




July 2018

Toyama City the Sustainable Development Goals Report — Compact City Planning based on Polycentric Transport Networks — 2018

TOYAMA
City

IGES
Institute for Global
Environmental Strategies



Toyama City Sustainable Development Goals Report
Compact City Planning based on Polycentric Transport Networks

Toyama City
Institute for Global Environmental Strategies

Toyama the Sustainable Development Goals Report 2018

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Compact City Planning based on Polycentric Transport Networks

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Institute for Global Environmental Strategies



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Opening Statement



Toyama City is located in the middle of Honshu Island on the Japan Sea side, boasting diverse terrain and grand natural scenery with an elevation range of approximately 4,000 m—all the way from the waters of Toyama Bay, which are 1,000 m deep and provide a treasure trove of seafood, to the Northern Alps Tateyama Mountain Range rising 3,000 m above sea level. Toyama City is historically renowned as a town of medicine and continues to develop as a core city on the Japan Sea coast with various industries, led by pharmaceuticals. It also functions as an advanced city, rich in culture and history.

The city has faced issues including a decreasing population, declining birth rate and a super-aging society, deterioration of public transport from excessive dependency on cars, and decreasing population density in urban areas. To tackle these issues and build a sustainable city, we have been promoting various measures with “compact city planning based on polycentric transport networks” as the basic policy.

Our efforts have resulted in Toyama being selected as an “Eco-Model City” and a “FutureCity” by the Japanese government, “District Energy in Cities Initiative” by the UN, and “100 Resilient Cities” by the Rockefeller Foundation. In June 2018, we were selected as a “SDGs FutureCity” to lead the promotion of SDGs by domestic municipalities. Toyama is highly appreciated as a city presenting a model for resolution of issues faced by cities in Japan and around the world, and there continues to be high expectations for our future.

We prepared the Toyama City Sustainable Development Goals Report 2018 in collaboration with the Institute for Global Environmental Strategies (IGES) to communicate to Japan and the world about our efforts to achieve the SDGs. The report forms the foundation for further deepening our “Compact City Planning based on Polycentric Transport Networks” platform for urban planning by linking the SDGs to efforts in areas including environment and energy, health and welfare, advancement of women, and promotion of industry, to accurately respond to changing times and social demands and become a sustainable added-value creation city.

We aim to disseminate SDGs throughout the report and to present an image of a desirable SDGs FutureCity with enhanced regional characteristics and appeal through the achievement of multiple goals and synergy effects created through collaboration amongst various stakeholders across multiple areas, rather than to merely achieve the individual targets listed in the SDGs.

We intend to continue our cooperation with IGES and contribute to the achievement of the SDGs in Toyama City as well as around the world.

July 2018

A handwritten signature in black ink, reading '森 雅史' (Mori Masashi).

Mayor of Toyama City, Masashi Mori

Opening Statement



It is an honor to be presented with the opportunity to publish the Toyama City Sustainable Development Goals Report 2018 prepared in collaboration with Toyama City at the High Level Political Forum on Sustainable Development (HLPF2018). Our cooperation has begun with the joint sponsorship of the G7 City Session held at Toyama City in 2015. Our relationship has flourished since then, mainly in the area of international cooperation on environment and resource exchange, while receiving significant moral and material support. These efforts have resulted in signing of an agreement on achieving sustainable society with harmony between environment and economy in emerging economies and building a carbon-free society on December 14, 2017.

Considering that one of the priority goals for HLPF2018 is "Goal 11. Sustainable Cities and Communities," we followed the VNR handbook by the UN to prepare the world's first SDGs report by a city with cooperation by related parties. Toyama City has been recognized in Japan as well as internationally for visionary projects such as OECD Green Growth in Cities, Eco-Model City, FutureCity, and SDGs FutureCity. In particular, SDGs are already being implemented through compact city planning in the city center as well as in mountainous areas.

I serve as the chair of the Central Environment Council, which presented the "Regional Circular Decarbonized and Ecological Sphere (Regional CES)" as the main concept for the Fifth Basic Environment Plan in April 2018. The next step for IGES as a change agent is to promote specific designs and achievements of the concept by Toyama City together with stakeholders and local research institutes and communicate the results to Asia and the world to contribute to the global achievement of SDGs.

July 2018

A handwritten signature in black ink, consisting of four characters: 武井 和彦 (Takeuchi Kazuhiko).

Institute for Global Environmental Strategies (IGES) President Kazuhiko Takeuchi

About this report

In September 2015, “Transforming our World: the 2030 Agenda for Sustainable Development” and the Sustainable Development Goals (SDGs) consisting of 17 goals and 169 targets were adopted at the United Nations Sustainable Development Summit in New York.


The SDGs are global goals that integrate social, economic and environmental issues, and aim to “leave no one behind” in realizing sustainable, diverse and inclusive societies. SDGs target not only developing countries, but require actions from all countries, including developed nations. Moreover, the SDGs place emphasis on global partnerships whereby all stakeholders, including governments, civil society, the private sector and UN organizations, utilize all available resources to engage in working towards achieving the goals.

At present, over half the world’s population lives in cities, and both the number of cities and urban populations are expected to continue to rise. While situations differ from city to city, most cities face an array of socio-economic problems such as unemployment, inequality, poor living environment and environmental problems such as air and water pollution. Meanwhile, it can be argued that with their economic power and diversity, cities are equipped with the potential to solve these problems. Actions by cities on sustainable development lead to solutions to global issues including climate change not only locally, but also to the achievement of international goals such as the SDGs.

City mayors and community leaders, together with relevant stakeholders play an important role in city planning that leads to safe, sound and high-quality lives for the people living and working in cities. Against urban issues such as poverty, violence, social inequality, environmental destruction, climate change and food issues, the SDGs provide cities with opportunities to ascertain linkages between these issues, and also serve as a framework to link differing policy areas in order for cities to discover and implement new mutually-complementary policies and measures. Further, the SDGs can connect diverse stakeholders in cities, serving as a common language among stakeholders such as local governments, citizens and companies working to find solutions to urban issues.

Although cities recognize the importance of engaging in the SDGs, they are still struggling to find ways to take SDGs into account in their local context, and to implement SDGs and carry out monitoring. Due to differing local characteristics, there is no one method or answer that fits all. Therefore, support for cities to learn from each other and apply the SDGs in their own contexts is essential for cities to advance SDG-related initiatives.

The Government of Japan established the SDGs Promotion Headquarters in May of 2016, chaired by the Prime Minister with the Chief Cabinet Secretary and Minister of Foreign Affairs as Vice-Chairs, in order to comprehensively and effectively promote measures related to the SDGs and close coordination among related government agencies. The Promotion Headquarters have drafted guidelines for implementation of the SDGs that incorporate eight priority issues and 140 measures in economic, social and environmental areas. Likewise, the Headquarters released the “SDGs Action Plan



2018” in December 2017 and its expanded version in June 2018, aimed at creating Japan’s model for SDG implementation based on further substantiation and expansion of major initiatives. Included as one of the three pillars of the SDGs model in this plan is unified government support for local governments that can serve as advanced models and expansion of these best practices in order to “realize regional revitalization and resilient, environmentally-friendly and outstanding city planning that promotes the SDGs and is suited to the needs and strengths of localities”. As one measure, in June 2018, the Government of Japan selected 29 municipalities to become “SDGs Future Cities”, and of these selected the leading initiatives of 10 cities to become SDG model projects.

This report, prepared with the Strategic Research Fund of the Institute for Global Environmental Strategies (IGES), will introduce activities of three Japanese local governments aiming to become sustainable cities, namely Shimokawa Town (Hokkaido), Toyama City (Toyama Prefecture), and Kitakyushu City (Fukuoka Prefecture). IGES has a close collaborative relationship with each of these three municipalities, which have worked to address issues faced in their respective locations based on partnerships with citizens from the perspectives of society, economy and environment. These three local governments are engaged in advanced initiatives related to the SDGs and were selected in June 2018 as the aforementioned “SDGs Future Cities” and as SDGs model projects for local governments. Within this framework, they intend to implement even more concrete initiatives going forward.

For the structure of this report, the authors referred to the “Handbook for the Preparation of Voluntary National Reviews: 2018 Edition”. The structure takes into consideration specific characteristics and the state of progress on initiatives in each city. In a manner of speaking, it is a voluntary local review on the progress of SDGs actions in each city.

By revealing the current state of SDG-related initiatives in each city, this report can serve as a communication tool for residents when engaging in future initiatives, and likewise can serve as a reference to those in other cities in Japan and around the world as they engage in addressing the SDGs.

July 2018

Institute for Global Environmental Strategies

Acknowledgements

This report was prepared through cooperation between Toyama City and the Institute for Global Environmental Strategies (IGES). Toyama City's SDGs report was developed for the purpose of introducing initiatives related to the SDGs by leading cities in Japan to a global audience. It is hoped that this report will serve as a driving force for cities to incorporate the SDGs into their measures.

A writing team comprised of IGES' City Taskforce Ryoko Nakano, Junichi Fujino and Yatsuka Kataoka prepared the report based on information provisioned and reviewed by the Toyama City Environment Policy Section among others. This report was made possible by referencing actions conducted by various stakeholders to realize Toyama as a sustainable city. We would like to express our sincere gratitude to all.

Highlights

Compact City Planning Based on Polycentric Transport Networks

Background

Toyama City is located in the middle of Honshu Island, surrounded by the Toyama Bay and the Northern Alps Tateyama Mountain Range, full of nature with abundant water and greenery. It has developed as a leading city on the coastlines of the Japan Sea, with rich culture and various industries including pharmaceuticals, biotechnology, robotics, and electronics.

In 2005, a merger of seven municipalities increased the urban area by five-fold to 1,242 km² but the population density decreased at the same time. The population (417,472 as of June 2018) is expected to decrease by approximately 20% by 2045. Lower population density in the city centre coupled with significant needs to finance maintenance and management costs of aging public facilities is one of the challenges faced by Toyama.

Toyama City has addressed various issues such as the social divide, stagnant regional economy and climate change, with aims of becoming a sustainable city. The city has been promoting “Compact City Planning based on Polycentric Transport Networks” since 2003.

In preparing the SDGs Report, we reassessed Toyama’s past efforts with the government bureau in charge. The report is a collaboration between Toyama City and the Institute for Global Environmental Strategies (IGES)



Status of SDGs in Toyama’s policies

Toyama City had promoted a number of initiatives that incorporate SDG concepts through the Japanese government’s “Eco-Model City” and “FutureCity” projects for regional revival, even before the United Nations’ 2030 Agenda for Sustainable Development (SDGs) was adopted. Toyama was selected for the “SDGs FutureCity” and “Municipal SDGs Model Project” by the Cabinet Office in June 2018. Toyama City will work on realizing its’ vision for 2030 to become a sustainable innovative city by promoting a compact city strategy, and incorporating the global goals into urban plans.

A number of measures taken by Toyama City relate to multiple SDGs, with many related to goals that deal with issues that we are currently facing, such as “a decreasing population and super-aging society,”

“underutilization of regional energy resources,” “falling industrial activities” and “decreasing community network.” On the other hand, there are few measures being taken regarding “Goal 14. Life Below Water,” and these are issues that we must consider.

Integrating economic social and environmental policies

Case study 1: Multiple benefits from sustainable transport – LRT network

Summary: Toyama City aims to develop a Light Rail Transit (LRT) network extending over approximately 25.3 km by connecting the Toyama Light Rail (opened in April 2006) with trams in the city, and sharing tracks with Centram loop (opened in December 2009) as well as Toyama 's railway Kamidaki Line that connects the city centre to the suburbs.

As more investment poured in from outside the city centre, the number of residents moving into the district exceeded those that moved out. The district sees a rise in the number of pupils attending the elementary school, and a reduction of CO₂ emission by 16 percent in 2016 (baseline 2005)

Case Study 2: Vertical integration of primary, secondary, and tertiary sectors - Egoma

Summary: In Yamada, a hilly and mountainous region in Toyama City, an attempt to revive regional industry by utilizing pharmaceutical technologies, which Toyama has historically been renowned for, is under way. Promotion and revitalization of the region and agriculture using “egoma,” a plant containing omega-3 fatty acids and expected to be effective against lifestyle diseases, aims to reduce abandoned farm land and maintain agricultural villages in the mountainous area. Vertical integration of primary, secondary, and tertiary sectors by Egoma also seeks to generate employment of local senior citizens and realize a healthy city known for longevity.

Leaving no one behind

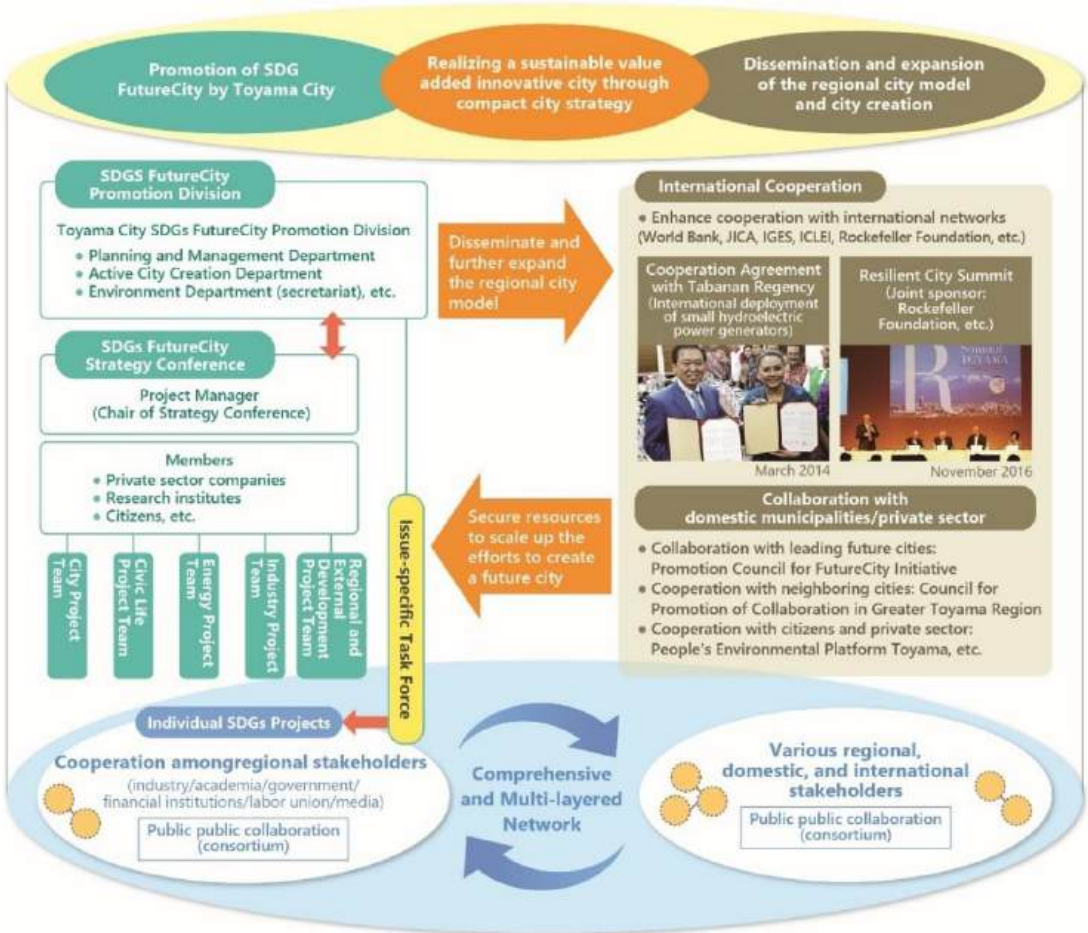
Case Study: Universal health for all - the Machinaka General Care Center

Summary: In Japan, a declining birth rate and aging population is accelerating at a pace unseen in other countries. Demand for medical and nursing care for the elderly will rise in 2025 while falling birth rates are likely to reduce population for the productive age and expand female population in the work force.

