

**Background information of
Nagano Prefecture on
Energy Transition and Global Environment
for Sustainable Growth**

On the occasion of

“G20 Climate and Sustainability Working Group 2 (CSWG2)”

15-17 April 2019 in Nagano City, Japan

Prepared by

Institute for Global Environmental Strategies (IGES)
ICLEI Japan

1. ABOUT NAGANO PREFECTURE

Nagano Prefecture, which has historically been known as the name of “Shinshu” or “Shinano” is located in the central part of Honshu Island and is blessed with many areas of outstanding scenic beauty thanks to its mountains, rivers and other natural resources (Figure 1). In summer, some areas have temperatures as high as those in Tokyo during the day, but it is cool and pleasant in the morning and evening. On the other hand, it is very cold in winter, with sub-zero temperatures and areas with huge amounts of snow. The 1998 Winter Olympics and Paralympics were held in Nagano.



Figure 1: Location of Nagano Prefecture

The population of Nagano Prefecture has been declining after reaching a record high of 2.22 million in 2000, and now has a population of approximately 2.06 million (as of January 2019). This preceded the national population trend which reached a peak in 2008. The aging rate of Nagano is 30%, which is above the national average. Women ranked 1st and men ranked 2nd in average life expectancy by prefecture (Statistics as of 2015).

The administrative area of Nagano Prefecture is 13.5 thousand km², the fourth biggest out of 47 regional governments in Japan and 78.5% of the area is covered by forest (66% of Japan is covered by forest). The prefecture has the second largest number of *onsen* (hot springs), and is the third largest in terms of area of natural park.

Most of the major cities in Nagano Prefecture are located within 200 km of the Tokyo metropolitan area, centred in Tokyo, and the Chukyo area, centred on Nagoya, making the prefecture a transportation hub. The Nagano Shinkansen will take you from Tokyo to Nagano station in about 1.5 hours, and this enables people to enjoy a lifestyle of spending weekdays in Tokyo and weekends in Nagano.

The manufacturing industry such as precision machinery and electronics is thriving in Nagano, and household disposable income exceeds the national average. The number of NPOs per 100,000 population is about 48, which is sixth in the country. This socio-economic background is a key factor behind Nagano's promotion of renewable energy and energy saving.

Nagano Prefecture is also known for its Shinshu soba noodles, Shinshu miso, as well as its apples. More recently, game meat cuisine has become popular. Over the last few years, climate change has had a major impact on rice crops and apple production, and efforts have been made on selective breeding to adapt the impact. On the other hand, changes in the climate means that Nagano is fast becoming a suitable place to grow grapes and produce wine.

As described above, Nagano Prefecture is rich in nature and has a large potential of renewable energy sources such as solar, water, and biomass resources, which means that there is high potential to supply heat to the region. On the other hand, the region is vulnerable to the impacts of climate change.

From such a background, Nagano Prefecture has been taking ambitious energy and global warming measures, especially after the Great East Japan Earthquake, and has achieved what is called decoupling, which reduces GHG emissions while growing the regional economy.

Therefore, Nagano is the suitable place to host the G20 Ministerial Meeting on Energy Transition and Global Environment for Sustainable Growth (Figure 2).

