

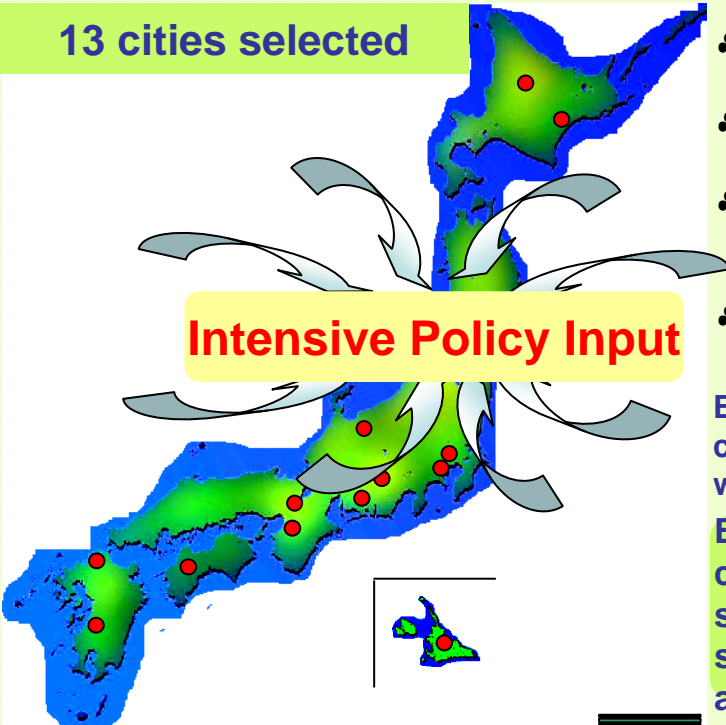
# Eco-Model City Project (EMCP)

## Regional Revitalization Project, Eco-Model Cities leading the transformation to the low-carbon society

### Selection and Support of EMC

Cities take on the challenge of implementing pioneering actions to achieve ambitious targets

13 cities selected



- ♣ Big  
Kitakyushu, Kyoto, Sakai, Yokohama
- ♣ Middle  
Iida, Obihiro, Toyama, Toyota
- ♣ Small  
Shimokawa, Minamata, Miyakojima, Yusuvara
- ♣ Tokyo  
Chiyoda

EMCs made action-plans, in which concrete policies to achieve the target were accumulated

EMCs serve as pioneer cities, demonstrating specific actions that should be taken to achieve a low-carbon society



EMCs play role as leaders

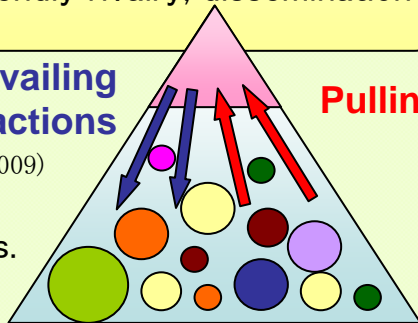
### Expansion of Actions in Promotion Council of Low-Carbon Cities (PCLCC)

Platform for local governments seeking to create low-carbon cities  
Role: Expansion of best practices nationwide, friendly rivalry, dissemination of information at home and abroad

- ♣ Consists of 168 parties
  - 85 cities
  - 46 prefectures
  - 12 ministries
  - 25 public agencies (as of 5<sup>th</sup>, Oct, 2009)
- ♣ Participating cities create action plans in the same manner as EMCs within around five years.
- ♣ Produce best practices and expand them

Prevailing actions

Pulling up



Drastic reform of social system

### Transformation to Low-Carbon Society



- Reform of life-style and business-style
- Transformation of city structure, transportation system
- Utilization of local resources

Realize Simultaneously

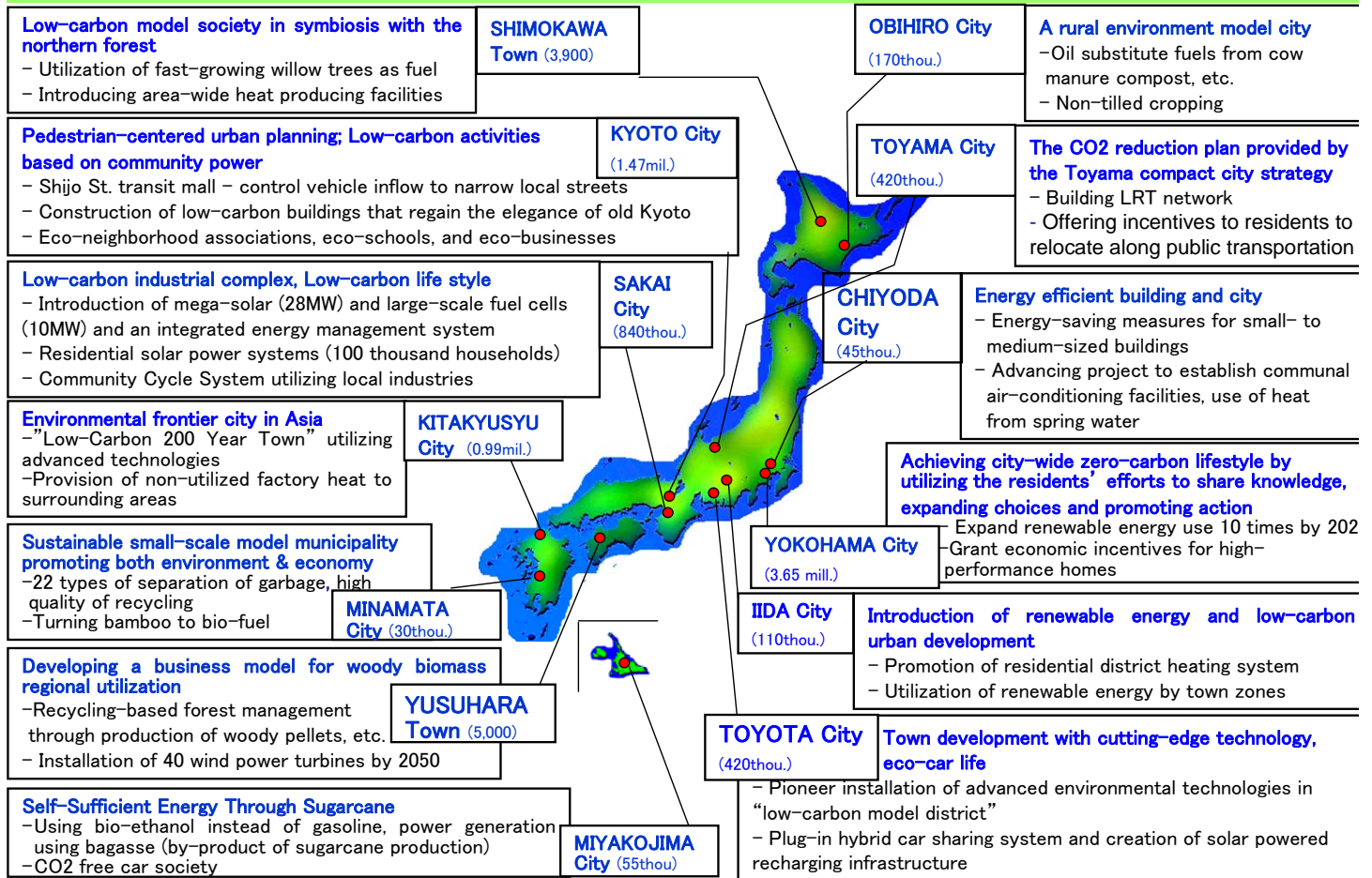
### Revitalization of Local Society

- Improvement of QOL
- New business generation
- Economic effect
- Enhanced inter-community exchange
- Revival of local community



