



**The 7th Meeting of Low Carbon Model Town Task Force (LCMT TF)
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Policy Review Report on Low-Carbon Development Plan in Da Nang (LCMT-TF7-02.2)

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Asia-Pacific
Economic Cooperation



Outline

- **Review Team Members**
- **Policy Review Activities in Da Nang, Viet Nam**
- **Major Findings**
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Review Team Members

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- *Dr Yeong-Chuan Lin*, Senior Researcher, APERC.
- *Ms Naomi Wynn*, Researcher, APERC.



Review Activities in Da Nang, Viet Nam

Date 1 (December 4th, 2013)

- Background information, Index and target for the moving of Danang Low Carbon by Mr.Nguyen Dinh Phuc, Vice Director of Department of Industrial& Trade (DOIT)
- Explanation of Feasibility Study by Newjec
- Result of environmental project implement in Danang city by Dr.Dang Quang Vinh, Director of Environmental Protection Agency
- Danang city construction plan by Department of Construction
- Solid Waste treatment question by Ms.Dang Thi Nu, Head of URENCO (Danang Urban Environmental Corporation)



Review Activities in Da Nang, Viet Nam

Date 2 (December 5th, 2013)

- Energy planning in Danang
by Mr.Do Ha Anh Vu, Expert of Department of Industrial& Trade (DOIT)
- Danang city on Climate Change program
by Dr.Dinh Quang Cuong, Vice Head of Steering Committe on Climate change
- Applied Technology on Pollution control for Low Carbon
by Dr.Tran Van Quang, Head of Environmental Faculty, Danang National University
- Working Lunch and Discussion among Experts
- Tentative comments from Experts



Review Activities in Da Nang, Viet Nam

Date 3 (December 6th, 2013)

- Preparation on Draft Recommendation by Experts
- Presentation on Draft Recommendations by Experts
- Site visit:
 - ✓ Danang industrial Zone
 - ✓ Ngu Hanh Son District where Low Carbon Model is suggested



Major Findings

1. INSTITUTIONAL CONTEXT

- **Institutional Framework**

- Da Nang's low carbon relevant departments and agencies are: the Department of Foreign Affairs, the Department of Industry and Trade, the Department of Natural Resources and Environment, the Department of Construction, the Department of Transport, the Department of Planning and Investment, the Department of Agriculture and Rural Development

- **Legal Framework**

- Da Nang has three city-wide plans that complement the national policies and programs.
 - 'Da Nang's Master Plan for Socio-economic Development up to 2020'
 - 'Plan for 2000-2020 in Da Nang'
 - 'An Environmental City'
- In addition, there are two district-wide plans for Ngu Hanh San District ("NHSD").
 - 'Socio-Economic Plan with a vision for 2020'
 - 'Urban Development Plan with a vision for 2030'.



Major Findings

1. INSTITUTIONAL CONTEXT (Cont'd)

- **Organisational structure**

- 'Implementation board'

- To provide information and feedback to NEWJEC for the Feasibility Study and selected emissions reduction measures from the Feasibility Study for implementation in Da Nang.

- 'The Standing Office of Da Nang Steering Committee for Response to Climate Change and Sea Level Rise'

- An interdisciplinary body that researches, proposes, guides, coordinates, collaborates and supervises climate change response programs and projects at the local, national and international level

- 'The Da Nang Climate Change Coordination Office (CCCO of Da Nang)'

- To support the Steering Committee for Climate Change Response and Sea Level Rise
- To implement the 'Plan for Responding to Climate Change and Sea Level Rise in Da Nang by 2020'
- To coordinates the Plan's climate change projects in Da Nang funded by the Rockefeller Foundation



Major Findings

2. SUSTAINABLE DEVELOPMENT PLAN

- 'Master Plan for Socio-Economic Development up to 2020'.
 - To aim to develop Da Nang's society and economy in a rapid and sustainable way
 - By shifting the economic structure towards service-industry-agriculture
 - By utilising the city's potential and advantages

- 'Building Da Nang City as an Environmental City'
 - A three stage plan to 2020
 - To focus on land, water and air quality
 - To providing a safe and healthy environment for the people of Da Nang
 - To aim to make the people of Da Nang aware of environmental protection and Da Nang's development as an environmental city
 - To set quantitatively determined CO2 reduction targets into concrete measures and policies for Da Nang City