The multi-complex Sogawa Legato Square served not only as a sanctuary for giving birth, or rearing children but also as a location to which senior citizens could turn to when they were suffering from health issues. Machinaka General Care Center is part of that facility and provides pick-up and childcare service for a working couple when their child becomes sick, with full-time childcare staff and nurses. The service is gathering attention as first of its kind in Japan. Private sector facilities such as nursing school and sports are located nearby, creating a regional community function.

Framework for Implementation

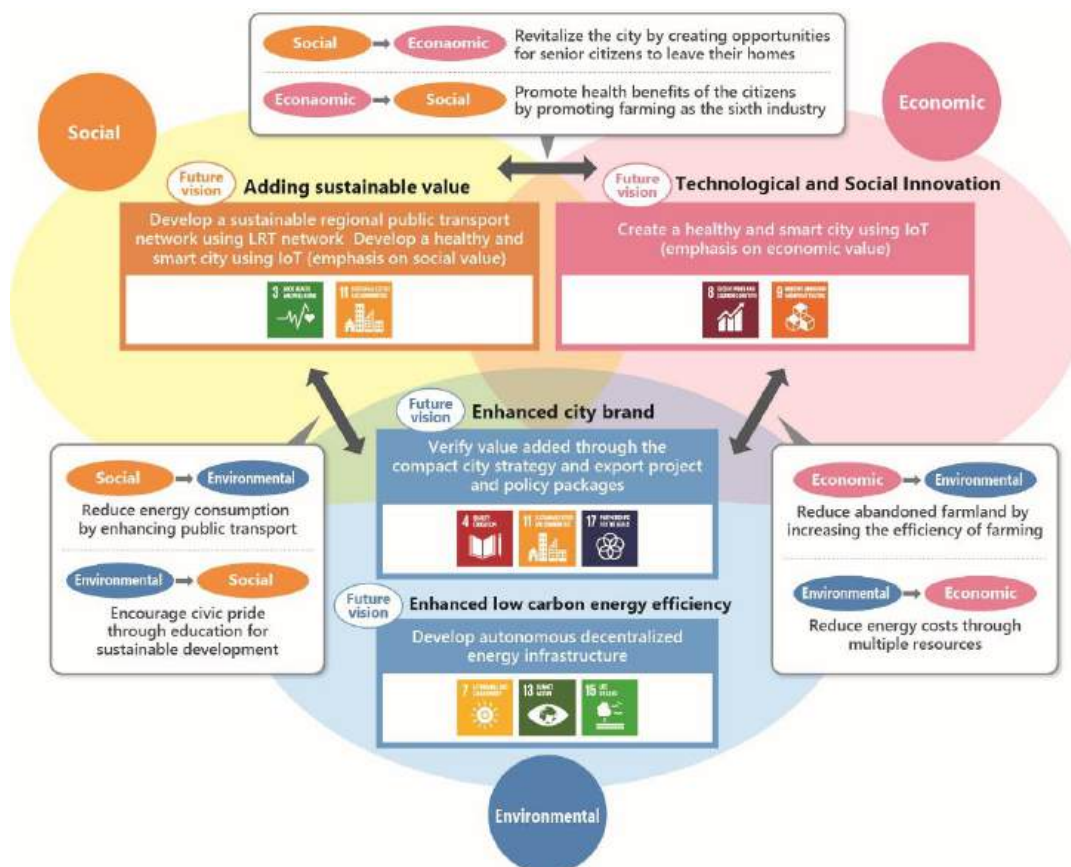
A Promotion Division for the "FutureCity" project, cooperation among industry, government and academia has been established in Toyama City. The city intends to strengthen this framework for the "SDGs FutureCity" initiative by establishing five working groups (city, civic life, energy, Industry, regional and external development) to expand and enhance organic cooperation between the issue-specific task force and various stakeholders in and outside the region.



Summary of Findings

- Toyama City will incorporate SDGs for designing policy measures under the strong leadership of the Mayor.
- The review confirmed policy making frequently used an integrated approach by balancing economic, social and environmental dimensions and by encouraging knowledge exchange among relevant parties.
- Many plans could be linked to SDG goals relevant to decreasing population and super-aging society; underutilization of regional energy resources; falling industrial activities; and decreasing community network. However, there is room for further improvement on "Goal 14. Life Below Water."

- When carrying out the Municipality SDGs model projects, Toyama City shall resolve regional issues, enhance the industry, and measure the progress of the relevant nine goals and targets with quantitative evidence.
- Toyama’s Municipality SDGs model project will serve as a foundation for a business model that envisions regional revitalization by 2020. They will be applicable to other regional cities which also aim to pursue sustainable development through international cooperation as well as collaboration with domestic municipalities.



Moving forward on the SDGs

Toyama City will continue to examine the interconnection between various issues in order to address them by integrating and incorporating multiple SDGs that complement one another.

Our next steps will be to strengthen our compact city strategy by revitalizing the LRT network and other public transportation networks, integrating them through autonomous decentralized energy infrastructure that utilizes local renewable energy sources. Our aim is to create technical and social innovation that will in turn promote additional sustainable values.

1. Introduction

1.1 Overview of Toyama City

1) Overview

Toyama City is located in the middle of Honshu Island along the Japan Sea. It is famous for its diverse terrain and natural scenery and an elevation range of approximately 4,000m—from the 1000 meter deep waters of Toyama Bay to the 3000 meter peaks of the Northern Alps Tateyama Mountain Range. Toyama City is historically renowned as the town of medicine and continues to be one of the most powerful cities located on the coastlines of the Japan Sea with pharmaceuticals leading various industries. It is also an advanced city, rich in culture and history.



Figure 1 Map of Toyama City

Toyama is placed on an alluvial fan with multiple rivers including the Joganji River and the Jinzu River running through the city. Many branches flowing from the upstream mountainous areas have been controlled through levee construction and check dams over many centuries. However, large typhoons and torrential downpours have increased in recent years, and there are concerns that these could increase damages to the city's assets.

About 70% of the city land is forested, and rich farm land is also available. The spectacular view of the Tateyama Mountain Range from the city center is a favorite among the locals. The 2015 opening of the Hokuriku Shinkansen that connects Toyama City to the Tokyo metropolitan area has promoted a rise in the number of tourists visiting the city.

2) Historical Context

During the Edo Era (1603-1868), the Toyama Clan had in its possession 100,000 koku of rice (15000 MTs), and encouraged industries such as medicine and Japanese paper production. Since the medieval period the city was the center for traditional Chinese and Japanese medicine that was distributed throughout Japan by medicine merchants using unique sales methods, and via transport and logistics networks including the Hida Kaido (road) and Kita-Mae-Bune shipping route.

The first hydroelectric power plant in northern Japan (the Hokuriku area) was built in Toyama, and abundant electricity provided the foundations for the development of heavy industries, aluminium and precision machinery. The urban area suffered devastating damage from air strikes in August 1945 but after WWII, the foundations for an industrial economy were developed allowing Toyama City to become a leading commercial and industrial city along the Japan Sea coast, with pharmaceuticals, biotechnology, robotics, electronic machinery and finance as key players. More recently, the opening of Hokuriku Shinkansen has significantly reduced the travel time from the Tokyo metropolitan area, and business innovation through development of unique new technologies and products is also taking place. The business environment, however, remains severe as competition against large suburban malls and online shopping prevail and difficulty in business succession to the

next generation persist. Toyama must create an attractive commercial environment to bring back prosperity.

The economy grew rapidly after WWII, and the Jinzu River basin experienced cadmium soil contamination which caused the outbreak of “itai-itai” disease, one of the four major pollution-triggered diseases in Japan. The land recovery project was concluded after 33 years with much collaboration between citizens and other stakeholders within and outside of the city.

3) Socio-Economic Profile

Like other regional cities a rapidly declining population and an aging society are some of Toyama’s key challenges for the future. If this happens with the current urban sprawl, it is likely to become more difficult to provide basic services including medical and commercial services which are supported by certain accumulation of population, sustainable and reasonable administration costs. Therefore, it is essential for the city to incorporate in its’ urban plans policy measures to create a safe, healthy and comfortable environment for senior citizens and the child-rearing generation, while also being financially and economically sustainable.

Under these circumstances, it is important for Toyama to focus on the SDGs and promote a “Compact Plus Network” by reviewing the city in its entirety including welfare and transport issues. In particular, medical, welfare and commercial facilities should be located close to the residential area, and public transport should provide access to these convenient facilities for residents including senior citizens.

Toyama City has been careful to cooperate with health, medical and welfare service providers and has paid extra attention to the regional agricultural and mountainous areas. The city aims to promote “compact city planning based on a polycentric transport network” utilizing existing resources in each regional district. More recently, the city has been actively encouraged relocation from the suburbs and from outside of Toyama City to the city center where the population decline has been significant, as well as to regional community hubs. Subsidies were granted to encourage use of public transport, and districts within walking distance from railway and LRT stations were renovated to become lively and engaging.

As an indicator to measure the progress in becoming a compact city, Toyama City Urban Master Plan aims to increase the ratio of residents living in areas with good access to public transport from 37% in 2017 to 42% by 2025.

A declining population and the aging of the population is expected for the whole of Toyama City, but it is particularly serious in the hilly and mountainous areas and villages. This is causing villages to disappear and farmland degradation. To achieve the SDGs, we aim to centralize various functions and services around regional community hubs and secure transport network for surrounding villages while preserving excellent nature, landscape, and farmland.

Decreasing Population and Super-aging Society

In Toyama City, the total population has been decreasing since its peak in 2010, and a 20.3% decrease is expected by 2045. As the number of children (0 to 14 years old) and the working age population (15 to 64 years old) decreases, senior population (65 years and above) will increase, with about 30% of the total population to comprise of senior citizens by 2030. Consequently, there are concerns over possible contraction of the economy caused by a decline in the working age population and a rise in social security expenses such as medical and nursing insurance expenses due to an aging population.

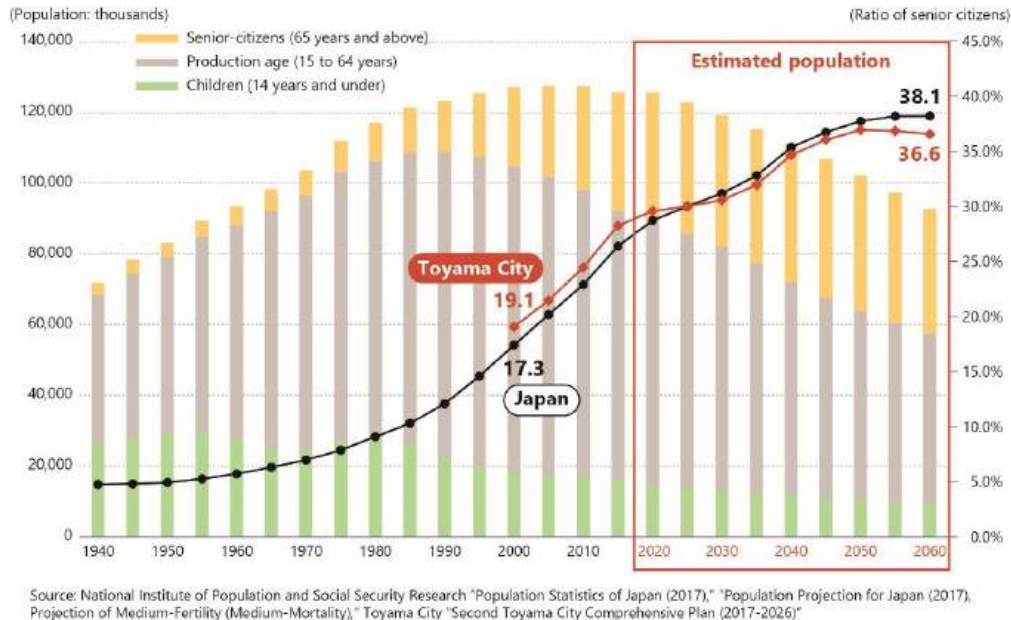


Figure 2 Changes in Toyama City's population (source: Toyama City)

Falling Population Density in Urban Area

The urban area of Toyama City quickly spread to the suburbs as the population and number of households increased, supported by the flat terrain surrounding the area, and affordable pricing in the suburban areas. The area of densely inhabited district (DID) has roughly doubled in the last 35 years, but the population density within DID is the lowest among prefectural capitals in Japan at 40.7 / ha (Figure 3).



Figure 3 Changes in Toyama City's densely inhabited district area and population density (source: Toyama City)

Rising Administrative Costs

Lower population density in the urban area is a major factor in rising administrative costs in terms of city management. Urban sprawl will require establishment of new infrastructure such as roads, water, sewage and parks, and increase the districts that need snow ploughing, road cleaning, and garbage collection. With concerns over falling tax revenue from shrinking working age population, administrative costs for city management per capita are expected to rise.



Dependency on Cars and Deterioration of Public Transport

Toyama Prefecture has the second highest car ownership per household in Japan. In contrast, public transport has deteriorated significantly, and the number of public transport users has been decreasing in the past two decades. Buses have seen a large decrease in the number of users.

Residents without Free Use of Cars

According to a survey by Toyama City targeting citizens aged 15 and over, about 30% of respondents stated that they did not have free use of cars. Of which, about 80% were women, and about 70% were senior citizens aged 60 or above. Those without free use of cars mainly rely on being driven in cars, or they use buses and bicycles. However, continued deterioration of bus services for their daily lives is making the city a very inconvenient place for them to live. With further aging of society, the ratio of people without free use of cars is expected to rise higher.

Measures towards Low-Carbon Society (Increase in CO₂ Emission)

In Toyama City, excessive dependency on cars and the structure of scattered city functions resulted in about 15.7% increase in CO₂ emissions between 1990 and 2005 across four divisions: industry, households, business/other, and transport. The growth in emissions is above the national average in three divisions (households, business/other, and transport), and requires significant reduction.

		Unit: thousand ton of CO ₂				
		1990		2005		Change
			Ratio		Ratio	
Energy origin CO ₂ emission by category	Energy conversion	76.8	1.9%	45.6	1.0%	-40.6%
	Industry	1670.9	42.1%	1534.1	34.8%	-8.2%
	Household	518.1	13.1%	801	18.2%	54.6%
	Business other	411.3	10.4%	619.1	14.0%	50.5%
	Transport	848.8	21.4%	1037.4	23.5%	22.2%
Non-energy origin CO ₂ (industrial process, waste)		272.3	6.9%	245.6	5.6%	-9.8%
CH ₄ , N ₂ O		90.6	2.3%	80.7	1.8%	-10.9%
3 fluorinated gas alternatives		76.8	1.9%	44.8	1.0%	-41.7%
Total		3965.6	100.0%	4408.3	100.0%	11.2%

Figure 4 Toyama's Greenhouse Gas Emissions (excluding those absorbed by forests) (source: Toyama City)

1.2 Compact City Planning by Toyama City

To address the issues stated in section (1) above, the Toyama City Urban Master Plan was established as the grand design for city planning in 2008.

