# COMMUNITY BUILDING TOWARD A SMART CITY THROUGH REGIONAL COLLABORATION

Yasuo Utsumi

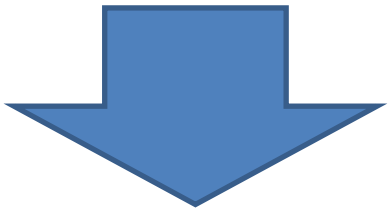
National Institute of Technology

# Contents

- Damages and the city status at the starting point
- The future city project in terms of the safety, environment, energy and super-aged society
- The concrete projects, schedule and structure of organization for the management
- The framework to share knowledge and to build up social networks

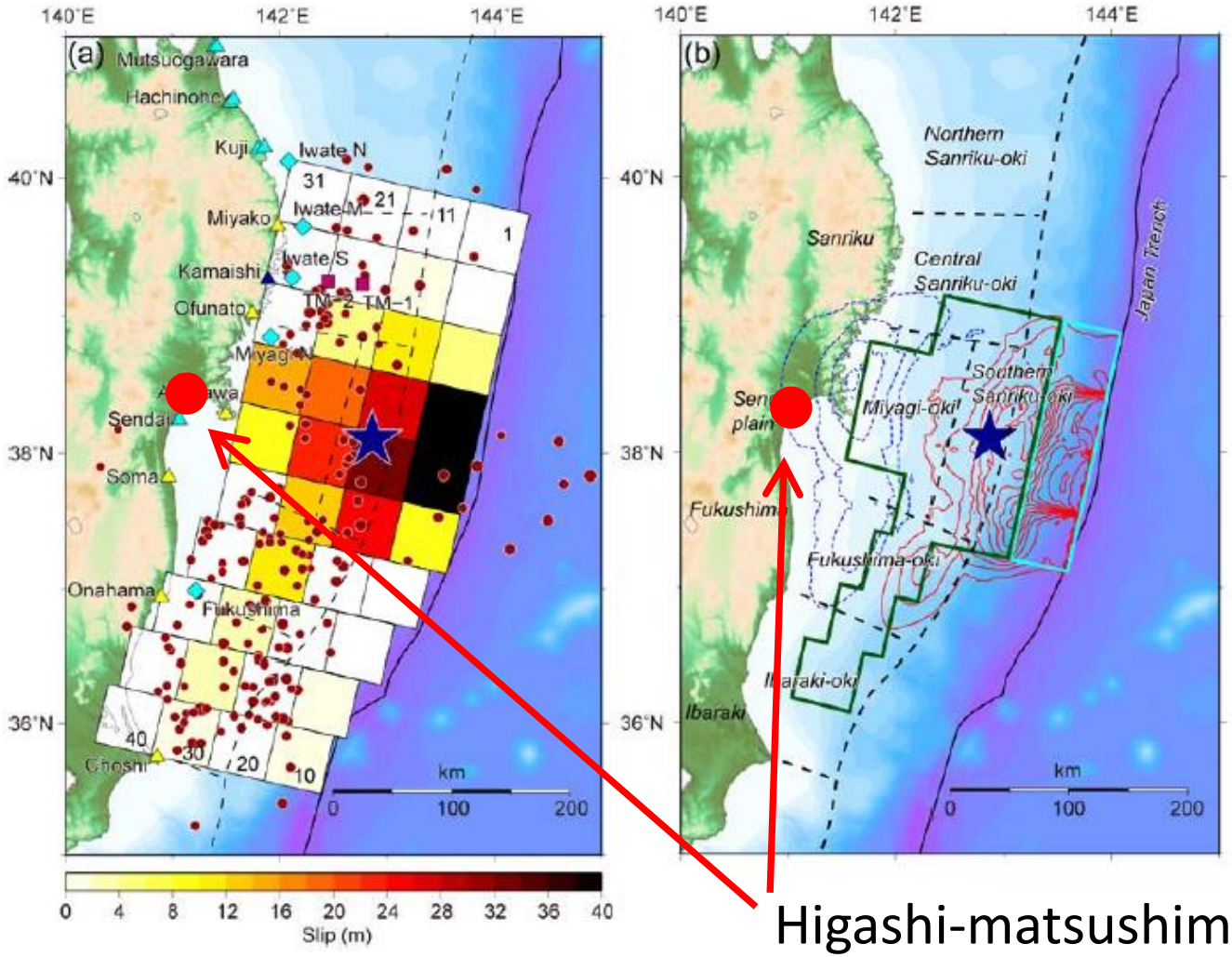
# Kosen (National Institute of Technology)

