RESEARCH

REAL ESTATE DEVELOPERS' CONCERNS ABOUT UNCERTAINTY IN BUILDING ENERGY EFFICIENCY (BEE) INVESTMENT— A TRANSACTION COSTS (TCS) PERSPECTIVE

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ABSTRACT

Buildings account for 40% of global energy consumption and nearly one-third of global CO_2 emissions; and the resulting carbon footprint significantly exceeds that of all forms of transportation combined. Attractive opportunities exist to reduce buildings' energy use at lower costs and higher returns than in other sectors. This paper analyzes the concerns of uncertainty, in terms of transaction costs, to the real estate developers when they make decisions about investing in Building Energy Efficiency (BEE). To solicit views of developers regarding BEE investment, in-depth interviews were conducted with 15 executives and architects who work in big real estate development firms covering 80% of real estate activities in Hong Kong. This research applies transaction cost economics (TCE) to study the underlying reasons resulting from uncertainty that cause market reluctance to accept BEE by choice. It provides a detailed analysis of the current situation and future prospects for BEE adoption through studying the impacts from three aspects: economic, market and policy uncertainties. It delineates the market and suggests possible policy solutions to overcome the uncertainties and to attain the large-scale deployment of energy-efficient building techniques. The findings establish the groundwork for future studies on how to choose a particular policy package and what roles government should play to solve the existing problems in BEE development.

KEYWORDS

Building Energy Efficiency (BEE), Transaction Costs (TCs), uncertainty, real estate developers, Hong Kong

INTRODUCTION

The building industry consumes a substantial amount of resources and has a large impact on the environment (Chan & Lau, 2005; OECD, 2003; Qian et al., 2006; Zhang, 2004). Buildings account for 40% of global energy consumption and nearly one-third of global CO_2 emis-

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sions (Levine et al., 2007). New buildings that are energy-inefficient are being built every day, and millions of today's inefficient buildings will remain standing in 2050 (WBCSD, 2009). Moreover, the energy usage of buildings is growing rapidly as more people move into modern homes and acquire amenities such as heating, cooling, and refrigeration. The International Energy Agency (IEA) estimates that the energy demands of buildings will have grown at an average annual rate of 1.2% between 2008 and 2035 (WEO, 2010, pp439), which means that by 2035, the demand by buildings for energy will increase by 38% compared to a base level set by 2008. There is an urgent call for the building industry to raise their awareness and contribute their efforts on BEE development so as to combat climate change and address environmental concerns.

With socio-economic progress, more building market stakeholders are getting involved and each of them looks after their own business interests which may conflict with each other. Real estate developers generally do no more than just meeting the basic requirements of the law and policies to minimize the costs engendered by the extra work entailed by mandatory energy efficiency regulations. Contractors also want to avoid these extra tasks, which require special expertise and specialized equipment that they do not typically possess. Manufacturers of BEE products want regulations to be even stricter to create greater demand in the market. Financially, building-design professionals and institutes will not be adversely influenced by the new policies but are apt to succumb to the demands of developers because of the nature of their relationship with them. These conflicting interests are the main sources of the uncertainties of and barriers to BEE development. Government could play an essential role by looking into their concerns and taking them into consideration in policy design.

Economic theories suggest that market structure and performance is determined by the ease of entry and exit (Baumol et al., 1982). Compared to conventional building, the barrier to the BEE market is higher due to uncertainties, such as greater capital costs, new information, new technology, financial risks, and so forth. If there is asymmetric information about quality standards or requirements that are not mandatorily imposed onto the market, the opportunistic behavior of most market players may lead them to continue producing conventional buildings (Akerlof, 1970). There is a growing attention to the BEE market; however, it has expanded less rapidly than the world would like to see. The benefits to be secured from BEE are only vaguely understood by the general public and have not been widely pursued, particularly in the private sector of the building industry, which needs closer study.

A lack of concern and the failure to study the role of transaction costs also affects the potential economic effectiveness of policy implementations and markets. Moreover, research has not typically treated the uncertainty aspect among the perspective stakeholders as involving extra costs. So far, there has been little theoretical research into transaction costs (TC) with major stakeholders of BEE, i.e., real estate developers. This research fills this gap with analysis and findings relating to institutions to illuminate its policy implications.