The urban master plan states that the concept of city planning is “compact city planning based on polycentric transport networks by reviving public transport led by railways, and accumulating various city functions including housing, commerce, business and culture along them.” The city structure is described as “skewed dumplings”, with the regional centers as the dumplings and the public transport as the skewer.

This compact city concept serves as the backbone for Toyama’s urban planning and is reflected in the Comprehensive Plan (the highest-level plan for the City) and other related plans for welfare and the environment.



Figure 5 Compact city planning based on polycentric transport networks

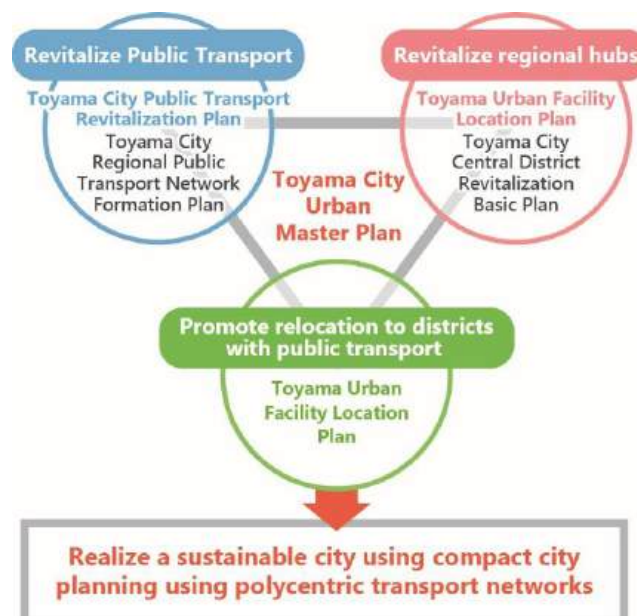


Figure 6 Relevant plans for the compact city strategy

(source: Toyama City)

1.3 Significance of Promoting SDGs in Toyama City

Compact city planning by Toyama City has been highly appreciated by the Japanese government, and the city was selected to participate in the national initiatives for leading cities, the Eco-Model City project in 2008 and FutureCity project in 2011. The aim of these projects were to realize “a city where everybody wishes to live” and “a city where everybody is active,” by addressing the common issues faced by humanity such as environment and aging.

The SDGs promote sustainable development by integrating three dimensions: economic, social and environmental. Toyama City’s “FutureCity” project used the same integrated approach as the SDGs allowing it to stay one step ahead other municipalities. Our efforts to achieve the SDGs through compact city planning have the potential to become a global role model. By deploying and spreading our success in Japan and overseas through cooperation and collaboration with various stakeholders, we can present an example of a Future City for the SDGs. Toyama City is a strong promoter of the SDGs.

2. Preparing the report

This report was prepared by collaboration between Toyama City and the Institute for Global Environmental Strategies (IGES) who has concluded a partnership agreement with Toyama City on supporting its path to develop a sustainable society.

Toyama city was selected in June 2018 as a participant to a national initiative by the name of “SDGs FutureCity” and “Municipal SDGs Model Projects” that seeks to promote regional revitalization. This report was based on background studies when drafting the Japanese government’s call for applications on the institutional framework used to promote such projects as well as the regional issues that prevail in Toyama. The report has been developed using the “Handbook for the Preparation of Voluntary National Reviews: 2018 Edition” as reference.

SDGs FutureCity and Municipal SDGs Model Project

- SDGs FutureCity program: Participants are select 29 cities and regions with the potential for achieving sustainable development by creating new values in economic, social and environmental dimensions. They aim to achieve this by promoting basic and general policies aligned with the SDGs concepts.
- Municipal SDGs Model Projects: 10 leading projects by participants in the SDGs FutureCity program above that are likely to achieve an autonomous cycle in the region through collaboration with various stakeholders.

3. Policy and Enabling Environment

3.1 Creating Ownership of the Sustainable Development Goals

In Toyama City, citizens have historically taken ownership to address various issues and problems.

Toyama established working groups comprising of representatives from the private sector, academic institutions, NGOs and municipal employees to determine the specifics of the city's resilience strategy (2017). The working groups discussed issues that had surfaced in Toyama City such as the aging society and gender, extracted the nature of the problem, and prepared strategies for each theme to improve our resilience.

In terms of global warming, the "Team Toyama City" Promotion Project was instrumental for engaging households, businesses and citizen groups. Teams were developed under the motto of "Changing Toyama. Changing the future" and have engaged in various activities: developing targets; holding public events; and facilitating knowledge exchange. In April 2016, the "Team Toyama City Forum" was held to commemorate the G7 Toyama Environment Ministers' Meeting. The "Team Toyama City Declaration", a statement by citizens, businesses and government, was drawn up to demonstrate their commitment for further collaboration and cooperation to prevent global warming.

As stated above, Toyama City has created a sense of ownership for each respective initiative by its citizens by building a framework that ensures participation by various stakeholders.

3.2 Incorporation of the Sustainable Development Goals in National and Local Policy Frameworks

Toyama City will aim to become a sustainable value added innovative city with the compact city strategy serving as the foundations to realize visions under the SDGs FutureCity programme which should extend our past efforts conducted through Eco-Model City and FutureCity programmes and ensure ever-increasing improvements in city development. This shall be achieved through the integration of economic, social and environmental values (Figure 7).

Toyama City Municipality SDGs Model Project seeks to build a business model for local revitalization by 2030. We will deepen collaboration with various stakeholders and start an autonomous positive cycle for compact city strategy, which in turn should lead to the realization of a sustainable and innovative city with added-values.

Toyama City's measures for revitalizing public transportation reflect the key concept of compact city strategy, with the central theme of creating a sustainable regional public transport network including the LRT network. This could be a leading model for regional cities facing a super-aging population. In addition to reducing the dependency on private cars and promoting low-carbon cities, it will present a wide range of means for mobility and generate multiple benefits such as creating opportunities for seniors and other citizens to go out; revitalizing the city center; and promoting health by walking.

Our aim is to present a city system with low environmental load and high energy efficiency, maximizing the use of regional energy sources including renewable energy. Demand for energy from public transport such as LRT and public facilities in Toyama City will be addressed by building an autonomous and decentralized energy infrastructure network, and we will also enhance our resilience against natural disasters.

The Municipality SDGs Model Project is an effort to provide immediate response to energy supply/demand for the city, improve our resilience, and deepen and enhance the compact city scheme by adding smart wellness city factors through the combination of autonomous and diverse energy management. We will also enhance Toyama City's visionary commitment to build a compact city, a low-carbon and carbon-free society, by developing a public transport network such as LRT.

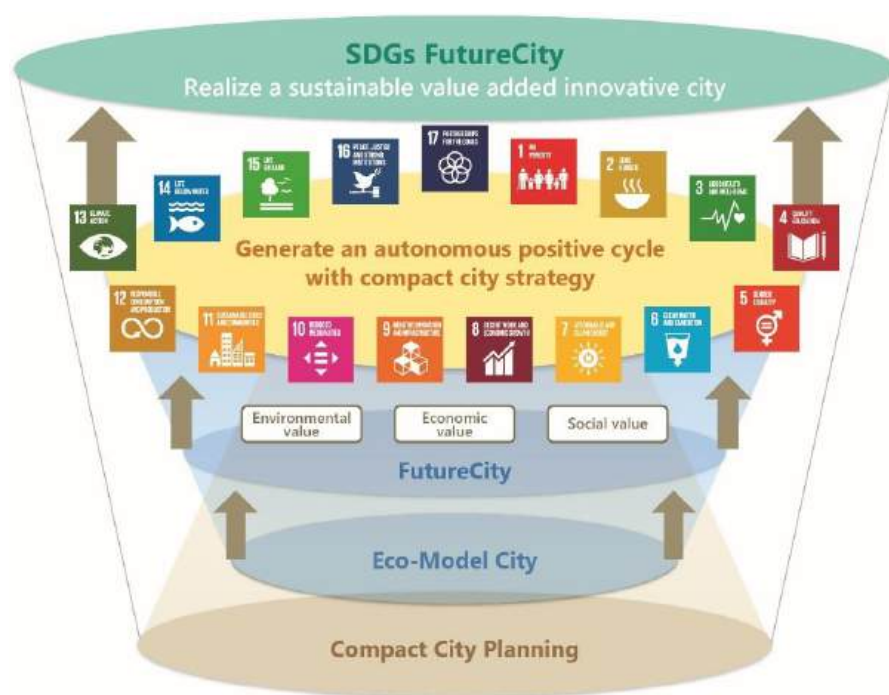


Figure 7: Toyama City's aim to scale up as an innovative city

3.3 Integrating economic, social and environmental benefits

Policy makers need to switch from conventional silo-styled policies and measures to those that are more comprehensive, collaborative, and applicable regardless of limited funding and resources for Toyama's sustainable compact city planning to be effective. Toyama City has been promoting city planning by collaborating with various entities, developing policies with economic, social and environmental benefits, and by visualizing and sharing the policy effects. This clause addresses two of those case studies.

1) Case study 1: Multiple benefits from sustainable transport – LRT network

The main purpose of the Light Rail Transit (LRT) was to secure means of public transport for people such as senior citizens who do not have free use of cars, to revitalize the city center, and to develop an efficient city environment. Toyama City aims to develop an LRT network extending over approximately 25.3 km by connecting the Toyama Light Rail (opened in April 2006) with trams in the city, developing the central loop (opened in December 2009), as well as sharing tracks with Kamidaki Line that



Figure 8 Toyama Light Rail

leads to the suburbs.

a. Toyama Light Rail Transit (LRT): Portram

A public private partnership approach was applied to the local port line (JR Toyama-ko Line) which was experiencing significant decline in users. To substantially improve the level of service, new stations were built, low-floor carriages were introduced and the number of services were increased significantly. It was revitalized as a tram line and re-introduced as Japan’s first full scale LRT – “Portram”.

b. Toyama City Tramloop Line: Centram

To make the city center more desirable, convenient and accessible, the existing tram line was partially extended to form a city loop, under a two-tier system where the city government funded the installation of the infrastructure, and the private sector was responsible for the operation.

c. North-and-South Tram Links

Projects around Toyama Station include opening of Hokuriku Shinkansen Line in March 2015, development of continuous multi-level crossings for an existing railway line, and redevelopment of the station square. By 2020, the existing railway line is scheduled to be elevated, with the Toyama Light Rail (south) and city tram (north) to be linked under the elevated railway.

d. Track Sharing by the City Tram and Kamidaki Line

Minami Toyama Station is considering track sharing between the city tram and the suburban Kamidaki Line. This will enhance access between the city center and southern areas of Toyama City.

To implement the significant policy change of converting the JR Toyama-ko Line which was experiencing decline in number of users to a next-generation tram system LRT, more than 120 regional town hall meetings were held, with the Mayor persistently explaining to citizens the need to revitalize to the citizens. His aim was to secure their support and understanding. In addition, “Toyama Light Rail Co., Ltd.” was established as a private company in charge of operations. Total funding was secured with JPY 5.8 billion from national expenditure, and JPY 1.3 billion from Toyama City. Conversion of JR Toyama-ko Line to LRT was aimed at reconsidering the lifestyle which was excessively dependent on cars and creating a walkable city.

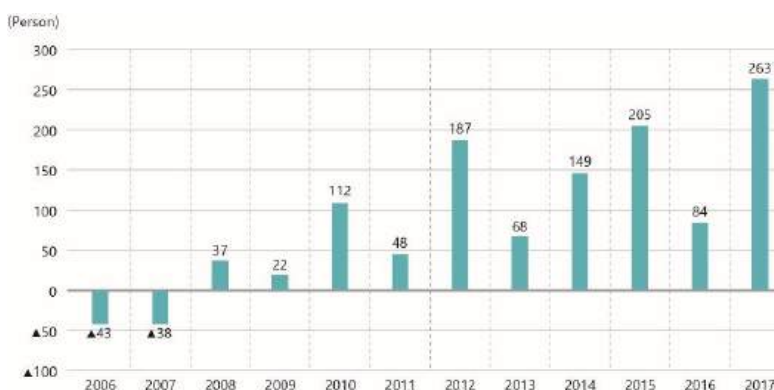


Figure 9 Change in City Center Population (difference between inbound and outbound relocations)

(source: Toyama City)

The LRT system developed in Toyama City comprises of the Toyama Light Rail and the city loop running in the city center (Centram). They have become an important means of transport for the citizens, expanding areas that do not require driving.

The average number of steps taken by senior citizens using the “Odekake Pass” issued for citizens aged 65 and above is approximately 6,124 steps per day, an increase of 2,150 steps per person. Data shows that this increase will result in reduction of JPY 75 million in annual medical costs. “Toyama City Health Plan 21” (2013–2022) is a health promotion plan that includes goal on walking (Goal 3), and the LTR can be viewed as a case at which integration between city planning and regional health promotion policies were successful.

In September 2007, a large department store and all-weather multi-purpose square “Grand Plaza” opened in the city center. An apartment construction boom and urban area redevelopment projects followed increasing the number of citizens relocating to the city centre, driving up the price of real estate around Toyama Station and along the city loop (Centram). The amount of inbound relocation to the city center has exceeded outbound relocation since 2008, and the number of pupils at city center elementary schools increased by 183 (21.8%) between 2007 and 2017. Modal shift from cars to public transport reduced greenhouse gas emissions and improved the city landscape.

Toyama City is also committed to realizing a symbiotic society by actively engaging regional residents. Direct sale shops such as Jibamonya Sohonten promote local production and consumption of agricultural, forest and marine products, and communicate information on safe regional agriculture, creating a network that provides local produce and cultivates and fosters producers.

【Added values】

Economic Values	Social Values	Environmental Values
An influx of public investment attracted private investment, leading to a rise in inbound relocation to the city center.	Increase in female senior citizens (aged 60 and above) outings. A 23% rise on week days, and 51% rise on weekends (2010–2014)	Reduced car traffic resulted in a 16% decline of CO ₂ emissions by 2016 (baseline 2005)
Increase in LRT users (Doubled on weekdays, 3.4 times on weekends between 2006 and 2017)	A rise in the average number of steps taken by public transport pass users aged 65 and above. An additional 2,150 steps/day/person	
	Increase in the number of pupils enrolled in elementary schools located in the city center. 21.8% rise (2007 - 2017)	

Table 1: Achievements of the LRT Network (source: Toyama City)

【Relevant SDGs Goals】



2) Case Study 2: Vertical integration of primary, secondary, and tertiary sectors - Egoma

In Yamada, a hilly and mountainous region in Toyama City, an attempt to revive the local industry by utilizing pharmaceutical technologies, which Toyama has historically been renowned for, is under way. Promotion and revitalization of the region and agriculture using “*egoma*,” a plant containing omega-3 fatty acids expected to be effective against lifestyle diseases, aims to reduce abandoned farm land and maintain agricultural villages in the mountainous area. The Egoma project” also seeks to generate employment of local senior citizens and realize healthy longevity city.

Egoma contains omega-3 fatty acids that prevent oxidization of the body and the plant came to the attention of a local cooking expert and botanical researcher as a health food. It has strong historic ties with Toyama City, as it has been found in ancient shell mounds from the Jomon period (dating back over 2300 years).

