

持続可能な開発目標 (SDGs)

内閣府作成資料(2017)



ロゴ: 国連広報センター作成

日本自身の課題に関係が深い目標の例 ⇒ 実施には、多くの国内省庁が関係。

- 成長・雇用
- クリーンエネルギー
- イノベーション
- 循環型社会 (3R: Reduce Reuse Recycle 等)
- 温暖化対策
- 生物多様性の保全
- 女性の活躍
- 児童虐待の撲滅
- 国際協力 等

Session2 Green Growth through SDGs - Interactive Collaboration among Global Cities and Regions -

【Presentation】

- ① Integrative Actions toward Sustainable Circular Ecological Cities and Regions Tsuyoshi Fujita, NIES, Japan
- ② The most recent progress of IPCC-AR6 Yong Geng, Professor, Shanghai Jiao Tong University, China
- ③ Climate Village as Low Carbon Actions in Indonesia Rizaldi Boer, Bogor Agricultural University, Indonesia
- ④ From Local Renewable Energy toward SDGs; social innovation of Stadtwerke from Germany; Guido Wallraven, Saerbeck City, Germany
- ⑤ Climate Change Adaptation in Japan; Mimi Nameki, Center for Climate Change Adaptation, Japan

16th Kawasaki Eco-Business Forum
November 13th, 2019

Integrative Actions toward Sustainable Circular Ecological Cities and Regions

Prof. FUJITA, Tsuyoshi

Director of Social Environmental Systems Center,
National Institute for Environmental Science, Japan
Specially Appointed Prof. of Tokyo Inst. of Tech.

Co-Authored by

Dr. K.Gomi, Dr. M.Fujii ,Dr. S.Maki, Dr. Y.Hirano

Hurricane Maria: Devastation in Puerto Rico



SDGs Promotion Headquarters (third meeting) relating to working with local governments, June 9th, 2017

(Excerpt from Prime Minister's statement)

“Sustainable Development Goals, or SDGs, are important efforts that all countries, both developed and developing, are responsible for. Japan's standpoint is from that of providing security for people, and through our leadership we plan to realize a society in which no one is left behind, and in which each and every individual can demonstrate their abilities.

Focusing on July's UN report and September's UN General Assembly meeting, I will once again provide instructions regarding the following 3 points
(Abridged)

Second is the promotion of SDGs in the regions. These are sure to contribute to the invigoration of localities. I request that related cabinet ministers work together to consider policies to promote regional efforts to achieve SDGs, as well as implement these policies.

Held June 9, 2017 (at Prime Minister's Office)



Eco-cities, Smart Cities and SDGs Future Cities

● Eco-Model Cities since 2008; 23 cities

Low-carbon Unification Initiatives for Cities/Regions

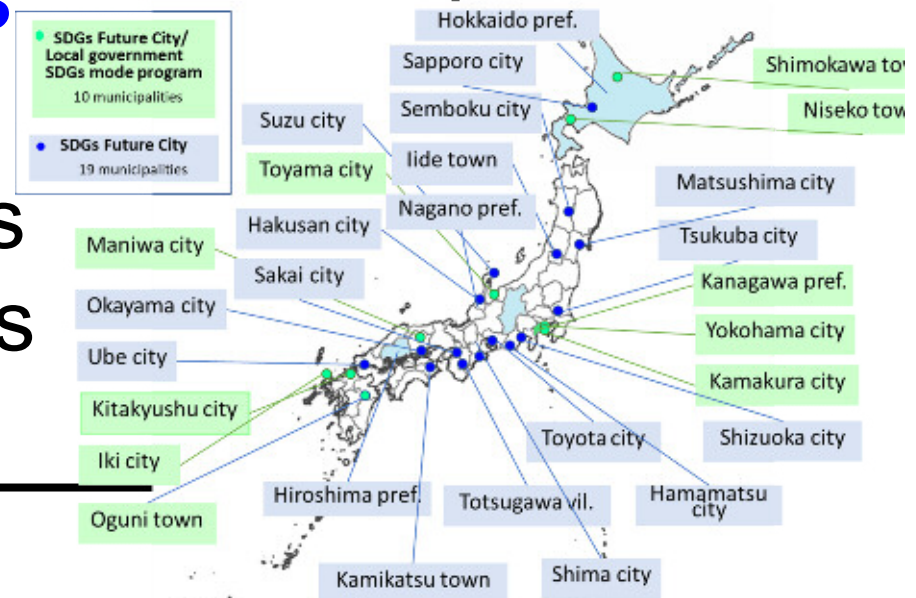
● Future Cities since 2011; 11 cities

The creation of successful examples to be spread throughout Japan and internationally

● SDGs Future Cities

2018; 29 2019; 31

Autonomous SDGs Plans and Model Project Cities



This map is made based on the blank map of Geospatial Information Authority of Japan (<http://www.gsi.go.jp>)

【Inclusion · Integration】 Efforts to local governments

Welfare · Health

Education



Urban
Planning Built
Environment

Environment · Energy ·
Water

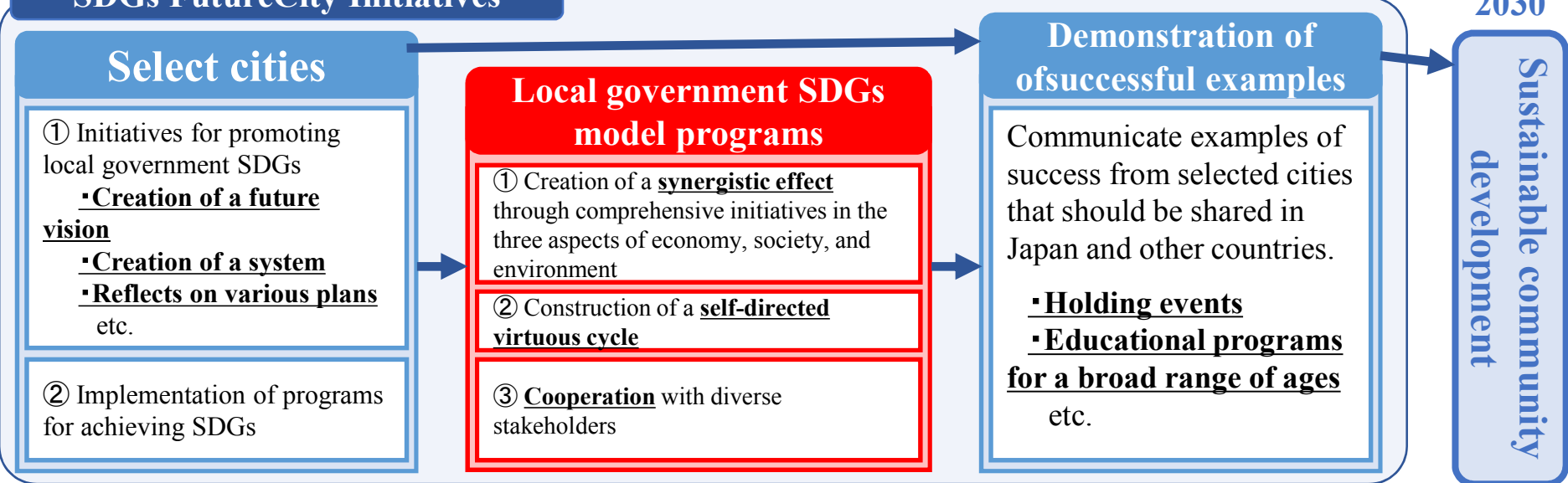
Industry · Tourism ·
Agriculture

Promoting Local Government SDGs for Invigoration of Localities

Aim Materials from Promotion of Overcoming Population Decline and Vitalizing Local Economy, Cabinet Office, Japan

- Initiatives for achieving SDGs in local governments contribute to the realization of locality invigoration.
- Initiatives for achieving SDGs by local governments will be publicly sought and cities proposing outstanding initiatives will be selected as an **SDGs FutureCity** and strong assistance will be provided by the Government Offices Taskforce for Promoting Local Government SDGs.
- 10 pioneering initiatives will be chosen as **Local Government SDGs model programs** and financial support provided. (FY2018 estimated budget is 400 million yen (new))

SDGs FutureCity Initiatives



Government Offices Taskforce for Promoting Local Government SDGs (scheduled for establishment in January 2018)

Based on the Comprehensive Strategy for Community, People, and Work Creation 2017 Revision (Cabinet Decision 12/22/2017)

Office for Promotion of Overcoming Population Decline and Vitalizing Local Economy in Japan, Cabinet Office (Office)					Cabinet Secretariat	Reconstruction Agency	Cabinet Office	National Police Agency	Financial Services Agency	Consumer Affairs Agency
Ministry of Internal Affairs and Communications	Ministry of Justice	Ministry of Foreign Affairs	Ministry of Finance	Ministry of Education, Culture, Sports, Science and Technology	Ministry of Health, Labor and Welfare	Ministry of Agriculture, Forestry and Fisheries	Ministry of Economy, Trade and Industry	Ministry of Land, Infrastructure, Transport and Tourism	Ministry of the Environment	Ministry of Defense