This research is to ascertain the developers' concerns about transaction costs (invisible costs or hidden costs, including risks and time, as opposed to capital costs), and to disclose the role of uncertainty in the BEE investment, which causes the transaction costs. It studies the real estate developers' concerns of uncertainty in their BEE investment from three aspects: economic uncertainty, market uncertainty and policy uncertainty. The study is based on the interviews with real estate developers and their professional representatives in Hong Kong to identify the impacts of uncertainty on their decision-making in actual practice of BEE investment.

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LITERATURE REVIEW

BEE research and transaction costs economics (TCE) approach

Most BEE research is either focused on pure technology from an engineering point of view or on government policy generally in a cost-benefit analysis. These two different approaches both suggest that BEE is beneficial to most of the market stakeholders, as well as to society. Although the net benefit for society has been known for a long time, not enough action has been taken to promote energy efficiency (Koeppel and Urge-Vorsatz, 2007). The stakeholders still seem to hesitate about voluntarily entering the BEE market. This may be due to certain characteristics of the market, technologies, and end-users who reject rational, energy-saving choices in the purchase and use of appliances during the life-cycle of a building. It justifies a critical review of the current market situation to address BEE development. Given the current sophistication of technology, a better-designed policy package to promote BEE could increase effectiveness and efficiency by 40% (OECD, 2003). Therefore, there is a great potential in studying the stakeholders' concerns that affect BEE investment.

Neoclassical economics shows that a perfectly functioning market will yield an economically efficient outcome in equilibrium. However, no real-world markets meet all the assumed attributes of perfection. From the new institutional economics perspective, transaction costs are huge, and market failures, which often occur, inhibit exchange, production, and economic growth. The power of transaction costs under alternative institutional arrangements is also crucial to the workings of markets (Cheung, 1998; Coase, 1998; Benham and Benham, 1997; North, 1990, 1991). From a transaction cost economics perspective, researchers regard energy efficiency as a co-ordination and incentive problem, rather than one of utility maximization, and they emphasize that policy intervention and different institutional structures may lower transaction costs and provide net social benefits (Golove and Eto, 1996; Levine et al., 1995). A better understanding of the nature and structure of transaction costs is necessary to design an incentive scheme that changes the market mechanisms for BEE investment. This study intends mainly to look into the uncertainty aspect to the BEE market from the transaction costs economics perspective.

Transaction cost economics (TCE) argues that markets and organizations provide alternative means of organizing economic activities and that the choice between them depends upon a number of factors, including the relative magnitude of transaction costs (Williamson, 1979, 1985). In common with orthodox economic theory, TCE explains the behavior of individuals rather than social structures and assumes these individuals to be rational actors in that they seek out opportunities to improve economic efficiency. In common with agency theory, TCE attaches particular importance to asymmetric information and opportunism. However, TCE extends the orthodox/agency framework by first introducing the behavioral assumption of bounded rationality, then focusing on the natures of different transactions and the costs and risks associated with them, and third, explaining why particular types of transaction are associated with particular types of governance structures (Sorrell et al, 2004).

In practice, transaction costs are notoriously difficult to measure, with the result that "… there is a suspicion that almost anything can be rationalized by involving suitably specified transaction costs" (Williamson, 1979, p. 233, Sorrell et al, 2004). This study chooses to focus upon one dimension of transaction costs- uncertainty, their impact and perspective in different scenarios, and how they can be minimized by the choice of an appropriate governance structure or policy packages. For the purpose of this research, TCE provides a comprehensive

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framework through which to understand the stakeholders in the real estate market in general and the BEE market and its barriers in particular.

Uncertainties—Economic, Market and Policy Uncertainty

The key transaction costs (TCs) variables are asset specificity, (environmental and behavioral) uncertainty and frequency. Asset specificity refers to durable investments that are undertaken in support of particular transactions; and these specific investments represent sunk costs that have much lower value outside of these particular transactions (Williamson, 1985). Environmental uncertainty is commonly conceptualized as outcome unpredictability due to environmental volatility (e.g. changing technology) (Heide & John, 1990, Noordewier et al, 1990, Rindflesisch & Heide, 1997). Behavioral uncertainty arises due to the difficulties associated with monitoring the contractual performance of economic exchange parties (Williamson, 1985). Frequency refers to how often the buyer purchases in the market (Williamson, 1985).