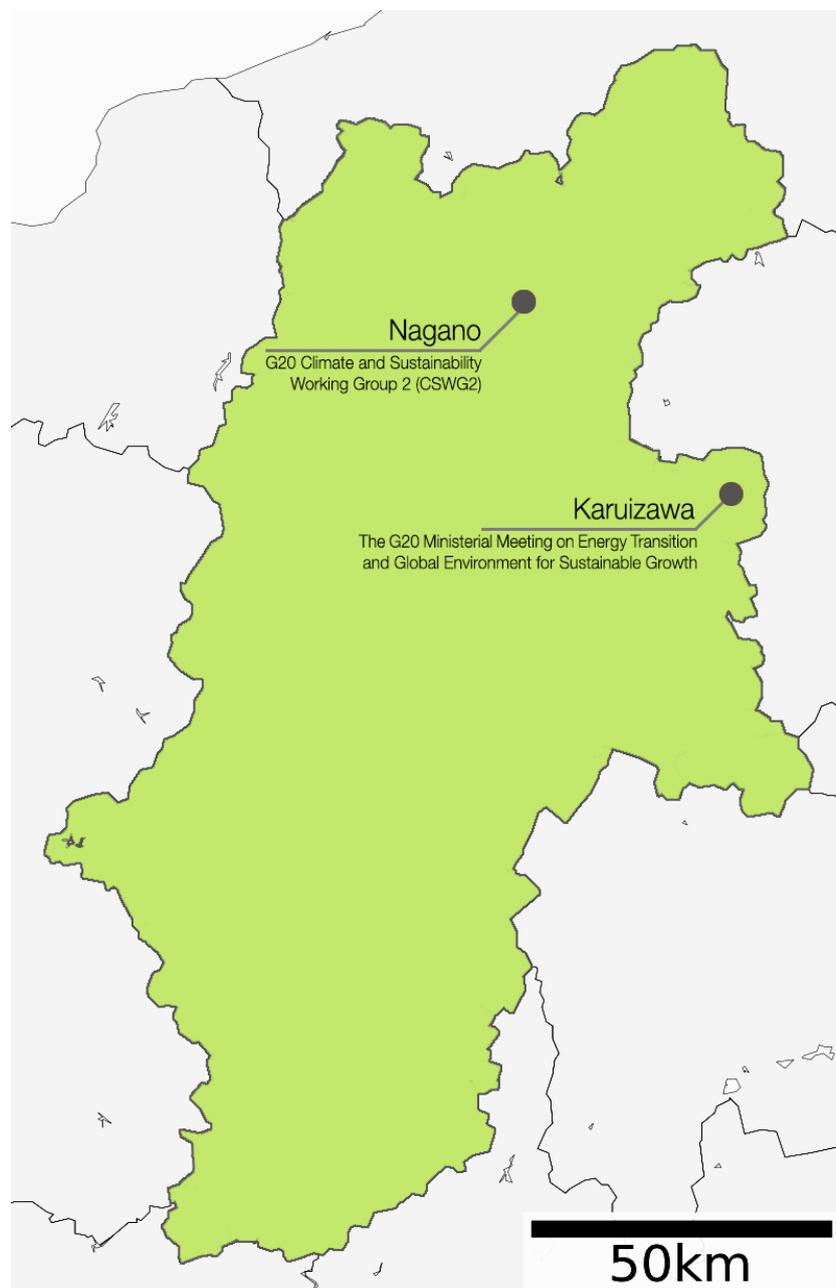


Figure 2: Location of Nagano City and Karuizawa Town within Nagano Prefecture

2. NAGANO PREFECTURE’S ACTIONS FOR ENERGY AND ENVIRONMENT

According to the Act on Promotion of Global Warming Countermeasures established in 1998 by the Japanese government to implement the Kyoto Protocol adopted in December 1997, Nagano Prefecture made continuous efforts, such as establishing the “Nagano Action Plan for Global Warming Prevention” in 2001 and the “Nagano Sustainable Energy and Climate Change Policy Plan” in 2003, setting a target of reducing GHG emissions by 6% from fiscal 2010.

The Great East Japan Earthquake and the Fukushima Daiichi nuclear power plant accident of 11 March, 2011, led Nagano Prefecture to establish a review committee with key experts, which conducted a general review of past measures of energy and environment, and issued “Recommendation Report on the Nagano Prefecture Strategy of Global Warming Countermeasures” in March 2012. Nagano Prefecture aimed to stimulate circulation of more money and energy in the region (higher rate of regional circulation), and stimulate the local economy by supplying renewable energy generated from local resources to outside the region (improvement of the balance of local payments) in order to promote strategic decoupling. It was hoped that this could contribute to local achievement of the SDGs (Figure 3).

In order to implement more concrete actions, Nagano Prefecture established “Third Nagano Prefectural Plan on Global Warming Prevention” (plan period: 8 years from fiscal 2013) in February 2013. The plan is included in the area policy section as part of the action plan by local governments required to be formulated under the Act on Promotion of Global Warming Countermeasures. The plan set the creation of a sustainable, low-carbon environmental and energy local society as its top goal. The plan consisted of two packages

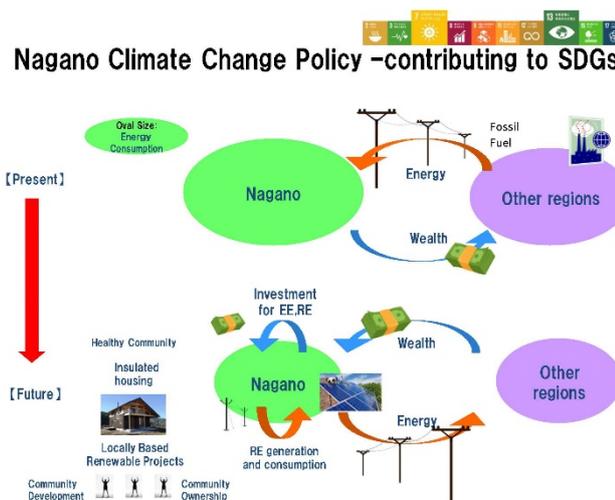


Figure 3: Nagano’s climate change policy contributing to SDGs

— an energy-efficiency policy package and a renewable energy package — which were formulated with proactive advice from experts both inside and outside the prefecture, and involved relevant sections in Nagano Prefectural Government and stakeholders both inside and outside the prefecture to increase collaboration within the Prefectural Government as well as between the Prefectural Government and local municipalities in the prefecture. Furthermore, the ordinance for global warming countermeasures in Nagano Prefecture was amended to enhance enforcement of the plan.

Having been recognized as the most advanced local government of the abovementioned actions, Nagano Prefecture won the best local government award of the Low-Carbon Cup 2016, created to coincide with COP15. Nagano Prefecture was also selected by the Japanese government as one of the “SDGs Future Cities”

in June 2018. According to recent statistics, decoupling (meaning, prefectural GHG emissions decreased and prefectural GDP increased) was targeted in the plan (Figure 4).

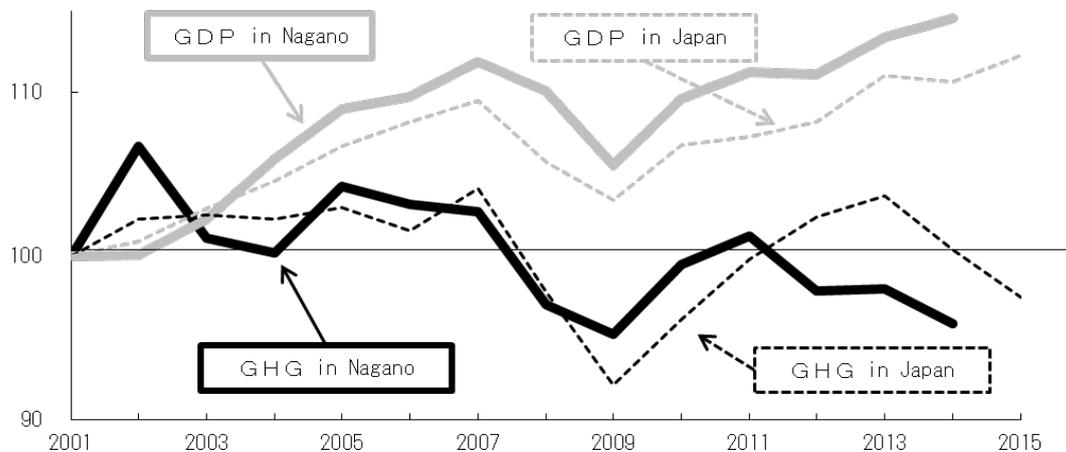


Figure 4: Comparison of GDP and GHG emissions between Nagano Pref. and nationwide (Index: 2001=100)

* CO₂ emission factor is based on the brake-specific emission in each FY.

