**GREEN CITIES**

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# THE IMPLEMENTATION LOW CARBON CITIES FRAMEWORK (LCCF) OF LOCAL AUTHORITY IN DEVELOPMENT CONTROL TOWARDS GREEN CITIES

Siti Kartina Binti Juhari[1*], Dasimah Binti Omar[2], Siti Mazwin Kamarudin[3] and Mohd Sallehuddin Mat Noor[4]
[1,2,3,4] Faculty of Architecture, Planning and Surveying, UniversitiTeknologi MARA, 40450, Shah Alam, Malaysia.
kartinauitm@gmail.com*

***Abstract*** **-** Low Carbon, low emission or even carbon-neutral cities contribute significantly towards sustainability. The low-carbon green city refers to a city that is ecologically low in $CO^2$ emission, uses energy and environmental technologies to eliminate CO2 emission. This paper aims to investigate the LCCF implementation in local authorities. The objectives of the paper are to study the implementation by selected local authorities for further improvement of the LCCF Checklist. The methodology of this study was qualitative data analysis with NVivo. The article only focuses on Selangor Local Authorities. The finding of this research is Local Authority plays a major role in manifesting the LCCF Checklist in development control. The LCCF Checklist must be incorporated in the Development Proposal Report (LCP), an incentive to the developer and monitoring the implementation of the LCCF Checklist from the federal and state level.

***Keywords*** **-** Low Carbon Cities Framework (LCCF), Development Control, Green Cities, LCCF Checklist.

## 1 INTRODUCTION

The environmental problem becomes from cities affect and are affected by climate change. Local land use comprehensive development plans have an essential role in greenhouse gas (GHG) emission reduction. (Wei, T., & Tang, Z., 2014) Environmental problems have been recognized and acknowledged at the United Nations Conference held in Rio de Janeiro in 1992, which composed in Agenda 21. However, the global system of environmental management which focuses on lifestyle and industrialization is moving slowly in the right direction (Ho C. S., Abdul-Azeez and Isiaka A., 2013). Among the approach is the Low Carbon City Framework (LCCF). Human activities in cities contribute 80% of greenhouse gas (GHG) emissions which are mainly responsible for the current climate change threat (Satterthwaite, 2008). In this sense, LCCF is one of the most important tools applied in local authorities as a guiding blueprint for low carbon cities amongst the local authority's community. Malaysia's involvement in climate change agenda towards green and sustainability since 2011. (MIP, 2015).

Low Carbon City relates to carbon minimization in all sectors by developing a society that emits GHG only in an amount that can be absorbed by nature and achieving a lifestyle that realizes the richer quality of life. Health and interaction with nature as well as promoting nature-friendly technologies such as the utilization of biomass is expected in the near future by manifesting in LCCF (Ho C. S., 2011). Despite that, it is acknowledged that challenges exist which recorded in the local authority lab report of LCCF implementation (UPEN, 2016). There were also recurrences of reports in planning permission submission stage in this matter (UPEN, 2016). Aim of this paper is to review the current initiative of LCCF Checklist implementation in the local authority of Malaysia. The objectives of this paper are to study the implementation by selected local authorities for further improvement of the LCCF Checklist. The method of this research is was qualitative data analysis with NVivo.

## 2 LOW CARBON CITIES FRAMEWORK (LCCF)

The Ministry of Energy, Science, Technology Environment and Climate Change (MESTECC) and GreenTech was jointly developed the LCCF with implement the strategies to effectively and take action to reduce CO2 emission (Press Reader, 2018). In general, Low Carbon Cities (LCC) is defined as a city that comprises of societies that consume sustainable green technology, green practices and emit relatively low carbon or GHG as compared with present-day practice to avoid the adverse impacts

on climate change (KeTTHA, 2011). There are two aspects in a low carbon city conception, namely; (a) low carbon economics which increase energy, water efficiency and reduce carbon emission based on efficiency in use of resources and green technology; and (b) low carbon consumption which reduce carbon emission from all aspects of city living which include recycling, protecting the natural environment, maintaining green areas in the city and increasing carbon sink (KeTTHA, 2013). These aspects were translated in LCCF in Malaysia.