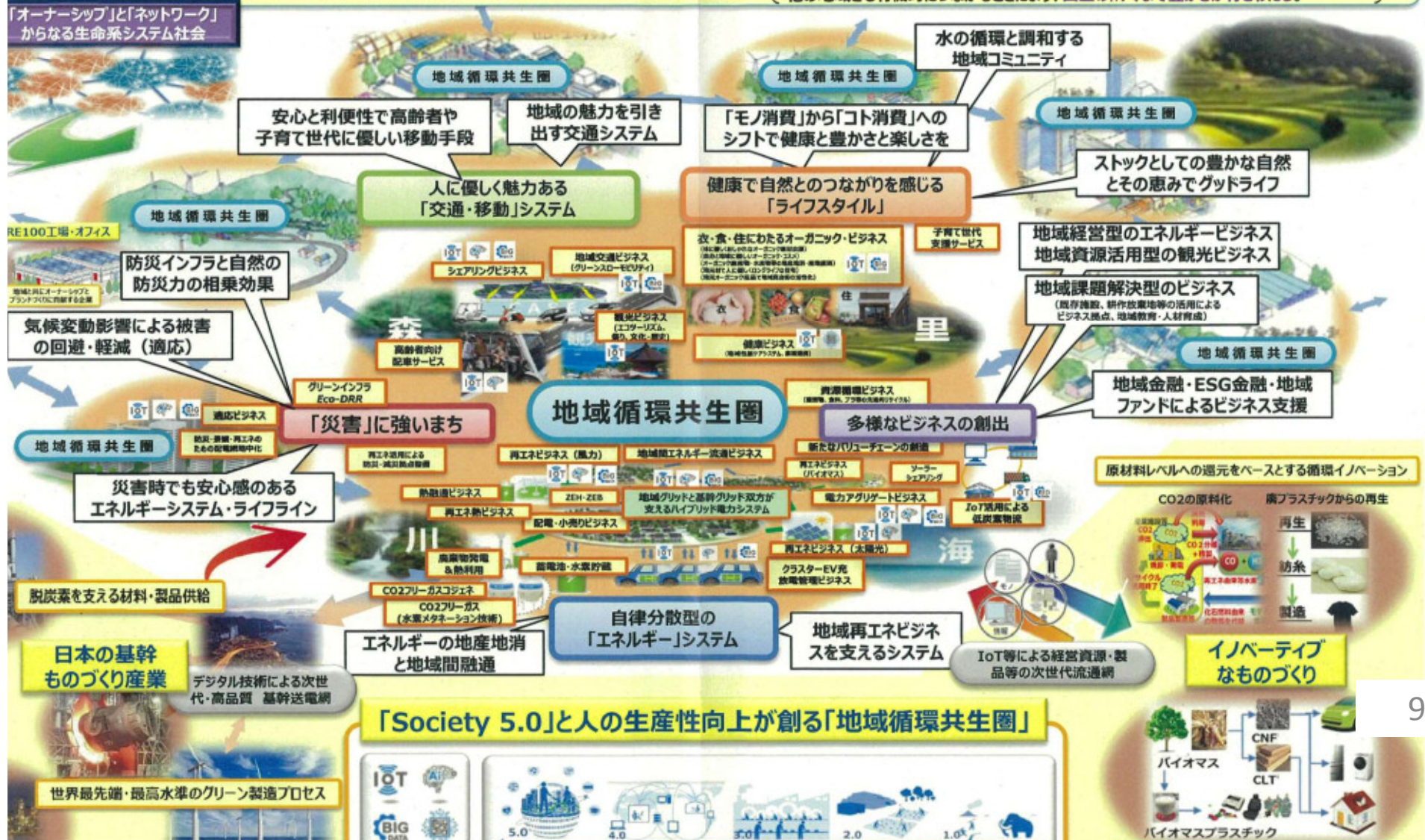
地域循環共生圏（日本発の脱炭素化・SDGs構想）

— サイバー空間とフィジカル空間の融合により、地域から人と自然のポテンシャルを引き出す生命系システム —

「自立分散」×「相互連携」×「循環・共生」= 活力あふれる「**地域循環共生圏**」 ⇒ 「**脱炭素化・SDGsの実現、そして世界へ**」
 「オーナーシップ」「ネットワーク」「サステナブル」
 「人間の安全保障、次世代・女性のエンパワメントを基盤に」

⇒ **新たな価値とビジネスで成長を牽引する地域の存立基盤**

人々が健康で生き活きと暮らし幸せを実感することで、地域が自立し誇りを持ちながらも、他の地域とも有機的につながることで、国土の隅々まで豊かさが行きわたる。



Local Energy Pilot Projects for SDGS

① Circular Industrial Parks

② Local Energy System

③ Strategic Land Use Planning

Industrial Symbiosis and Urban Industries to empower cities by circularization

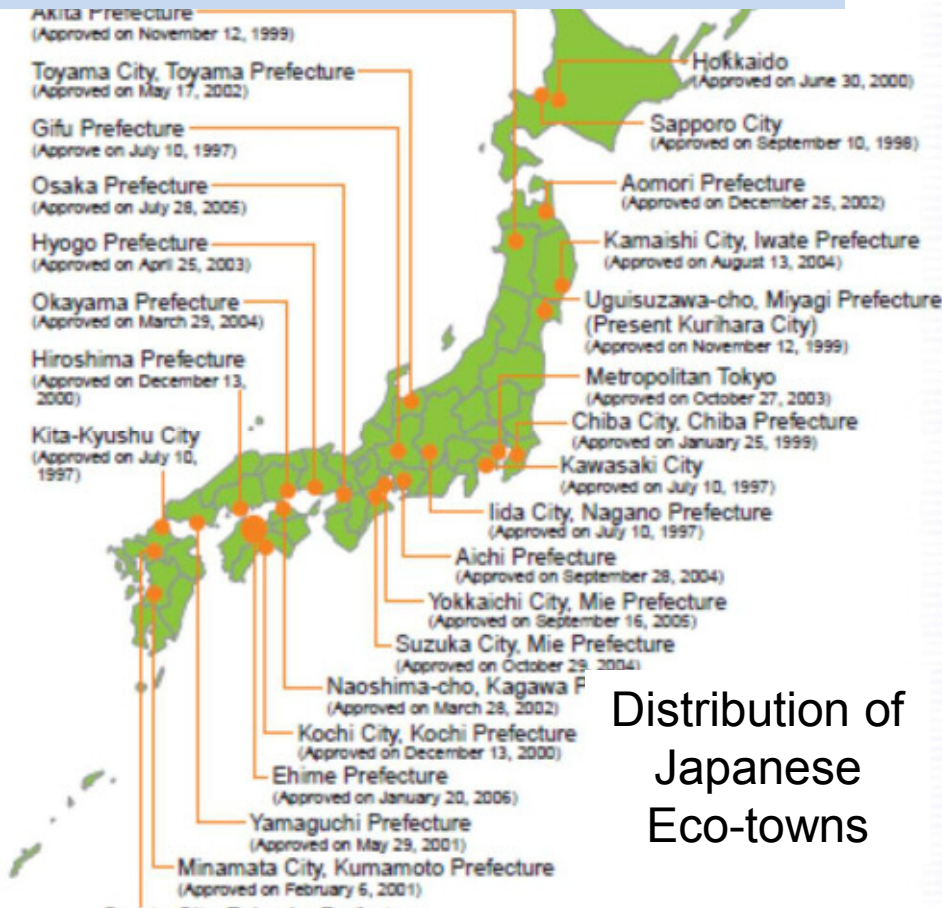


Eco-town area as demonstration project for Sound material cycle society

METI & MOE approved Eco-Town Plans for 26 areas as of the end of January 2006, and they provided financial support to 62 facilities located within the appropriate areas.



Forming the basis of capacity that totally 2.18 mil t of wastes were treated



Edited by Prof. Fujita, T., Published by METI,,2006

<p>Distribution of Total Investment Subsidy projects in 24 Eco-Towns 600mil. US\$</p>	<p>Distribution of Total Investment 60 projects in 24 Eco-Towns 1.6 bil. US\$</p>
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Berkel and Fujita et. al., Environment, Science and Technology, 2010

Variation of Eco-Industrial Parks(EIP) Strategies in Eco-towns

URBAN REDEVELOPMENT

TYPE EIP **Kitakyushu**



Green Institute (Minneapolis)

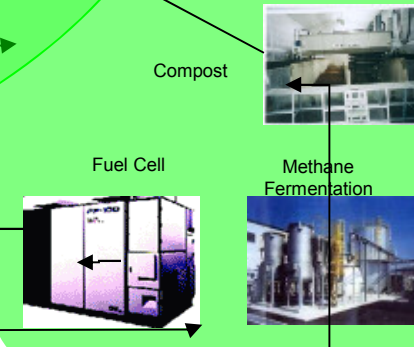
Rural Area

Cape Charles Sustainable Farm
Technology Park (Virginia)



CITY-FARM COLLABORATION TYPE EIP

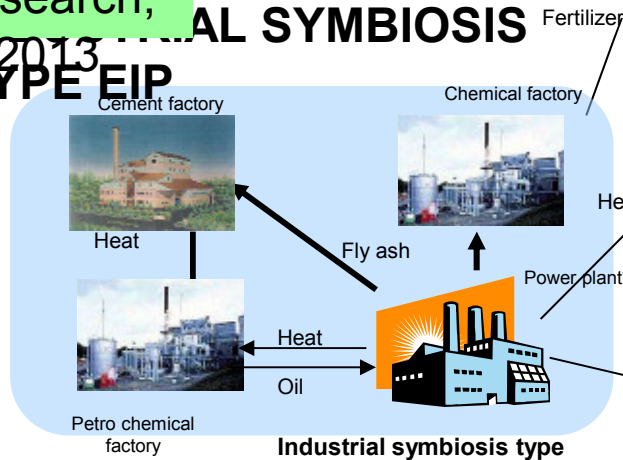
Hokkaido



Chen and Fujita et al.,
Euro. J. of Operation Research,
2013

INDUSTRIAL SYMBIOSIS

TYPE EIP



Urban Area



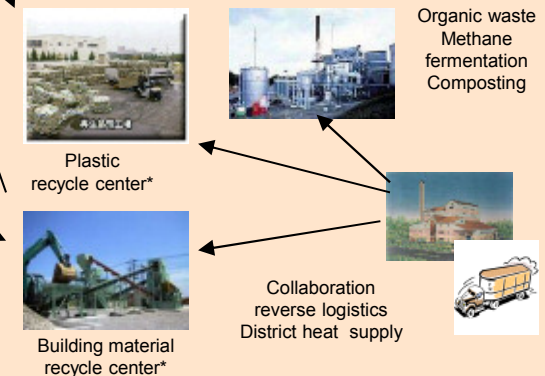
Brownfield Neighborhood



Industrial complex

Residential Districts

Akita, Osaka



PRODUCT REMANUFACTURING TYPE EIP

Kawasaki, Minamata

Water Front

SDGs Cities from Circular Economy

- Circular region through local circularization and energy management
- Information and infrastructure system for resource circularization, local energy management and eco-system utilization