Nagano Prefecture carried out an interim review on the plan in order to create linkages and to coordinate with subsequent plans such as the Nagano Prefecture Five-Year Comprehensive Plan and the Fourth Nagano Prefecture Environmental Basic Plan. In addition, the plan was reviewed to incorporate the viewpoints of the SDGs adopted in 2015 at the General Assembly of the United Nations and, as the result, measures for the eight items shown below were added to enhance actions for achievement of goals in 2020 (Figure 5).

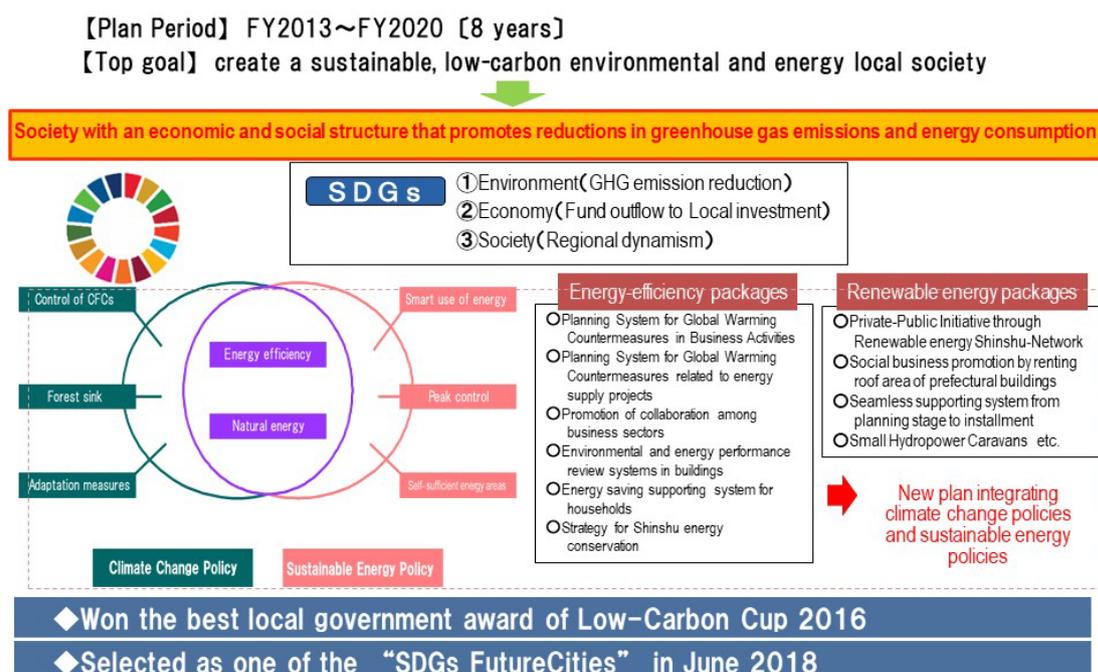


Figure 5: Nagano’s Strategy on Sustainable Energy

2.1 For spreading the use of renewable energy

In July 2012, Act on Special Measures Concerning Procurement of Electricity from Renewable Energy Sources by Electricity Utilities (so called Feed-in-tariff law) was enacted to enable the producers of electricity from renewable energy resources to sell the electricity at a stable price. In light of this change, Nagano Prefecture laid out a concept as described below to promote renewable energy through local investment based on the idea of “community power.” (Figure 6).

This means:

1. Utilizing the framework of the above-mentioned Act
2. Working with local stakeholders to identify the installation project
3. Ensuring private sectors, NPOs, farmers, lumber camps and individuals take ownership of local renewable energy promotion
4. Creating an enabling environment to prevent environmental destruction and to build a consensus by setting clear rules and creating a positive relationship among the local communities
5. With these conditions, enhancing support measures, such as capacity development of those who run these renewable energy projects, by creating a circulation in which the local banks, credit banks, JA, Labour Banks, and other civil funds invest in those projects and hence profits of those projects come back to the locality

