RESEARCH

MARKET READINESS AND POLICY IMPLICATIONS FOR GREEN BUILDINGS: CASE STUDY FROM HONG KONG

Zhonghua Gou[1], Stephen Siu-Yu Lau[2], and Deo Prasad[3]

ABSTRACT

This study is to assess developers' market readiness to green construction including their ideas on green construction, their understanding of current green building policies, their awareness and familiarity with green building and related industries, and the barriers they are facing for implementing green building projects. By eleven face-to-face semi-structured interviews with locally-based developers, the study finds that the Green Building Market in Hong Kong is basically ready in technology level. However, the motivation for green development is confined to commercial buildings for lease. Legislation is agreed by developers as an effective motivator to green building development. An effective mechanism to provide incentives for market players to adopt green voluntarily is explored in this paper. Expedited permits and density bonus are thought to be major incentives.

KEYWORDS

green building, market readiness, developers' perspective, policy recommendations

Green building or construction involves using resource-efficient modes of construction, renovation, operation, maintenance and demolition of buildings (USGBC 2009). Around the globe, sustainable site development, energy efficiency/performance, water recycling/efficiency, usage of materials resources, and indoor environmental quality are the five core assessments of green building. Many countries have been proactive and have achieved major progresses in green buildings. In 1990, U.K. BRE (Building Research Establishment) announced a building environmental performance assessment system known as the BRE Environmental Assessment Method (BREEAM). Since then, many countries and cities began their research on green building assessment tools and gradually developed their own systems such as HK-BEAM (Hong Kong Building Environmental Assessment Methods, now replaced by BEAM Plus) by Hong Kong BEAM Society, LEED (Leadership in Energy and Environment Design) by U.S. Green Building Council, EEWH (Ecology, Energy saving, Waste Reduction and Health) in Taiwan, CASBEE (Comprehensive Assessment System for Building Environmental Efficiency) in Japan, Green Star in Australia, Green Mark in Singapore and GBL (Green Building Label) in China. Started in 1996, Hong Kong's BEAM certification had been granted to

[1]Corresponding Author. Faculty of Built Environment, University of New South Wales, gouzhonghua@gmail.com
[2]Department of Architecture, University of Hong Kong / College of Architecture and Urban Planning, Tongji University
[3]Faculty of Built Environment, University of New South Wales

about 200 properties by 2010, including properties owned by private developers and landlords (commercial and residential premises), government departments, academic and research institutions, and large corporations with their own offices (including banks and utilities) and warehouses. Despite Hong Kong being one of the first regions to start working on green construction, only a small number of buildings have received certification and green development lags behind many other countries (see Table 1).

Besides lagging behind other world cities, Hong Kong, as a serviced economy with no major energy-intensive industries, has to rely heavily on promoting green building to contribute to major carbon emissions cuts. Power generation is Hong Kong's major source of carbon dioxide emissions, which makes up more than 60% of total emissions; of this, buildings (both commercial and residential) account for 90% of electricity consumption (EMSD & EPD 2010). Therefore, whether the building is a green construction or not is significantly connected to electricity consumption and thus to carbon dioxide emissions. Apart from carbon reduction and air quality improvement, green construction can also protect people's health and improve employee productivity (USGBC 2010). Hong Kong therefore needs to encourage the rapid development of a green construction industry.

Despite the urgency and the shortcomings of current green building policy, there are information gaps that we seek to explore: firstly, how ready are the Hong Kong developers to

TABLE 1. Green construction certification in various countries.[1]

