

Green Technology Facilitation for Carbon Free Island Initiative in Korea: Lessons-Learned from *Gapa* Island Case

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1. Development Cooperation Framework for Islands
2. Carbon Free Energy Independent Island Initiative in Korea
3. Cases for Future Development – A Way Forward



- 1. Development Cooperation Framework for Islands**
2. Carbon Free Energy Independent Island Initiative in Korea
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1. Development Cooperation Framework for Islands

The Busan Principles (OECD)

Agenda	Description
Ownership by developing countries	The backbone of effective development co-operation must be countries' own goals and plans.
A focus on results	Goals and Targets should be very straightforward in way way that have a sustainable impact, and that fit with developing countries' priorities.
Inclusive partnerships	Stakeholders of development should have openness, trust, mutual respect and learning are important.
Transparency and accountability	Stakeholders are accountable to each other and, most importantly, to publics. Transparency and verification, report, and monitoring are the key elements.

1. Development Cooperation Framework for Islands

Reflections for Elements of Development Cooperation in Island Contexts

Aligned with
National
Development
Master Planning

Actual
Implementation of
Initiatives

Mobilizing
Modalities and
Financial Options

Usage of Green
Technologies for
Sustainable
Developments

Reflecting Islands
Contexts

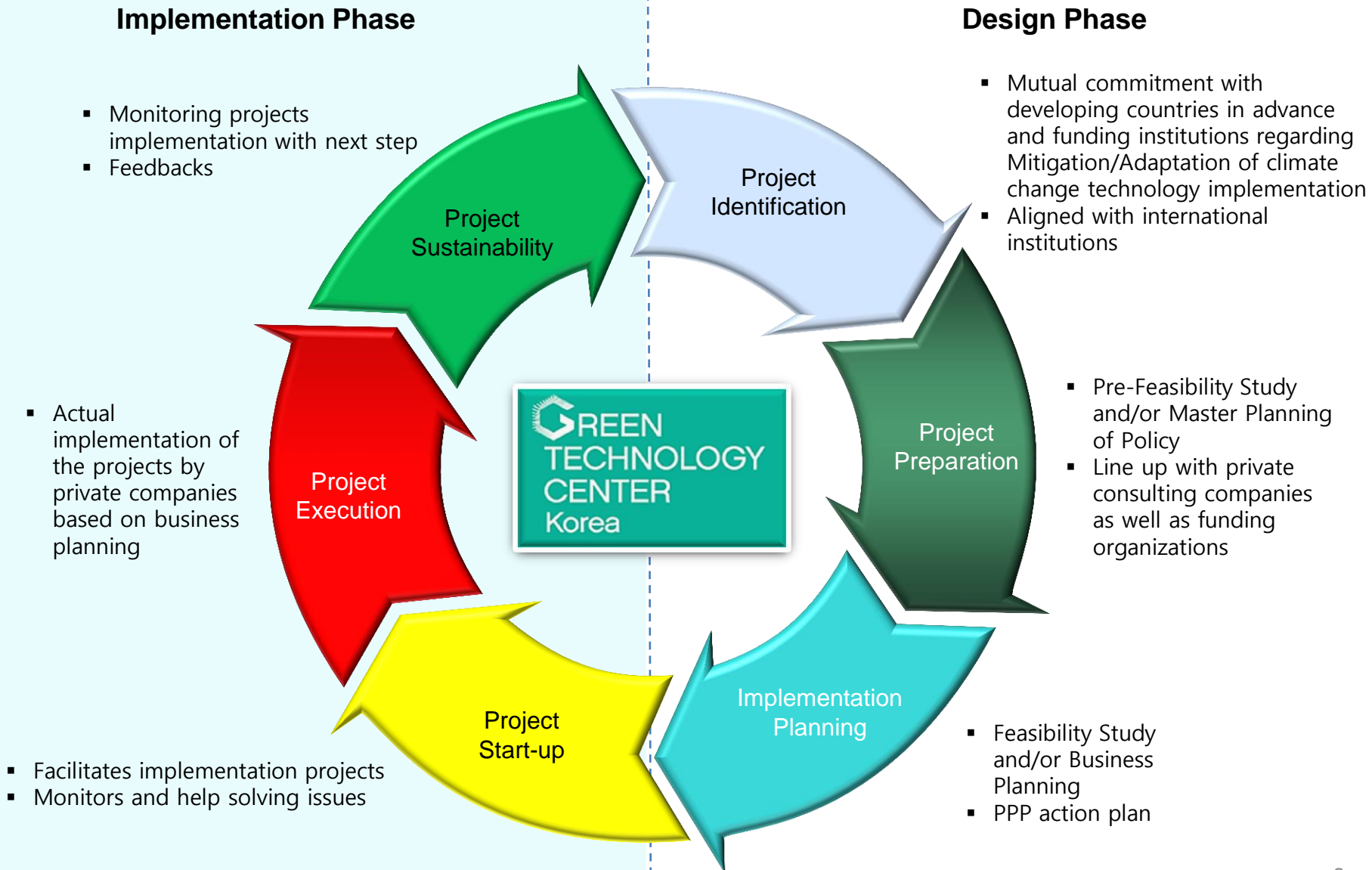
Maintenance and
Operation Issues

"Rather than setting universal (or "one size fits all") targets on volumes of development finance, modalities, or co-operation practices, a post-2015 framework for development co-operation will need to recognize the distinct roles of different types of co-operation actors." (ibid, p6)

Importance of the Coordinator !

1. Development Cooperation Framework for Islands

Global Cooperation Framework(A GTC-K Perspective)



