

PUTRAJAYA GREEN CITIES: CONSTRAINTS AND MITIGATION  
STRATEGIES TOWARDS LOW CARBON CITIES

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Dedication to my beloved father, Abd Razak Bin Selamat, my beloved mother, Zin Binti Awab whom support me, physically, mentally and emotionally, throughout my Master's study.

For my siblings and friends, appreciate your encouragement and help.  
To all my lecturers, you are my inspiration for today and future time, Insya-Allah

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## **ABSTRACT**

The thesis presents the constraints and mitigation strategies that will be facing in making Putrajaya as Green Cities. As the Malaysian Government aspiration to reduce 40% of CO<sub>2</sub> emission intensity by the year 2020 as compared to the 2005 as benchmark, a few actions have been taken to fulfill the aspiration. Two main contribution of Green House Gas (GHG) have been identified which are come from buildings and transportation. Effect of the action taken to reduce the GHG emission from this two sector will be discuss with the feedback from residents of Putrajaya will be taken in justification the result. As a result, it can be summarized that the action taken have to be review back in a few part to encourage the resident of Putrajaya to play the main role to make the Putrajaya as Green Cities success.

## **ABSTRAK**

Tesis membentangkan kekangan dan strategi mitigasi yang akan dihadapi dalam menjadikan Putrajaya sebagai Bandar Hijau. Sebagai sebahagian aspirasi daripada Kerajaan Malaysia untuk mengurangkan 40% daripada CO<sub>2</sub> intensiti pelepasan pada tahun 2020 berbanding dengan tahun 2005 sebagai penanda aras, beberapa tindakan telah diambil bagi memenuhi hasrat itu. Dua penyumbang utama Gas Rumah Hijau (GHG) telah dikenal pasti yang datang dari sektor bangunan dan pengangkutan. Kesan tindakan yang diambil untuk mengurangkan pelepasan GHG dari dua sektor ini akan dibincangkan dengan mengambil kira maklum balas daripada penduduk Putrajaya akan diambil sebagai justifikasi dalam membuat keputusan. Hasilnya, ia boleh dirumuskan bahawa tindakan yang diambil perlu mengkaji kembali dalam beberapa bahagian untuk menggalakkan penduduk Putrajaya untuk memainkan peranan utama untuk menjadikan Putrajaya sebagai Bandar Hijau berjaya.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction

In a row with Putrajaya Green City 2025, the Malaysian Government aspiration to reduce 40% of CO<sub>2</sub> emission intensity by the year 2025 as compared to the 2007 as benchmark. This project will become as benchmark for future urban development. Malaysia is among 183 countries in the world which have signed and ratified the Kyoto Protocol to the United Nations Framework Convention on Climate change (UNFCCC) on February 2009. The convention had come with the goal of achieving stabilization of greenhouse gas concentrations.

Furthermore, in July 2009, the Prime Minister of Malaysia; *YAB Dato' Sri Mohd Najib Bin Tun Abd Razak*, has launched National Green Technology Policy. In showing the serious of Malaysian Government aspiration, in tabling the 2010 Malaysian Budget, the Prime Minister announced to “develop Putrajaya and Cyberjaya as Pioneer Township in Green Technology as a showcase for the development of other townships”.

As a way to Putrajaya Green City 2025, environmental impacts are one of the big issues that cannot be ignored in the development. The goals for Putrajaya Green City 2025 in term of quantitative environmental targets are outlined in three themes. The three themes are “Low-carbon Putrajaya” for climate change mitigation, “Cooler Putrajaya” for mitigating urban heat environment, and “3R Putrajaya” for recycle-based society.

1. **Low-carbon Putrajaya: GHG Emission Intensity Related to Energy Use -60%**  
The target for “Low-carbon Putrajaya” is reducing GHG emission intensity (per economic activity) related to energy use by 60% compared to year 2007 level. This target was set in line with the National Target of 40% reduction of CO<sub>2</sub> emission intensity by 2020 and also based on the future plan as stated in the Putrajaya Structure Plan (Perbadanan Putrajaya, 2009). Therefore the City Planning Department of PJC set this target for this study. To achieve this target, energy efficiency improvement, utilization of renewable energy and low carbon transport and structures will have to be introduced.
2. **Cooler Putrajaya: Peak Temperature -2°C**  
Mitigating urban heat environment and lowering peak temperature are important for not only comfortable life of Putrajaya residents and workers, but also reducing air-conditioning demand that will be effective for “Low-carbon Putrajaya”. For “Cooler Putrajaya”, the target is reducing peak temperature 2°C from year 2005 level.
3. **3R Putrajaya: Final Disposal of Solid Waste -50%, GHG Emission per Waste Generation -50%**  
Currently, most of the solid waste from Putrajaya is land filled. However, because of limited natural resource of the earth, it is required to convert current material consumption style to more recycle-oriented, sustainable one. It also can contribute to reduce energy demand, waste-related GHG emission, and carbon footprint. Therefore, two targets were set for “3R Putrajaya”; reducing final disposal of solid waste and GHG emission from solid waste management by 50% compared to 2025BaU level.