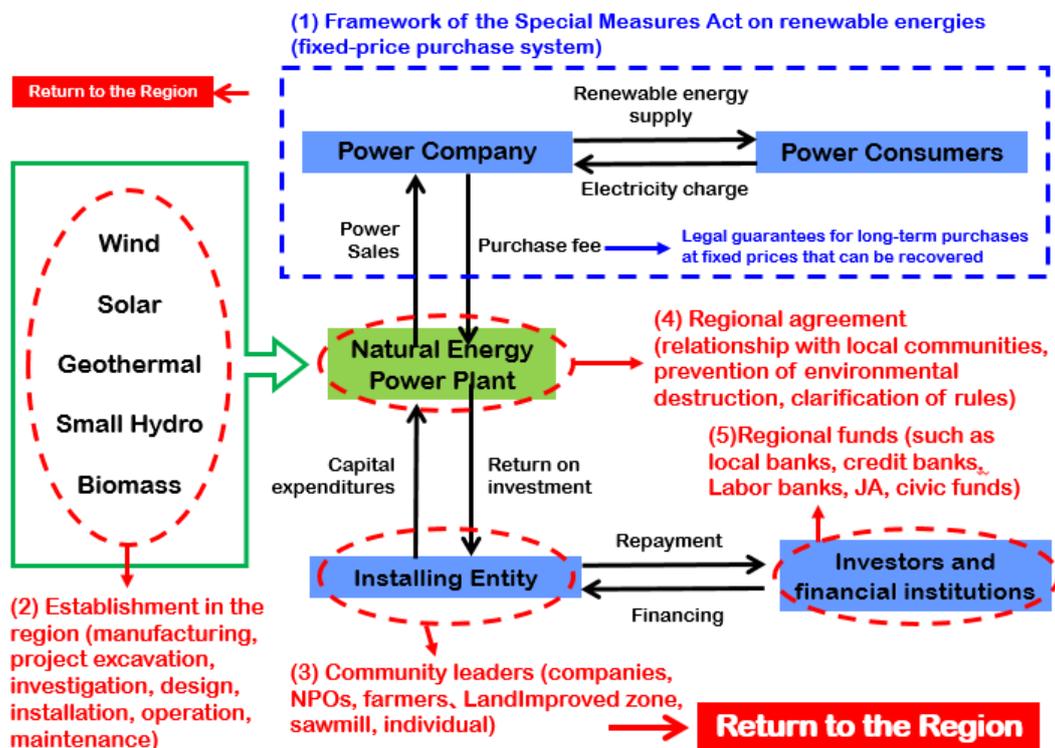


Figure 6: Five points of Regional Initiative.

As one component in such a system, Nagano established the "Profit-Return Based Subsidy System" (Figure 7). This system works as follows: for those businesses that face difficulties in raising funds on their own, Nagano examines their business and provide subsidies up to one third of their initial investment. Those recipient businesses will pay back the profits under the FIT system to Nagano. By comprehensively supporting the project from designing to the actual installation with support from experts, Nagano increased the ratio of successful projects and created an investment-friendly environment for local financial sectors. Moreover, by allowing exemption from payment in the case of unsuccessful business operation due to unforeseeable circumstances, the system was welcomed and many projects have been created (six cases in FY2014, nine cases in FY2015, three cases in FY2016).

"Profit-Return Based Subsidy System"
Supports initial investment of businesses that are difficult to raise funds on their own
(subsidies to be repaid to Nagano pref. from their profit under the FIT system)



Systematic support from planning to installation

By Nagano's taking a certain amount of risk through our assessment, loans/investments from financial institutions can be more easily drawn out.

<Case>

Methane fermentation biomass power generation business by used culture medium of mushrooms

Shinshu Nakano Eco Powerland Co., Ltd.
 (Nakano city)

Stats & Results

【Support cases】

- FY '14: 6 cases
- FY '15: 9 cases
- FY '16: 3 cases

【Expected project creation】

Solar : 5, 1,890kW
 Micro-hydro: 7, 2,390kW
 Total: 12 projects, 4,280kW

【Total Subsidies】

295,114,000 Yen

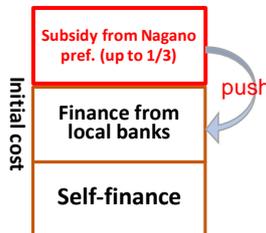


Figure 7: Initiatives of Nagano to help community-based business.

2.2 Implementation of Energy-Saving Policies

Energy-Saving Policies of Nagano are characterized by the way the Prefecture utilises the existing national policy framework, and how it contextualizes it in the context of local areas, as well as improving usability and accessibility of the system (Figure 8).

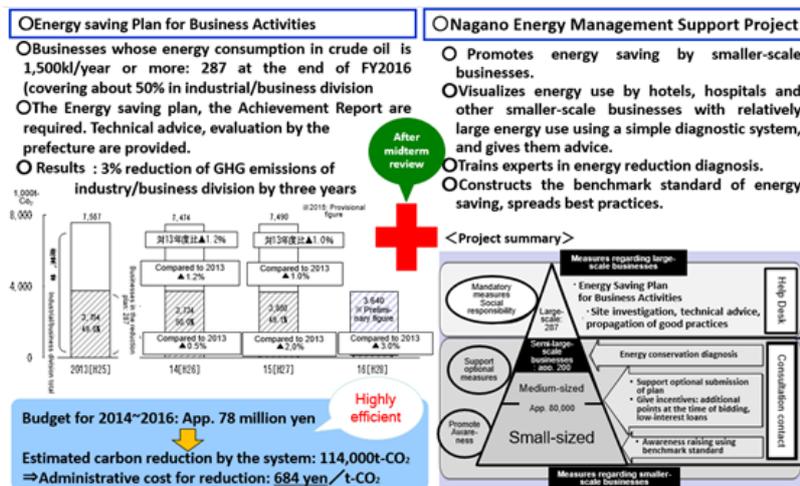


Figure 8: Unique efforts by Nagano Prefecture (1): Energy saving policy for business activities.

The Act on Promotion of Global Warming Countermeasures of Nagano mandates the energy

consumption reporting to prefectural business establishments with an annual energy consumption of 1,500 kl (287 establishments at the end of FY2016) which accounts for about half of the total emissions from the industrial and business sectors, and obligates them to report their energy-saving plans and results. In addition, Nagano encourages energy-saving measures by business enterprises with large energy consumption by ensuring they can receive advice from experts. The budget used by Nagano Prefecture over three years from FY2014 was about JPY 78 million, and an expected reduction in emissions of about 114,000 tons of CO₂. A simple calculation of the cost comes to less than JPY 700 per ton, so this was an extremely effective measure.