1. Development Cooperation Framework for Islands

Technology Transfer to Development Frameworks for Island Developments



**Coordinator
& Planner**



**Finding Opportunities
with Partners**



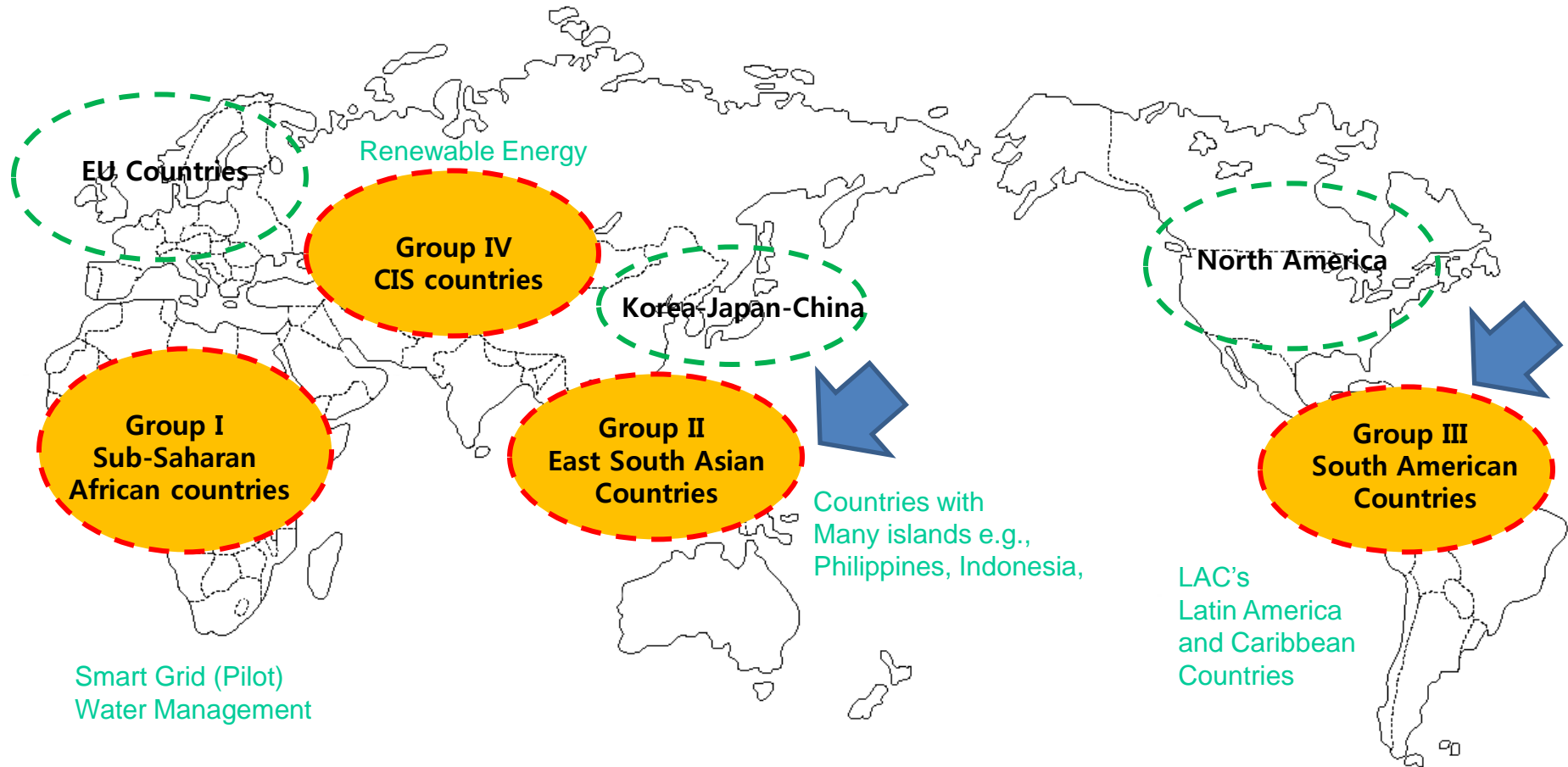
R&D Institutes



**Technology Transfer
and implementation by
private sector companies**

1. Development Cooperation Framework for Islands

Target Ares for Carbon Free Eco-Tourism Islands of GTC-K



-  Green Technology/Funding Cooperation with Developed Countries
-  Priority Areas of Global Cooperation for GTC-K



1. Development Cooperation Framework for Islands
2. **Carbon Free Energy Independent Island Initiative in Korea**
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2. Carbon Free Energy Independent Island Initiative in Korea

Gapa Island Case #1



2. Carbon Free Energy Independent Island Initiative in Korea

Gapa Island Case #2



Area	0.84km ²
Time from Land	20 Min
Households	145
Population	275

2. Carbon Free Energy Independent Island Initiative in Korea

Gapa Island Case #3



2. Carbon Free Energy Independent Island Initiative in Korea

Gapa Island Case #4

- **Energy Generation : Renewable Energy 100% Replacement**

- Now Diesel Generator of 300kW → Wind 500kW, Photovoltaic 63kW, ESS 2MW

- **Cars : All vehicles in Gapa island will be changed to EV's**

- 4 Sedans, 2 Trucks, 3 Vans

- **Daily life Application : Pilot Case of Smart Grid**

- Smart Meter (AMI, Advanced Metering Infrastructure) Deployment – Real-time billing
- Total Energy Control and Management system – Energy, Security, Disaster Manager, and Water management, etc.