Launched	Country/City	Certification	Enforcement	Buildings certified (by the end of 2011)
1990	U.K.	BREEAM	Voluntary/Compulsory for government buildings and schools	Over 200,000
1996	Hong Kong	BEAM/BEAM Plus (since 2009)	Voluntary	Over 200
1998	U.S.	LEED	Voluntary/Compulsory for public buildings in some states	Over 40,000
1999	Taiwan	EEWH	Voluntary/Mandatory for the public sector (central government)	Over 500
2001	Japan	CASBEE	Voluntary/13 local governments in Japan have made it mandatory for certain businesses	Over 190
2003	Australia	Green Star	Voluntary/Mandatory for all commercial buildings of more than 2,000 square metres	Over 250
2005	Singapore	Green Mark	Voluntary/Regulations require all new buildings be constructed to the Green Mark standard since April 2008	Over 500
2007	China	GBL	Voluntary	Over 200

adopt green construction? And, secondly, what are the political and socio-economic situations that influence the way green construction develops in Hong Kong? This study investigates these questions by eleven face-to-face semi-structured interviews with locally-based developers with the aim to assess their market readiness to adopt green construction, including their ideas on green construction, their understanding of current green building policies, their awareness and familiarity with green building and related industries, and the barriers they are facing for implementing green building projects. We hope that this study will generate more effective policies to stimulate green construction.

LITERATURE REVIEW

We have reviewed existing literature on green building to identify the benefits, motivations, barriers and key policies that help in the development of green construction. Insights from this review formed the basis for the design of this study and data analysis.

Benefits

The U.S. Green Building Council reports that a typical LEED-certified building uses 32% less electricity, causing a reduction in annual average CO2 emissions of 350 metric tons (385 tons) (Bon and Hutchinson 2000; Occupational Health Service 2003). Savings in energy, water, productivity and health costs in a green building's operation could be four to five times larger than the initial cost premium in its construction. Green construction is a high-return investment because of improved employee productivity and health giving rise to less sick days. Green commercial developments offer a win-win situation for investors, landlords, and tenants. Furthermore, green buildings positively contribute to business performance and organizational effectiveness. Green buildings have been shown to affect high-level organizational outcomes, such as productivity, customer satisfaction and innovation (Heerwagen 2000; Gou, Lau et al. 2012; Gou, Lau et al. 2012).

Motivations

Developers' demand and willingness to adopt green construction practices are critical factors that determine the scale of development of the green construction sector. Demand is closely related to issues such as supply, knowledge, method, cost and value (Grosskopf and Kibert 2006; Hakkinen and Belloni 2011). Arguably, investors are unlikely to be significantly motivated simply by energy costs to purchase green construction. However, in the U.K., where the green building movement was first launched, owner–occupiers, who are less constrained by market norms, were the major driving force behind green construction development (Bordass 2000; Chan, Qian et al. 2009). Waddel (2008) also highlights the relevance of corporate policies and market-related issues. The commercial sector will become more positive towards green construction after establishing stronger corporate social responsibility and environmental reporting (Yau 2012). Some retailers already regard environmental responsibility as a competitive issue (Hakkinen and Belloni 2011). Leading actors have begun considering the life-cycle performance of retail buildings as an environmental impact and this has affected their behaviour as users and owners of buildings. Many international companies have begun insisting that their offices and factories are green to demonstrate their commitment to sustainability.

Barriers

Green construction is often perceived as having higher initial design and construction costs than conventional construction: energy-efficient mechanical and electrical systems may be more expensive, green materials also significantly add to costs (Aiello 2010). For example, compressed wheat board, a green substitute for plywood, costs about 10 times more than ordinary plywood (Hwang and Tan 2010). Some have reported that it is difficult to keep within project budgets in green construction (Eyre 1997; Davis 2001). Extra costs are also incurred searching for green alternatives and in the certification process (Ranaweera and Crawford 2010). Based on a study of 150 recent conventional and green buildings in 33 states across the U.S. and 10 other countries, Kats et al. (2008) found that green buildings cost up to 4% more than conventional buildings.

Furthermore, the benefits of green construction mostly accrue to the final owners and users of the building, and not to the developer. Therefore, it is difficult to convince developers about the benefits of green construction when most of those do not go to the developer. The additional costs of green construction are footed by the developer and cannot easily be passed to the tenants or eventual owners (Yudelson 2008). The return on investment period is generally around 20 years. It is anticipated that these extra costs are likely to gradually fall as new practices and technologies are developed and accepted by the market. However, these extra costs for now and the extra risks may dissuade many developers from voluntarily adopting green construction practices.