Local Energy Pilot Projects for SDGS

① Circular Industrial Parks

② Local Energy System

③ Strategic Land Use Planning

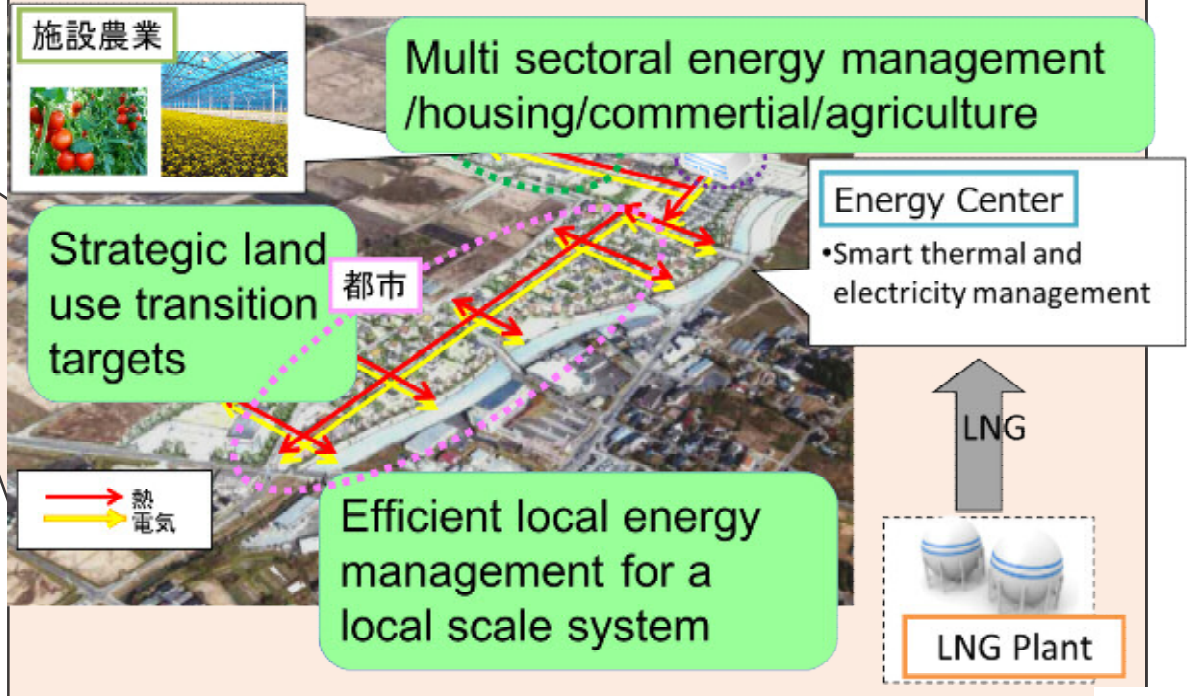
Newest Smart Community underway in Fukushima



Shinci Town,
Soma-Futaba Region, Fukushima Prefecture
 Population: 8,247 / Households: 2,754 /
 Area: 46.35 km² (As of Jan. 1st, 2017)

SDGs from Local Energy Business

Sustainable rebuilding projects through collaborative planning among town planning, industrial development and local energy system

