

Renewable Energy Towards Samui Low Carbon Model Town

International Conference on Climate Change
and Coral Reef Conservation

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Presentation Topics

1. Introduction of SAMUI Island
2. Renewable Energy for Low Carbon Strategy for SAMUI Island









SAMUI Information

- Area 227 km²
- Population >50,000
- Immigrant 100,000
- Tourist 1,000,000/year



- 54% mountain and hilly area in the central part and uninhabitable
- 33% plane area
- 8% beaches
- 5% low land

Climate

- Tropical weather
- Averaged temperature 29 °C with
- Highest averaged temperature 37 °C in April and May
- Lowest averaged temperature 21 °C in December and January



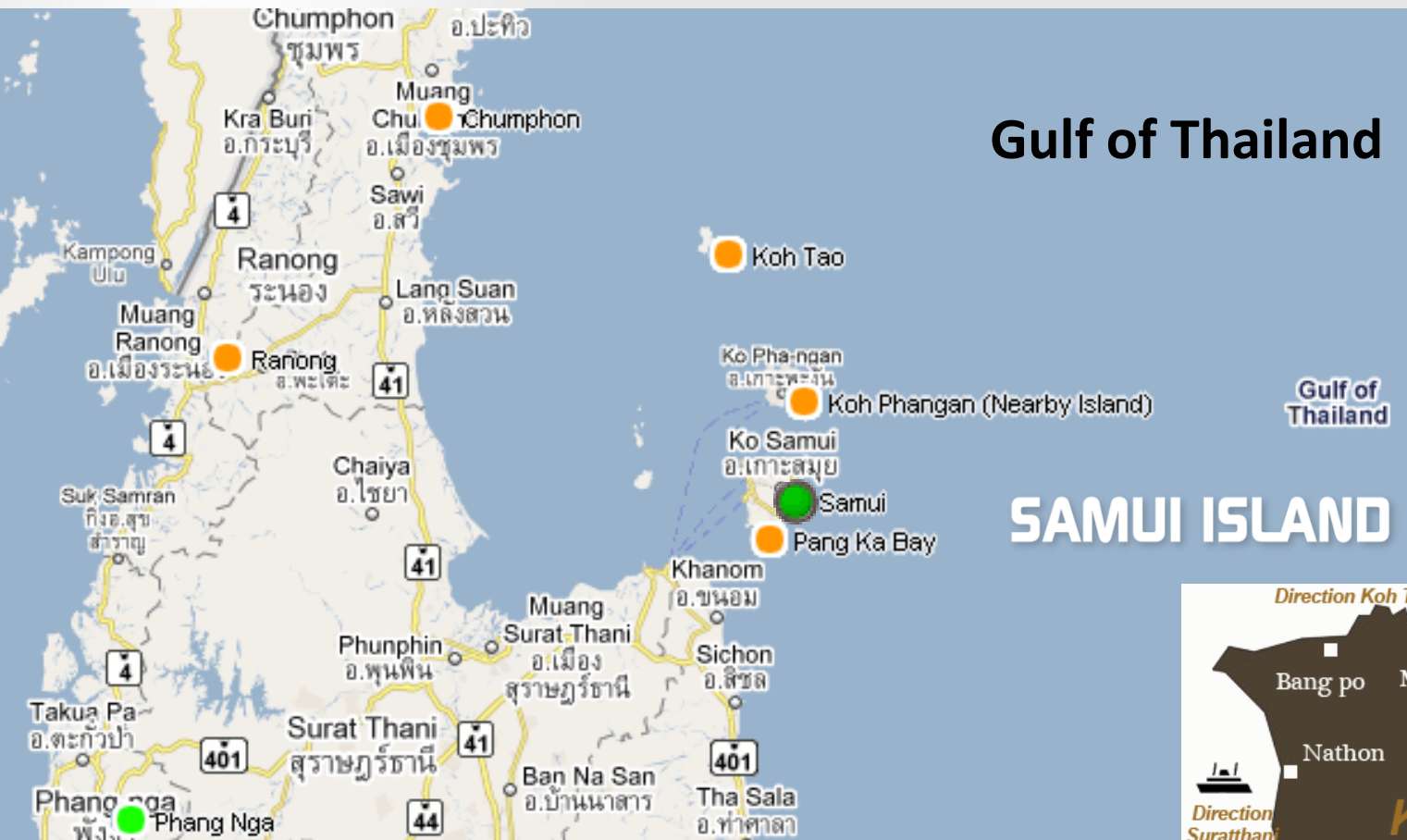
Commercial Buildings

- Hotels and Resorts ~15,000 rooms, Stores, residence

Economics Values

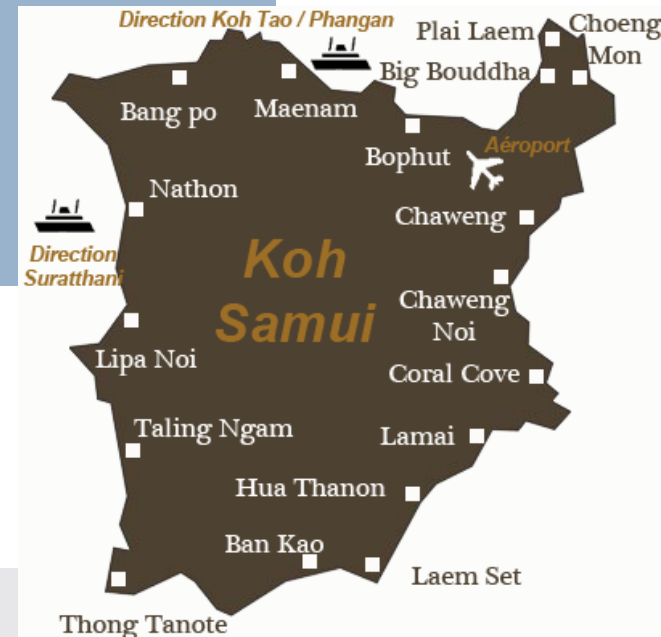
- Rely on tourism industry
- The averaged visitors and tourists' expenditure is 100 USD/person/day

