Low Carbon Practices in Hotels
—— Case Studies on Green, Low Carbon and Energy Conservation Best Practices in China’s Hotel Industry
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Summary

This report reviews low carbon practices and technologies implemented within the hotel industry, including results of the implementation, thus providing practical insights for industry players and policy makers to pursue low carbon development.

This report focuses on three five-star hotels, the Swissotel Beijing, the Westin Beijing Financial Street, the China World Hotel, and one four-star hotel, the Xinhai Jinjiang Hotel, as well as several three-star and newly-built hotels as its case studies. An in-depth study of the hotels and their low carbon practices and technologies provides the data for analysis, conclusions, and recommendations.

This report’s conclusions and recommendations are placed before the main body of text in order to emphasize their importance, be direct, and guide the reader.

The report’s main body of text is divided into three parts. The first part starts with a macro-analysis of the increasing energy consumption of buildings, and then describes the rapid growth of the hotel industry and its energy consumption, revealing the industry’s tremendous potential for adopting green, low carbon and energy conservation practices and technologies.

The second part provides the hotel case studies, and draws a number of conclusions, including that low carbon practices and retrofits have actual effects on energy saving, that energy and resource consumption is directly related to a hotel’s operational performance, and that a hotel’s energy supply and consumption structure influence energy saving and emission reduction.

The third part summarizes the best low carbon practices and technologies, and the results of their implementation, in order to provide guidance for the industry’s low carbon development.

This report also provides A Reference Guide to Green, Low Carbon, and Energy Conservation in the Hotel Industry and A Reference Standard and Guide to Green Conferences amongst its attachments, thus supplying concrete references for energy saving and emission reduction in the hotel industry.
Main Conclusions

In the surveyed hotels, low carbon practices and technologies have brought social, economic, and environmental benefits, including notable energy savings. Management and staff are deeply aware of the low carbon practices at their property, and these practices – involving employees and guests – have become integrated into daily hotel management and operations.

1. Low carbon practices and technologies have brought clear social and environmental benefits.
Based on tentative survey results during the research period, energy consumption at the Swissotel Beijing, the Westin Beijing Financial Street, the China World Hotel, and the Xinhai Jinjiang Hotel (hereafter referred to as the “four main hotels”) followed a clear downtrend. Their total energy savings were 3445 tce (tonne of coal equivalent), and emissions reductions were – carbon dioxide, 8613 tons; carbon dust, 2343 tons; sulphur dioxide, 258 tons; and nitrogen oxides, 129 tons.

2. Low carbon practices and technologies have brought clear economic benefits.
The proportion that energy expenses account for in total turnover fluctuates depending on a hotel’s operational performance. According to un-weighted mean statistics of the four main hotels, energy/utility expenses as a proportion of total turnover were – electricity, 5.24%; water, 0.49%; oil for boilers, 0.5%; gasoline for automobiles, 0.27%; natural gas, 0.47%; and municipal heating power, 1.14%. Although the energy sources and amount of consumption vary among the four main hotels, the proportion that energy expenses accounted for in total turnover was no lower than 7.61%. This is at the low end of the 8-15% range that is empirically considered the typical range for small expenditures on energy in the hotel industry.

3. Advanced low carbon technologies are a critical component of low carbon development.
Surveyed hotels have adopted comparatively advanced water-saving and energy-saving technologies such as motor system frequency conversion, efficient lighting products, building automation solutions, and recycled water systems, all of which have shown positive results. According to tentative data collection, energy savings of 2052 tce, and emissions reductions of – carbon dioxide, 5130 tons; carbon dust, 1395 tons; sulphur dioxide, 154 tons; and nitrogen oxides, 77 tons – were achieved at the four main hotels due to technology modifications. Altogether, about 60% of energy savings at the four main hotels can be attributed to technology.

4. Low carbon practices are a critical component of low carbon development.
Energy-saving technologies start with energy-consuming facilities. Through retrofitting, the energy efficiency of these facilities is improved. Energy-saving practices start with users. With the formulation and implementation of energy conservation plans, techniques, methods, and processes, surveyed hotels have reduced the waste of energy and resources, and have guaranteed the effective implementation of energy-saving technologies. Altogether, about 40% of energy savings at the four main hotels can be attributed to practice and unidentified technology improvements.
5. Only by continuing investment in energy conservation and emission reduction can positive results continue to increase.

Average energy consumption per construction area for five-star hotels in China is 60.87kgce/m². For four-star hotels it is 47.29kgce/m². The energy consumption of the four main hotels is 68.70kgce/m², 56.16kgce/m², 83.15kgce/m², and 76.92kgce/m² respectively; only one consumed less energy than the average value of 60.87kgce/m². What can be accomplished through practices is fixed. That is why it is necessary to invest in energy-saving technologies, and continually upgrade them.

6. Existing advanced low carbon technologies and products have laid a foundation for low carbon development at new hotels.

