

Review on the LCT Planning of Da Lat City

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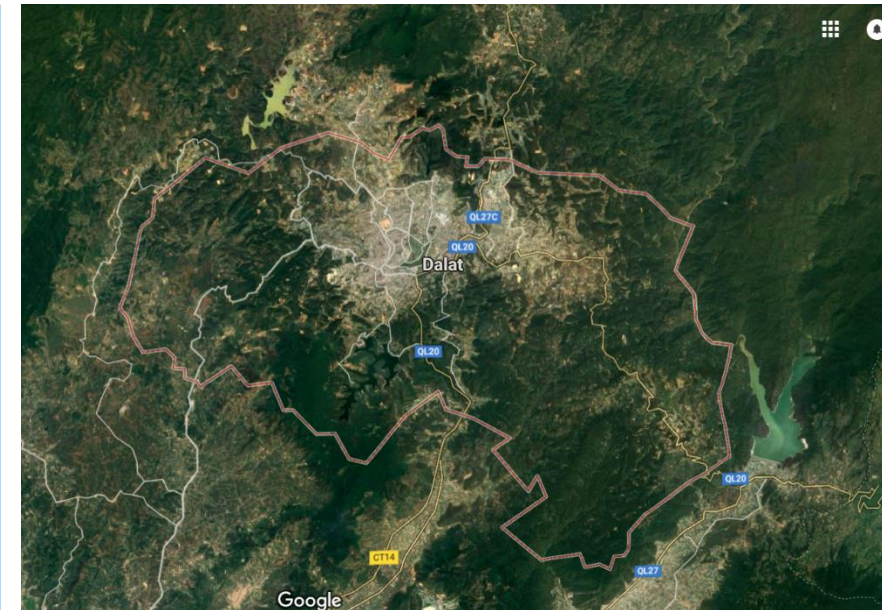
Industrial Technology Research Institute

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Findings on the LCT Planning of Da Lat City

► Characteristics of the town

- ◆ **Da Lat City** is the capital of Lam Dong Province in southern Vietnam's Central Highlands of 1,500m above sea level.
- ◆ **Population:** 226,978 in 2017, **Expected population growth is 1.05%** in 2017.
- ◆ **Size of town:** 394.64 km²
- ◆ **Major function of town:** Development of Tourism services and high tech agriculture.
- ◆ **Climate conditions:** Wet, Windy, Cool/cold



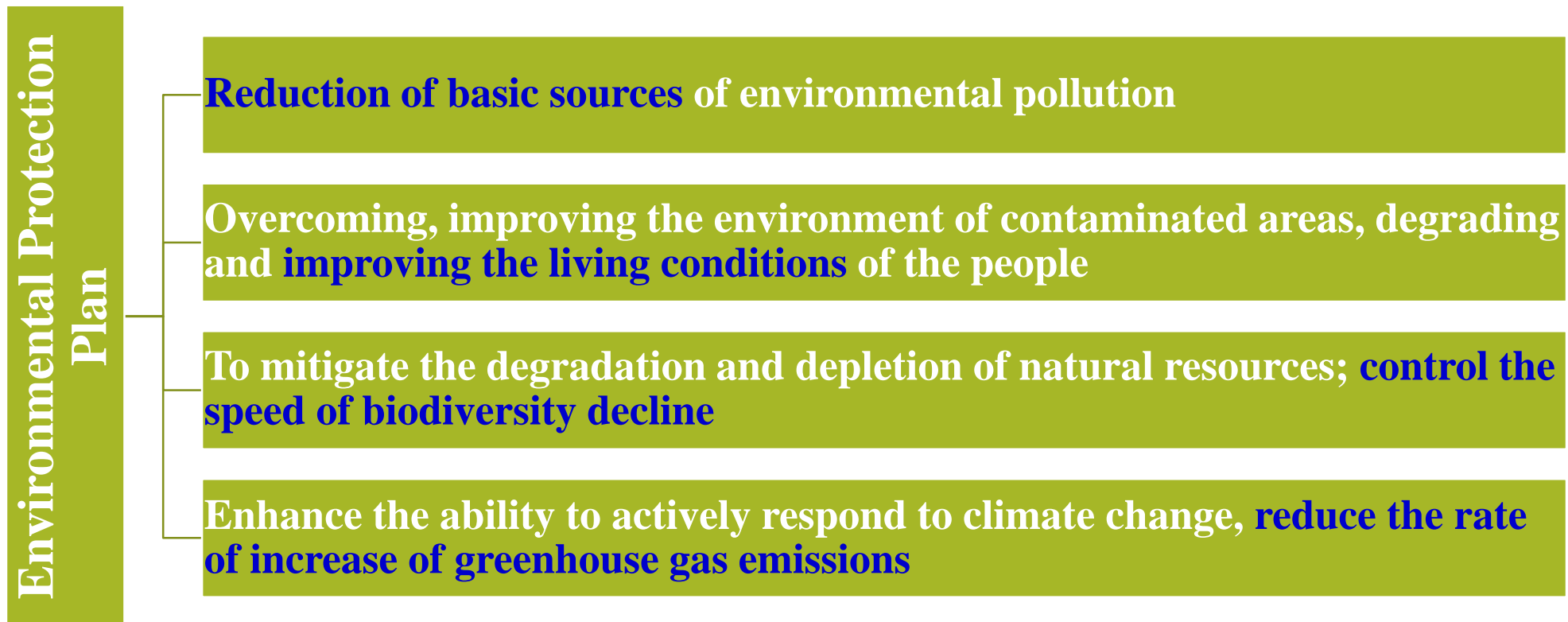
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily mean °C	15.8	16.7	17.8	18.9	19.3	19	18.6	18.5	18.4	18.1	17.3	16.2
Average rainy days	2	2	5	11	18	20	23	22	23	19	10	5
Average relative humidity(%)	82	78	77	84	87	88	90	91	90	89	85	84

