

**International Conference on Promoting the Low-Carbon
Cities in Kyoto
February 11, 2011**

**Objectives of panel discussion:
efforts to build low-carbon cities and expected
roles of international collaboration**

Tsuyoshi Fujita, Director, Environmental Technology Assessment System Section,
National Institute for Environmental Studies.
Alliance Professor, Nagoya University .
Visiting Professor, United Nations University.
Professor, Toyo University.
(fujita77@nies.go.jp)

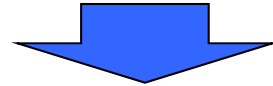
Strategy to build Japan into a low-carbon society

Japan's mid- and long-term targets

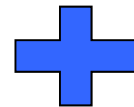
(long-term target: 60%–80% reduction in GHG emissions by 2050)

- A bill for the Basic Act for Prevention of Global Warming approved by cabinet
in October 2010:

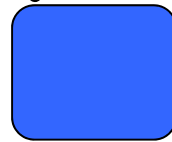
-25% by 2020, -80% by 2050



- Developing innovative technologies, popularizing existing advanced technologies, **and popularizing renewable energy and energy conservation**
- Mechanisms to drive the whole nation toward a low-carbon society (e.g. emissions trading, tax reform, visualization)



- Capabilities of local communities: Eco-Model City Initiative (from 2008) with concerted low-carbon efforts by cities and communities



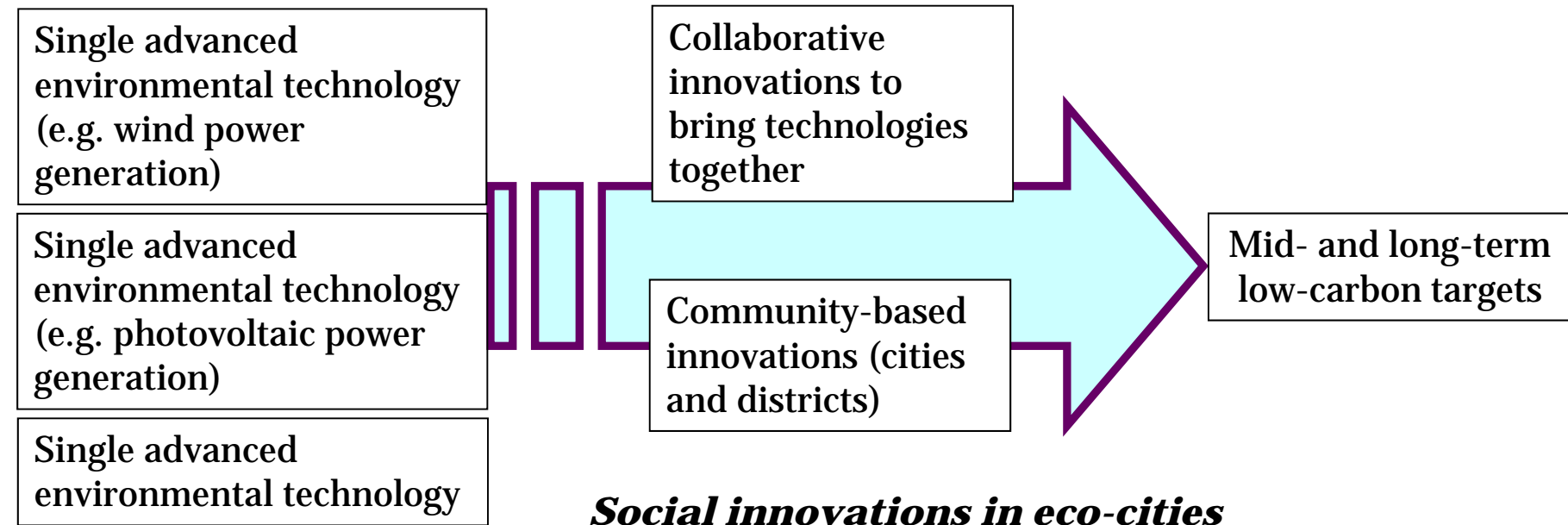
Eco-cities that lead to a low-carbon society

- Shifting from single innovations to collaborative social innovations

Technology Innovation →

System Innovation or Collective Innovation

- Applying best practices to structural innovations in the social system



Single environmental technology innovations

Japan's low-carbon cities in the context of the international community

Knowledge and wisdom of low-carbon cities in Europe and America (Western style)

- Low-carbon efforts in the midst of a shift toward a post-industrial and post-material society
- High levels of eco-consciousness among citizens and companies and capabilities to coordinate diverse entities and manage cities