A plant factory using heat from hot springs, solar power and LED lighting started operations in 2014, which enabled stable production of *egoma* leaves. Outdoor test planting and productivity research is being conducted to establish *egoma* farming and expand its growing area.

Toyama City is pursuing various possibilities for *egoma* and has succeeded in marketing the plant internationally. In 2015, Toyama entered into an agreement with the University of Gastronomic Sciences in Italy, starting a research project on the best balance between *egoma* oil and olive oil, in cooperation with the University of Toyama. In 2017, a company used the results of this research to develop a healthy oil product optimally comprising of 30% *egoma* oil and 70% olive oil, expanding sales to Europe including Italy. Collaboration with the Japan External Trade Organization (JETRO) led to the first case of “Certification of Japanese Food and Ingredient Supporter Stores Overseas” issued by the Ministry of Agriculture, Forestry and Fisheries in Italy, promoting *egoma* as Japanese food from Toyama.

From 2018, products related to *egoma* produced in Toyama are subject to registered certification as “Toyama Egoma” as part of regional branding of *egoma* (38 products by 10 companies certified as of June 2018). *Egoma* -based products will be provided at the National Health and Welfare Festival (Nenrinpic) held in November 2018.

A group promoting Egoma was established by about 80 companies including local producers and distributors with the aim of having *egoma* recognized as regional specialty. The group is engaged in development of new products and marketing routes through various workshops and tasting events.

【Added values】

Economic Value	Social Value	Environmental Value
10 companies have developed 38 new products using egoma	Utilized abandoned farmland	Use of solar power and hot springs for energy
Established a market in Italy		
Co-production by approximately 80 companies		

Table 2 Achievements of the Egoma Project (source: Toyama City)

【Relevant SDGs Goals】



3.4 Leaving no one behind

Deteriorating community functions caused by decreasing and aging population, increase in single households, and escalating depopulation would make people feel very anxious about everyday life, let alone at times of large-scale natural disasters. Therefore, we will create a sociable and mutually supportive environment by nourishing community bonds between citizens across regions and generations. This chapter addresses two case studies of relevance.

1) Case study 1: Universal health for all – the Machinaka General Care Center

Toyama City aims to create a healthy and social city, where medical and welfare facilities, commercial facilities and residential areas are near, and residents including senior citizens can walk and/or use public transport to access these community facilities safely and comfortably and socialize with their friends. As part of this initiative, the Machinaka General Care Center was developed by converting a former elementary school site that became available due to consolidation of schools caused by the falling birth rate. The idea for a medical and welfare complex providing friendly and convenient services for residents of all ages from babies to senior citizens was presented as a free format proposal by businesses. The center is now providing medical and welfare services that were not offered by conventional medical institutions.

The trend of nuclear families has more young couples struggling with child-rearing issues. The Machinaka General Care Center provides care for women suffering from post-natal depression, including accommodation and post-natal physical and psychological support by midwives. To support working couples, a public service to provide care for sick children was introduced. As a first of its kind service in Japan, children at day-care who suddenly become sick are picked up by full-time registered childcare staff members and nurses pick up children from kindergartens and nurseries, and the children are cared for at the Center. A Child Consultation Office is also available to provide social worker support for infants and toddlers who are showing signs of development issues such as autism, learning disabilities, and hyperactivity. The government is working together with the regional community and businesses to support child rearing to address issues related to falling birthrate.

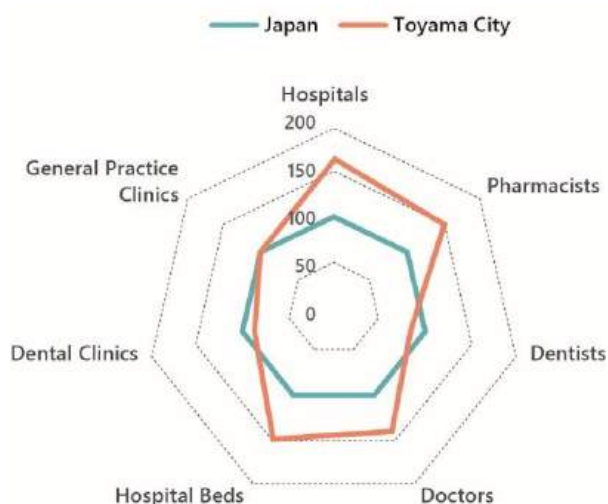
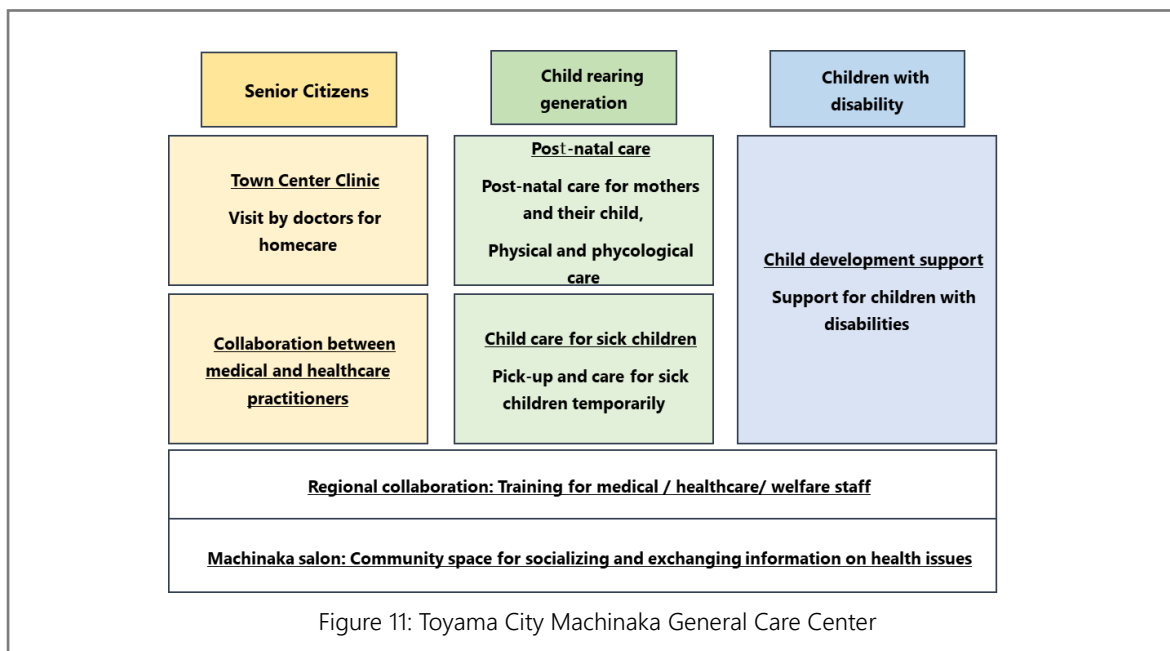


Figure 10 Medical Service per Capita
(source: 2018 Statistics of Toyama)

Care services for seniors are also being implemented to prepare for 2025, when the baby-boomers reach the 75+ age group, the so-called “Elderly in the Latter Stage of Life.” A visiting doctors’ system solely focused on providing home care was introduced in the urban area, which was also the first in Japan. Our aim is to manage the increase in hospital beds and to increase healthy senior citizens. We are also leading activities such as civic health lectures by inviting nurses and nutritionists from NPO operated general hospitals in Toyama City.

Sogawa Legato Square, which incorporates the Machinaka General Care Center, includes a nursing

school, vocational schools for food, medical and welfare professions, a community cafe, and a sports center. Toyama will promote health and welfare and enhance child-rearing environment with the aim of realizing a city that provides high quality life and work-style to citizens. This can be done by creating a healthy and sociable city where the regional community and government can work together on health, child-rearing and education.



【Achievements】

Programs	Achievement	Goals
Child development support	Number of inquiries : 5,379 (2017.4-2018.3) Number of users : 10,974 (2017.4-2018.3)	Goal 1, 3
Town Center Clinic	Number of doctor visits: 894 (2017.4-2018.3)	Goal 1, 3
Post-natal care support	Occupancy rate 80% (2018.5)	Goal 1, 3
Medical/Health Care Collaboration	Institutionalized collaboration between medical and healthcare practitioners	Goal 1, 3
Childcare for sick children	Number of users : 814 (2017.4-2018.3)	Goal 1, 3
Regional collaboration	Promoted	Goal 1, 3
Machinaka salon	Established a community network for knowledge exchange on health issues	Goal 4
Vocation schools for food, medical treatment and welfare	Provide cuisine using local agricultural and marine produce to the community	Goal 12
Green preservation	Promote greening within the grounds	Goal 15

Table 3 Achievements of the Machinaka General Care Center (source: Toyama City)

【Relevant SDGs Goals】



2) Case Study 2: Toyama City Low Carbon Farming Village Model

Toyama City pays attention to maintaining regional characters such as protecting the function of villages in agricultural and mountainous areas. The city aims to promote compact city planning based on a polycentric transport network utilizing existing stock in each region. Rice crops comprise 96% of agriculture in Toyama City as the abundant water supply and climate is suited to growing rice. Another feature is the high ratio of farmers with secondary source of income (92.9%). In recent years, agricultural use of land has been decreasing with more farmers becoming dependent on non-farming income. Toyama City evaluated the value of abandoned farm lands and implemented the Toyama City Low-Carbon Farming Model using renewable energy at a support center for farmers as an attempt to revitalize farming with crops other than rice, such as vegetables that have low crop acreage locally.

The facility uses renewable power sources including solar, geothermal heat pumps and small hydroelectric power for agricultural machinery and air-conditioned green houses for multiple crop vegetables such as komatsuna (Japanese mustard spinach), myoga ginger and egoma. The produce is offered to elementary schools, welfare facilities, nursing homes and facilities for the disabled, and conduct hands-on agricultural tours for agricultural high-school students and the public.

A project team comprising of academics, agricultural cooperative and private sector businesses, evaluates and disseminates to farms and mountain villages the benefits of renewable energy equipment: energy efficiency; cost reduction; and disaster prevention.

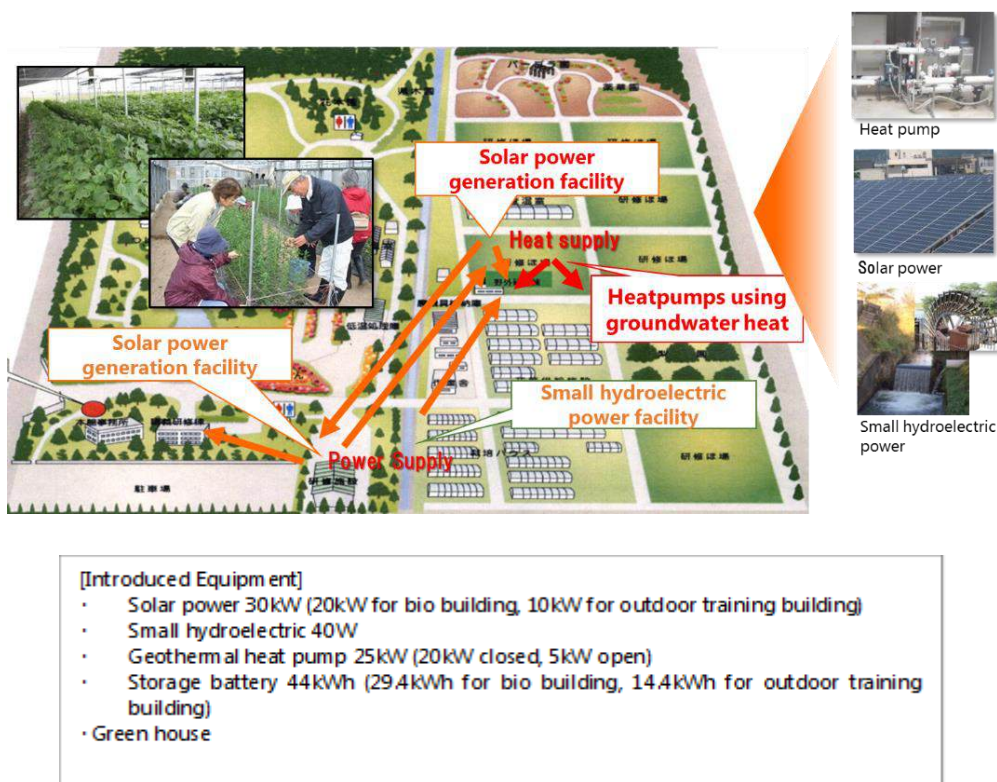


Figure 12: Agriculture revitalization project using renewable energy (source: Toyama City)

【Relevant SDGs Goals】



3) Citizens' priority

In response to a survey, citizens revealed their satisfaction for the municipality's measures concerning creation of a good living environment. "Creation of a comfortable living environment" ranked at the top, followed by "improved recycling infrastructure for circulating resources" (ranked third), "good urban planning for safe and comfortable communities" (ranked fifth), and "development of parks and green space" (ranked sixth). Support for senior/disabled citizens, enhancement of child-rearing environment, and transport systems connecting the regional community hubs were among the high-ranking topics for which respondents wanted to see focused support and measures by Toyama City. (source: Second Comprehensive Plan 2017-2026)

4. Progress on Goals and Targets

4.1 A quick overview of the SDG goals and Toyama policies

As seen in the previous chapter many policy measures taken by Toyama City take an integrated approach by addressing multiple SDG goals. Several measures are related to goals concerning “decreasing population/super-aging society,” “underutilization of regional energy resources,” “falling industrial activities” and “decreasing community network” which are issues Toyama is currently facing. On the other hand, few measures have been implemented related to “Goal 14. Life below water” as we can see in the table below. Toyama city might need to consider how to address this goal.

	Toyama’s Major Plans	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Goal 1	No Poverty	○						
Goal 2	Zero Hunger	○	○	○		○	○	
Goal 3	Good Health and Well-Being	○				○		
Goal 4	Quality Education	○						○
Goal 5	Gender Equality	○					○	○
Goal 6	Clean Water and Sanitation	○	○					
Goal 7	Affordable and Clean Energy	○	○	○		○		○
Goal 8	Decent Work and Economic Growth	○			○	○	○	○
Goal 9	Industry, Innovation and Infrastructure	○	○	○	○	○	○	○
Goal 10	Reduced Inequalities	○				○		
Goal 11	Sustainable Cities and Communities	○	○	○	○	○	○	○
Goal 12	Responsible Consumption and Production	○	○					
Goal 13	Climate Action		○	○	○	○		○
Goal 14	Life Below Water	○						
Goal 15	Life on Land	○	○	○		○		
Goal 16	Peace, Justice and Strong Institutions	○				○		
Goal 17	Partnerships for The Goals	○	○	○		○	○	○

Note 1: A circle is placed where there is policy related to the SDG goal. The name of each plan can be found on the reference list under the same designated number. The goals highlighted in grey (6,7,11,12,15,17) will be reviewed at the High Level Political Forum for the SDGs in 2018.

Note 2: Plan 1 Second Comprehensive Plan 2017-2026; plan 2 Basic Environment Plan 2017-2026; plan 3 Environmental Model City Action Plan; plan 4 Land Tolerance Regional Plan; plan 5 Environment FutureCity Plan; Comprehensive Strategy for City, People and Work (2015-2019); plan 7 Resilience Strategy (30-Year Plan).

