

# LCMT : LOW CARBON MODEL TOWNS

## Basic Information

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**Name of Town:** Waterfront Cultural Town -Low-Carbon Yingge

**Managing Organization:** New Taipei City Government

### Description:

Yingge is a region comprises art, culture, history, environmental protection, health, passion, and diversity. The New Taipei City Government' s continuous development of reclaimed land of "Sang-Ying Taohuayuan," San-Ying Art Studio and the "San-Ying Bridge" in front of San-Ying Ceramics Museum, featuring cultural and historical

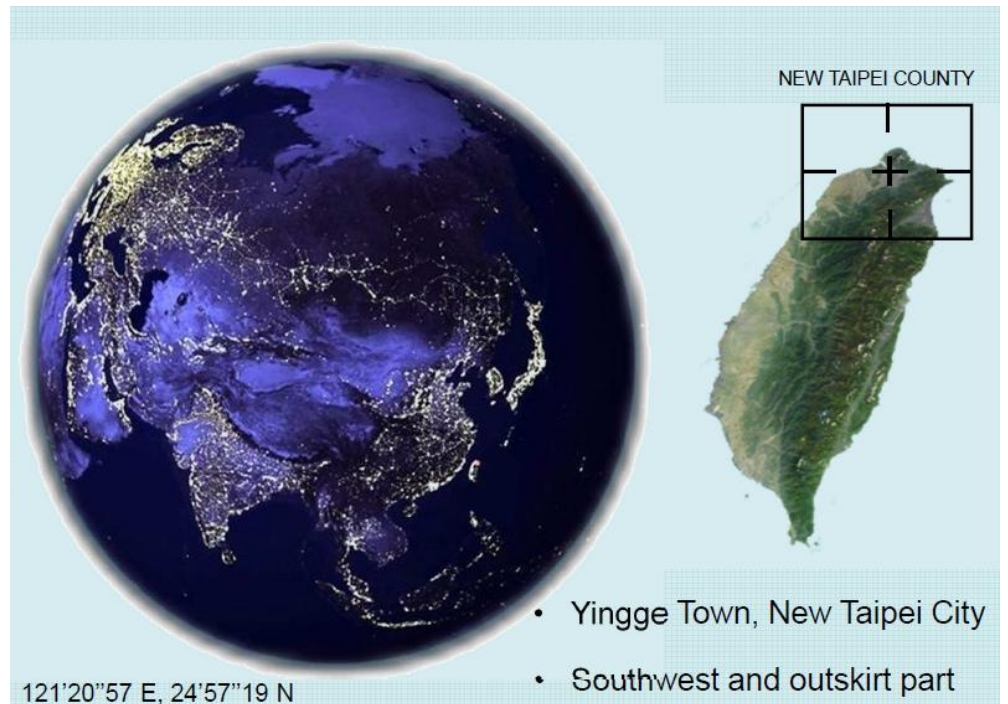
characteristics in recent years, have brought tremendous changes to Yingge area in terms of urban development and landscape. Yingge has seemingly become "Taiwan' s Ceramics City" and one of the best places to live in New Taipei City. Yingge is distinguished internationally



as the example of “Best Practice in Environmental Management,” which was awarded with “Live Com Awards,” the Bronze Medal in category “The International Awards for Liveable Communities” of Group C from United Nations Environment Programme. The awards demonstrate the efforts of New Taipei City in environmental sustainability and eco-friendly policies have drawn international attention and recognition.

## APEC Economy:

- ☐ Australia
- ☐ Brunei
- ☐ Canada
- ☐ Chile
- ☐ China
- ☒ Chinese Taipei
- ☐ Hong Kong
- ☐ Indonesia
- ☐ Japan
- ☐ Korea
- ☐ Malaysia
- ☐ Mexico
- ☐ New Zealand
- ☐ Non-APEC Economies
- ☐ Papua New Guinea
- ☐ Peru
- ☐ Philippines
- ☐ Russia
- ☐ Singapore
- ☐ Thailand
- ☐ United States
- ☐ Vietnam



# Description of Town

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## Type of Town:

- ☐ Urban ( Central Business District )
- ☐ Urban ( Mainly consists of commercial area )
- ☐ Urban ( Mainly consists of residential area )
- ☒ Village ( Village )
- ☐ Village ( Island )
- ☐ Others

Coverage rate of population with access to tap water : 97.51%(2011)

Specific power plant type (e.g. coal, geothermal, etc.): There is no power plant within the area.

Per capita area of paved roads : 6.08 square meters per capita (2011 Urban Planning)

Per capita area of public green space: 0.42 square meters per capita (2011 Urban Planning)

**Climate Conditions:** Humid. The climate is the warm and humid subtropical northwest that is divided into dry season and raining season. The dry season is attributed to the stronger southwestern monsoon in summer and autumn while the raining season is attributed to the prevalence of northwestern monsoon in winter.

# Expected Future Development

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Per capita area of public green space: <sup>1</sup>

1. The population growth in Yingge (including Fengming) Urban Planning District is relatively lower than that of Sanxia District. The population growth reached its highest at 4.99% in 1997, followed by annually gradual decline afterwards while reaching negative growth in 2010. Nonetheless, the population growth increased by 0.99% after 2001 with an average annual population growth of 1.49%. The average annual population growth for area outside of Yingge Urban Planning District is 0.84%. According to the demographic data between 1991 and 2011, the population growth did not show certain trend and this population of this area is centralized in southwestern side of Yingge District, including Erqiao Village, Yongchang Village, Jianshan Village, Nanying Village, and Jianguo Village.
2. The population for Yingge (including Fengming) Urban Planning District in 2032 will fall between 33,581 and 89,263 people. In consideration of the future convenient commute (MRT San-Ying Line) and the experience in development of peripheral area, the geometric progression is applied to yield 80,115 people from the estimated population growth and used as the gradual population growth (rounded to 81,000 people for planning population) for the population quantity for Yingge (including Fengming) Urban Planning District in target year. The population result of dense

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<sup>1</sup> New Taipei City Sanxia District and Yingge District Sewage Treatment System Phase I Implementation Project, Construction and Planning Agency, October, 2012

building area outside of Yingge Urban Planning District is estimated to fall between 9,755 and 12,281 people. The arithmetical progression is applied to the estimated population quantity to yield 11,960 people (rounded to 12,000 people) for the population quantity of the target year.

Expected industrial/economic changes:<sup>2</sup>

1. Building industrial environment: Improve the fundamental public facilities, IT facilities, environmental protection facilities, and hardware/software in and outside of factories to strengthen industry nature and solidify the industry potential.
2. Encourage establishment of excellent association by providing proper subsidy and counseling: For example, encourage the private sectors with investment into operations through preferential tax cut to gradually boost Yingge ceramics industries.
3. Establish professional ceramic art R&D center: Provide professional talents with advanced studies and R&D in new products and new technology to strengthen technology and production R&D capacity with improvement as well as quality enhancement. To exhibit the infinite vitality of Yingge ceramic culture by becoming a true "Taiwan' s Ceramic City" in order to increase the international competitiveness of Yingge ceramic in the international ceramic market.

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<sup>2</sup> Regional development planning on "Revision to New Taipei City Comprehensive Development Plan," Construction and Planning Agency, 2002.



4. Cultivate and introduce professional talents: Encourage the enterprises to introduce talents. For example, to establish industry-academia cooperation with local Yingge schools (such as Yingge Vocational High School) or establish funding guidelines for graduates with major in craft or design, in order to guide these students to work at the ceramic factories that require advancement in technology and design. As a result, ceramic and education are integrated to bring booming business opportunities for Yingge ceramics.
5. Speed up corporate information: ° Computers and internet are the best routes to integrate resources, facilitating the fastest implementation of promotion, contact and discussion. In the future, Yingge ceramic industries can also provide ceramic related and consumer information online to create more business opportunities and to centralize the marketing power of Yingge ceramics.
6. To develop cultural and tourism industry using characteristics of local conventional industries, which not only take into consideration the preservation of ceramic culture and prosperity of ceramic lifeline but also provide significance in tourism and education. The establishment of ceramics museum will facilitate its integration with community industries, thereby to draw a growing number of tourists and to create business opportunities.

