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Research Challenges to Integrate Missions
in a Short-run and Sustainable Targets
in a Long-run

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【Inclusion · Integration】 Efforts to local governments

Welfare · Health

Education



Urban
Planning Built
Environment

Environment · Energy ·
Water

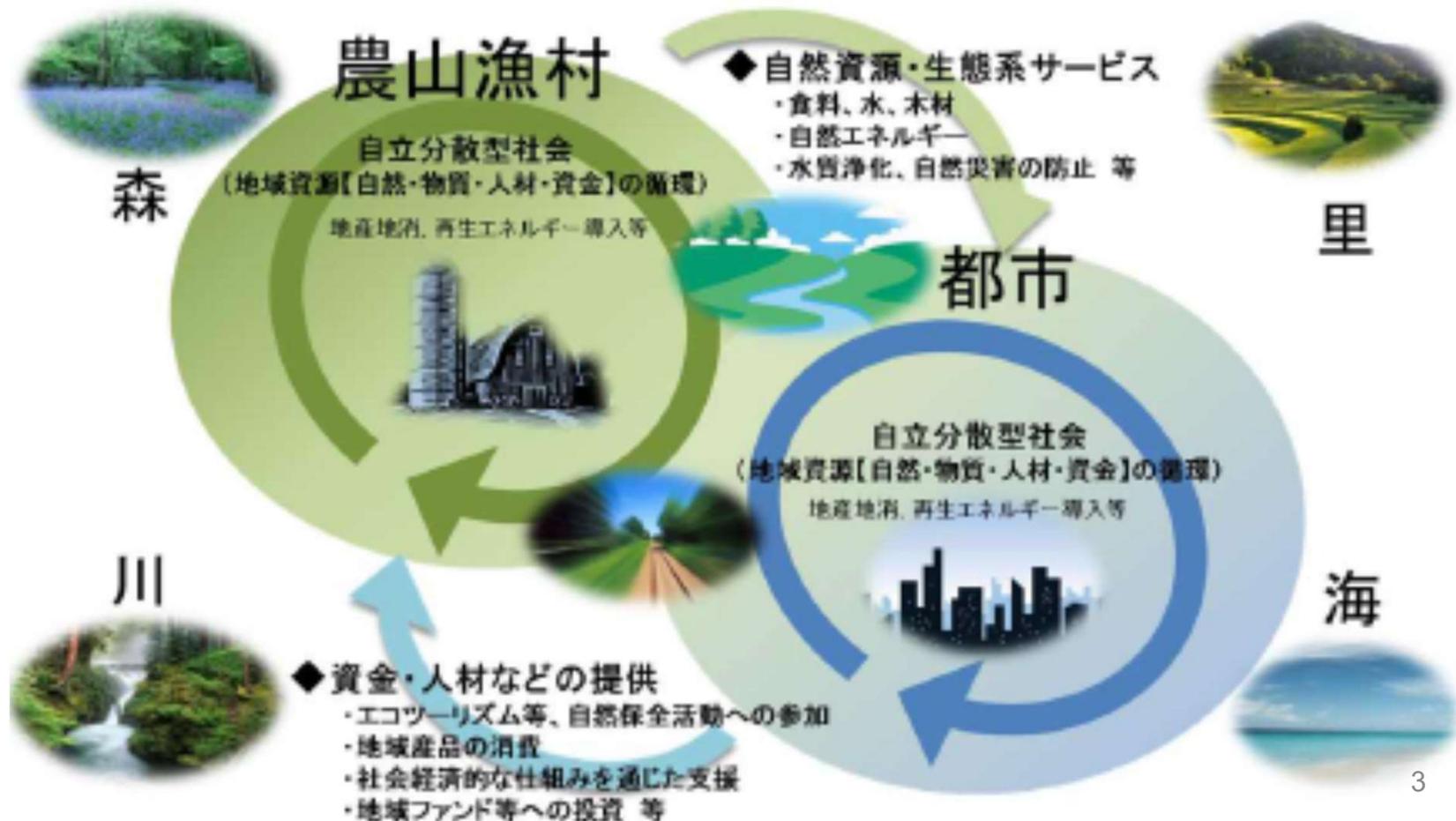
Industry · Tourism ·
Agriculture

「Circulating Ecological Regions」; Japan Style SDGs

Development based on local Characteristics

→ **Autonomous • Decentralized Society**

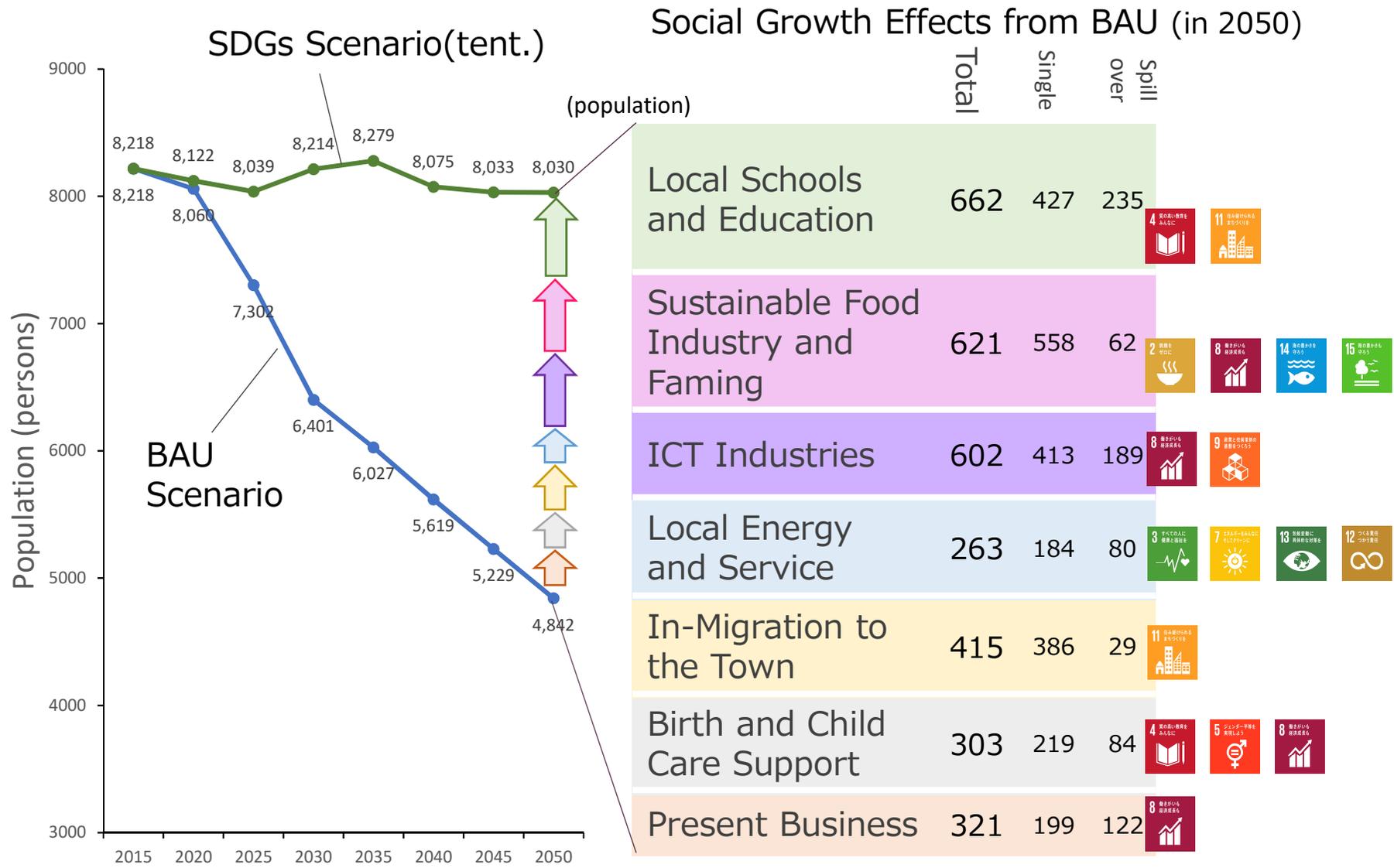
→ Collaboration Co-work and Mutual Support