- **Organic Food without chemical fertilizer**

- Organic vegetable and crops as area specific items

- **Smart water**

- Fresh water, swage total management

2. Carbon Free Energy Independent Island Initiative in Korea

Gapa Island Case #5



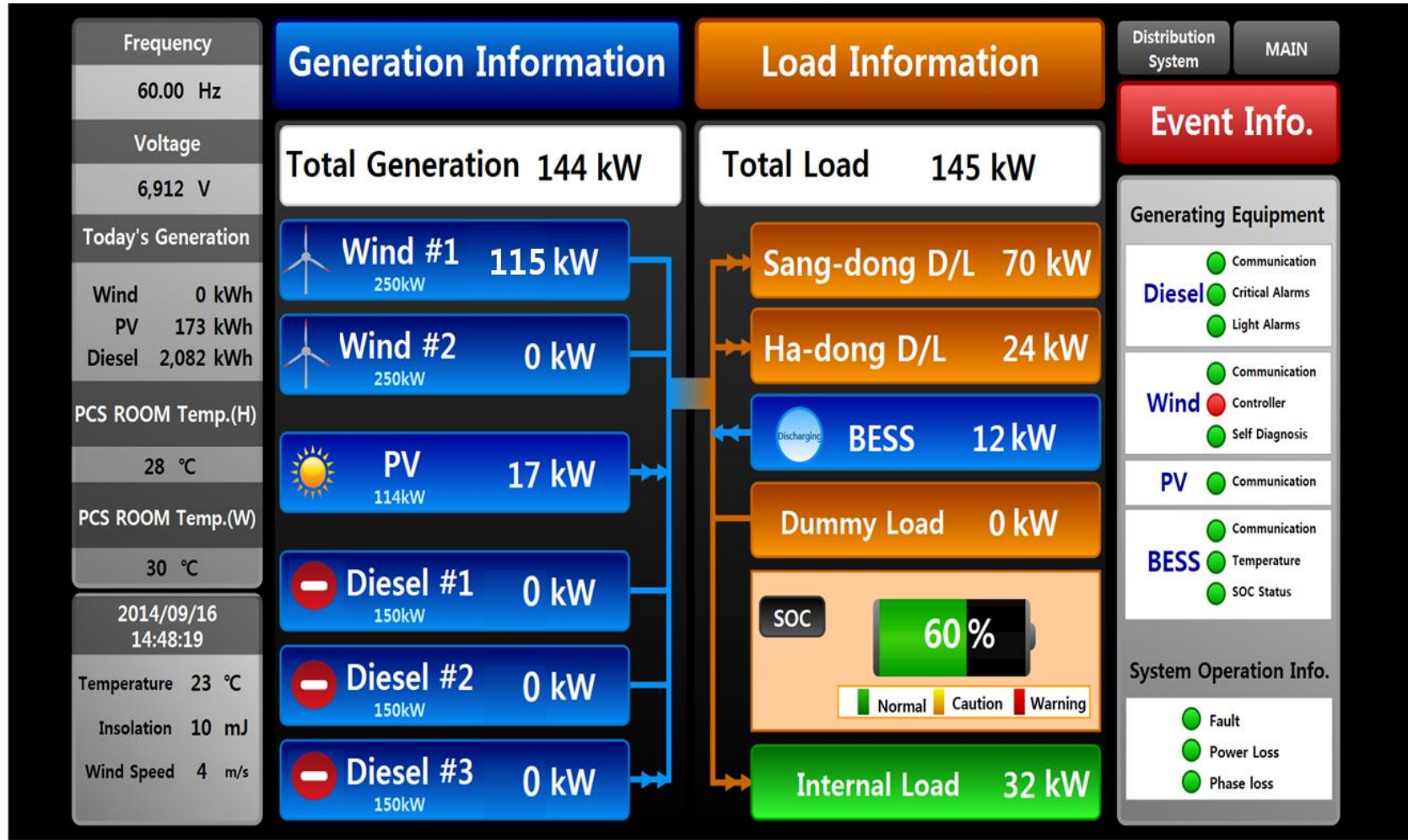
Gapa Island Wind Power Generation

Operation Center (TOC)

Sources: Song Jae Do (2013) Smart Grid for Energy Independency, Daekyung Engineering

2. Carbon Free Energy Independent Island Initiative in Korea

Gapa Island Case #5-1



Source: KEPCO, 2014

2. Carbon Free Energy Independent Island Initiative in Korea

Gapa Island Case #6



ESS (Energy Storage System)