# Examples of EMCs' Initiatives

( ) stands for population



Cities	Population	Area	Reduction (Mid-term)	Reduction (Long-term=2050)	Base year
Kitakyusyu	0.99 million	488 km <sup>2</sup>	30% (2030)	50% to 60%	2005
Kyoto	1.47 million	828 km <sup>2</sup>	40% (2030)	60%	1990
Sakai	840 thousand	150 km <sup>2</sup>	15% (2030)	60%	2005
Yokohama	3.65 million	437km <sup>2</sup>	Over 30%/head (2025)	Over 60%/head	2004
Iida	110 thousand	659km <sup>2</sup>	Household sector 40% to 50% (2030)	70%	2005
Obihiro	170 thousand	619 km <sup>2</sup>	30% (2030)	50%	2000
Toyama	420 thousand	1,242 km <sup>2</sup>	30% (2030)	50%	2005
Toyota	420 thousand	918 km <sup>2</sup>	30% (2030) Challenge:50% (2030)	50% Challenge:70%	1990
Shimokawa	3,900	644 km <sup>2</sup>	32% (2030)	66%	1990
Minamata	29 thousand	163km <sup>2</sup>	33% (2020)	50%	2005
Miyakojima	55 thousand	205km <sup>2</sup>	30~40% (2030)	70% to 80%	2003
Yusuhara	5,000	237km <sup>2</sup>	50% (2030) *energy conversion sector excluded 3.5 times GHG sink (2030)	70% *energy conversion sector excluded 4.3 times GHG sink (2030)	1990
Chiyoda	45 thousands	12km <sup>2</sup>	25% (2020)	50%	1990

# Eco-Model City Initiatives (Kitakyushu City)

- Overview : Population of approx. 990,000; total area of approx. 488 km<sup>2</sup>
- As an industrial city, Kitakyushu has a history of overcoming serious pollution levels
- The city plans to cut greenhouse gases by 30% by 2030 and 50% by 2050 (compared with 2005), and to achieve a **150% reduction for all of Asia**
- Kitakyushu is striving to forge an environmental model for Asia and the world.

## Adopting new energy sources

### Untapped energy sourcing systems

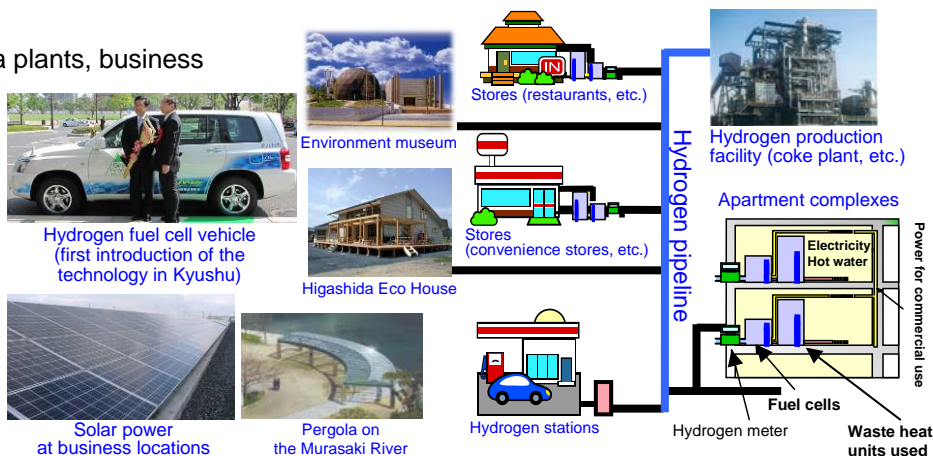
Waste heat from plants is supplied to area plants, business buildings, farms, etc.

### Kitakyushu hydrogen town

Utilizing hydrogen produced at plants, we are building "hydrogen towns" where the hydrogen is supplied to fuel cell cars and to stores

### Solar factories

Using untapped rooftops of plants, public spaces, etc. we are implementing a large-scale solar energy generation project



## Creating low-emissions communities

### Advanced-model low carbon emission "town"

Create a low carbon emission model district by: 1) adopting long-lasting energy-efficient housing (incorporating cutting-edge technology) and 2) fostering a public transport hub

### Popularizing environment-friendly buildings

For private buildings exceeding a certain size, builders must submit environmental performance evaluation results (evaluation using the CASBEE system)

### Advanced vehicle transport systems

Set up an effectiveness verification project for fuel cell cars and electric cars, and electric car charging facility networks

### Environmental initiatives using community electric bicycle systems

Set up an electric bicycle rental system where the bikes can be rented and returned anywhere in the city

### Creating a low carbon emissions/revitalization plan for city centers

Build solar roofs on top of city center bridges, arcades, etc.



Electric cars and rapid charging stands



City motorbike recharging station



Solar rooftops on the Murasaki River

Solar arcade

## Resident participation system

### Kitakyushu's carbon offsetting/eco point system

Create a system where ecopoints earned for environmental activities are circulated. Working capital is then used to purchase carbon offsets.

### Integrated study system for a low emissions society (Super CAT)\*

Construction of an eco house involves adoption of solar power for all elementary schools, enabling a system where the concept of the low-carbon emission society can be integrated into general curriculum around the city.



Solar power generation at Sone Higashi Elementary School



CAT core (environmental museum) and Eco House

※Center for Alternative Technology

## An Asian shift to low-carbon emissions

### Asia Low-Carbon Emissions Center (tentative name)

Boost technology for low carbon emissions, transfer it to all Asian regions, and help Asian nations achieve lower carbon emissions as they grow



Foster a cooperative network of Asian cities on the environment (foreign diplomacy with a view to urban environmental improvement)

# Eco-Model City Initiatives -Kyoto City (Kyoto)-

- **Outline:** Population of approx. 1,470,000; total area of 828 km<sup>2</sup>
- The birthplace of the Kyoto Protocol. Famous for its natural beauty with three-fourths of its area forested, Kyoto is visited by around 50 million tourists every year.
- Aiming for a 40% reduction of greenhouse gases by 2030, and 60% by 2050 (compared with 1990).
- Striving to become a “Zero-Carbon City” through pedestrian-centered urban planning, low-carbon buildings, use of local materials, and lifestyle changes.

## Pedestrian-centered Urban Planning

### OMobility management

Expand the city’s policies for "eco-commuting" to 200 local government and public offices and 700 other offices over a certain size (encompassing some 190,000 employees). Have local travel agencies encourage tourists to refrain from using personal vehicles.