Major Findings

3. TOWN STRUCTURE

- To date, Da Nang's spatial structure remains compact and dense due to its urban infrastructure.
- Da Nang will need steady economic growth but at the same time further environmental protection. To achieve this, compact city policies could play an important role for Da Nang.
- The Ngu Hanh Son District is a new development area and there are a lot of opportunities for it to become a LCMT. It is more appropriate for the city to develop the district as a place for local communities, as well as for tourists. Much more attention should be paid to neighbourhood-scale development for locals.
- APEC's LCMT project is a timely opportunity to review the current town structure in Da Nang as a whole, and the Ngu Hanh Son District in particular.



Major Findings

4. LOW CARBON BUILDINGS

- As Da Nang rapidly develops as a city, constructing infrastructure, especially buildings will provide an excellent opportunity to help the city transition to a more low-carbon built environment.
- While there are technical regulations in Da Nang City encouraging energy efficient buildings, compliance with the regulations is not a requirement for obtaining construction permits.
- The Feasibility Study surveyed 20 building in Da Nang and assessed the energy efficiency of these buildings in Da Nang under the Comprehensive Assessment System for Built Environment Efficiency (CASBEE) system. All of the surveyed buildings were ranked between good and slightly poor.



Major Findings

5. TRANSPORTATION

- World Bank's Da Nang Sustainable City Development Project
 - The second phase: to develop a bus rapid transport system
 - The third phase: to improve the connectivity of the urban arterial system, including constructing two new east-west connecting roads to the north-south bypass of Da Nang and the national expressway network.
- Traffic density is currently relatively low in NHSD and dominated by motor bikes.
- For children, older people and cyclists in particular, mobility in NHSD and other parts of Da Nang is hazardous.
- Traffic lights at some junctions only function during peak hours.
- Demand for 'E-motorbikes' could grow, but careful analysis is needed.
 - ←If the existing high-carbon grid electricity will be used for recharging the E-motorbikes, then the total GHG emission reductions will be far less than predicted in other reports.



Major Findings

6. AREA ENERGY MANAGEMENT SYSTEM

- Da Nang experiences power shortages during the dry season in April and June.
 - ⇒ The Da Nang People's Committee provides guidance to consumers on saving energy during high demand times by providing manuals, brochures and leaflets on energy efficiency.
 - ⇒ The People's Committee adjusts the public lighting system and cooperates with large energy users to either manage their internal energy consumption or to provide energy from their private power plants.
- Da Nang also plans to improve its energy security by installing a mini SCADA (supervisory control and data acquisition) system by 2017 and replacing public lighting with LED.
- The Energy Development Plan for 2011-2015 was developed and approved.
- To include plans for a hydroelectricity plant and plans to install solar PV for use by the international airport.



Major Findings

7. UNTAPPED ENERGY RESOURCES

- Da Nang has high potential to produce energy from waste water and waste solids.
=Kitchen and food waste accounts for the largest percentage of waste.
- Four out of the six industrial parks in Da Nang have their own waste water treatment plants.
- 22 out of 27 hospitals have their own waste water treatment plants.
⇒Work to improve infrastructure is needed to complete connection pipes.
- The Feasibility Study proposed two high potential sources of untapped energy:
 - Electrical power generation from biogas (digestive gas);
 - Electrical power generation from biomass (solid waste-kitchen garbage).



Major Findings

8. RENEWABLE ENERGY

- Renewable energy use and development is already underway in Da Nang.
 - The Da Nang People's Committee plans to install a hydroelectric power plant to supply electricity to Da Nang and the national grid system.
 - A stand-alone photovoltaic (PV) is planned to supply electricity to Da Nang's airport.
 - Solar hot water heaters were installed to residential homes in Da Nang.
- Da Nang's year average solar irradiation makes it a good site for promoting the use of PV systems.
- Renewable energy, such as PV systems and wind power is still at the research and demonstration stage.
- There is no buyback scheme or feed-in tariff for PV systems and wind power, and the costs of implementing renewable projects remains high.