Data from: Wikipedia

Findings on the LCT Planning of Da Lat City (Cont'd)

□ Low Carbon Objective

- Da Lat city's target is advancing to “a beautiful green city” in 2020.
- **Environmental Protection Plan for the period of 2016 – 2020** was approved by People's Committee of Da Lat City in 2017. Four targets to achieve in 2020:



Findings on the LCT Planning of Da Lat City (Cont'd)

➤ Reduction of basic sources of environmental pollution

Environmental protection

- Production & business establishments **meet the requirements of environmental protection.**
- Production, service & trade establishments in their respective localities shall **strictly and efficiently apply environmental protection measures** as already committed in their approved environmental dossiers.
- All communes meet **environmental sanitation criteria** under the new rural criteria.
- People in the city are disseminated about environmental protection.

Waste water

- To expand the construction and improvement of the city's concentrated **waste water collection and treatment system** by 2020, **70% of households** in the locality will **connect to the waste water treatment system.**
- Production establishments, industrial spots and tourist resorts have concentrated **waste water treatment systems** that meet Viet Nam's environmental standards.

Solid waste

- **Daily-life and industrial waste** shall be collected and handled by respective regulations.
- **Agricultural solid waste** is collected and treated as regulated.
- **Medical solid waste** shall be collected and treated according to concerned regulations.
- **Solid waste is reused, recycled or recovered, fertilizer production.**

Findings on the LCT Planning of Da Lat City (Cont'd)

- **Overcoming, improving the environment of contaminated areas, degrading and improving the living conditions of the people**
 - The 50% increase of the area of degraded natural ecosystems will be restored and regenerated.
 - To meet the standards on the content of harmful substances in the air in urban centers and population quarters.

- **To mitigate the degradation and depletion of natural resources; control the speed of biodiversity decline**
 - No increase compared to 2016: For indicators on the number of areas where water sources are exhausted due to excessive use of water; Number of precious and valuable gene sources lost; number of species and extent of invasive alien species invasive environment.
 - No number of precious and rare species is extinct.
 - Forest coverage ratio is about 51% - 52%.

Findings on the LCT Planning of Da Lat City (Cont'd)

- Enhance the ability to actively respond to climate change, **reduce** the rate of increase of **greenhouse gas emissions**
 - 100% of the people have knowledge on adaptation and living with climate change.
 - Integrate and implement activities to reduce greenhouse gas emissions with the socio-economic development plan.
 - **Greenhouse gas emissions reduction** in the period 2016-2020 reached **156,220 tons CO₂**.

Total Energy Saving in the period 2016-2020

156,220 tons CO₂ = 62,992 kLOE = 295,871 kWh

- **Total emission reduction** in both energy sector and agriculture/forestry is **70.54%** in 2020 compared to 2010.