### OShijodori Transit Mall

Secure space for pedestrians with wider sidewalks and give preference to public transportation with special lanes on roadways.

### ORestricting vehicle access to narrow streets

Working through Eco-neighborhood Associations, implement a creative system of flexible and efficient restrictions on vehicle traffic. Share results at conferences and use to pursue even more efficient initiatives.

### OLow-carbon public transportation

- Connect the southern region of the city with Kyoto Station by means of high-frequency, highly reliable buses.
- Continue to power city buses with biodiesel so that their operation is made more environmentally friendly.

### OTransitioning the city’s fleet to “eco-cars”

Transition the entire city fleet to “eco-cars” (fuel-efficient vehicles) and electric vehicles by 2018. Develop the necessary infrastructure to support recharging of vehicle(EV) batteries.

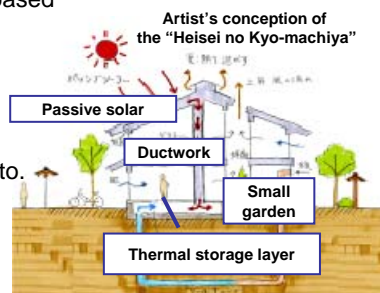


## Low-Carbon Building and Use of Local Materials

### OCASBEE Kyoto-certified Buildings

Promote the construction of low-carbon buildings (energy-saving, long-lasting structures built using locally produced materials that shorten transport routes) that still retain the elegance of old Kyoto through CASBEE Kyoto certification, which recognizes and gives benefits to qualified buildings based on efficiency and aesthetics.

The symbol of this program is the “Heisei no Kyo-machiya,” a new house created in the style of the traditional wooden townhouses that typify old Kyoto.



### OLocal lumber, local consumption

Promote local production and local consumption of lumber through Kyo no Yama, Somabito Workshop and the Miyako Somagi Certification System for locally produced building material labeling and green purchasing.



### OLntroducing renewable energy

Promote the use of residential solar power systems by expanding installation subsidies. Deploy wood pellet production equipment.

## Lifestyle Changes

### ○An “eco-fund”

Establish an “eco-fund” to implement environmental policy by promoting activities in the community and at schools and businesses.

- Eco-neighborhood Associations: Use "eco-points" and carbon offsets to promote energy conservation and the collection, conversion, and reuse of waste oil and garbage for waste biomass.
- “Eco-schools”: Award points to schools for “eco-friendly” efforts that translate into bonus money for the school budget.
- “Eco-business”: Work to increase “eco-commuting” and the use of fuel-efficient company cars. Allow businesses to use reductions they have achieved to offset emissions reported and disclosed in accordance with ordinances.

### ○The “DO YOU KYOTO?” Project

Observe “DO YOU KYOTO? Day,” held on the 16th of every month in commemoration of the day the Kyoto Protocol entered into force, by encouraging residents of all ages to participate in a variety of “DO YOU KYOTO?” activities, ranging from the “No TV, No Videogames” campaign at local kindergartens to a program in which local restaurants lower their lights and use candles to reduce electricity use. Use the day as a chance to try out new efforts and see what sticks.

“DO YOU KYOTO?”  
(Are you doing anything good for the environment?)



# Eco-Model City Initiatives –Sakai City (Osaka)-

- **Outline:** Population of approx. 835,000; total area of 150 km<sup>2</sup>
- **Some 60% of GHG emissions originate in industrial sector (2005).**
- **Aiming for a 15% reduction of greenhouse gases by 2030, and 60% by 2050 (compared with 2005).**
- **Striving to become “Cool City Sakai,” a low-carbon city, by transitioning to low-carbon industry, developing sustainable public transportation, and creating environmentally friendly lifestyles.**

## Transition to Low-Carbon Industry

### ○Developing a low-carbon industrial complex

Implement pioneering initiatives (installing some of the world’s largest fuel cells, using LED lighting, etc. at all plants) at a new industrial complex to be built in the Rinkai coastal area.

### ○Enhancing partnerships between businesses

Conclude a Cool City Sakai Support Agreement (tentative name) with businesses. Additionally, build the Sakai Low-carbon Technology Strategic Center (tentative name) to encourage the development of technologies that contribute to energy and resource conservation as well as the use of existing state-of-the-art technologies.

### ○Actively disseminating information

Provide information to surrounding communities and other regions in Japan and overseas, the initiatives underway in the Rinkai coastal area taking the role of showcase.

<Industrial zone in the Rinkai coastal area>



A Sakai district no. 7-3 Artist’s conception of a solar power plant (10 MW)



B Sakai industrial complex Artist’s conception of a solar power plant (18 MW)



<Examples of low-carbon businesses>

- (1) Power generation at a residential waste processing facility
- (2) Bioethanol plant (wood waste)
- (3) Hydrogen plant (using LNG-powered heating and cooling)
- (4) LNG station
- (5) Power generation at a waste wood chip incineration plant
- (6)(7) High-efficiency LNG thermal power station

## Toward Sustainable Public Transportation

### ○ Transportation network friendly to bicycle

As “a city of bicycle,” develop the environment convenient and safe to ride on bicycle. Toward the establishment of the bicycle network all over the city area, prepare areas for the bicycle.



### ○Community bicycle system

Provide a safe and highly convenient environment for riders so that Sakai lives up to its reputation as a bicycle-friendly community.

- Construct a community cycle system to be used by both city residents and tourists.

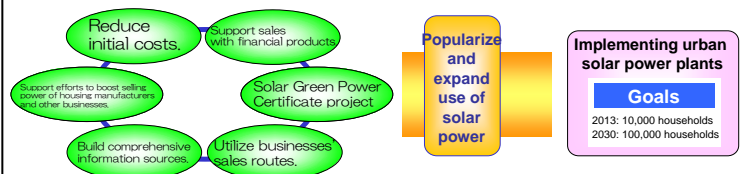
- Develop a bicycle-friendly infrastructure with the ultimate goal of building a network of cycling roads throughout the city.



## Creation of Eco-Culture

### ○Developing urban solar power plants:

Popularizing solar power generation  
Bring solar power to 100,000 households (one-third of all households in the city) by the year 2030.



### ○Preserving and creating “cool spots”

Facilitate independent action by industry, government, academia, and residents to bring the natural beauty of trees and water to the city by forming the Sakai Green Project to preserve and create nature, for example in the form of burial mounds, reservoirs, and the Kyosei-no-Mori plan.

### ○Drawing on the wisdom of residents and local companies

- Create a system whereby the city recognizes residents and local businessmen who have rendered distinguished service, for example through their efforts to achieve a low-carbon society.
- Put the flexible ideas generated from local youth to use through “Sakai student idea bank for urban development (tentative name)”

# Eco-Model City Initiatives -Yokohama City (Kanagawa)-

- **Outline:** Population of 3.67 million; total area of approx. 434 km<sup>2</sup>
- Reached target of cutting garbage volume by 30% ahead of schedule in two years through resident recycling efforts.
- Aiming to reduce greenhouse gases by more than 30% per person by 2025, and by more than 60% per person by 2050 (compared with 2004).
- Striving to achieve a zero-carbon lifestyle citywide by sharing knowledge, increasing the number of alternatives available, and utilizing the strengths of its residents.

