

EV•PHV Town Symposium in Goto, Nagasaki
2013.2.7-8 @Fukue Culture Hall

EV&ITS Smart Society Model Created from Region & Islands

- Nagasaki EV&ITS Project -

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Goto Islands, Nagasaki

- Nagasaki EV&PHV Town Master Plan
- Revitalization of Isolated Islands
- Action for Registration to the World Heritage
“Churches and Christian Sites in Nagasaki”
- Electrically Connected Islands

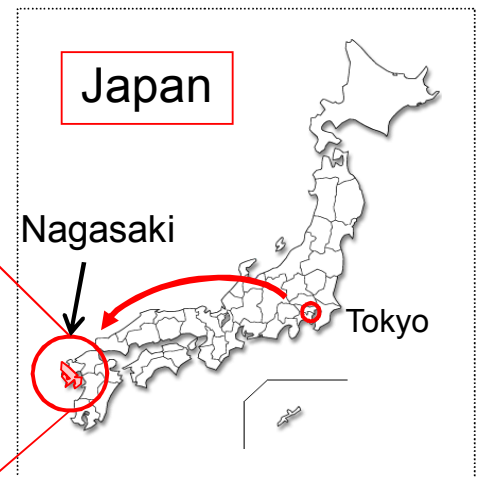
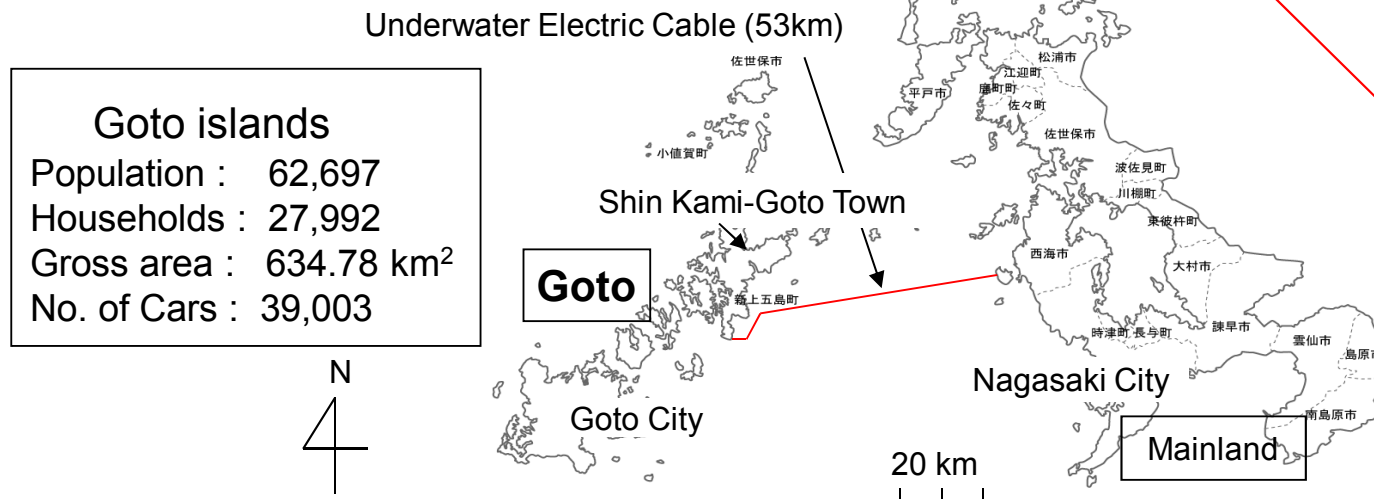
⇒ Nagasaki EV&ITS Project

EV&PHV : 140 cars

Charger : 14/27 Quick + 20/29 200V

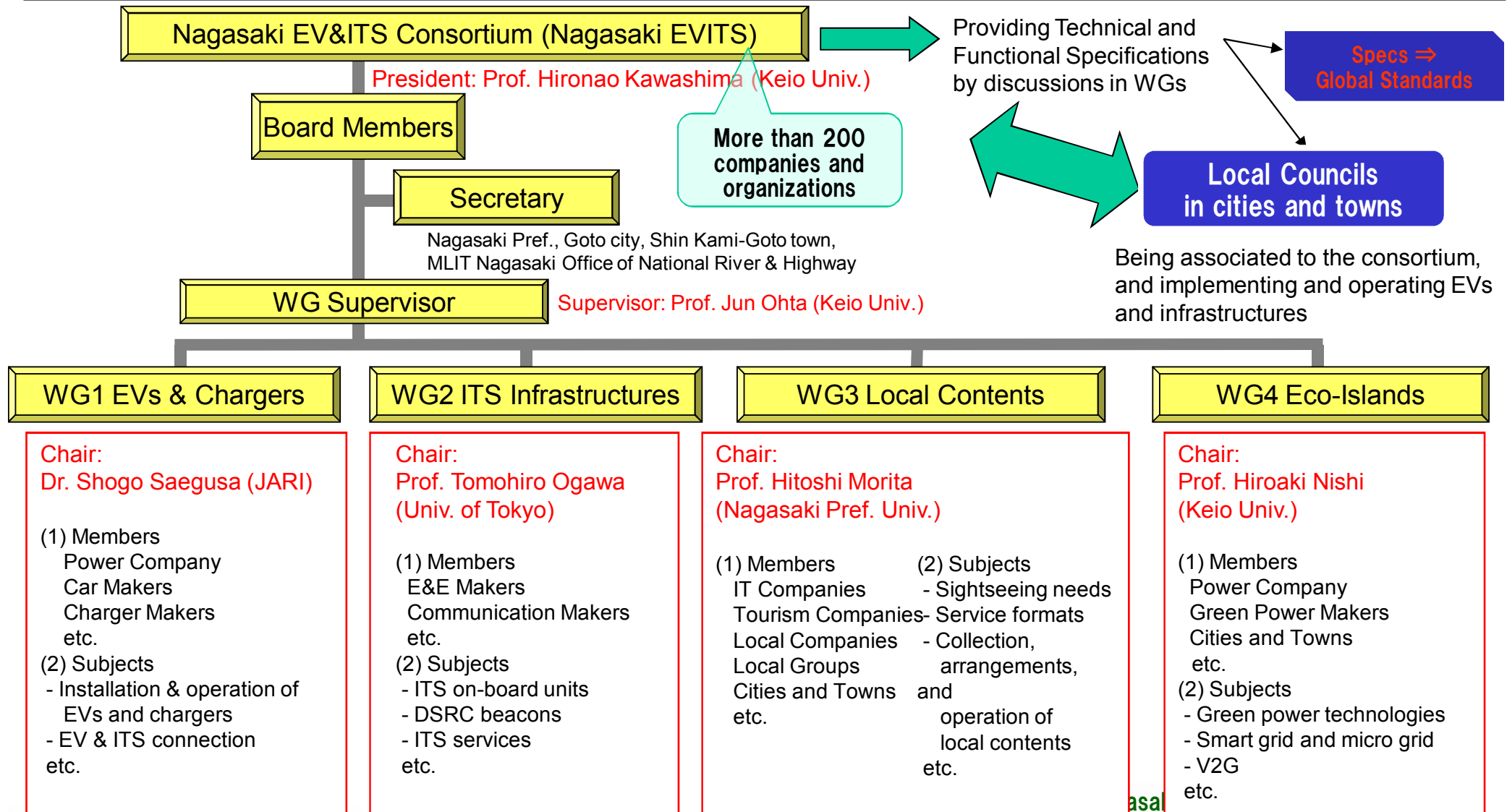
ITS spot : 12 spots (IP) + 8 spots (non-IP)

Renewable Energy & Micro/Smart Grid Models



Nagasaki EV&ITS Consortium (Nagasaki EVITS)

Aims: <Practical installation and operation of EVs and ITS tourism>, <Conducting project with creating global rules and standards from region>, <Promoting regional industries led by sightseeing and ecology>, <Demonstration of connecting energy grid and EV>, etc.