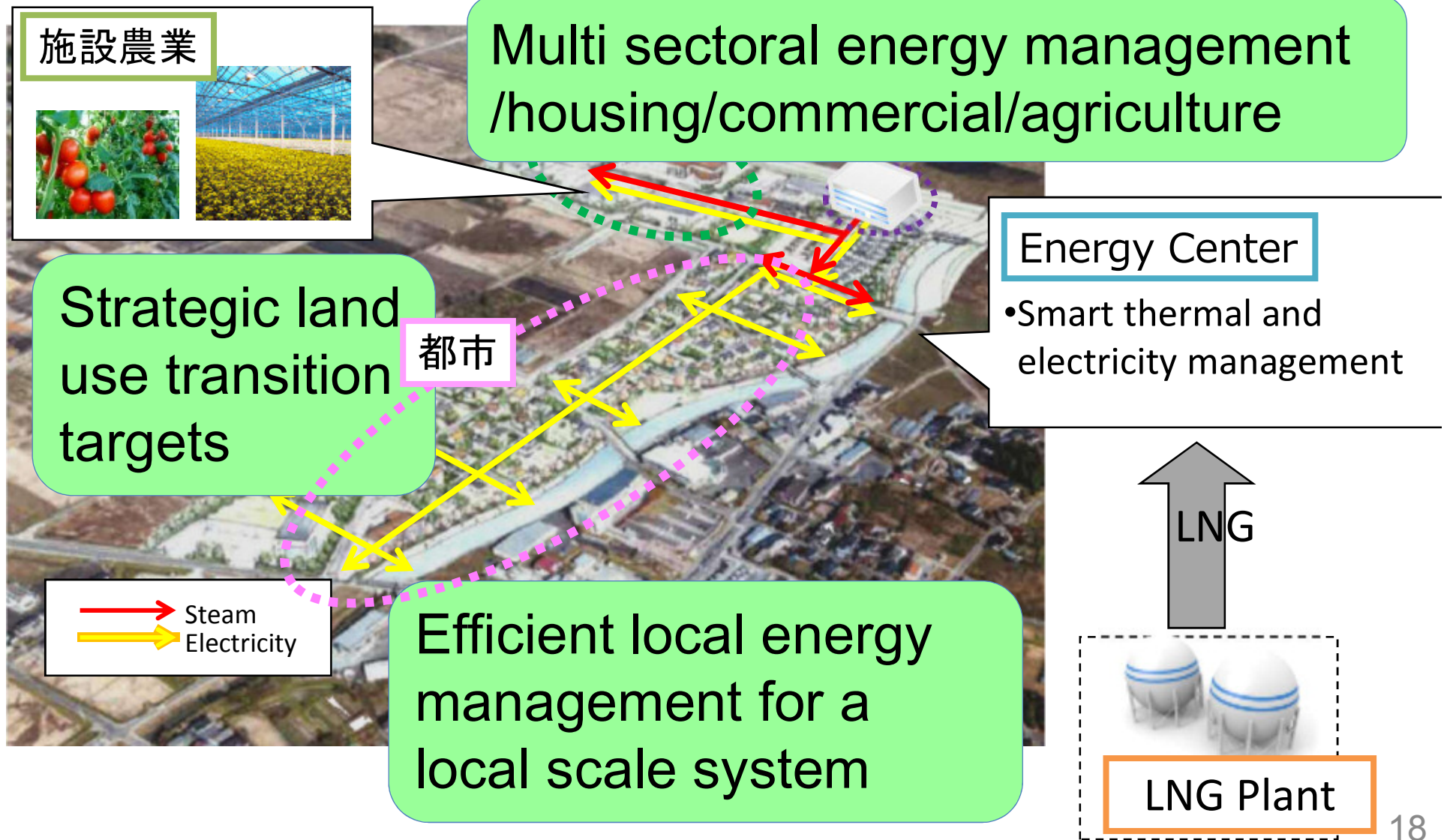


町のシンボルとなる地域エネルギーセンター建設状況 Oct. 2018



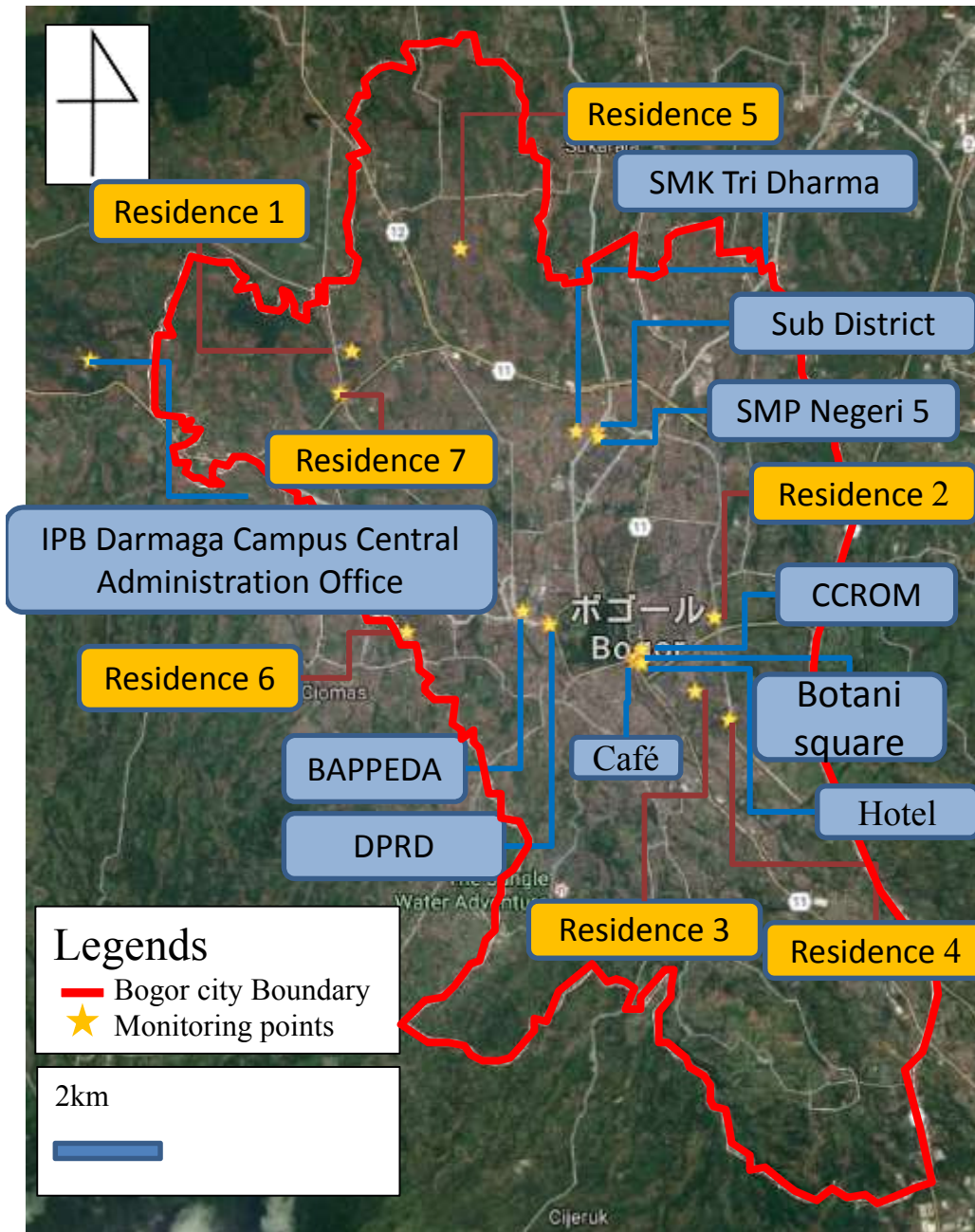
Local Energy Based Urban Rebuilding Project in Fukushima

Sustainable rebuilding projects through collaborative planning among town planning, industrial development and local energy system



Distribution of Monitoring System in Bogor City

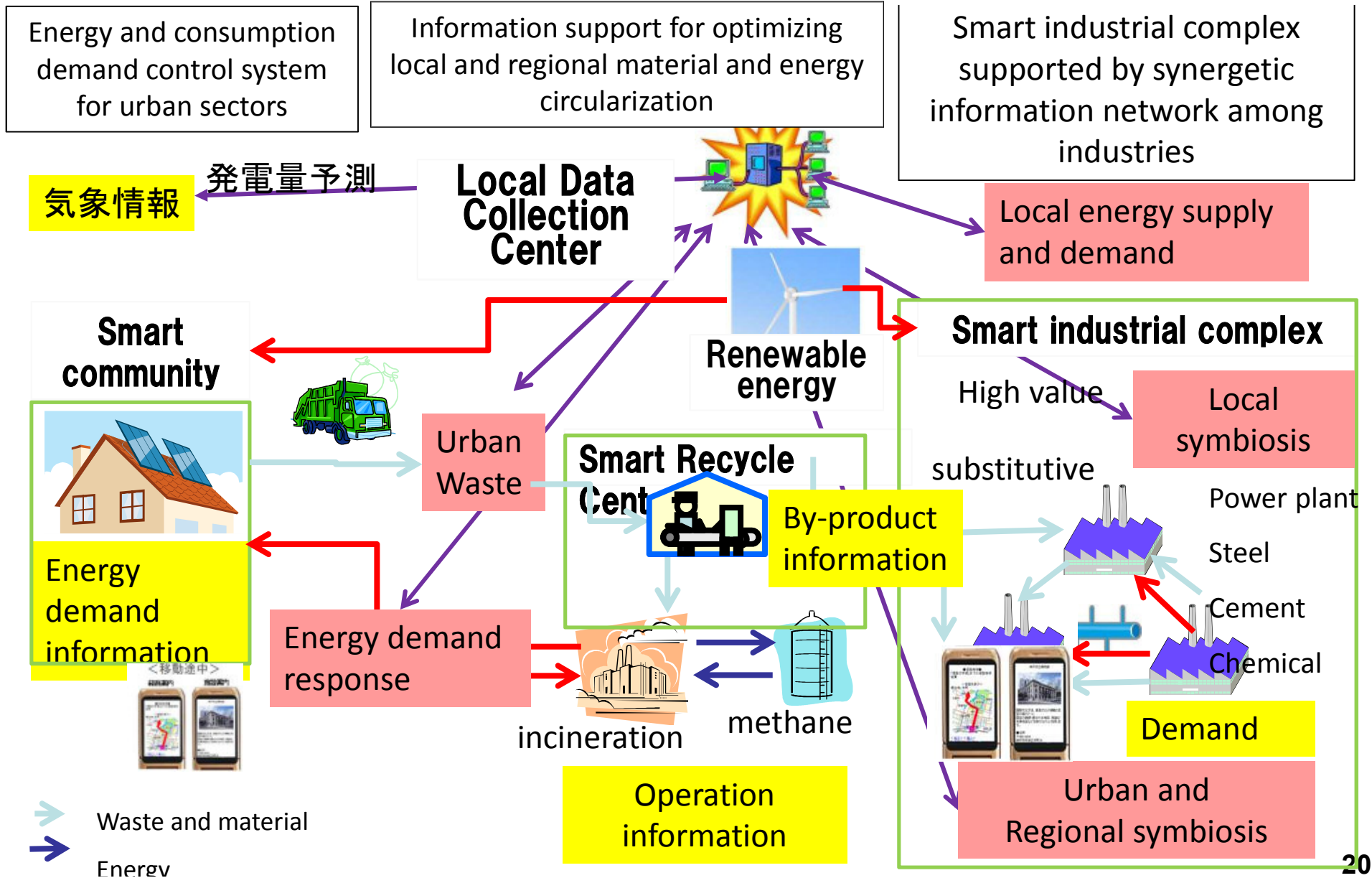
We have been monitoring about 180 points in Bogor city since FY 2014



	Sensor	Area [m ²]
CCROM	15	243
Hotel	16	413.8
Café	6	150
Admin	46	?
Residence 1	4	68
Residence 2	6	80
Residence 3	4	87
Residence 4	12	210
BAPPEDA	13	377.8
DPRD	7	1021.6
Sub District	10	587
Botani square	10	42000
Residence 5	3	99.4
Residence 6	3	137.1
Residence 7	4	156.4
SMP Negeri 5	6	2600
SMK Tri Dharma	6	8000

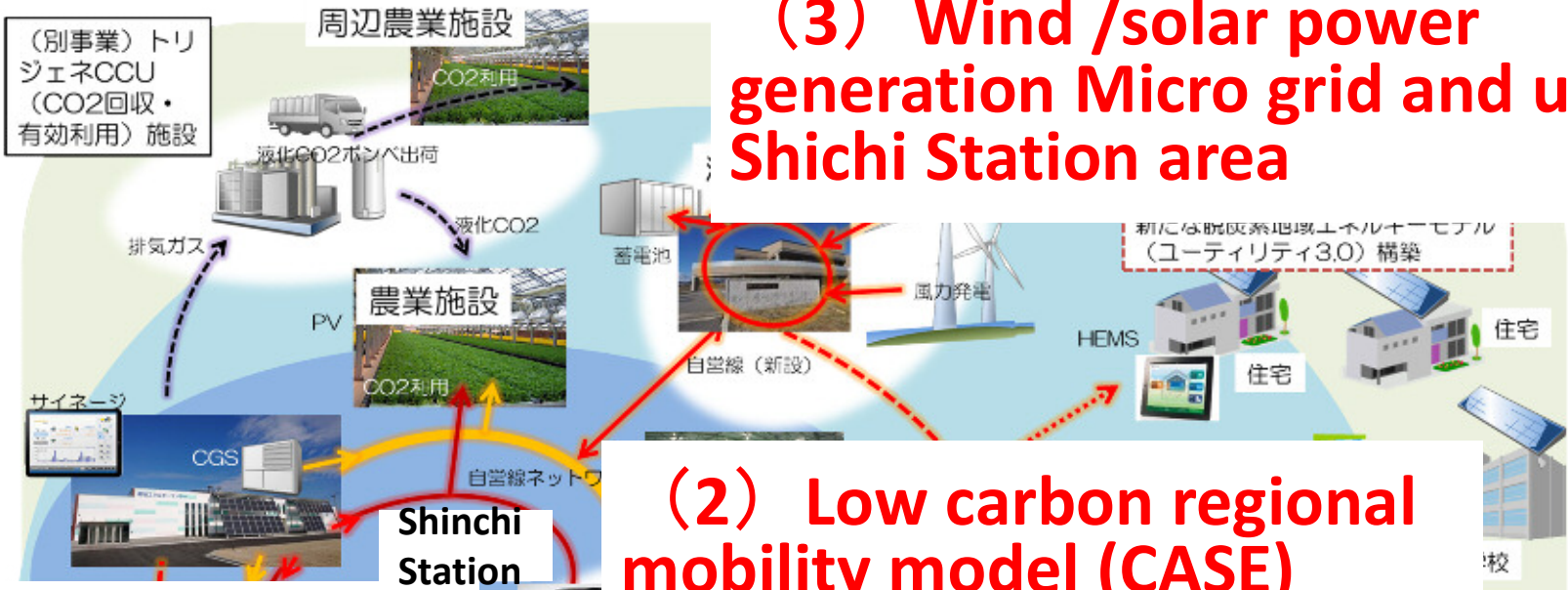
Smart Symbiosis Initiatives for Eco town Innovation