- The age of 15 to 22
- 5 years + 2 years of advanced course
- 55 campuses
- 10,000 graduate students per year



Region Oriented

# Damages and the city status at the starting point




M9.0 is the largest earthquake in recorded history in Japan

★earthquake center

Higashi-matsushima City

http://www.kenken.go.jp/japanese/contents/topics/20110311/0311quickreport.html, 2011.8.3

# Damages 1/2 Ishinomaki city

# Damages 2/2 Onagawa town

# Current status of Higashi-matsushima city

Right after the earthquake

Present

Right after the earthquake

Present

Photo provided by Higashi-matsushima city


7
7

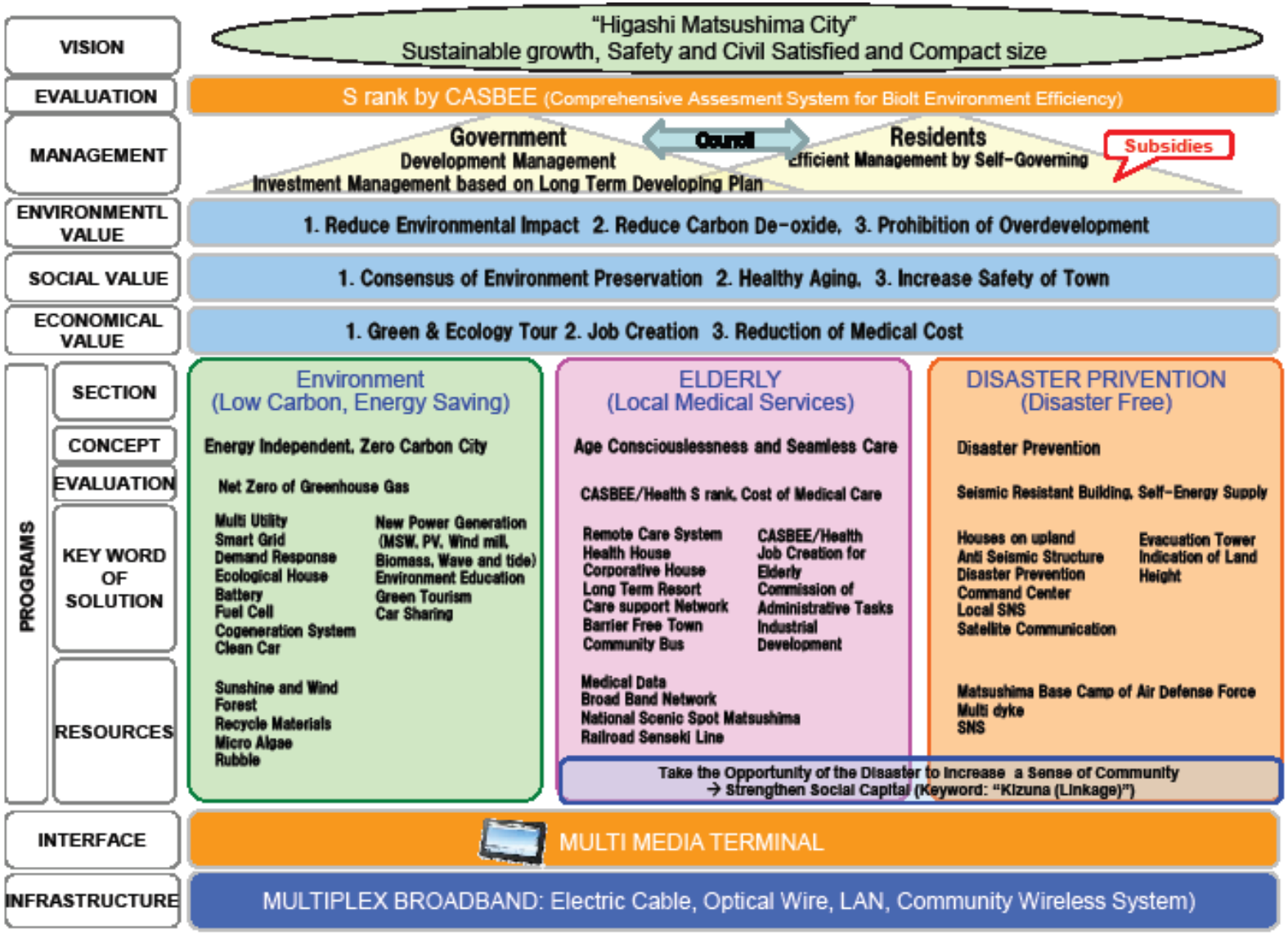
# The future city project in terms of the safety, environment, energy and super-aged society