Nagasaki EV&ITS Project

- What we did :
 - Widely known as advanced EV field
 - Practical distribution & operation
 - Construct “Driving Tours of the Future”
 - Construct a regional next-generation society model

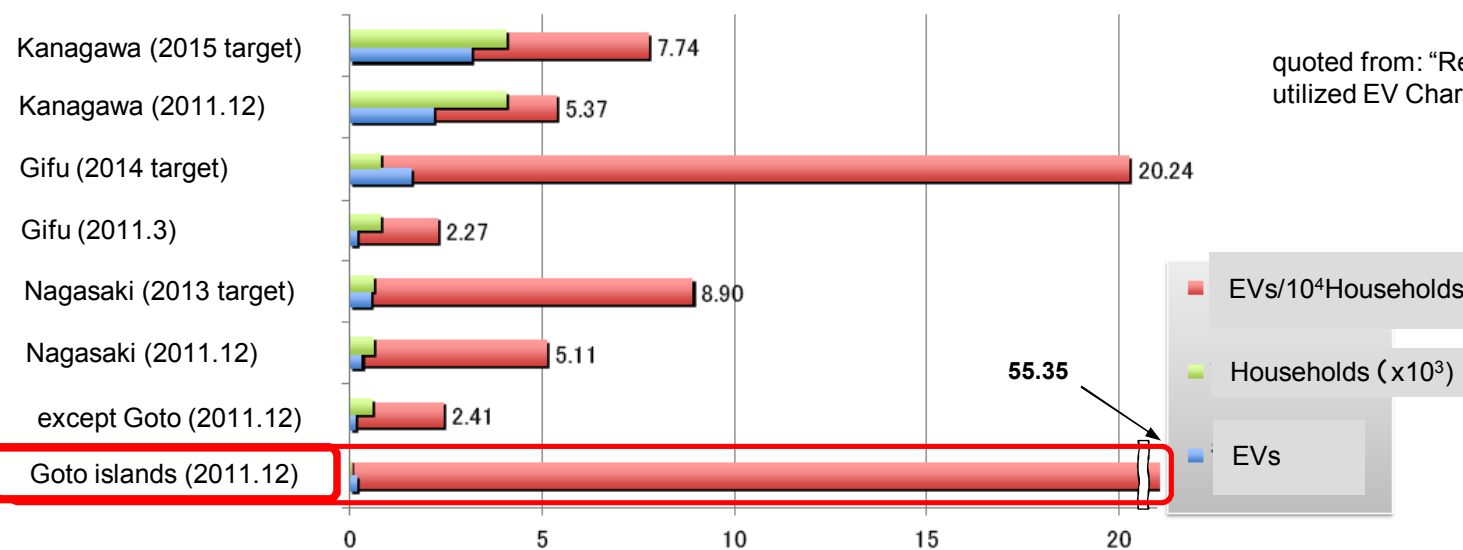
Advanced EV Field

Goto Islands as a “Future EV Society” in advance

EV diffusion rate in Goto islands is much higher by far in density even than those target values in the other regions.

Table: EV diffusion rate in Japan

項目	EVs	Households (x10 ³)	EVs/10 ⁴ Households	備考
Total in Japan (2011.3)	8600	52324	1.64	世帯数は平成20年1月1日
Kanagawa (2015 target)	3000	3876	7.74	世帯数は平成24年1月1日
Kanagawa (2011.12)	2080	3876	5.37	世帯数は平成24年1月1日
Gifu (2014 target)	1500	741	20.24	世帯数は平成24年1月
Gifu (2011.3)	168	741	2.26	世帯数は平成24年1月
Nagasaki (2013 target)	500	562	8.90	世帯数は平成23年12月
Nagasaki (2011.12)	287	562	5.11	世帯数は平成23年12月
except Goto (2011.12)	132	547	2.41	世帯数は平成23年12月
Goto islands (2011.12)	155	28	55.35	世帯数は平成23年12月



quoted from: “Report of Business Model Research utilized EV Charging Facilities (2011)” (Nagasaki Pref.)

Figure: EV diffusion rate in Japan

Global Networking by “Nagasaki EV&ITS Project”

Germany-Japan Environment Forum in Berlin (2010.9)



Japan-China Environment Forum Nagasaki, Goto Technical Tour (2010.10)



ITS World Congress 2010 in Busan Exhibition & Goto Technical Tour (2010.10)



2nd EV Initiatives Forum In Shanghai (2011.4)



2nd Jeju Smart Grid Week (2011.11)



11th Yellow Sea Rim Economic-Technological Conference in Daejeon (2011.11)

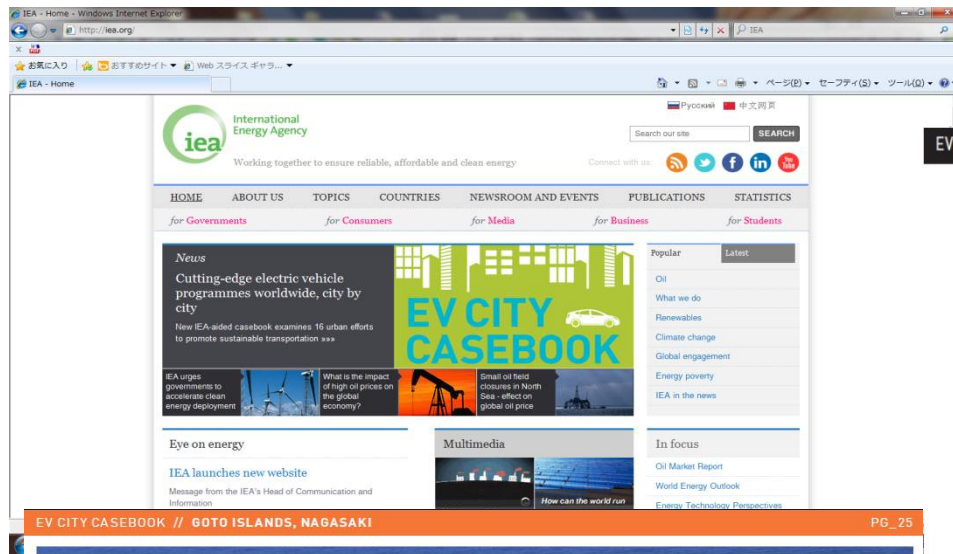


Moreover:

- 2011 China-Japan-US Forum on Sustainable Built Environment in Shanghai (2011.7)
- ITS World Congress 2011 in Orlando (2011.10)
- Japan-China Environment Forum in Beijing (2011.11)
- MOU signing with POSCO ICT Consortium (2011.12)

...

EV City Casebook



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EV CITY CASEBOOK

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GOTO ISLANDS NAGASAKI, JAPAN

CREATING DRIVING TOURS OF THE FUTURE

// In 2009, the Nagasaki Prefecture established the Nagasaki development by local industries, the utilization of renewable

 **NAGASAKI PREFECTURE**



Nagasaki エビッツ
長崎EV&ITS 

Practical Distribution and Operation

Data Collection: EV Quick Charger Use

- EV quick charger use from August to January was 3,026 times in Goto city and 854 times in Shin Kami-Goto Town.
- The use per day was 14.3 times (1/3 of its peak use) in Goto city and 4.0 times (1/2 of its peak use) in Shin Kami-Goto Town.
- The use ratio in each charging spot was 36% at Fukue port and 30% at Furusato-kan in Goto city, 48% in Udon-no-sato in Shin Kami-Goto Town. The spot with good access has high use ratio.