SAMUI Information



Gulf of Thailand

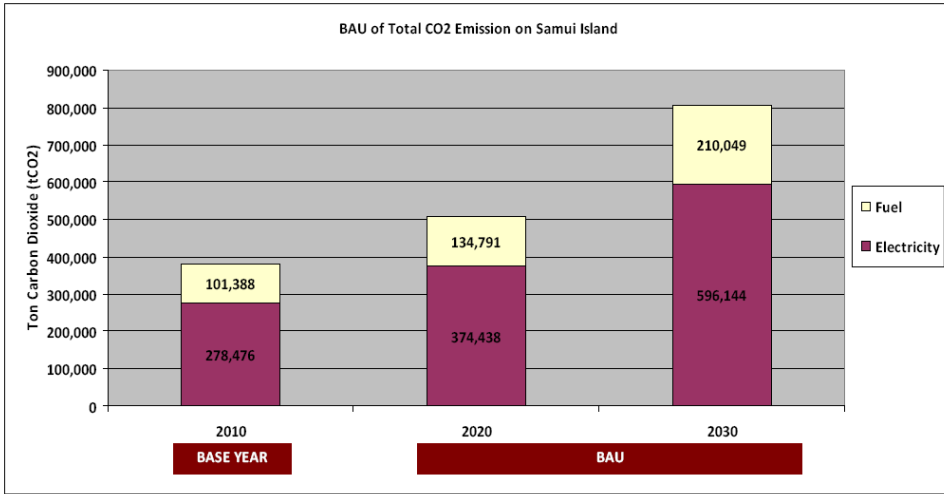
SAMUI ISLAND



Reaching to SAMUI

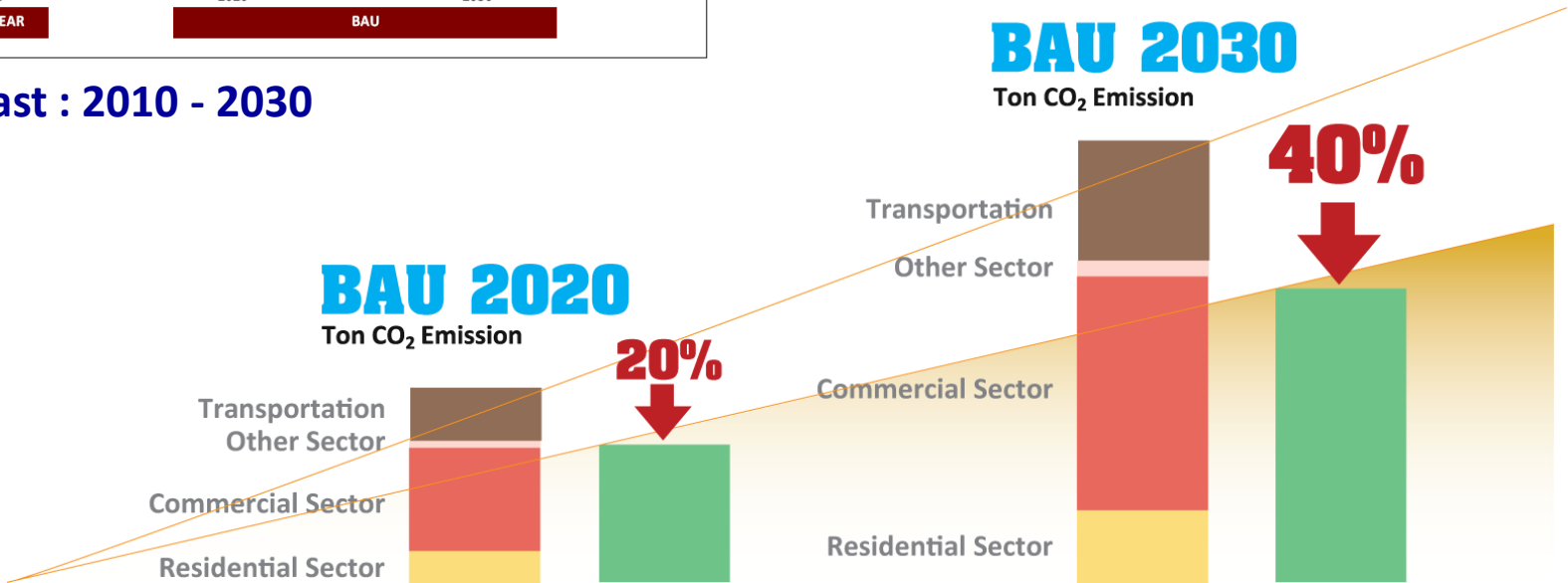
- By buses and connecting to SAMUI via Ferry Ports
- By airplane via SAMUI Airport
- By personal cars and connecting to SAMUI via Ferry Ports

Target Setting



SAMUI low carbon target

BAU - Forecast : 2010 - 2030



Transportation Planning

BRT bus system should be considered for connecting each community ,air port, ferry port and other main place.



Conclusion

- Transportation demand in Samui may be not big for elevated public transportation such as monorail.
- BRT's capacity is feasible and initial cost and management cost is cheaper than monorail.
- Customized bus vehicle design may be symbol of "Low carbon Samui"

Transportation Planning

Low Carbon Vehicles – Future in Y2030

■ EV

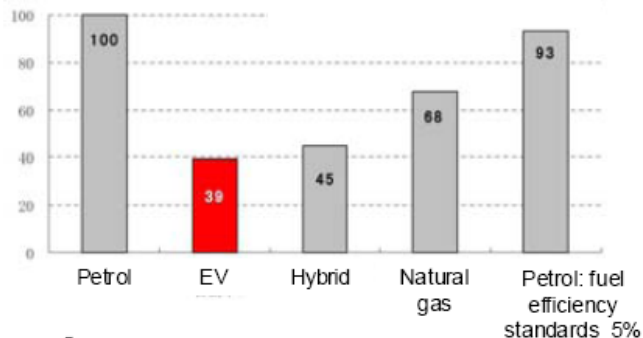


Price	4,599,000 yen
Travel distance per 1 charge	160km
Charging time	14hours ※ 0.5hour (rapidly charge system)

■ EV Bike



Price	240,000yen
Travel distance per 1 charge	43km (30km/h)
Charging time	6hours



Comparison of Fuel Efficiency among Different Types of Vehicles] 1500cc class petrol passenger vehicle = 100)

■ EV Bus

【 Big Bus 】



40persons
(cost:1mil US\$)