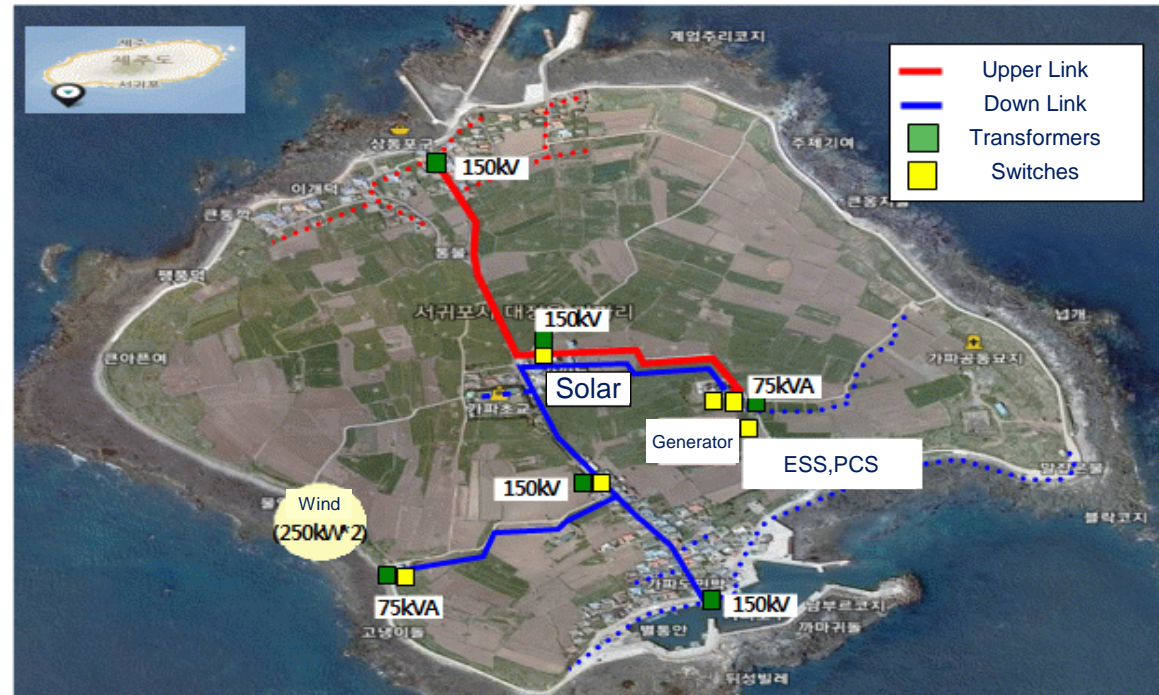


Photovoltaic Power Generation

2. Carbon Free Energy Independent Island Initiative in Korea

Gapa Island Case #7

Index	Gapa Island
Area	0.84km ²
Time from Land	20 Min
Households	145
Population	275
Electricity Consumption	1,044Mw/Year
Max	224kW
Monthly Average	119kW
Capacity	150kW×3
Diesel Fuel Consumption	240kl/year



2. Carbon Free Energy Independent Island Initiative in Korea