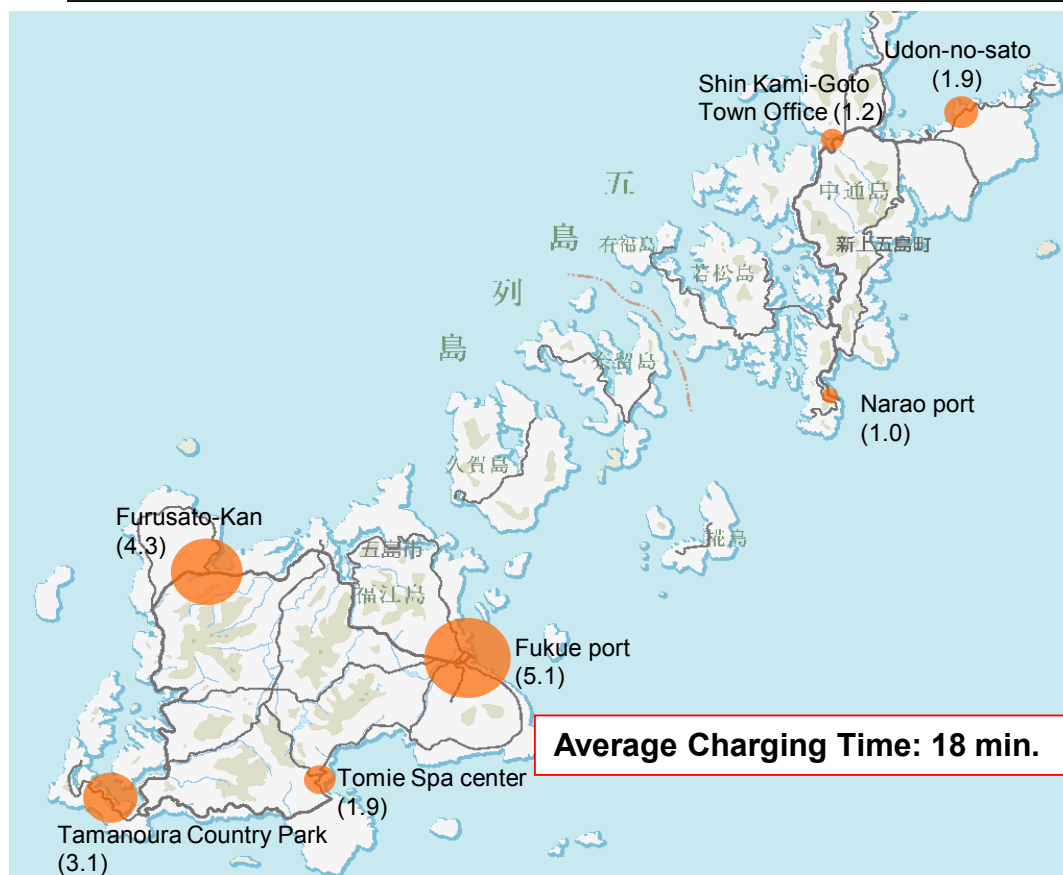


Fig. Quick charger use per day

Table: Quick charger use and ratio from Aug.,2010 to Feb, 2011

		Charging units	Charger Use		Frequency (times/day)
			Time	Ratio	
Goto City	① Fukue port	2	1,078	36%	5.1
	② Furusato-kan	2	901	30%	4.3
	③ Tomie Spa	2	383	13%	1.8
	④ Tamanoura	2	664	22%	3.1
	Subtotal	8	3,026	100%	14.3
Kami-Goto	⑤ Udon-no-sato	2	407	48%	1.9
	⑥ Town Office	2	244	29%	1.2
	⑦ Narao port	2	203	24%	1.0
	Subtotal	6	854	100%	4.0
Total		14	3,880	----	18.3

※ Excluding 1 Quick Charger Data at Naru Island

※ Ratio is calculated excluding EVs who do not use chargers.

Table: Quick charger use and ratio in peak period (Aug. 14-20, 2010)

		Charging units	Charger Use		Frequency (times/day)
			Time	Ratio	
Goto City	① Fukue port	2	139	44%	19.9
	② Furusato-kan	2	95	30%	13.6
	③ Tomie Spa	2	45	14%	6.4
	④ Tamanoura	2	40	13%	5.7
	Subtotal	8	319	100%	45.6
Kami-Goto	⑤ Udon-no-sato	2	36	54%	5.1
	⑥ Town Office	2	14	21%	2.0
	⑦ Narao port	2	17	25%	2.4
	Subtotal	6	67	100%	9.6
Total		14	386	----	55.1




※ Excluding 1 Quick Charger Data at Naru Island

※ Ratio is calculated excluding EVs who do not use chargers.


In the highest season, nearly 20 of 55 EV rent-a-car in Goto city dropped to the charging spot !

Installation Condition in Goto Islands


Notes

-  Quick charger x1
-  ITS spot (IP)
-  ITS spot (non-IP)


Infras

-  Quick chargers

Goto city	7 spots(15 units)
Shin-Kami Goto Town	7 spots(12 units)
Total	14 spots(27 units)

-  ITS spot (IP)

Goto city	6 spots(6 units)
Shin-Kami Goto Town	6 spots(6 units)
Total	12 spots(12 units)

-  ITS spot (non-IP)

Goto city	4 spots(4 units)
Shin-Kami Goto Town	4 spots(4 units)
Total	8 spots(8 units)

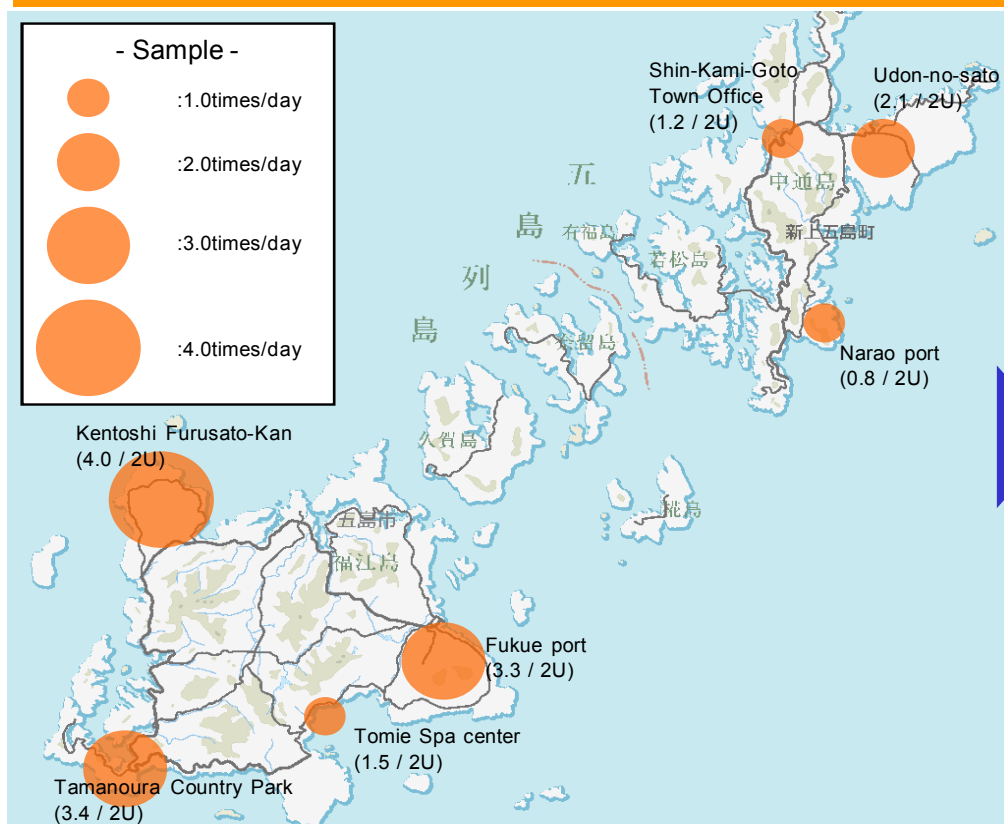
* Including instruction in 2011



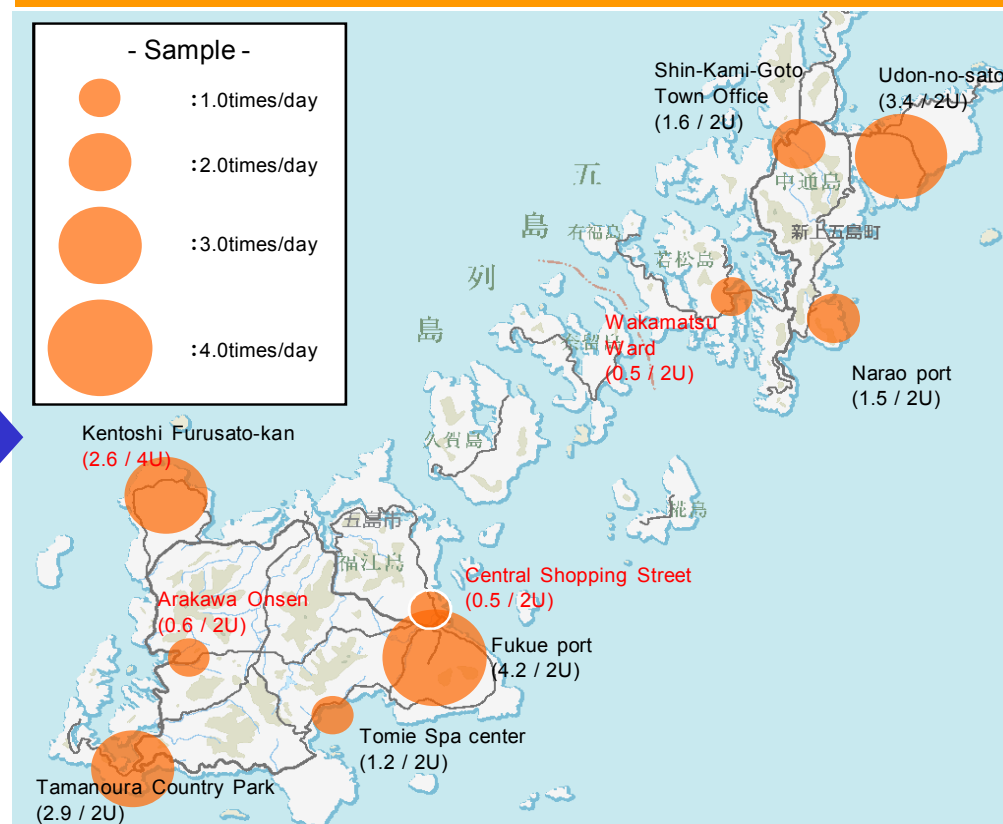
PDCA - Before & After

Quick Charger Use

2010.9 – 2010.11 [8 spots/15 units]