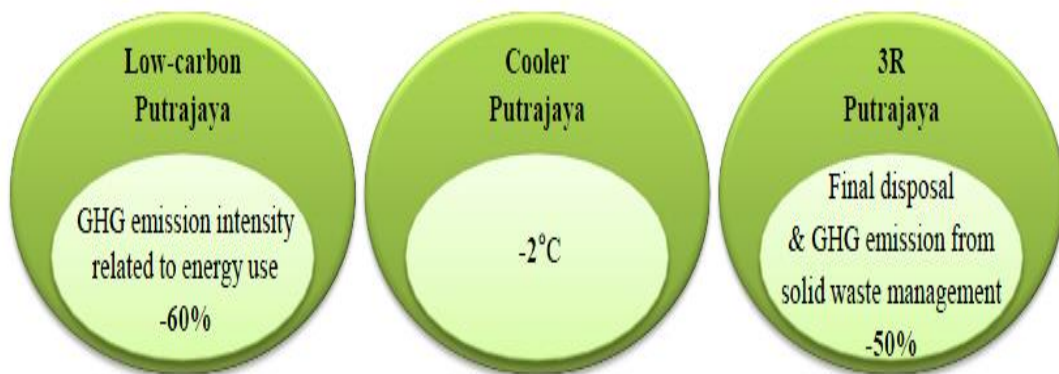


Figure 1 : Three Environmental Targets

As towards in making Putrajaya as Green Cities, official ground breaking for the Putrajaya Project had been done by the Prime Minister in 1995 before he moved in four years later. Putrajaya development strategies were originally based on two underlying concepts which is:

- i) City in a Garden : Integrates with natural elements & environment (sustainable development)
- ii) Intelligent City : Incorporates high technology features in developing & managing the city

Based on those concepts, a master plan was drawn up and approved for implementation which can be see almost 40% of the city area designated as open space where includes 400 hectares of a man-made lake and 200 hectares of wetlands, created to bring in nature and enhance urban bio-diversity. This city is divided into 20 precincts with central business district located on an 'island' surrounded by the lake and residential precincts at the peripheral are planned on a neighbourhood planning concepts as show in Figure 2

Up to date, with 14 years of development, 17 ministries and more than 50 government departments and agencies have been relocated to Putrajaya. The cities at present have a population of approximately 70,000 people, and are equipped with numerous community facilities, retail out-lets, sport and recreational amenities. By year 2012, the remaining 4 ministries in Kuala Lumpur will be moved to Putrajaya.

