LOW CARBON HOTELS: HONG KONG AND ZHEJIANG

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Abstract

Greenhouse effect leads to gradual increase in global temperatures and accelerate the dissolution of the iceberg. Global government puts forward strategies and measures and the major industry will also respond. Since a great deal of carbon dioxide is the main reason leading to the greenhouse effect, the global hotel industry thus focus on building low-carbon policies. Owing to the increasing tourism activities and associated lodging facilities demand, the local governments in Hong Kong and Zhejiang have launched low-carbon practice to mitigate the environmental impact created by the industry.

The Hong Kong Government Environmental Protection Department and the Electrical and Mechanical Services Department have stepped up environmental effort by creating a portal to facilitate enterprises to calculate and report the carbon emission. The Zhejiang Tourism Bureau has circulated the one hundred low-carbon operating measures as reference for restaurants and hotels to design or reinforce their environmental conservation systems. Other than highlighting the two approaches, the paper has a review of the environmental actions in the past and suggests the approaches, directives and actions to be undertaken by the local tourism colleges and industry associations to match with the government initiated low-carbon campaigns.

Key words: pollutants, emission, electricity, low carbon
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Introduction

In recent years, concern about the environment and the world ecosystem has become a major world-wide public issue. Low-carbon economy or low-fossil-fuel economy with a minimal output of greenhouse gas emerge as the goal of city development. As such, in Hong Kong and Mainland China, there is a growing concern about energy consumption and its likely implications for the environment. Among the various types of energy required, electricity is the most common form. However, most electricity in these two places are generated by coal-firing plants. The largest environmental impact of coal utilization is the combustion process in which large amounts of sulphur dioxide, nitrogen oxides, carbon oxides and fly ash are produced. The first two pollutants are the main elements causing acid rain, while carbon dioxide is a greenhouse gas affecting the global climate. The fly ash could react with the absorbed gases on the surface of the ash or act as a catalyst to chemical reactions. The products can be extremely hazardous to human health and the surroundings. To mitigate these environmental impact, a large number of renewable energy and energy-efficient technology has been developed and applied.

Within its tourism sector, hotels have been generally regarded as the major energy end-user. In particular, the rapid growth in the number of hotels in the past three decades has brought a considerable increase in energy consumption. In 2011, there were about 184 hotels in Hong Kong consuming, in total, at least HK$ 13,838 million worth of energy (Hong Kong Tourism Board, 2010).
In light of this development, the authors of this paper conducted some analyses on the pollutants and costs generated by the Hong Kong industry in early 2000s (Chan, 2002a; Chan, 2002b; Chan and Lam, 2001a; Chan and Lam, 2001b; Chan and Lam, 2001c). Table 1 shows the estimated amount of pollutants directly or indirectly produced by the hotel sector.

Table 1

<table>
<thead>
<tr>
<th></th>
<th>SO₂ (ton)</th>
<th>NOₓ (ton)</th>
<th>CO₂ (ton)</th>
<th>Particulate (ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>2,772</td>
<td>3,187</td>
<td>655,039</td>
<td>151</td>
</tr>
<tr>
<td>1995</td>
<td>2,105</td>
<td>3,147</td>
<td>613,251</td>
<td>150</td>
</tr>
<tr>
<td>1999</td>
<td>1,576</td>
<td>2,742</td>
<td>515,584</td>
<td>89</td>
</tr>
<tr>
<td>2003</td>
<td>1,889</td>
<td>3,022</td>
<td>605,014</td>
<td>104</td>
</tr>
</tbody>
</table>

The reduction of emission in the late 1990s was attributable to the installation of flue gas desulphurisers and precipitators, which can effectively clean up 90% of the sulphur and ash. A slight reduction of NO₂ and CO₂ was observed during the same period. However, we may witness the rebound of emissions following the increase in the number of new hotels in the early 2000s. This indicates that existing green measures may not be able to cope with the estimated rise in pollutants. Following the tourism expansion policy, it is projected that the number of hotel room will rise from 62,470 in 2011 to 71,024 by 2016 (Hong Kong Tourism Board, 2011). The surging up of rooms implies that the carbon activities and associated emissions will also be on the increase then.