Gasa Island Case #1



■ Outline

- Location: Gasado-ri, jodo-myeon, join-gun, Jeollanam-do, Korea
- Population: 286 (168 household)
- Power Generation : 300 kW (Three 100kW)
- Average load : 95 kW
- Weather : Avg. wind speed 5.8m/s, avg. solar radiation 3.88kWh/m²

■ Equipment installation

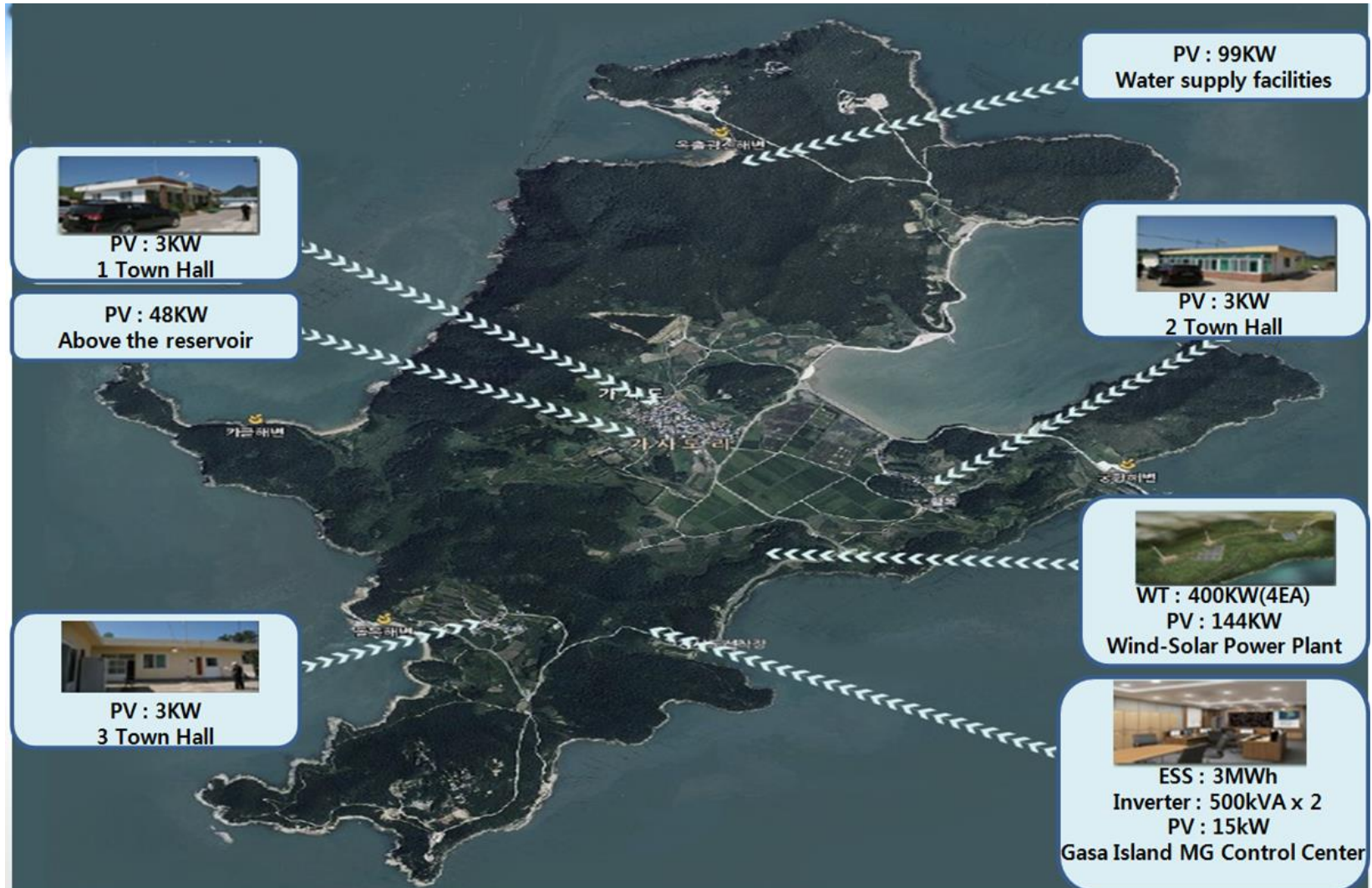
- PV 320kW, WT 400kW, ESS 3MWh, 3 inverter motors, EMS