Research Challenges to Integrate Missions in a Short-run and Sustainable Targets in a Long-run

- 1) Integration and Inclusion of various range of environmental research and values
 - Strategic analysis of environmental technologies and policies from back-casting approach
- 2) Solution design and development of green cities and regions with Integrative Improvement among economic and environmental values
- 3) Integrative monitoring and modelling challenges for sustainable cities

Socio Economic Environmental Forecast of Future Scenarios



Gomi, K, et. al. (2019)

Estimation of Alternative Future Recovery Scenarios

Alternative Spatial Scenario

Quantification of Impacts and Costs

BAU



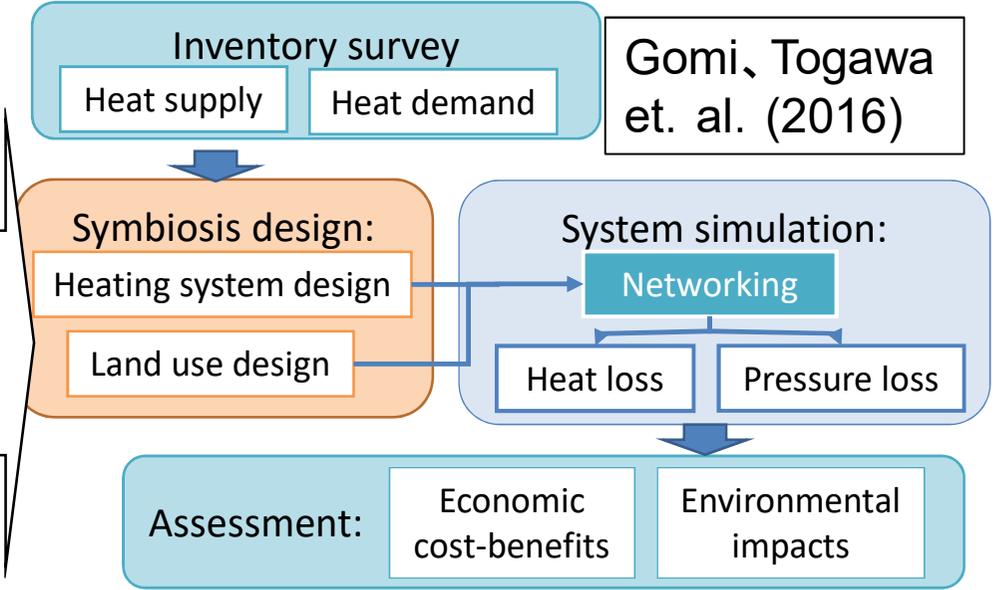
+Compact City



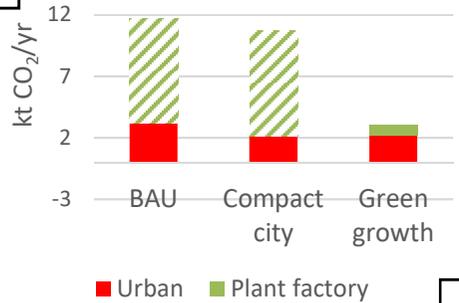
+Green Growth



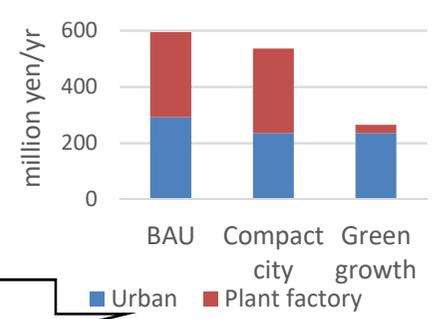
Effects of Local Energy Management



CO₂ emission comparison:



Fuel cost comparison:



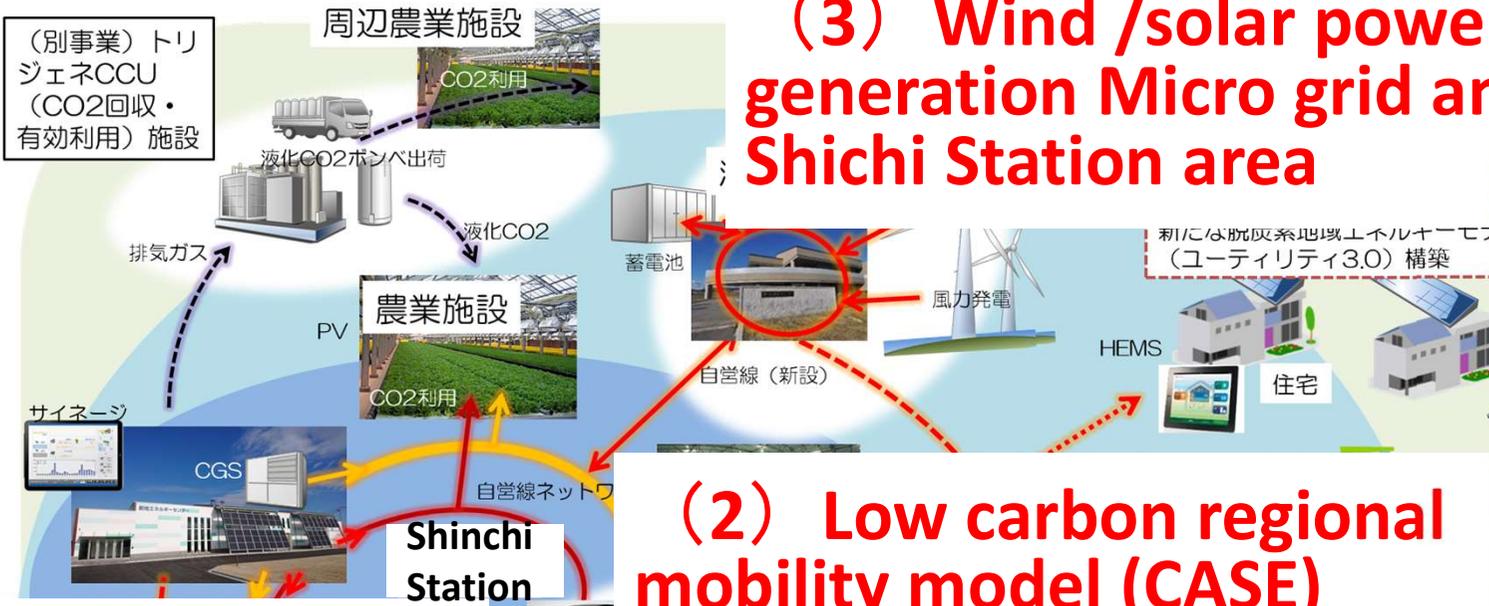
Green growth can bring significant co-benefit of CO₂ emission reduction and fuel saving.

Shinchi Energy Center Oct. 2018



Future Design for Fukushima Circulating Ecological Sphere

(3) Wind /solar power generation Micro grid and use in Shichi Station area



(2) Low carbon regional mobility model (CASE)