Other expected development: This offers long history of cultural and historical industries, rich natural landscape and waterfront space. The environmental characteristics impel this planning district to develop

“Literary Axis, “Nature Axis,” and “Waterfront Axis.” In the future, the planning district is defined as a string of the peripheral river reclaimed land of the base, Yingge Ceramic industries, historical and cultural space, and natural landscape resources to form a remarkable waterfront literary town for experience of local Yingge culture. The development of reclaimed land and restructuring of Yingge train station will build Yingge into the new ceramic culture center.

## Town Policy, Vision or Objective

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What is the policy, vision, or objective of the town ?

Reconstruct urban activity function of Yingge Riverbank and build the overall integrated concept of low-carbon and cultural Yingge will meet human demand for economic and residential activities through land use planning in addition to reexamining properness of land use, insight, and timely adjust possible disasters and environmental impacts. In addition, the development of spatial order is effectively guided to define the role and find the competitiveness in resource integration and utilization for urban and town adaptive development.

Brief outline of the low carbon town development plan:

1. Green Commute:

(1) People-oriented Green Bridge Passage:



The Yingge Ceramic Old Street Viewing Overpass opened in 2009 is intended for shaping the image of entrance to Yingge Ceramic Old Street while facilitating the traffic of the public between the Ceramic Museum and Old Street. A viewing bridge for pedestrians and biker was built near the entrance to Ceramic Old Street and Zhongzhen 2<sup>nd</sup> Road, Wangshantong for easy and convenience access among tourists and bikers.



**Figure 1 Yingge Ceramic Old Street Viewing Bridge**

The Multi-Purpose Overpass in front of Yingge Ceramic Museum adopts the boxed-beams and steel-structural materials with back-slope design that comes with a total length of approximately 300 meters. It cones the Yingge Tourist Pedestrian area and is bounded to Yingge Ceramic Museum, Yingge Old Street, and San-Ying Art Studio as well as the “San-Ying Taohuayuan” leisure sports space with exceptional landscape and views. The back-slope design provides movement of pedestrians and bikes so that they will maintain more safety in travelling between Wenhua Road and Guangqian Road.



**Figure 2 Multi-Purpose Overpass in front of Yingge Ceramic Museum**

## (2) MRT San-Yin Line and Taiwan Railway Fengming Station

Green commute is one important part of constructing low-carbon model town. Due to the traffic advantage of Yingge with railway transport (MRT Yingge Station and the Fengming Station under construction), the future construction of MRT San-Ying Line will be incorporated plus the building of pedestrian space and biking space to build Yingge District into the best model site for New Taipei City People-Oriented Transport Environment. In August 2012, the New Taipei City MRT San-Ying Line Feasibility Research Report was discussed and approved by the Executive Yuan Council for Economic Affairs Review Committee, which is scheduled for construction in 2014 and to be completed in 2021. When the line between Dingpu Station and San-Ying is opened in the future, San-Ying Line will pass Tucheng Line for transfer and will arrive to Taipei Train Station in 40 to 50 minutes.

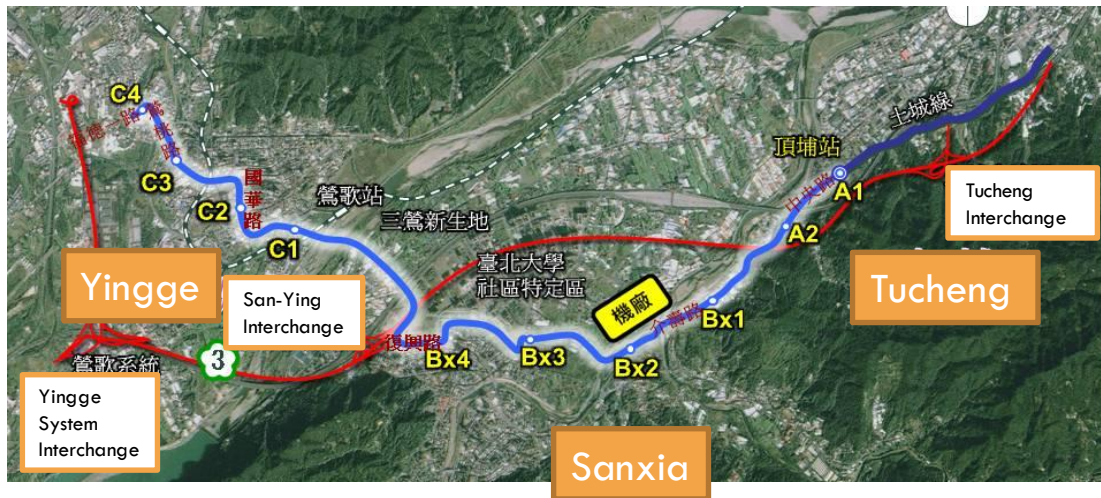


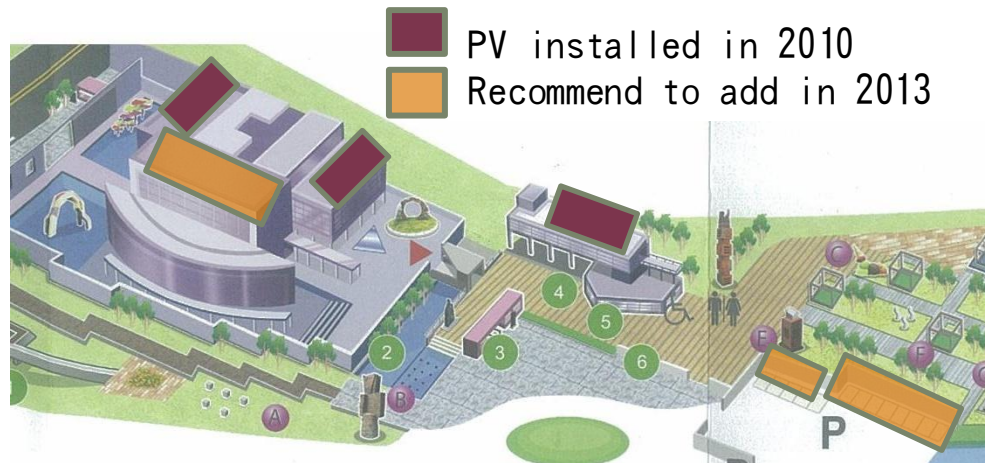
Figure 3 Route Planning for MRT San-Ying Line

## 2. Green Energy

### (1) Yingge Ceramic Museum

Yingge Ceramic Museum is a signature landmark of Yingge District and the key tourism recreational site in New Taipei City. The New Taipei City Government has installed electric vehicle charger socket and PV panel facilities at the parking lot of the museum to highlight the importance of environmental protection education. In 2010, the PV panel capacity of 36.06kWp was installed and more capacity is scheduled for installation in automobile/motorcycle parking yield and the roof of Ceramic Museum in 2013. The total capacity for renewable energy facilities at Yingge Ceramic Museum will reach 70kWp and the total power generation is estimated at 63,000 kWh/year and the reduction of carbon emission at 33.77 tones of CO<sub>2</sub>e/year, as shown in Figure 4 and Figure 5.





**Figure 4 Deployment for Ceramic Museum PV Panel System Installation Sites**

<p>Tourist Center Solar Power System (Silicon 15.18kWp)</p>	<p>Museum Rooftop Solar Power System (Film 20.88kWp)</p>

**Figure 5 Ceramic Museum PV Panel System Installation Overview**

## (2) Yingge District Office

Yingge District Office is a composite administrative building consists of 6 floors above ground and 2 floors underground. It is supported by Gueilun Mountain and faces Dahan River, located at 200 meters from primitive hillside and approximately 300-400 meters from the beach. Yingge District Office is currently planned for building large-scale ecological green roofing environment and using PV panel as the mobile platform shield for green roofing to become the green model for green roofing, as shown in Figure 6 and Figure 7. The greening area reaches 548m<sup>2</sup> and the reduction of carbon reduction is estimated 1,370 kgCO<sub>2</sub>e /year. PV Panel system offers 6kWp and is estimated to generate power at 4,975 kWh/year and the reduction of carbon emission at 2.66 tones CO<sub>2</sub>e/year.



