Asia-Pacific Economic Cooperation

Knowledge Sharing Platform (KSP) Workshop
for the Energy Smart Communities Initiative
ESCI Executive Meeting

Topic: Low Carbon Islands Development in Chinese Taipei

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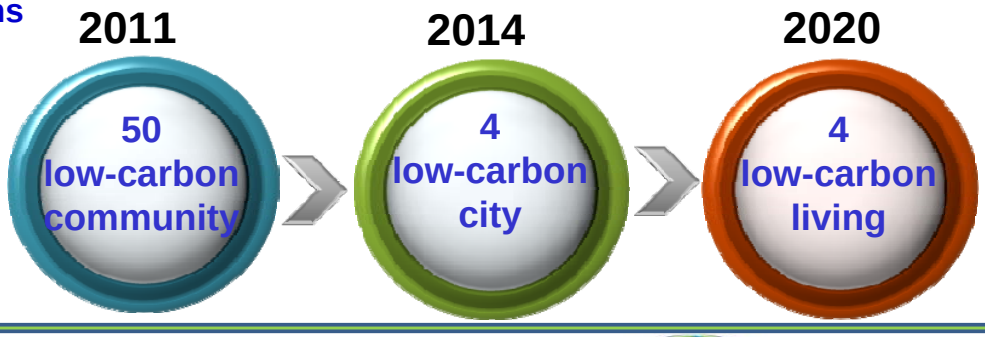
Presentation Outline

- Introduction
- Goals
- Comprehensive Framework
- Expected Benefits

Introduction

- Conclusions of 2009 National Energy Conference :
  - Build Taiwan as a low-carbon society
    - -Stepwise approach
      Low-carbon community➔Low-carbon city➔Low-carbon living
    - -Construct a pilot renewable energy living area for demonstration (55% energy supplied by renewable energy)
- In 2009, Penghu County proposed a "Penghu Low-carbon Pilot Plan":
- 2010/3/4 Penghu Low-carbon Pilot Plan was approved in "National Energy Saving and Carbon Reduction Master Plan" as one of the 35 benchmark plans



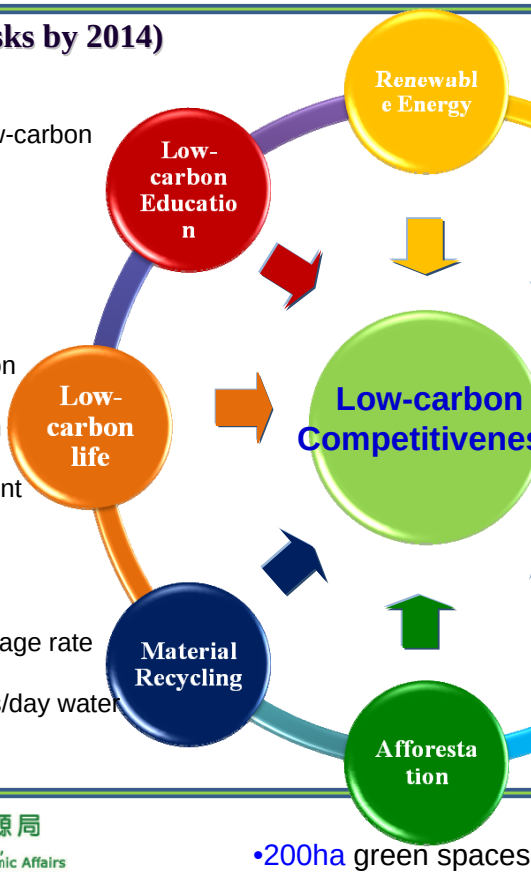
Goals

Make Penghu a world-class low-carbon island
- a low-carbon clean-life living area

IMAGE	• A pilot low-carbon sightseeing island
ENERGY Supply	• >55% renewable energy technology
ENERGY SAVING	• Widely use energy-saving equipments and advocate the concepts of energy saving strategies to common households
RESOURCE	• Efficient use of water, and wastes should be reduced and recycled
INDUSTRIES	• Promote sightseeing business with green energy infrastructures to boost local economy
LIFE	• Sustainably use local resources and construct a low-carbon LOHAS of environment

Comprehensive Framework

(complete all tasks by 2014)



- Promote low-carbon education

•Large wind turbines 96MW
•Photovoltaics 1.5MW
•Solar water heater 6,400m²

•2,106 smart meters
•4,000 LED streetlights
•14,000 energy-saving domestic appliance

•Promote low-carbon community
•Public participation
•Carbon labels and energy management
•Zero carbon pilot islands

•6000 electric motorcycles
•Demo electric vehicles
•B2 bio-diesel on the island
•Island-wide bicycling network

•Reduce water leakage rate from 32% to 25%
•Reduce 5,700 tons/day water supply
•Zero waste

• 100% green building for all new public buildings and main private investments

•200ha green spaces

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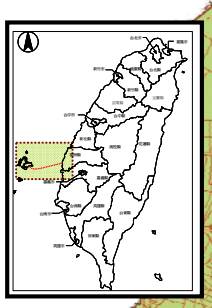
APEC Asia-Pacific Economic Cooperation

Infrastructure— Seabed Cable

- **Goal: link regional power to main grid, no supply shortage**
- **Start from Kouhu, Yulin to Jianshan, Penghu**
- **Length: 66.3 km**
- **Capacity:2*200MW(2 loops 6 lines)**
- **Estimated electricity: 8.8billion kWh/yr**
- **Budget: 21 billion TWD**
- **Construct Period: 2010~2014**
- **Benefit: in winter, electricity surplus can be sent back to main grid in Taiwan**