Knowledge and wisdom of low-carbon cities originating in Japan (*Japan's unique low-carbon style*)

- Low-carbon packages that take advantage of technology and product development capabilities focusing on fulfilling targets (a combination of device technologies, network technologies, and social technologies)
- A social governance system encompassing efforts to build eco-consciousness among citizens and companies
- Communities with capabilities to take eco-action based on experiences with environmental pollution



Efforts to build low-carbon cities in Asia (Asian style)

- Promoting low-carbon efforts interlocked with industrialization and economic growth
- Promoting projects based on a top-down approach; capabilities to implement policies

Creating cities where the economy is in harmony with the environment

- **Eco-Model City Initiative (from 2008)**

 - Concerted low-carbon efforts by cities and communities

- **Promotion Council for the Low-Carbon Cities**

- **Best practice for building low-carbon cities (from 2010)**

- **Future City Initiative (from 2011)**

 - Developing the world's leading Future City Initiative and making concentrated investments based on the initiative, in an effort to build successful cases for popularization in Japan and development outside Japan

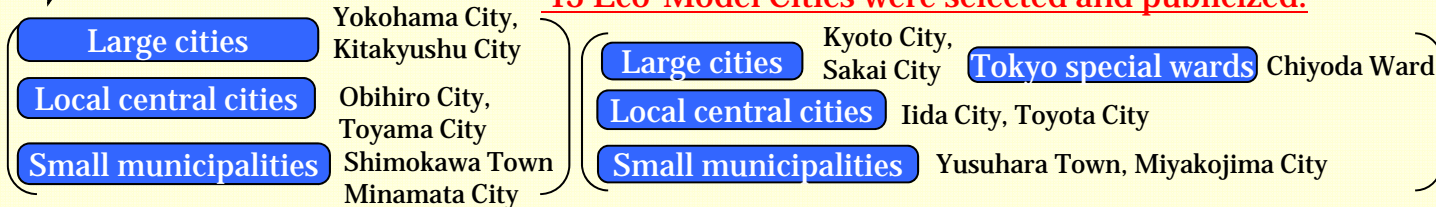
Promoting the Eco-Model City Initiative to revitalize communities

Objectives

- To turn Japan into a low-carbon society, social mechanisms such as lifestyle, models of cities and transportation services need to be fundamentally changed.
- To present a specific and clear model of a low-carbon society that should be pursued in the future, the national government has selected Eco-Model Cities (i.e. cities that are working on pioneering efforts to attain ambitious targets, including significant reductions in GHG emissions) and supports these cities in fulfilling their targets.
- The potential of communities is unleashed via concerted efforts (including participation by citizens and local companies) to achieve low-carbon-oriented community models, thereby reducing environmental impact, attaining sustainable development of communities and at the same time revitalizing communities.

Selection process

- Applications were accepted from April 11 to May 21, 2008. 82 applications were made by 89 entities (cities and communities).
13 Eco-Model Cities were selected and publicized.



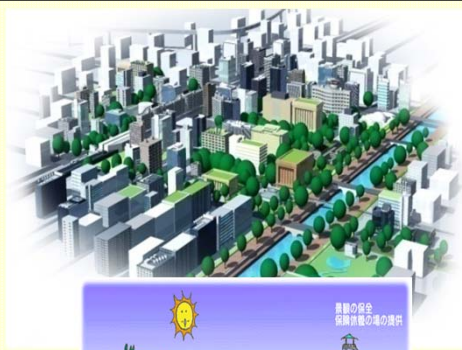
Cities that failed to fulfill some standards but are expected to meet the standards by solving problems in the process of developing implementation plans (action plans) in future

Concept of the Eco-Model City Initiative

- Achieving compact cities (a pedestrian lifestyle in cities)
- Improving transportation systems (utilizing public transport services such as LRT systems, popularizing EVs)
- Revolutionizing housing styles (popularizing “200-year houses,” energy-efficient houses, and fuel cells)
- Popularizing renewable energy (popularizing photovoltaic, wind power generation systems, biomass, etc.)
- Utilizing unused energy (utilizing sewer systems, waste, waste heat from factories, etc.)
- Conserving and utilizing forests (e.g. utilizing forest resources and green spaces as carbon offset measures, local production for local consumption)

Achieving all of these targets in cities

- Presenting a specific model of low-carbon cities while taking advantage of the unique characteristics of respective cities and communities
- Local governments take the initiative to build a momentum toward significant social changes (e.g. transformation of lifestyles and business styles) by involving industry, academia, and citizens, in an effort to revitalize communities.