**Figure 6    Location of Yingge Composite Administrative Building**



## PV Mobile Platform Shield Simulation Diagram



## Green Roofing Plane Layout

**Figure 7 Yingge District Office Green Roofing Planning and Simulation**

(3) Public Agency Roof leased for installation of PV Panel system

The list of Yingge Renewable Energy Potential Investigation Installation is shown in Table 3.3.3-1. A total of 10 schools and 1 agency are installed with PV Panel capacity of 434kWp and 600W for wind power generation system.



According to the “Guidelines for New Taipei City Public Housing Roofing Installation of PV Panel System Collective Leasing Operations” approved on March 1, 2013, the idle roof of public housings will be leased to PV system suppliers for installation of PV systems. The first phase is targeted at the school rooftops of municipal public high school and vocational high schools. The idle roof can be offered for installation of PV panel systems to include physical facilities into teaching content o the schools as well as reducing the indoor temperature to meet demand for energy conservation and carbon reduction. The annual leases paid by the suppliers can also be used to support educational campaigns and projects of public property repair and maintenance.

Table 1 List of Potential Renewable Energy Installation in Yingge District<sup>3</sup>

No.	Name	Assessment of Installation Capacity
1	Fengming Elementary School	PV 121 kWp
2	Fengming Junior High School	PV 65 kWp
3	Yingge Elementary School	PV 59 kWp
4	Jiangguo Elementary School	PV 50kWp
5	Yongji Elementary School	PV 39kWp

<sup>3</sup>2011 “Renewable Energy and Green Traffic Planning and Promotional Plan” and “2010 Green Industry Promotion and Inventory Count and Reduction Counseling Plan.” Environmental Protection Department, New Taipei City

No.	Name	Assessment of Installation Capacity
6	Changfu Elementary School	PV 34kWp
7	Yingge Elementary School	PV 27kWp
8	Zhonghu Elementary School	PV 24kWp
9	Erqiao Elementary School	PV 13kWp
10	Health Center	PV 2kWp
11	New Taipei Municipal Yingge Vocational High School	Wind Power Generation 600W

### 3. Local Energy Supply:

#### (1) Yingge Ceramic Museum adopts thermal waste for cooling system

Fucheng Co., Ltd./Fuhe Ceramic Co., Ltd. is a 24-hour manufacturing factory of ceramic tiles. The company can recycle thermal energy at  $1.35 \times 10^8$  kcal/hr and is only 520 meters away from the Yingge Ceramic Museum. The corresponding position of the two halls demanding air-conditioning in Ceramic Museum and energy supply terminals are shown in Figure 8. The demand for Yingge Ceramic Museum appeals in the cold water of air-conditioning with projects to use the thermal waste recycling method for cooling from tunnel kilns to conserve energy and utilize. The energy conservation benefit analysis uses an average annual cooling supply hours of 1,350 hours/year to yield an annual energy-saving at 47,250 kWh/year and reduction of carbon emission at 28.2 tonesCO<sub>2</sub>e /year.



**Figure 8 Corresponding Position for the Two Halls Demanding Air-Conditioning in Ceramic Museum and Energy Supply Terminal**

(2) Long Chang Ceramics Co., Ltd / Thermal Supply System at Yingge Junior High School Heated Swimming Pool Installation Area

Long Chang Ceramics Co., Ltd. is a bathing equipment manufacturing factory that is cross the road from the Yingge Junior High School Swimming Pool. The corresponding position is shown in Figure 9. There is a demand for cooling energy and thermal energy from Yingge Junior High School Heated Swimming Pool during summer and autumns while a thermal energy demand is needed for spring and winters. The local supply grid can be used for utilization of surplus thermal energy from the factory.

The hot water in the heated swimming pool is supplied with a heating pump. The annual temperature in Yingge District is 22.7°C

and the average annual COPH yields average thermal manufacturing capacity of 45,615kcal/hr when calculated at 2.6. The energy consumption of water pumps during the residual heat recycling time is preliminarily estimated at 0.375kw, the average annual production is 126 batches while each batch is recycled for 7 hours and the recycled thermal energy is 88,300kcal/hr. The average energy saving is estimated at 34,100 kWh and the reduction of carbon emission is estimated at 18.2 tones CO<sub>2</sub>e/ year.

The heated swimming pool adopts thermal pump to supply thermal energy with high energy efficiency in COPH (approximately 2.6). It is three times the thermal efficiency (0.85) supplied by general heated swimming pool furnace. Under such excellent energy efficiency, the recycling of thermal waste contains economic benefits. The integration of thermal pump and thermal waste can result in extremely lower power consumption in heated swimming pool, which also offers the model and promotional values. During the heating period in winter, the problems with substantially decline in the hot water supply capacity by thermal pump can also be effectively solved.



**Figure 9 Corresponding Position of Yingge Junior High School Heated Swimming Pool and Energy Supply Terminal**

#### 4. Low-Carbon Planning for San-Ying Reclaimed Land

The overall construction plan for Great San-Ying area, including Yingge River Granite Purification Project, San-Ying Spatial Art District, san-Ying Reclaimed Land Landscape Project, San-Ying Art Studio, New Taipei City Gallery, Sewage Treatment Site, Pedestrian area, Spatial restructuring project in front of Ceramic Museum, San-Ying Viewing Overpass, and San-Ying weir Project. Currently, the weir, municipal gallery, international hotels, and cable cart projects are all under organization and will become the cultural and art center of New Taipei City. The use plan and overview of 30-hectare San-Ying Reclaimed Land is shown in Figure 10 and Figure 11.



### (1) San-Ying Reclaimed Land Renewable Energy Model

New Taipei City plans to install renewable energy facilities at the biking trail, San-Ying Art Village and Parking Lot already completed with the corresponding positions shown in Figure 12. The 40kWp PV Panel system and small wind turbine 20kW are installed to estimate the power generation reaching 50,000 kWh/year, with the intention to replace approximately 50% energy consumption for San-Ying Art Village in operation currently.



Figure 10 San-Ying Reclaimed Land Use Plan





**Figure 11 San-Ying Taohuayuan Overview**

## (2) San-Ying Water Purification Park<sup>4</sup>

The commissioned planning, design and monitoring technology service for New Taipei City Wastewater Treatment Construction (Sanxia District, Yingge District) have been implemented in 2011. A multi-purpose water purification park will be built in San-Ying Reclaimed Land, adopting semi-underground wastewater treatment facility and relevant landscape construction above ground to discharge the waste water into Dahan River estuary in addition to installing the hydroelectric power generator.