■ Utilization

- Supply 100% of power as a renewable energy(solar, wind)
- save dump power into ESS which provides capacity of 3MWh
- Power supplied to each facility in the island such as household, lighthouse, school, etc.

2. Carbon Free Energy Independent Island Initiative in Korea

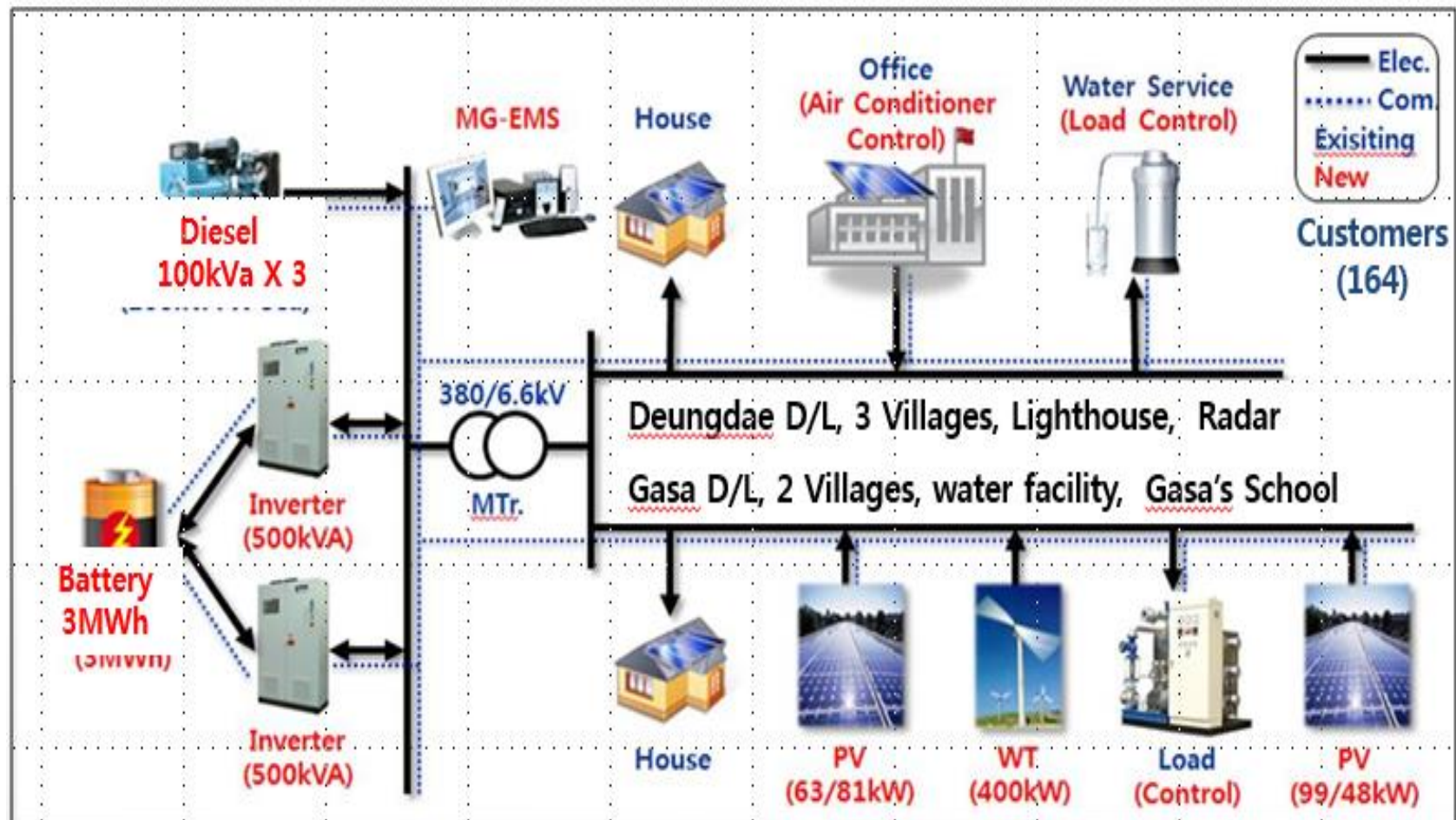