Major efforts under the Eco-Model City Initiative

Source: materials available from the Regional Revitalization Bureau (Cabinet Secretariat)

The map shows Japan with red dots indicating the locations of the Eco-Model Cities. Callout boxes provide details for each city, including their population and key initiatives. The cities and their populations are: Shimokawa Town (3,900), Obihiro City (170,000), Kyoto City (1.47 million), Toyama City (420,000), Sakai City (840,000), Chiyoda Ward (45,000), Kitakyushu City (990,000), Fukuoka City (3.65 million), Minamata City (30,000), Ideta City (110,000), Yusuhara Town (5,020), Miyakojima City (55,000), and Toyota City (420,000).

<p>Shimokawa, a low-carbon model society to attain harmony with forests in the northern region</p> <ul style="list-style-type: none"> Fast-growing willows are grown for carbon fixation and utilized as fuel. A district heating and cooling system has been introduced. 	<p>Shimokawa Town pop. 3,900</p>	<p>Obihiro City pop. 170,000</p>	<p>Obihiro, a rural Eco-Model City</p> <ul style="list-style-type: none"> Using cattle manure compost, etc. as an alternative fuel for kerosene No till-farming
<p>Pedestrian-oriented city planning, activities for promoting low-carbon efforts by unleashing community capabilities</p> <ul style="list-style-type: none"> Turning Shijo Street into a transit mall, controlling vehicle traffic in narrow streets, etc. Popularizing low-carbon houses that retain Kyoto's atmosphere; building <i>Kyomachiya</i> houses in the Heisei (1989-) period Efforts that take advantage of communities' capabilities: eco-neighborhood associations, eco-schools, etc. 	<p>Kyoto City pop. 1.47 million</p>	<p>Toyama City Pop. 420,000</p>	<p>Toyama City's CO2 reduction plan based on the compact city strategy</p> <ul style="list-style-type: none"> LRT network Encouraging residents to relocate to areas that are readily accessible to the public transport services
<p>Creating a low-carbon industrial complex, low-carbon lifestyle</p> <ul style="list-style-type: none"> Setting up a mega solar system, large fuel cells, energy conservation equipment, etc. Solar power station in the city (setting up a photovoltaic power generation facility for 100,000 households) A community cycle system in collaboration with local industries 	<p>Sakai City pop. 840,000</p>	<p>Chiyoda Ward pop. 45,000</p>	<p>Building an energy-efficient city, increasing energy efficiency</p> <ul style="list-style-type: none"> Achieving energy conservation of medium and small buildings Upgrading the district heating and cooling system, utilizing the heat of spring water
<p>Carbon Free City in Asia</p> <ul style="list-style-type: none"> Low-carbon 200-year District taking advantage of advanced technologies Supplying unused heat from factories to local communities 	<p>Kitakyushu City pop. 990,000</p>	<p>Fukuoka City pop. 3.65 million</p>	<p>Achieving a large city type zero-carbon lifestyle by unleashing the potential of citizens: sharing knowledge, making more options available, and encouraging action</p> <ul style="list-style-type: none"> Increasing renewable energy 10 times by 2025 Giving economic incentives to build energy-efficient houses
<p>Proposing a model of a sustainable small local government where the environment is in harmony with economy</p> <ul style="list-style-type: none"> Sorting waste into 22 categories, attaining high-quality recycling Turning bamboo, etc. into biofuels 	<p>Minamata City pop. 30,000</p>	<p>Ideta City pop. 110,000</p>	<p>Utilizing natural energy and building a low-carbon city with citizens' participation</p> <ul style="list-style-type: none"> Extending the heating system to private houses Utilizing renewable energy on a city block basis
<p>Wood biomass community recycling model project</p> <ul style="list-style-type: none"> Recycling-based forest management by producing wood pellets, etc. Setting up 40 wind turbines by FY2050 	<p>Yusuhara Town pop. 5,020</p>	<p>Miyakojima City pop. 55,000</p>	<p>City planning by utilizing cutting-edge environmental technologies, and eco-friendly car use</p> <ul style="list-style-type: none"> Introducing advanced environmental technologies in a low-carbon society model district before implementing these technologies in other districts Next-generation car sharing system, photovoltaic charging infrastructure
<p>Local-production-for-local-consumption-based energy system utilizing sugar cane, etc.</p> <ul style="list-style-type: none"> Using bioethanol fuel, generating power with bagasse (fibrous residue remaining after the extraction of juice from the crushed stalks of sugar cane), achieving a CO2-free automobile society 	<p>Miyakojima City pop. 55,000</p>	<p>Toyota City pop. 420,000</p>	<p>City planning by utilizing cutting-edge environmental technologies, and eco-friendly car use</p> <ul style="list-style-type: none"> Introducing advanced environmental technologies in a low-carbon society model district before implementing these technologies in other districts Next-generation car sharing system, photovoltaic charging infrastructure