Cities generate very huge carbon dioxide emissions and are responsible for consuming two-thirds of the world's energy and generating over 70% of its greenhouse gas emissions. About 2.6 billion tCO2e is generated by the world's 50 cities annually. Currently, half of the world's population lives in cities and this is expected to reach 70% by 2050. Also, cities account for over 67% of the energy-related global greenhouse gases, expected to rise to 74% by 2030 (The World Bank, 2010). The key to creating low carbon cities in the field of urban planning is to freely come up with ideas to create a complementary and mutually supportive situation in which people's lives are improved and they have a better environment in which to live (Onishi, T. and Kobayashi, H. 2011).

Low Carbon Cities had been implemented globally and defined a slightly different name as a reference to a province, city, municipality, or community that pursues a systematic process to achieve GHG emission reductions. (Asia Leds Partnerships, 2013). There were a few case studies in Asia and Europe. Issues were addressed, the approach was taken contextualized locally. The rapid urbanization causes rapid environmental degradation demanded a new development pattern with less energy consumption. The new concept of Low Carbon City namely the eco-city was among the answer. Implementing the concept require a change in the development mode from only focusing on economic growth to an equal focus on the social and environmental aspects in the planning process had taken place in Shenzhen, China (Ruben Cales, 2014). Thailand's "Low Carbon City" initiative aimed to help achieve reductions in GHG emissions and catalyze this shift to a low carbon society. Another example was the UK is Oxford City Council. In 2008 City Council created a Carbon Management Plan aimed to reduce the City Council's emissions by 25% by 2011 with its measures (Paul Wedgwood, 2015).

### 2.1 Low Carbon Cities Framework (LCCF) & Assessment in Malaysian Local Authorities

The LCCF is only applied to participating local authority in Malaysia (UPEN, 2016). This is cascading from the Malaysian government is cognizant of the effects of global warming and is committed to combating this global phenomenon. The nation's commitment was announced to the global community. To reduce carbon footprint in Malaysia, the Prime Minister, pledged commitment at the 15th United Nations Framework Convention on Climate Change (COP15) 2009 in Copenhagen, Denmark. Malaysia has committed to reducing its carbon dioxide emission intensity based on GDP by 40 percent by 2020, as compared to 2005 levels, conditional upon transfer of technology and finance from developed nations (KeTTHA, 2013). Ministry of Energy, Green Technology and Water proposed strategic planning for green technology as one of the machineries for economic growth which includes the LCCF.

(Kui, 2011) simplified the LCCF are a system developed by the Ministry of Energy, Green Technology and Water (KeTTHA, 2013). The purpose of this system is to assist industry stakeholders such as developers, local councils, town planners, non-governmental organizations (NGO's) and the public to lower the levels of carbon emission in cities towards achieving sustainable urban developments. It serves as a guide that will propel stakeholders for cities, townships and neighborhoods to re-assess their priorities in the planning and developing of new projects, as well as strategies that can be taken by existing cities, townships and neighbourhoods in reducing their carbon emission levels.

The assessment system of LCCF encompasses a carbon calculator guiding users to determine their current baseline of carbon emission (KeTTHA, 2011). Various approaches are recommended in the framework to achieve a certain reduction level to the user. The calculator will be used again to reassess the carbon emission levels to see if the user has obtained a good reduction level. The built-in calculator equipped with carbon emission factors enables the user to calculate based on their requirements. The LCCF is only applying to the local authority who participate which means not all local authority is obliged. This is among the challenges identified in making LCCF implementation effective. The assessment is carried out by the planning department of respective local authority specifically in the department control unit. It is made by reviewing the planning permission documents requirements submitted by the submitting person of newly developing projects at One Stop Centre

(OSC) counter. All pertinent matter was carried forward to the Planning Permission meeting together with primary stakeholders of the proposed projects.