Another important obstacle is the difficulty in defining quantifiable requirements during procurement and tendering. Process-related barriers for green building include models of cooperation and networking, models of communication, roles of different actors (designers, contractors, managers etc.) (Scott 2006; WBCSD 2008), decision-making and management processes, and scheduling (Thibaudeau 2008). Since there is a lack of common knowledge and accepted terminology on sustainability, green construction development could be further hindered because of communication problems between individual actors and within organizations themselves (Hakkinen and Belloni 2011).

Policies

Government policies are essential to promoting green building development and each country develops its own policy instruments. Via extensive literature reviews (Yudelson 2008; Yudelson 2008; Pippin 2009) on U.S. green building development, nine popular incentives adopted by governments to encourage green construction by the private sector were identified and characterized (Table 2). However, the reviews also revealed that although developers are aware of these incentives, they do not always take advantage of them. One reason is that developers' timetable for a project sometimes cannot incorporate the response time needed by a local government. Developers need to make quick decisions but governments prefer to move slowly and observe "due process."

METHOD

We conducted 11 face-to-face semi-structured interviews with locally-based developers. There are 20 major local real estate developers in Hong Kong. Interview invitations were sent by email to them in December 2010. After phoning the emailed developers, 11 leading developers agreed to be interviewed. The interviews were conducted between December 2010 and

TABLE 2. Nine incentives most frequently offered in the U.S.

Incentive	Frequency
Incentive payment from a utility energy-efficiency program	1
Direct monetary payment (grant, rebate or reimbursement)	2
Expedited permit processing	3
Marketing/publicity/awards	4
State income tax credit	5
Property or sales tax rebates or abatements	6
Density bonus	7
Access loans/loan funds	8
Full or partial refunds for development fees	9

February 2011. Even though the number of interviews is small, the 11 developers represent a diverse background in terms of business nature and scale of operation. 8 of the 11 are private developers, while three are institutional developers (governmental or semi-governmental). Several of them are among Hong Kong's top developers, while others are small- to mid-size. Some of the developers are only engaged in construction, while others also lease their properties. Although our findings are not conclusive, they can help in indicating developments and challenges to green construction in Hong Kong.

Interview questions were split into seven themes: 1) organization background; 2) understanding of green construction; 3) experience of green construction; 4) motivations to engage in green construction; 5) barriers to engaging in green construction; 6) prospects for green construction; and 7) attitude to public policies/incentives for green construction. Each interview lasted about one hour.

ANALYSIS

Developers' experiences of green construction

All respondents said they were familiar with green building certification systems. They said they were most familiar with HK-BEAM the locally recognized assessment scheme, LEED from the U.S., BREAM from the U.K., and GBL from China. They also said they believed they knew a lot about various aspects of green construction (Table 3). None of them said they were unaware of any of these aspects. We can conclude that they are all confident about their knowledge of green construction. One respondent said:

> "We have a good knowledge of all the above. We use it, we keep records, conduct technical reviews and apply it in our projects. We are very aware of it."

However, in actuality, the proportion of buildings that are green construction in their projects is quite low (Table 4). 5 of the 11 developers said some of their portfolio could be classified as green construction, and of these only two of them have all their properties BEAM certified.

The respondents identified savings in energy costs, environmental concerns, comfort, health and productivity, and a company's social responsibility as the main attractions of green construction (Table 5).

TABLE 3. Six key green building elements and developers' awareness of them.

Green elements	Responses			
	Little knowledge	Some knowledge	Good knowledge	Don't know
Sustainable site	0	3	7	1
Water efficiency	0	2	9	0
Energy efficiency	0	2	9	0
Material efficiency	0	3	8	0
Indoor environment quality	0	2	9	0
Management and operation	0	2	9	0

TABLE 4. The percentage of buildings with BEAM certification in respondents' portfolios (of buildings completed after BEAM was launched)

Developer	1	2	3	4	5	6	7	8	9	10	11
Proportion	100%	90%	<10%	0%	Unknown	0%	100%	0%	0%	<5%	Unknown

TABLE 5. What developers see as the main motivation to voluntarily adopting green construction practices.