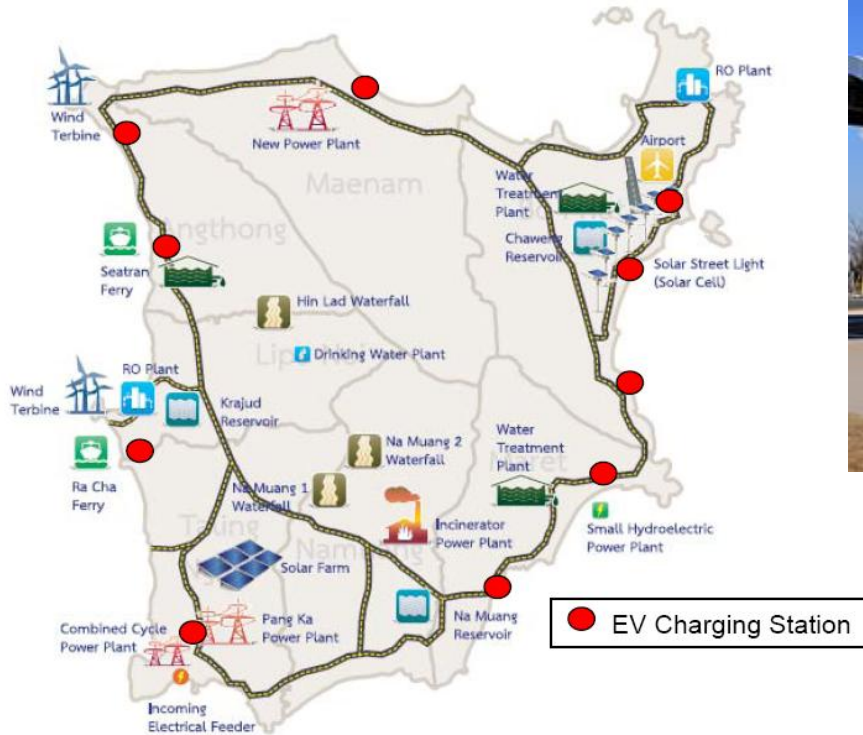
【 Mini Bus 】



29persons
(cost:0.75mil US\$)