Uncertainty is the key element of transaction costs (Staley, 1998) and plays a vital role in the stakeholders' decision-makings of their BEE investment (Qian, 2012). The primary reason is that the degree of compliance of BEE code cannot be perfectly observed from the public, and some developers and manufacturers may exaggerate the energy efficiency performance. The extreme case is to sell the conventional building product at the price of BEE, which would fill the BEE market with a lot of fake and low-quality non-BEE products. As practical evidences show, the inability to distinguish the BEE from the non-BEEs and the constant doubt from the public further undermines the attractiveness of BEE to stakeholders and eventually leads to a "Lemon market". Moreover, the external factors, such as the stability of economic and policy environment, will also cause the concerns of the stakeholders in their decision-making process on BEE. Based on the interviews among the real estate developers, we may have a better understanding the impacts of transaction costs from the perspective of uncertainties.

In this study, the authors mainly focus on the uncertainty impact on the real estate developers' decision-making of BEE investment. According to the unique features of BEE market, we further break down the environmental and behavioral uncertainty into three aspects: economic and policy (- environmental) and market (- behavioral) uncertainty.

METHODOLOGY

Interview with the Real Estate Developers

In-depth interviews with the executives and architects who work in big real estate development firms in Hong Kong were conducted to solicit their views on issues regarding BEE investment. The interviewees selected were 15 top managers, directors or their representatives who actively worked in major real estate development firms or architectural firms, covering 80% of real estate activities in Hong Kong. The purpose was to get the first hand opinions of real estate developers about the role of uncertainty in their BEE investment. This study also provides a better picture of BEE market development relating to a specific institution in the Hong Kong case, and gives a reference for designing rational policy.

Real estate developers are the dominant force in the building market. As most incentive schemes for BEE promotion are market-based and voluntary, the stakeholders involved are free to accept or reject them. There are two major reasons that real estate developers are not

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motivated by most of the existing incentive schemes. First, the extra transaction costs involved are too heavy and the developers would rather give up potential benefits to avoid the attendant difficulties; second, the benefits from the schemes are not enough, which means that the incentive itself is not a sufficient inducement for the potential investors to become involved.

Setting Hypotheses and Design of Interview Questions

The interview questions were designed to address "uncertainty"—one of the three major theoretical dimensions of transaction costs: specific investment, frequency, and uncertainty. Four hypotheses regarding "uncertainty" were developed from three aspects- "economic uncertainty", "market uncertainty" and "policy uncertainty", and related open questions about the interviewees' opinions were designed to test them.

The hypotheses and the interview questions were designed based on the literature review and pilot discussions with a few experts in industry and academia. The relations between the three aspects- economic, market and policy, four hypotheses (H), and seven interview questions (Q) are listed in Table 1 below. Remarks in the following paragraphs explain how the interview questions relate to the hypotheses. The purpose of these interviews is to understand

TABLE 1. Setting Hypotheses and Questions for Uncertainty.

	Economic uncertainty
H1	The economic context (upturn or downturn economic transition) affects the concerns of the real estate developers about BEE investment.
Q1	At times of economic transition, what new challenges or opportunities arise for investments in BEE? How do shifts in the economy change the developers' major concerns (neutral, positive, or negative) and in which aspects?
Q2	When the direction of the economy shifts, how might developers integrate green features into original investments to increase market competitiveness?
H2	Changes in economic conditions (upturns and downturns) call for the attention of government to adjust BEE policies as necessary to seize BEE development opportunities.
Q3	What role should government play in BEE promotion (more intervention or less intervention in a recessionary economy)?
Q4	What BEE promotions or incentive could government introduce in times of economic change that would be less upsetting to the market players' normal activities?
	Market uncertainty
H3	The end-users' variable expectations about BEE increase market uncertainty to the developers (e.g., they may misinterpret a focused group as the end-users of their final products.)
Q5	Occupants' behavioral differences may lead developers to produce different BEE/GB at different performance levels. What is your view?
Q6	Will concerns about social classes (different education levels, experiences, financial ability to enjoy the benefits of BEE) affect the developers' concern about BEE investment?
	Policy uncertainty
H4	The earlier the stage of BEE policy implementation, the greater the real estate developers' concern about transaction costs.
Q7	Would a new incentive and a currently mature incentive affect the developers' concerns about BEE differently? In other words, encountering BEE incentives, would the developers have more concerns during the early or later stage of the implementation of the incentive? How are they different?