# Future city project of Japan

**Purpose (Cabinet Office):** To create an unprecedentedly successful practices in technology, socioeconomic systems, services, business models and city development in regard to the **environment** and **preparation for a super-aging society**, as well as to realize **demand expansion** and **employment creation**, etc. by promoting and developing such practices in and outside Japan, and ultimately to **realize sustainable socioeconomic development for the entire nation**.


Efforts to create a successful model to promote in and outside Japan

# Strategic map of Higashi-matsushima city



# The concrete projects and structure of organization for the management

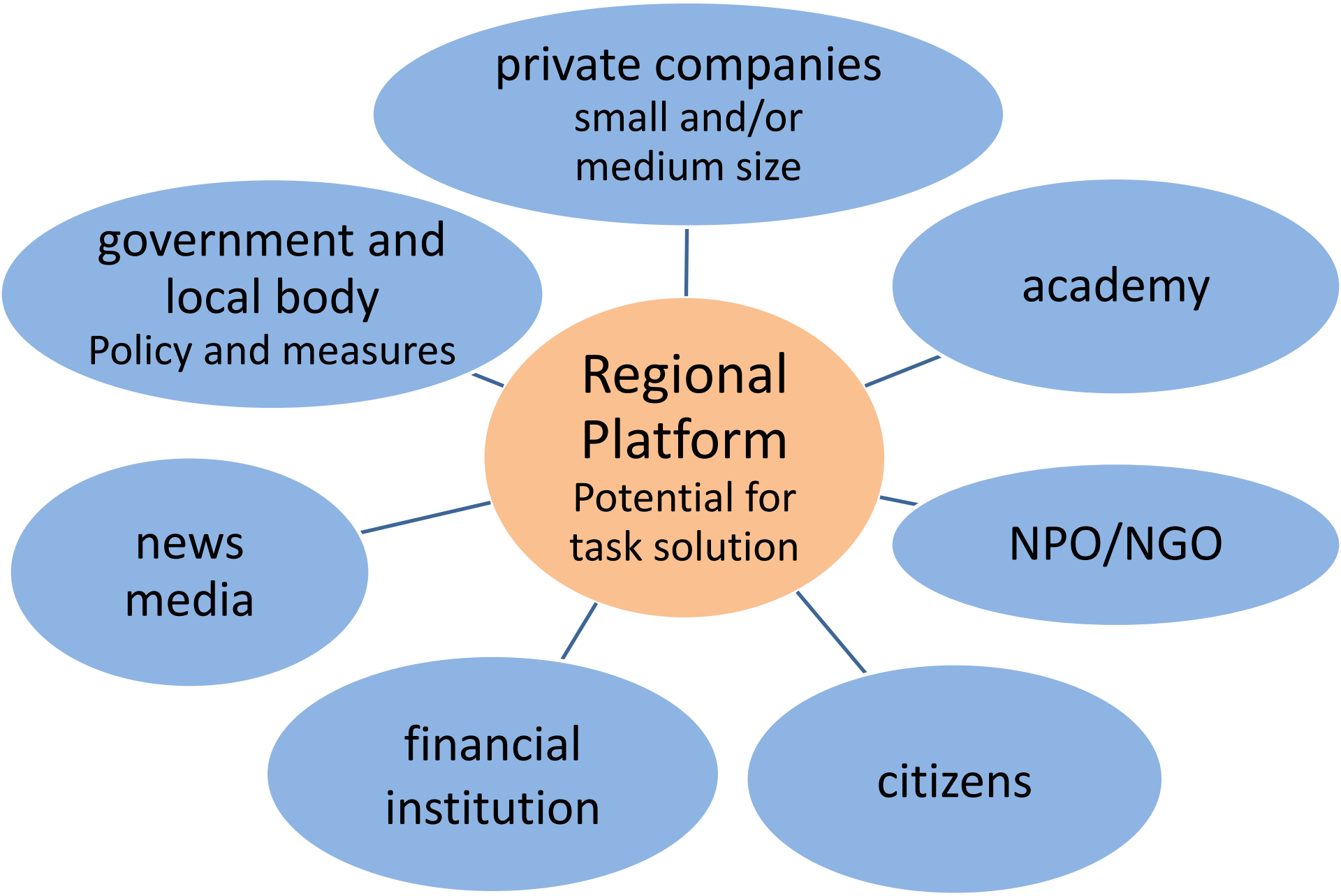
- Stakeholders
  - Government, local body, city council
  - Private companies of different sizes
  - financial institutions
  - Academic organization
  - NPO, NGO
  - citizen