<sup>4</sup> New Taipei City Sanxia District and Yingge District Sewage Treatment System Phase I Implementation Project, Construction and Planning Agency, 2012

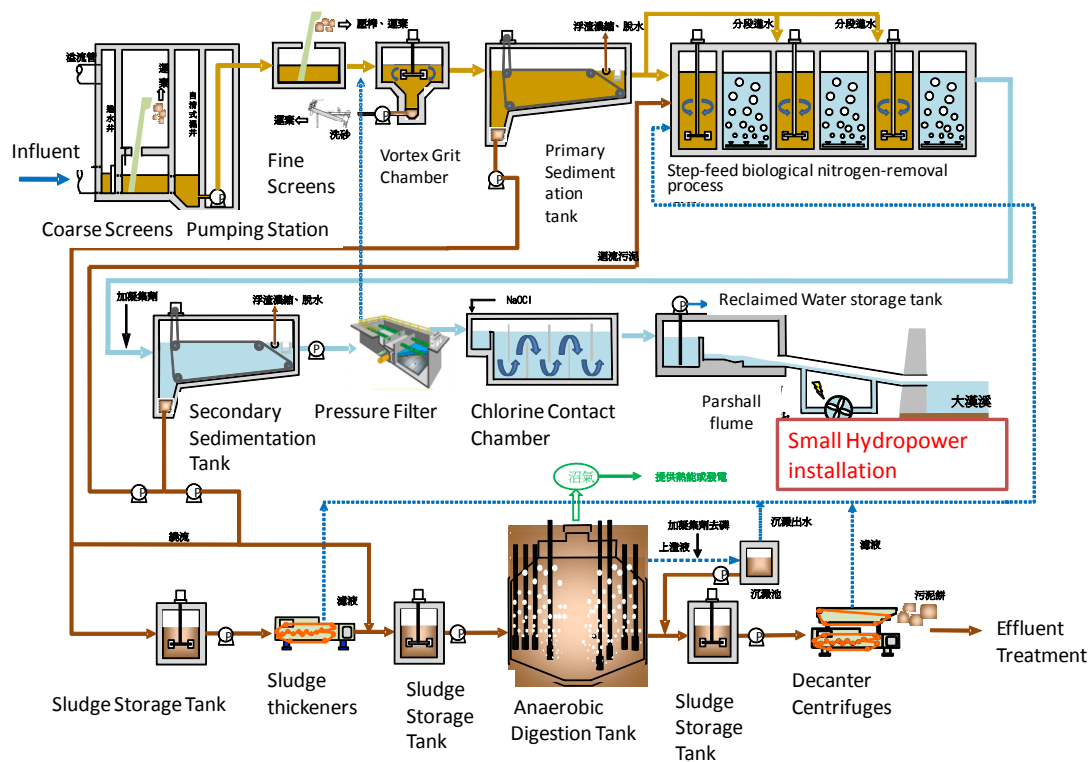
The water Purification Park will also incorporate nearby landscape to integrate PV systems, building a park that offers education on environmental protection and public recreation.



**Figure 12** Deployment Plan for San-Ying Reclaimed Land Renewable Energy Facility Demonstrative Locations

Upon completing the overall project on Sanxia District and Yingge Wastewater Treatment, water carrying residential excrement and urine, kitchen waste and bathroom waste water will be directed to the wastewater treatment via sewage pipelines to reduce waterborne disease, improve residents' physical and mental health, improve living quality, and enhance urban status and image. Additionally, the wastewater will no longer be discharged into Sanxia River and Dahan River to effectively reduce the pollution in Dahan



River related reaches, thereby to further improve the water quality of rivers.



**Figure 13 Flowchart for Wastewater Treatment at San-Ying Water Resource Recycling Center**

(3) Green transport: Biking trail connects to Yingge Train Station and heads for Shuling and Taoyuan

The biking trail is part of Dahan River Biking Trail with approximately 5km in length. It goes between Shulin and Dahan River while pasting by the Riverside Park, San-Ying Spatial Art District, and Yingge Ceramics Museum to arrive Taoyuan County. People can also take their bikes with them on the train to Yingge, followed by taking the Huanhe Road Biking Trail. Figure 14 shows the relevant overview.

	
<p>San-Ying Reclaimed Land Biking Trail</p>	<p>Train station exist incorporated with bicycles for access to friendly measures</p>

**Figure 14 San-Ying Reclaimed Land Biking Trail**

**Current stage of development of the town: Please choose one.**

- ☐ Planning stage
- ☒ Construction stage
- ☐ Already existing

**Start date of the project:** 2013 (PV Panel for Yingge Ceramics Museum)

**Completion date of the project:** 2021 (MRT San-Ying Line )

# Low Carbon Measures

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**Does your low carbon town or development plan have CO2 emission reduction target ? target ?**

☐Yes

☒No

## Key low carbon measures employed or to be employed

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### Urban Functions

☐Compact city design

☒ Heat island phenomenon countermeasures: Ceramic industries recycle thermal waste for use as regional energy supply and reduction of thermal emission.

☐Efficient road arrangement plan

☒ Well-developed public transportation: For existing sites passed through by railway, train station and MRT system will be added.

☐Car sharing

☐Intelligent Transportation Systems (ITS)

☒ Plan for highly efficient infrastructure: San-Ying Water Purification Park will adopt roof greening, LED lighting, wastewater reuse, and PV panel, small hydroelectric power generation, and biogas power generation to generate approximately a capacity of 585kW with cost saving of 25% approximately.

■ Others: Low-carbon restructuring on public buildings such as Yingge District Office, Yingge Ceramics Museum, and Yingge Junior High School Swimming Pools

## **Industry Sector**

■ Factory energy management system: Thermal waste recycling and reuse at Horng Jou Ceramics Co., Ltd. and Long Chang Ceramics Co., Ltd.

☐ Other

## **Transporter Section**

☐ Bus Rapid Transit (BRT)

☐ Light Rail Transit ( LRT )

■ Inter-city community bicycle: Dahan River Bike Trail heads to New Taipei City, Taipei City and Taoyuan County

■ Electric vehicles: Two electric vehicle charging station and shuttle electric bus for tourism factories are available.

■ Electric busses: : Electric buses introduced for operation on San-Ying trial bus routes °

☐ LED street lighting

☐ Other

## **Residential Sector**

☐ Fuel Cells

■ Low or zero emission houses: Subsidy for carbon community restructuring



■ Eco-friendly home appliance: Subsidy from Central Government

☐ PV Panel

☐ Solar heated water supply facilities

☐ Heat-pump hot water supply with natural refrigerant

■ Use of natural light

☐ Low emission glass

☐ Home Energy Management System ( HEMS )

☐ Thermal storage air conditioning system

■ Others: The “Per Bag Trash Collection” fees on waste disposal has decreased garbage output by 50% and substantially increased material recycling and kitchen waste recycling.

## **Commercial Sector**

■ Low or zero emission building

☐ High insulation /highly airtight materials

☐ Sun shading system

☐ High performance façade

☐ Low emission glass

☐ Double skin façade

☐ Roof greening

☐ Highly efficient conditioning facilities

☐ LED/Inverter lighting

■ Use of natural light

☐ Building Energy management System (BEMS )

☐ Thermal storage air conditioning system

☐ Other

### **Other demand side measures:**

- Roof greening: Yingge District Office
- Green Wall: Yingge Ceramics Museum wall surface
- Counseling farms associations with establishment of civic organic land
- Wastewater treatment for constructed wetlands

### **Renewable Energy**

- PV Power Generation: Yingge Ceramics Museum, San-Ying Reclaimed Land, Yingge District Office
- Solar thermal utilization: San-Ying Water Purification Park
- Biomass power generation: San-Ying Water Purification Park
- Wind power generation: San-Ying Reclaimed Land
- ☐ Geo-thermal power generation
- Micro-hydroelectric power generation: San-Ying Water Purification Park
- ☐ Others

### **Untapped energy**

- ☐ Use of sea/river water
- ☐ Use of waste heat such as waste incineration plants
- Use of waste heat such as sewage treatment plants: The biogas power from San-Ying Water Purification Park will be used.
- Use of waste heat from factories
- ☐ Others

### **Other supply side measures:**

**Demand and supply side measures:**

- ☐Advanced metering systems
- ☐Smart grid system
- ☐Electric condenser system
- Area Energy Management System
- ☐Others

Estimated cost savings in implementing low-carbon measures: The estimation is calculated based on low-carbon restructuring for low-carbon regional energy and renewable energy facilities, which does not include green commute construction. The estimated energy saving is 199,000 kWh/Year and the estimated cost saving is NT592,953 per year. The total estimated cost savings for 20 years can reach NT11.85 million. Refer to Table 2

**Table 2 Estimated cost savings in implementing low-carbon measures**

Project	Location	Energy savings (kWh/Year)	Cost savings (kWh/Year)
Green Energy	Yingge Ceramics Museum (PV:70kWp)	63,000	187,299
	District Office (PV:6kWp)	4,975	14,791
	San-Ying Reclaimed Land (PV:40kWp, Wind power 20kW)	50,000	148,650
Regional Energy	Yingge Ceramics Museum	47,250	140,474
	Yingge Junior High School Swimming Pool	34,100	101,379

Note: Average electricity price estimated for lighting at NT2.973/kWh in 2012.