For the situations in Mainland China, there is a paucity of information about the projected
amount of pollutants directly or indirectly created by the hotel industry. However, it is quite sure that the number of hotel room has increased substantially since its open door policy in early 1980s and subsequent tourism and economic boom. Published information indicated that the number of international visitors rose from 83 million in 2000 to 133 million in 2010 (Zhang et al, 2011 and Zhang et al 2000). The mentioned figures do not include the domestic travelers. Thus, the environmental problems created by travelling is generally believed to be important.

In light of this development, this paper aims at (1) reviewing the evolution of hotel’s response to environmental protection movement before 2000; (2) highlighting hotel responses to the low carbon hospitality movement in recent decade and (3) discussing likely contribution by hotel school and industry association to the government launched low-carbon operations.

**Environmental Action in Pre-2000 period**

With the much-publicized debate on climate change and global warming, the green movement has gained more recognition in the hotel industries worldwide through efforts made by various associations after the Rio Earth Summit in 1992. In 1993, the green campaign was reinforced by the International Hotels Environment Initiative and the Prince of Wales Business Leaders Forum. Eleven international hotel chains agreed to work together and initiated the development of manuals and guidelines to advance better environmental performance in the hotel industry (International Hotels Environment
Initiative, 1993). In the following year, another 16 hotel groups echoed this campaign and formed the Asia Pacific Hotels Environment Initiative (Mackie, 1994).

Since then, environmental guide books for the hotel sector published by trade associations, hotel chains and scholars have become more readily available and have drawn more attention from the hotel industries (IHIE 1993, Green Globe 1994, Reynolds 1995, Deng 1996, Marriott International 1998, Burnett et al., 2000a and 2000b). Many of these publications highlighted the importance of emission such as sulphur dioxide and nitrogen oxides and their environmental implications such as global warming, acid rain, and the depletion of natural resources. These publications also described different approaches taken by the hotel industry to address the environmental problems.

For Hong Kong, hotels had practiced various degrees of energy saving in the 1980s. On entering the late 1990s, the focus of environmental movement in the hotel sector fall on the formation of environmental management systems, its associated documentation and environmental measures (Chan and Ho, 2006; Chan 2009). There is, however, very little information on how to quantify environmental impacts due to hotel operations, particularly the emission of pollutants as a result of energy consumption. Thus, it appears to be a need for a better understanding of the local emission problem in relation to hotel operations and to find out the hotel industry’s share in the total emission.

**Hong Kong Hoteliers’ Response to Low Carbon Campaign**
More recently, local EPD has encouraged carbon audit in various enterprises. And a dedicated portal for assisting the estimation of greenhouse gas emitted by the business has been established. However, local hotels have been slow in following the steps in estimating the greenhouse gas. As shown over the portal, Hotels merely share the environmental practice and some achievement on the web; no quantified figures of greenhouse gas reduction. These environmental practices include the application of variable speed drive, LED lighting, T5 light tube, use of building management system, sensor for turning on/off rooftop signage, participating in used cooking oil recycling program, diverting bathroom exhaust to cool down the lift machine and so on. However, it is noted that Regal iClub Hotel has already launched the carbon offset program – the counter balancing of carbon emission through purchase of a carbon credit to help fund projects that reduce or offset overall greenhouse gas reduction. The program is to donate money to the Sichuan North West Afforestation and Reforestation Project which has been certified in 2009 under the United Nations Clean Development Mechanism, Executive Board and the Board of Climate, Community and Biodiversity Standard (CCB).

Zhejiang Tourism Office Response to Low Carbon Campaign

Following this low carbon campaign and echoing to central government demand for energy saving, the Zhejiang Tourism Office has promulgated one hundred environmental measures for hoteliers’ reference in carrying out energy savings. Seventeen measures deals with staff cooperation in energy reduction and washing water. Eleven are techniques related to water saving. Nine measures are associated with standards setting or regulatory control. Eight measures are about energy calculation such as creation of
electricity measurement system, independent measurement for large energy consumption equipment and energy saving; energy balance test and collection of energy related information. The remaining fifty five are energy efficient hardware and supporting technologies. It can be seen that one of the focuses or characteristics of these measures is again the quantification on energy measurement.

After reviewing these 100 measures, it is suggested that hotels in China may continue to partnership with energy saving technology companies to explore and invent new energy saving devices capitalizing the lower research and development costs in mainland China.