Table 4 Toyama’s policies in relation to the SDG goals

4.2 A review of key SDG goals and targets

As the next step, this report assessed Toyama’s policies in relation to key SDG goals and targets which the United Nation’s platform for follow-up of the Sustainable Development Goals, the High Level Political Forum on Sustainable Development (HLPF2018), will review in 2018: Goals 6, 7, 11, 12, 15 and 17. It was revealed that Toyama has in place proxy indicators for much of the targets for these key goals and is experienced in tracking progress.

Furthermore, the case studies in this section shows that partnership between multiple stakeholders have been essential in addressing natural calamities such as flood control, global climate change, and human induced environmental issues such as waste management. While Toyama city is known for its Compact City Strategy that addresses infrastructure as a key solution to its social challenges, this assessment shows the city has also been very attentive in addressing environmental issues to transform into a sustainable city.



Goal 6 Clean Water and Sanitation

Toyama City has many rivers flowing from the mountains to Toyama Bay, as well as abundant ground water of good quality. Rivers flowing from the mountains to the plains have historically been controlled with levee construction and check dams, but the increase in large typhoons and torrential rain in recent years mean that the community must remain vigilant with flood control efforts.

SDG target	Toyama Indicator	Past	Last	Plan
6.1 Achieve universal and equitable access to safe and affordable drinking water for all	Water service coverage	98.92% (2013)	98.72% (2016)	3
6.2 Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation.	Ratio of concrete pipes with measures against dilapidation		38.5% (2016)	4
6.2 Pay special attention to the needs of women and girls and those in vulnerable situations	Proportion of population with sewage treatment		99.1% (2015)	3
6.3 Improve water quality	Achievement of environmental standard (water quality)		100.00%	3
6.4 Substantially reduce the number of people suffering from water scarcity.	Achievement of environmental standard (ground water)		100.00%	3
6.6 Protect and restore water-related ecosystems	Promote management of waterfront scenery and protection of aquatic life in rivers and ocean.			1
	Promote social activities utilizing waterfront environment by the rivers and development of recreation sites, as well as waterfront space that is considerate of the landscape and water amenities.			

Note: Plan 1 Second Comprehensive Plan 2017-2026; plan 2 Basic Environment Plan 2017-2026; plan 3 Environmental Model City Action Plan; plan 4 Land Tolerance Regional Plan; plan 5 Environment FutureCity Plan; Comprehensive Strategy for City, People and Work (2015-2019); plan 7 Resilience Strategy (30-Year Plan).

Table 5 Goal 6 and Toyama’s relevant indicators

Column: Flood control utilizing rice paddies and irrigation canals

Flood protection requires significant control of flow of rivers, but river improvement takes time. Measures such as storage of rain water in rice paddies can be effective as a temporary means for controlling the flow of rainwater into rivers and canals. Toyama City has collaborated with Fuchu region which lies between two rivers (Jinzu and Ida) to utilize rice paddies for water storage. This is an effort to mitigate flood damages with the participation of the public.

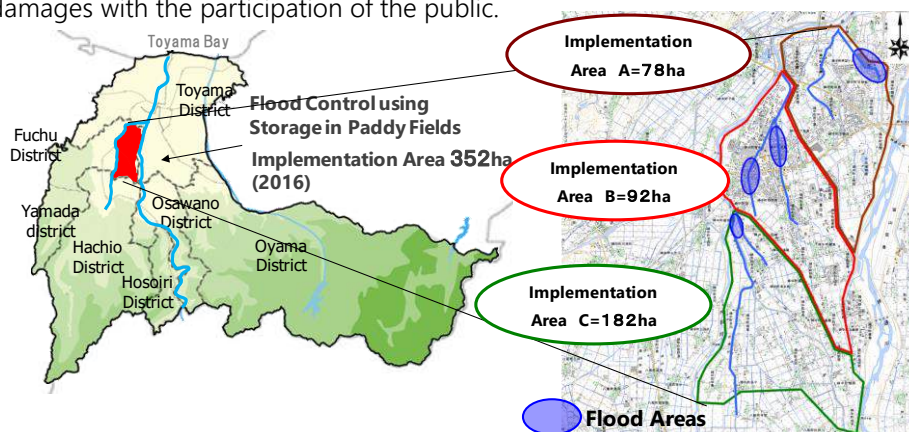


Figure 13 Toyama City's Measures to Control Floods



Goal 7 Affordable and Clean Energy

Attempts are being made across Japan to change the vertically integrated power market. As an Eco-Model City that leads efforts on prevention of global warming, Toyama City promotes the use of renewable energy. The city is developing a regional economic cycle by consuming locally produced renewable energy.

Toyama City is also part of the UN's SEforALL Global Energy Efficiency Accelerator Platform, and is committed to improving the energy efficiency of the entire city

SDG target	Toyama Indicator	Past	Last	Plan
7.2 Increase the share of renewable energy	Volume of timber from thinning hauled to biomass power plants		8100m ³ (2015)	1
7.2 Increase the share of renewable energy	Number of subsidies provided for residential solar power systems	356/year (2010)	500/year (2016)	2
7.3 Double the rate of improvement for energy efficiency	Number of subsidies for energy saving equipment	25/year (2010)	50/year (2016)	2

Note: Plan 1 Second Comprehensive Plan 2017-2026; plan 2 Basic Environment Plan 2017-2026; plan 3 Environmental Model City Action Plan; plan 4 Land Tolerance Regional Plan; plan 5 Environment FutureCity Plan; Comprehensive Strategy for City, People and Work (2015-2019); plan 7 Resilience Strategy (30-Year Plan).

Table 6 Goal 7 and Toyama's relevant indicators

Column: Eco-Model Cities

The Japanese government launched the Eco-Model City initiative to promote future low carbon urbanization. In doing so cities with low carbon pilot projects were selected for their potential to significantly reduce greenhouse gas emissions. Toyama City was selected as the first Eco-Model City in July 2008. The municipal government has worked together with citizens and businesses to reduce greenhouse gas emissions under the city's strategy: Compact City Planning based on Polycentric Transport Networks.

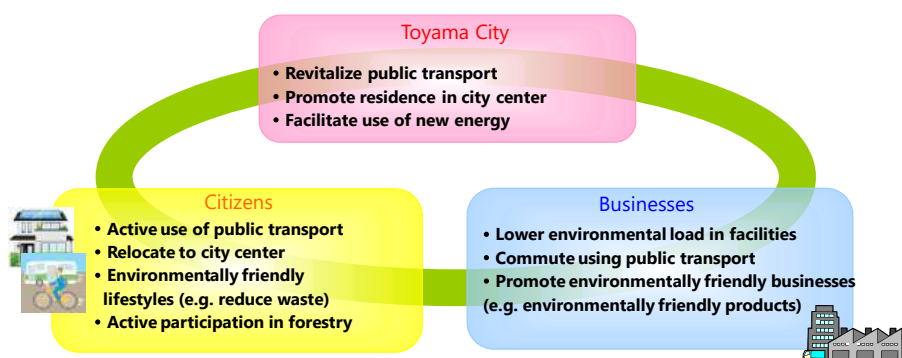


Figure 14 Toyama City Eco-Model Cities



Goal 9 Industry, Innovation and Infrastructure

Toyama City is an industrial hub and home to many businesses. However, the number of younger residents departing the city for higher education or for work has exceeded those who join as residents. To generate stable employment, Toyama needs to implement a growth strategy that would develop new markets and attract businesses with strong potential. Toyama City is making efforts to transition to a city of commerce, services, and culture and recognized for its sound infrastructure.

SDG target	Toyama Indicator	Past	Last	Plan
9.1 Develop sustainable, resilient and inclusive infrastructure	Proportion of aseismic distributing water pipes		42% (2016)	1
9.2 Promote inclusive and sustainable industrialization	Volume of pedestrian traffic in CBD and station area		44,374persons (2015 Sunday)	1
9.3 Increase access to financial services and markets	Product shipping amount, etc.	1166 bil yen (2010)	1348 bil yen (2016)	1
9.5 Enhance scientific research and upgrade technological capabilities of industrial sectors	Areas for cultivation of medicinal crops and healthy crops		Medicinal 2.9 ha	1
			Healthy 8.8ha	1

Note: Plan 1 Second Comprehensive Plan 2017-2026; plan 2 Basic Environment Plan 2017-2026; plan 3 Environmental Model City Action Plan; plan 4 Land Tolerance Regional Plan; plan 5 Environment FutureCity Plan; Comprehensive Strategy for City, People and Work (2015-2019); plan 7 Resilience Strategy (30-Year Plan).

Table 7 Goal 9 and Toyama's relevant indicators



Goal 11 Sustainable Cities and Communities

SDG target	Toyama Indicator	Past	Last	Plan
11.1 Ensure access to safe and affordable housing	Proportion of aseismic housing		79.4% (2015)	1
11.2 Provide access to safe and sustainable transport systems	Proportion of total population living in areas with convenient access to public transport	32.% (2005)	37.0% (2016)	4
11.3 Enhance inclusive and sustainable urbanization	Equipment of radio communications for disaster prevention and administration (mobile)		91.2% (2015)	1
11.3 Enhance inclusive and sustainable urbanization	Proportion of areas that are safe from heavy rains		77% (2016)	1

Note: Plan 1 Second Comprehensive Plan 2017-2026; plan 2 Basic Environment Plan 2017-2026; plan 3 Environmental Model City Action Plan; plan 4 Land Tolerance Regional Plan; plan 5 Environment FutureCity Plan; Comprehensive Strategy for City, People and Work (2015-2019); plan 7 Resilience Strategy (30-Year Plan).

Table 8 Goal11 and Toyama's relevant indicators



Goal 12 Responsible Consumption and Production

Toyama City aims to build a resource circulating society as part of a comprehensive approach to minimize the negative impact of consumption and production on the environment, and to improve quality of life for everyone.

SDG target	Toyama Indicator	Past	Last	Plan
12.2 Sustainable management and efficient use of natural resources	Recycling of general waste		24.6% (2010)	3
12.3 Halve per capita food waste	Volume of kitchen waste recycling in recycling project area	528MT (2010)	1,800MT (2015)	3
12.4 Environmentally sound management of chemicals and all wastes	Reduction and recycling of industrial waste		95.6% (2014)	3
12.5 Substantially reduce waste generation	Volume of processed general waste		13,676MT (2010)	3 3
12.6 Encourage companies to adopt sustainable practices and to integrate sustainability information into their reporting	Number of on-site inspections for industrial waste generating businesses		356 (2010)	3
12.8 Ensure that people have information for sustainable lifestyles	Number of users for eco-town socialization promotion center		8,921per (2010)	3

Note: Plan 1 Second Comprehensive Plan 2017-2026; plan 2 Basic Environment Plan 2017-2026; plan 3 Environmental Model City Action Plan; plan 4 Land Tolerance Regional Plan; plan 5 Environment FutureCity Plan; Comprehensive Strategy for City, People and Work (2015-2019); plan 7 Resilience Strategy (30-Year Plan).

Table 9 Goal 12 and Toyama's relevant indicators

Column: Resource recycling: Toyama City Eco-Town Industrial Park

Toyama City developed an Eco-Town Plan (urban planning in harmony with the environment), which was approved by the national government in May 2002 as the first plan in northern Japan and 16th in the country. Based on this plan, Toyama has developed a sophisticated eco-friendly city through promotion of waste reduction and recycling.

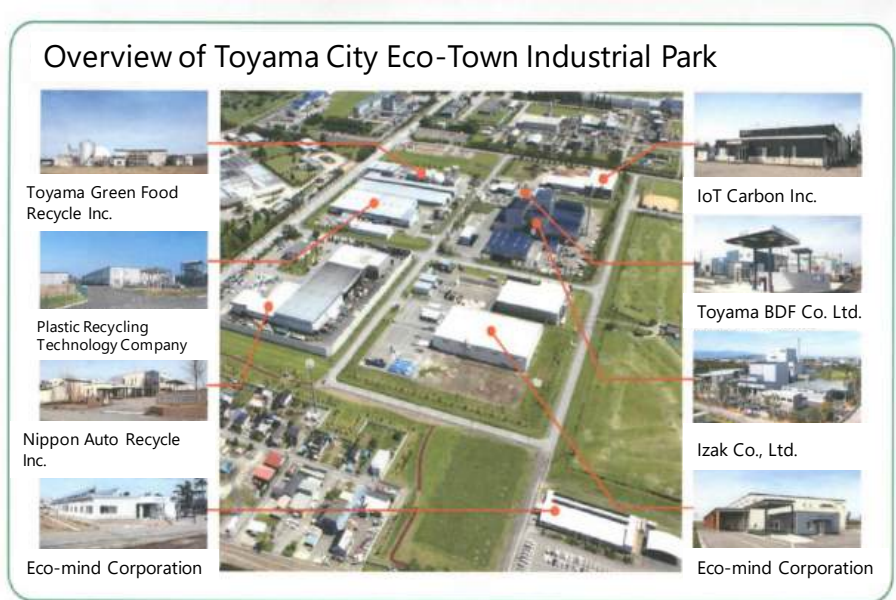


Figure 15 Eco-Town Industrial Park



Goal 15 Life on Land

Forests cover 70% of Toyama City. The forests serve as resources for timber, prevent disasters, facilitate provisions of abundant water, serve as the habitat for wildlife, and prevent global warming. Proper forest management is essential for ensuring the forests continue to fully perform these functions.

SDG target	Toyama Indicator	Past	Last	Plan
15.2 Prevent deforestation and restore degraded forests	Forest management area Forests: 85,962 ha	165ha (2005)	250ha (2015)	2
15.4 Ensure conservation of mountain ecosystems	List of wildlife in the city is being prepared.			2
15.7 End poaching and trafficking of protected species	Wildlife habitat in the city are designated as special protection area.			2
15.8 Prevent introduction of invasive alien species on land and water ecosystem	We will preserve and manage rich satoyama environment (mountain close to rural settlement) and prevent negative impact from alien species on native ecosystem.			2

Note: Plan 1 Second Comprehensive Plan 2017-2026; plan 2 Basic Environment Plan 2017-2026; plan 3 Environmental Model City Action Plan; plan 4 Land Tolerance Regional Plan; plan 5 Environment FutureCity Plan; Comprehensive Strategy for City, People and Work (2015-2019); plan 7 Resilience Strategy (30-Year Plan).

Table 10 Goal 15 and Toyama's relevant indicators



Goal 17 Partnerships for the Goals

Toyama City actively promotes collaboration between citizens, businesses, civil society organizations, and the municipality to face pressing challenges in the city. It also forms partnerships with cities in Southeast Asia by transferring technology and knowledge on small-scale hydroelectric power and solar power generation that support local city planning and contributes to improve the standard of living. This has also allowed Toyama to promote the city brand and become “selected” as a city for partnerships.

SDG target	Toyama Indicator	Past	Last	Plan
17.16 Enhance global partnership for sustainable development	Secure high appreciation from partner institutions such as international agencies			1
17.17 Promote effective partnership	Implement collaborative projects with public proposals			1

Note: Plan 1 Second Comprehensive Plan 2017-2026; plan 2 Basic Environment Plan 2017-2026; plan 3 Environmental Model City Action Plan; plan 4 Land Tolerance Regional Plan; plan 5 Environment FutureCity Plan; Comprehensive Strategy for City, People and Work (2015-2019); plan 7 Resilience Strategy (30-Year Plan).