2011.9 – 2011.11 [11 spots/23 units]



Average use rate of quick chargers (per day, spot)

Regional Charger Network Service System

1st step: Remote & Easy operation of distributed chargers
2nd step: Smart service for general users

Charger Network System Structure & Functions

<Function 1> Charging data collection

<Function 2> Remote surveillance

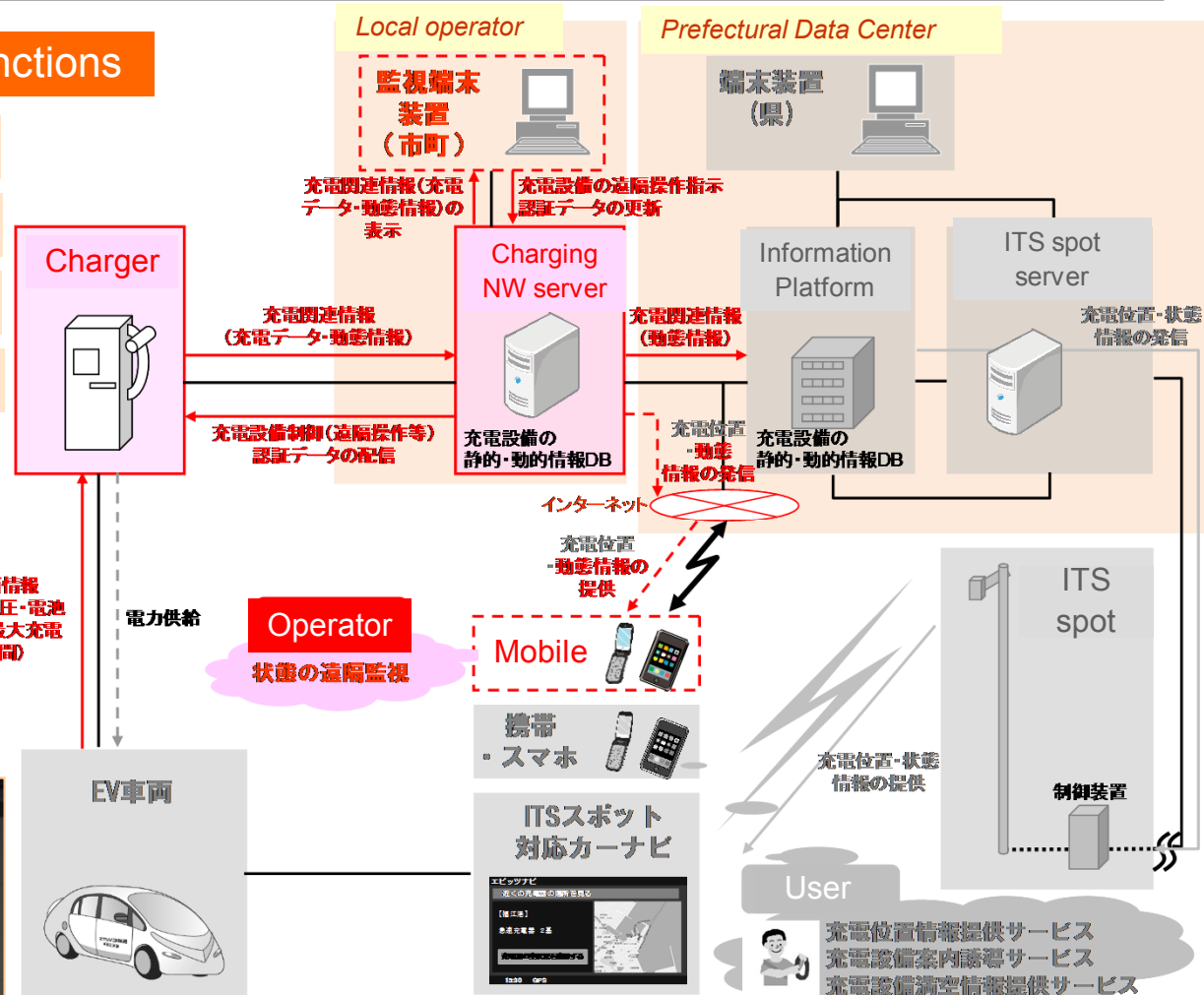
<Function 3> Remote operation

<Function 4> Update registered users



<- Func1:
Charging data
collection

Func2:
Remote
surveillance ->



Driving Tours of the Future

“ITS Onboard Unit” with CAN connection & ITS spot service

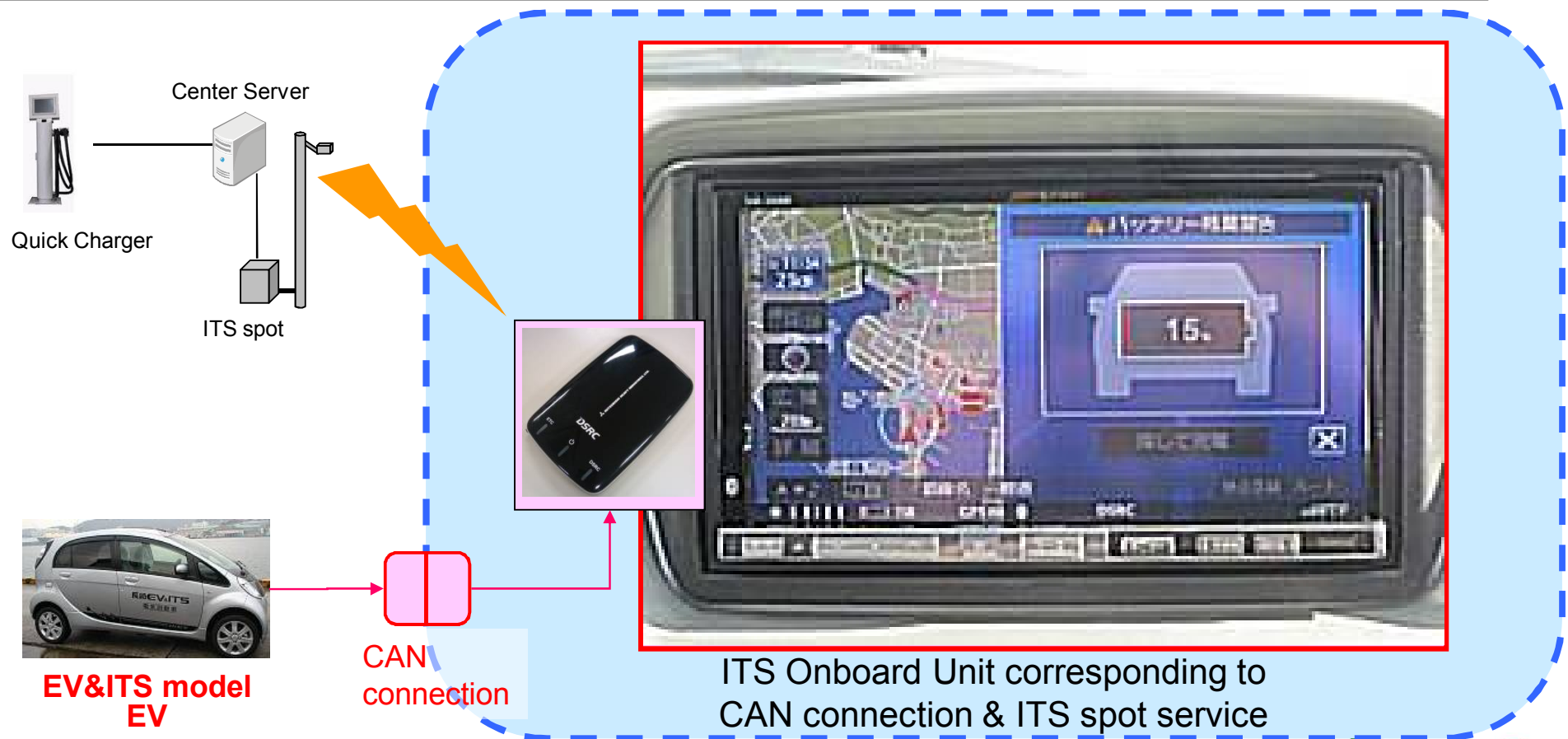
○ Advanced Service realized by integrated with EV and ITS

1) Onboard EV Navigation Service :