HOPE
Higashimatsushima
Organization for
Progress and
Economy, Education, Energy

- HOPE for management organization

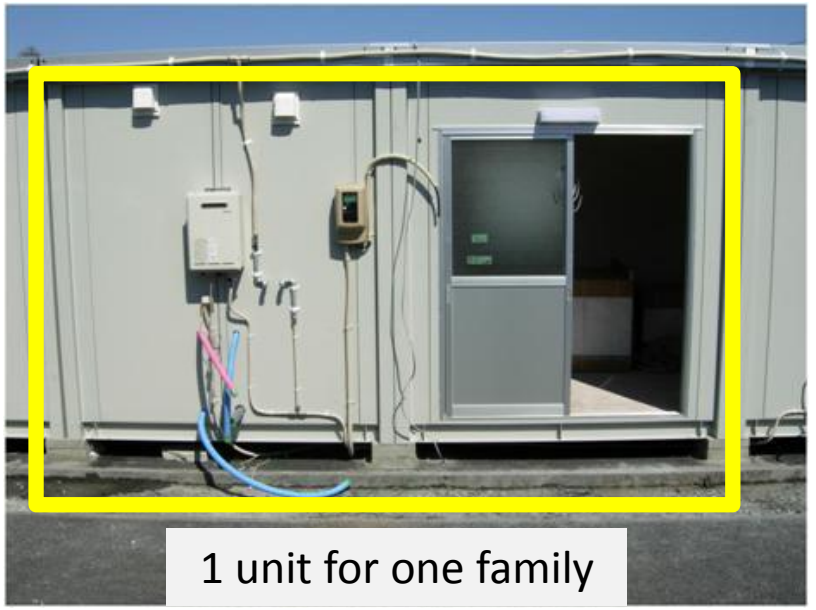
  Higashimatsushima Organization for Progress and E (economy, education, energy)

# Stakeholders

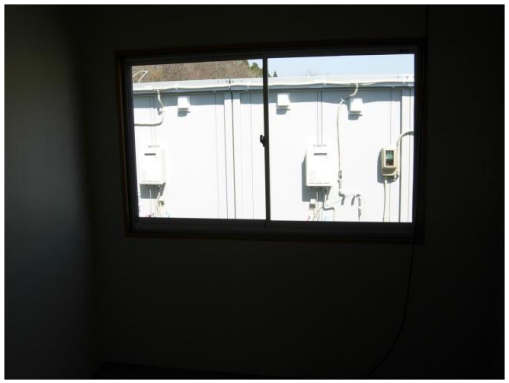


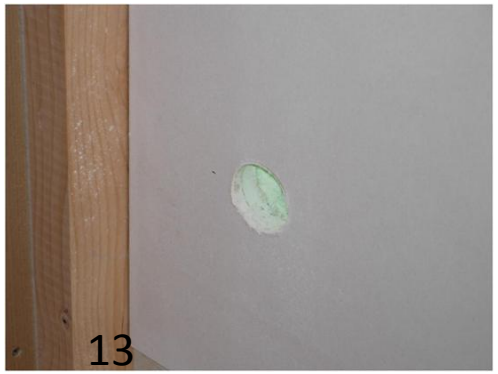
# Case 1 : The project to improve indoor environment of temporary houses

