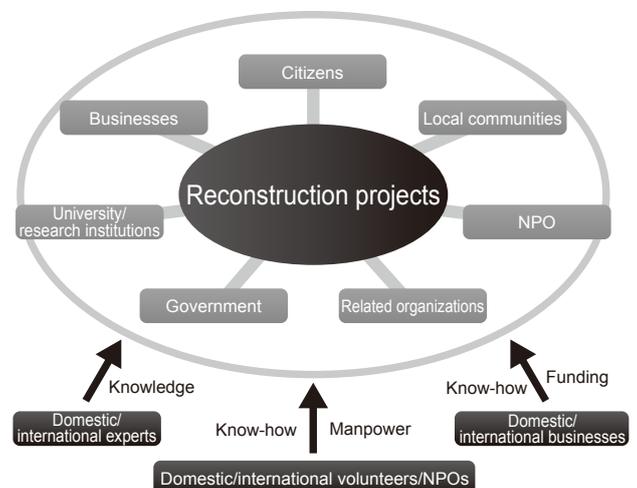
10 Earthquake disaster memorial project to “convey the memory of the earthquake disaster to future generations”

This project will develop memorial facilities that archive the threats of earthquake disasters and subsequent reconstruction efforts to pass them on to future generations.

This project will also develop a mechanism of widely publicizing the efforts to reconstruct Sendai and the Tohoku region through cooperation with citizens, as well as a mechanism for using the intellectual resources of Sendai, the City of Education, as well as private-sector expertise and funding, for reconstruction projects.

Specific initiatives

- **Accumulating and using records of the earthquake disaster**
 - Record the damage caused by the disaster and the restoration and reconstruction process, and store such records through cooperation with citizens and experts. Use various accumulated data widely.
- **Developing memorial facilities**
 - Develop a center to archive and disseminate the earthquake disaster and reconstruction efforts and pass them on to future generations.
 - Build monuments that will convey the memories of the earthquake disaster to future generations and in honor of the victims in the eastern part of Sendai.
- **Developing a symbol of reconstruction with ties and through cooperation**
 - Develop a mechanism for retaining the memory of the earthquake disaster and widely publicizing the efforts to reconstruct Sendai and the Tohoku region, and promote the redevelopment through cooperation with citizens.
 - Develop a mechanism for using the intellectual resources of Sendai, the City of Education, as well as knowledge, know-how and funding of domestic and international experts and businesses.



III

Revitalizing life and local communities

1 Supporting disaster victims in rebuilding their life

- (1) Establishing a healthy and safe life
- (2) Establishing economic independence
- (3) Securing permanent housing
- (4) Enhancing systems for supporting disaster victims in rebuilding their lives

2 Revitalizing agriculture

- (1) Restoring farmland
- (2) Study on highly productive agriculture
- (3) Supporting disaster-affected farmers to resume farming
- (4) Cooperating with universities and research institutions

3 Ensuring the safety of residential land and supporting its restoration

- (1) Preventing secondary damage
- (2) Supporting restoration efforts

4 Supporting local businesses

- (1) Providing financial support to local businesses
- (2) Providing support for re-starting business activities and starting new businesses
- (3) Providing support for expanding transactions and sales channels and developing technologies and human resources

5 Responding to the nuclear power plant accident

- (1) Voicing our concerns to the national government
- (2) Monitoring radiation levels and providing information
- (3) Preventing malicious rumors

IV

Urban development through reconstruction

1 Developing a disaster-resistant city that protects its citizens' lives and livelihoods

- (1) Comprehensive measures against a tsunami with multiple defense functions
- (2) Creating disaster-proof urban infrastructure
- (3) Enhancing the ability to respond to disasters
- (4) Enhancing extensive cooperation and being a center for support

2 Developing a city powered by energy-saving/new energy

- (1) Developing an eco model town
- (2) Implementing initiatives for reducing environmental impact
- (3) Promoting the use of public transportation
- (4) Promoting cooperation to promote energy-saving efforts

3 Developing a city of independence and cooperation where its citizens support each other

- (1) Promoting local mutual support activities
- (2) Developing leaders who support reconstruction efforts
- (3) Promoting new forms of civic cooperation

4 Developing a city of exchange and vitality to drive the restoration of the Tohoku region

- (1) Agricultural and food frontier
- (2) Attracting new energy-related industries
- (3) Developing a disaster-prevention industrial city
- (4) Supporting diverse local businesses, shopping streets, etc.

V

Implementing the Reconstruction Plan

- (1) Implementing the plan in a creative and flexible manner based on ties and cooperation
- (2) Clarifying roles that each entity should play
- (3) Ensuring consistency with a sustainable fiscal administration
- (4) Using the special reconstruction zone system
- (5) Systematic implementation based on the implementation plan

III

Revitalizing life and local communities

IV

Urban development through reconstruction

V

Implementing the Reconstruction Plan

Support the reconstruction from the earthquake disaster with Sendai, the City of Trees “Kizuna” Aid

One of our important missions is to pass on the lessons learned from the earthquake disaster to other municipalities and future generations. With tremendous support received from both Japan and abroad, Sendai City, together with its citizens, is moving ahead with the reconstruction, creating hope for the future.

The road ahead is long and difficult, and therefore we hope that as many people as possible will make a Sendai, the City of Trees “Kizuna” Aid to support the reconstruction from the earthquake disaster, to expand their kizuna, or ties, and to support one another beyond community boundaries.

We will effectively use your contribution and repay your generosity by achieving the early reconstruction of Sendai, the City of Trees and Lively People, where everyone can live a spiritually affluent life.

We will use contributions received for the earthquake disaster reconstruction project for the following purposes:

- (1) To help people who have been severely affected by the tsunami and earthquake live a safe life again
- (2) To support the raising of children affected by the disaster, to give them hope for the future
- (3) To support disaster-affected elderly and handicapped persons by making their lives more bearable
- (4) To revitalize disaster-affected small and medium-sized companies and to secure employment
- (5) To expand cultural, art, and exchange activities that provide the vitality for reconstruction
- (6) To facilitate revitalization projects, including an eco-model town that represents reconstruction of the Tohoku region and the agricultural and food frontier
- (7) To develop “a disaster-resistant, environmental city of a new level” that contributes to sustainable development of the Tohoku region.

* The status of donations will be disclosed and updated regularly on the Sendai City website. Information on how donations are being used will also be provided.

For details on how to make a donation, see the website <http://www.city.sendai.jp/language/english.html>

Finance Section, Finance Bureau Telephone: +81-22-214-8111 Fax: +81-22-262-6709 E-mail: zai003010@city.sendai.jp

Sendai City Earthquake Disaster Reconstruction Plan, Digest Version

December 2011

Post-Disaster Reconstruction Division, Post-Disaster Reconstruction Head Quarters, City of Sendai

3-7-1 Kokubuncho, Aoba-ku, Sendai, 980-8671

Telephone: +81-22-214-1266 Fax: +81-22-268-4311