Table 11 Goal 17 and Toyama’s relevant indicators

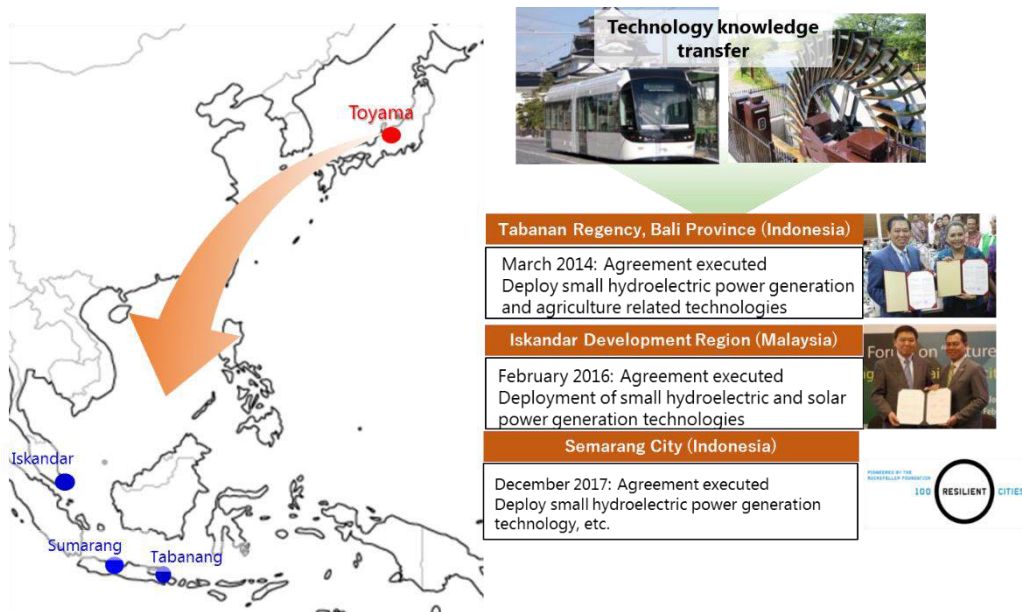


Figure 16 Global partnerships

4.3 Toyama's goals of priority

Toyama City will work on becoming a sustainable innovative city by 2030 with a compact city strategy serving as the backbone of policies. Components to the strategies and their SDG goals are as follows.

Address the super-aging society; engage in mode shifts from cars to public transport.



Goal 3	Good Health and Well-Being
Goal 11	Sustainable Cities and Communities

By 2025, approximately 30% of the entire population of Toyama City is expected to comprise of senior citizens. The city shall engage in efforts to revitalize public transport, promote health and a better state of well-being. Emphasis will be placed to reduce heavy reliance on cars, create a walkable city and recover the number of public transport users that have dropped in recent years.

Utilize regional energy resources; promote environmental education and awareness raising



Goal 4	Quality education
Goal 7	Affordable and clean energy
Goal 13	Climate Change
Goal 15	Life on land

Toyama City has become one of the largest cities in Japan in terms of land size through a merger of seven municipalities in 2005. In terms of elevation, it spans over 3,000m. The city will address local energy issues, implement climate change-related measures and low-carbon projects. Toyama is ranked second for its rich energy resources: geothermal energy and hydroelectric power. Forests cover 70% of the city, and are sources that can be used for local production and consumption of power.

Further education and environmental awareness targeting the public and businesses is also necessary to become a smart city. Public and private collaboration should be promoted to build energy -efficient new buildings and to retrofit existing buildings with energy efficient equipment.

Enhancement of industrial activity and generation of technological and social innovation



Goal 8 Decent work and economic growth

Goal 9 Industry, innovation and infrastructure

With the opening of the Hokuriku Shinkansen Line in 2015, activity in every sector including industrial, commercial, and service sectors should increase, and new sectors would be created through technological and social innovation. On the other hand, the city must respond flexibly to competition from a wider geographic area.

Toyama City's farming and fishing industry suffers from an aging and declining primary sector, as well as the low market price for primary products, coupled with rising production costs. An on-going effort must be made to support the sector by securing and nurturing future generations and encourage local production and consumption. One way to address this is by facilitating vertical integration of primary, secondary, and tertiary industries to achieve greater value added in products and services, through cooperation with a spectrum of sectors and industries.

Creating a Symbiotic Society through Collaboration and Cooperation with Various Stakeholders



Goal 17 Partnerships for goals

Deteriorating regional community functions caused by an aging and declining population, an increase in single households, and rising depopulation add up to make people feel very anxious about everyday life, let alone life at times of large-scale natural disasters. Therefore, we must build a new network of citizens across regions to create a sociable and mutually supportive society.

To address varying administrative needs under a difficult financial environment, a symbiotic society is needed, where a wide range of stakeholders such as NPOs, universities, businesses and financial institutions collaborate and cooperate with the government to resolve social issues.

4.4 Concrete actions to address the priorities

Revitalization of public transport is the key concept for Toyama City's compact city planning based on polycentric transport networks, and creation of a sustainable regional public transport network including the LRT lies at its core. It will not only reduce dependence on private vehicles and promote low-carbon city, but also create opportunities for the senior citizens to go out and improve health through walking. By presenting wider mobility to citizens, multiple benefits, such as the enlivenment of the town center, are also expected. This is a leading model for regional cities facing decreasing and super-aging population.

Together with slimming of the city through compact city strategy, a system with low environmental load and high energy efficiency will be essential. By maximizing the use of regional energy sources such as renewable energy and building an autonomous and decentralized energy infrastructure, we can meet the demand for energy from public transport such as LRT and public facilities in Toyama City, and enhance resilience against natural disasters.

By combining the public transport network such as LRT, which is the core of the visionary efforts by Toyama City towards a low-carbon and free-carbon compact city, as well as autonomous and diverse energy management, the SDGs model project will further deepen and enhance the compact city scheme which can provide immediate response to energy demands of the city, improve resilience, and add a smart wellness city factor. In adopting the SDGs model projects, Toyama City shall resolve regional issues, enhance our industry, and measure the progress of the nine goals and targets with quantitative evidence.

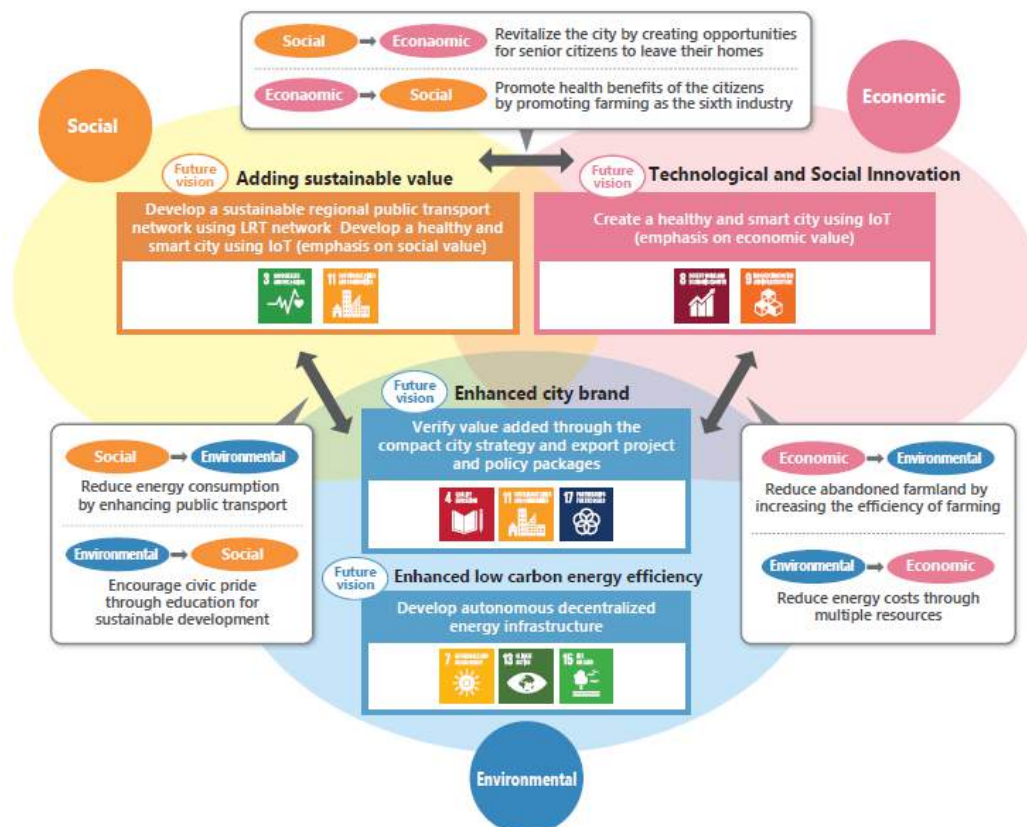


Figure 17 SDGs Model Project (source: Toyama City)

Case Study 1 : Integrate the LRT Network with an autonomous decentralized energy management system to strengthen the Compact City Scheme



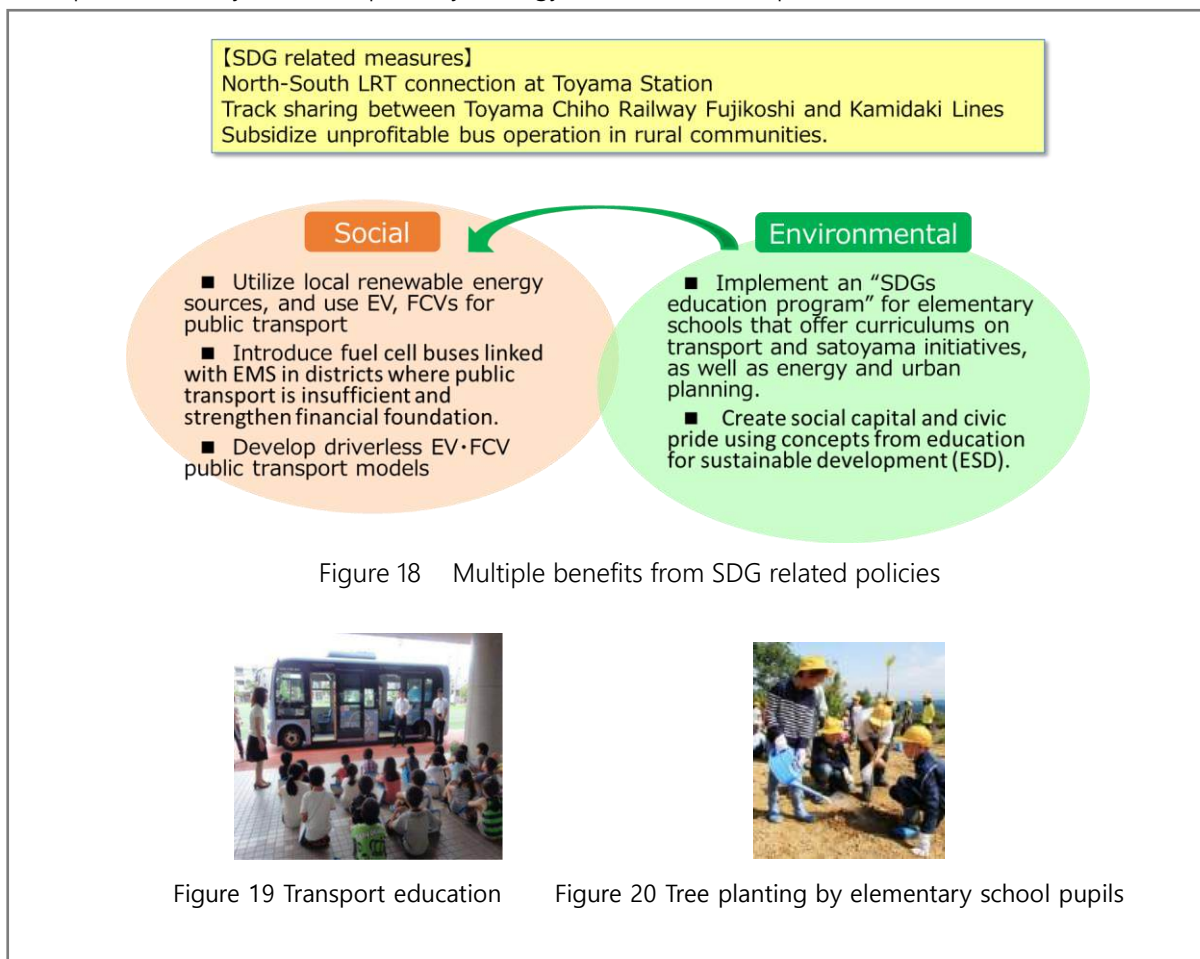
Target 3.8 Achieve universal health coverage

Target 11.3 Integrated, sustainable human settlement planning

Toyama is making efforts to promote relocation to existing urban areas such as the city center and hubs where there was a significant drop in population. There are plans to connect the LRT line and the tram line that are disconnected from each other, one extending to the north of the city, the other to the south, under the elevated platform of Toyama station. This is one of the leading projects to revitalize the public transport network. Other aspects include better access to secondary transport from Toyama Station; and securing various other means of transport.

This will enhance social capital and resilience of the city. It will also provide opportunities to senior citizens to go out and become healthy.

In agricultural and mountainous villages experiencing depopulation, the city will accommodate to the residents' wishes to preserve public transport necessary for their daily lives. The added value created by the compact city strategy (Figure 18) will offer benefits to health, quality of life, low-carbon and disaster prevention. It will also review cross sector benefits generated by public transport are reducing the overall expense for the society. By communicating the information supported with evidence, the city will enhance the reputation of Toyama's compact city strategy and increase civic pride.



