

# The Role of the Green Building Code in Achieving Sustainable Green Built Environment: the Philippines

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**Abstract:** *The continuing trend of built environment set forth by the rise of modernization and industrialization has led every country in achieving their respective economic development. Along side this trend is an issue that needs to be addressed - the environmental impacts of the built industry. Construction and maintenance of buildings are said to consume 40% of the world's energy, 65% of electricity, and 40% of raw materials, creating drastic pollutants harmful not only to the environment but also to human. Figures have been released and analyzed proving the contributions of built environment with environmental depreciation. Said figures earned concerns not just from different private and non-profit organizations but also the governments of every country, thus, steps towards sustainable development are being implemented. As a response, the "green" was added in the built environment. Later on, the now emerging concept of "National Green Building Code" found its role in the policy of various states in protecting the people in accord with the nature. This paper appreciates the initiatives of various countries and non-profit organizations in their drive to pursue sustainable green built environment in general, and specifically proposes an establishment of an "incentives grant framework" as an additional legislative policy to be included in the draft of the National Green Building Code of the Philippines.*

**Keywords:** *Green Built Environment, Green Building Code*

## I. INTRODUCTION

With the world heading towards the integration on the influences of modernization and industrialization, the built environment has found its way in changing the landscape of every megacity across the globe. Evident contribution of it is the continuously growing number of buildings being built in specific commercial areas, that in turn, attracted not just local and foreign investors but also local migration – after all, the common notion of the millenials is that the number of buildings determine progress, and progress means development. On the other hand, what was isolated from the general idea is another important issue that should be taken seriously: that the "building sector generates a large amount of pollutants" (Tam, Hao, and Zeng, 2012). Abair and Urban (2008) stated that the construction and maintenance of buildings across the globe amounts to "40% of the world's energy, 65% of all electricity, and 40% of raw materials". In addition, Hwang and Tan (2010) also said that building constructions also contributes to environmental issues such as atmospheric and water pollution from the use of toxic and harmful materials during the construction. Buildings, therefore, may physically look like a progress but behind these developments, are the effects it causes to the environment.

The above stated figures have attracted not just non-profit organizations but also various countries to initiate programs and legislative frameworks to address present conditions of the built environment. Particularly, among other international organizations, the United States' Green

Building Council ("USGBC"), a private, non-profit organization, has developed a rating sustainable building system, the Leadership in Environmental Design ("LEED") which addresses the impacts of building constructions to social and environment health by embracing to "what we build, how we built, where we built, and how we operate buildings over the long term" (Owens and Sigmon, 2010). According to Abair and Urban (2008), the LEED system "has become the default standard for determining what makes a building 'green'". Korean government's response, on the other hand, are various policies (mandatory and incentive-based), such as the Korean Green Building Code, to establish low greenhouse gas emissions on its constructions (Kang, 2010).

In the Philippines, efforts are being made to join in the emerging phenomenon of the green built environment ("GBEs"). Recently, the Department of Works and Public Highways ("DPWH") has conducted consultations on its proposed draft code for national green building and is slated to be ready by the year 2015. According to the Department's (2014) statement published in the Official Gazette, the National Green Building Code ("GB Code") will be the department's response to the "clamor for sustainable building regulations to reduce greenhouse emissions and introduce electricity and cost savings for new buildings".

This paper appreciates the initiatives of various countries and non-profit organizations in their drive to pursue sustainable GBE's in general, and specifically

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proposes an establishment of an “incentives grant framework” as an additional legislative policy to be included in the draft of the GB Code targeted in the year 2015.

## II. OVERVIEW OF GREEN BUILDING RELATED LITERATURES

### WHAT IS GREEN BUILDING?

Green buildings are “high performance buildings that (1) use energy, water, and materials more efficiently and (2) use measures related to siting, design, construction, operations, maintenance, and removal to reduce the building’s impacts on human health and the environment” (Sussman, 2008, in Pike, 2014). The term varies from different perspectives on what and how a building can be called “green” (Hwang and Tan, 2010). In Singapore, they termed buildings “green” if they met certain standards imposed by a scheme requiring a building “to be both energy and water efficient, be environmentally sustainable, have a minimum indoor environment quality and [possesses] green features” (BCA, 2009b in *Ibid*). Similarly, the United States Office of the Federal Environmental Executive (in De Guzman, 2014) defines green buildings as the practice of “increasing the efficiency with which buildings and their sites use energy, water, and materials”. Accordingly, Rinard (2003, in Assad, Hosny, Elhakeem and Hagggar, 2015) presents the main approach of green building as to the “efficient use of resources, enhance indoor quality and reduce pollution/wastes” in which it “advocates [that] green buildings offer huge economic, social and environment benefits”.