Among the surveyed hotels, Fairmont Beijing is newly built. During the design and construction process, Fairmont Beijing benefited from the energy conservation and emission reduction experiences of other hotels, and therefore adopted advanced low carbon technologies and products, including hollow bridge windows, exterior wall insulation, water-saving toilets, efficient electrical conversion devices, ice storage systems, building automation systems, and efficient lighting – all of which laid the foundations of the hotel’s low carbon development.

7. A hotel’s energy consumption is closely related to its market positioning and occupancy rate. A singular or simple energy structure is not helpful to a hotel industry – where electricity is the main form of energy – seeking low carbon development.

Market positioning and special services influence the energy source breakdown at hotels. Occupancy rate directly influences turnover and total energy consumption, but has little influence on energy consumption in hotel public areas. Therefore, the relationship between energy expenses and turnover and energy consumption is not simple and linear; much depends on a hotel’s operational performance.

The main energy sources and resources used by hotels include electricity, fuel, gas, municipal heating power, and water, and the average proportion of electricity to the total energy mix is no lower than 70.7%. Such an electricity-reliant energy structure obviously reduces the consumption of the other kinds of energy. At present, more than 80% of China’s electricity comes from thermal power, so high levels of electricity consumption are not conducive to overall societal energy conservation and emission reduction. Therefore, main areas for future low carbon development in the hotel industry should include the strict implementation of energy conservation and emission reduction technologies and practices, including the adopting of renewable and alternative energy sources, all in accordance with local conditions.

8. Funding sources, ability to differentiate technologies, and accuracy of third-party assessments are bottlenecks to low carbon development in the hotel industry.

The surveyed hotels are actively exploring low carbon development pathways in accordance with their own conditions. However, bottlenecks such as funding sources, ability to differentiate technologies, and accuracy of third-party assessments make it difficult for most hotels to be able to make a thorough low carbon technological transformation through their own strength.
Funding Sources: With large amounts of available funding, five- and four-star hotels have completed some retrofitting projects with a short payback period. However, there is still great potential for energy saving in terms of the hotels overall. As for three-star and lower hotels, limited capital restricts them to simple retrofits, leaving extremely great potential for energy conservation indefinitely into the future.

Ability to Differentiate Technologies: There is a variety of energy-saving technologies and products, good and bad, currently available. However, the engineering departments at hotels, who are responsible for energy conservation retrofitting, often have limited understanding of and ability to select energy-saving technologies and products. Hence, the effectiveness of energy conservation retrofits is hampered.

Accuracy of Third-party Assessments: Even if funding and relevant advanced technologies are available to an energy conservation retrofitting project, the energy conservation and emission reduction process is still hampered by the difficulty of obtaining accurate data on the benefits of energy conservation and emission reduction. This is due to a lack of objective, fair and accurate third-party testing, as well as a lack of authoritative assessment and analysis by an appraisal agency on a hotel’s energy consumption, energy conservation potential, and probable retrofitting outcomes.

9. The hotel industry is crucial to energy conservation and emission reduction; it cannot be ignored during the Twelfth Five-Year period and for the future.
Although there are obstacles to low carbon development in the hotel industry, it must proceed. The tourism industry will become a pillar industry of the national economy. By 2015, there will be more than 1000 five-star hotels in China. Using the average annual energy consumption of the four main hotels – 6974 tce – as a basis, the total energy consumption of five-star hotels in China will exceed 7 million tce in 2015. If potential energy savings is 30%, that means 2.1 million tce in savings by 2015. This is equivalent to 0.33% of the total energy savings of 630 million tce during China’s Eleventh Five-Year Plan. The emissions reductions in such a scenario would be – carbon dioxide, 5.25 tons; carbon dust, 1.43 million tons; sulfur dioxide, 160 thousand tons; and nitrogen oxides, 80 thousand tons.
Key Recommendations

Low carbon development in the hotel industry requires not only action on the part of hotel companies, but also extensive national macro-policy support, as well as guidance and encouragement from relevant government departments and industry associations.

Concerning policy, relevant government departments and industry associations should integrate energy conservation and emission reduction standards into the system of hotel star ratings. For implementation, it is important to use pilot programs and choose several provinces as experimental zones. It is also important to be transparent about the current state of energy consumption in the hotel industry, which can be the baseline for formulating reasonable energy-saving goals. When it comes to new hotel construction, the government should implement and enforce a compulsory energy-saving standard. Hotels that fail the standard cannot be built and operated.

In order to further undertake energy-saving practices in the hotel industry, three platforms must be set up: a dynamic energy consumption monitoring platform, a technology and project evaluation platform, and a financing platform. These platforms can help overcome bottlenecks to low carbon development, such as lack of funding, ability to differentiate technologies, and accuracy in third-party assessments.

Based on the above research and analysis, this report proposes the following recommendations to relevant government departments, hotel industry associations, and hotel companies.