Case Study 2: Creating a Healthy and Smart City using IoT (internet of things) - No. 1



Target 8.2 Achieve higher levels of economic production
 Target 9.2 Promote inclusive and sustainable industrialization

Toyama City’s pharmaceuticals industry is one of the best recognized regional brands dating back to the Edo era. The industry’s turnout is one of the highest for pharmaceutical production in Japan. In light of heightened demand for Chinese medicine and herbal medicine against the backdrop of rising awareness on health issues, and desires for longevity, Toyama will build a medicinal plant cultivation system leveraging the expertise of medical universities; engage in strategic development of regional specialties including egoma (a local medicinal herb) and establish stable production by utilizing IoT; and apply leading-edge technologies of pharmaceuticals and related industries to create a healthy and smart city. (Figure 21) This is hoped to keep the city worthy of the name “Medicine City Toyama”, generate technological and social innovation, thereby revitalizing the local economy

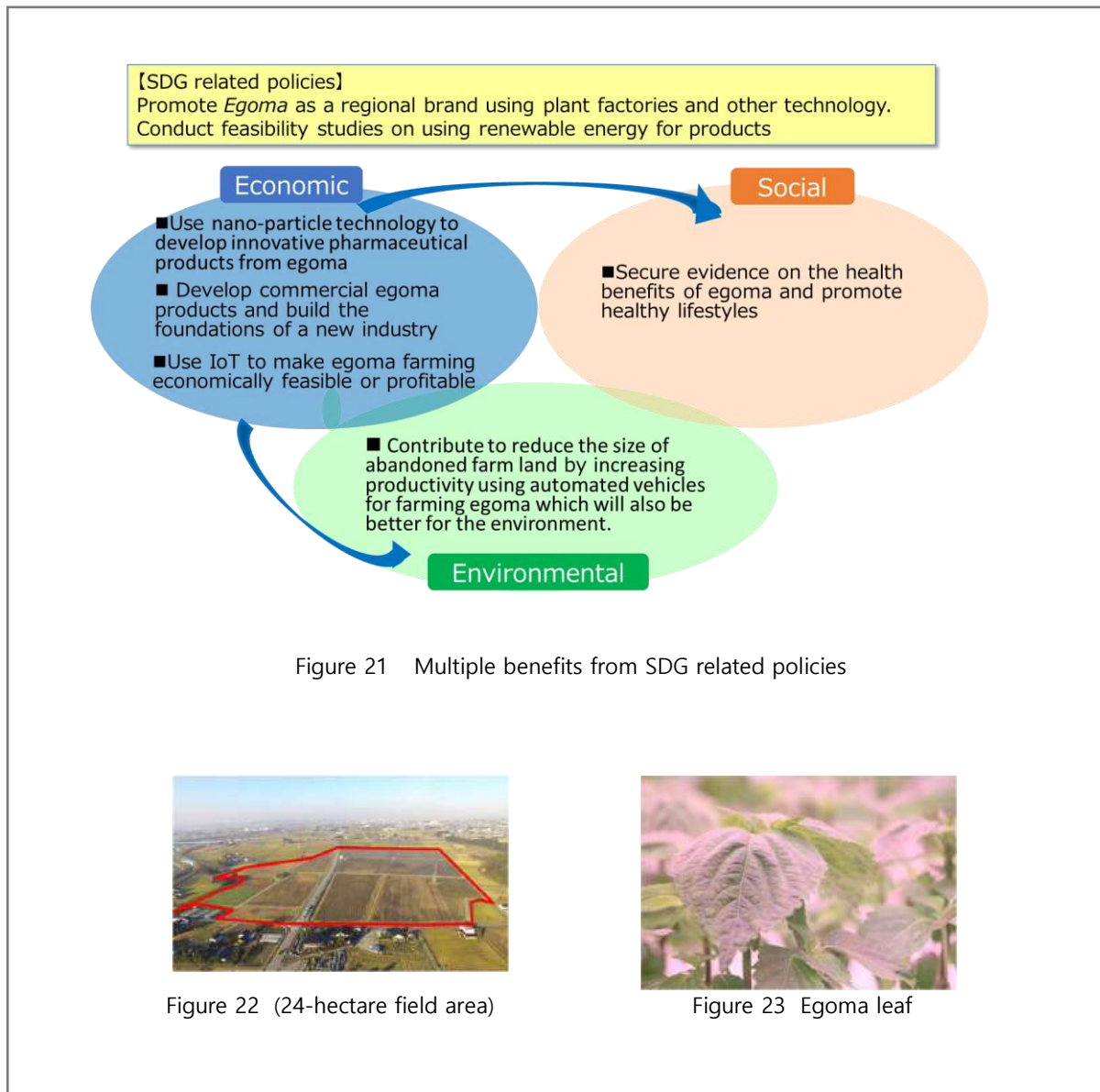


Figure 21 Multiple benefits from SDG related policies



Figure 22 (24-hectare field area)



Figure 23 Egoma leaf

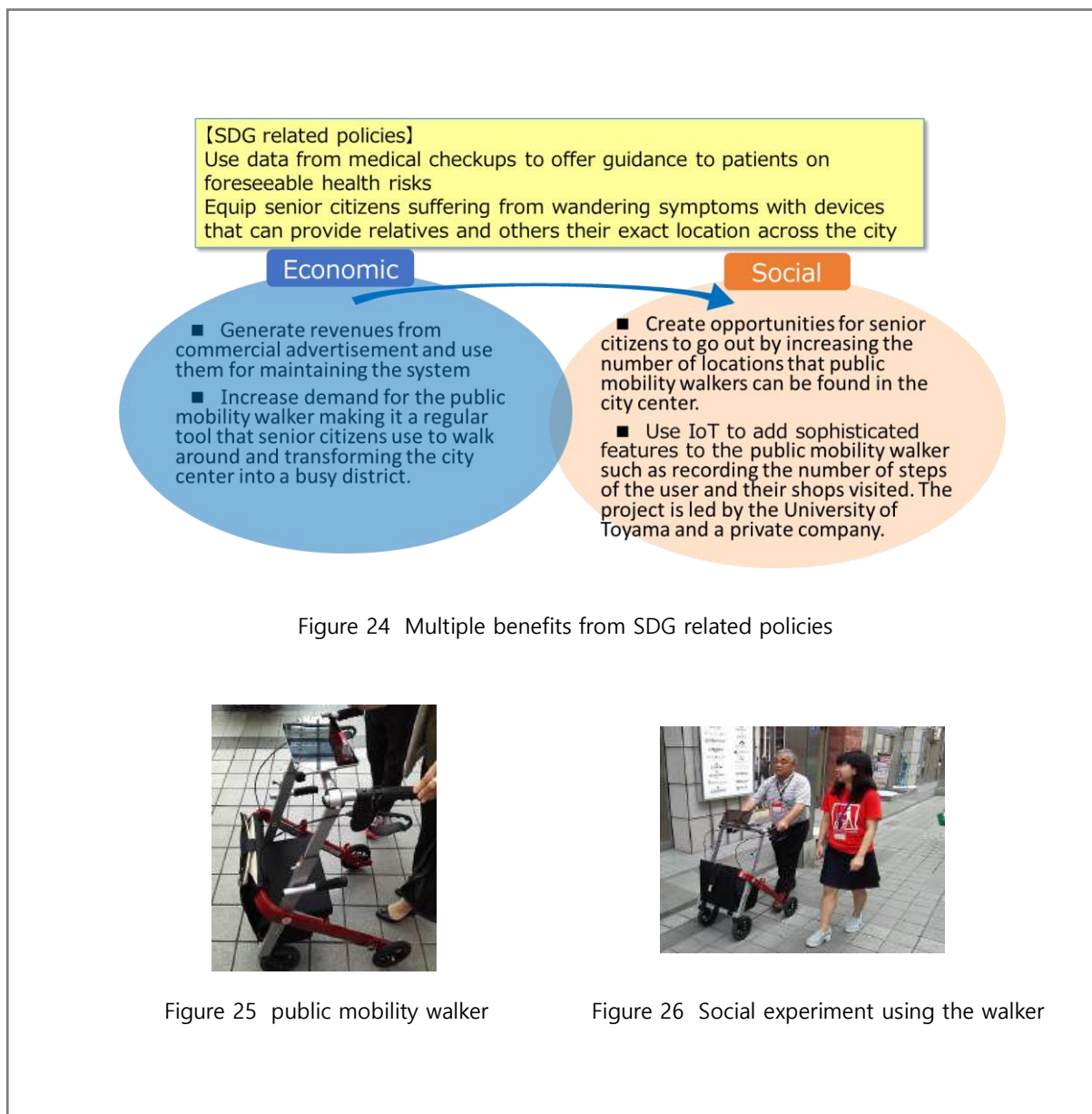
Case Study 3: Creating a Healthy and Smart City using IoT (internet of things) - No. 2



Target 8.2 Achieve higher levels of economic production

Target 9.2 Promote inclusive and sustainable industrialization

Toyama will build a comprehensive regional care system that ensures everyone from children to senior citizens are healthy and safe. Citizens should be able to live in their homes respectfully and for an extended period, even when they require medical treatment and nursing care. The comprehensive regional care system will provide such services and integrate care prevention, housing and living support. The city will also draft a plan for smart city development that will include the use of IoT in health care services and incorporates concepts to realize a smart city that assures the well-being of Toyama's citizens.



Case Study 4: Creating an autonomous and decentralized energy network



- Target 13.2 Integrate climate change into policies, planning
- Target 7.2 Increase the share of renewable energy
- Target 15.2 Promote sustainable management of forests

Through effective use of abundant renewable energy resources generated on the terrain, Toyama City will create an autonomous and decentralized energy infrastructure network that controls and distributes renewable energy, meets the regional energy demand, reduces greenhouse gas emissions, promotes local production and consumption of energy, and improves disaster resilience of the city.

The city will focus on the rich resources from the forests in Toyama City to promote satoyama revitalization activities, human resource development, introduction of renewable energy, and the establishment of an environment where forest space can be accessed safely and comfortably. Utilization of the forests as space for hands-on learning on environmental preservation by citizens of all ages will create an environmental field museum for symbiosis between people and nature.

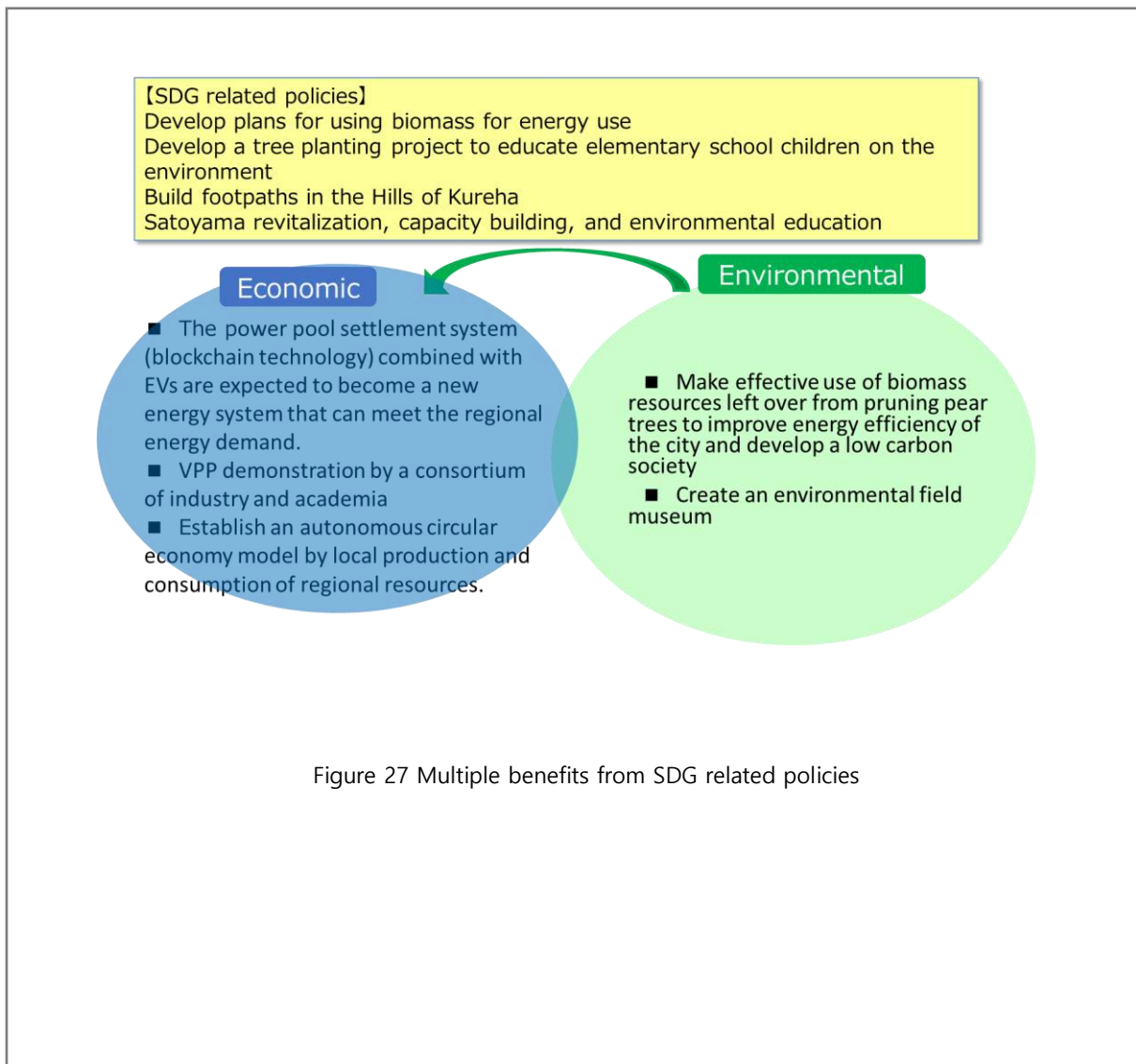


Figure 27 Multiple benefits from SDG related policies

4.5 Plans to be reflected

Specific goals and actions for promotion of the SDGs are to be drawn up as a SDGs FutureCity Action Plan, and reflected to other key plans when they are revised (see Figure 26).

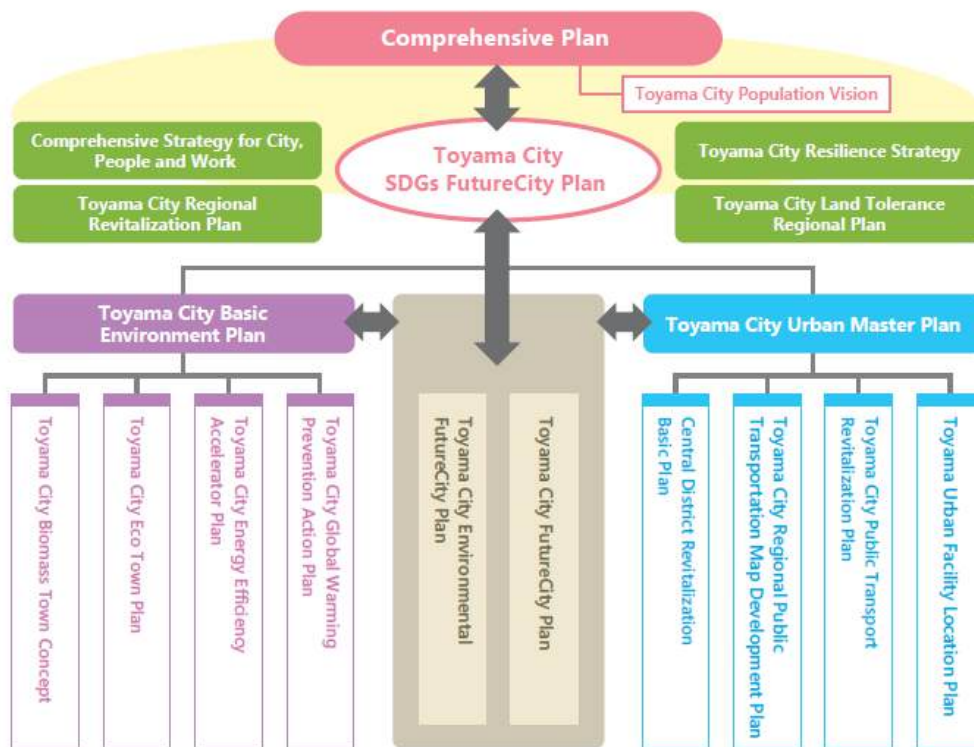


Figure 28 Toyama SDGs FutureCity Plan and other major plans (source: Toyama City)

5. Institutional Structure of Implementation

The framework for promoting SDGs involve cross-organizational efforts by the Toyama City SDGs FutureCity Promotion Division, which was established with collaboration across municipal bureaus including the Environment Department, Planning and Management Department, Active City Creation Department and Welfare and Health Department. In addition, the SDGs FutureCity Strategy Conference comprising of experts was established for preparation of SDGs FutureCity Plan and management of progress of individual projects. Municipal Issue-specific Task Force also organically collaborate with the SDGs Model Project Team.