During the mid-term review of “Nagano’s Strategy on Sustainable Energy” (March 2018), the Shinshu energy management support project was established for approximately 80,000 small and medium enterprises (SMEs) (less than 1,500 kl). Nagano supports visualisation of the actual use of energy by simple diagnosis for forestry and hospitals, etc. whose amount of energy consumption is relatively large amongst SMEs. Nagano also set up a consultation desk, provided training for energy-saving diagnostic experts, built benchmarks, and carried out energy-saving advice.

In this way, Nagano is making obligatory measures for large-scale businesses with strong social responsibility, and for SMEs, promoting voluntary efforts. The system in Tokyo uses this system as a reference. Nagano Prefectural staffs are dispatched to Tokyo to promote this initiative.

Japan established its first energy saving standard (the previous energy saving standard) for buildings in 1980. The latest standard was set in 2013. Notification and regular reporting is required for buildings with a floor area of more than 300 square meters. Currently there is no duty for buildings with a floor area of less than that.

Nagano Prefecture took a step even before the national government and other local governments, and enacted regulations from April 2014 that obliged all building owners to consider insulation of renewable energy equipment and enhance environmental energy performance, such as heat insulation, when constructing buildings including housing. In its implementation, Nagano aimed to develop the capacity of local builders by hosting workshops to provide training on how to use a tool to evaluate the energy-saving performance of buildings and energy saving technologies. They asked for understanding from local financial institutions as energy-saving investment increases the amount of investment (Figure 9).

As a result, according to the questionnaire survey conducted by Nagano Prefecture, the compliance rate with energy-saving standards set by the national government is 83.7%, which is 30% higher than the national average of 53%, and is second only after Hokkaido, which has a colder climate. In addition, the rate of introduction of renewable energy such as solar power generation, solar heat utilization, kiln and pellet stove, reached 40%.

After the mid-term review of "Nagano's Strategy on Sustainable Energy", the prefecture launched an energy-saving renovation support system for existing buildings occupying a great majority in number. It provides simplified diagnostic tools, training, seminars for the general public, etc., and approves businesses that meet certain requirements, such as participating in training and acquiring skills, as "energy-saving repair support business operators" who provide a simple diagnosis of the energy-saving performance for no charge. In addition, because environmentally-friendly housing leads to comfortable and healthy living, the prefecture provides environment-friendly housing subsidies and encourages new construction and renovation.

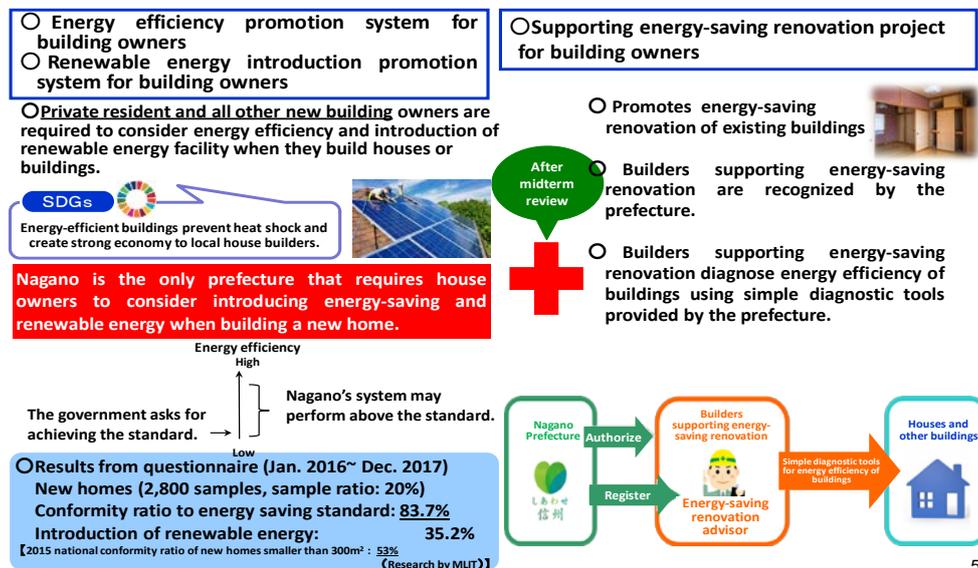


Figure 9: Unique Efforts by Nagano Prefecture (2): Energy conservation of buildings.

2.3 Adaptation to Climate Change Impacts

Even with maximum reduction in greenhouse gas emissions, global warming has progressed to a certain extent, and the risk of climate change is obvious. Therefore, in addition to the mitigation measures that curb greenhouse gas emissions, there is a need for adaptation measures that address the effects of climate change and avoid or reduce damage.

The impact of climate change has become a concern in various sector such as agriculture and disaster management (more details to follow). The average temperature in Nagano Prefecture rose by 0.3°C compared to the global average, and in a hundred years it is expected to rise by 1°C from the baseline temperature, regardless of any countermeasures taken or not.

When drafting “Nagano’s Strategy on Sustainable Energy”, Nagano Prefecture conducted a full review of its climate change measures by establishing a study group for discussing effective policies to achieve their long-term visions in 2012. The study group consisted of several sub-groups with separate themes, one of which focused on adaptation. Discussions among the taskforce members of the adaptation group evolved into the climate adaptation package as shown in Figure 10. The package indicator shows the need for a systematic approach as in the establishment of a monitoring network and a platform for facilitating communication flow with citizens.