Smart ICT network will promote and complement the synergetic network functions among stakeholders

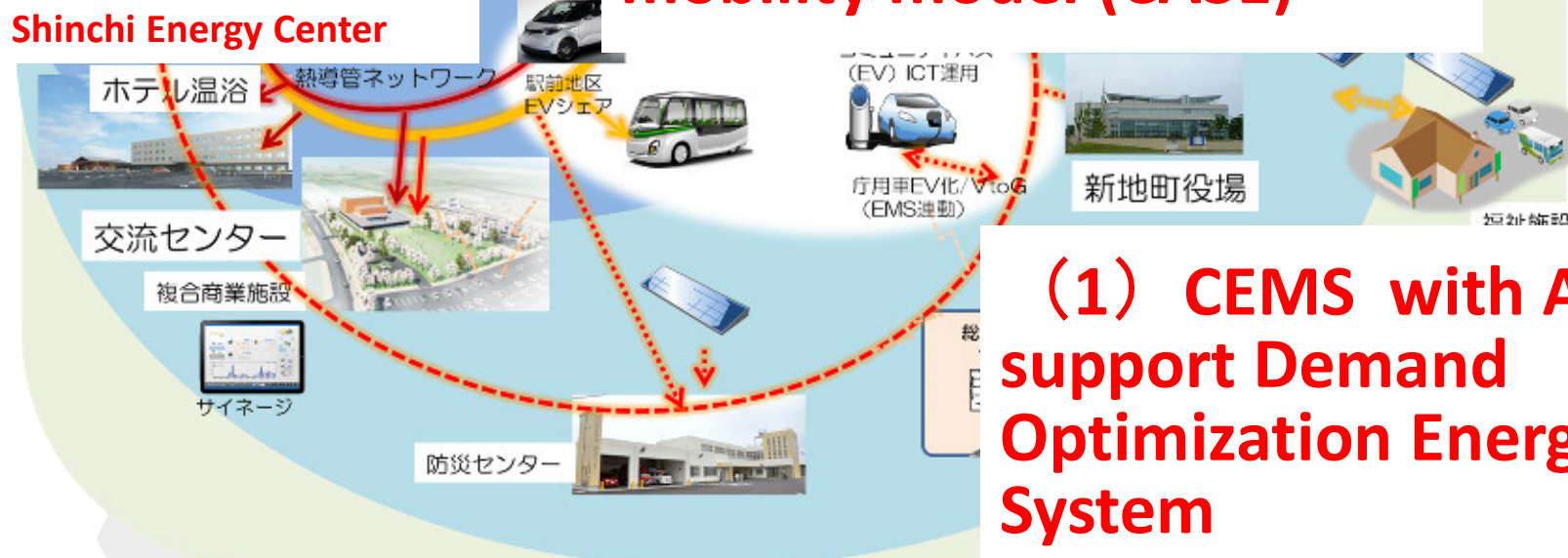


Future Design for Fukushima Circulating Ecological Sphere

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

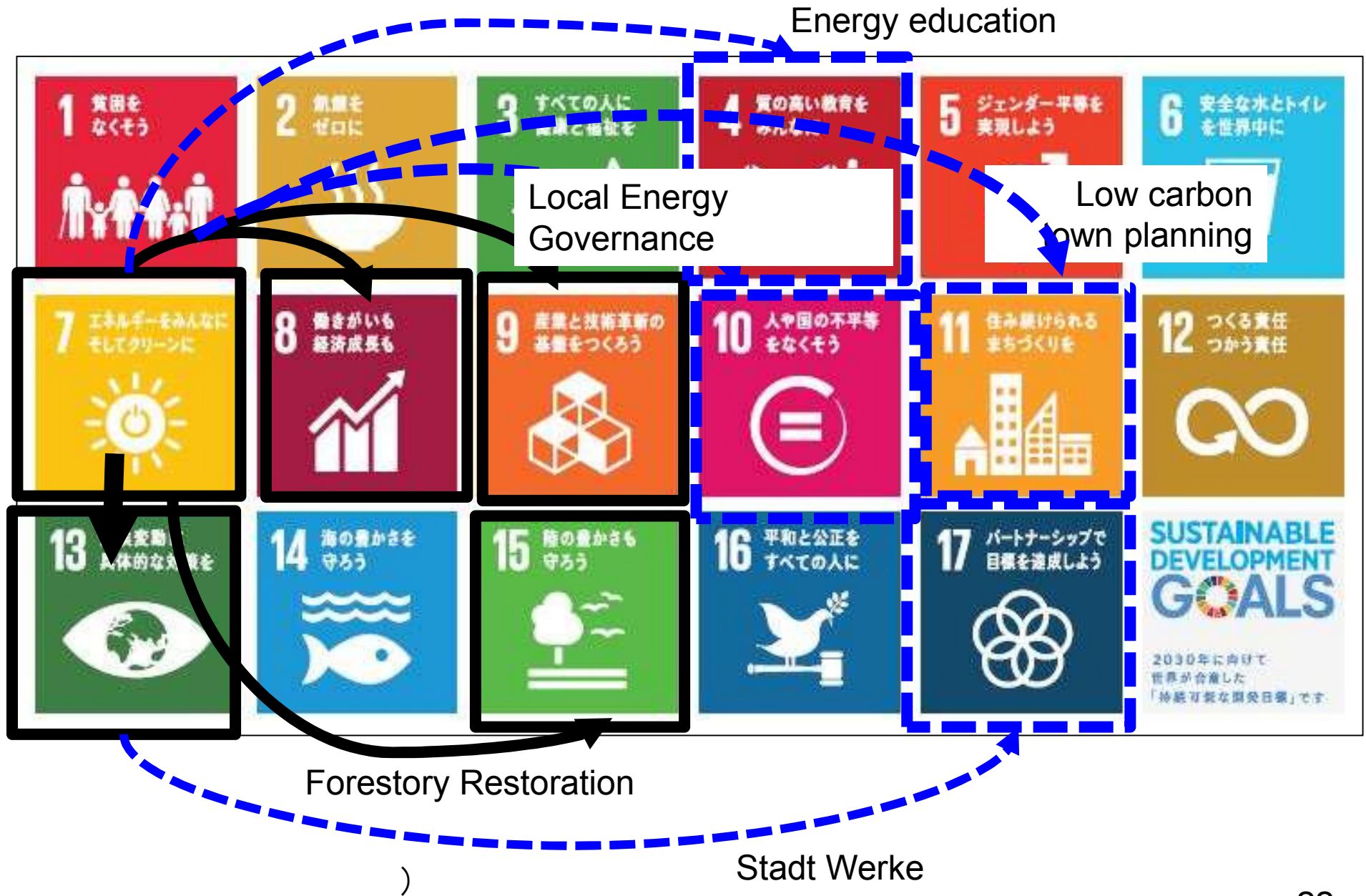


(2) Low carbon regional mobility model (CASE)