Gasa Island Case #2



Source: KEPCO, 2014

2. Carbon Free Energy Independent Island Initiative in Korea

Gasa Island Case # 3



Source: KEPCO, 2014

2. Carbon Free Energy Independent Island Initiative in Korea

Ulleung Island Case #1



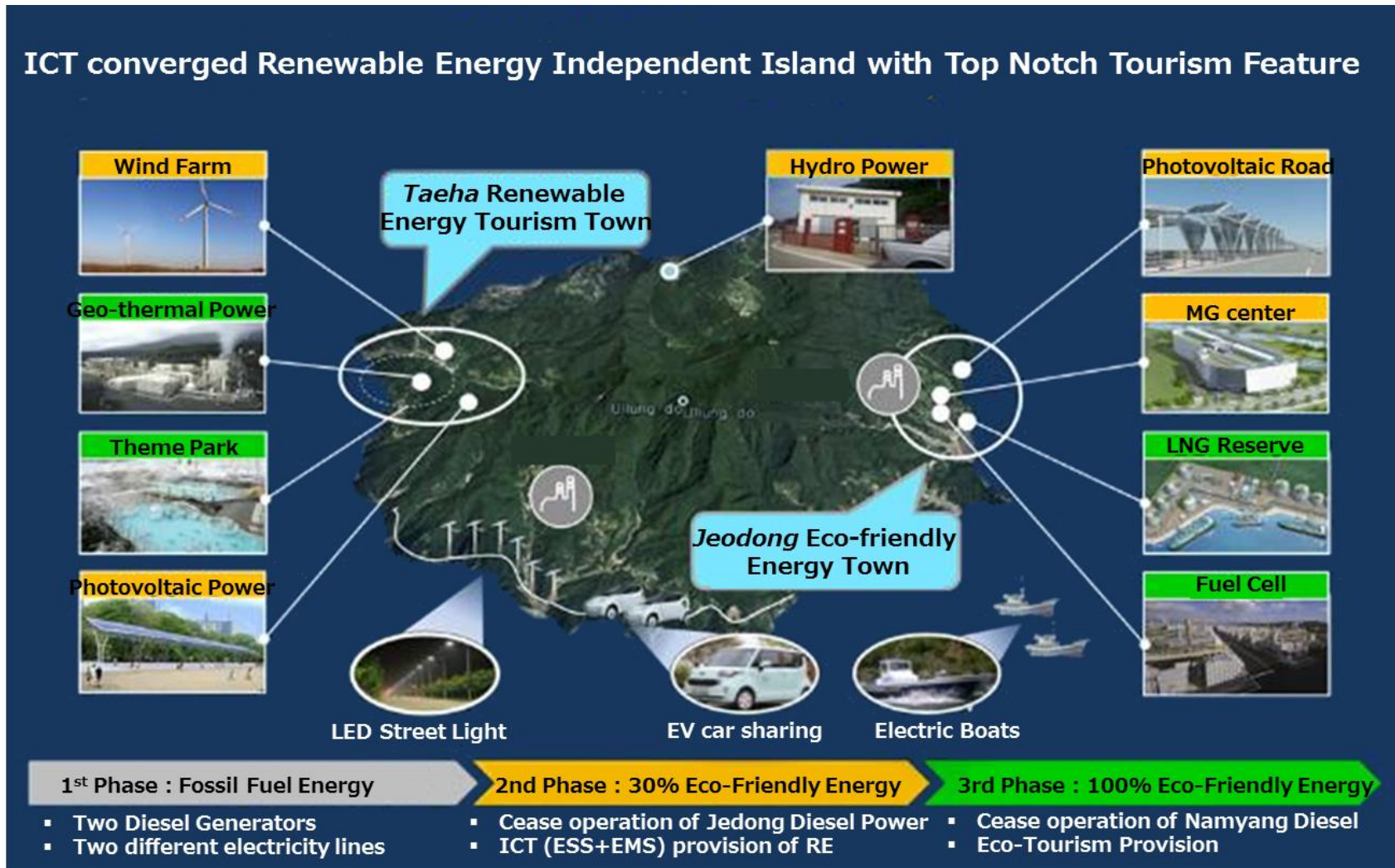
2. Carbon Free Energy Independent Island Initiative in Korea