Transportation Planning

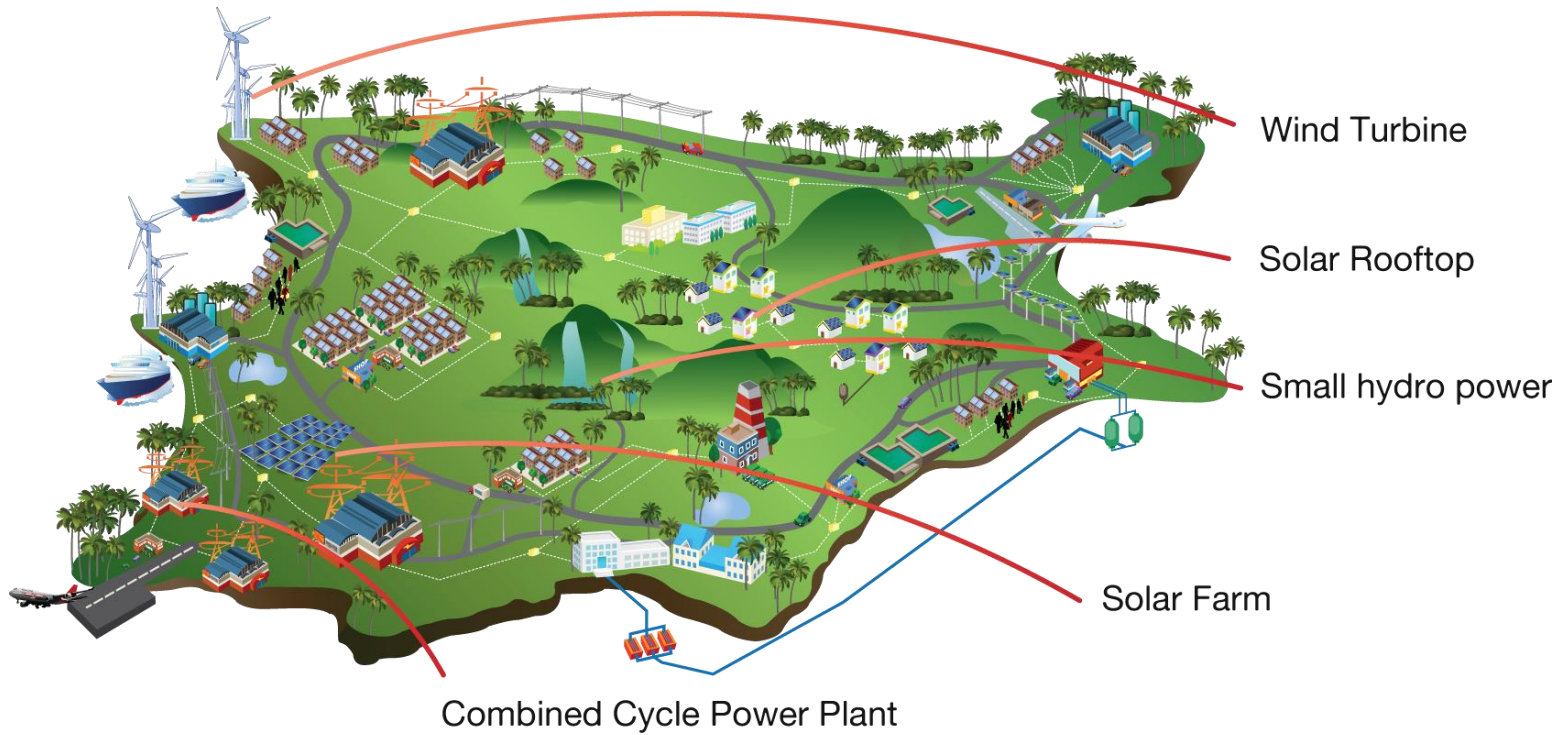
Charging Station



10 Charging Stations

: Three charging outlets, PV Roof and three parking lots

Area Energy Planning



EE Power from Mainland – Submarine Cable – 193 MW

Potential of EE Generating on SAMUI using LC Emission Sources/Technologies ~ 100 MW

↑
50%

SAMUI'S SMART GRID MODEL



Define Number

1. Incinerator power plant
2. Electrical Substation
3. Solar farm
4. Power Transmission Lines
5. Energy Storage for Micro Grid
6. Fuel cells
7. Solar Rooftop
8. Small hydro power
9. Solar Street Light
10. Local control and Communication center
11. Off-Shore wind turbine
12. Micro Grid
13. Electrical Charging Station
14. Compressed hydrogen storage
15. Combined Cycle power plant
16. Second Airport
17. Non-automobile Community Walking Street