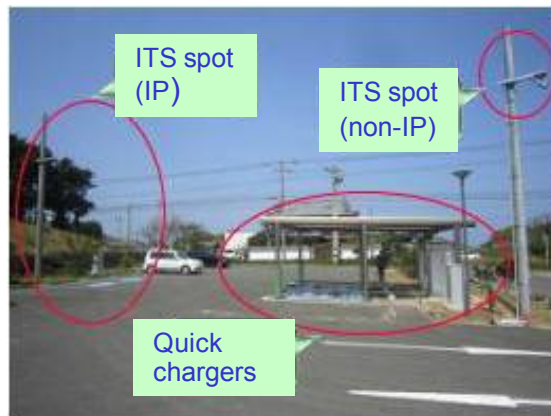
Low Battery Level Warning, Navigation to Charging Spots, Battery Level Forecast along the Route

2) Cloud-like Center Service : Charging Spot Information Service, EV Probe Service

3) Standardized Specification : ITS spot service



Advanced Navigation Service for EV



Charging spot with ITS spots
(Road station
"Kentoshi Furusato-Kan")



Pushed information Service
by non-IP type ITS spot



Downloading "My PLAN" from
ITS spot (IP) to Car-Navi makes
possible to set the destination
smoothly



Low battery level warning and battery level forecast according to the route realized by CAN connection

Nagasaki "Mirai" Navi in Goto (Nagasaki Futuristic Navigation System)



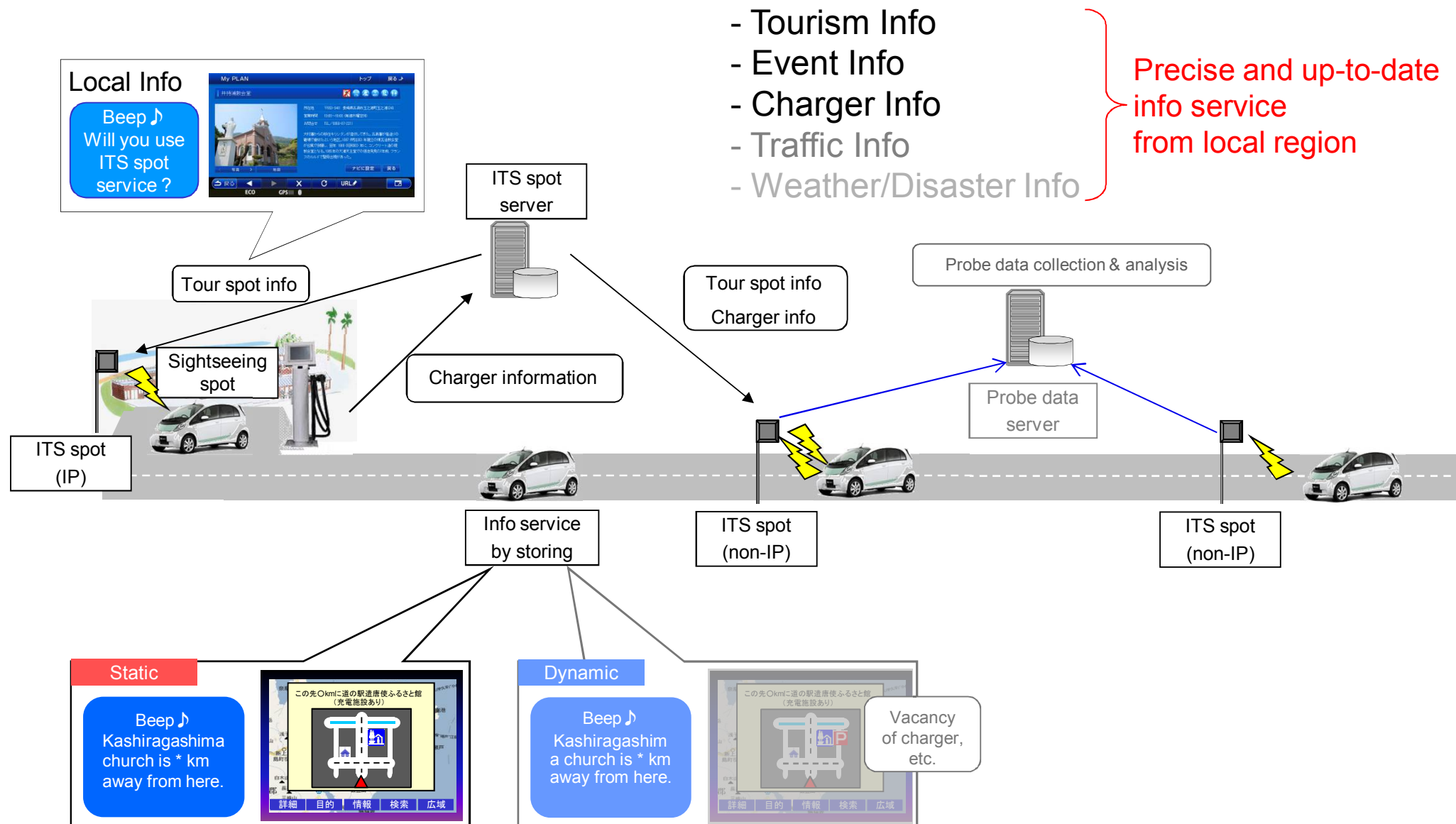
(for ITS OBU)

(for Cellular)



(for Smartphone)

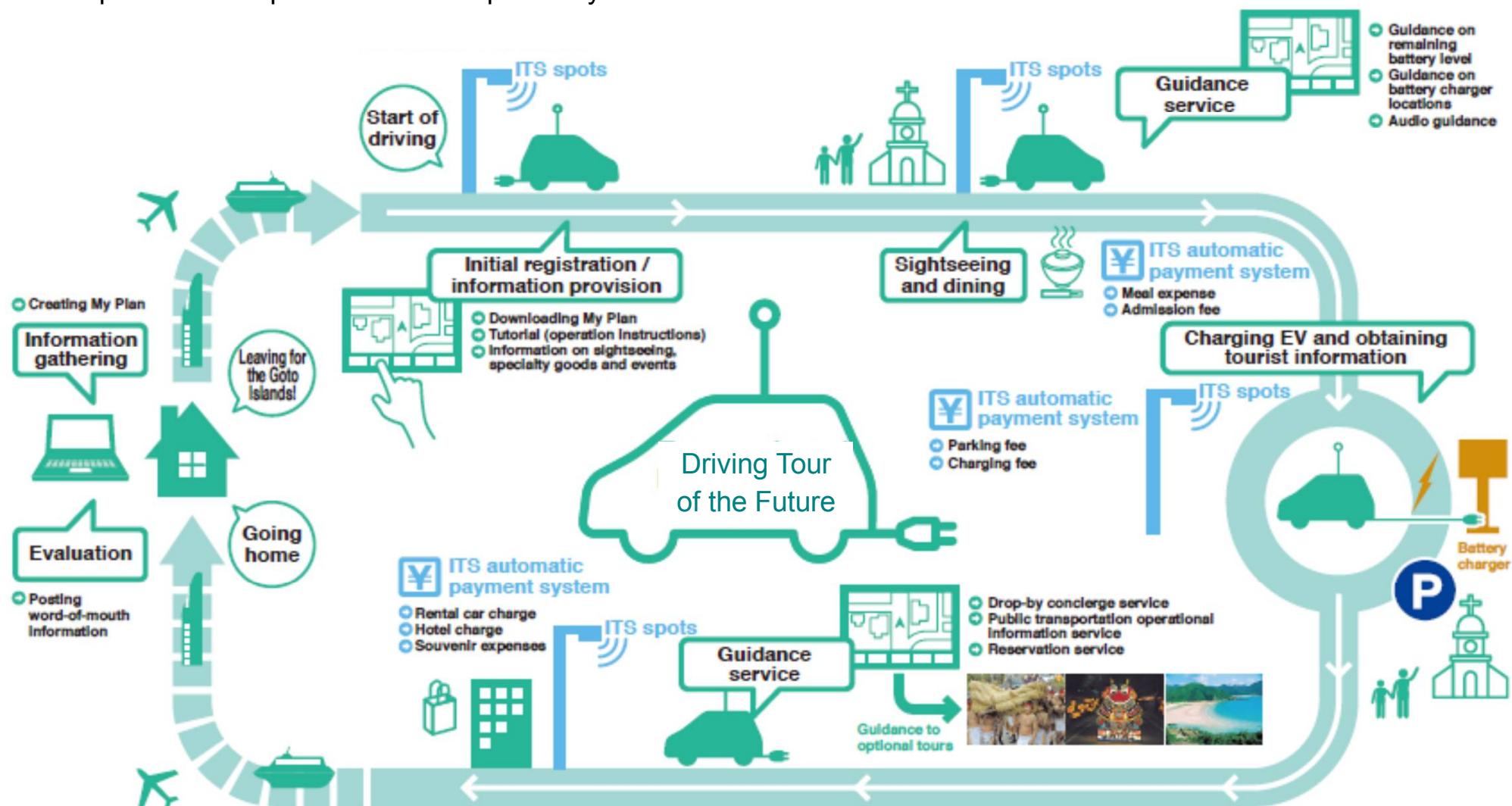
Regional ITS spot service for EV



Driving Tour of the Future

Locally-driven tourist services realized by ITS

*In this overall view, some services are still under development and expected to be completed by fiscal 2013.