Estimated energy consumption before completion of the project: The estimation is calculated based on low-carbon restructuring for low-carbon regional energy and renewable energy facilities, which does not include green commute construction. The estimated energy consumption before completion of the project is approximately 3.2 million kWh/Year. Refer to Table 3.

**Table 3 Estimated energy consumption before completion of the project**

Location	Energy Consumption (kWh/Year)
Yingge Ceramics Museum	2,000,000
District Office	720,000
San-Ying Reclaimed Land	94,320
Yingge Junior High School Swimming Pool	385,920
Total	3,200,240

Estimated energy consumption after completion of the project: The estimation is calculated based on low-carbon restructuring for low-carbon regional energy and renewable energy facilities, which does not include green commute construction. The estimated energy consumption before completion of the project is approximately 3 million kWh/Year. Refer to Table 4.

**Table 4 Estimated energy consumption after completion of the project**

Location	Energy consumption (kWh/Year)
Yingge Ceramics Museum	1,889,750
District Office	715,025
San-Ying Reclaimed Land	44,320
Yingge Junior High School Swimming Pool	351,820
Total	3,000,915

## Project Management

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What central/local government departments are/will be involved in development of the project? Refer to Table 5

**Table 5 Central/local government departments that are/will be involved in development of the project**

Project	Location	Central Government	Local Government
Green commute	People-Oriented Green Bridge Passage		■
	MRT San-Ying Line	■	
	Fengming Train Station	■	
Green Energy	Yingge Ceramics Museum		■
	District Office		■
	San-Ying Reclaimed Land		■
	San-Ying Water Purification Park	■	
Regional Energy	Yingge Ceramics Museum		■
	Yingge Junior High School Swimming Pool		■

What private company, non-governmental organizations are/will be involved in development of the project? **Refer to table 6.**

**Table 6 Private company, non-government organization that are/will be involved in development of the project.**

Project	Location
Regional Energy	Yingge Ceramics Museum
	Yingge Junior High School Swimming Pool

**How is/will be the development of the town funded?**

The different low carbon planning for Yingge is mainly funded by public budgeting while the regional energy takes seeks for co-funding from government resources, investment by ceramic factories and pay-as-you-use for the public, taking into consideration the costs and ROI.

**Other relevant information, if any: N/A**

**Project status: N/A**



## Additional Project Details

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Image:



LCMT Overview File: PPT file (Refer to attachment)

Project Website: N/A

APEC Publication URL: N/A

Enter the site URL that contains any related APEC publications.

## Contact Information

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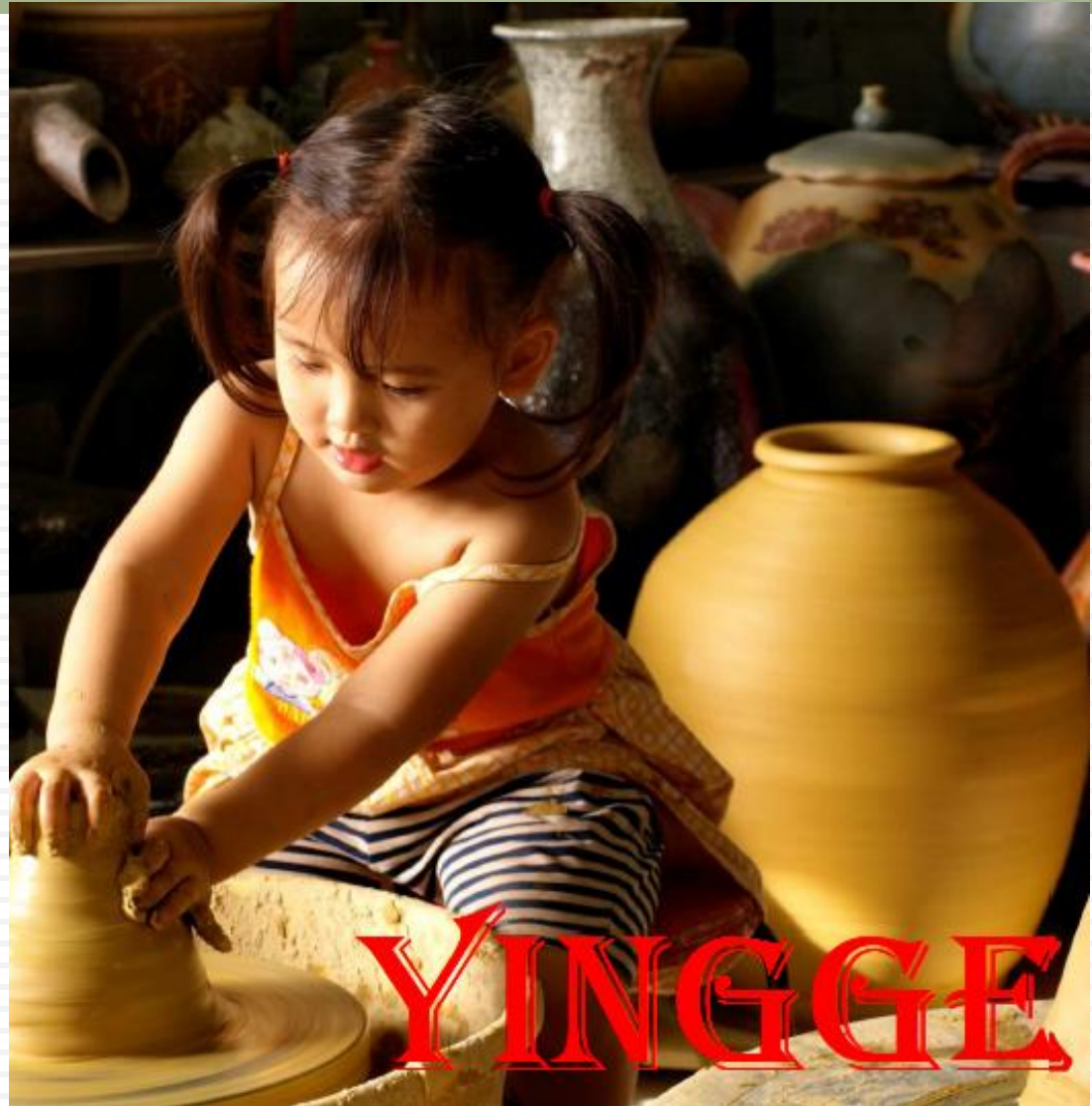
# WATERFRONT CULTURE CITY-LOW CARBON YINGGE