- The typical temporary houses



1 unit for one family





13

# 16. Installation of smart-devices in temporary housing
## （The situation of Higashi-matsushima）

Smart-device: An independent power supply system combining solar panels, small-scale wind-power generator and storage batteries to provide electricity for lighting, telecommunications and measurement instruments

Temporary housing


Smart-device installed near temporary housing

⇨ **Toward creating disaster-resilient city with high environmental performance, efforts to build independent local energy system have been started**



Photo provided by JASFA

14

# Case 2 : The establishment of a limited liability company

- ‘Machi no Chikara’ => the power of community
- To provide goods necessary to achieve the smart community in Higashi-matsushima city
- Task oriented activity
- Denmark, Finland, France, Spain and Taiwan

# The products for the safety

Lighting system with hybrid power generator (solar and wind) and battery

Festival showing solar cooker

Tsunami alarming system


Bio-powder to improve soil quality

# The products for the energy

※画面イメージ

iPAD HEMS, Home Energy Management System

Solar cooker

Equipment to set the solar panel on the roof

Equipment to set the solar panel on the ground

Power generator using hot spring water and steam

Hybrid power generator and battery

Energy conservation system for the electricity

# The products for the super-aged society

Collective house

‘super hinge’ Hinge of doors


※画面イメージ

iPAD HEMS, Home Energy Management System


Cosmetic Humidifier

# Case 4 : Higashi-matsushima smart eco-town with disaster prevention system

- To utilize renewable energy against the global warming
- To generate and to consume in the region using the high capacity battery to stabilize
- To create the employment according to the power generation and supply project
- The system to manage power supply in the emergency


Higashi-matsushima smart eco-town
with disaster prevention system

〈システム概要図〉

※1
※1
地域低炭素発電所
（ごみ焼却所等）
既存電力網
地域低炭素発電所
（メガソーラー）
受変電設備
電力需要と供給量の管理を行う
エネルギー管理システム
CEMS
Community Energy Management System
住宅と周辺の病院、公共施設を自営線で結び、
全国初のマイクログリッドを構築。
CEMSにより最適制御しながら
電力供給。
受変電設備
病院×4
防災エコホスピタル地区
公共施設
防災調整池
ミドルソーラー
PV400kW
バイオディーゼル
非常用発電機
（500kW）
充電
放電
大型蓄電池
（480kWh）
戸建70戸
災害公営住宅
集合住宅15戸
（ソーラー付）
PV49.9kW
集会所（防災拠点）
（ソーラー付）PV9.1kW
自営線PPS
※1 地域低炭素発電所からの送電は
将来想定されるものとして記載しております。
※2 詳細検討により、より良い実施の為、
若干の仕様変更等が発生する可能性があります。
発電した電力を送電
電力の供給


2016.6.12 [ Higashi-matsushima smart eco-town with disaster prevention system ] an unveiling ceremony

# Five key aspects to build smart city 1/2

## 1. Collaboration of stakeholders

• Government and local body, private companies (small and/or medium size), academy, NPO, citizens, financial institution, and news media in the region

• The matching between needs and seeds is essential. Needs driven is preferable for small size project since the seeds initiated project takes more than 20 years to the goal generally

## 2. Connection of relevant policies and measures

• Existing activities and actual performance should be extended, not from a scratch.

• The risk management is important according to the fail system of the project environment.

# Five key aspects to build smart city 2/2

## 3. Selection of themes to be settled

• The theme should be selected considering available resources and the evolution of the activity in sustainable shape.

• The concrete theme would concern to the followings that are common to the countries, such as; Environment and energy, Security and disaster prevention, Declining birth rate and a growing proportion of elderly people

## 4. Utilization of ICT

• Information sharing and app development

• For the elderly people there should be special care and support must be implemented, considering the performance gap for ICT system.

## 5. Growing the human capability

• To make all issues sustainable, the leader of small number of group is necessary.

•The leader should be able to execute the project management under multi-culture environment.

# Remarks

- Overview of the future city project in terms of the safety, environment, energy and super-aged society
- The introduction of the undergoing concrete projects
- Five key aspects to build smart city with sharing knowledge and building up social networks