## Zero-carbon Lifestyle

### ○Assessment and rating system for home performance

Grant economic incentives (lower property taxes, etc.) for houses that meet a certain level of performance (CASBEE Yokohama ranking, etc.) to popularize zero-carbon houses and “200-year houses.”



Meeting for which consumed electric power was offset by purchasing a Green Certificate



### ○“Eco-entertainment”

Aim to eliminate the use of disposable utensils and other wasteful practices at fast-food restaurants, hotels, and other establishments, and require carbon offsets at concerts and sports events sponsored by the city or held at municipal facilities.



### YOKOHAMA FC

Green Certificate purchased with funds donated by residents and companies on the occasion of a J-League match

### ○Energy-saving in large-scale developments

- Utilize the City Planning Proposal system (a system based on city planning legislation whereby land owners, NPOs, and other entities can propose land-use projects for land that exceeds a certain size) to promote the adoption of 10% renewable energy and to facilitate the acquisition of high rankings from CASBEE-Yokohama for large-scale developments.
- Adopt future regulatory measures, such as mandating the examination of renewable energy adoption.

### ○Yokohama Environmental Point system

- Emphasize the promotion of energy-saving actions in the home, environmental education for elementary students, revitalization of regional shopping areas, and resident-run activities as part of the Yokohama Port 150th Anniversary Event in 2009.
- Following verification of results, implement initiatives starting in 2010 to create structures that encourage actions that contribute to the reduction of emissions, for example purchases of energy-saving home appliances.

## Renewable Energy from the Power of Residents

Utilizing the J-Curve, increase use of renewable energy 10 times over current levels (raise the share in energy consumption from 0.7% in 2004 to 12% by 2025).

### ○Supply: Yokohama Green Power

Supply and increase renewable energy, for example through revenue from resident contributions and sales of Green Energy Certificates. Buy environmental electricity values at fixed prices.

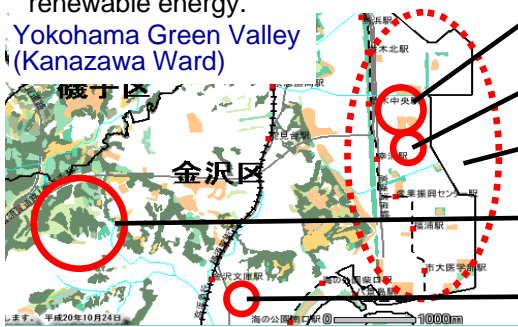
### ○Demand

- Utilize sewage treatment plants and other facilities to gather technology and knowledge about renewable energy and turn the Yokohama waterfront into a cutting-edge area that utilizes renewable energy.
- Turn all municipal buildings into high-efficiency facilities that make use of renewable energy.

Hama Wing (residential wind power plant)



### Yokohama Green Valley (Kanazawa Ward)



Treatment and utilization of sewage sludge (Southern Sludge Treatment and Recycling Center)

Recycling of residential garbage

Mutually beneficial use of electric power by businesses

Use of renewable energy at Kanazawa Zoo and Nature Park

Heat island countermeasures and central deployment model project at the Kanazawa Ward Office

## Transportation Measures

### ○Encouraging adoption of low-fuel-consumption vehicles

Promote the purchase of electric vehicles and plug-in hybrid cars (for example, through low-interest loans). Reduce fixed property taxes for infrastructure created for charging vehicles.

### ○Share appealing modes of transportation

Share use of electric cars with outstanding design features as well as “micro-mobility” (electrically powered two-wheeled vehicles, etc.).



Example of a fuel-efficient car

## Partnerships with Rural Areas

### ○Stopping global warming: Partnership models for cities and rural areas

Partner with Doshi Village in Yamanashi Prefecture and other rural areas to build a system where companies that support forest management can utilize carbon offsets. Facilitate partnerships among government, industry, and academia to promote businesses that utilize biomass resources such as thinned wood.

# Eco-Model City Initiatives –Iida City (Nagano)-

- **Outline:** Population of approx. 106,000; total area of 658km<sup>2</sup>
- **Declared in 1996 to be an “Ecological Cultural City”** that involves residents in tackling various environmental issues.
- **Aiming for a 40% to 50% reduction in greenhouse gases in the residential sector by 2030, and 70% by 2050 (compared with 2005).**
- **Aiming to be an ecologically sound, culturally dynamic low-carbon city by using local renewable energy from the sun and the forest.**

## Developing Urban “Eco-energy” Systems

### ○Encouraging use of solar energy

Develop passive solar and solar power projects with funding including Citizens’ Fund through local energy companies based on expertise developed in connection with residential solar power co-ops.



Residential solar power co-op at a nursery school

### ○Developing “urban eco-energy systems”

Establish a new entity to develop “urban eco-energy systems” to provide heat for individual city blocks through the use of passive solar heating and wood pellets and to sell and manage low-carbon real estate. Launch a demonstration system in a downtown area and eventually bring the system to all city areas.

### ○Saving energy in buildings

Promoting energy savings in existing homes and offices by establishing the region’s own energy-saving standards and enlisting the assistance of industry in switching to high-efficiency energy equipment.

## Low-Carbon Transportation

### ○Changing to eco-friendly vehicles

Induce residents to adopt low-carbon modes of transportation by supporting a move toward environmentally friendly vehicles such as electric automobiles and powered bicycles, and by developing a cycle-sharing system.



### ○Utilizing public transportation system

Introduce ride-share taxis in areas without convenient access to public transportation in order to curb the use of private vehicles and inefficient taxis.

## Promoting Lumber Use and Forest Management from an Environmental Perspective

- Increase demand, for example by developing a brand for locally produced lumber.
- Develop an integrated supply system encompassing thinning, transport, processing, and distribution.
- In addition to managing forests appropriately through selective thinning (to ensure adequate CO<sub>2</sub> absorption capacity), utilize thinned wood as a source of wood biomass energy.



Nanshin Biomass Coop's pellet manufacturing plant

## Transforming Awareness throughout the Region to Achieve a Low-carbon Society

### ○Basic Ordinance on the Achievement of a Low-carbon Society (tentative name)

Enact a Basic Ordinance on the Achievement of a Low-carbon Society (tentative name) designed to clarify and share goals related to the realization of a low-carbon society throughout the region and mandate efforts to achieve action goals. At the same time, establish a Low-carbon Society Fund (tentative name) to encourage low-carbon behavior and utilize it in various ways, including in the administration of an “eco-point” system.

### ○Fostering the development of global warming prevention coordinators and utilizing their efforts in the community

Foster the experts and utilize their efforts in the community in order to cultivate an awareness of environmental issues among residents and to encourage the adoption of low-carbon lifestyles.

### ○Holding regional carbon offset exchange programs

Create exchange (carbon offset exchange) opportunities with other cities utilizing the capacity of Iida’s abundant forest resources to absorb CO<sub>2</sub>.

### ○Pursuing every opportunity for environmental education

Work with businesses, citizen groups, and other organizations to provide environmental education for the current generation of workers as well as the children on whom the future depends.