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the concerns in terms of uncertainty that affecting the BEE investment decisions by using an in-depth local case study from the developers' viewpoint to ascertain the impact of transaction costs in practice.

Remarks

- Uncertainty about BEE investments is one of the general features of transaction costs that cause real estate developers worry. Uncertainty is examined in this study from three perspectives: economic uncertainty, market uncertainty, and policy uncertainty.
- What is the impact of economic transition on the BEE development (to the developer – H1; to the government – H2)? Is it a challenge or an opportunity? How do the developers' concerns change in an economic downturn or upturn? What should government be alert to during such periods and how can it develop the most effective policies to promote BEE accordingly? These are the main issues that are addressed in interview questions Q1–Q4.
- The market also creates many uncertainties for developers. They may be hesitant to invest in BEE due to a lack of confidence in estimations of market demand. The end-users' expectations and concerns about BEE may be better known, so that both the developers and the government could seize the opportunity to promote BEE. This brings H6 onto the horizon. Q5 and Q6 are designed to detail the behavior and concerns of the market end-users about BEE by segmenting the customers so that the real estate developers might have a more confident business strategy and so that the government can design its incentive policies to cater to more focused groups based on a better understanding of the needs and concerns of both end-users and developers.
- Policy also affects uncertainty during different implementation stages. This uncertainty affects the worries and enthusiasm of the market variously, thus affecting the effectiveness of the policies themselves. The policy uncertainty is based on the assumption that the timing of the policy's introduction is a major factor in causing uncertainty for the real estate developers (H4). Q7 is designed to elicit information about how the stage at which the policy is implemented affects the real estate developer's concerns, which gives government information that lets it have market concerns in mind as it implements policy at different points in the process.

EMPIRICAL ANALYSIS AND INTERVIEW RESULTS

Tables 2, 3, 4 cover the data collection and analysis from the interviews.

1. Economic Uncertainty

Observations on the findings:

- This table illuminates the market situation and developers' business concerns and is one of three tables regarding the uncertainty aspect of transaction costs. Four interview questions are designed to test H1 and H2 as to one of the three categories of uncertainty – economic uncertainty. All four questions look at how economic uncertainty affects BEE development by causing additional transaction costs.
- The respondents had a wide ranges of viewpoints about new challenges and opportunities at times of changing economic conditions: 40% believe that "It all

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TABLE 2. Interview results on economic uncertainty.

H1 The economic context (upturn or downturn economic transition) affects the concerns of the real estate developers about BEE investment.																			
Questions		Responses	Remarks on interviewees																Overall
			VC	MT	KS	FC	Pe	SK	JP	Sm	SY	Q	NB	TM	WC	KC	EC		
Q1	At times of economic transition, what new challenges or opportunities arise for investments in BEE?	It depends on the planning and priority and value judgment of the corporation and individual decision-maker.		√							√	√	√		√		√		40%
		When product harder to place in the market (less demand, more competition), green building can be competitive advantage which is not necessary in times when easy to sell. So more incentive to go in green building								√									6.7%
		Do more, faster and put more resources in the economic upturn.						√	√		√							√	26.7%
		Limited budget in the downturn.	√			√													13.3%
		More challenges than opportunity in the downturn.			√			√							√				20%
	How do shifts in the economy change the developers' major concerns (neutral, positive, or negative) and in which aspects?	Like in this economic downturn in Hong Kong, the developers are more willing to do the energy retrofits, because it's much quicker to get the capital return back. (neutral)	√		√														13.3%
		When it's economic downturn, the developers will be more conservative/ reluctant to any innovative project including green features due to limited budget; while in its upturn, they will be more likely willing to invest in BEE.				√	√	√							√				26.7%
		Economic downturn is a better chance to further the green/ BEE development, because people expect changes; however, in the economic upturn, everything is prosperous, and why would the developers change their regular earning formula of their investment (MT). Also, it also because if the government takes the opportunity in the economic downturn to shout loud to promote BEE/ green, it is more an opportunity than a challenge to further its development (SY).		√					√		√	√	√	√		√	√		53.3%
Q2	When the direction of the economy shifts, how might developers integrate green features into original investments to increase market competitiveness?	The previous economic downturns maybe different from the current one, because the green movement is not as heat-up as it is now. Therefore, it more depends on the individual developer and its own capital capacity and business strategy to integrate green features into the practice.	√		√			√											20%
		Need more government incentives, moneywise, to promote BEE to the developer; education wise, to the whole public.				√					√	√	√	√		√	√		46.7%
		Both the government and the developers should have long term views and will, regarding BEE, even in economic downturn.					√												6.7%
		At the economic down-turn, the developer would mainly to improve the "green" image to add to their brand-name, but the end result is not very significant. Because it attract mainly the user-buyers, not the speculators. The developers want the speculators for profits more than the user-buyers.		√					√		√	√	√	√	√	√	√		60%
H2 Changes in economic conditions (upturns and downturns) call for the attention of government to adjust BEE policies as necessary to seize BEE development opportunities.																			
Q3	What role should government play in BEE promotion (more intervention or less intervention in a recessionary economy)?	Basically, during the economic up-turn, government incentives or promotion are less effective than the down-turn, because the property sells well and the buyers are less concern about green features. During the economic downturn, government incentives are more important, because the developers are more reluctant to invest in green and people who buy also need to be more assured by the benefits from green incentives.	√	√	√			√	√		√	√			√	√	√		66.7%
		During economic upturn, but steady and gentle growth would be the best time to developers to invest in BEE, and the best time for the government to promote BEE, too.				√													6.7%
Q4	What BEE promotions or incentive could government introduce in times of economic change that would be less upsetting to the market players' normal activities?	Basically, during the economic up-turn, government incentives or promotion are less effective than the down-turn, because the property sells well and the buyers are less concern about green features. During the economic downturn, government incentives are more important, because the developers are more reluctant to invest in green and people who buy also need to be more assured by the benefits from green incentives.		√	√			√	√		√	√	√			√	√		60%