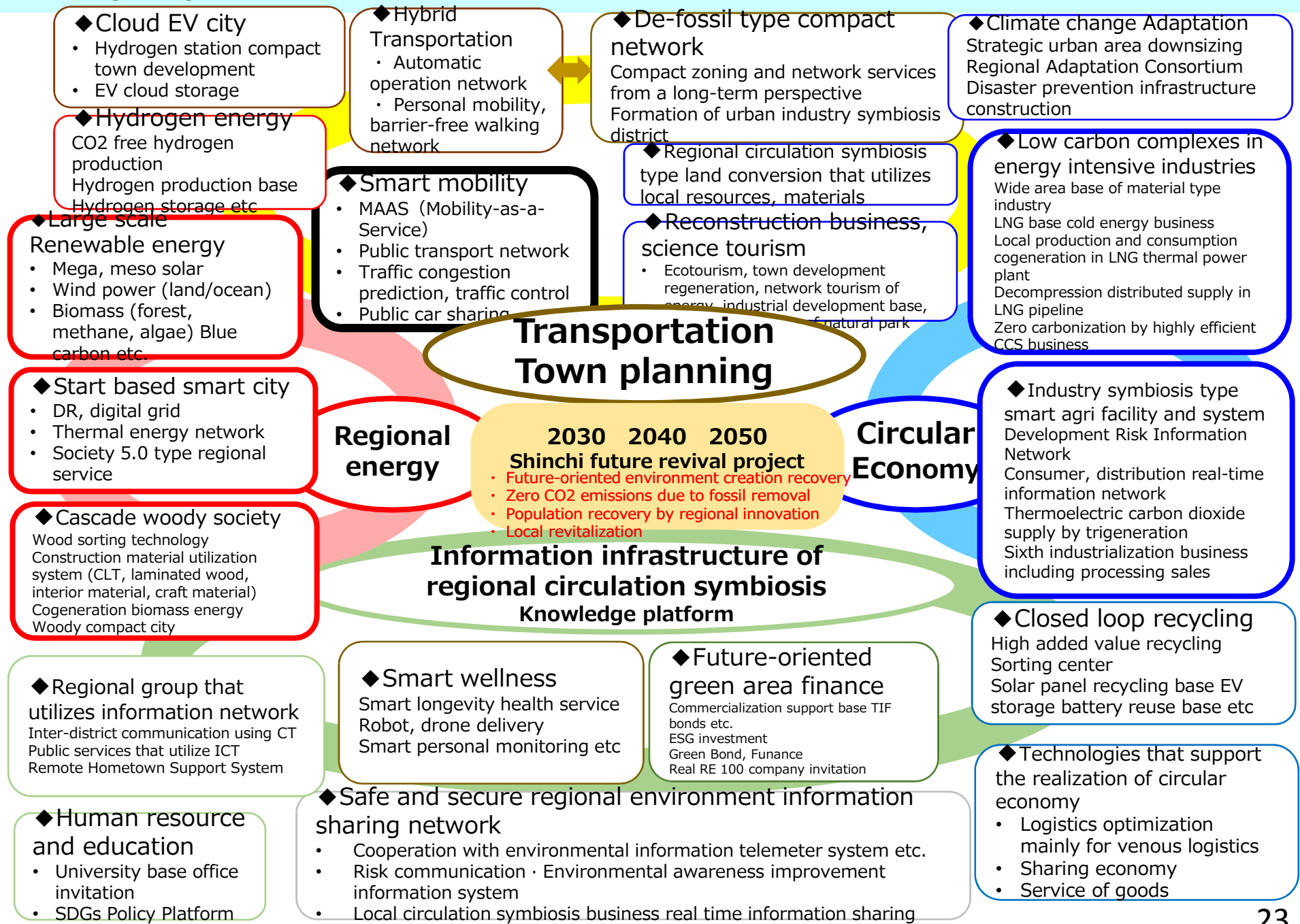


(1) CEMS with AI support Demand Optimization Energy System

SDG Pilot Projects from Local Energy Policies



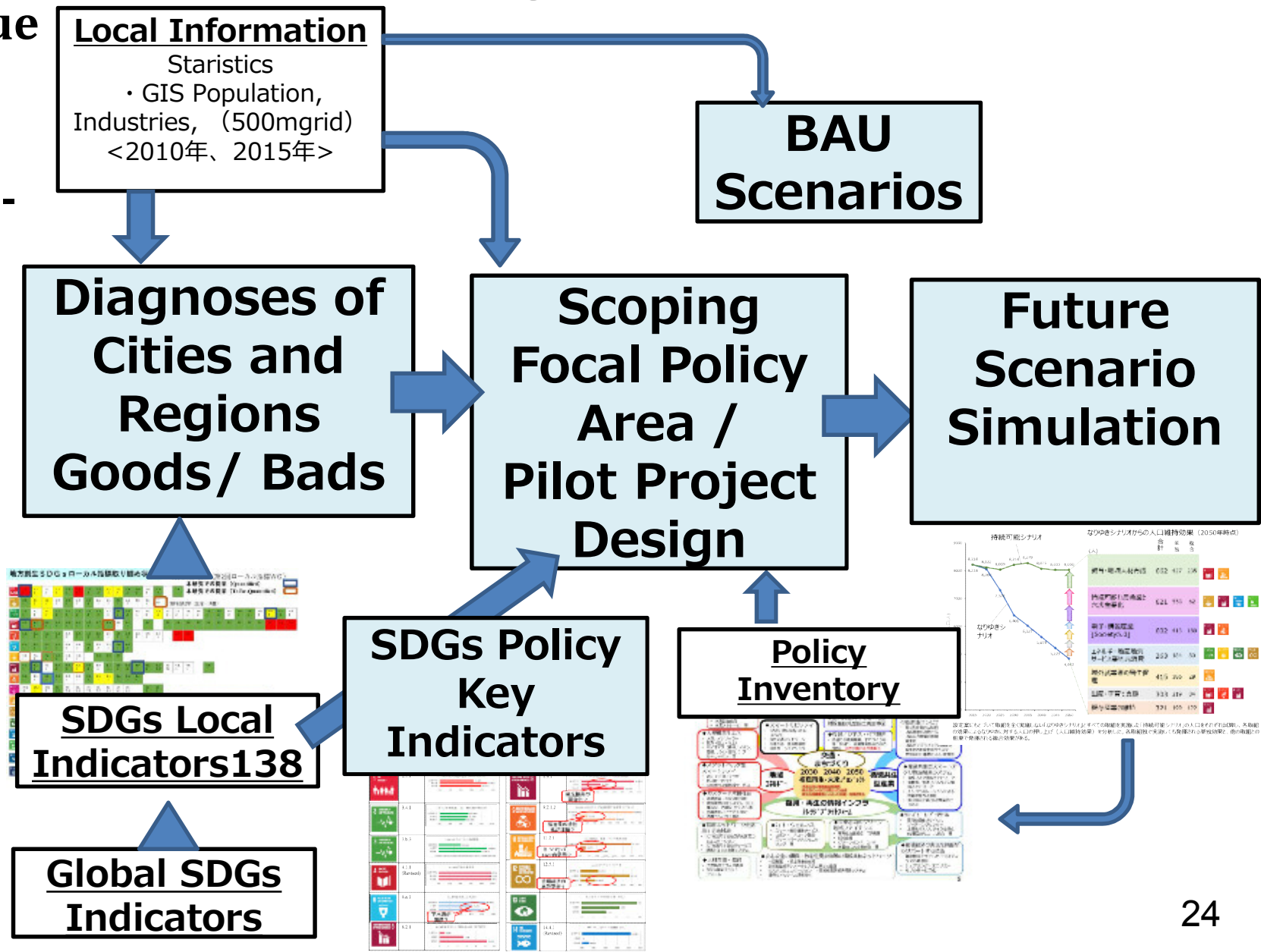
Scope plan of low carbon Future Scenarios for Cities



Policy Scenario Design Process for SDGs Model Cities and Regions

Dialogue with Local Governments

Research Consortium



Local Indicators from Japan for HDPF in UN, NY

as Official Local SDGs indicators for Japanese Cities

Revised by authors from the Material of Cabinet Office Local SDGs Committee, Local Indicator WG

SDG	1.1	1.2	1.2.2	1.3	1.4	1.4.2	1.5	1.5.2	1.5.3	1.5.4	1.a	1.a.2	1.a.3	1.b	1.X	SDGs Policy Key Indicators (Quantified)	SDGs Policy Key Indicators (To Be-Quantified)											
1	1.1.1	1.2.1	1.2.2	1.3.1	1.4.1	1.4.2	1.5.1	1.5.2	1.5.3	1.5.4	1.a.1	1.a.2	1.a.3	1.b.1	1.X													
2	2.1.1	2.1.2	2.2.1	2.2.2	2.3.1	2.3.2	2.4.1	2.5.1	2.5.2	2.a.1	2.a.2	2.b.1	2.c.1															
3	3.1.1	3.1.2	3.2.1	3.2.2	3.3.1	3.3.2	3.3.3	3.3.4	3.3.5	3.4.1	3.4.2	3.5.1	3.5.2	3.6.1	3.7.1	3.7.2	3.8.1	3.8.2	3.9.1	3.9.2	3.9.3	3.a.1	3.b.1	3.b.2	3.b.3	3.c.1	3.d.1	
4	4.1.1	4.2.1	4.2.2	4.3.1	4.4.1	4.5.1	4.6.1	4.7.1	4.a.1	4.b.1	4.c.1	4.X			3.X	3.X	3.X	3.X	3.X	3.X	3.X	3.X	3.X	3.X	3.X	3.X	3.X	3.X
5	5.1.1	5.2.1	5.2.2	5.3.1	5.3.2	5.4.1	5.5.1	5.5.2	5.6.1	5.6.2	5.a.1	5.a.2	5.b.1	5.c.1	5.X	5.X												
6	6.1.1	6.2.1	6.3.1	6.3.2	6.4.1	6.4.2	6.5.1	6.5.2	6.6.1	6.a.1	6.b.1																	
7	7.1.1	7.1.2	7.2.1	7.3.1	7.a.1	7.b.1		7.X	7.X	7.X																		
8	8.1.1	8.2.1	8.3.1	8.4.1	8.4.2	8.5.1	8.5.2	8.6.1	8.7.1	8.8.1	8.8.2	8.9.1	8.9.2	8.1.0.1	8.1.0.2	8.a.1	8.b.1	8.X										
9	9.1.1	9.1.2	9.2.1	9.2.2	9.3.1	9.3.2	9.4.1	9.5.1	9.5.2	9.a.1	9.b.1	9.c.1																
10	10.1.1	10.2.1	10.3.1	10.4.1	10.5.1	10.6.1	10.7.1	10.7.2	10.a.1	10.b.1	10.c.1		10.X	10.X														
11	11.1.1	11.2.1	11.3.1	11.3.2	11.4.1	11.5.1	11.5.2	11.6.1	11.6.2	11.7.1	11.7.2	11.a.1	11.b.1	11.b.2	11.c.1	11.X	11.X	11.X	11.X	11.X	11.X	11.X	11.X	11.X				
12	12.1.1	12.2.1	12.2.2	12.3.1	12.4.1	12.4.2	12.5.1	12.6.1	12.7.1	12.8.1	12.a.1	12.b.1	12.c.1															
13	13.1.1	13.1.2	13.1.3	13.2.1	13.3.1	13.3.2	13.a.1	13.b.1		13.X																		
14	14.1.1	14.2.1	14.3.1	14.4.1	14.5.1	14.6.1	14.7.1	14.a.1	14.b.1	14.c.1																		
15	15.1.1	15.1.2	15.2.1	15.3.1	15.4.1	15.4.2	15.5.1	15.6.1	15.7.1	15.8.1	15.9.1	15.a.1	15.b.1	15.c.1														
16	16.1.1	16.1.2	16.1.3	16.1.4	16.2.1	16.2.2	16.2.3	16.3.1	16.3.2	16.4.1	16.4.2	16.5.1	16.5.2	16.6.1	16.6.2	16.7.1	16.7.2	16.8.1	16.9.1	16.10.1	16.10.2	16.a.1	16.b.1	16.X	16.X			
17	17.1.1	17.1.2	17.2.1	17.3.1	17.3.2	17.4.1	17.5.1	17.6.1	17.6.2	17.7.1	17.8.1	17.9.1	17.10.1	17.11.1	17.12.1	17.13.1	17.14.1	17.15.1	17.16.1	17.17.1	17.18.1	17.18.2	17.18.3	17.19.1	17.19.2			