Environmental education for children at a nursery school

## Business Sector Efforts

### ○Promoting low-carbon corporate activities through local environmental ISO study groups

Promote initiatives by small- and medium-size companies, for example through favorable evaluation of emissions reductions when companies join or are promoted within Minami-Shinshu EMS 21 (a simplified environmental management system).

Have companies that have joined local environmental study groups take the lead in putting industrial-sector initiatives into practice.



Environmental education program offered by a study group

# Eco-Model City Initiatives –Obihiro City (Hokkaido)-

- **Outline:** Population of 170,000; total area of approx. 619 km<sup>2</sup>
- **Central hub city in the Tokachi Region** that is developing large-scale farming centered on crop and dairy farming.
- **Aiming to reduce greenhouse gas emissions by 30% by 2030 and 50% by 2050.**
- **Striving to become a Rural Eco-Model City with a focus on agriculture.**

## Promotion of Low-carbon Agriculture and Livestock Raising

### OPopularizing and promoting no-tilling (reduced) farming

- Reduce plowing (turning soil), cut fuel consumption in farming machinery, and encourage the storage of carbon in the soil.

### OPromoting appropriate agricultural management

- Supply quality compost through crop/livestock integration (reducing chemical fertilizers), manage fields through precision farming using soil analysis and other techniques, and reduce pesticide use by utilizing antagonistic plants and other means.



## Forest Development through Resident Participation

### ONurturing and utilizing Obihiro Forest, a symbol for residents

- Develop the forest by planting and nurturing trees (4,400 trees on 5.2 ha), manage tree density through thinning (59 ha), and hold volunteer activities for residents that build up the forest (5 groups on 38 ha).
- Build and operate the Obihiro Forest Community Support Center (tentative name) to provide environmental education and other programs.
- Improve trails and promote use of wood biomass.



Hands-on forestation program in Obihiro Forest



Obihiro Forest

## Utilization of Renewable Energy and Other Resources

### OUUsing rich biomass resources

- Produce pellets from soybean straw, cow manure compost, and wood as a substitute for kerosene.
- Use food processing waste, fruit processing residues, and other materials in animal feed.
- Refine used cooking oil to manufacture biodiesel fuel (BDF).



Pellets manufactured from cow muck



Collecting used cooking oil



BDF refinery

### OADopting clean energy

- Increase subsidies for the use of solar energy systems in homes and set a precedent by installing systems in public facilities.
- Run cars and buses on bioethanol, BDF, and CNG.
- Switch to natural gas for heating and other fuel needs.



BDF bus



Solar panels on an elementary school

## Eco Town Development (tentative name)

Attract wood biomass, new energy, recycling, and other facilities to the Nakajima District.

## Citywide Public Action

Popularize household “eco-accounting” ledgers, reduce plastic shopping bag use by switching to reusable bags, have residents carry their own reusable chopsticks and drink bottles, promote wood pellet stoves, etc.





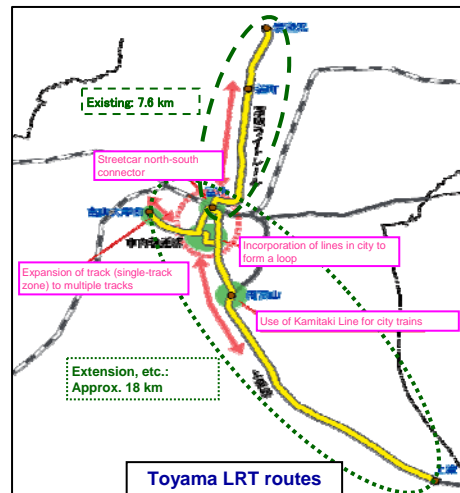
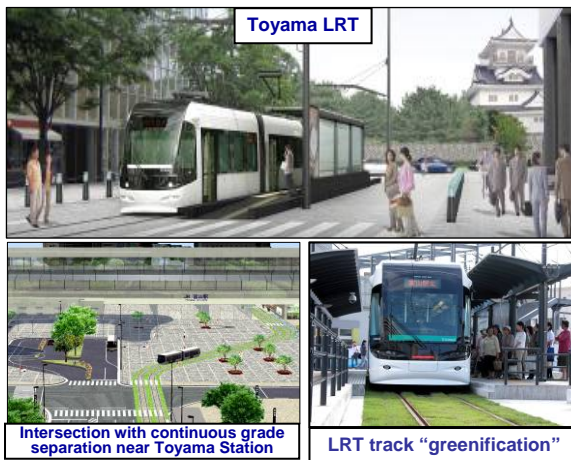
# Eco-Model City Initiatives –Toyama City (Toyama)-

- Outline: Population of approx. 420,000; total area of 1,242 km<sup>2</sup>
- The area is significantly dependent on the automobile (per-household gasoline consumption is the second highest in Japan).
- Aiming for a 30% reduction in greenhouse gases by 2030, and 50% by 2050 (compared with 2005) through initiatives including expanding the city's public transportation network based on light rail transit and achieving a compact city built around public transportation.

## Transportation System Development

### Expanding the city's light rail transit network

Introduce people who normally travel by car to light rail and reduce dependence on automobiles by expanding a user-friendly light rail transit network through such measures as drastically increasing the number of trams in service and offering barrier-free service. Implement continuous grade separation in areas surrounding transportation nodes that serve to relieve transportation congestion and plant grass along light rail transit tracks.

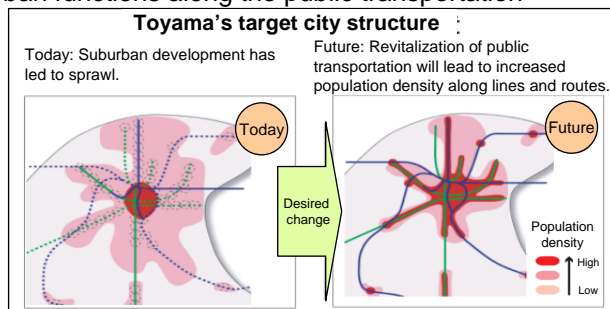


## Realization of a Compact City

### Promoting residential areas along public transportation corridors

Realize a "compact city" where it is possible to get around comfortably without using automobiles by intensifying the urban functions along the public transportation corridors in which light rail transit serve as the hub and promoting private residences within the city.

Reduce the distances residents must travel in their daily lives and significantly decrease dependence on the automobile.



## Initiatives to Encourage Resident Participation

### Tackling environmental activities with Team Toyama

The team consists of government, residents, and local businesses engages in imaginative activities to aid in the prevention of global warming. Involve residents in activities to prevent global warming, for example building energy-saving houses, installing environmentally friendly appliances, and reducing garbage volume.

## Utilization of Renewable Energy and Similar Resources

### Developing Toyama Eco-Town

Utilize biomass, thermal, and other forms of energy by establishing a resource recycling facilities base.