Among other benefits stated above, Kansal and Kadambari (2010) listed the following benefits of Green Buildings:

- [Reduce] energy consumption without sacrificing the comfort levels
- [Reduce] damage to natural areas and habitats
- [Reduce] soil erosion
- [Reduce] water consumption
- [Limits] waste generation due to recycling and reuse
- [Reduce] pollution loads
- [Increase] user productivity
- [Enhance] image and marketability
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### GREEN BUILDING CODES AND INITIATIVES

Building Codes, in general, are “tools we use to ensure the basic health and safety of a building’s occupants” (Owens and Sigmon, 2010). Building codes have an important role in ensuring the standard practice of safety against fire, sanitary, among others, in built establishments such as homes, commercial and public buildings. (*Ibid*). With the world on the road adopting sustainable concepts as a response to the rise of different effects of the built environment, various countries are now

on the process of incorporating the now emerging “green building codes”.

### United State’s Leadership in Energy and Environmental Design (LEED)

In the United States (US), an estimated 170,000 commercial buildings are constructed while 44,000 are being demolished annually; this accounts 154 million tones of building-related construction and demolition debris (Boschmann and Gabriel, 2012). Evidently, according to Yun (2014), building and construction industry is of importance in order to provide human development needs. However, amidst the efforts to sustain human needs in terms of construction, said are also contributing to environmental problems. In 2012, the US posted that 73.6% of total electricity expenditures and 40% of the total carbon emissions all came from the building industry.

US’ response to above cited statistics is by enacting Green Building legislation to “promote the adoption of green building construction in which it is mandatory to satisfy [LEED] standards in building construction” (Renewable Energy World, 2005, in Hwang & Tan, 2012).

LEED is a system for rating sustainable development developed by the U.S. green Building Council (“USGBC”) – a non-profit organization that consists of individuals and organizations within the building industry. According to Abair and Urban (2008), LEED “has become the default standard for determining what makes a building ‘green’”. Lee (2012) identified LEED as a rating system with checklist of items that measures or identify the greenness of a building.

### Korean Green Building Code

According to Kang (2010), in 2007, Korea’s residential and commercial sector was among those who generate high greenhouse gas emissions accounting to 25.6 percent, second only to their industrial sector having 52.6 percent; this according to Kang was due to its 90 percent population living in their cities. In response, the Korean government has presented measures to encourage initiatives in lowering greenhouse emissions.

In November 2009, among other initiatives of the Korean government to fulfill their objective of low carbon green growth, they unveiled the “Measures to Develop Green Cities and Buildings”. Said government green building plan is divided into Mandatory Regulations and Incentives for Voluntary Certification. The Mandatory Regulations includes (1) strengthening design standards for green home builders, (2) reinforcing the criteria for energy use, (3) supplying 1 million green homes, and (4) promoting environmentally-friendly certification and expanding use of renewable energy in public buildings. While on the other hand, the Incentives for Voluntary Certification system awards incentives to those who receive specific awards or label to their buildings. There are two subdivisions under this system, the “environmentally-friendly building certification system”

that exempt a certain company from acquisition and registration taxes if awarded with “excellent” or “very good” grades. The other subdivision is the “energy efficiency certification system” where “[b]uildings can enjoy eased construction standards and tax benefits according to the energy efficiency grade they receive” (*Ibid.*).

### III. METHODOLOGY

A conduct of study on green built environment related topic is complex for it requires considering different aspects such as, among others: construction and materials, location, environmental and economic performance.

Thus, in this paper, literatures on green built environment, including (but not limited) to green building, sustainable construction, legislative frameworks and management and incentive/labeling/awarding approaches are first reviewed for purposes of exploring differences and or similarities of approaches by different sectors of various countries or cities in integrating the green building phenomenon.