Motivations	Responses			
	Disagree	Half-half	Agree	Don't know
Low operation energy cost	0	0	9	2
Environmental friendly	0	0	11	0
Reduces greenhouse gases	0	1	9	1
Ability to differentiate in the market	0	1	8	2
Lower vacancy rates	1	2	4	4
Ease in re-sale	0	1	5	5
Higher rents and/or sales prices	0	2	6	3
Improves comfort, health and productivity	0	1	9	1
Company commitment to sustainability	0	0	10	1

It is interesting to note that tenants, particularly high-end tenants looking for Grade A office buildings, are a key driving force for developers to apply for international green certification, such as LEED. One respondent told us:

> "When you work for a developer and an international company, you have to think about what the new building will be, what kind of people will your tenants be. In fact, if we have a Grade A office building certified by LEED, it's more likely that we can attract international tenants."

Some interviewees said that they would rather apply for LEED certification in commercial developments, than for HK-BEAM, because potential tenants are likely to be more familiar with LEED.

It is also important to note that the developers did not believe that green construction itself carried strong financial incentives, such as lower vacancy rates, easier to resell, and able to charge higher rents. They cited lack of interest from clients as one of the major reasons that made residential developers in Hong Kong lukewarm to adopting green construction practices. One respondent told us:

> "Electricity and water prices are still low in Hong Kong…Hong Kong people probably don't think these costs are expensive and so they are more concerned about the view or something else about the building rather than evaluating the building's environmental performance."

Ten of the respondents agreed that according to their experience, initial costs for green construction were higher than conventional construction projects. However, some of them agreed that if green elements were integrated early on in the project then the difference in cost could be kept low. Some of them also pointed out that the difference in cost depended on what kind of green elements were incorporated into the design.

One respondent perceived that this difference in initial costs could vary from 2 to 5 %; another respondent estimated that it could be 10%–15%. The extra costs were for purchasing green materials, energy-efficient systems, grey water systems, and to pay for consultant and certification fees. Provided that the systems or technologies purchased were all well established, the developers said the extra costs would not be significant.

One respondent said it would take a long time to get back the costs for some new green technologies. For example, a residential project that installed solar panels might need to pay an extra HK$3 million. The yearly savings from reduced energy costs would be HK$ 40,000 and therefore, it would take 75 years before the initial cost could be regained. For technologies which used wind power, it might take 100 years to get back the costs, because wind is so variable. Those respondents who had had experience in green construction said they would first research the performance of green features before incorporating them into a project. One of the respondents said:

> "We do not yet use solar panels or wind turbines to generate energy for urban buildings. We don't have them because it does not make good business sense… for a green roof, we can lower the heat-island effect and also have a good business case to save energy and money. So basically we choose the features because of the combination of environmental, social and economic factors."

These responses indicate that the balance of initial cost and payback is still higher for high technologies (like solar panels), in line with the findings from other studies (Chan, Qian et al. 2009). However, the developers suggest that there are opportunities to save money in green construction if the green elements are incorporated at an early stage. One respondent commented: "When we start the process a little bit later, then there might be a few things that we can do, but now we are changing our practices, we get it in at the very beginning and it does not bring additional costs."

Potential barriers for the development of green construction

Respondents were asked what they believed were the main problems holding back the development of green construction in Hong Kong. As Table 6 shows, the main issues were the lack of green materials suppliers and a lack of interest from the public and clients.

TABLE 6. The main problems holding back green construction according to the developers.

Barriers	Responses			
	Disagree	Half-half	Agree	Not sure
Lack of training/education	2	4	5	0
Lack of expressed interest from clients	3	2	6	0
Lack of expressed interest from the public	2	2	7	0
Lack of interest from the project team	5	3	1	2
Lack of technical understanding of the design team	5	1	5	0
Lack of technical understanding of the sub-contractors	1	3	6	1
Lack of technical understanding of the construction team	4	3	3	1
Not sure where to get news and information	7	2	2	0
Green building options are too expensive	3	6	0	0
Difficult to obtain financing from banks	6	2	1	2
Long pay-back period	1	5	4	1
Lack of relevant professionals	4	1	6	0
Lack of green materials suppliers	2	2	7	0
Insurance/liability issues for non-standard materials or technologies	5	2	3	1