Significance of the Eco-Model City Initiative

(1) Applications from diverse strongly-motivated local governments in large numbers

- Applications accepted from over 80 local governments, ranging from “designated cities” with populations over 500,000 to local governments with populations under 10,000
- 13 Eco-Model Cities selected

(2) A comprehensive approach involving environmental and urban policies

- Reviewing cross-sectoral policies including energy, urban renewal, resource recycling, citizens’ actions, forest biomass, conservation and restoration of **water resources** and satoyama
- Calculating indirect low-carbon effects in and outside Japan

(3) Presenting unique action programs

- Selecting low-carbon priority districts and model city blocks

Strategy to promote local governments' efforts toward low-carbon cities

[Low-carbon efforts with single technologies, by single entities, in single buildings]

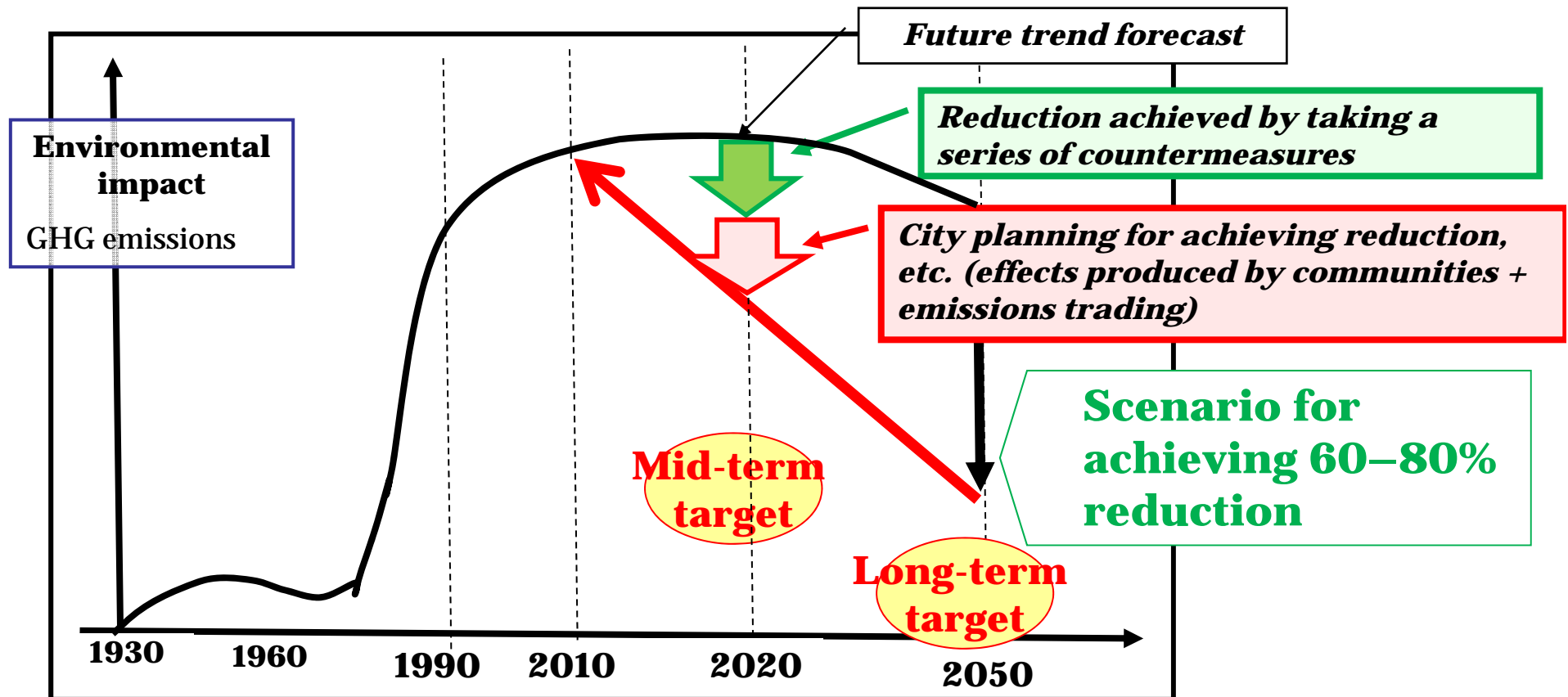
- Energy-efficient buildings, photovoltaic power generation, measures taken in respective industry sectors, forest restoration, etc.
 - Effects can be produced in the short term. Entities' responsibilities for emissions are clearly defined.