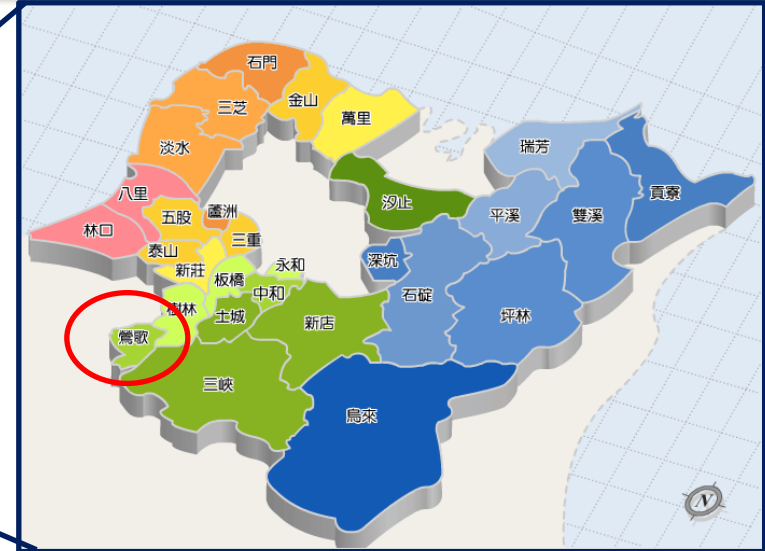
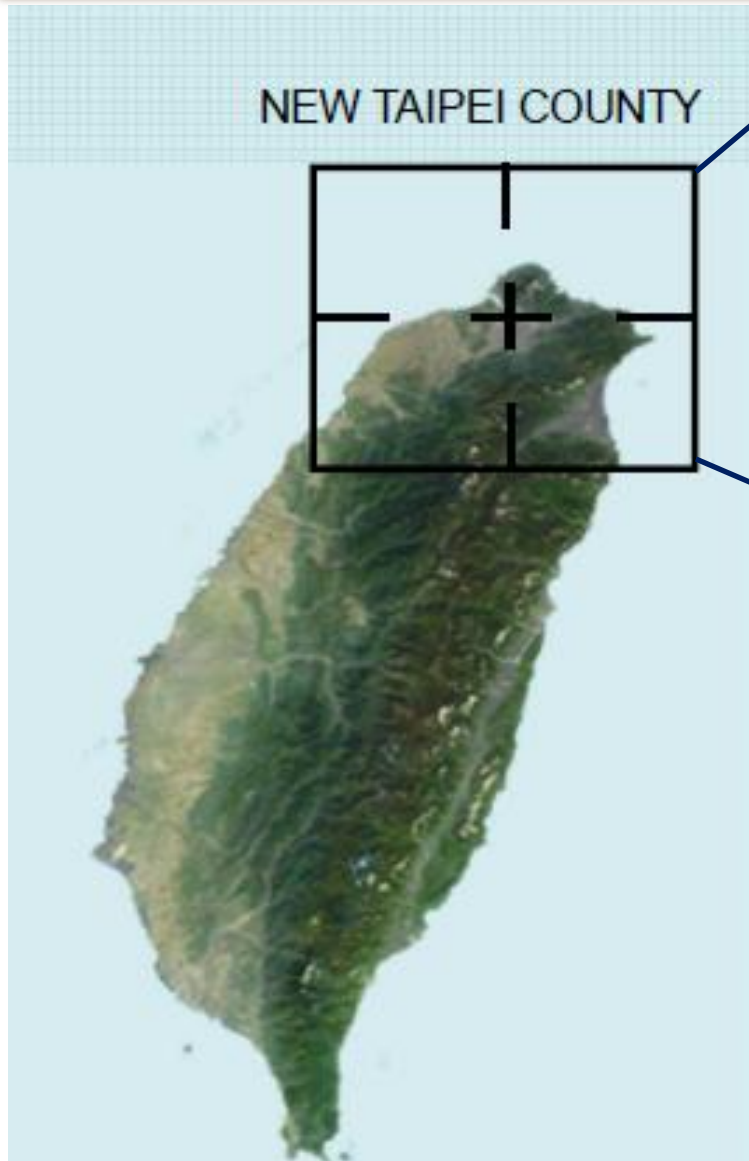
# Presentation Contents

- Background information
- Low carbon development and planning
- Project management and benefits



# Geographical location

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# Industry and Human Activities

4

## Basic information

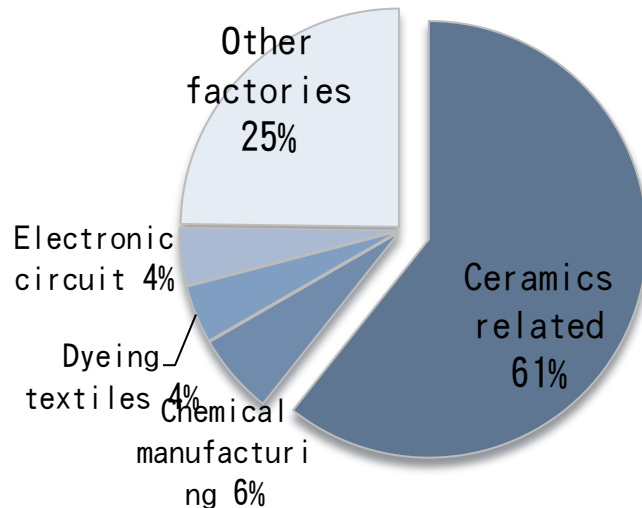
- Population: 88,336 people (2.2% of whole city population)
- Area: 21.1km<sup>2</sup> (1.0% of whole city area)
- Population density: 4,186 people/km<sup>2</sup>
- Energy consumption for residential and commercial sectors: 1,621kW/person/year
- Water connection rate: 97.51 %
- Climatic conditions: warm and humid northeastern subtropical climate

## Sightseeing

- 18 hiking trails
- 23 km long Dahan river bicycle track
- 32 hectares Sanying reclaimed land
- Yingge Ceramics Museum
- Yingge ceramics old street
- Yingee public farms



## Industry type



**Visitors to the Ceramics Museum reaches 1 million 6 thousand people/year**





# Low carbon development and planning of the Waterfront cultural city-Yingge

6



## Green transportation

- Humanistic green pedestrian bridge
- Planning: MRT Sanying line and Taiwan Railway Fengming station



## Green energy

- Yingge Ceramics Museum
- Yingge District Office
- Leasing and installation of photovoltaic systems on publicly owned rooftops



## Regional energy supply

- Yingge Ceramics Museum utilizes waste heat cooling system
- Heated swimming pool of Yingge Junior High School is heated with heat pumps and plant waste heat



## Overall planning of Sanying reclaimed lands

- Renewable energy models in Sanying reclaimed lands
- Sanying water purification park
- Maturation of bicycle track construction



# Green transportation

7

- The construction of the humanistic green pedestrian bridge has been completed



- Ceramics old street landscape bridge

- Crossing the railroad tracks, facilitated the traffic between the Ceramics Museum and the Old Street
- This landscape bridge doubles as bicycle track, to facilitate the passage of travelers and cyclists



- Multifunctional pedestrian bridge before the Yingde Ceramics Museum

- Ramp design provides concatenation with the bicycle track
- Provide a safe crossing environment to pedestrians and cyclists

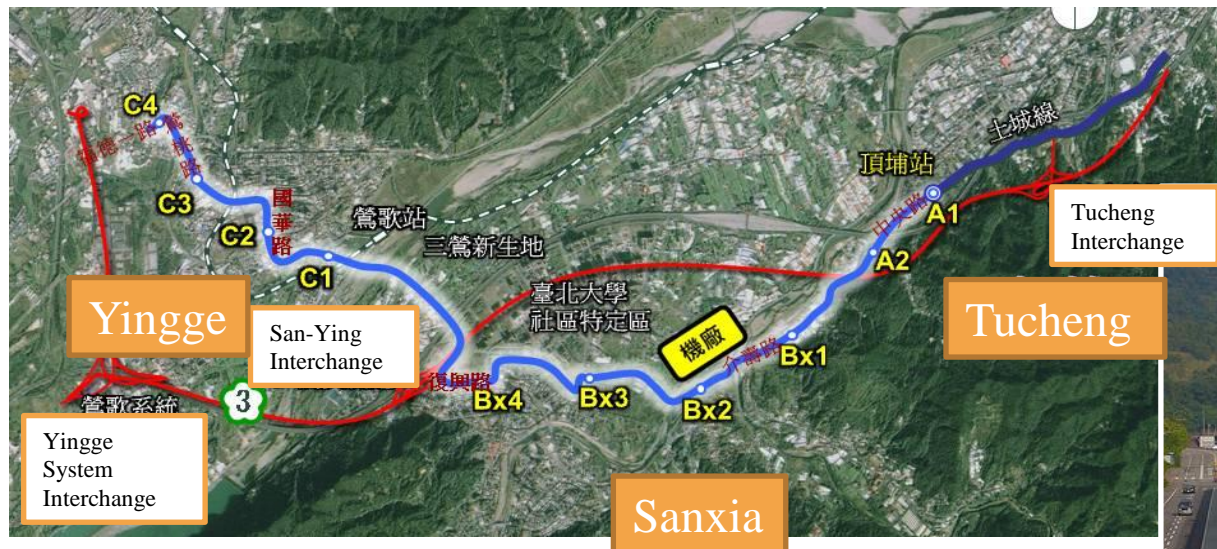
# Green transportation

8

## □ MRT Sanying line is in planning

- Yingge has the advantage of rail transportation traffic
- With the construction of the Sanying line, and the establishment of the pedestrian and bicycle areas
- Is the best demonstration zone of New Taipei City's humanistic transportation environment