### 2.2 LCCF Checklist and Planning Permission

To date, the LCCF only established until only at the planning permission stage and argue to be too general by the Malaysia Institute of Planner (MIP, 2016). The assessment takes place in the development planning permission stage as part of the need statement for the future project undertaking somehow may need revision. It is also fewer practices the implementing of LCCF in a local authority for the stakeholders to assist those who involve in a development project be it developers, professionals, consultants and local authorities in evaluating the carbon emissions level (MIP, 2016).

#### 2.2.1 LCCF Checklist

LCCF Checklist is the minimum requirement list to gauge whether planning permission or project is ready or not ready to commit in the development and implementation of the Low Carbon Project, the Checklist must be fully complied. The criteria consist as below: The four elements of LCCF are further categorized into 13 performance criteria and 35 sub-criteria, each of which provides specific intents towards carbon reduction targets.

Table 1: Element, Score, Performance Criteria and Sub Criteria for LCCF

| 4 Element | Perfomance Criteria | Score | 15 Performance Criteria | 41 Sub Criteria |
|---|---|---|---|---|
| Urban Environment (UE) | • UE 1: Site Selection | 10 | 3 Performance Criteria | 14 Sub Criteria |
| | • UE 2: Urban Form | 18 | | |
| | • UE 3: Urban Greenery and Environmental Quality | 9 | | |
| | ***Total Criteria Achieved for UE*** | **37** | | |
| Urban Transportation (UT) | • UT 1: Reduction Use of Private Motorised Transport on Urban Road Network | 8 | 6 Performance Criteria | 11 Sub Criteria |
| | • UT 2: Increase in Public Transport | 5 | | |
| | • UT 3: Mode Shift from Private to Public Transport and Non-Motorised Transport | 5 | | |
| | • UT 4: Use of Low Carbon Transport | 4 | | |
| | • UT 5: Improvement to Level of Service of Road Links and Junctions | 2 | | |
| | • UT 6: Utilisation of Transit-Oriented-Development (TOD) Approach | 5 | | |
| | ***Total Criteria Achieved for UT*** | **29** | | |
| Urban Infrastructure (UI) | • UI 1: Infrastructure Provision | 9 | 4 Performance Criteria | 10 Sub Criteria |
| | • UI 2: Waste | 10 | | |
| | • UI 3: Energy | 3 | | |
| | • UI 4: Water Management | 4 | | |
| | • ***Total Criteria Achieved for UI*** | ***26*** | | |
| Building (B) | • B 1: Sustainable Energy Management System | 3 | 2 Performance Criteria | 6 Sub Criteria |
| | • B 2: Low Carbon Buildings | 10 | | |
| | ***Total Criteria Achieved for UB*** | **13** | | |

(Source: Ministry of Energy, Green. Technology and Water (KeTTHA, 2017)

If the Checklist process failed, the application must take necessary action to comply with the Checklist requirement. Failure to pass minimum marks in the checklist will not approve to validate itself suitable to enroll in the LCCF project. There is no literature discussing LCCF strategy formulation and implementation in other local authority. There is also a recurrence of a report by Submitting Person (SP) on a misunderstanding of LCCF checklist criteria in the planning permission stage. Internally some planning department officers within local authority argue the checklist is effective. External stakeholder namely planning consultants and developer representative issued the same problems. LCCF Checklist as a tool for planning permission in development control. It depends on the LCCF Criteria. The approach is City Based (mitigating all the criteria as stated within the LCCF) and One System (mitigating one criterion or not all the criteria in the LCCF).

### 2.2.2 Planning Permission and Development Control

#### i. Planning Permission

As global climate change phenomena are felt in our country, efforts must be made to mitigate the impact, especially in our cities. Urban areas support 75% of Malaysia's population and are estimated to touch 80% by 2025. Hence, our urban areas have to be planned, designed and developed with a different approach. The attitude of "Business As Usual" should NOT be acceptable if planners are to be the game changers towards more environmentally and ecological cities. (MIP, 2015). Planning permission is Is the written permission of the Local Planning Authority (LPA).