Moreover, the review of related literatures has helped analyze certain parts of the Philippine GB Code and related various empirical results of previous studies to the feasibility of the GB Code.

### IV. ANALYSIS/DISCUSSION OF RESULTS

#### **Draft of Philippine’s Green Building Code**

The Philippines is of no exemption in dealing with environmental problems caused by the emergence of building and construction.

Among any other initiatives from the Philippine government, the following are the laws that are already in existence:

- RA 9275 Clean Water Act
- RA 9003 Solid Waste Management Act
- RA 8749 Clean Air Act
- RA 9367 Biofuels Act
- RA 7586: National Integrated Protected Areas System (NIPAS) Act

Accordingly, at the end of 2013, the Department of Public Works and Highways has initiated the move to draft the National Green Building code or referred to as the “GB Code”. The Department has already conducted number of consultations with different national agencies and accredited Professional Organizations (APO) in improving the said draft. As of writing, the DPWH is in the process of integrating comments and suggestions accumulated from the consultations and according to the Department, the GB Code will be ready for signing by June of 2015. The said code is intended for adoption on a mandatory basis that shall apply to all new construction of buildings in a specified categories accompanied by a required minimum total gross floor areas<sup>1</sup>. According to the Department, the GB Code is not intended to replace

the existing National Building Code, but to work in tandem with it.

The GP Code in *Section 6 of Chapter I* defines the concept of Green Building as “the practice of adopting measures that promote resource management efficiency and site sustainability while minimizing the negative impact of buildings on human health and the environment” (lines 56-58). Moreover, according to same *Section*, “this practice complements the conventional building design concerns of economy, durability, serviceability and comfort. (lines 58-60). Chapter I, Section 3 outlined the objectives of the GP Code. According to this *Section*, “[t]he GP Code provides a framework of minimum standards for sound environmental management that seeks to improve resource management efficiency while minimizing the negative impact of buildings to health and environment throughout the building’s life-cycle including site selection, construction, use, occupancy and maintenance” (lines 24-28).

Participation from the private sector is of importance in achieving the GB Code’s objectives and principles. And in order to better attract the same in pursuing a greener built environment is to have an “incentives grant framework” included in the policy arena to motivate participation. The Korean government’s Green Building Policy, for example, has an aggressive plans in fulfilling their objective of low carbon growth and said government believed that it will “require nationwide efforts to achieve [it]” (Kang, 2010). Thus, to make their efforts happen, in 2002, their government introduced their version of a Green Building Certification System. In that said system, under the Environmentally-friendly Building Certification System, buildings who acquire a green certificate with excellent and very good grades are awarded with exemptions from acquisition and registration taxes, while under the Energy Efficiency Certification System, buildings can enjoy eased construction standards and tax benefits according to the energy efficiency grade that they receive. As a response, major Korean construction industries have launched their respective research and development, that according to Kang (2010), “rather than taking a passive attitude towards the government’s measures, they are setting concrete goals and making aggressive efforts to achieve them”. In addition, Kang also stated that some construction companies has already been pursuing in constructing “advanced technology-applied buildings” such as zero-energy or carbon-zero houses.

Meanwhile, in the United States, several federal tax incentives have been designed to enhance the construction of energy-efficient buildings. According to Watson II (2009), these measures “should be equally attractive for business and individuals looking to remodel existing homes and workplaces to save energy and, as a bonus, taxes”.

In the current draft of the GB Code, nothing was stated that would ensure participation of the local and private sector. Although in Chapter III and Chapter IV where a

<sup>1</sup> Section 8 of the GB Code. (Coverage and Application)

Green Building Resource Center and a Green Building Certificates, respectively, are included, no such thing as a policy that would inspire the community in cooperating to achieve GB Code's goals.

Section 19 of Chapter III only deals with creating an office that will serve as a center for development and promotion of green buildings in the Philippines, while Section 21 of Chapter IV only elaborates on building permit applicants to secure a green building certificate for the purpose of certifying that the building designs and plans conforms to the requirements of the GB Code.

With the above-given related literature, the author suggests to add a policy on incentives grant, such as Korea and US' Tax incentives in the GP Code as to attract participation.