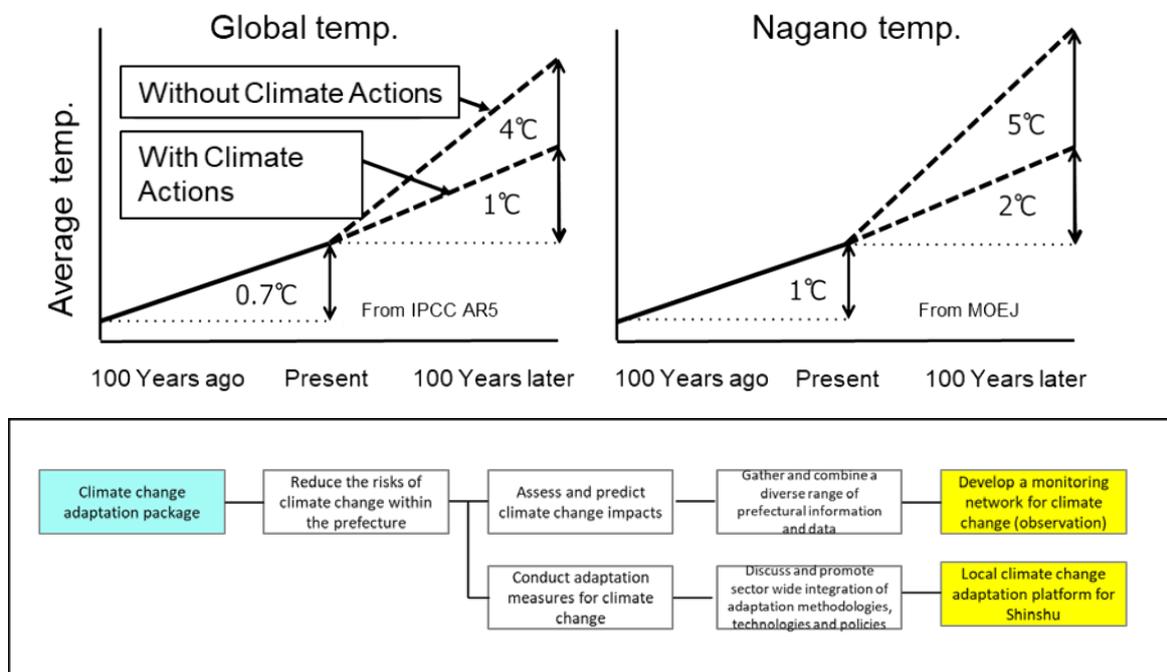


Figure 10: Development of the climate adaptation package.

The Nagano Prefecture Environmental Conservation Research Institute has participated in an adaptation research project of the Ministry of the Environment since 2010, which encouraged the prefecture to develop the “Nagano’s Strategy on Sustainable Energy” in 2012 that clearly stated the need for adaptation measures ahead of the whole country.

The “Shinshu Monitoring Network for Climate Change” was established in 2014 with 50 institutions and the number of observation points for temperature and rain were added for the purpose of understanding the status. In 2016, Nagano Prefecture became the first regional government to establish the “Local Climate Change Adaptation Platform for Shinshu” with 49 participants from local institutions and companies. The platform has facilitated in depth discussions on climate adaption with four task groups targeting agriculture, disaster reduction, eco-systems and health respectively (Figure 11).

The agriculture task group conducted climate change impact assessments that would contribute to research and development of new production technology and breeds of rice, apples and lettuce under a warmer climate. The disaster prevention task group developed a probabilistic risk analysis map of landslides of slopes taking into account precipitation patterns, and conducted on-site research to improve the accuracy. Both of these outputs have been disseminated from the “Local Climate Change Adaptation Platform for Shinshu” but there still remain some issues. Recognition of climate change adaptation is still fairly limited among citizens, efficient methodologies for collection and quality management of data is required, and effective ways need to be developed to give back to society what was learned from the collected data. Additionally, collaboration between different local government offices responsible for implementation of adaptive measures is quite limited.

Nagano Prefecture is making efforts to support the development of adaptive measures against climate impacts at local level in the region by setting up the “Shinshu Climate Change Adaptation Centre” in FY 2019.

Dissemination of climate change related information needs to continue from a single website, monitoring and climate change impact analysis needs to continue. Other requirements include innovative technology to be developed through stronger partnership with the national government/other prefectures/academia, information sharing among the academia, companies and the government, as well as assessment of needs and seeds of Nagano Prefecture, relevant towns and cities, the academia, and companies. Furthermore, Nagano Prefecture intends to support towns and cities in tackling climate adaptation, construct ways to channel data to entities that implement adaptation projects, and upload information as a result of impact assessment for different sectors.