[Low-carbon efforts with composite technologies, via entities' collaboration, under the social system]

- **Compact cities: restricting land use, improving infrastructure, giving incentives for reconstruction**
- **Low-carbon city blocks: Area EMS, utilizing heat sources by communities, greening**
- **Low-carbon industrial districts: resource recycling, coordination between cities and industries (heat/resources), utilizing waste in place of natural resources**
- **Coordination between satoyama and cities: utilizing biomass resources, networking green spaces, utilizing environmental resources in communities**

Meeting mid-term targets of low-carbon efforts based on local implementation plans



To build eco-cities, proposals are required for improving social infrastructure, etc. by taking advantage of environmental and social resources available in cities and communities.

Future Cities in the context of the New Growth Strategy (approved by cabinet in June 2010)

Chapter III Basic Policies and Targeted Outcomes for Seven Strategic Areas

Growth Sectors Driven by Japan's Strengths

(1) Strategy to make Japan a leading country in environment and energy through green innovation

[Targets to be attained by 2020]

“Creating new environment-related markets worth over JPY 50 trillion”

“Creating 1.4 million new jobs in the environment sector”

“Reducing global GHG emissions by at least 1.3 billion tons (equivalent to Japan's total emissions) by utilizing Japan's technologies available in the private sector”

(A model to reform the socioeconomic structure from local areas)

In creating an eco-friendly society, we will support efforts, for example, by building low-carbon cities and communities by promoting the use of public transportation services, etc.; promoting the use of, and building smart grids that underpin such uses of renewable energy; ensuring proper recycling of resources; **utilizing info-com technologies**; and achieving zero emissions of houses, etc. We will make the first step toward achieving a transformation, driven by self-supporting local entities, toward a sustainable socioeconomic structure by utilizing comprehensive policy packages (including regulatory reforms and green tax reforms) and developing projects via **intensive investments primarily in environment, health, and tourism**.

<21 national strategic projects for reviving Japan in the 21st century>

Growth Sectors Driven by Japan's Strengths

I. National strategic projects in the context of green innovation

2. Future City Initiative

We will produce world-class successful cases by means of future-oriented technologies, mechanisms, services, city planning, and thereby build Future Cities. The models of Future Cities will be popularized and developed in and outside Japan. Specifically, based on city planning that is intended to build Japan's and the world's leading cities “endowed with greenery and human warmth.” “Project feasibility and impact on other cities” will be fully taken into account when building urban energy management systems (combining smart grids, renewable energy, and next-generation vehicles). We will promote business restructuring, develop relevant industries, and expand the overall use of renewable energy, etc. These measures will be taken fully in strategic cities and communities carefully selected from Eco-Model Cities, etc. A new act (tentatively named the Act for Promoting Development of Future Cities) will be enacted to implement these measures. Relevant ministries and agencies will invest budget funds to subsidize next-generation social systems and equipment, etc., and offer extensive support in reforming frameworks (e.g.,¹ regulatory reforms, green tax reforms). The overall models of these cities will be exported as packaged solutions to promote intergovernmental partnerships with other Asian countries.

21 national strategic projects in the context of the Future City Initiative
 (source materials available from the Cabinet Office)

Governmental backup with policy-based measures related to demand

Environment & energy

- Rapidly popularizing renewable energy by introducing a feed-in tariff system, etc.
- Future City Initiative
- Plan to revitalize forests and forestry



Health (medical & nursing care)

- A framework for selecting medical institutions to promote practical applications of medical care, etc.
- International exchange in medical care (accepting patients from outside Japan)



Asia

- Developing infrastructure packages outside Japan
- Reducing effective corporate tax rates and promoting Japan as a business hub in Asia, etc.
- Developing global human resources and accepting professional human resources in larger numbers
- Promoting strategies regarding intellectual properties/standardization and developing Cool Japan outside Japan
- Economic partnership strategies by establishing the Free Trade Area of the Asia-Pacific (FTAAP)



Promoting a tourism-oriented nation and revitalizing communities

- Launching a Comprehensive Special Zone program and promoting full open skies, etc.
- A program to boost the annual number of visitors to Japan to 30 million, and setting consecutive holidays by region
- Doubling the size of existing home and renovation markets, etc.
- Putting public facilities under private sector management and promoting projects with private funds



Governmental backup with policy-based measures related to supply

Science, technology & info-com

- Enhancing international competitiveness and developing human resources via the Leading Graduate School Initiative, etc.
- Promoting use and utilization of info-com technologies
- Increasing R&D investments