### CONCLUSION & RECOMMENDATIONS

The development of national approach on green building codes and standards has become an emergent focus in the regulatory arena today. Various code documents are now available or are scheduled for completion, just like the National Green Building Code of the Philippines. Consideration of these model codes by regulators is accelerating. But still, there are doubts and troubling questions about the impacts of mandatory green building regulations on the economic benefits, that as of writing, no empirical data were still published on the said economic benefits a certain Green Building project has published.

Given the complexities of studying the Green Building Environment phenomena, particularly, the Green Building Code, the author in this paper recommends separating every aspects of a national code since each requires expertise from different field.

### REFERENCES

- [1] (2014). Philippines: DPWH prepares to launch green, sustainable building code in 2015. *Official Gazette*. Retrieved from <http://www.gov.ph/2014/07/25/dpwh-prepares-to-launch-green-sustainable-building-code-in-2015/> on 25 March 2015.
- [2] Abair, J. W. (2008). Green Buildings: What It Means To Be "Green" and the Evolution of Green Building Laws. *Urban Lawyer*, 40(3), 623-632.
- [3] Assad, M., Hosny, O., Elhakeem, A., & El Haggag, S. (2015). Green building design in Egypt from cost and energy perspectives. *Architectural Engineering & Design Management*, 11(1), 21-40. doi:10.1080/17452007.2013.775100.
- [4] Boschmann, E.E., & Gabriel, J.N. (2012). Urban sustainability and the LEED rating system: case studies on the role of regional characteristics and adaptive reuse in green building in Denver and Boulder, Colorado. *The Geographical Journal*, (179)3, 221-233. doi: 10.1111/j.1475-4959.2012.00493.x.
- [5] Burton, R., & Cox, J. (2011). BUILDING CODES RACE to GET GREEN. *Buildings*, 105(7), 39-42.
- [6] Hwang, B., & Tan, J. S. (2012). Green building project management: obstacles and solutions for sustainable development. *Sustainable Development*, 20(5), 335-349. doi:10.1002/sd.492
- [7] Kang, H. (2010). Korean Green Building Code. *SERI Quarterly*, 3(4), 105-111.
- [8] Kansal, R., & Kadambari, G. (2010). Green Buildings: An Assessment of Life Cycle Cost. *IUP Journal Of Infrastructure*, 8(4), 50-57.
- [9] Lee, T. (2012). Building Green: Local Political Leadership Addressing Climate Change. *Review of Policy Research*, (29)5, 605-624. doi: 10.1111/j.1541-1338.2012.00579.x.
- [10] Owens, B. ),, & Sigmon, J. ). (2010). LEED & green building codes. *ASHRAE Journal*, 52(6), S6-S8.
- [11] Pike, J. (2014). A TALE OF TWO CODES: THE INFLUENCE OF ALBUQUERQUE AND WASHINGTON ON GREEN BUILDING. *Boston College Environmental Affairs Law Review*, 41(1), 201-232.
- [12] Tam, V. Y., Hao, J. L., & Zeng, S. X. (2012). What affects implementation of green buildings? An empirical study in Hong Kong. *International Journal Of Strategic Property Management*, 16(2), 115-125. doi:10.3846/1648715X.2011.645559.
- [13] Watson, R.S. (2009). Harvesting Tax Benefits of Green Building Incentives. *Journal of Accountancy*.
- [14] Yun, W. (2014). Modular construction and evaluation of green building technology system based on LEED. *Journal of Chemical and Pharmaceutical Research*, 6(6), 2904-2913.
- [15] M. King, B. Zhu, S. Tang, "Optimal path planning", *Mobile Robots*, vol. 8, no. 2, pp. 520-531, 2001.
- [16] S. Burton, P. Steane, "Surviving Your Thesis", 1<sup>st</sup> ed., London: Routledge, pp. 21-44, 2004.
- [17] M. Beck, C. Hunter, "Private finance initiative uptake in UK local authorities", in *Public Private Partnerships: Managing risks and opportunities*, Eds. A. Akintoye, M. Beck, C. Hardcastle, Blackwell Publishing, pp. 369-383, 2003.
- [18] D. Mckinney, "Impact of Commercial Off-The-Shelf (COTS) software on the interface between Systems and Software Engineering", *Proceedings of the 21st International Conference on Software Engineering*, Los Angeles, CA, USA, pp. 627-628, 1999