Planning permission is required after approval of land conversion approval is obtained, where it was before the building plans to continue. Based on section 21 (1), an application for planning permission of a development shall be made to the local planning authority and shall be in such form and contain such particulars and accompanied with documents, plans, and the prescribed fees. The LCP is an addition to the documents and plans required to be submitted under subsection 21 (1) for the Planning Permission, the applicant must submit an LCP. The LCCF Checklist may be included in section 21A (d) of the particulars of the building, which may be subject to such development.

#### a) Meaning Of Planning Permission By Act 172

- ***Subsection 2(1)*** of the Town and Country Planning Act 1976 (Act 172) Decoding planning permission be given, with or without conditions for carrying out the development.

- ***Subsection 19(1)*** provides that no person, other than local authority (LA), can start, operate, or carry out any development unless planning permission in respect of the development has been granted to him under section 22 or extended under subsection 24 (3).

- In general "planning permission" is a procedure in which the applicant must submit an application to the local planning authority for approval before starting any development on the land or building as provided under section 21A of the [Development Proposal (LCP)] and section 21B [Layout Plan ] (Act 172, 1976).

#### b) Proposed Development Report. (LCP)

LCP is a report required to be prepared in accordance with the provisions of Section 21A, Town and Country Planning Act (Amendment) 1995. It must be submitted together with the layout plan submitted either to the application requirements change, subdivision or erect buildings where appropriate. It presents the basics of planning, the rationale and justification are to strengthen the compatibility of development proposals. It can also help smooth the process of consideration by the Local Authority on applications submitted. (PlanMalaysia@Selangor, 2019)

#### c) Development Control

Development control is the process of regulating the use of land and buildings by the local planning authority. Definition of development is Section 2 of the Town and Country Planning Act 1976 (Act 172) is defined as the carrying out of building, engineering, mining, industrial or

other operations in, on, over or under land or the making of any material in the use of any buildings or other land or part of or to subdivide or amalgamate the land; and; "development" should be defined accordingly'. (Act 172, 1976).