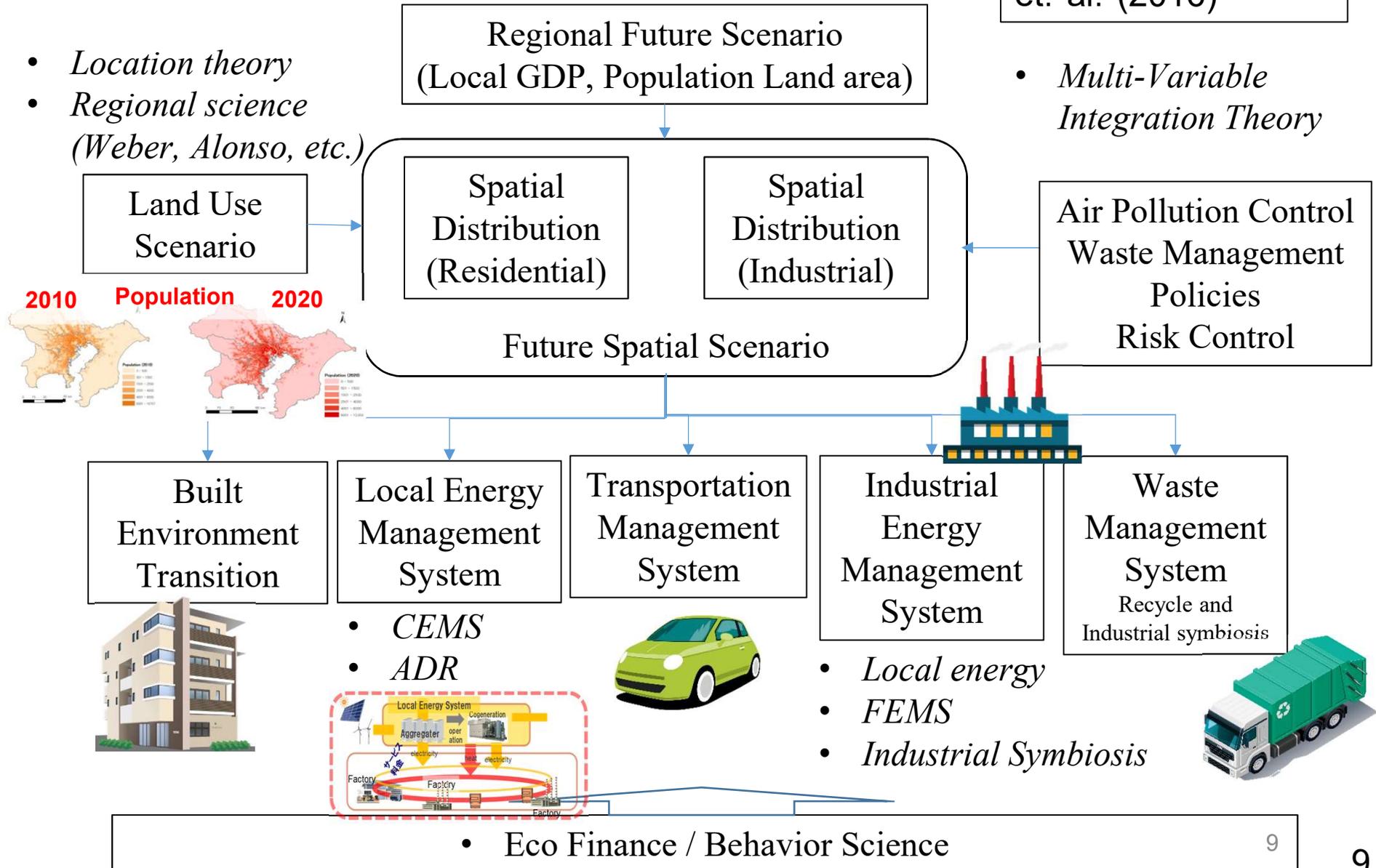
(1) CEMS with AI support Demand Optimization Energy System

Integrative Eco-city Assessment Challenges

Ashina, Gomi, Fujita et. al. (2016)

- *Location theory*
- *Regional science (Weber, Alonso, etc.)*

- *Multi-Variable Integration Theory*



Fukushima Shinchi Tablet Network as a Social Monitoring and Activity Support System