- (Recycling and energy facilities)
- Difficult-to-process fiber and mixed waste plastics
  - Used cooking oil
  - Wood waste matter
  - Garbage and pruned branches
  - Hybrid waste plastics
  - Automobiles
  - Waste energy center building site



### Introducing micro-hydropower

Build micro-hydropower stations as a small-scale distribution model for renewable energy utilizing the area's abundant water resources.

# Eco-Model City Initiatives -Toyota City (Aichi)-

- Outline: Population of approx. 420,000; total area of 918 km<sup>2</sup>
- Famous as a “automobile city”; a large part of GHG emissions is from industry and transportation. (Toyota boasts the highest value of delivered products in Japan.)
- Striving to implement the concept of “Hybrid City Toyota,” in which residents, environmental considerations, and technology come together.
- Adding to the three centerpieces, “transport,” “industry,” and “forest,” positioning “downtown” as a symbol from which dispatch information, “citizen” as support for those area. Aiming for a 30% reduction of greenhouse gases by 2030, and 50% by 2050 (compared with 1990), though the initiatives in these areas.

## Development and Diffusion of Environmental Technology

### OLow-Carbon Society Model District

Solicit and deploy advanced environmental technologies for transportation and residential construction. Spur the adoption and development of advanced technologies both inside and outside the city limits through demonstrative research projects.



## Industry: Promotion of Measures for Small to Medium-Sized Factories

### OEco-Management Network

Form the Toyota City Eco-Management Network to allow technological advice from companies advanced in their environmental actions, subsidies from the city, and management guidance from the Chamber of Commerce to be implemented in a single integrated policy in order to promote measures for small and mid-sized factories.

## Transport: Transportation Measures Utilizing Environmental Technologies

### OAchieving an eco-lifestyle with use of cars

Popularize “eco-cars” through such measures as joint pHV use and purchasing assistance.

- Promote “eco-driving” through such measures as the development of roads that encourage environmentally responsible driving and the 10,000-strong Declaration.
- Create areas in the city that give preference to pedestrians through measures like the development of transit malls.



pHV sharing



Toyota Oiden Bus (trunk line bus)

### ODEveloping user-friendly public transportation

Promote measures that encourage residents to switch to public transportation, including installing elevated multiple-line railroad track, developing P&R parking areas, testing priority bus lanes, and implementing mobility management.

## Forestry: Ensuring the Health of Man-made Forests

### OThinning forests and developing organizations to build local consensus

Implement an aggressive thinning program that doubles the pace of existing efforts to ensure the health of the 70% of the city’s area that is forested through the efforts of the Forest Development Council, a local consensus-building organization dedicated to concentrating business sites, and through 90% subsidies from the national, prefectural, and city governments. Ensure the health of all man-made forests by fiscal 2027.



Maximizing carbon absorption by forests

Forest Development Council

### OEstablishing a forest management organization and strengthening systems that promote the utilization of local lumber

Separate artificial forest ownership and administration and entrust the administration of all man-made forestland to a forest management organization. Develop a plant to process local lumber and promote the use of biomass.

## Citizen: Promotion of Resident Initiatives

### OPopularizing solar power

Accelerate the deployment of solar power by working to expand subsidy programs and take the lead with public facilities, linking efforts to the development of infrastructure for charging EVs and pHVs.

### OPromoting unified initiatives by residents, companies, government, and other entities

Have residents, corporations, government, and other entities work together to establish resident organizations to stage campaigns designed to accelerate the achievement of a low-carbon society as well as promotional organizations that will provide technical and institutional support for those activities. Expand the Eco Points program as a cross-cutting promotional tool for related initiatives.



Eco Points program

# Eco-Model City Initiatives (Shimokawa, Hokkaido)

- **Outline:** Population of approx. 3,900; total area of approx. 644 km<sup>2</sup>
- **Some 90% of the city's area is forested.**
- **Aiming for a 32% of reduction of greenhouse gas emissions by 2030, and 66% by 2050. Aiming to increase CO<sub>2</sub> absorption by 3.8 times by 2030, and 4.5 times by 2050 (compared with 1990).**
- **Striving to create a "Low-Carbon Model Society in Symbiosis with the Northern Forest."**

## Creation and Utilization of Biomass Resources

### Introducing forest biomass energy

- Introduce a district heating supply system using wood chips as fuel for areas where public facilities are concentrated. Reduce use of heavy fuel oil and kerosene by 90%.
- Develop processing and storage facilities to ensure that unused resources such as forest area remnants, etc., can be converted to fuel for the district heating supply system.
- Implement pilot tests for a collection system for forest area remnants.



### Implementing renewable forest management

- Steadily implement the deforest-afforest cycle (30 to 50 ha per year).
- Obtain internationally recognized FSC (Forest Stewardship Council) Forest Certification, which promotes forest conservation, benefits the local community, and contributes to a sustainable economy.



- Receive registration for the first forest management project under J-VER (offset credit) system. Promote cooperation with companies making advanced environmental efforts, etc.

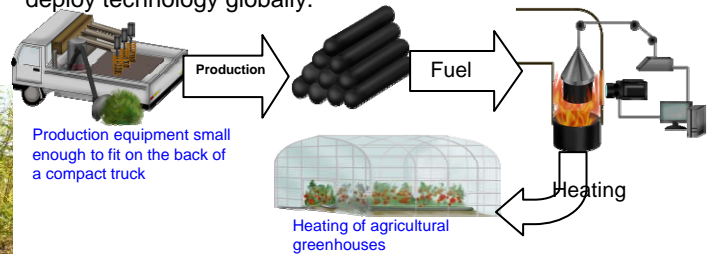
### Harvesting and use of the fast-growing yanagi (willow) trees

- Use willow trees as energy source
- Implement the "foster parents of yanagi eco-tour"
- Absorb (fix) CO<sub>2</sub>



### Development of new biomass energy technologies

- Through joint research with Kinki University and others, work to develop and demonstrate plant-derived bio-coke production vehicles and compact size burning equipment.
- In cooperation with farming households use the above as heating fuel for greenhouse and implement a pilot project to use the heat for the production and harvesting of winter tomatoes, which have a high market value.
- Use coal alternatives steel making and in such industries and deploy technology globally.



Production equipment small enough to fit on the back of a compact truck

Heating of agricultural greenhouses

## Development of Low-carbon Housing

### 21st Century Model Eco-House Project

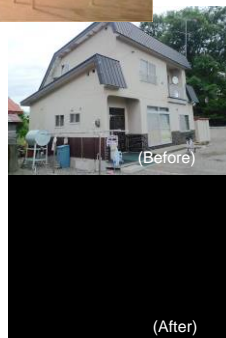
Construction of a model eco-house that has low environmental burden while providing all living comforts throughout the entire lifecycle of construction, inhabitation and rebuilding. The characteristic of this project is to make active use of local energy sources and live a simple life without undue reliance on various systems. The aim is to reduce CO<sub>2</sub> emissions in the household sector over the mid- to long-term by expanding this project around the town and beyond.