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depends on the planning, priorities, and value judgments of the corporation and individual decision-makers," 20% think it is "More a challenge than an opportunity in an economic downturn," 26.7% believe that it is more a challenge "in an economic upturn" when developers need to "do more, faster, and with greater resources," and 13.3% respond that "Limited budgets in a downturn" will affect BEE development.

- More than half of the interviewees (53.3%) agree that, "An economic downturn is a better chance to further BEE development, because people expect change; whereas, in economic upturns, everything is prosperous, developers have little reason to change their regular earnings formula to try something new and risky." Hence, "If the government takes the opportunity of the economic downturn to promote BEE vigorously, it is recognized that conditions present more of an opportunity than a challenge." However, 26.7% take the opposite viewpoint, "In an economic downturn, developers will be more conservative and reluctant to take on any innovative project, including green features, due to limited budgets; in an upturn, it is more likely that developers will be willing to invest in BEE." A further 13.3% take a view based on a local example: "In this economic downturn in Hong Kong, the developers are more willing to do energy retrofits, because it is much quicker to get the capital return back."
- Regarding Q2, most of the interviewees focus on the current "economic downturn." Sixty percent respond that "In the economic downturn, developers would want improve their reputation for being green to add to their brand name, but the end result would not be very significant, because it attracts mainly the user-buyers, not the speculators. The developers want the speculators for profits more than the user-buyers." In addition, 46.7% think that "Both the government and the developers should have long-term views regarding BEE and will, even in economic downturns." However, 20% express a more conservative view; they think "This economic downturn may be different from earlier ones, because the green movement was not as popular as it is now. Therefore, integrating green features will depend more on the individual developer, its capital capacity, and its business strategy."
- Regarding the role that government plays during times of economic change, most people agree that "Basically, during an economic upturn, government incentives and promotion of BEE are less effective than in a downturn, because the property sells well and the buyers are less concerned about green features. During economic downturns, government incentives are more important, because the developers are more reluctant to invest in green technologies, and people who buy also need to be more assured of the benefits." There is a striking statement by one interviewee, though, who said, "Steady and gentle growth would be the best time for developers to invest in BEE and the best time for the government to promote BEE, too."

2. Market Uncertainties

The table above shows the market situation and the developers' concerns about BEE, and is one of three tables regarding the uncertainty aspect of transaction costs. Two interview questions are designed to test Hypothesis 3 in one of the three categories of uncertainty—market uncertainty, as a transaction cost. Both questions look at how market uncertainty affects BEE development by causing more transaction costs.

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TABLE 3. Interview results on market uncertainties.