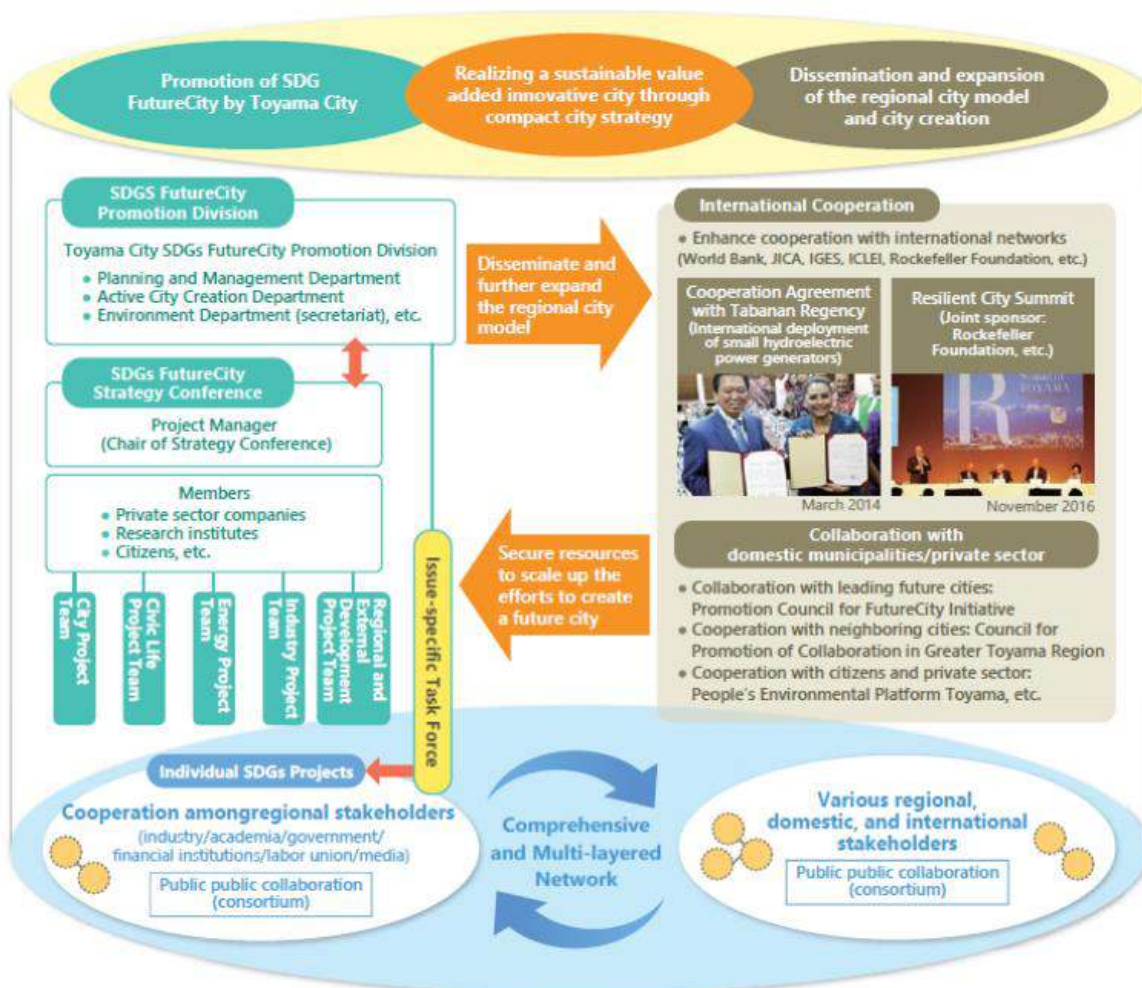



Figure 29 Toyama City SDG promotion framework (source: Toyama City)

Cooperation among industry, government and academia already exists in the form of Toyama City SDGs FutureCity Promotion Council, and the SDGs FutureCity Strategy Conference will deepen this framework for strategic implementation of the SDGs FutureCity initiative in five areas (City, Civic Life, Energy, Industry, Regional and External Development). The private sector in the city are also involved by actively expanding economically feasible SDGs related businesses, and the conference will promote their initiatives by pursuing mutual collaboration. Activities to promote SDGs by NPOs driven by the public are emerging,



and we will fully collaborate with such organizations to encourage voluntary activities by the regional community.

In terms of collaboration with other municipalities in Japan, Toyama will enhance mutually beneficial relationships to further promote municipal SDGs. To this end, Toyama will continue to engage with the national government's Promotion Council for the FutureCity Initiative and with other cities that are part of this initiative to create opportunities for sharing individual cases and exchanging opinions.

Toyama will collaborate with neighboring cities to ensure that our regional city model will be inclusive of all regional cities and regions to resolve such issues and to spread our model, for example, through Greater Toyama Cooperation Core Cities Conference (Toyama City, Namerikawa City, Kamiich Machi, Tateyama Machi, Funahashi Village).

6. Means of Implementation

6.1 Technology

The case studies presented have identified technology development has been one of Toyama's strengths when promoting better systems for transport, flood control, or waste management. It was able to do so by consciously linking actors in research and society and facilitating co-production. This will continue for the foreseeable future as Toyama continues to strategically support state of the art technology when it is still in its infancy in districts and regions in need of social and economic transitions. Knowledge transfer for tested technology is also another measure Toyama actively pursues. It is known for promoting locally appropriate technology transfer as can be seen in the collaboration with South East Asian Cities.

6.2 Capacity building

Achieving a sustainable society is a transformation that will require capacity building in the long term. Toyama City pursues this through education of the SDGs in elementary schools. Also, by encouraging collaboration between the research community and the private sector under a participatory platform to learn how to develop sustainable practices by doing.

6.3 Multi-stakeholder partnerships

The 2030 Development Agenda highlights the importance of a global partnership where all actors including the government, civil societies, private sectors and international organizations mobilize available resources to achieve the SDGs as the Means of Implementation (MOI). As activities to promote SDGs by NPOs and citizen driven institutions emerge, Toyama City will collaborate with these organizations to encourage voluntary activities by regional communities. (Please refer to Attachment for a list of partners).

For example, the Platform for Environmental Citizens Toyama ("PEC Toyama") was established in 2018 by citizens and businesses. PEC Toyama engages the younger generation in information-gathering and dissemination and plays a role in promoting SDGs initiatives involving regional NGOs, NPOs and corporate activities.

Toyama City will also aim to achieve SDGs globally by enhancing collaboration with our international network (OECD, JICA, SEforALL, ICLEI, World Bank, Rockefeller Foundation, etc.).

We will further collaboration with developing countries and cities in Southeast Asia where we are providing support for small-scale hydroelectric power generation and compact city packages as well as contribute to resolving local issues from the perspective of the SDGs.

7. The Way Forward

Toyama City has approached pressing social and economic issues such as population decline, the decreasing and super aging society, the rapid rate of globalization, global environmental issues, under the strong leadership of the mayor, and by using measures that would increase quality of life (QOL) for citizens and reflect the key concept of Toyama's compact city strategy by revitalizing public transportation. The city is creating a society that is less dependent on cars, and offers holistic and integrated medical and health care services that would enable senior citizens to remain healthy and safe.

Toyama City will engage in attempts to use the rich natural resources strategically based on the concept of "Regional Circular Decarbonized and Ecological Sphere (Regional CES)"; and to connect the city center, regional community hubs and agricultural villages economically and socially. We will continue to develop a grand design for a vibrant SDGs FutureCity envisioned by Toyama City, where the individuality of each citizen will be respected, regional renewable energy is effectively used, and competitiveness of local businesses will be enhanced with superior technology.

Our next steps will be to strengthen our compact city strategy by revitalizing the LRT network and other public transportation networks and integrating them with an autonomous decentralized energy infrastructure that would utilize local renewable energy sources.

This model project will be implemented by application to overseas initiatives such as sharing of technological knowledge and exporting of project packages and policies, as well as for domestic initiatives such as public-private cooperation and partnership, public and private ownership, and implementation of good governance. Toyama aims to use this as a catalyst for realizing a sustainable innovative city with added values by 2030.

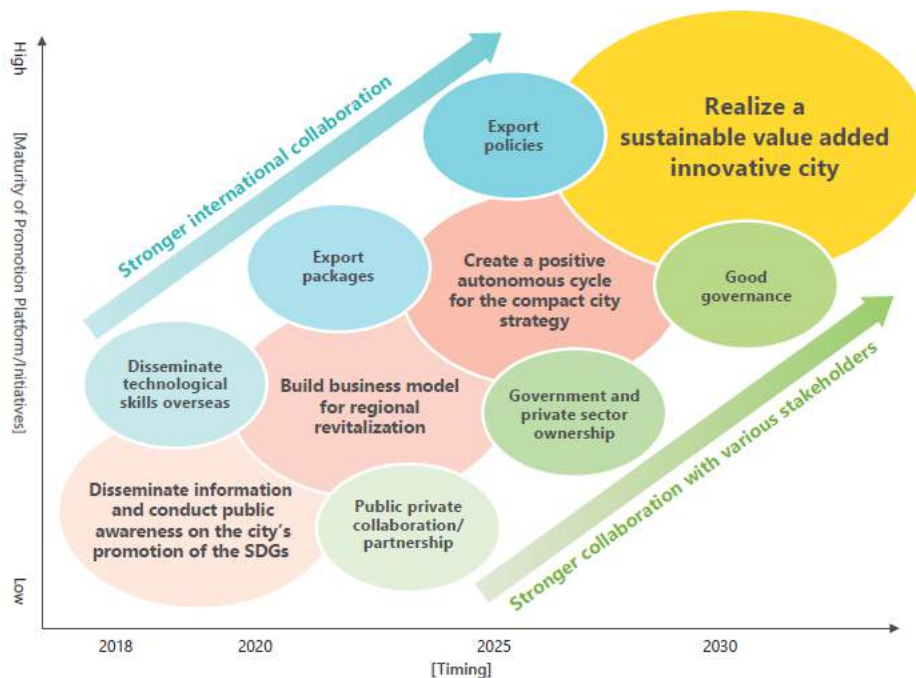


Figure 30: Promotion of SDG efforts

Reference

- 【1】 Toyama City (2017) Second Comprehensive Plan 2017-2026
- 【2】 Toyama City (2017) Second Toyama City Basic Environment Plan 2017-2026
- 【3】 Toyama City (2009) Toyama City Environmental Model City Action Plan
- 【4】 Toyama City (2017) Toyama City Land Tolerance Regional Plan
- 【5】 Toyama City (2017) Second Toyama City Environment FutureCity Plan
- 【6】 Toyama City (2017) Comprehensive Strategy for City, People and Work (2015-2019)
- 【7】 Toyama City (2017) Resilience Strategy (30-Year Plan)
- 【8】 Toyama City (2017) Toyama City Urban Facility Location Plan
- 【9】 2018 Statistics for Toyama
<http://www.city.toyama.toyama.jp/kikakukanribu/johotokeika/tokei/tokeikaramiru/2018tokeikaramiru.html>

Appendix

1) Collaboration Frameworks

- Collaborative Consortium led by the University of Toyama

In conjunction with the establishment of a new faculty in the University of Toyama in April 2018 (Faculty of City Planning), the University of Toyama Energy Initiative Grand Design Review Committee was established with members including private sector companies (Toyama City is an observer). A demonstration on zero energy building (ZEB) on campus and virtual power plant (VPP) using energy resources and review on local energy production and consumption model leveraging on the regional characteristics is scheduled to start in 2018.

- Biomass Resource Utilization Project Team

A review team was established in 2018 in collaboration with Kanazawa University and regional power companies to conduct research for utilization of leftovers from tree pruning from Toyama City's specialty product, *kureha* pears. Also, Toyama University of International Studies is scheduled to adopt a biomass boiler using timber from forest thinning in the area to replace the aging heating and cooling equipment. Toyama City will be considering creation of a network of effective use of forest resources by increasing the use of heating and cooling systems using local biomass energy through collaboration with private sector companies.

- Consortium of Industry, Government and Academia for Nano-Technology Application

A consortium of industry, government and academia between private sector companies, universities, hospitals and the government is to be established for application of nano-technology. We will aim at early commercialization based on clinical trials to be performed with healthy participants.

2) Regional Project Promotion Platforms

- A. Platform for Environmental Citizens Toyama

The Platform for Environmental Citizens Toyama ("PEC Toyama") was established in April 2018 to promote information and personnel exchange on SDGs in Toyama. Activities by PEC Toyama enhances research and information gathering/dissemination in and out of the region, and promotes SDGs initiatives by local NGOs, NPOs and in corporate activities. Toyama City is aiming to create a symbiotic society in cooperation with the public and will collaborate with activities that boost SDGs to empower all citizens.

- Toyama Regional Platform

Toyama City established the Toyama Regional Platform with Hokuriku Local Finance Bureau, Hokuriku

Bank, and Development Bank of Japan, as a model project supported by the Cabinet Office to promote utilization of PPP/PFI in the Prefecture.

The platform will build the foundation for the creation of a network of relevant parties in the region, sharing know-how, enhancing project origination, and communication between the government and private sector. It will also aim to generate new business opportunities for the private sector and encourage private investment.

- Council for Promotion of Collaboration in Greater Toyama Region

The Council for Promotion of Collaboration in Greater Toyama Region was established to create a collaborative central city zone with the participation of Toyama City, Namerikawa City, Funahashi Village, Kamiichi Machi and Tateyama Machi. Its aim is to develop the entire region by realizing active regional society and economic growth.

- Toyama Hydrogen Energy Promotion Council

In February 2016, Toyama Hydrogen Energy Promotion Council was established to promote use of fuel cell vehicles (FCV) and hydrogen stations in Toyama Prefecture. The Vision and Road Map for Hydrogen Energy Utilization in Toyama was prepared to clarify the issues and measures for realizing a hydrogen-based society in Toyama (the council became a general incorporated association in 2018). The municipal government participates as an observer and provides enhanced support for development of hydrogen stations. We will also consider conducting a demonstrative introduction of renewable energy-based hydrogen stations at public facilities of the city to further promote hydrogen energy.

3) International Collaboration

- World Bank


A memorandum of understanding was drafted in November 2016 between Toyama City and the World Bank on identification of opportunities to utilize Japan's knowledge for project level activities in developing countries and to cooperate in joint research and knowledge sharing (City Partnership Program).

- Japan International Cooperation Agency (JICA)

In February 2017, Toyama City and JICA entered into a memorandum of understanding on collaboration for promotion of FutureCities, effective and efficient international cooperation with developing countries and regions, and to contribute to the growth of developing regions and global stability. Toyama City is promoting various international projects in collaboration with JICA, including the small hydroelectric power generation project in Tabanan Regency of Bali, Indonesia.

C. Institute for Global Environmental Strategies (IGES)

In December 2017, Toyama City and IGES entered into a basic agreement for contributing to realization



of sustainable society and building carbon-free society. Toyama City, in cooperation with IGES, is conducting the FY2017 City-to-City Collaboration for Low-Carbon Society project sponsored by the Ministry of the Environment, along with Semarang City Indonesia.

■ The Rockefeller Foundation

As a result of the selection of Toyama City as one of the “100 Resilient Cities” by the Rockefeller Foundation in 2014, the Resilient City Summit was held in Toyama City in November 2016.

Toyama City established a comprehensive resilience strategy in March 2017 (Toyama City Resilience Strategy) with the support of the Rockefeller Foundation. We will make international contributions by holding workshops to promote and educate on the concept of resilience, as well as offering our knowledge and technology in response to request for cooperation from the 100 Resilient Cities, OECD and World Bank programs, as well as overseas municipalities and organizations facing common issues.



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