Local Energy Assist

Electricity sensor: sensor networked with server and tablets

distributor



Real time monitoring



Incentives for efficient energy saving activities



Dual Direction ICT Communication System



役場

Local Life Assist



Emergency



Health



Public Service



Local Event

Dual-direction information sharing system



Community Information Assist



GIS Maps



Survey Function



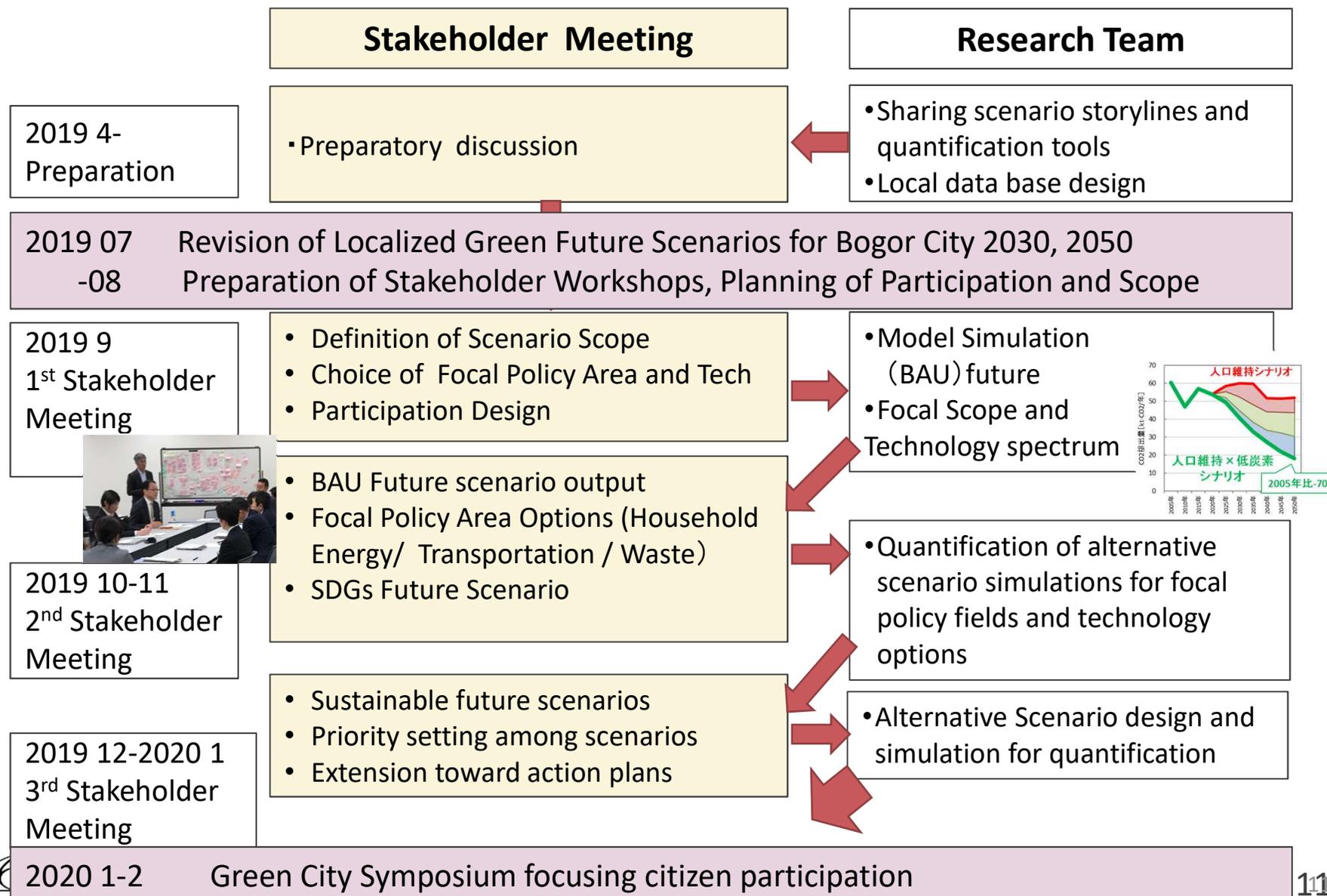
Bulletin Board

Multi-user information sharing system
Frequent questionnaire system
Information sharing among uses