Employment & human resources

- Integrating kindergartens and day care centers, etc.
- Introducing “career grading” and “personal support” systems
- New Public Commons

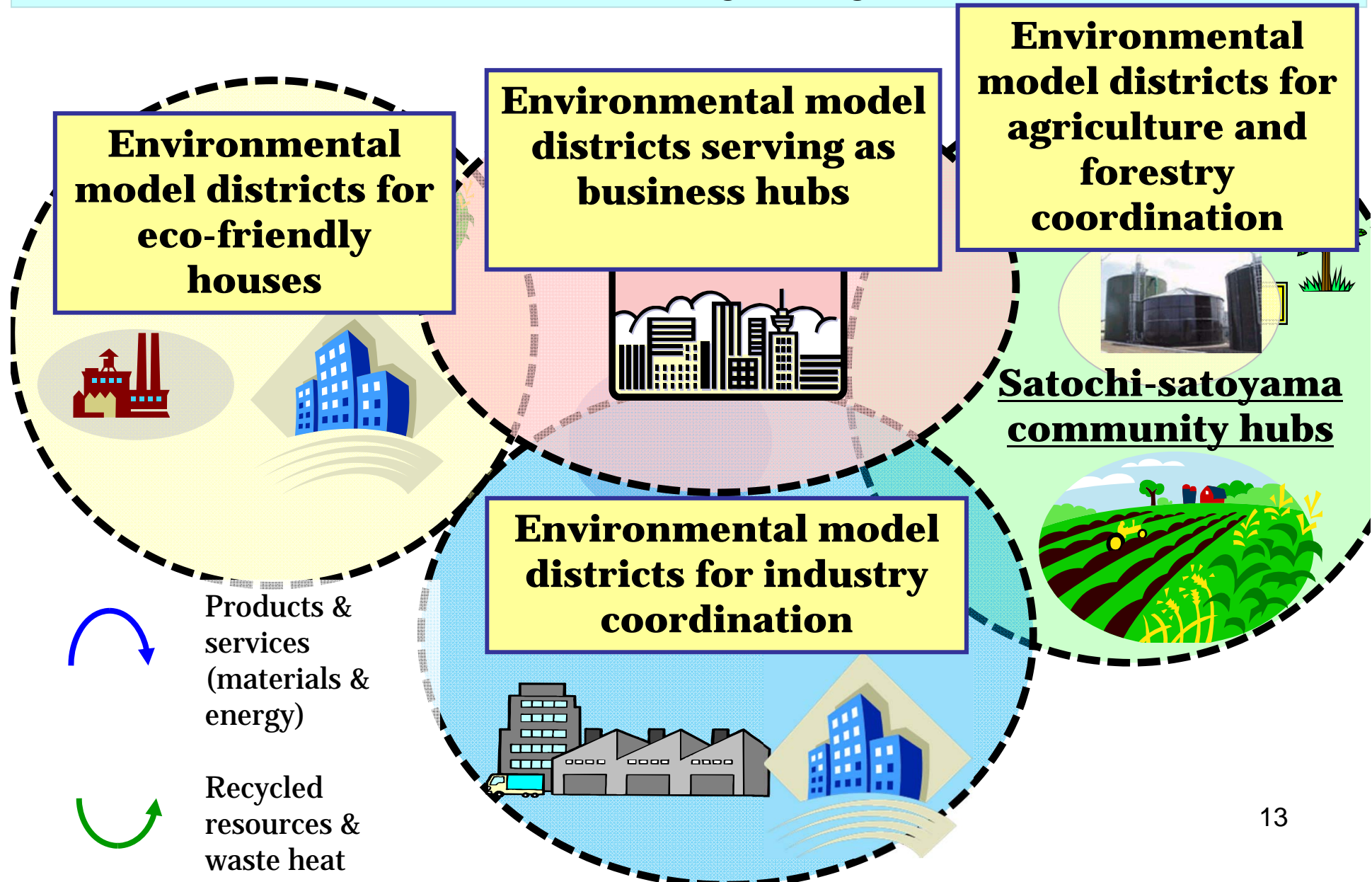


Finance

- Promoting establishment of integrated exchange markets (securities, financial products, and commodities)

Organizing low-carbon countermeasures and measures into packaged solutions to meet the characteristics of communities

Low-carbon environmental model districts taking advantage of communities' characteristics