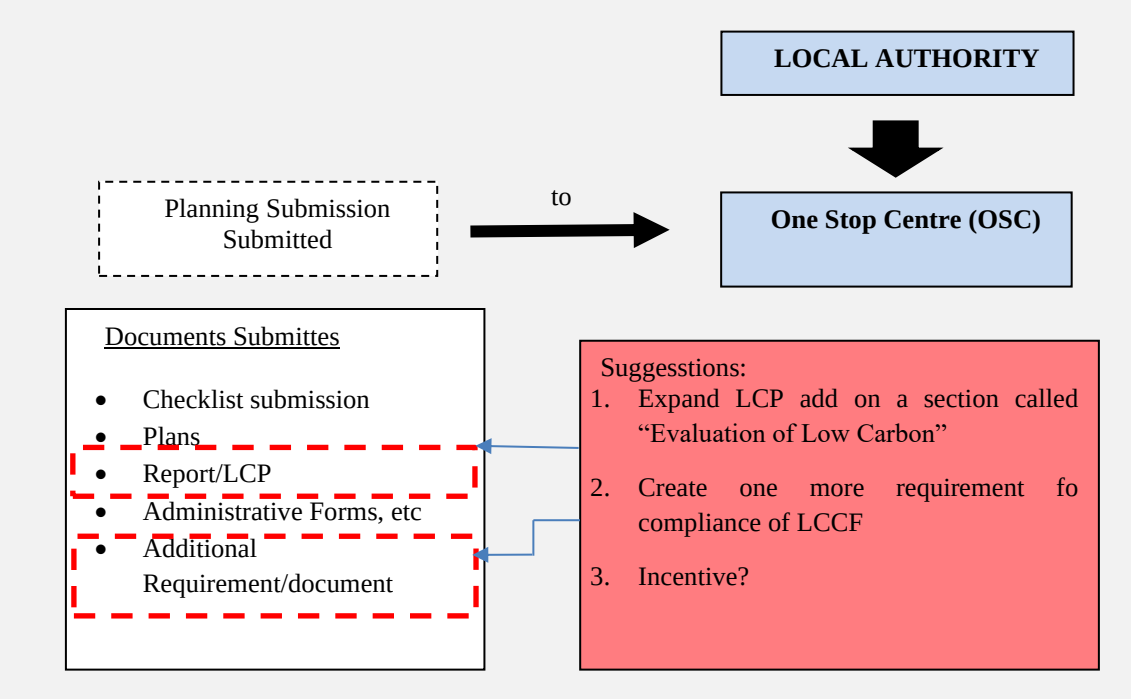


Figure 1 : Incorporating LCCF in The Planning Approval Process

## 3 RESEARCH METHODOLOGY

The selected case study area is the Subang Jaya Municipal Council (MPSJ), Shah Alam City Council (MBSA), Petaling Jaya City Council (MBPJ) and Putrajaya Corporation (PJC). It is consisting of five (5) zones, namely Subang Jaya, Kinrara, Puchong, Seri Kembangan, and Putra Permai. Research methods that are applied in this research are qualitative approaches analysis with Nvivo. The interview with the selected local authorities has been done and the local authority gives their comment the LCCF should be incorporated in the LCP. The interview will focus on issues, concerns and constraints in incorporating LCCF into the Process and Procedures of a development application is below:

- LCC can be imposed at the plan application stage for both existing (during renovation/retrofitting stage) and new buildings;
- Most authorities already giving incentives such as assessment rebates for green initiatives;
- Self-evaluation can be done if have more manpower and upskilling;
- Recommend LCC to be incorporated in local plans; and
- There have been many programs already by authorities to create greater awareness of green initiatives.

This research is going to explore 4 elements of the LCCF Checklist, i.e. the stakeholders' willingness and perception, effort, knowledge and pro-active attitude in implementing LCCF/Low Carbon Cities and should elaborate in layout plan and LCP. This research is focused to study the criteria and readiness of LCCF implementation by stakeholders and to investigate the achievement of LCCF of the aspects of Economy, Social, and Environment.

## 4 FINDING AND DISCUSSION

LCCF criteria must be studied and detailed to ease the understanding and implementation of local authority and stakeholders of the construction industry. Local authority within its jurisdiction has a real responsibility to be part of the leader in developing a more recognized, and applicable LCCF framework internally and for the industry. Local authority plays a major role in manifesting LCCF is a newly developed project, but few challenges must highlight the effectiveness and applicability of the implementation of the LCCF Checklist. The input from the local authorities and developers must be strengthening for further improvement of the LCCF Checklist.

Table 2. Interview with the Local Authorities in Implementation of LCCF Checklist