(Image)



### Project to promote the development of comfortable living environments

Provide partial financial assistance to cover the costs of renovations with the aim of improving home functionality, including insulation and privacy. Promote the development of living environments where residents feel safe and comfortable, and reduce the environmental impact of living arrangements. (FY2008: 35 homes, FY2009: 40 homes (anticipated number))



## Introduction of Resident Activities

### Complete reuse of waste cooking oil and the "My Bag" movement

Since April 2009 1,100 liters of waste cooking oil from homes and businesses has been collected as recyclable waste. This oil will be refined into bio-diesel fuel (BDF), enough to power one refuse collection truck. The "My Bag" movement is being implemented with the distribution of a reusable "my bag" to all households.



### Children's environmental classes

Staff from Hokkaido Environment Foundation hold classes to teach children about the links between global warming and daily life and what efforts they can make in the home.



# Eco-Model City Initiatives –Minamata City (Kumamoto)-

- **Outline:** Population of approx. 29,000; total area of approx. 163 km<sup>2</sup>
- **Aiming for a 33% reduction of greenhouse gases by 2020, and a 50% reduction by 2050 (compared with 2005). Striving to contribute to CO2 reductions outside Minamata through the Eco Town project.**
- **Committed to energizing the economy through environmental technology and activities and to learning from the Minamata disease outbreak.**

## Promotion of Region-wide Activities

### OPromoting Minamata’s own created environmental ISO program as an environmental management standard

Create an environmental ISO program addressing the full range of regional characteristics to change resident lifestyles at the base.

\*Includes business (plant, office), home, school, kindergarten/pre-school, lodge/hotel, and livestock industry versions (and in the future, high-school and new home versions, etc.).

Achieve dramatic reductions by expanding initiatives at factories and businesses.

#### O”Eco-shop” certification

Certify shops that conserve energy and resources, promote recycling, and sell environmentally responsible products.

There are currently 16 certified shops, and the number is expected to increase in the future.

#### OEnvironmental Agreement Zone system

Create rules for residents to protect the environment and promote efforts to observe those rules. There are currently eight such zones.

#### OForest cultivation by residents

Promote volunteer planting of forests to absorb CO<sup>2</sup> and protect the local forests that cover 75% of the city’s area.

ISO school edition



”Eco-shop” certification

Forest development by residents



## Resource Recycling Efforts

### OReducing and sorting garbage

Implement programs to sort garbage into 22 categories with resident cooperation (for example, small battery-operated devices using rare metals) to reduce garbage volume.



Garbage sorting by residents

Promoting  
partnerships  
Resource  
circulation

Reuse and recycling plant



Minamata  
Eco Town

### O Eco Town

Eco Town currently consists of recycling plants representing eight companies. Minamata is also developing the No. 2 Eco Industrial Park (tentative name) to serve as the recycling hub of not only Minamata, but also the entire southern Kyushu region.

## Utilization of Renewable Energy

### O Developing biomass energy using regional resources

Produce bioethanol from bamboo, citrus fruit extract, thinned wood, and other materials to use for fuel for city public transportation (including shipping).

### O Actively utilizing new energies

Establish power plants that use clean, natural energy sources such as solar and wind for public and other facilities.

Solar power  
(Fukuro Elementary School)



## Development as an Environmental Education City

### O Minamata Environmental College

Encourage students to learn through hands-on experience at this college without a campus as part of an effort to raise environmental awareness within and outside Minamata. Minamata Environmental College is currently working to become an accredited school.

### O Lifestyle Museum Village

There are currently four certified Lifestyle Museum Villages, areas that practice environmental conservation, recycling, and reuse to provide a village-based, hands-on learning experience in how to live green without wasting resources.

# Eco-Model City Initiatives -Miyakojima (Okinawa)-

- Outline: Population of approx. 55,000; total area of approx. 205 km<sup>2</sup>
- A coral island surrounded by beautiful ocean, being visited by 400,000 tourists every year.
- Aiming for a 30% to 40% reduction of greenhouse gases by 2030, and a 70% to 80% reduction by 2050 (compared with 2003).
- Striving to exploit sugarcane, a local natural resource, to the utmost extent in order to create a self-sufficient energy supply system.

## Self-Sufficient Energy through Sugarcane

### OPower generation with bagasse

Use bagasse, a residue from the manufacture of sugar from sugarcane, as a fuel for power generation, eliminating dependence on fossil fuels in favor of a carbon-free power source by increasing production of sugarcane, which is Miyakojima's chief crop.



### OUsing bioethanol for transport

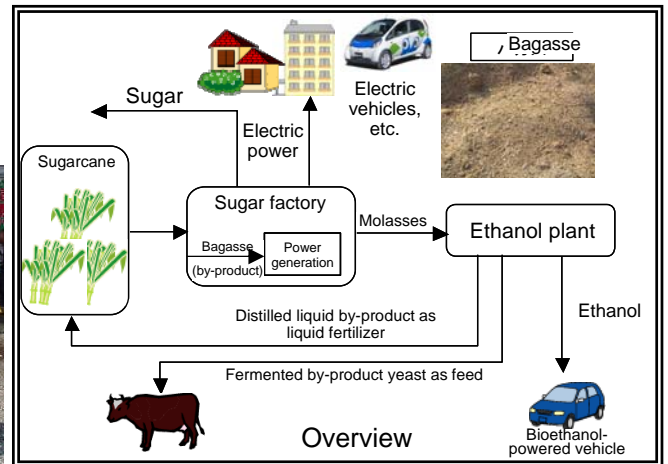
Produce bioethanol from molasses, a by-product of the manufacture of sugar from sugarcane, and use it as a fuel for cars and other vehicles. E3 (a 3% ethanol mixture) is currently being produced, but the goal is to produce E10 and eventually E100.

### OUsing biodiesel made from used cooking oil

Develop a system for collecting used cooking oil and expand its use as a fuel for garbage trucks and other vehicles.



BDF taxi



## CO<sub>2</sub>-free Transportation

### ODEveloping large-scale renewable energy power plants

Utilize city-owned land and other sites to develop large-scale renewable energy power plants. Combine those facilities with storage batteries to facilitate a stable supply of renewable energy.



### OExpanding use of "eco-cars"

Take advantage of an environment that is ideal for widespread use of electric vehicles (a drive around the island is only about 50 km) to actively introduce electric vehicles and charging devices.

Additionally, develop an environment (including infrastructure, etc.) conducive to the use of "eco-cars" such as bioethanol-powered vehicles and plug-in hybrids.

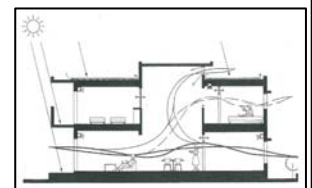


## Using Solar and Community Energy

### OBringing southern-style "eco-houses" to Asia

Work to bring "subtropical eco-houses\*" featuring air-conditioning and hot water systems that take advantage of the strong insolation characterizing southern climes as model houses to the island and other Asian communities.

\*From "Guideline of design for Low-Energy Housing with Validated Effectiveness" by the Institute for Building Environment and Energy Conservation.



### ORaising awareness with "Kagisuma (beautiful island) donation boxes"

Promote efforts to secure funding for natural and environmental protection and forestation programs as well as awareness-raising activities targeting local residents and visitors to the island. Through these activities, work to raise residents' awareness of the need to protect the area's natural endowment, environment, and culture.