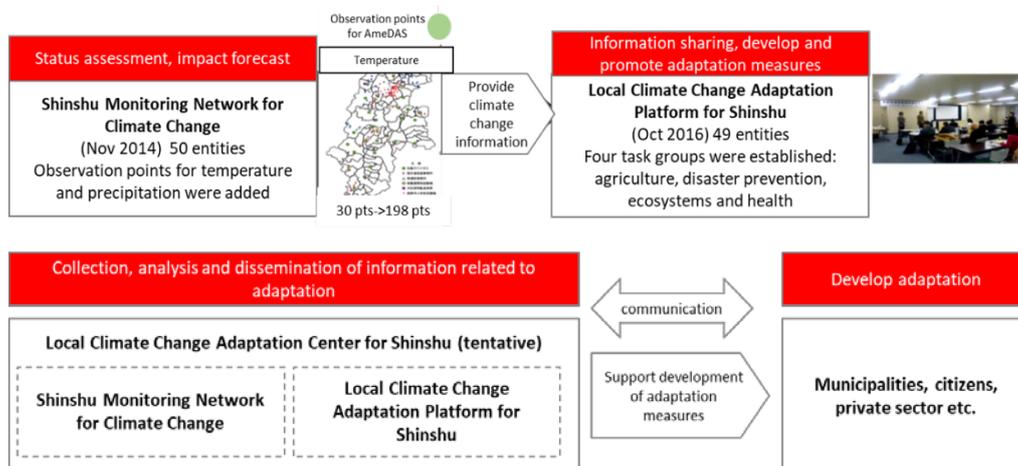
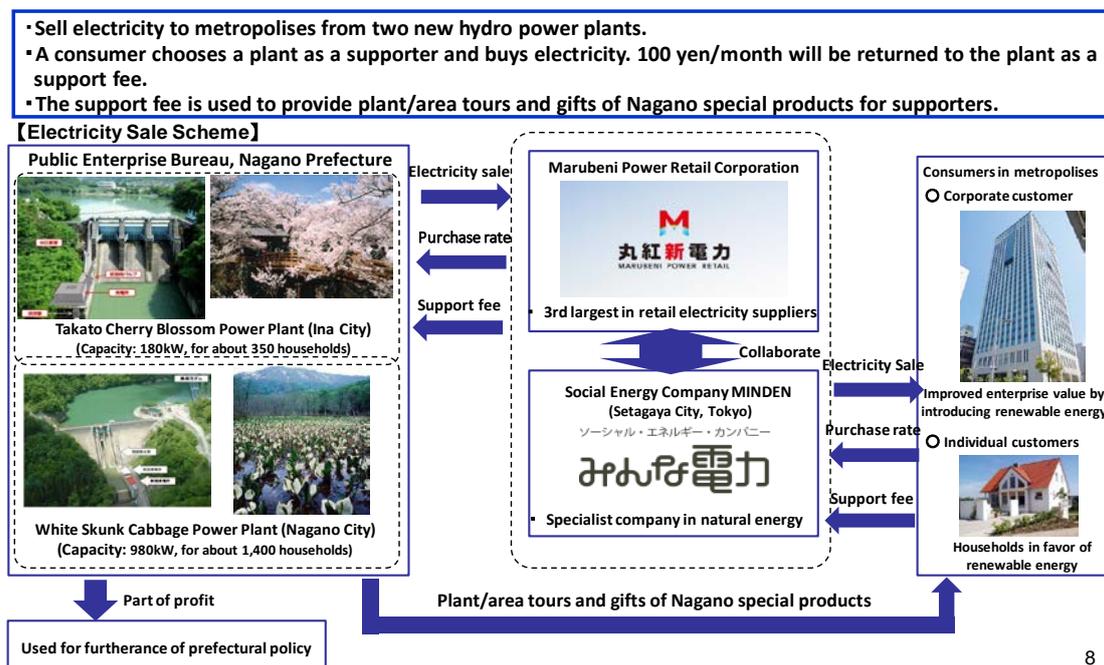


Figure 11: Nagano’s actions towards climate change adaptation.

2.4 Collaboration with stakeholders in other regions in Japan and international collaboration

In addition to promoting renewable energy and energy efficiency within the prefecture, collaboration with other local and regional governments is important.

For example, Nagano Prefecture sells electricity generated at the 2nd Kisana Power Plant (White Skunk Cabbage Power Plant) to public buildings and private residence in Setagaya Ward, Tokyo in partnership with Marubeni Power Retail Corporation and Social Energy Company MINDEN. As such, the Prefecture contributes to promotion of renewable energy use in the Tokyo metropolitan area (Figure 12).



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Figure 12: Unique efforts by Nagano Prefecture (3): Electricity sales connecting Nagano and other metropolitan areas (Public Enterprise Bureau).

Nagano Prefecture hosted the “Local Renewables Conference 2017 in Nagano” in 7-8 September 2017 with the Ministry of the Environment, Japan and ICLEI Japan, with the aim of achieving 100% renewable cities and regions. The conference was started by ICLEI and the City of Freiburg, Germany and is organised biannually in Europe; Nagano became the first host of the Conference in Asia. The conference received 765 participants from all over Japan, Germany, France, Denmark, and Taiwan and offered a unique opportunity for local governments, energy service providers, business representatives and experts to meet, and it served as an important forum to share both domestic and international knowledge, experiences, and good practices. The local leaders gathered at the conference presented the “Nagano Declaration: Local leaders working together to achieve 100% renewable energy cities and regions” as an outcome of the conference. The declaration indicates the commitment of mayors and governors of the Japanese local governments attended the “Local

Leaders Summit” to take new action and enhance cooperation to achieve 100% renewable energy cities and regions (Figure 13).



Figure 13: Local leaders gathered at the Local Renewables Conference in Nagano on 7~8 September 2017 (copy right by Nagano Prefecture)

Nagano Prefecture is also one of the initial members of the Green Circular Cities Coalition (hereafter: GCCC) initiated by ICLEI. With the recognition that cities across the world are at a critical point to transition from a linear take-make-dispose pattern to a more circular one, GCCC was initiated by ICLEI to empower global cities to shift from the linear paradigm towards the circular and sound-material cycle society through synergising with Sustainable Development Goals (SDGs), integrating ecological, spatial, and economic resources in the urban/regional system.

As part of GCCC, Nagano Prefecture together with other cities from China and Europe will have occasion to engage in city-to-city collaboration, including sharing good practice to strengthen its action towards achieving a circular and ecological economy. Together with solution providers (mainly private companies) and knowledge partners such as research institutes and organisations, collaborative actions will be accelerated among stakeholders and Nagano Prefecture is expected to take an active role in the coalition.

3. FUTURE DIRECTIONS

By having tailored domestic and international good practices such as those in Tokyo and Germany to local circumstances, Nagano Prefecture developed and implemented its energy and climate change policies that are suited to local circumstances and beneficial to the region. As a result, the local economy is growing while GHG emissions were reduced, which means that decoupling was realised. This also directly links to implementation of SDGs at the local level, and in June 2018, Nagano Prefecture was selected as an SDGs Future City by the Japanese government.