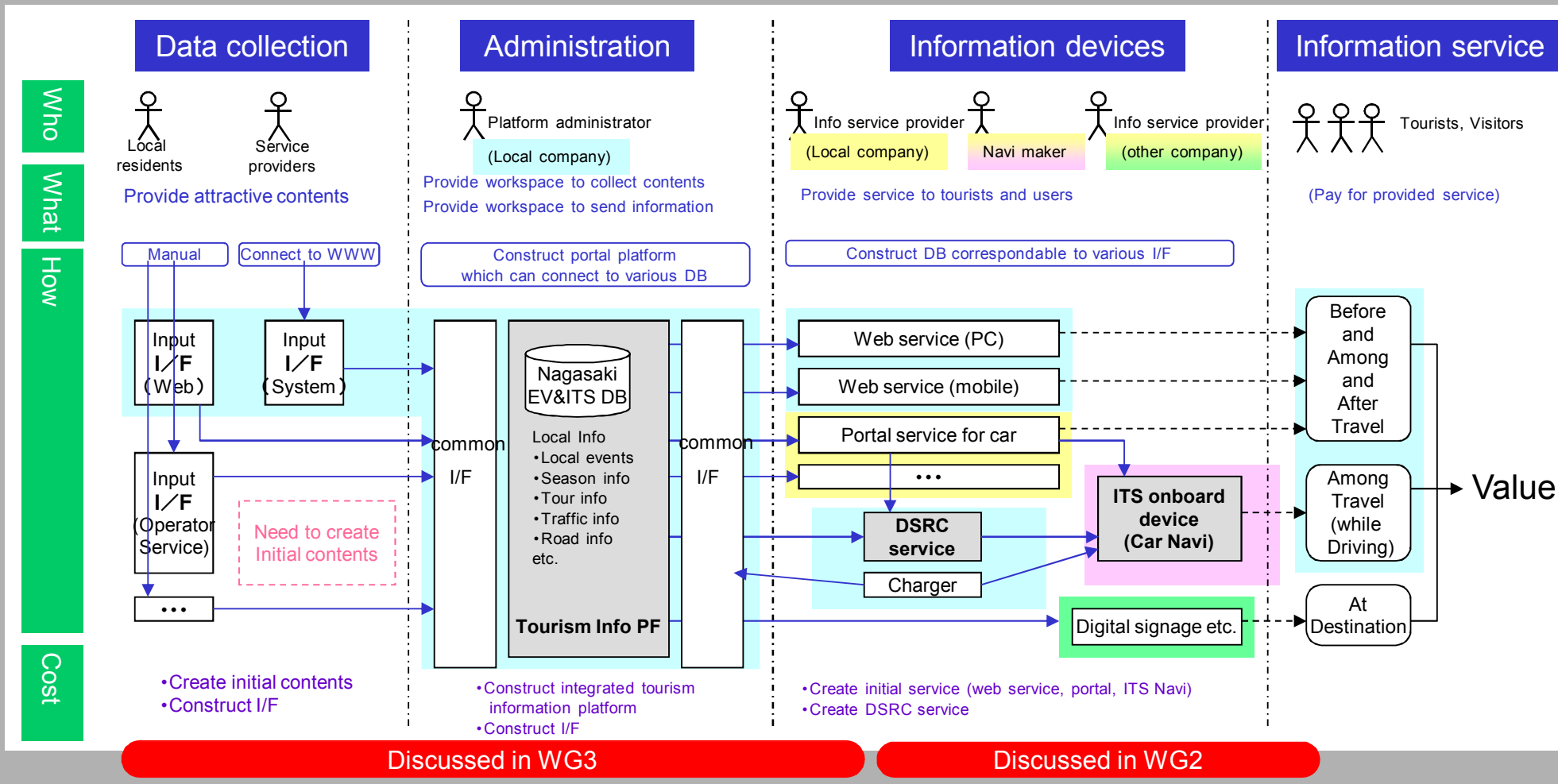
Integrated Tourism Information Platform (Regional Data Center)

【Plan】

Constructed in 2012

Construct in 2010

Considerable business market field to be discussed in future



Local Workshop

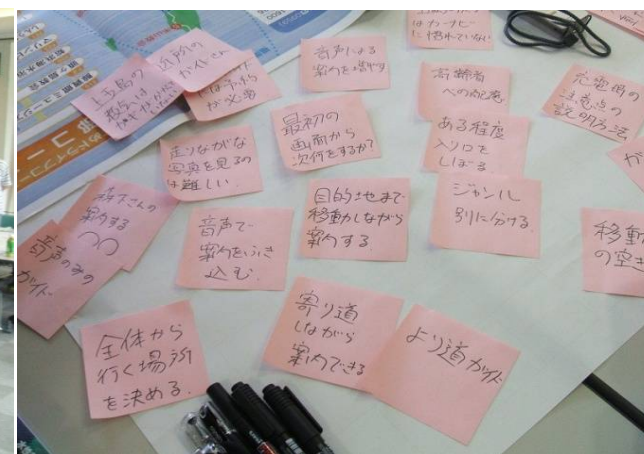
[2010.6.19 in Shin Kami-Goto]

Experience EV & ITS

Regularly open local workshops
Education by experience of advanced technology
+ Collect opinion from public