H3 The end-users' variable expectations about BEE increase market uncertainty to the developers (e.g. ., they may misinterpret a focused group as the end-users of their final products.)																			
Questions		Responses	Remarks on interviewees																Overall
			VC	MT	KS	FC	Pe	SK	JP	Sm	SY	Q	NB	TM	WC	KC	EC		
Q5	Occupants' behavioral differences may lead developers to produce different BEE/GB at different performance levels. What is your view?	In Hong Kong, we are going to have (not yet) a measurement for the building whether it's a good performance or not. The trend is changing, Hong Kong now is going to have carbon audit, which will be an annual report of the carbon performance of each building/ household. This will be very good in transforming the occupant's behavior. It's always about the awareness and transparency. In the future, Hong Kong will have the carbon audit, people can understand and compare the carbon performance, and by that information and transparency, people can compare and shape their behavior.	√	√	√				√	√	√	√			√	√	√		66.7%
		Less than 20% (10-20%) of the influence by the occupant's behavior.				√						√							13.3%
		Still the cost is the major concern.		√				√			√	√	√	√		√	√		53.3%
Q6	Will concerns about social classes (different education levels, experiences, financial ability to enjoy the benefits of BEE) affect the developers' concern about BEE investment?	Yes. The rich people in higher social classes will appreciate the benefits of BEE better than the low income people, which attract the developers to invest in BEE for high price buildings.				√		√		√	√	√		√		√	√		53.3%
		The higher educated class will appreciate the BEE better, which would contribute towards a better environment.	√	√	√				√				√		√	√	√		53.3%

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Observations on the findings:

- Regarding the occupants' behavior, 66.7% of the interviewees believe that "In Hong Kong, we are going to have (not yet) a measurement of the level of a building's green performance. The trend is changing, Hong Kong now is going to have carbon audit, which will be an annual report of the carbon performance of each building/household. This will be very good in transforming the occupants' behavior. It's always about awareness and transparency. In the future, Hong Kong will have the carbon audit, people can understand and compare carbon performance and use that information and transparency to compare and shape their behavior." Around half (53.3%) agree that "Cost is still the major concern to the occupants".
- Regarding how social class might affect the developers' concerns, two equally weighted views have been found: "The rich people in higher social classes will appreciate the benefits of BEE more than lower-income people, and this will attract investments in BEE for high price buildings;" "The more-educated will appreciate BEE more, and this which will contribute towards a better environment." These responses suggest that the developers and government incentives will target those with more money and education.

3. Policy Uncertainties

This table sheds light on market conditions and how they affect developers' concerns about BEE, and is one of the three tables regarding uncertainty as a transaction cost. One interview question is designed to test Hypothesis 4, regarding policy uncertainty. All four questions look into how policy uncertainty affects BEE development by creating additional transaction costs. This question solicits the opinions of the interviewees about the developers' concerns regarding the different stages of BEE policy implementation.

Observations on the findings:

- The majority (73.3%) think "More concerns arise during the early stages because there is more uncertainty then." Another large group (66.7%), when asked what the government could do better, said that "Given international experience, the government will first take part in the new movement by initiating all their projects involving new BEE features as pilot or demonstration projects and share the experiences with the market. After a certain period of time (some said a few years), they can investigate the concerns that arose and then mandate the policy." In general, the majority agree that "For a new incentive, the greatest concern to the market is if it is stable and long-lasting. Therefore, the earlier the stage of development, the greater the challenge, and the more established the practice, the less the concern."

DISCUSSIONS AND RECOMMENDATIONS

This study tests those TC theories in the real world through interviews based on the case study of Hong Kong. The following summarizes the key discussions, from the aspects of economic, market and policy uncertainty accordingly.

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TABLE 4. Interview results on policy uncertainties.

H4 The earlier the stage of BEE policy implementation, the greater the real estate developers' concerns about transaction costs.																		
Questions		Responses	Remarks on interviewees															Overall
			VC	MT	KS	FC	Pe	SK	JP	Sm	SY	Q	NB	TM	WC	KC	EC	
Q7	Would a new incentive and a currently mature incentive affect the developers' concerns about BEE differently? In other words, encountering BEE incentives, would the developers have more concerns during the early or later stage of the implementation of the incentive? How are they different?	Based on the international experience/ practice, the government will first take part in the new movement by integrating all their projects with the new features as pilot projects (demonstration projects) and share the experience with the market. After a certain period of time/ few years, they could find out all these worries, they will then mandate the polity to the market.	√	√	√				√	√	√	√			√	√	√	66.7%
		The developer will welcome early incentives in early stages. And established schemes of incentives are more easily understandable and acceptable.					√											6.7%
		Yes. The earlier stage it is, the more challenge will be, the latter stage it is, it becomes more like a formula.				√												6.7%
		For a new incentive, the most concern to the market is if it's stable and long-lasting. Therefore, the more established the less concern.		√				√			√	√	√	√				46.7%
		The later stage, because the developers would like to see what happened to the others.					√											6.7%
		More concerns during the early stage because more uncertainty.	√	√	√			√	√		√	√	√	√		√	√	73.3%