Out of the 11 respondents 7 of them said that the lack of green products suppliers is a barrier. One respondent said:

> "We have tried getting air-conditioners that recycle excess heat for hot water systems. They are readily available in China, Japan, Canada, the U.S. and Europe, but no one carries them in Hong Kong. So market availability of certain products is one of the barriers. Usually, they are made in China, but they have to be shipped to the U.S., and then shipped back here. FSC (Forest Stewardship Council) certified timber and other similar products often get certified bamboo from China, but you can't readily get it in Hong Kong."

Six respondents also agreed that there is a lack of interest from clients for green construction. Prospective buyers are more concerned with a building's location and quality over its environmental performance. The government should therefore provide incentives and encourage public awareness so that buyers start to take environmental factors into account. Six of the respondents agreed that workers in Hong Kong's building sector lacked knowledge of green construction. Six respondents said sub-contractors lack knowledge in this area, although the project, design and construction teams generally have a better awareness. They said they were aware where to get information on green construction and said it was not difficult to obtain financing from banks for green projects.

Government policy

We asked respondents to rank the following incentives in term of their effectiveness at driving a green construction market: Monetary incentives (e.g. fee reduction, subsidies, grants, special

loans, tax rebates); Development priority (e.g. favourable zoning, development density, expedited permit/review); Publicity (e.g. awards, public promotion); Technical support (e.g. provision of free or subsidized education/ technical consultancy services); Legislation (e.g. mandate green building development). For the most favourable, five points are awarded; for least favourable one point is awarded (Table 7).

Legislation was voted the most effective policy. One respondent said, "There are lots of studies that prove legislation is the most effective method. If you don't legislate, people won't start to do it. But legislation needs to be supported by other methods to make it more attractive to the commercial sector."

Development priority was thought to be fairly effective. Hong Kong land prices are high, and so this will bring in considerable profits, so it will stimulate green development. Monetary incentives were ranked third. Although it is more direct, developers are more skeptical about the amount of money that would be awarded. Publicity and technical support were considered to be least effective.

One respondent said, "Technical support and publicity do not help much. It is good for public awareness but not for the tenant….we do it ourselves, the government doesn't do it. We educate the tenants ourselves."

Since most of the respondents said that legislation was the most effective way to push green construction in Hong Kong, we asked them if the government were to make all developers apply for a minimum green standard in the next three years, what needs to be done to make it easier for them to comply. Most respondents said they doubted that the government would be able to implement such a policy.

> "Maybe there is no strong leader in government who believes in doing this. The best way is to put it in legislation. The weakness of this policy is that the government wouldn't be fully motivated to do it."

Most respondents said they hoped the government would provide clear directions and guidelines. One respondent said that the HK-BEAM currently works on a voluntary basis and there is a manpower shortage and so any new such policy would suffer from the same problem. One respondent recommended that the government should set up a semi-governmental body to beef up capacity. Some respondents said that the government should increase cooperation between its own departments and restructure the government to make it easier to run this kind of scheme.

Respondents were asked whether they believed governmental incentives are effective in encouraging green construction in their organization. Table 8 shows their responses. All respondents said the incentives were very useful. Among all incentives, expedited permits and density bonus were considered to be the most effective. Favourable zoning, public promotion, and other monetary incentives were also thought to be effective.

TABLE 7. Five major incentives.

Incentives	Monetary incentive	Development priority	Publicity	Technical support	Legislation
Points	35	41	18	17	54

TABLE 8. Government's green construction incentives and developers' views on their effectiveness

Incentives	Responses			
	Useless	Half-half	Useful	Not sure
Fee reduction	3	2	6	0
Subsidy	2	2	7	0
Grant	3	1	6	1
Special loans	1	1	7	2
Tax incentives	2	0	7	2
Expedited permitting/reviews	1	0	9	1
Density bonus	1	1	8	1
Favourable zoning	1	3	7	0
Awards	1	4	5	0
Public promotion	3	1	7	0

DISCUSSION AND CONCLUSION

This study investigates Hong Kong developers' perceptions, practices and experience on green building, and market readiness for the government to achieve more effective green building policy in the future. The results by interviewing 11 local developers are summarized in Table 9. The study finds that the Green Building Market in Hong Kong is basically ready in technology level, as most interviewees are familiar with different types of green building certification systems, and have a good or very good knowledge of the key elements of green buildings. Most respondents show that they know how to invest in green buildings, and have accumulated experience to reduce risks or additional costs.