Area Energy Management

Area Energy Management



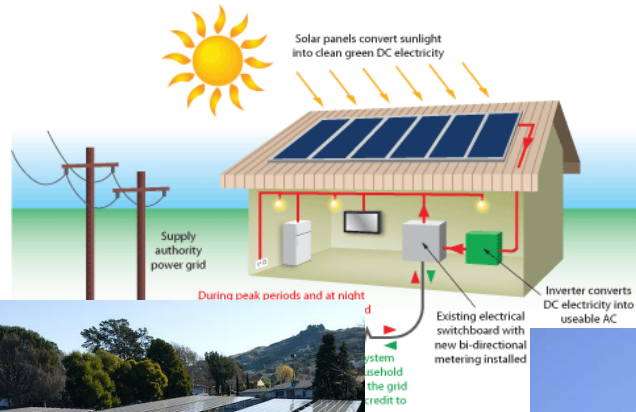
Chaweng : Micro Grid Model

Renewable Energy

Potential



**Solar PV Farm
35 MW**



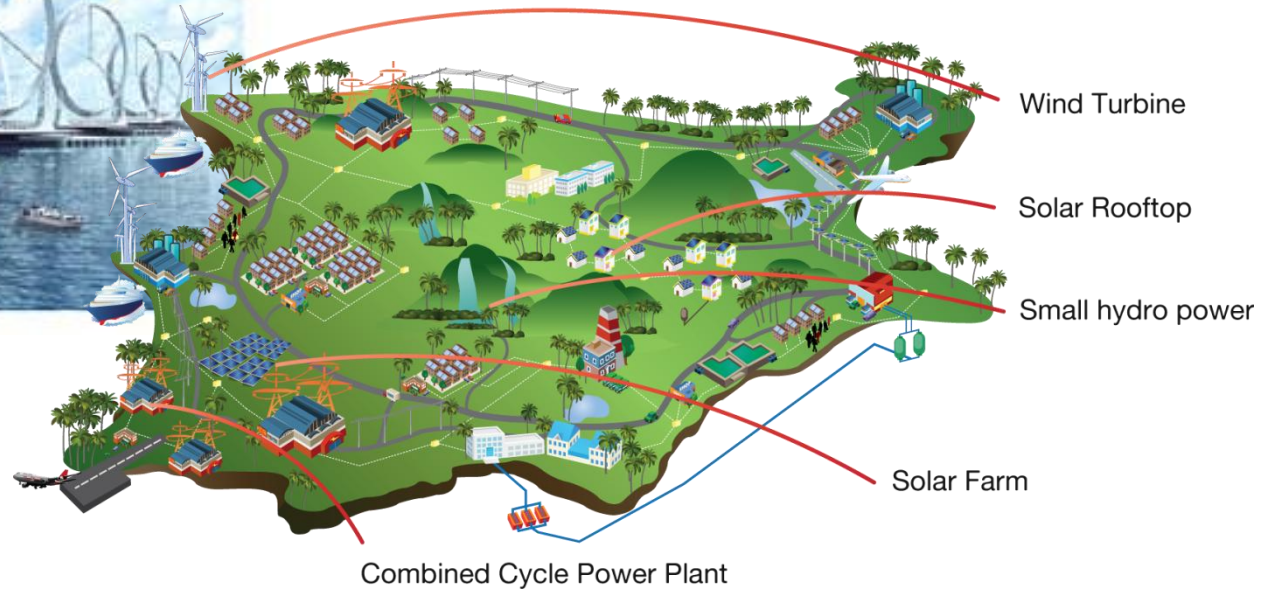
**Solar PV Rooftop
50 MW**



**Solar Street
Lighting (LED)**

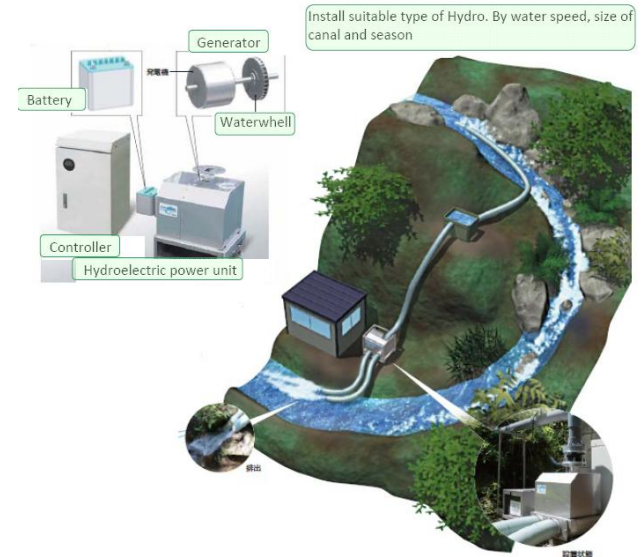
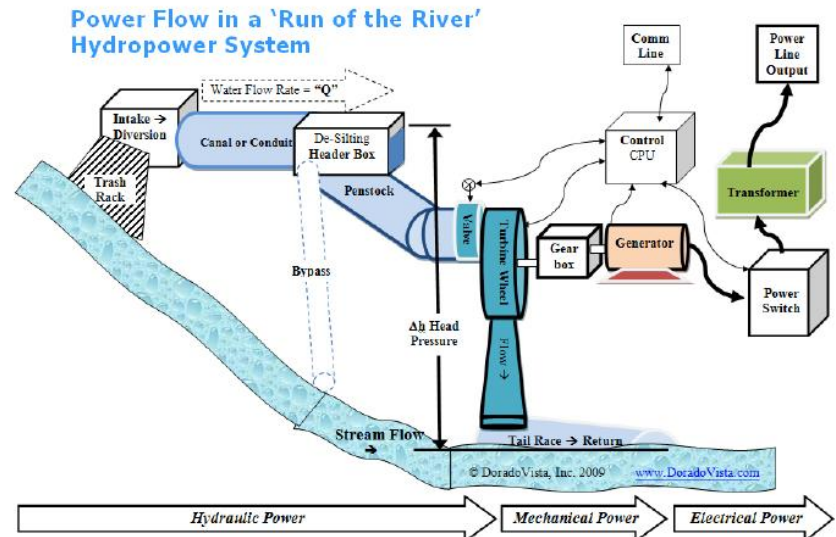
Renewable Energy

Wind Energy



Renewable Energy

Small Hydroelectric Power



Potential of Electricity Generation from Solar, Wind and Hydropower on SAMUI Island

Renewable Energy	Installed Capacity	Energy per day	Estimated Investment (Million USD)	Input	Area required	Note
Solar PV Farm	35 MW	52.5 MWh	112.9 MUSD	Sunlight	280,000 m ² for solar PV panel and 280,000 m ² for space between panel	Operating factor=0.3, and 5 Operating hours per day
Solar PV Rooftop	50 MW	75 MWh	297.2 MUSD	Sunlight	385,000 m ² for Solar PV 38,500 rooftops (10 m ² /site)	Operating factor=0.3, and 5 Operating hours per day
Solar Street Light	0.676 MW	3.38 MWh	6.7 MUSD	Sunlight	78 km	Located on Chaweng Walking Street and along main ring road 4169
Wind Turbine	0.24 MW		1.6 MUSD	Wind	Depend on location	Located along Nathon Beach
Small Hydropower	0.75 MW		2.4 MUSD	Water	Depend on location	
TOTAL	86.45 MW	130.88 MWh	420.8 MUSD			





Thank You for Your Attention