SDGs Key Indicators for Policy Planning

SDGs Focal Projects for Model Project Planning

Smart ICT Cities

Local Energy Business

Local Transit System

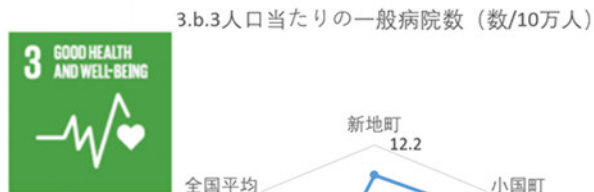
Local Circularizing Business

Goal	Global Indicator(GI)	Localized Indicator (LI)
1	1.1.1	相対的貧困割合
2	2.1.2.2	生産額ベースの食料自給率（各都道府県の食料生産額/食料消費仕向額）
3	3.4.1	心血管疾患、癌、糖尿病の死亡率
3	3.b.3	心血管疾患、癌、糖尿病の死亡率/総死亡数
3	3.b.3	人口当たりの一般病院数（一般病院数/人口）
4	4.1.1	中学登校者割合（（中学校在学者数-不登校者数）/中学校在学者数）
4	4.2.1	5歳未満の入院者割合（5歳未満の入院者数/5歳未満人口）
4	4.a.1.2	学校におけるコンピュータの設置状況率
6	6.3.1	汚水処理人口普及率
6	6.a.1	人口当たりの下水道費（下水道費/総人口）
7	7.1.1	人口当たりの電力エネルギー消費量（電力エネルギー消費量/人口）
7	7.2.1.4	新エネルギー発電割合（新エネルギー発電量/最終エネルギー消費量）
7	7.3.1	エネルギー消費量当たりの県内総生産（県内総生産/エネルギー消費量）
8	8.2.1	就業者当たりの県内総生産（県内総生産/就業者数）
8	8.4.1	1人1日当たりのごみ排出量（家庭部門）
8	8.5.1	労働者の平均時給（平均所得/所定内+超過実労働時間）
8	8.5.2	失業率（完全失業者数/労働力人口）
8	8.9.1	県内総生産当たりの観光消費額（観光消費額/県内総生産）
9	9.2.1.2	人口当たりの製造業粗付加価値額（製造業粗付加価値額/人口）
9	9.4.1	県内総生産当たりのCO2排出量（CO2排出量/県内総生産）
9	9.5.1	県内総生産当たりの研究開発費（研究開発費支出総額/県内総生産）
9	9.c.1	インターネット普及率
10	10.2.1	相対的貧困世帯割合
10	10.4.1	労働生産性（付加価値額/従業員数）
11	11.2.1	鉄道、電車、バスの利用割合
11	11.3.1.3	人口自然増減（出生数-死亡数）/総人口
11	11.6.1	廃棄物の最終処分割合（最終処分量/ごみ総排出量）
12	12.2.1	1人1日当たりのごみ排出量（家庭部門）
12	12.4.2	有害廃棄物割合（その他廃棄物/廃棄物の総搬入量）
12	12.5.1	リサイクル率
13	13.1.1	災害等の自然外因による死亡者割合（災害等の自然外因による死亡者/人口）
13	13.X	人口当たりのCO2排出量（CO2排出量/総人口）
14	14.4.1	人口当たりの漁獲量（漁獲量+養殖收穫量）/総人口
15	15.1.1	森林面積割合（森林面積/面積）
16	16.1.4.1	人口当たりの刑法犯認知件数（刑法犯認知件数/総人口）
17	17.1.2.1	財力指数
17	17.8.1	インターネット普及率
17	17.17.1	地域サポーターを設置している市区町村の割合

SDGs Key Indicators (Prototype) for Policy Design

through Co-Planning Process

Comparative Diagnosis of Cities by SDGs Key Indicators (2010)



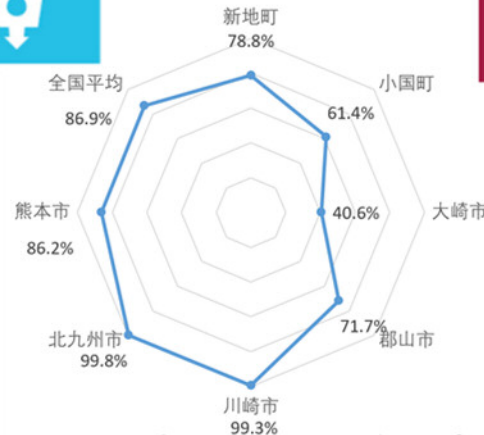
3.b.3人口当たりの一般病院数 (数/10万人)



3.b.3人口当たりの一般病院数(数/10万人)



6.a.1汚水処理人口普及率



6.3.1汚水処理人口普及率



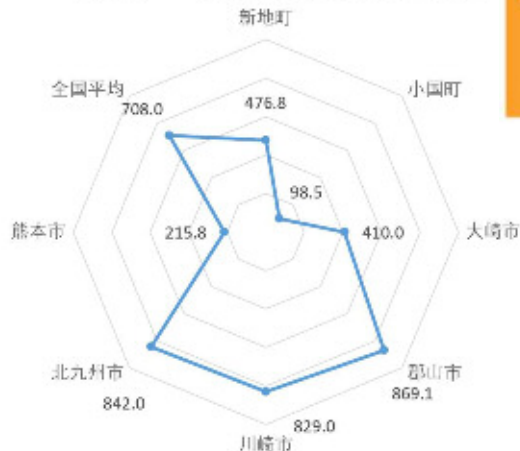
8.2.1就業者当たりの町内総生産 (百万円/人)



8.2.1就業者当たりの町内総生産(百万円/人)



9.2.1.2人口当たりの製造業粗付加価値 (千円/人)



9.2.1.2人口当たりの製造業粗付加価値(千円/人)



11.2.1鉄道・電車・バスの利用割合



11.2.1鉄道・電車・バスの利用割合



13.x人口当たりのCO2排出量 (t/人)

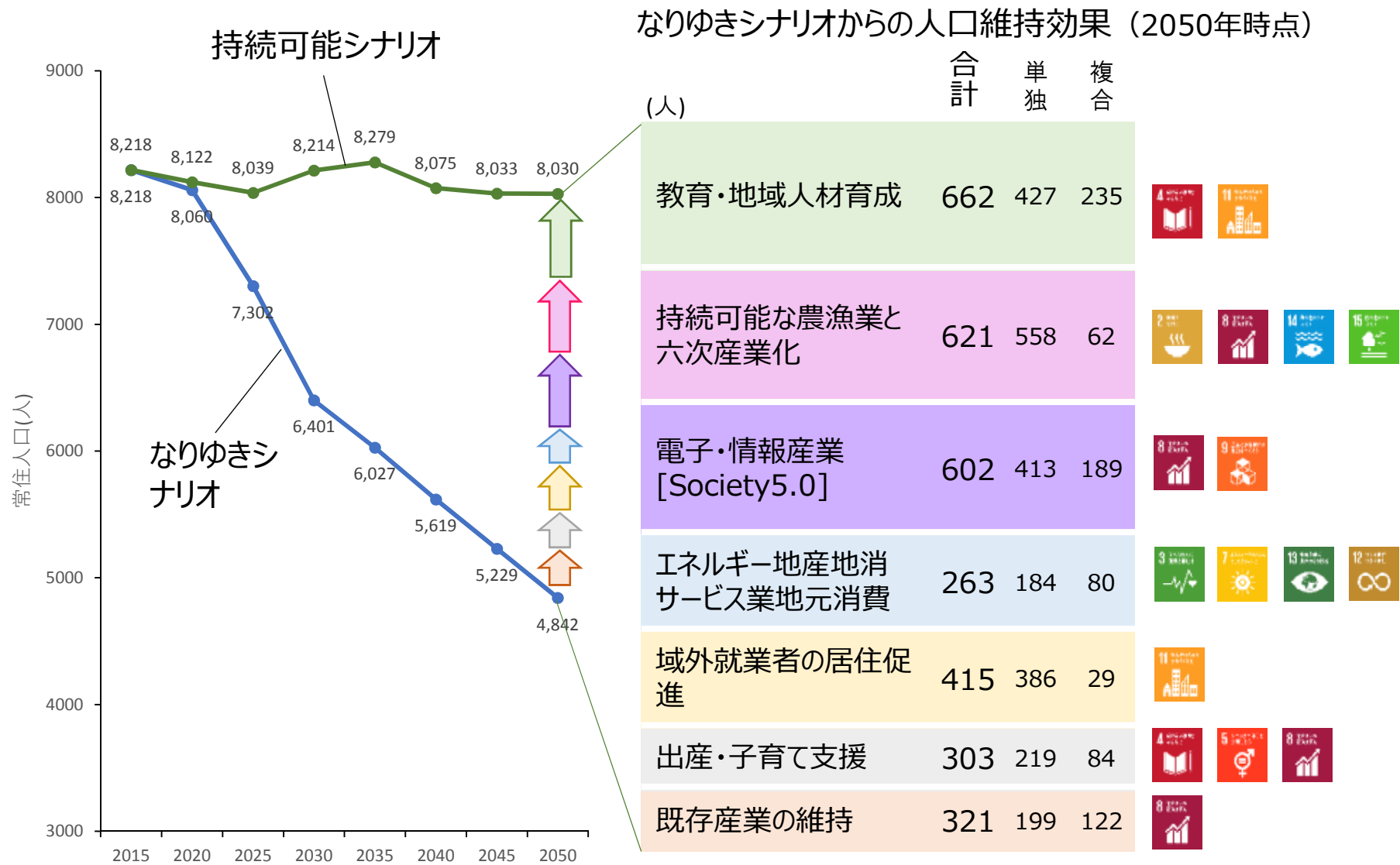


13.x人口当たりのCO2排出量(t/人)