Stabilize electricity supply

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APEC Economic Coop

Public Participation

❒ Public co-investment

- County government establishes an energy company to invest in large wind turbines, and encourage public investment
- Private investment: < 50%,government investment: > 50%

❒ Public participation through adoption program

Determine locations → Open to the public → Confirm exhibition contents → Installation/ maintenance

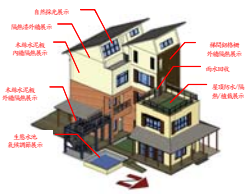
- Provide and maintain renewable energy devices
- Regenerate commercial circles
- Tree planting and greening
- Promote low-carbon activities

Expected Benefits

1. Future appearance

Large wind turbines

Green building



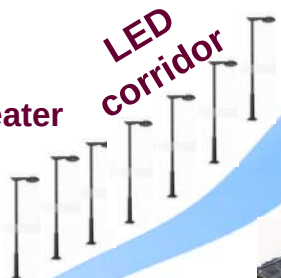
Photovoltaics (MW)

Entrance of airport

water reuse

hotel Solar water heater

LED corridor



PV passage/cafe

Magong city center

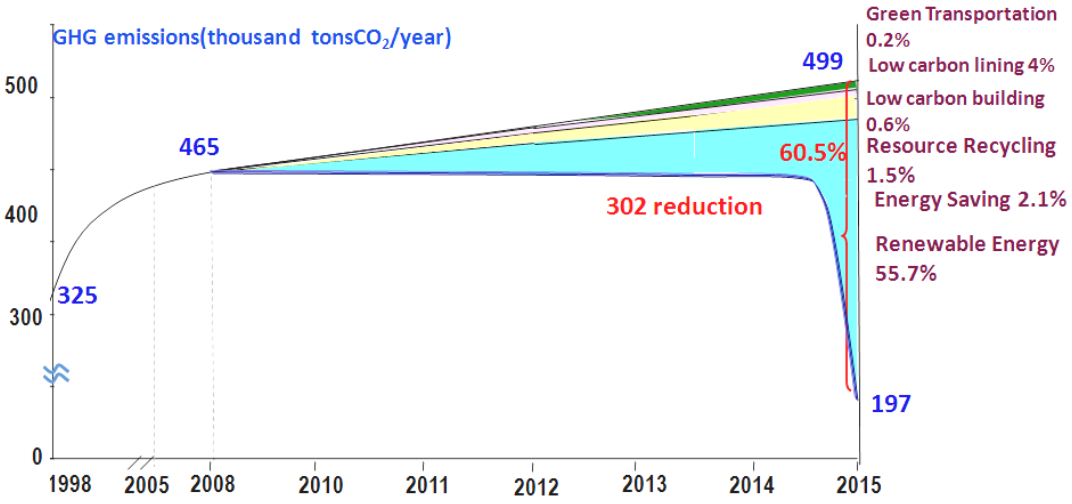
PV charger station

PV bus stops

Greening

2. Benefits

- Carbon emission will be reduced by 60% compared to BAU in 2015 ,and reduced to about 50% compared to emission in 2005
- Renewable energy supplies 56% of total energy consumption in 2015 , the generated electricity will have surplus to send out to Taiwan
- Reduce CO_2 emission from 5.4 tons/cap-yr (2008) to 2.1 tons/cap-yr (2015)
- Annual cost: 1.06 billions TWD, payback period: 6.8 years
- Boost sightseeing industry



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3. Comparison to other countries

Ratio of renewable energy

Ratio of renewable energy	No. of islands
75-100%	3
50-74%	2
26-49%	10
0-25%	33

(source：Renewable Energy on Small Islands, 48 islands)

TOP 10%

International cities/islands carbon reduction goals

Type	City	Base Year	Achieving Year	Reduction Goal
Island	Penghu Island	2005	2015	50%
	Samso, Denmark	1997	2003	100%
	Cheju, Korea	2005	2020	50%
City	Munich, Germany	1990	2010	20%
	London, UK	1990	2015	20%
	Geneva, Switzerland	1990	2012	10%
	Berlin, Germany	1990	2010	25%
			2020	40%
	Bangkok, Tailand	2007	2012	15%
	Masdar City, Abu Dhabi	New town	2018	100%
	Tokyo, Japan	1990	2020	25%
	Kyushu, Japan	2005	2030	30%
	Kyoto, Japan	1990	2030	40%
	Yokohama, Japan	2004	2025	30%
	Minamata, Japan	2005	2020	32%

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Current Status and Challenges

1. **Preparation of the establishment of Penghu Energy Tech. Co., Ltd.**
2. **1.5MW Solar Panels:**
   - Designs and budget have been prepared.
   - Part of the projects will be completed in this year.
3. **Construction of seabed cable**
   - Communicate with local residents
4. **Promotion of electrical motorcycles**
   - Number increases continuously

Potential International Cooperation

- **Installation of wind turbines (off-shore and on-shore) in Penghu Island**
  - Off-shore:
    - Taipower company plans to build 120MW capacity of off-shore wind turbines
    - International construction experience is desirable
  - On-shore:
    - Penghu Energy Tech. Co. will build 96 MW capacity of on-shore wind turbines
    - Qualified international building groups and wind turbine manufacturers are welcome

http://www.re.org.tw/PengHu/index.aspx

Thank you for your attention!