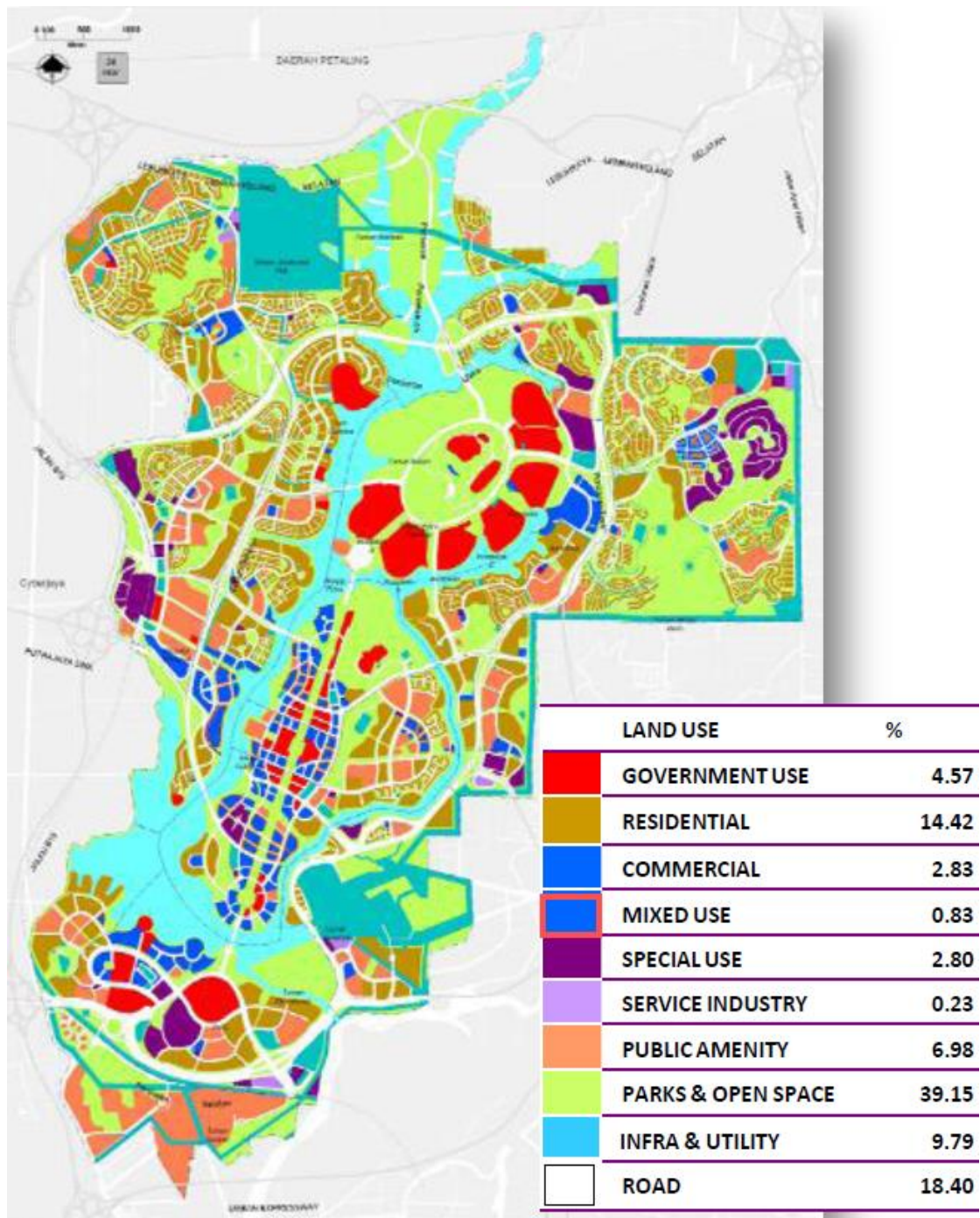


Figure 2 : Plan Development of Putrajaya

## 1.2 Low Carbon City Framework

Low Carbon City Framework is use to assist local authorities in assessing whether any development to be carried out within the city contributes towards abatement of GHG. The environmental achievements in a development are defined by the sum of the CO<sub>2</sub> reduction over the baseline CO<sub>2</sub> emissions. Projects/developments shall be awarded with the corresponding environmental performance achievements according to the achievement level. The maximum limit of 40% Co<sub>2</sub> reduction aligns with the commitment made by Malaysia in arriving at the 2020 target. Table 1 show level of achievement which has been put in the guideline in the Low Carbon City Framework.

<b>Carbon Reduction Level</b>	<b>Level of Achievement</b>
100%	Carbon Neutral
70-95%	Best Practice 5 (BP5)
50-69%	Best Practice 4 (BP4)
30-49%	Best Practice 3 (BP3)
10-29%	Best Practice 2 (BP2)
1%-9%	Best Practice 1 (BP1)

Table 1 : Level of Achievement of Low Carbon City

## 1.3 Problem Statement

Nowadays, a lot of research has been done on strategy to mitigate the carbon emission and has been implement to few cities which are in development process towards Low Carbon Cities such as Putrajaya, Iskandar Malaysia, Kyoto, Shiga, Ahmedabad, Jilin and etc. For Putrajaya, year by year positive report has been published which give a picture that the strategy that they use are drive them in the right path. The feedback from the community gives the contrast picture. In this



proposal, a strategy to mitigate the carbon emission for Putrajaya towards Green Cities with consideration of community voice is proposed.

#### **1.4 Objective**

The objective of this study is to determine the current achievement of GHG emission in Putrajaya. The more specific objective of this study was:

- 1) To get the opinion from resident of Putrajaya over the effectiveness of public transport system
- 2) To get projection of gas emission in 2025 with and without countermeasure action compare to 2007 as baseline
- 3) Propose mitigation initiatives to achieve 40 % reduction in Carbon Emission by 2025

All the four objectives are only will cover one major sector which is transportation which will put projection development of population into consideration. The main objectives are to propose the strategy to be use with feedback from the community as the main player that will give big impact to the successful of the target towards Putrajaya Green Cities 2025.

#### **1.5 Organization of Report**

Chapter 1 describes the overview of the study including the objectives, problem statement throughout the project works. Meanwhile, Chapter 2 outlines the fundamental information on the action will taken by authority to realise the target develop Putrajaya as Green Cities.

Chapter 2 also described about Air Pollution Index (API) reading as it also play a role as measurement the air quality status of Putrajaya. Green Building Index (GBI) also been discuss in this chapter on the criteria of achievement. Chapter 3 explained on the author's methodology that been use to full fill the objective of this study with explanation of the step that have taken.

In Chapter 4, the author will explained fully on the result obtained from the data collection either from resources or from survey that have been done. Meanwhile, in Chapter 5, the author will discussed on the result obtained in Chapter 4 and recommend some future works to be conducted.

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