Major Findings

9. WASTE MANAGEMENT

- 'An Environmental City Plan' aims to achieve an environmental index as reasonable levels by 2015, which include:
 - Processing 90% of waste water from industrial zones.
 - Collecting and processing waste water from 90% of households in the inner city.
 - Controlling hazardous waste sources.
 - Collecting and processing 90% of solid waste.
 - Recycling 50% of recyclable waste.
- From 2015-2020 Da Nang aims to reach targets to declare Da Nang as 'an environmental city' and this will include:
 - Processing 100% of wastewater from industrial zones.
 - Recycling 70% of solid waste.
 - Reusing 25% of waste water.
- There are presently no recycling facilities in Da Nang.
- There are currently no waste treatment facilities within the Ngu Hanh Son District.



Recommendations

The Review Team made 75 recommendations in this final report.



Recommendations

1. INSTITUTIONAL CONTEXT

1. Maintain a long term vision and leadership for low carbon policies and programs across all sectors.
2. Identify and implement short term and low cost solutions for immediate implementation.
3. Seek international funding to support the LCMT concept.
4. Emphasise developing human resources and environmental skills in education to promote future sustainable development.
5. Seek Prime Ministerial approval for Da Nang's LCMT plans to ensure compatibility with economy-level planning.
6. Establish an 'implementation board' that coordinates the implementation stage of the LCMT development plan.
7. Maintain close communication with the Central Government of Viet Nam.
8. Involve the People's Committee and the residents of Da Nang during the implementation stage of the LCMT development plan.



Recommendations

2. SUSTAINABLE DEVELOPMENT PLAN

9. Encourage urban development within and near existing communities and public transit infrastructure (for more details see section 3).
10. Promote redeveloping the existing cities, suburbs and towns while limiting expanding the development footprint in the region (for more details see section 3).
11. Develop balanced communities that are proximate to housing and employment opportunities (for more details see section 3).
12. Encourage low carbon transport options (for more details see section 5).
13. Preserve water quality, natural hydrology, habitat and biodiversity through conservation wetlands and water bodies.
14. Design safe walkable streets that promote efficient transportation and walking (for more details see section 5).
15. Promote compact development that conserves land and protects farmland and wildlife habits.
16. Provide access to civic areas, public spaces and recreational facilities that improve ¹⁹ physical and mental health (for more details see section 3).



Recommendations

2. SUSTAINABLE DEVELOPMENT PLAN (Cont'd)

17. Grow tree-lined and shaded streets that reduce urban heat island effects, improve air quality and reduce cooling load in building.
18. Build neighbourhood schools that promote community interaction and engagement by integrating schools and educational institutions (for more details see section 3).
19. Promote Da Nang as a 'biophilic' town and join the international biophilic city network (e.g. Wellington, New Zealand).
20. Encourage the design, construction and retrofit of buildings using green building practices.
21. Use on-site renewable energy sources (solar, ground source heat pump, small wind, biomass heat such as pellets) (for more details see section 8).
22. Promote the use of recycled and reclaimed materials in infrastructure.
23. Reduce light pollution so that it minimises light trespass from projects, protects wildlife and people.



Recommendations

2. TOWN STRUCTURE

24. Foster political and citizen's consensus so Da Nang's compact spatial characteristics become a long term asset that is protected for the future prosperity of the city, and incorporate this in every long-term vision.
25. Study and recognise the benefits of a compact town structure.
26. Identify areas to be designated as protection areas for the green environment and wildlife.
27. Monitor 'population density on urban land' and 'average trip distance'.
28. Create a system that prioritises urban development on already developed urban land compared with green-field development.
29. Develop a land inventory that checks current urban land availability, and tries to accommodate development within existing urban areas as much as possible by setting a target 're-fill rate' that promotes inner city development by providing incentives.
30. Develop the Ngu Hanh Son District as a world class resort that is attractive for local residents and businesses.



Recommendations

2. TOWN STRUCTURE (Cont'd)

31. Promote high-density development with strong urban design codes to foster value both for tourists and residents.
32. Raise district specific revenue (e.g. tourist tax) which could be reinvested in the district (compensation to the residents).