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Economic Uncertainty

- Economic conditions (upturns or downturns) call for attention by the government to adjust BEE policies in order to seize BEE-development opportunities. Most people agree that during economic upturns, government incentives or promotions are less effective than they are during downturns, because property sells well and buyers are less concerned with green features.
- During the economic downturn, government incentives are more important, because the developers are more reluctant to invest in green projects, and people who buy also need to be assured of the benefits of green incentives.

Market Uncertainty

- Regarding how social classes might affect the developers' concerns about BEE investments, two equally weighted views have been found. One holds that richer people in higher social classes appreciate the benefits of BEE more than do lower income people. In this case, developers will be attracted to invest in BEE for high-price buildings. The more highly educated will also appreciate BEE more, which could contribute towards a better environment. This suggests that those people who would be easily motivated by BEE business strategy or by government incentives are likely to be both richer and "better educated."
- Most people believe that the diversity of occupants' behaviors could lead developers to produce different BEE/GB at different levels of performance. There is a need to have a standard measurement for buildings so that consumers know what good performance actually is.

Policy Uncertainty

- The earlier the stage of BEE policy implementation, the higher the real estate developers' concerns about transaction costs.
- The conclusions drawn from the interviews with developers are that during the early period (e.g., the briefing stage) of a BEE project, there are more extra tasks involved than at other stages, and they present higher risks and greater TC concerns.
- Government policies/incentives should address the problem in the early stages of BEE projects. Any new incentives should avoid unnecessary uncertainties for the stakeholder at the early stage of implementation of a new scheme.
- Most people think that more concerns arise during the early stages of development because of more uncertainty. Most people agree that the government can do better on the basis of international experience and practices. The government could first take part in the new movement by integrating their new pilot or demonstration projects and sharing the experience with the market. After a certain period of time, a few years, they could delineate these concerns and then mandate a solution to the market.
- In general, the majority of respondents agree that for a new incentive, the greatest concern for the market is if it is stable and long lasting. Therefore, the more established the incentive, the less the concern, and the earlier the stage, the greater the challenge.

It is crucial for the government to have long-term strategies and clear policy signals for BEE promotion, to create a positive investment environment and raise the stakeholders' confidence and the market's expectations for business investment in BEE. For example, the gov-

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ernment should formulate and implement a package of polices by taking into consideration the impact of transaction costs on the decisions of market stakeholders. Policy mechanisms alone will not work and market forces by themselves will not achieve the potential for energy efficiency. Because the spread of energy efficiency improvements cannot be left to the market, there has to be an emphasis on policy-assisted, market-oriented mechanisms for promoting energy efficiency. Only when both the end-users and the developers appreciate the benefits of energy efficiency building will they create a business channel for BEE products and the BEE market. This study provides a wide but sound platform for future research. The discussion provides good food for thought for those venturing into new studies. In particular, this study has identified several key issues to help design the incentives and promote BEE. However, the incentives should be thoroughly investigated to ascertain market conditions and stakeholders' concerns to ensure their maximal effectiveness. This will be an area of fertile ground for further in-depth research.

CONCLUSION

This study has adopted a TCs approach to studying the real estate developers' concerns on BEE investments and has focused on uncertainty in particular. This research has analyzed the uncertainty from the perspectives of economic, market and policy. The research design employed an interview survey, which has provided data from discussions with top-level practitioners and executives of development companies. The data provides a list of findings and a valid test of the hypotheses as they apply to the case of the Hong Kong BEE real estate development, which helps pinpoint the focus for discussions.

ACKNOWLEDGEMENTS

The work described in this paper was supported by a research grant from Hong Kong Polytechnic University. The authors would like to thank all those who contributed to the interviews and those who contributed in reviewing the manuscript.

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