12.5.1ごみのリサイクル率

14.4.1人口当たりの漁獲量(t/万人)

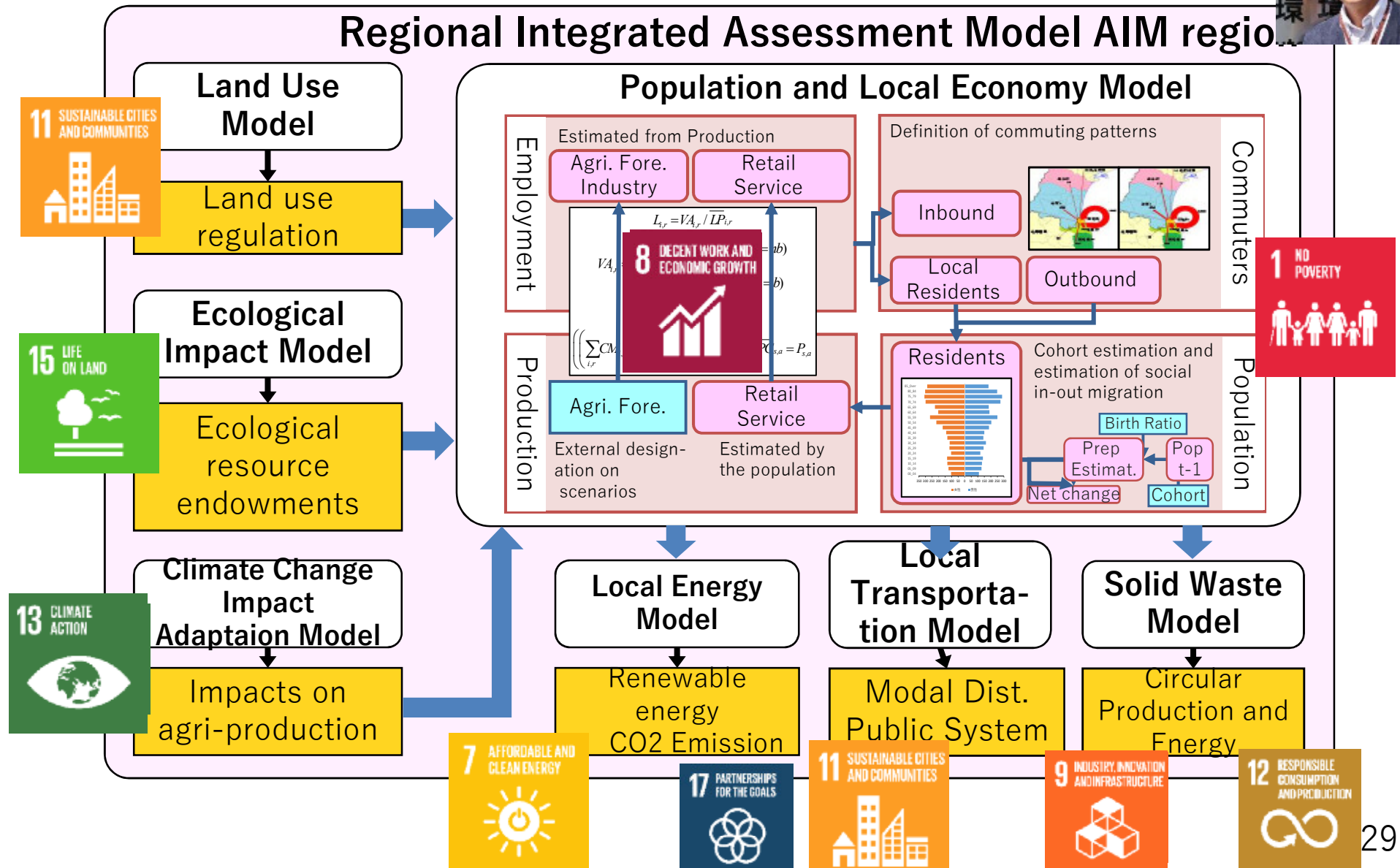
Socio Economic Environmental Forecast of Future Scenarios



設定案にもとづいて取組を全く実施しない「なりゆきシナリオ」とすべての取組を実施した「持続可能シナリオ」の人口をそれぞれ試算し、各取組の効果によるなりゆきに対する人口の押し上げ（人口維持効果）を分析した。各取組独で実施しても発揮される単独効果と、他の取組との相乗で発揮される複合効果がある。

AIM Regional Model to Quantify the SDGs Accomplishments

Dr. Gomi NIES



Interactive Eco-policy Simulation System in Asia

Fukushima Shinchi
Township

Community Assist Tablet Network



Local
Needs

Regional
Environment
Information

National Institute for Env. Studies

Urban Spatial
Analysis

Local
environment
diagnosis

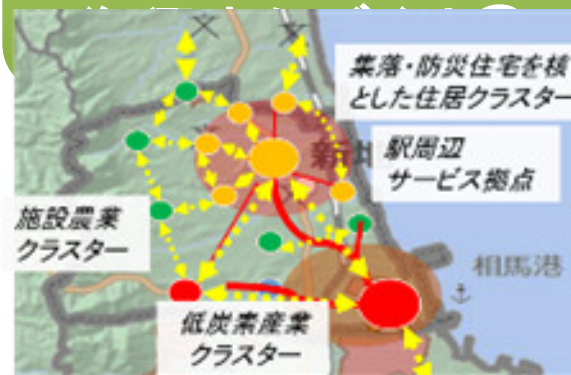
Integrated
Modelling

Future scenario
assessment

Tech. and policy
inventory

- low carbon tech
- circulation tech
- industrial symbiosis
- policy / regulation
- land use control

Simulation for
recovery roadmap

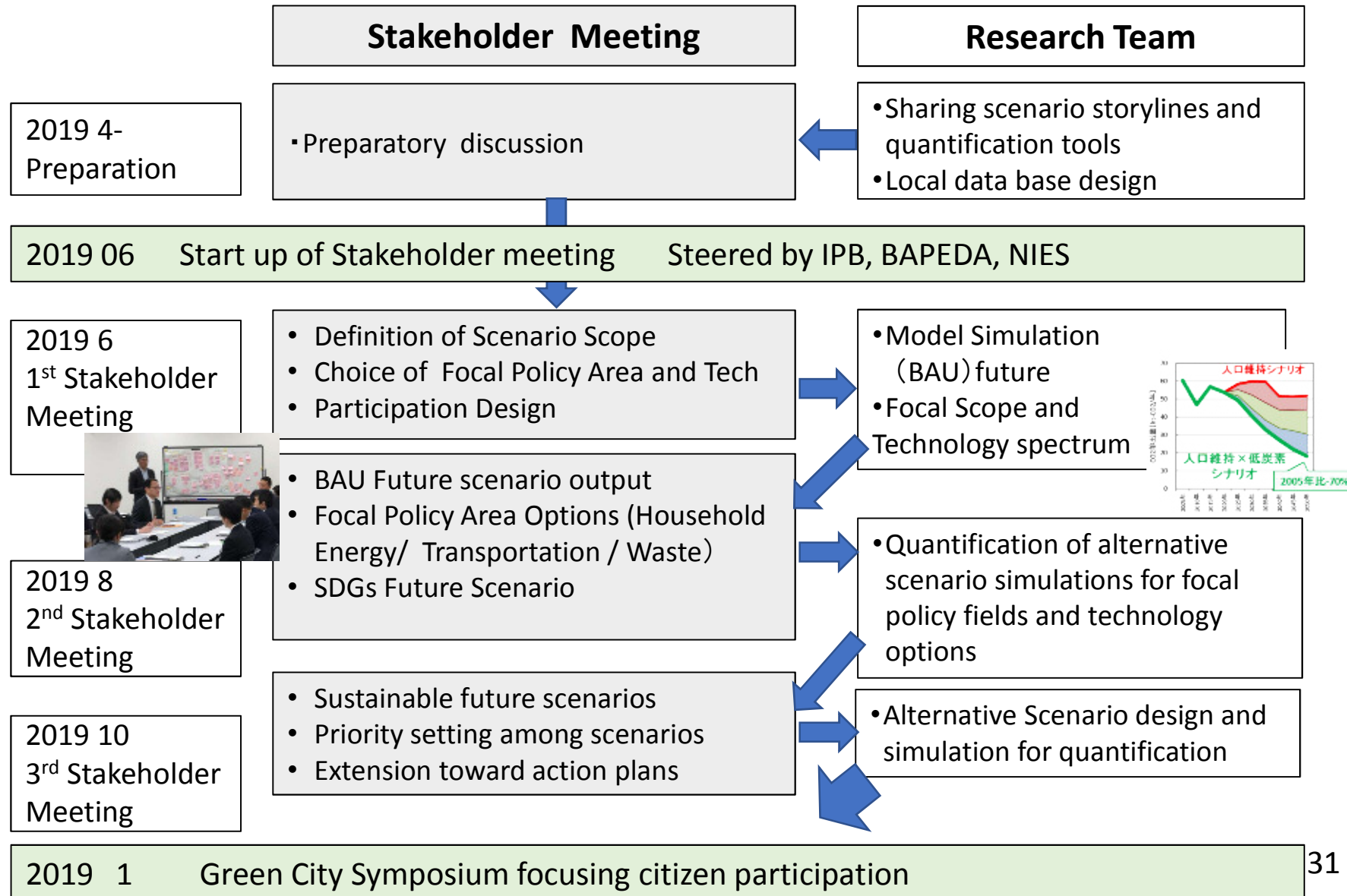


Planning for
Sustainable Future



Discussion materials for Interactive Simulation

Interactive Scenario Simulation in Fukushima



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, in press
- 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