- 2014 construction begins
- 2021 completed and opened to traffic
- Sanying line interchanges with Tucheng line, only 45-50 minutes to Taipei Main Station

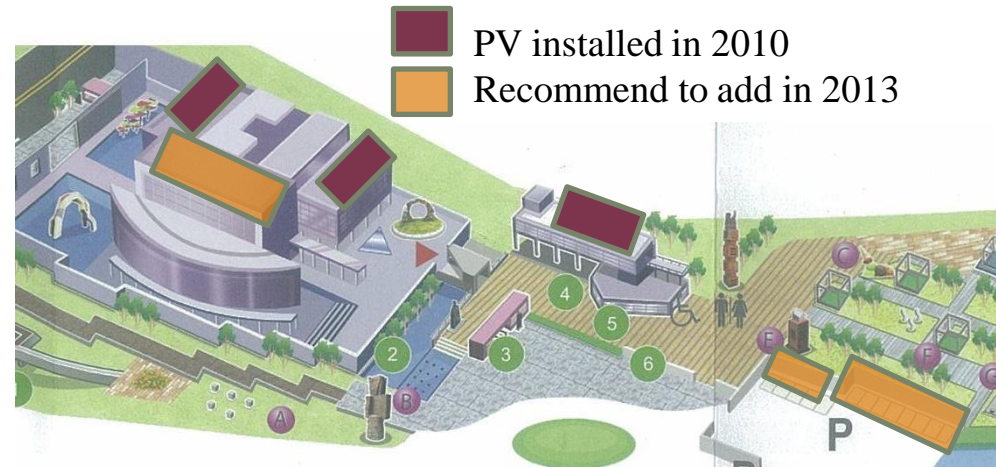




# Green energy: Yingge Ceramics Museum

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- Existing setting capacity at the Ceramics Museum 36.06kWp
  - ▣ Added 28kWp
    - ▣ Parking lot shed combined with electric vehicle charging system
    - ▣ Museum rooftop



Charging station of electric vehicle



Solar power system in Visitors center  
(Crystalline silicon 15.18kWp)



Solar power system on Museum's rooftop  
(Film 20.88kWp)

# Green energy: Yingge District Office and public roof leasing

- Idle roofs of public owned houses are leased to solar photovoltaic system companies to install photovoltaic systems
  - The “Guidelines for bid and leasing of New Taipei City rooftops of public owned houses for installation of photovoltaic systems” was passed in March 2013
- Green energy rooftop demonstration case: Yingge District Office
  - Using solar photovoltaic panels as moving grandstand shading for the green rooftop, it has become a environmental demonstration case for green rooftops

- Bidder with the highest value in bid and leased set capacity (MWp) of an effective tender application, multiplied by percentage of electricity sales feedback (%) is the winner
- Lease period: from the day after tender awarding date, total 119 months

## Evaluation of PV system setting capacities

Fengming elementary school	121 kWp
Fengming junior high school	65 kWp
Yingge junior high school	59 kWp
Chienkuo elementary school	50kWp
Yong Ji elementary school	39kWp
Chang Fu elementary school	34kWp
Yingge elementary school	27kWp
Zhonghu elementary school	24kWp
Er-Qiao elementary school	13kWp
Health center	2kWp





# Regional energy supply: Yingge Ceramics Museum

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- **Supplier: Fuchen Ceramic Company**
- **User: Ceramics Museum**
- Demand from the Yingge Ceramics Museum is mainly ice water for air conditioning, the plan is to recover waste heat from the tunnel kiln to generate refrigeration, for energy re-use planning



# Regional energy supply: Yingge Junior High School swimming pool

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- **Supplier: Long Chan Company**
- **User: Yingge Junior High School swimming pool**
  - The heated swimming pool in Yingge Junior High School uses hot pumps to provide heat, its heating efficiency is three time higher than boilers, also utilizing factory heat through the regional supplying pipe network is also in planning.





# Sanying reclaimed land: plans for renewable energy model sites

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- Estimated generated capacity 50 thousand kWh/year
- Target is to replace 50% of electricity used currently in the Sanying art village



Wind and light complementary street lamps 6 sets

Wind turbine: 300W  
Solar panels: 130W  
LED street lamps: 24W  
Deep cycle batteries 12V 55Ah x4



Parking lot solar system



Art Village 3KW wind turbines 6sets



Long kiln bridge 700W wind turbines 2sets

- Small park parking grid about 60 units
- Connected with 220V municipal power, provide lighting to Art Village

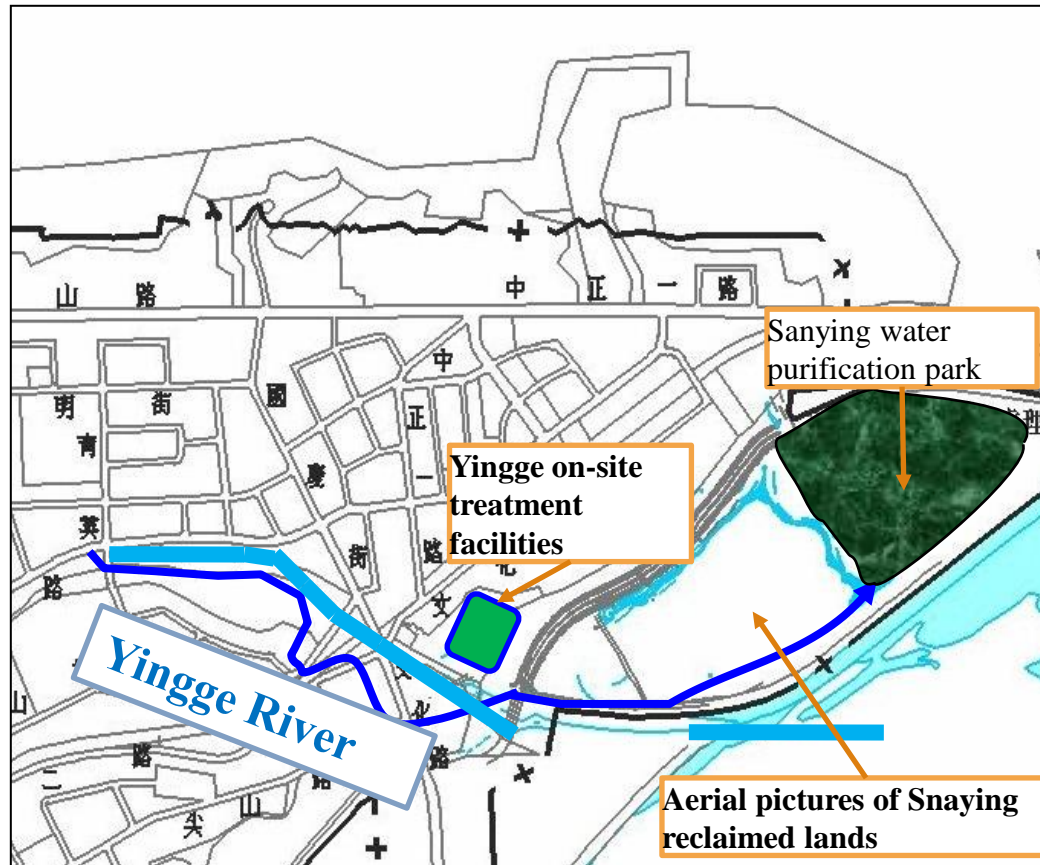
- Connected with 220V municipal power, provide lighting for Art Village and Long kiln bridge
- With estimated wind speed at 5m/s, annual generation capacity 18,570 kWh/year