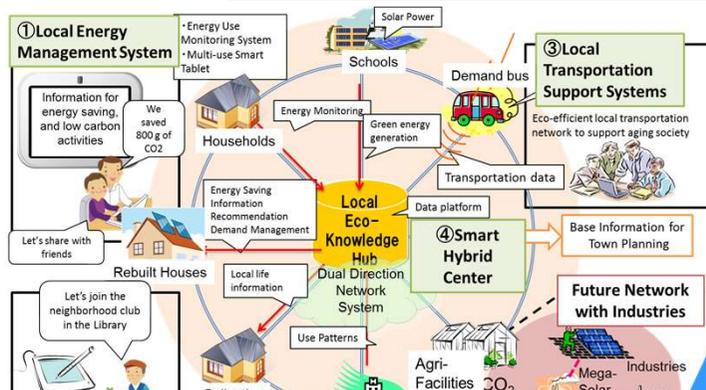
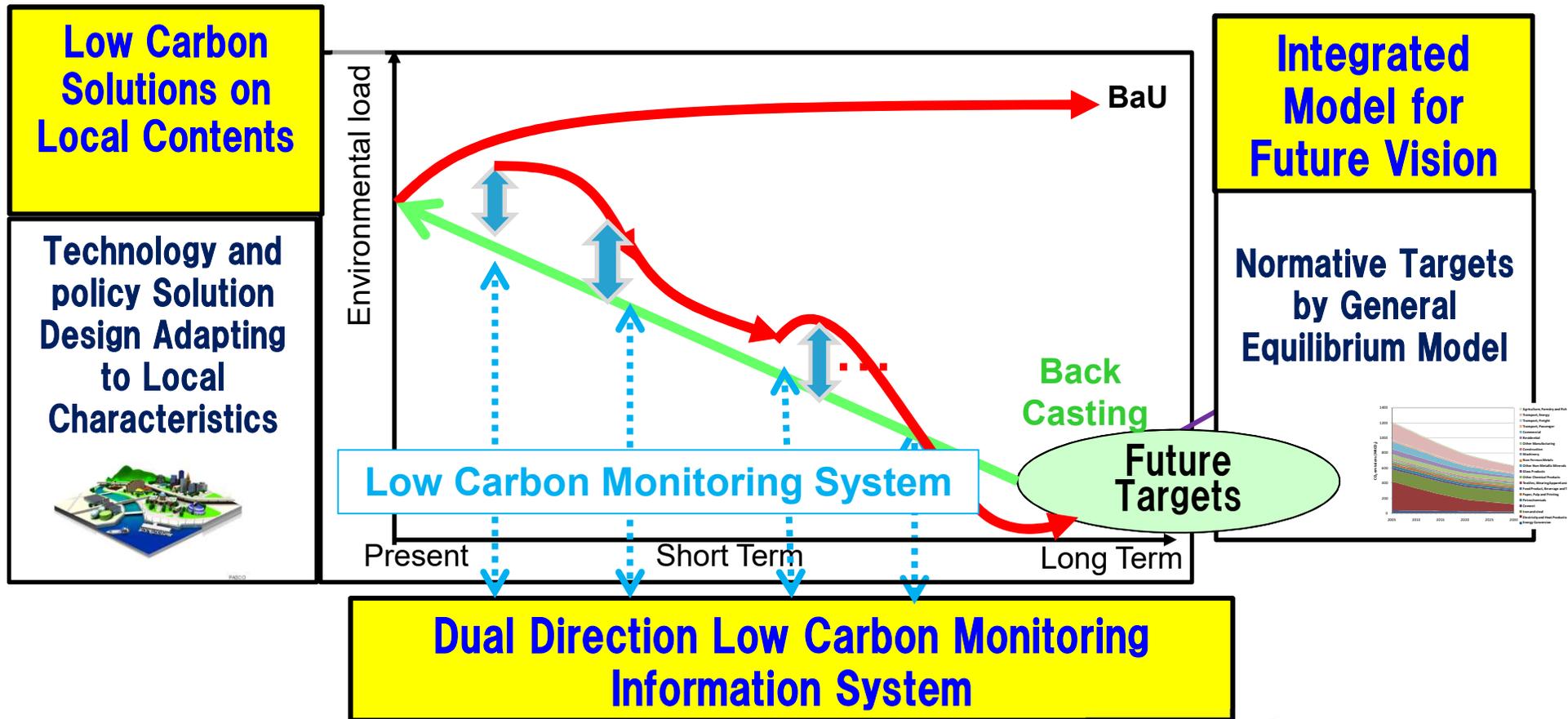
Electric Message Board