Ulleung Island Case #2



2. Carbon Free Energy Independent Island Initiative in Korea

Ulleung Island Case #2



2. Carbon Free Energy Independent Island Initiative in Korea

Ulleung Island Case #3

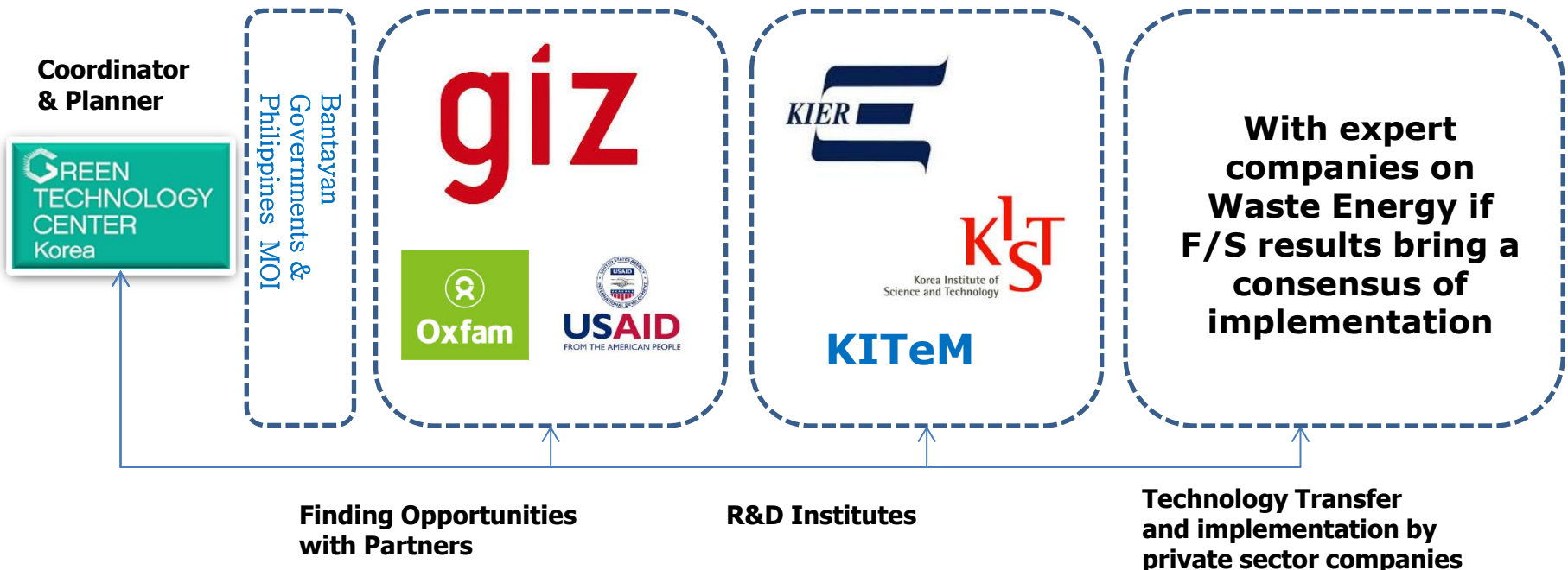
- The Largest Eco-Friendly Energy Independent Island Project with Population over 10,000.
- Purpose of the project is to change diesel generators to ICT based ESS/EMS Eco-Friendly Energy Island with Tourism Features
- SPC will be setup for budgeting and 330 Million USD will be SPC investment and project financing
- Local Government, KEPCO and other private sector companies will be joining the project
- Milestone
 - By 2017, 30% of Energy from Renewable Energy
 - By 2020, Zero Diesel Power with Renewable Energy Provision



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3. **Cases for Future Development – A Way Forward**

4. Cases for Future Development – A Way Forward

A GTC-K Development Cooperation Platform for Bantayan Island



4. Cases for Future Development – A Way Forward

Bantayan, Philippines



GTC-K – Waste Management Master Planning for eco-Tourism in Bantayan, Philippines

Date : 2014.11 – TBD

- GTC-K provides master planning for Bantayan island regarding waste management and waste-to-energy over carbon free island concepts
- Policy and Master Planning for Bantayan is needed for long-term development of the reason
- The project is with GIZ, Oxfam, USAID





Thank You!

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