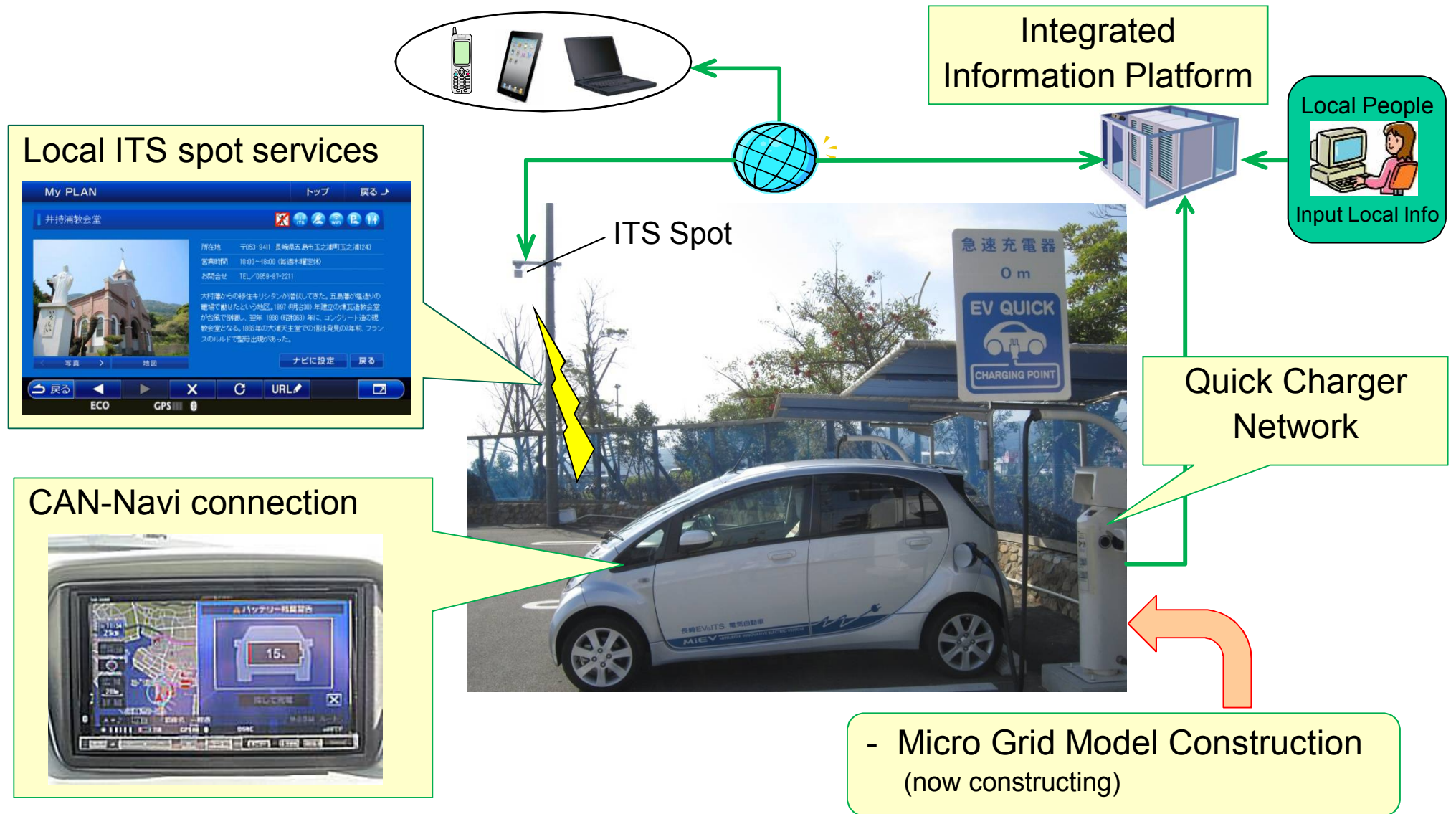
Discussion



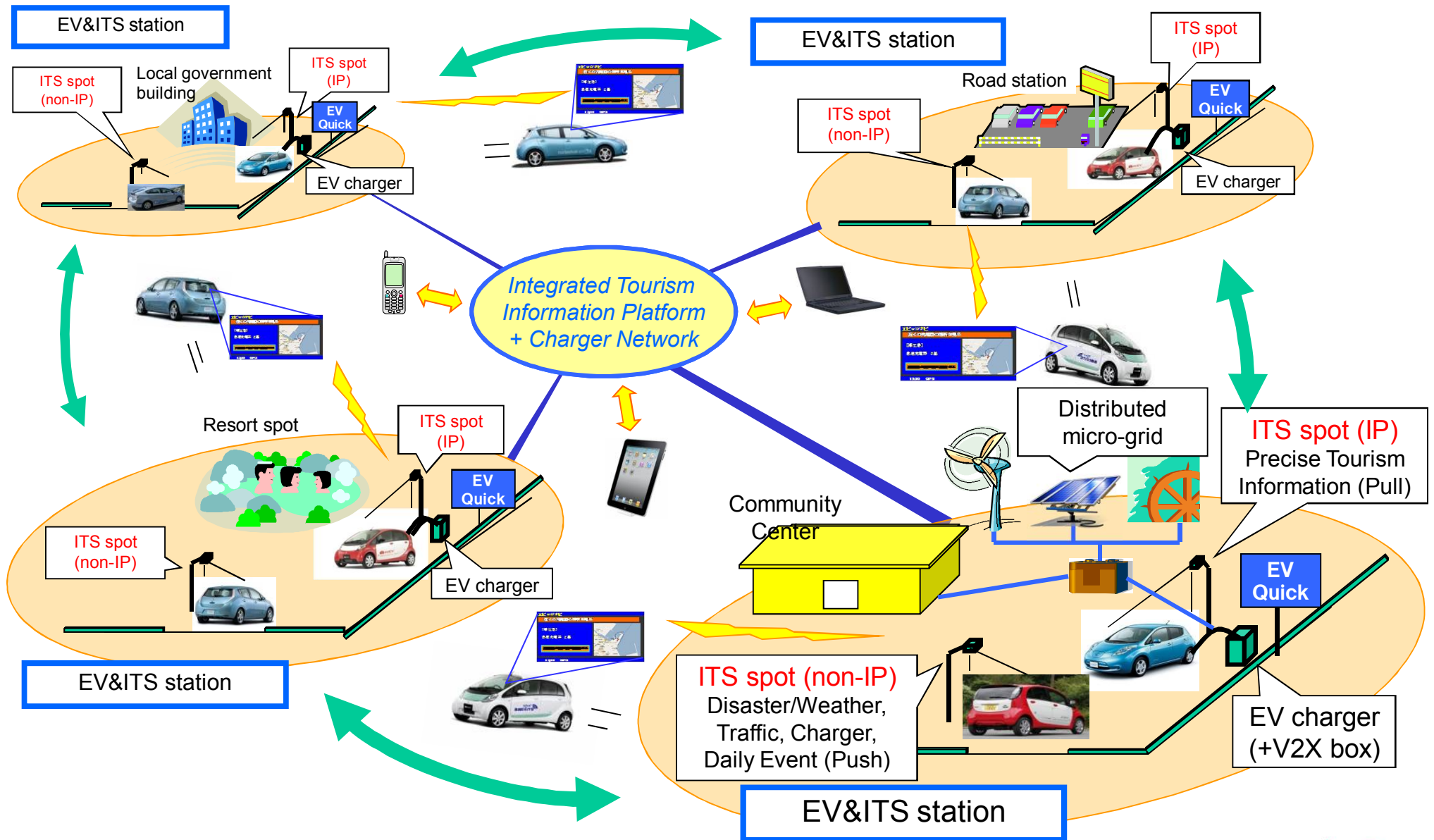
Various participants : Tour volunteers, Students, Hotels&Inns, Rent-a-car agents, NPO, Sealine, City/Town officers

Regional Next-Generation Society Model

EV&ITS Station Network Model : EV Quick Charger & ITS spot

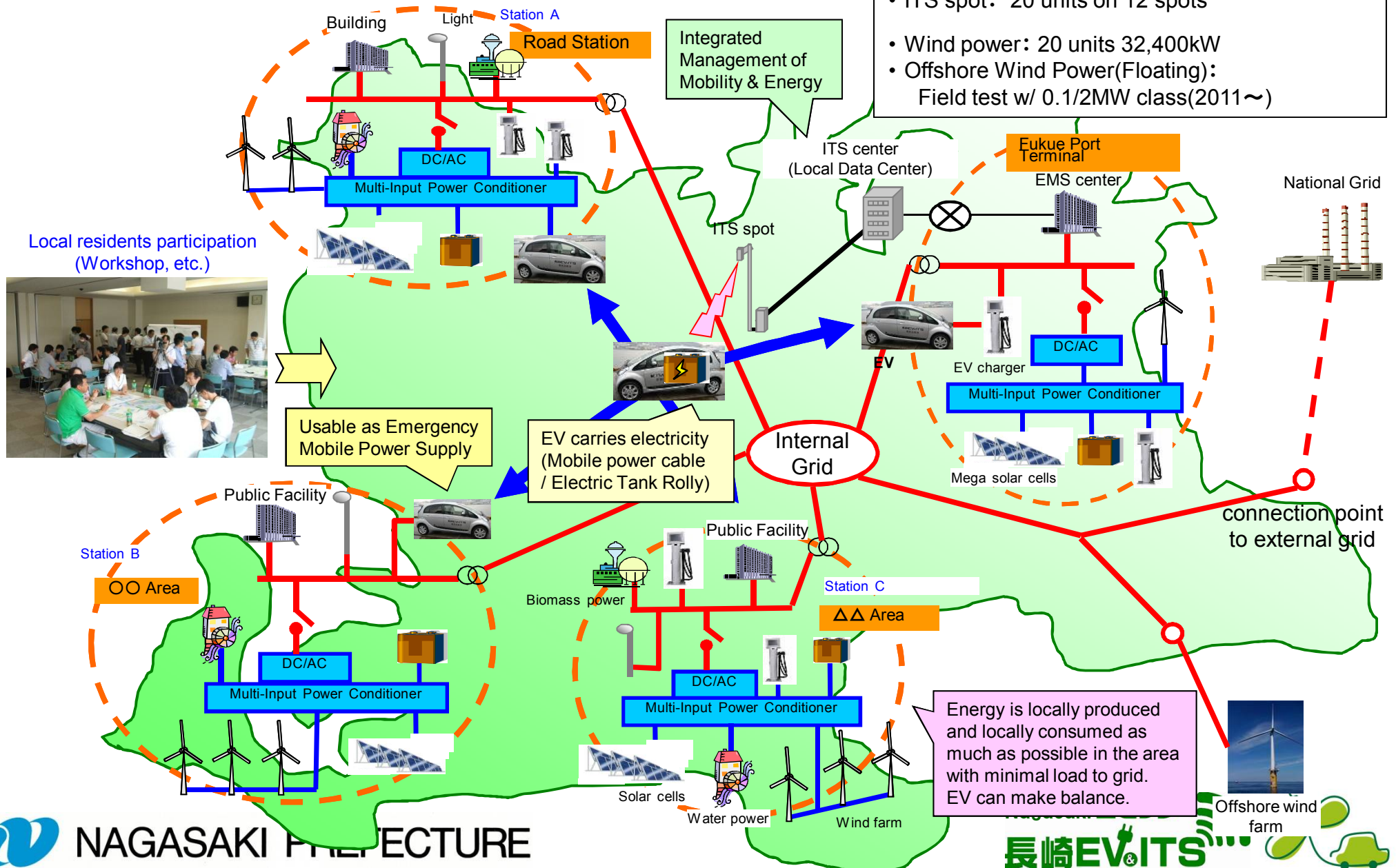


Nagasaki EV&ITS Station Network Model



Distributed Micro Grid

- EV•PHV: 140 cars (i-MiEV, LEAF, Prius PHV)
- Quick Chargers: 27 units on 14 spots
- Normal Chargers: 29 units on 20 spots
- ITS spot: 20 units on 12 spots
- Wind power: 20 units 32,400kW
- Offshore Wind Power(Floating):
Field test w/ 0.1/2MW class(2011~)