Low-carbon technologies and their impact: water, materials, and energy in cities

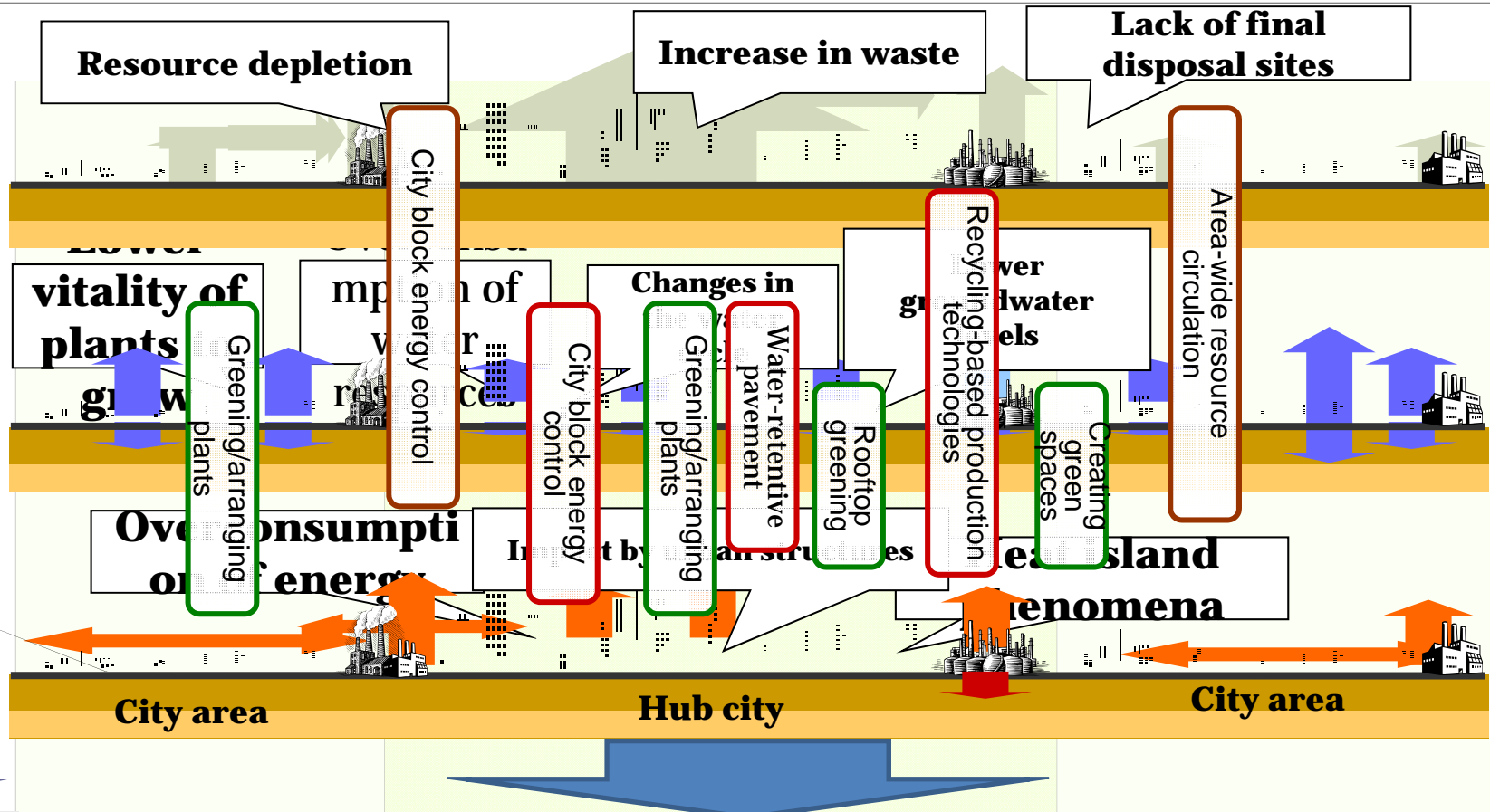
The urban environmental GIS database and environment analysis model are used to calculate environmental flux, based on environmental impacts. Processes are in place to evaluate technologies for low-carbon cities.