**Figure 1:**
**Development of Low Carbon Hotels**
Suggested Participation and Action of Hotel and Tourism Schools

To support government and hoteliers’ actions on the low-carbon movement, hotel and tourism colleges may also consider a number of matching options as shown in Figure 1. Firstly, college may adjust the existing program or design some new energy saving program to strengthen the knowledge and skills of students at senior or executive level to help the industry to lower the carbon content of operations. For instances, the incorporation of teaching elements: (1) knowledge of energy-efficient equipment and application of renewable energy technology, (2) energy audit and performance test of energy efficiency test of energy-consuming equipment, (3) calculation methods of carbon content and emission level, (4) energy simulation software and (5) carbon offset and tax program.

Other than teaching energy saving knowledge, college and faculty may initiate and collaborate with Engineering faculties, laboratories and manufacturers of energy saving equipment to undertake research to investigate new energy saving facilities or optimize existing energy-related facilities.

Apart from the emission release from energy consumption on site (hotel), it has been identified that transportation of goods and passengers (including hotel guest and staff) is another major source of emission. Thus, it is necessary for the lodging industry to reach out to endorse the emission cutting actions in the transportation system. For examples, the urge and support the development of hydrogen fuel cell bus. Other way to achieve
this is encouragement on bicycling by guest and staff supported by installing more parking lots, lockers, showering and drying facilities in or near hotel.

Another stakeholder in this low-carbon movement is local lodging associations. The support that these types of trade or professional association can render include the following: (1) provision of regular technical seminars about the trend or experience in using energy-efficient equipment or renewable energy technology, (2) writing support letters to research institute for application of research funds in developing energy saving devices, (3) offering support or grant to demonstrative project about the application of energy saving technology.

In addition, hotel association may also present award to those supporters in the low carbon campaign by acknowledging their endeavor and recognizing innovative breakthrough in energy saving action. Such a sort of recognition and encouragement would give incentive and momentum to hotel profession to keep on the support of low carbon campaigns.

Also some special task forces relating to low-carbon operations could be established to further explore any areas with potential energy saving. Particularly there is a need to set up the data base of energy usage of all hotels in 2005 and the related equation to simulate the energy usage. It is mainly because the central government has recently promised to the world to lower greenhouse gas by 20~25% based on the level emitted in 2005. Therefore, it is necessary for hotels in China including special administrative regions to
have a record about the amount of energy usage and corresponding level of greenhouse gas emitted in 2005. This record may help hotels justifying payment for the likely carbon taxation or carbon offset in future.

In addition, hotel leaders may pay more attention and effort on reducing NOx and CO2. Thus, clean air technology and measures such as NOx burners, CO2 scrubbers and tree planting should have more promotion and development.

**Conclusion**

In 1999 a Hong Kong survey with just over a thousand visitors revealed that air quality was acceptable to more than 75% of the tourists. But if the air quality deteriorated further, this could affect the local tourist industry (Cheung and Law, 2000). Another study also acknowledged that in the near future, air pollution might deter visits by overseas visitors and the report encouraged the use of clean technologies within this and other sectors (Hong Kong Productivity Council, 1999). In order to have more clean air for our tourism growth, there is a need for utility companies, the government and hotel operators and trade association to step up actions to lower pollutants and to adopt more energy-saving measures.

The energy-saving measures taken in the hotel industry should continue. Particular attention should be paid to measures to achieve electricity saving in heating, ventilation and air-conditioning plus lighting systems as they account for about 70% of total
electricity use in local hotels (Deng and Burnett, 2000). Recommended electricity-saving measures such as heat pump, energy-efficient lighting, natural day light, solar energy, variable frequency drives for air handlers and pumps, as well as variable air systems are worthy of serious consideration (IHEI, 1993 and Stipanuk, 2001).

To mitigate the pollution problem as a whole, the hotel sector should also consider taking a more proactive step in endorsing the energy-saving practice in other sectors. For example, it can consider, granting an award to hotels that successfully reduce energy consumption, providing a place for energy-saving research, and leading the trial use of energy-saving devices and so on. Perhaps, hotel industry leaders can even contemplate adopting a reach out approach by disseminating the energy-saving technique to nearby hotels such as those in Southern China.
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