Evaluation on the Application of the LCT- I System

Question	Excellent	Good	Average	Below Average	Poor
Information of the LCT-I Volunteer Town				✓	
Understanding of each LCT-I System indicators			✓		
Explanation (evidence) provided for the self-evaluation		✓			
Collection of data necessary for the evaluation			✓		
Calculation of CO ₂ emissions			✓		

Feedback on the Self-Evaluation at Demand Side

Tier 1	Tier 2	Tier 3	Comments
Demand	Town Structure	<ol style="list-style-type: none"> 1. Adjacent Workplace and Residence 2. Land Use 3. TOD (Transit Oriented Development) 	<ul style="list-style-type: none"> • Land use efficiency is estimated at 30% • Public transport is very low, people still use many personal vehicles. • At present, Da Lat City has no specific plan so much attention needs of the higher level • These three indication do not have detail description, but with high score (3★~5★)
	Buildings	<ol style="list-style-type: none"> 1. Energy Saving Construction 2. Green Construction 	<ul style="list-style-type: none"> • No system or criteria in place. • Enforce subsidized and incentive systems to accelerate the implementation, or have binding legal forces. • The score should be adjust again, original with high score. (4★~5★)
	Transportation	<ol style="list-style-type: none"> 1. Promotion of Public Transportation 2. Improvement in Traffic Flow 3. Introduction of Low-Carbon Vehicles 4. Promotion of Efficient Use 	<ul style="list-style-type: none"> • Planning is not available, public transport is very low, people still use many personal vehicles and the situation of personal vehicles is increasing, • The score should be adjust again, original with high score. (3★~4★)

Feedback on the Self-Evaluation at Supply Side

Tier 1	Tier 2	Tier 3	Comments
Supply	Area Energy System	Area Energy	<ul style="list-style-type: none"> The main energy resource is hydroelectric power. Area Energy system should be planed to develop an urban city. Like smart grid system.
	Untapped Energy	Untapped Energy	<ul style="list-style-type: none"> The city has no specific plan, can not use untapped energy
	Renewable Energy	Renewable Energy	<ul style="list-style-type: none"> Currently, the whole city is using hydroelectric power. The city has a project to build a wind power plant in Xuan Truong commune.
	Multi-Energy System	Multi-Energy	<ul style="list-style-type: none"> As the city uses renewable energy such as hydroelectric power, wind power; But there are no plans to build a multi-energy system

Feedback on the Self-Evaluation at DSER

Tier 1	Tier 2	Tier 3	Comments
Demand & Supply	Energy Management	Energy Management of Buildings/Area	<ul style="list-style-type: none"> Smart grid can expand to whole city and connect supply side to demand side for energy management and control.
Environment & Resource	Greenery	Securing Green Space	<ul style="list-style-type: none"> The rate of trees per capita is about 4.4 m²; the forest coverage rate was 49.02%. The Lam Dong Provincial People's Committee has promulgated a biodiversity conservation plan for the whole province.
	Water Management	1. Water Resources 2. Water Reuse	<ul style="list-style-type: none"> Surface water is abundant; groundwater is used for daily activities as well as for agriculture. Residents in some areas use rainwater for their livelihood activities.
	Waste Management	Waste Products	<ul style="list-style-type: none"> Da Lat is conducting propaganda activities to limit waste emissions. Classify products from the beginning to reuse organic products to make fertilizer for the crop Reused or recycled for products such as metals, plastics, ...
	Pollution	1. Air 2. Water Quality 3. Soil	<ul style="list-style-type: none"> Water quality is quite good. there is no specific plan to enforce people control the pollution. Renewable energy vehicles, high-tech agriculture, non-smog industry activities will be good methods to reduce environmental pollution.

Feedback on the Self-Evaluation at Governance

Tier 1	Tier 2	Tier 3	Comments
Governance	Policy Framework	<ol style="list-style-type: none"> 1. Efforts toward a Low-carbon Town 2. Efforts toward Sustainability 	<ul style="list-style-type: none"> • Environmental protection plan for the period of 2016 – 2020 was approved by People's Committee of Da Lat city in 2017
	Education & Management	Life Cycle Management	<ul style="list-style-type: none"> • Promote Enlightenment and Education for Energy-savings and a Low-carbon Town activities and prepare environment protection film to school for education.