Environmental flux of materials

Environmental flux of water

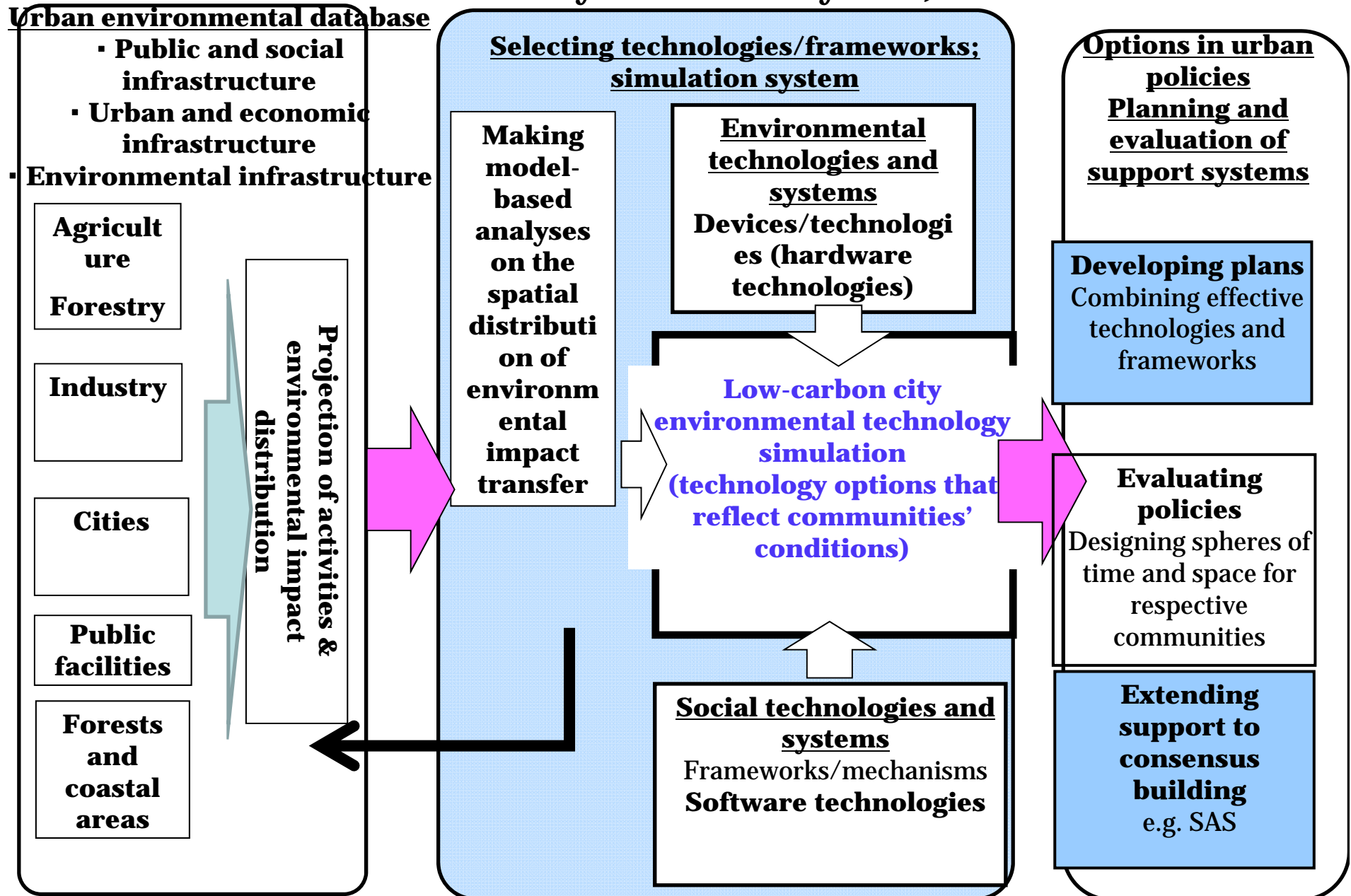
Environmental flux of energy

Evaluation with environment analysis model



- A system for analyzing the spatial characteristics of environmental impact (generation and transfer of waste water, thermal energy, and waste)
- Calculating annual low-carbon effects attained by introducing technologies within a target zone
- Setting up a framework for providing information obtained from the technology evaluation system to governmental bodies, citizens, and companies

Generalizing the experience of low-carbon cities across the globe to develop techniques for evaluating plans to be applied to communities (e.g. a low-carbon city simulation system)



Expected roles of international collaboration to build low-carbon cities in the lead-up to panel discussion

- Environmental innovation from Japan by building low-carbon cities: developing packaged solutions of technologies and measures to the rest of Asia
 - Gaining expertise in creating social demonstration models via environmental innovation, by developing low-carbon model districts
- Sharing and mutually reinforcing low-carbon knowledge via collaboration among eco-cities in Japan, the rest of Asia, and Europe/America
 - Designating zones to enhance the effects of eco-cities and environmental technologies (smart zoning) and developing a community management framework
 - A flexible eco-project financing system involving beneficiaries of indirect and inherent low-carbon effects and environmental effects
 - ***Low-carbon (self-sustaining) governance system, including district management***