Suggestions for government departments:

1. Legislate and amend low carbon development laws, regulations, and standards for hotels, and issue The Catalogue for Low Carbon Technologies and Products in Hotels.

The government should legislate and amend low carbon development laws, regulations, and standards relevant to the hotel industry as soon as possible. Relevant departments should guide and regulate design, building, management, retrofitting, services, and guest consumption related to the industry. Hotel companies can follow these policies.

Taking relevant experiences from other industries as a reference, following existing relevant standards, and considering the fact that the hotel industry is a subset of the hospitality industry, relevant departments can issue The Catalogue for Low Carbon Technologies and Products in Hotels and energy consumption standards for the hotel industry. These would serve as references for low carbon development in the industry.
2. Set up long-term incentives to foster the development and application of low carbon technologies and products, and direct capital towards energy-saving retrofitting in the hotel sector. The government should make appropriate fiscal and taxation policies; introduce third-party assessments; and set tax allowances, loan preferences, and financial rewards for both renovated hotels and unrenovated hotels. The government should also encourage the development and application of low carbon technologies and products in the hotel industry, and encourage hotels to take appropriate approaches to retrofitting such as energy performance contracting, bidding, etc. Such efforts can attract funding for further improvements in energy efficiency, which can help demonstrate and popularize this trend throughout the industry.

3. Launch the “Low Carbon Measures for Ten Thousand Hotels in One Hundred Cities” program to disseminate successful experiences. Together with industry associations, the government should lead the organization and launch of the “Low Carbon Measures for Ten Thousand Hotels in One Hundred Cities” program. This program will encourage hotels to sign the “Agreement on Voluntary Actions for Low Carbon Development” and commit themselves to voluntary low carbon practices. This program will also facilitate the dissemination of their successful experiences to other hotels.

Suggestions for industry associations:

4. Provide service platforms for low carbon development of hotels. Strengthen services for the application and mainstreaming of low carbon technologies and products; and organize and provide a platform for dynamic energy consumption monitoring, a platform for technology and project evaluation, and a platform for financing – all of which can be highly advantageous to the development of clean energy in the hotel industry. At the same time, industry associations can strengthen collaboration with non-profit conservation organizations who have been working with hotels, such as WWF.

5. Construct channels for extensive dissemination of different hotels’ experiences. Through channels such as websites and other forms of media, extensively disseminate good practices in low carbon development and encourage different kinds of hotels to implement appropriate low carbon practices and technologies.

6. Organize trainings on low carbon practices and technologies. Industry associations can organize trainings on low carbon practices and technologies – including such topics as energy planning, energy statistics, management systems, energy conservation measures, retrofitting, etc. – tailored to specific types of hotels and specific staff functions.
Suggestions for hotel companies:

7. Prioritize energy conservation and environmental protection, and lead low carbon development at properties.
   Hotel companies should develop energy conservation plans and energy consumption standards taking into account their own characteristics, supervise implementation of low carbon practices by their properties, and carry out corresponding inspections. At their properties, hotel companies should disseminate experiences in implementing low carbon practices, and promote the spread of advanced energy-saving technologies and management methods. They should also incorporate special funding for retrofitting into company development plans and establish long-term energy conservation funding plans.

8. Actively study low carbon practices and technologies – including retrofitting experiences – and implement them.
   Hotel companies should closely follow national energy conservation and emission reduction plans and policies, establish feasible energy conservation plans with short-term and long-term goals, and develop corresponding energy conservation practices according to the actual conditions of the hotel and follow the plan closely during implementation, so as to maximize benefits.
   They should also increase energy conservation technology investments, strengthen cooperation with professional service companies, implement substantive energy conservation retrofitting projects by combining external funding with internal investments, and continually seek the potential for energy savings.

   Hotel companies should develop and promote green rooms, green conferences, green food, etc., and encourage and guide guests to participate in low carbon actions through rewards. This will help with the implementation of other energy conservation and emission reduction practices in hotels and synchronize advancements at the hotel level with energy conservation and emission reduction advances throughout society.

The implementation of green, low carbon, and energy conservation practices is an inevitable challenge in the future development of hotels. They touch upon all hotel processes, from planning to design to management, as well as all functional units of hotels. The implementation should also be supported by the government, industry associations, and other societal sectors, according to the principle that “the government takes the lead, while the operation should abide by market rules”. It is important to accept reasonable and feasible approaches and techniques, strengthen testing and evaluation by third parties, and accept the public’s supervision – in order to realize the green, low carbon, and energy conservation development goals of hotels.

We appreciate case hotels’ kindness for allowing us to use their photos in this report.
Why we are here
To stop the degradation of the planet’s natural environment and to build a future in which humans live in harmony with nature.

www.wwfchina.org

WWF has worked in China for 30 years.

WWF has 110 staff in China.

WWF has 10 offices in China.

WWF works in the 5 main areas in China.

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+110

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