Discussion materials for Interactive Simulation

Interactive Scenario Simulation in Fukushima



Innovative Modelling and Monitoring Research Project



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Proposal for Local SDGs and New Life Design toward Post-COVID Society

National Cabinet Administration Office WG, 2020

1) Future Vision Design for Post COVID Locality

- Smart and Digitalized Society - Future Work Style under New normal
- Remote Consumption Patterns and Styles
- New Medical and Social Resilience
- Expanded Scope for Public Welfare - Changing Human Mobility

2) Post COVID Actions in Local SDGs Perspectives



Selected list of recent publications in the related topics

- Seiya Maki, Shuichi Ashina, Minoru Fujii, Tsuyoshi Fujita, et.al (2018); Energy consumption monitoring system and integrative time series analysis models - case study in the green city demonstration project in Bogor City, Indonesia , Frontiers of Energy
- Remi Chandran, Tsuyoshi Fujita, et.al.(2018); Expert networks as science-policy interlocutors in the Implementation of a Monitoring Reporting and Verification (MRV) system, Frontiers of Energy, in press
- Yi Dou, Takuya Togawa, Liang Dong, Minoru Fujii, Satoshi Ohnishi, Hiroki Tanikawa, Tsuyoshi Fujita (2018) Innovative planning and evaluation system for district heating using waste heat considering spatial configuration: A case in Fukushima, Japan. Resources, Conservation and Recycling, 128, 406-416
- Yujiro Hirano, Kei Gomi, Shogo Nakamura, Yukiko Yoshida, Daisuke Narumi, Tsuyoshi Fujita (2017) Analysis of the impact of regional temperature pattern on the energy consumption in the commercial sector in Japan. Energy and Buildings, 149, 160–170
- Yujiro Hirano, Tsuyoshi Fujita (2016) Simulating the CO2 reduction caused by decreasing the air conditioning load in an urban area. Energy and Buildings, 114, 87-95
- Yong Geng, Tsuyoshi Fujita, et.al. (2016) Recent progress on innovative eco-industrial development. Journal of Cleaner Production, 114, 1-10
- Hiroto Shiraki, Shuichi Ashina, Yasuko Kameyama, Seiji Hashimoto, Tsuyoshi Fujita (2016) Analysis of optimal locations for power stations and their impact on industrial symbiosis planning under transition toward low-carbon power sector in Japan. Journal of Cleaner Production, 114, 81-94
- Satoshi Ohnishi, Minoru Fujii, Tsuyoshi Fujita, et.al. (2016) Comparative analysis of recycling industry development in Japan following the Eco-Town program for eco-industrial development. Journal of Cleaner Production, 114, 95-102
- Takuya Togawa, Tsuyoshi Fujita, et.al. (2016) Integrating GIS databases and ICT applications for the design of energy circulation systems. Journal of Cleaner Production, 114, 224-232
- Minoru Fujii, Tsuyoshi Fujita, et.al. (2016) Possibility of developing low-carbon industries through urban symbiosis in Asian cities. Journal of Cleaner Production, 114, 376-386

Thank you for your Attention