| Item | Local Authority | Issues | | **Implementation LCCF Checklist** |
|---|---|---|---|---|
| 1. | MBSA | 1. | LCCF should be incorporated in the LCP. However, the person in charge to evaluate must be someone who knows/understand the LCCF very well. | LCCF Checklist for the Project Brief |
| | | 2. | Identify where LCCF can be incorporated in LCCF Checklist too (KM erection of building) | |
| | | 3. | The progress report can be done yearly or periodically. For example, the progress report for the overall master plan as well as a phasing plan | |
| | | 4. | The mechanism needs to be detailed out. Incentives need to have intensive guidelines | |
| 2. | MBPJ | 1. | LCCF should be incorporated in the Development Proposal Report (LCP) | Low Carbon Society (LCS) and |
| | | 2. | Possible incentive(s): e.g. plot ratio. However, the penalty should be given to those who failed to comply with the projected CO2 reduction. The mechanism to be right. | |
| 3. | PJC | 1. | LCCF can be **incorporated in the LCP**. However, the format of evaluation to be developed for consistency, maybe in a form a Checklist. | Low Carbon Society (LCS) |
| | | 2. | The checklist can be upgraded or changed over time, maybe every 3 to 6 months. | |
| | | 3. | Categorize based on the scale of development/project. | |
| | | 4. | LCCF needs to tackle the **decision-maker (KPKT and PlanMalaysia/JPBD)** to make the implementation more effective and successful. | |
| | | 5. | WHO to monitor? | |
| 4. | MPSJ | 1. | LCCF would the best incorporated in the LCP as "Kaedah". Refer Act 172, Section 58(i) and (ii): "Power to Make Rules". | LCCF Checklist |
| | | 2. | There's needed to have a **"lab session"** at the State level. This can be linked with the "Low Carbon State" idea. | |
| | | 3. | MPSJ will organize a Master Class session with developers 2015. A teach-in session on LCCF will be the main agenda to ensure that developers **embrace the LCCF** and in the long run help, MPSJ achieves a low carbon city status. | |

(Source: Lab Session Application Of LCCF Checklist And Calculator In Achieving Low Carbon Property Development (Grand Dorsett Hotel, Subang Jaya, Malaysia)

The finding of this research is Local Authority plays a major role in manifesting the LCCF Checklist in development control. The result of this paper is LCCF Checklist must incorporated in the LCP. The element in the plan should be elaborated in the LCP. Based on the lab session mostly the participation the LCCF choose the LCCF incorporated with LCCF Checklist. Hence the element and the performance criteria must behave stated into the LCP. All the implementation in the layout plan

must-have in the LCP. The table 2 is an interview with the Local Authorities in implementation of the LCCF checklist are refer to table 1 is Element, Score, Performance Criteria and Sub Criteria for LCCF. On another hand however the layout plan LCCF Checklist surprisingly not easy to the officer to check the plan. To solve this problem local authorities should have a lab and seminar to enhance the level of knowledge about application LCCF checklist in development control. The local authority also should give incentive(s): e.g. plot ratio. However, the penalty should be given to those who failed to comply with the projected CO2 reduction. The mechanism to be right. To monitor at federal level LCCF needs to tackle the decision-maker federal level (KPKT and PlanMalaysia/JPBD) to make the implementation more effective and successful. There are also needed to have a "lab session" at the State level. This can be linked with the "Low Carbon State" idea. Lastly, the local authority should organize a Master Class session with developers and stakeholders. A teach-in session on LCCF will be the main agenda to ensure that developers embrace the LCCF and in the long run help, local authorities achieve a low carbon city status. In this sense, the LCCF Checklist is one of the most important tools applied in local authorities as a guiding blueprint for low carbon cities amongst the local authority's community.

## 5 CONCLUSIONS

In conclusion, this study shows the article had reviewed the existing phenomena for the readiness of LCCF of Local Authorities to apply the low carbon cities framework (LCCF) in development Control towards green cities Surprisingly, that challenges and issues exist in multifaceted of policy implementation of LCCF in Malaysia. Therefore, it needs extensive research in this particular matter. The development of Green Townships in Malaysia is still quite new where it requires an active promotion and uses of green technologies and sustainable methods in the development and operation of a township. Achieving the objective requires integrated planning in the system and services of the township (MIP, 2014). Less promoting of LCCF with the developers as real estate development because every development needs planning permission before starting any development according to Act 172. The development is a huge and important urban system, responsible for funding, location and creating development projects such as residential, commercial and industrial estates that support the growth of the city. The development offers greater potential for the understanding of the energy consumption patterns of estates and the carbon emission phenomenon of service sectors of the cities. The recurring reports by the practicing planner in the participating local authorities and stakeholders of the industry must be heard and look properly. This is common in environmental solutions by bringing every major stakeholder on board which local authority is the moderator.

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