Output on the Self-Evaluation

Original Self-Evaluation

Demand Side	★	★★	★★★	★★★★	★★★★★
1. Town Structure	★★★★★				
2. Buildings	★★★★				
3. Transpotation	★★★				
Total(average)	★★★★				
Supply Side	★	★★	★★★	★★★★	★★★★★
4. Area Energy System	★★				
5. Untapped Energy	★				
6. Renewable Energy	★★★★★				
7. Multi Energy System	★★				
Total(average)	★★★				
Demand & Supply Side	★	★★	★★★	★★★★	★★★★★
8. Energy Management	★★				
Total(average)	★★				
Environment & Resources	★	★★	★★★	★★★★	★★★★★
9. Greenery	★★★★				
10. Water Management	★★				
11. Waste Management	★★★				
12. Pollution	★★				
Total(average)	★★★				
Governance	★	★★	★★★	★★★★	★★★★★
13. Policy Frame Work	★★★★				
14. Education &	★★				
Total(average)	★★★				



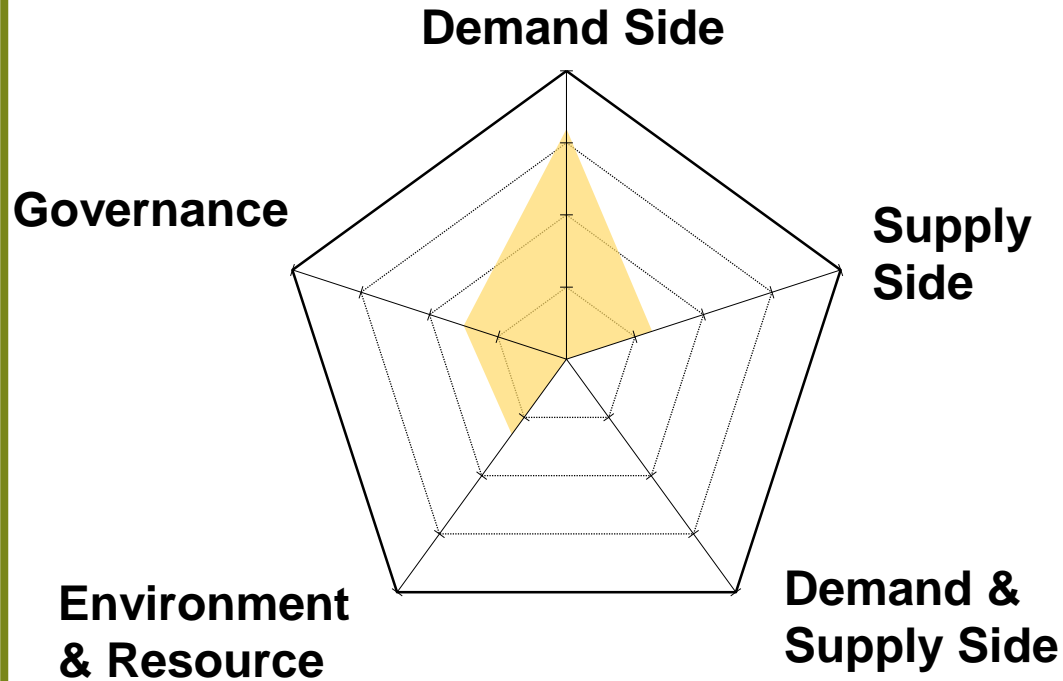
Re-modify Self-Evaluation

Demand Side	★	★★	★★★	★★★★	★★★★★
1. Town Structure	★★★★				
2. Buildings	★★				
3. Transpotation	★★★				
Total(average)	★★★				
Supply Side	★	★★	★★★	★★★★	★★★★★
4. Area Energy System	★★				
5. Untapped Energy	★★				
6. Renewable Energy	★★★★★				
7. Multi Energy System	★★				
Total(average)	★★★				
Demand & Supply Side	★	★★	★★★	★★★★	★★★★★
8. Energy Management	★★				
Total(average)	★★				
Environment & Resources	★	★★	★★★	★★★★	★★★★★
9. Greenery	★★★★				
10. Water Management	★★				
11. Waste Management	★★★				
12. Pollution	★★				
Total(average)	★★★				
Governance	★	★★	★★★	★★★★	★★★★★
13. Policy Frame Work	★★★★				
14. Education &	★★				
Total(average)	★★★				