Although for commercial buildings, international tenants are important market driven forces for green building certification, this incentive has a minimal effect in most properties for sale. Minimal market incentives has been created in the residential market because the developers neither need to pay for the electricity and the buyers pay very little attention to energy consumption when buying a flat as the cost of electricity bill is relatively low. Most interviewees agree that legislation is the most effective way to promote green building in Hong Kong. Respondents said that legislation was important for the development of green construction. For example, Singapore has released its green plan for the next 20 years, including the ambitious goal of having at least 80% of buildings certified at minimum Green Mark rating by 2030. The Singapore government will also take the lead by requiring all existing buildings owned by government agencies to meet the Green Mark Gold plus standard by 2020.

However, government intervention in the market can be controversial (Lee and Yik 2005). An effective mechanism to provide incentives for market players to adopt green voluntarily was an alternative. Many respondents said that expedited permits and density bonuses are major incentives. Density bonus is a very attractive incentive for developers in highly dense cities. For example, the Green Mark Gross Floor Area Incentives Scheme in Singapore grants developers who achieved the highest Green Mark Platinum or Green Mark Gold Plus Award an additional floor area up to 2% of the total gross floor area of the project, subject to a cap of 5,000 square metres.

TABLE 9. Key findings from interviews.

Experience	**Knowledge**	All respondents were familiar with green buildings.
	Motivation	International tenants looking for Grade A office buildings, were a key driving force for developers to apply for LEED.
	Barriers	The main issues were the lack of green materials suppliers and a lack of interest from the public and clients.
	Cost	The difference in cost depended on what kind of green elements were incorporated into the design.
Policy	**Effectiveness**	Legislation was voted the most effective policy.
	Incentives	Expedited permits and density bonus were considered to be the most effective incentives.

Monetary incentives will also stimulate interest in green construction. Green construction is associated with higher costs and a comparatively longer time before these costs can be recouped. In some countries, government subsidies help. For example, the Green Mark Incentive Scheme in Singapore offers allowances of S$3 to S$6 per square meter (equivalent to HK$19 to HK$38) for all buildings qualified for Gold and Platinum Awards respectively. Tax exemption is another possible incentive. The U.S. city of Baltimore offers tax credits for all new residential constructions that qualify for a minimum LEED Silver certification: namely 40% credit for LEED Silver certification, 60% for LEED Gold, and 100% for LEED Platinum, given as an annual maximum credit of US$5 million (Yudelson 2008; Yudelson 2008; Pippin 2009).

In sum, green construction is one of the key approaches that a city can apply to cut its carbon dioxide emissions and save energy. It plays a crucial role in saving government money, secure its energy supply, and helping a country achieve its target on carbon dioxide emissions cuts. This article suggests an effective carrot-and-stick system to stimulate green construction.

ACKNOWLEDGEMENTS

The authors like to thank all participants involved in the interview. Many thanks are due to Green Peace East Asia who funded this research. The interview is survey is approved by Human Research Ethics Committee for Non-Clinical Faculties at the University of Hong Kong. The reference No. is EA281010.

ENDNOTES

[1]Sources of current green construction information in various countries:
BREEAM: http://www.bre.co.uk/newsdetails.jsp?id=741
BEAM/ BEAM Plus (since 2009): www.beamsociety.org.hk/
LEED: http://www.cleanlink.com/news/article/Number-of-LEEDCertified-Buildings-Grows—13076
EEWH: http://web1.nsc.gov.tw/public/Data/1461454529.pdf
CASBEE: http://www.ibec.or.jp/CASBEE/english/certified_bldgs.htm
Green Star: http://www.fastthinking.com.au/current-affairs/green-star-buildings-explode-across-australia.aspx
Green Mark: http://www.eco-business.com/features/singapore-growing-asias-green-building-centre/
GBL: http://www.chinagb.net/gbmeeting/igebc7/xinxi/sjsj/20110401/76127.shtml

REFERENCES

Aiello, S. (2010). "Addressing Financial Objections to Sustainable Design and Construction." *Journal of Green Building* 5(4): 67–77.