Nagasaki EV&ITS Project

- What we did :
 - ⇒ What we want / will do :
 - Widely known as advanced EV field
 - ⇒ attract advanced R&D
 - Practical distribution & operation
 - ⇒ practice data collection
 - Construct “Driving Tours of the Future”
 - ⇒ make a standard model of EV&ITS integration
 - Construct a regional next-generation society model
 - ⇒ revitalize the region

EV&ITS Diffusion Promotion Policies in Nagasaki Prefecture

Target: Support the diffusion of EV, PHV, and quick chargers to promote "Nagasaki Prefecture EV & PHV town master plan"

(1) Subsidy to introduction of EV

- 1) Subject : Cities & Towns, Corporations & Companies
- 2) Amount : 1/2 of the national subsidy (2/3 for island area)
- 3) Requirement : Promotion activities for EV

(2) Subsidy to introduction of quick charger

- 1) Subject : Cities & Towns, Corporations & Companies
- 2) Amount : 1/2 of the **sum total of construction fee and** charger price except national subsidy
※ expanded to include the construction fee
- 3) Requirement : Open to the public

(3) EV & Charger Promotion Meeting

Discuss the suitable arrangement of quick chargers in Nagasaki prefecture for promotion of EV

EV-related Industry Promotion Policies in Nagasaki Prefecture

Target: Comprehensive supports to promote EV-related enterprises by local industries for Nagasaki EV&ITS project to be contributed to promote local industries

Actions:

- Local Enterprise Study Meeting
- Support to Feasibility Studies for EV-related Enterprises (FS)
- Support to Acceleration for EV-related Enterprises (Ex)

Achievements:

[2011]

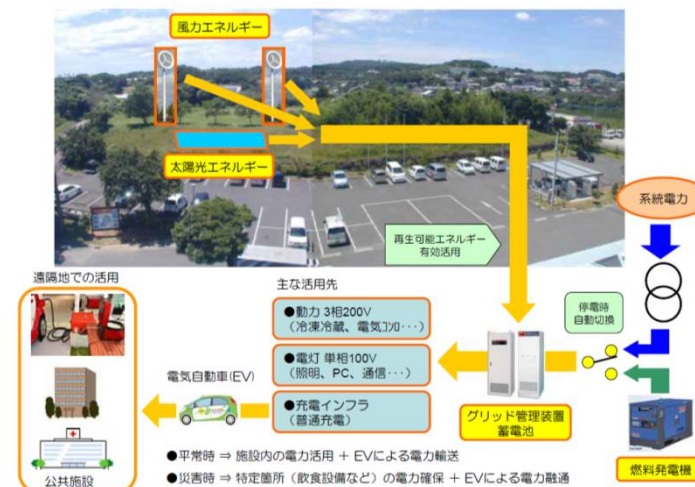
- "Feasibility Study for Nagasaki's "Resilient" Green Power Complex Micro Grid Model" (Kyowakiden Industry (w/ System Five, MHI control systems)) (FS)
=> Adopted as a project supported by Ministry of Environment from 2012
- "Development of High Efficient & Low Cost Charger Unit" (Isahaya Electronics) (Ex)

[2012]

- "Conversion to Front-Drive In-Wheel Motor Electric Scooter" (Sin-ei Industry) (FS)
- "Construction of Pedestrian Navi-Application for Smartphone using NFC sensors" (University of Nagasaki) (FS)
- "Building Business Model of Development & Manufacturing of various EVs corresponding to Local Features and Needs" (Ariyasu Auto) (Ex)
- "Development of Portable Charger by Coordination of Micro Gas Turbine and High Speed Inverter" (Isahaya Electronics (w/ Archive Works)) (Ex)



"Single Switch Converter Type Charging Unit (Prototype)"
(Isahaya Electronics)



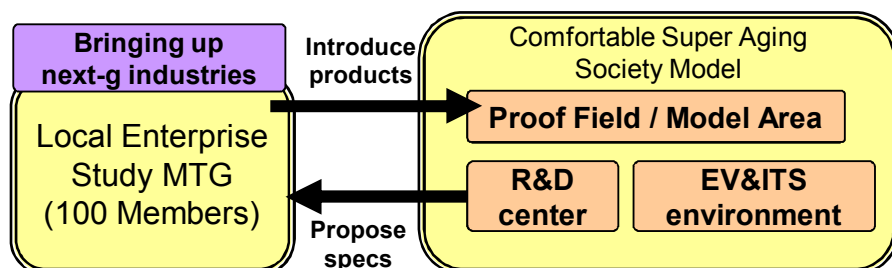
Kentoshi Furusato-kan Micro Grid Model Concept
(Kyowakiden Industry)

Eco-island Goto Project (planning)

- Micro E-mobility and Comfortable Super Aging Society Project - <EV&ITS 2.0>

Target

Bring up local next-generation auto industries in the prefecture in Goto area aiming for "Eco-island", by working on "constructing proof fields" and "introduction support for local industries and produced vehicles" for "micro e-mobility", which is promoted by national governments and is kind to elderly people and child care generation. Also aim to realize a comfortable super aging society utilizing features of introduced vehicles.



Features of "Micro e-mobility"

- match to the actual transport situation cf. <10km, <2passengers for daily transport (MILT, 2007)
- small and easy to drive → kind to elderly drivers
- decrease numbers of parts by about 1/3, and entry of local industries is expected
- need technology innovation such as improvement of safety and cost reduction

Backgrounds

- Results of "Nagasaki EV&ITS Project", relating infrastructures, local groups, and valuable human network of "Nagasaki EV&ITS consortium"
- Expected to construct easy & kind transport ways for remote islands with aging problems, taking an opportunity of renewal of the laws for remote islands
- In 2012.7, national government decided "Japan Rebirth Strategy" that aimed for 50% of a ratio in new car sale for the next-g cars by 2020, and expressed acquisition in advance and creation of innovation as an advanced problem solution country, through foundation of authorization system suitable for super aging society

Actions & Phases

	Phase 1	Phase 2
1	<ul style="list-style-type: none"> - Foundation of national authorization and operation system - Maintenance of relating infrastructures - Construction of proof fields 	<ul style="list-style-type: none"> - Top class of authorized vehicles in the nation-wide (Establishment of proof field position)
2	<ul style="list-style-type: none"> - Formation & operation of aging model area (vehicles produced in prefecture, commercial, or EV&ITS prototype) - Propose domestic standard specifications 	<ul style="list-style-type: none"> - Propose domestic standard specs - Formulation of next-generation society system (Local revitalization through road maintenance, construction of communication NW, and operation system maintenance)
3	<ul style="list-style-type: none"> - Propose requirements for safety improving elements and cost reducing technology to local industries - Support development & producing and practical introduction of locally produced vehicles 	<ul style="list-style-type: none"> - Bring up next-generation auto industries - Related industries: > 100 (current: about 30)
4	<ul style="list-style-type: none"> - Foundation of collaborative R&D center 	<ul style="list-style-type: none"> - Attract special R&D organization of nation, universities, or industries

Organization

Operation Division

- select model area
- prepare & operate environment

Social System Division

- data analysis
- discuss specs

R&D Division

- safety issues
- technical issues



“Nagasaki EV&ITS Project” Realize Advanced ITS Tourism ! Broadcasting to the world !!

Project Targets

- Construct Advanced ITS Tourism Model
- Expand tourists and visitors
- Create local industries and business
- Revitalization of local companies
- Invite companies and projects

Fukuoka

Hiroshima

Osaka

Tokyo

Kyushu Super-Express
West Kyushu route

大村

Nagasaki

New Nagasaki St.

The first super-express station
direct to sea in Japan

2009 Project start

2010 ITS world congress in Busan

World's specialists come to see and experience advanced EV&ITS tourism to Goto islands

~ Report the latest results in ITS WC 2011 in Orlando and 2012 in Vienna

2013 ITS world congress in Tokyo

World's specialists come to see the latest EV&ITS model in Nagasaki

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Goto city

Shin Kami-Goto town