Output on the Self-Evaluation

Original Self-Evaluation



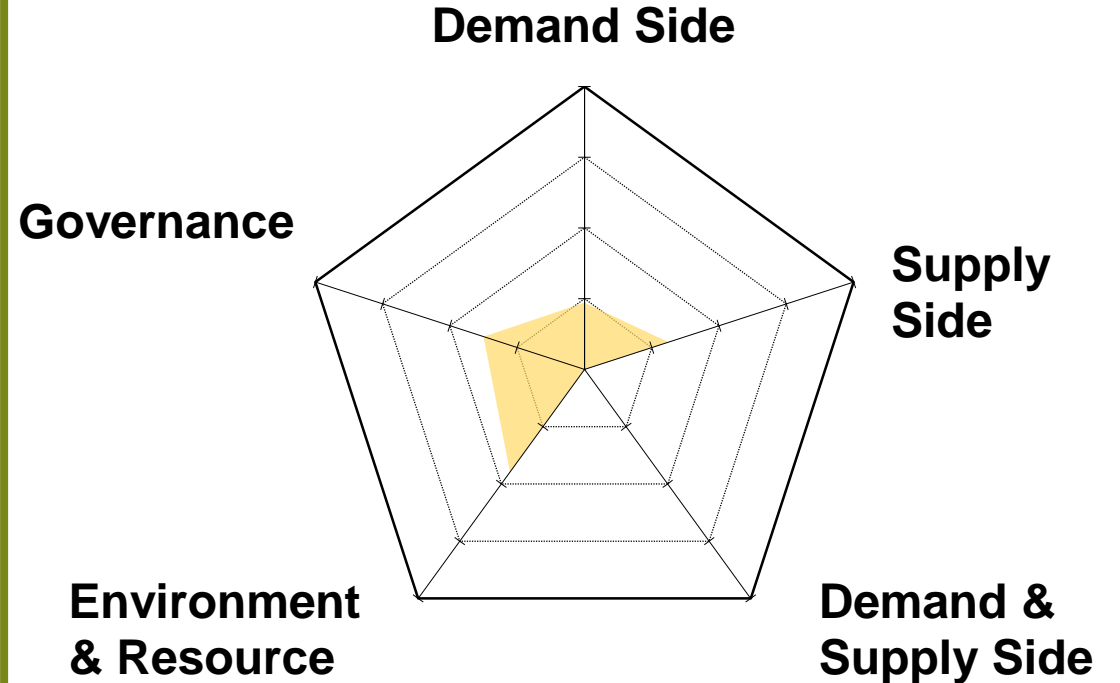
Overall Assessment

Overall Rank



Total Point
average of (1) to (14) **2.6**

Re-modify Self-Evaluation



Overall Assessment

Overall Rank



Total Point
average of (1) to (14) **2.3**

For the Improvement

	Tier 1	Tier 2 (No. of Tier 3 indicators)
Directly Related	Demand	1. Town Structure (3) 2. Buildings (4) 3. Transportation (6)
	Supply	4. Area Energy System (1) 5. Untapped Energy (1) 6. Renewable Energy (1) 7. Multi Energy System (1)
	Demand & Supply	8. Energy Management System (3)
Indirectly Related	Environment & Resources	9. Greenery (2) 10. Water Management (3) 11. Waste Management (2) 12. Pollution (3)
	Governance	13. Policy Framework (4) 14. Education & Management (2)

- **Building:** Establish Green building rating system and MEPS to reduce energy consumption by Lam Dong Province
- **Transportation:** Develop the Transportation Demand Management, Intelligent Transportation system or TOD is good for Capital to reduce Carbon emission.