### O"Eco-networking"

Develop networks and strengthen cooperation to facilitate "eco-activities" undertaken by residents (for example, mangrove planting with professional baseball players), and expand them to encompass the entire island.



# Eco-Model City Initiatives –Town of Yusuhara (Kochi)-

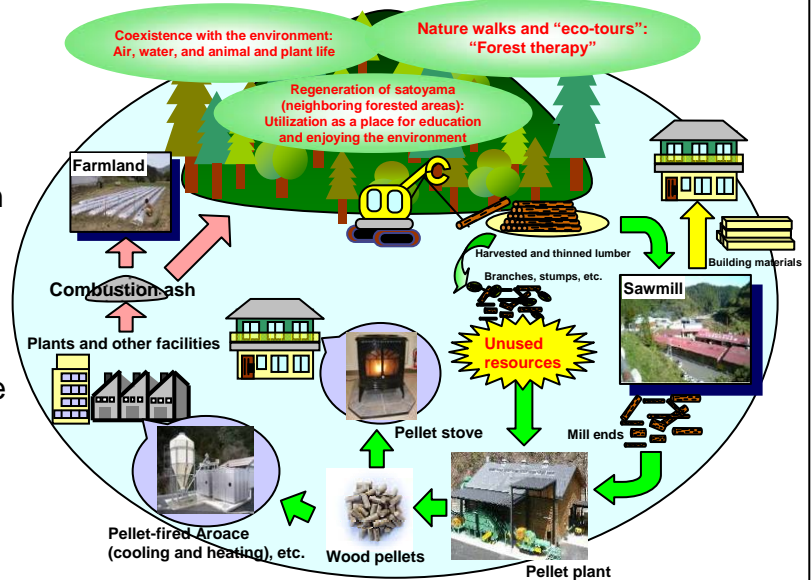
- **Outline:** Population of approx. 4,600; total area of approx. 237 km<sup>2</sup>
- **Implementing a wood biomass regional recycling model business project through cooperation between public and private sectors.**
- **Aiming for a 50% reduction of greenhouse gases by 2030, and a 70% reduction by 2050. Striving to increase CO<sub>2</sub> absorption by 3.5 times by 2030, and by 4.3 times by 2050 (all targets compared with 1990).**
- **Striving to achieve a mountain village-style low-carbon society through the Eco-model program and to exceed 100% energy self-sufficiency by utilizing local resources.**

## Regional Recycling Model Business Project

○ Produce wood pellets from thinned wood and mill ends for use as a fuel for pellet stoves.

Develop a model recycling business that generates revenue through the production and use of pellets with use as fuel for pellet stoves and work with companies to pursue forest development initiatives.

○ In the future, seek to develop sustainable business practices by securing funding through domestic credit transactions and popularizing pellet-fired appliances and equipment.



## Forest CO<sub>2</sub> Absorption Project

○ **Practicing sound forest management and streamlining operations**

The role of Yusuhara, which is located near the source of the Shimanto River, is to pursue forest development that protects water and forest resources (partly fund with income from selling wind power) and shows the public function of forests.

○ **Implementing sustainable forest management**

Through appropriate social, economic, and environmental management, obtain a Forest Stewardship Council (FSC) Forest Management Certification to add value to local lumber while providing employment opportunities and forest management stability

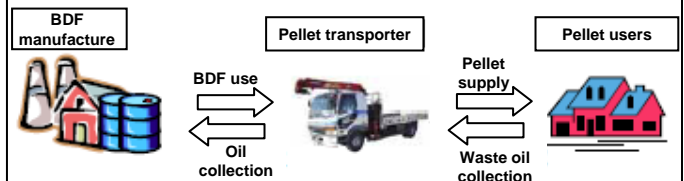


## CO<sub>2</sub> Reduction Project

○ Achieve 100% self-sufficiency in electric power by actively developing wind power (currently 2 turbines but plan to increase to 40 by 2050) as well as micro-hydropower and solar power generation.

○ Collect used cooking oil and produce BDF (biodiesel fuel) from it for use in powering garbage trucks and pellet transport vehicles.

○ Expand consumption of wood pellets by popularizing pellet-fired appliances and equipment, for example by encouraging a switch to wood pellets as a fuel for agricultural-use boilers.



## Human Resource and Mechanism Development Project

○ Maintain and strengthen efforts to build a low-carbon society through the human resources development programs targeting all ages and exchange and partnership programs with other cities and businesses and by promoting environmental industries such as forest therapy.



# Eco-Model City Initiatives -Chiyoda City (Tokyo)-

- **Outline:** Population of approx. 46,000; total area of approx. 11.64km<sup>2</sup>
- **Enacted an ordinance seeking to reduce CO<sub>2</sub> emissions 25% by 2020 (compared with 1990) on January 1, 2008.**
- **Striving to harmonize environmental and economic needs through partnerships among various groups to realize a low-carbon city at the political and economic center of Japan.**

## Sophisticated Building Energy Countermeasures

### OMeasures for new construction

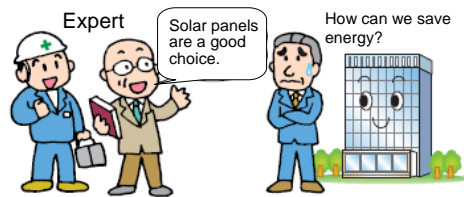
Promote the deployment of leading energy-saving equipment, renewable energy, and other technologies by mandating the submission of plans for new construction, expansion, and renovation of small/medium-scale buildings that do not fall under Tokyo's planning system.

### OMeasures for existing construction ("Green Stock" strategy)

Provide assistance for operational improvements to facilities as well as improvements and upgrades in existing small/medium-scale buildings by offering technical support for energy-saving measures, analyzing cost effectiveness, coordinating the use of the Domestic Emissions Trading Scheme and conducting model studies, and developing and utilizing databases.

### OSupport Center (tentative name)

Establish an organization to promote partnerships between the public and private sectors, including companies in the energy and related sectors, to provide information, technical support, and other forms of assistance.



## Two-dimensional Approach That Takes Advantage of Urban Planning Opportunities

### ODesignated areas for global warming measures

Designate urban regeneration priority development areas to spur the achievement of mid-term goals for fighting global warming while developing networks and expanding coverage of district heating and cooling systems, and utilizing unused energy and renewable energy throughout the area.



## Human and Urban Development Through Regional Cooperation

### OCoordinating with rural areas

In order to simultaneously achieve a low-carbon city center while revitalizing rural areas, use city center funds to install residential wind power turbines for local power supplies and to advance a wood biomass project.

### OReducing car emissions

Install charging stations for electric vehicles in the ward office parking lot, stipulate the deployment of charging stations in the guideline for apartment complexes, and implement car sharing by government agencies in order to reduce CO<sub>2</sub> emissions in the transport sector.

### OFacilitating partnerships between residents, academia, and business

Facilitate cooperation by ward residents with universities and businesses through the Chiyoda Eco-System, a conference for implementing "eco-policies," to promote ecologically responsible behavior and supplement environmental education.