# Sanying reclaimed land: Sanying water purification park

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- In conjunction with the construction of the Sanying sewage systems for cityscape improvement, to remodel the urban activities and functions of the Yingge riverbank



Yingge on-site treatment facilities



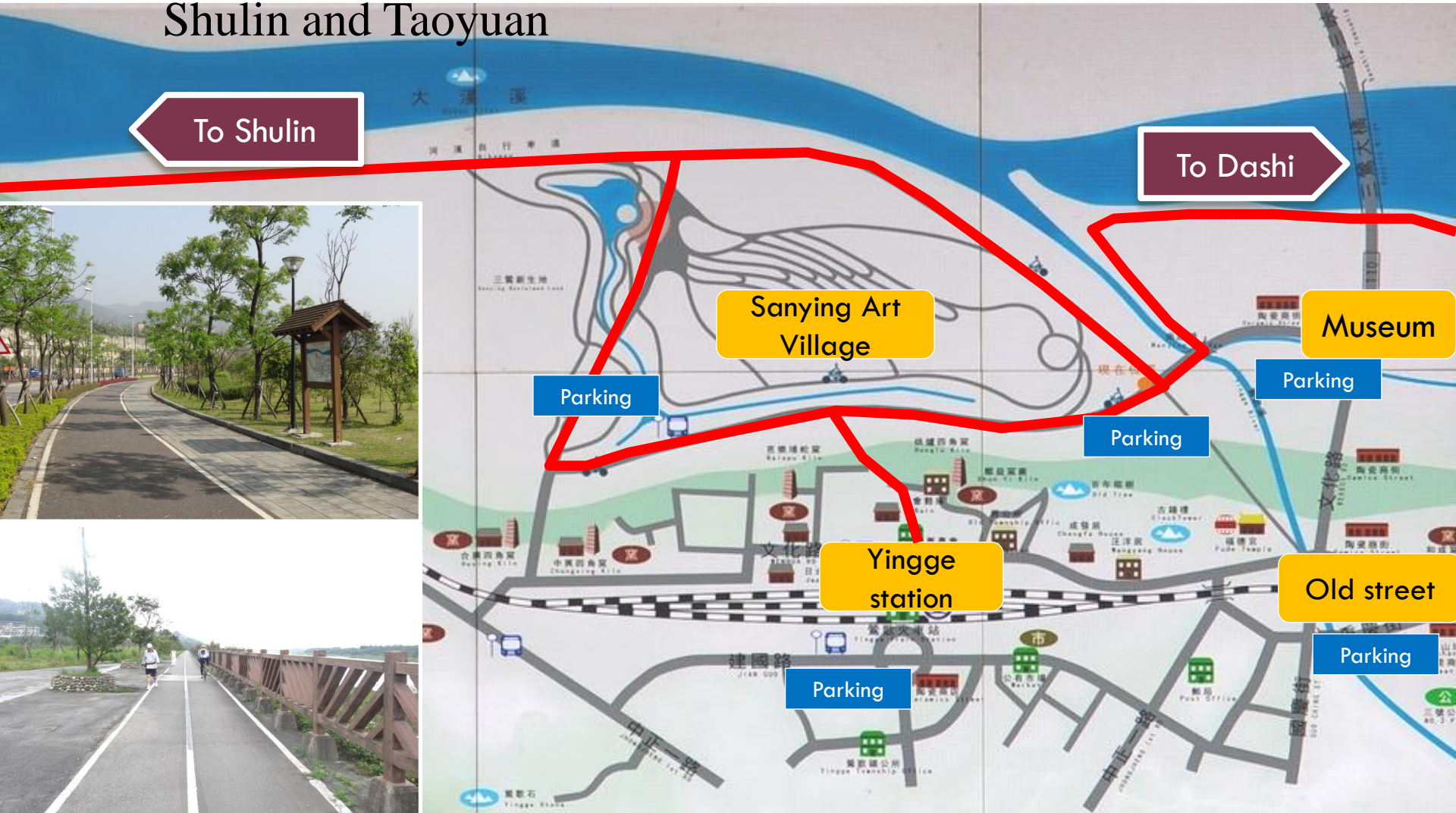
Aerial pictures of Sanying reclaimed lands



# Sanying reclaimed land: maturity of the bicycle track construction

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- Bicycle track and main attractions, Yingge Train Station, to Shulin and Taoyuan



# List of low carbon measures already implemented or to be implemented (1/2)

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Type	Item	Explanation
<b>Urban function</b>	Countermeasures for island heat	Heat recovery from ceramic industry to supply regional energy, decrease heat emissions
	Excellent public transports	Presently has a railway, will add train station and MRT system
	Efficient infrastructures planning	Sanying water purification park is in planning, will set up green rooftops, LED illumination, waste water recycling, and will use photovoltaic systems, small orifice hydropower, biogas power generation for a capacity of 585kW, with a 25% power saving
	Others	Low carbon modifications for Yingge district office, YMC, Yingge Junior High School swimming pool and other public constructions
<b>Industry sector</b>	Factory energy management system	Waste heat recycling from Hong zhou ceramic industry, Long Chan ceramic industry and other plants
<b>Transportation sector</b>	Cycling across urban communities	Dahan river bicycle track connected to New Taipei City, Taipei City and Taoyuan County
	Electric cars	2 Charge stations for electric cars, electric shuttle buses for factory tourism
	Electric Buses	Sanying precursor bus-lines is already using electric buses

# List of low carbon measures already implemented or to be implemented (2/2)

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Type	Item	Explanation
<b>Housing sector</b>	Low or zero carbon emission building	Carbon grants for community improvements
	Green appliances	Subsidies from Central government
	Others	Garbage fee is collected with garbage bag fees, garbage production decreased 50%, recycling and food waste recycling greatly increased
<b>Others</b>	Green rooftops	Yingge District Office
	Green walls	Walls of the Yingge Ceramics Museum
	Set up municipal organic farms	Set up counseling from Farmers association
	Artificial wetland sewage treatment	
	Energy reuse	<ul style="list-style-type: none"> <li>■ Photovoltaic: YCM, Sanying reclaimed lands, District Office</li> <li>■ Solar thermal use: Sanying water purification park</li> <li>■ Biomass power generation: Sanying water purification</li> <li>■ Wind power: Sanying reclaimed lands</li> <li>■ Micro-hydro power: Sanying water purification park</li> </ul>

# Management plan

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## □ Using official budget as investment funds

- For the regional energy part, considering cost and recovery efficiency, the mode of cooperation will be planned using tripartite founding of government resources, investments from ceramic factories and paying populace

Units involved in development		Central Government	Local Government	Private enterprises
<b>Green Transportation</b>	Humanistic green pedestrian bridge		■	
	MRT Sanying line	■		
	Taiwan Railway Fengming station	■		
<b>Green Energy</b>	Yingge Ceramics Museum		■	
	District Office		■	
	Sanying reclaimed lands		■	
	Sanying water purification park	■		
<b>Regional Power</b>	Yingge Ceramics Museum		■	■
	Yingge Junior High School swimming pool		■	■



# Program benefits

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## □ Energy consumption and electricity saving benefits

- Before conversion consumption was 3.2 million kWh/year
- After conversion consumption was about 3 million kWh/year
- Electricity savings is 199 thousand kWh/year, energy bills savings is 592,953 NT dollars/year
- In 20 years total savings will be 11.85 million NT dollars

Item	Location	Saved power (kWh/year)	Saved cost(NTD/year)
Green Energy	YMC(PV:70kWp)	63,000	187,299
	District office (PV:6kWp)	4,975	14,791
	Sanying reclaimed land (PV:40kWp 、 wind turbines20kW)	50,000	148,650
Regional power	YMC	47,250	140,474
	Yingge Junior High Swimming pool	34,100	101,379

Legend: average electricity charge estimated as 2.973 NTD/kWh in 2012.

# Overall planning to create low-carbon lifestyle in Yingge district

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*Towards A*

**LOW CARBON CITY**