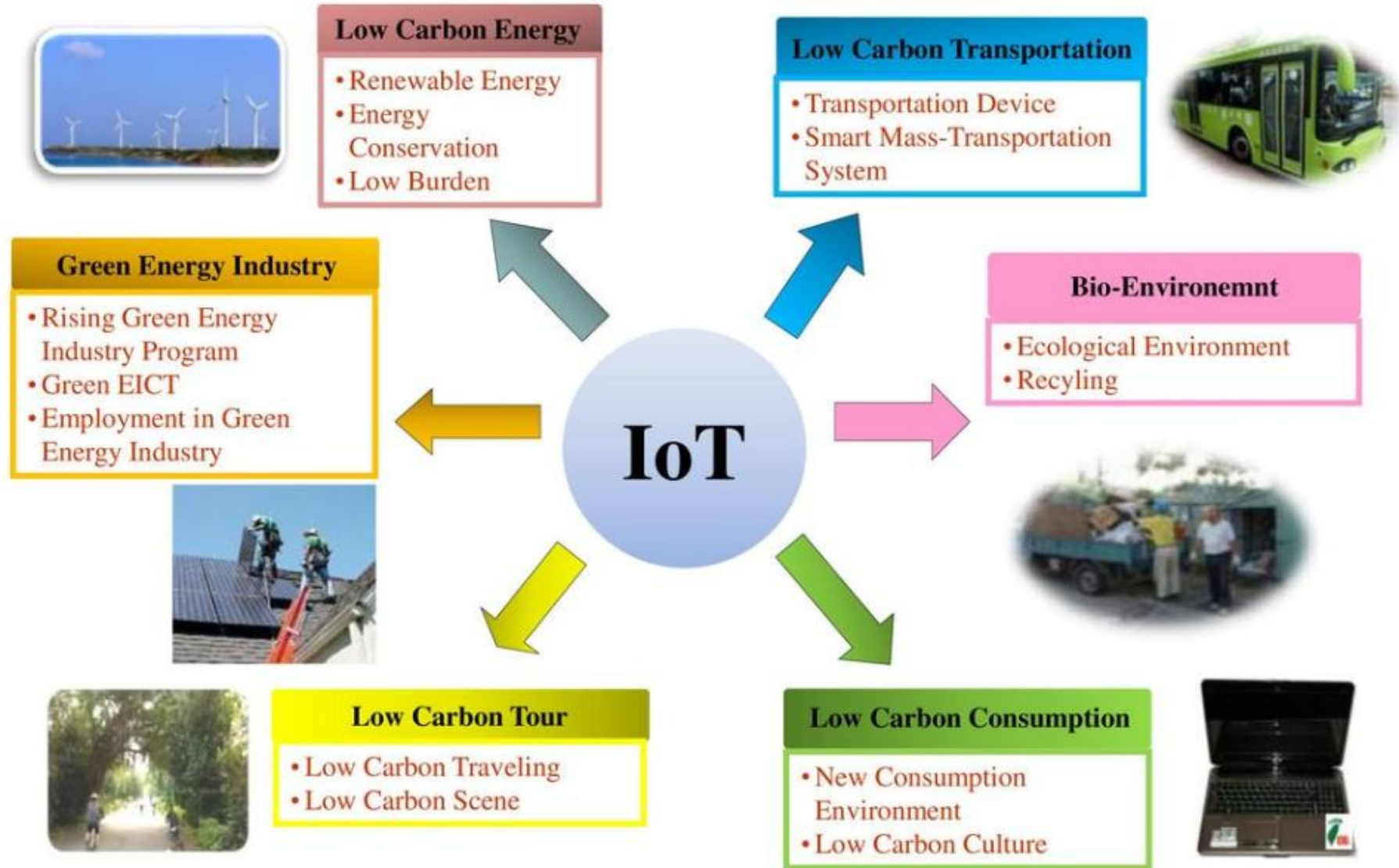
- **Multi Energy System:** implement district heating and cooling system, cogeneration system, energy storage system...

- **EMS:** AEMs/BEMs/HEMs would be implemented to monitor the energy consumption in Areas/buildings.

- **Water Management:** Wastewater treatment can be expanded to a watering plants or recycled for flushing toilets in developed world.

- **Policy Framework:** make performance measure standard and execute the performance verification regularly are good methods to maintain the low carbon city

Ideas for the LCT Development



Ideas for the LCT Development ITRI Green Campus



Ideas for the LCT Development

Peng-Hu Low Carbon Island

- A comprehensive demo project, **Peng-Hu Low Carbon Island**.
- Over **55%** of total energy supply are generated by renewable energy; GHG's emission reduces per capita by **62%**.
- Reduce CO2 emission from **5.4 tons/cap-yr** (2008) to **2.1 tons/cap-yr** (2015)



Thank you
謝謝指教
ありがとうございます
Cảm ơn bạn

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