On the other hand, the population continues to decline at a faster rate than the national average and the proportion of aging population is also higher than the national average. Even as we extend life-expectancy, we cannot always be optimistic when looking at how we will lead our lives in an era of 100-year-life. In addition, technological innovation and globalisation are rapidly advancing, and it is necessary to adapt to the movements of the international community and economy more than ever.

Based on such a background, Nagano Prefecture formulated "Shinshu Creativity Plan 2.0 — A new era developed with the power of learning and autonomy — Nagano Prefecture Comprehensive Five-Year Plan" in March 2018. It is a plan that aims to achieve a "Beautiful" Shinshu where people enjoy "Reliable Life" through "the power of learning and self-government." Priority policies include "promotion of regional economic circulation," "contribution to the global environment," and policies to improve the economy and society from energy and environmental approaches. It can be said that it is the Nagano version of the SDGs plan.

Almost as if synchronise with the above movement, the Japanese government established the "Fifth Basic Environment Plan" based on a Cabinet decision in April 2018. This Basic Plan was formulated after the adoption of SDGs and the Paris Agreement on climate change both in 2015. It utilises the concept of the SDGs and sets up six interdisciplinary cross-cutting "priority strategies" to create innovations across all perspectives including those concerning socio-economic systems, lifestyles, and technologies and to realising the integrated improvements on environment, economy and society, which will result in the new development that brings high quality of life in the future. The Basic Plan advocates a new concept of "Circulating and Ecological Economy" that maximizes the vitality of the region. Under the concept, it aims to promote actions to build a self-reliant and decentralized society in each region, complementing resources and providing mutual support with other regions.

Nagano Prefecture is bringing these objectives to the ground level by implementing particular "Circulating and Ecological Economy" actions. Nagano's Circulating and Ecological Economy plan seeks a 100% renewable energy and a bioeconomy based on de-carbonisation, resource circulation, and biodiversity (Figure 14). This will simultaneously revitalise local economies, and increase health and welfare. Nagano promotes three points to attain a Circulating and Ecological Economy. First is to create municipal and regional level models of Circulating and Ecological Economy through coordination, leadership, and resources. Second is to promote community-based energy saving and renewable energy projects – such as the ones discussed in this paper. The final point is to advance international exchange and cooperation in realms such as human resources

development and/or technology and knowledge transfer. Nagano's Circulating and Ecological Economy brings to the forefront de-carbonisation and renewable energy. The "Nagano's Strategy on Sustainable Energy" (2013-2020) targets a GHG reduction of 36% by 2030, exceeding Japan's target of 26%. As this paper has shown, Nagano is already implementing concrete de-carbonisation projects.

At the local level, Ina City is setting an example of good practice in implementing the Circulating and Ecological Economy. Ina City is pursuing a forest-based bioeconomy. The city released its Ina City Forest Vision for the next 50 years in 2016. The plan envisions a sustainable forest management system in which the forest supports economic development and contributes towards lowering GHG emissions. Within this plan, the citizens take a leading role in developing a circular economic model promoting the proper use of local wood in a myriad of products, from wood pellets to wooden houses, and also using biomass heating. An educational programme to teach children about the richness of forests and the importance of defending biodiversity complements this initiative.

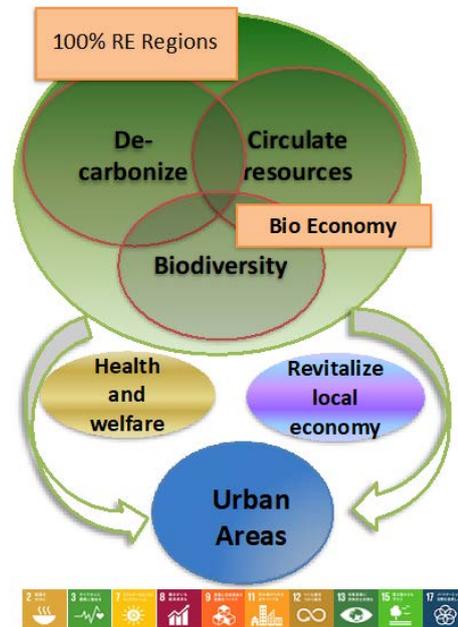


Figure 14: Key concept for Circulating and Ecological Economy.

These are just some highlights of Nagano's current work on SDGs and the Circulating and Ecological Economy. They show that by integrating every stakeholder and thinking creatively on how to use regional and local resources, local areas can take the lead into envisaging sustainable development pathways. Nagano Prefecture is fully embracing the Circulating and Ecological Economy in its framing of an ambitious agenda towards a sustainable future.

"The G20 Ministerial Meeting on Energy Transition and Global Environment for Sustainable Growth held on 15-16 June in Karuizawa" is set to be a good driving force to push forward the actions of Nagano Prefecture toward a sustainable society based on the revised "Nagano's Strategy on Sustainable Energy" in 2018.

Reference:

Nagano prefecture, "Evolving sustainable energy policy in Nagano Prefecture, Japan: The path towards a 100% renewable energy region" (2018.3) <http://copjapan.env.go.jp/talanoa/assets/pdfs/stories/en/20180601-001.pdf>

K. TAKEUCHI, J. FUJINO, F. ORTIZ-MOYA, et al., "Circulating and Ecological Economy - Regional and Local CES: An IGES Proposal", IGES Discussion Paper (2019.3) <https://pub.iges.or.jp/pub/circulating-and-ecological-economy-regional>

This Background Information is a summary by IGES (Institute for Global Environmental Strategies) and ICLEI Japan, based on information mainly provided by Nagano Prefecture. Giving their own views on actions in Nagano Prefecture that are at the forefront of initiatives being carried out in Japan on energy, climate change as well as the SDGs, this information shall be widely shared with participants at the “G20 Climate and Sustainability Working Group 2 (CSWG2)”. Any errors found herein are the sole responsibility of IGES.

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