Bon, R. and K. Hutchinson (2000). "Sustainable construction: some economic challenges." *Building Research and Information* 28(5/6): 301–304.

Bordass, W. (2000). "Cost and value: fact and fiction." *Building Research and Information* 28(5/6): 338–352.

Building Research Establishment (2008). Building Research Establishment's Environmental Assessment Method. Watford, UK, Building Research Establishment.

Chan, E. H. W., Q. K. Qian, et al. (2009). "The market for green building in developed Asian cities—the perspectives of building designers." *Energy Policy* 37(8): 3061–3070.

Davis, A. (2001). Barriers to Building Green. *Architecture Week.* 63.

EMSD & EPD (2010). Greenhouse gas emission and its control in Hong Kong. Hong Kong, Electrical and Mechanical Services Department & Environmental Protection Department.

Eyre, N. (1997). "External costs: what do they mean for energy policy?" *Energy Policy* 25: 85–95.

Gou, Z., S. S.-Y. Lau, et al. (2012). "Indoor Environmental Satisfaction in Two LEED Offices and its Implications in Green Interior Design." *Indoor and Built Environment* 21(4): 503–514.

Gou, Z., S. S.-Y. Lau, et al. (2012). "A comparison of indoor environmental satisfaction between two green buildings and a conventional building in China." *Green Building* 7(2): 89–104.

Grosskopf, K. R. and C. J. Kibert (2006). "Developing Market-Based Incentives for Green Building Alternatives." *Journal of Green Building* 1(1): 141–147.

Hakkinen, T. and K. Belloni (2011). "Barriers and drivers for sustainable building." *Building Research & Information* 39(3): 239–255.

Heerwagen, J. (2000). "Green buildings, organizational success, and occupant productivity." *Building Research & Information* 28(5/6): 353–367.

Hwang, B.-G. and J. S. Tan (2010). "Green building project management: obstacles and solutions for sustainable development." *Sustainable Development* In Press DOI: 10.1002/sd.492.

Lee, W. L. and F. W. H. Yik (2005). "Regulatory and voluntary approaches for enhancing building energy efficiency." *Progress in Energy and Combustion Science* 30: 477–499.

Occupational Health Service (2003). A Simple Guide to Health Risk Assessment: Office Environment Series OE 2/2003. Hong Kong, Occupational Health Service, Labour Department.

Pippin, A. M. (2009). Government Green Building Incentive Programs for Private Development. Athens, GA, University of Georgia Land Use Clinic.

Ranaweera, R. and R. H. Crawford (2010). "Using Early-Stage Assessment to Reduce the Financial Risks and Perceived Barriers of Sustainable Buildings." *Journal of Green Building* 5(2): 129–146.

Scott, A. (2006). "Design Strategies for Green Practice." *Journal of Green Building* 1(4): 11–27.

Thibaudeau, P. (2008). "Integrated Design is Green." *Journal of Green Building* 3(4): 78–94.

USGBC (2009). Green Building and LEED Core Concepts, U.S. Green Building Council.

USGBC (2010). Green building and human experience: Research program white paper, U.S. Green Building Council.

WBCSD (2008). Energy Efficiency in Buildings Facts and Trends: Summary Report, World Business Council for Sustainable Development.

Yau, Y. (2012). "WILLINGNESS TO PAY AND PREFERENCES FOR GREEN HOUSING ATTRIBUTES IN HONG KONG." *Journal of Green Building* 7(2): 137–152.

Yudelson, J. (2008). *The Green Building Revolution.* Washington, Island Press.

Yudelson, J. (2008). *Marketing Green Building Services: Strategies for Success,* Architectural Press.