Recommendations

4. LOW CARBON BUILDINGS

33. Develop an evaluation criteria for low carbon building design.
34. Promote energy efficiency standards for all non-residential buildings.
35. Reduce water demand in non-residential buildings.
36. Construct a model low-carbon building.
37. Publish a policy paper to promote low carbon building deployment and financing.
38. Establish building energy metering, including sub-metering to improve data recording and analysis systems.
39. In the future, use computer simulation to optimise building design.
40. Develop an energy savings plan for existing buildings.
- 41 Strengthen building energy system commissioning and maintenance.



Recommendations

5. TRANSPORTATION

42. Introduce dedicated cycle ways for use by both tourists and local residents.
43. Use locally produced renewable electricity to directly charge electric vehicles.
44. Improve the existing bus service by introducing dense and frequent bus networks within the district. This should be a first step if a new BRT system is a long-term goal.
45. Regain the footpaths for pedestrians in order to encourage safe, non-motorised journeys for use by all residents, young and old, and for tourists to easily access local shops and culture.



Recommendations

6. AREA ENERGY MANAGEMENT SYSTEM

46. Implement a Demand Side Management Program that strengthens demand side management to provide data on real time profiles of peak demand, local equipment efficiency, and knowledge on energy efficiency.
47. Develop diagnostic techniques and tools, and local skill training to identify and implement energy efficiency and energy management opportunities.
48. Formulate an Alternative Energy Development Plan (AEDP) from 2014-2020 for Da Nang.
49. Examine the potential for demand side smart systems energy storage and smart grid networks to allow consumers to manage their demand. This will complement the Alternative Energy Development Plan (AEDP).
50. Review electricity pricing structures to shift energy use away from peak load periods.
51. Develop a promotional scheme to raise public/tourist participation in implementing a demand-side management program, for example, the Eco Point Program (EPP).
52. Ensure that local projects qualify for Certified Emissions Reductions (CERs).



Recommendations

7. UNTAPPED ENERGY RESOURCES

53. Increase the number of users connected to the waste water treatment plant.
54. Develop a comprehensive waste management process.
55. Develop a promotional scheme that raises public/tourist awareness and implements waste management processes, for example the Eco Point Program.
56. Examine opportunities to implement a 'waste-to-energy electricity or combined heat and power (CHP) generation 'system from incinerating municipal solid waste to reduce landfill requirements and utilise heat waste in Da Nang.
57. Implement heat pump or solar water heating technologies to produce hot water in hotels and hospitals.



Recommendations

8. RENEWABLE ENERGY

58. Facilitate the planning consent process for installing renewable energy technologies in Da Nang.
59. Promote solar photovoltaic systems in Da Nang.
60. Design 'building-integrated photovoltaic (BIPV) materials and technology into new green buildings.
61. Evaluate the potential capacity to set up a medium to long term target for photovoltaic systems.
62. Monitor and survey the performance of existing photovoltaic system by collecting operation data.
63. Survey the total installed prices of photovoltaic system.
64. Consider the use of small scale photovoltaic systems in remote rural areas.
65. Develop incentives to encourage the use of grid connected photovoltaic systems.



Recommendations

8. RENEWABLE ENERGY (Cont'd)

66. Install solar hot water systems in commercial buildings and factories and expand the number of residential solar hot water heaters beyond the current 600 residential heaters.
67. Study the potential for wind energy in Da Nang.



Recommendations

9. WASTE MANAGEMENT

68. Establish a master plan for solid waste management to avoid further expansion of landfill and reduce GHG emission (see also recommendation 56).
69. Dispose of waste at the source by developing a knowledge based community driven waste management system.
70. Improve the waste collection system using GPS to achieve 100% waste collection.
71. Dispose of waste at the waste depot through technology-based management systems.
72. Introduce grease traps and energy management in households.
73. Promote grey water recycling in households for secondary purposes such as washing buildings, watering plants, cleaning vehicles.
74. Develop complete treatment facilities for hazardous and non-hazardous industrial waste within each industrial zone.
75. Promote urban forestry and biodiversity to operate as a buffer zone between industrial and tourism/residential zones.



Thank You for Your Attention!

**APERC looks forward to cooperating with
you in the future**

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