Business Reasons for Utilizing Renewable Energy Applications in Facilities to Assist in Extending the Life of the Heating Ventilation and Air Conditioning Systems

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Table of Contents

List of Figures

Summary

The political, cultural, and economic difference between China and the US are stark indeed. A new era for Sino-US ties were opened with the official visit of US President Richard Nixon to China in 1972. Since then scientific, technological, economic and trade cooperation, have become the most important backbone for Sino-US relations. The areas of energy efficiency and renewable energy are examples of such cooperation.

Neither country has sufficient domestic petroleum reserves to satisfy current demand; in a business as usual scenario, both countries will be increasingly dependent upon imports.[1] The availability of capital has a direct influence on how a nation can reduce its increase in energy demand. It is increasingly the case that the private sector—not the government—provides the capital for energy projects, and it does so by paying greater attention to returns than to societal needs or goals, such as the environment.[2]

Studying the thought processes of these private sector business people in these two countries as applied to a particular and major source of pollution and energy consumption is breaking into new ground and could lead the way for future research. It is the premise of this research that with regards to environmental

[1] http://books.nap.edu/openbook.php?record_id=12001&page=3 Energy Futures and Urban Air Pollution: Challenges for China and the United States (2007) retrieved 11/2/2007

[2] http://books.nap.edu/openbook.php?record_id=9736&page=15 Cooperation in the Energy Futures of China and the United States (2000) retrieved 11/2/2007

pollution and energy usage, both the US and China should consider themselves players on the same team.

The intended audience for this thesis research is facility managers, property managers, building owners and all others in the building industry who are interested in extending the life of their HVAC systems while also reducing the energy demands of their buildings the common utility grid. This body of work is also appropriate for decision makers and experts in the building industry who seek a better understanding of some of the driving forces behind the business decisions made by their counterparts with respect to the application of renewable energy solutions in either the United States or China. This study can be use as a method of establishing essential questions in selecting a renewable energy system from a broad perspective using detailed data from individual buildings or a collection of such buildings. This research done in this thesis can be used as background information in developing feasibility studies or business plans.

Questions were crafted to elicit responses from experts in the building ownership, management and maintenance professions. These questions and responses are intended to trigger ideas for business reasons for utilizing renewable energy applications to assist the HVAC system from both China and the US.

These business related questions were developed using my over twenty five years business experience, my over four years experience in the renewable energy field and literature review.[3]

The research confirmed that indeed there is much common ground between these two economic giants on opposite sides of the world. The research also found anomalies in the answers from the Chinese professionals with regards to the use of renewable energy and as such proposes future research.

Analyzing the data collected, a generic recommendation is suggested with the caveat that efficient and effective renewable energy applications are most often affected by local conditions.

[3] Campbell, Scott (1996). Green cities, growing cities, just cities?: Urban planning and the contradictions of sustainable development. American Planning Association. Journal of the American Planning Association, *62*(3), 296. Retrieved August 25, 2007, from ABI/INFORM Global database. (Document ID: 9808300).

Chapter 1: Introduction

This research is intended to discover business reasons for utilizing renewable energy applications in buildings to help extend the life of the heating, ventilation and air conditioning (HVAC) systems. It is designed to focus on gleaning information from the United States and China. These two countries differ politically, socially, economically and culturally. In history, trading and other economic activity has always been a point of common ambitions. Therefore studying business and economic reasons for applying renewable energy applications will be edifying. This research is also intended to be a pre-cursor for future research into China's renewable energy applications in new and existing buildings.

With the advent of the industrial age and urbanization there has been a dramatic increase in demand for energy. Fossil fuels have been the source of much of this energy. With the increased use of these fossil fuels came two problems, environmental pollution and the depletion of limited resources. One solution is to tackle these challenges where it is most concentrated, that is in the buildings that have accompanied the economic development. A further refinement to the level of the HVAC system allows a more manageable solution to the stated complex problems. If business reasons can be found to utilize renewable energy sources to augment the usage of the HVAC then a reduction of the rate of depletion of the fossilized fuel which includes a reduction in environmental pollution can be achieved. In an attempt to find valid business reasons for utilizing renewable

energy to extend the life of the HVAC system, this thesis is designed to discover trends or general opinion in order to derive suggestions for valid business reasons. This thesis is intended to help find practical, holistic approaches to an environmental and economic problem.

Chapter 2: The Problem

Since the Industrial Revolution (around 1750), human activities have substantially added to the amount of heat-trapping greenhouse gases in the atmosphere. The burning of fossil fuels and biomass (living matter such as vegetation) has also resulted in emissions of aerosols that absorb and emit heat, and reflect light.[1] The addition of greenhouse gases and aerosols has changed the composition of the atmosphere. The changes in the atmosphere have likely influenced temperature, precipitation, storms and sea level.[2]

As sovereign countries the United States and China are the number one and two energy consumers in the world.[3] China is the largest emitter of sulfur dioxide (SO_2) worldwide, and the two countries lead the world in carbon dioxide emissions (CO_2).[4] The energy consumption by all the buildings in the United States causes the emission of 15,353,000 short tons of SO_2 which is 52% of the total US SO_2 emission and 21,102,000 short tons of nitrous oxides (NO_x) which is 19% of the total US NO_x emissions.[5]

The buildings sector is responsible for around one-third of global energy use and associated carbon dioxide emissions. In 2004, China was responsible for 15% of world energy consumption and associated emissions. Residential and

[1] http://www.epa.gov/climatechange/science/recentcc.html retrieved 3/20/2008
[2] http://ipcc-wg1.ucar.edu/wg1/wg1-report.html retrieved 3/20/2008
[3] http://buildingsdatabook.eren.doe.gov/docs/1.1.10.pdf retrieved 3/22/2008
[4] http://books.nap.edu/openbook.php?record_id=12001&page=1 Energy Futures and Urban Air Pollution: Challenges for China and the United States (2007) retrieved 11/1/2007
[5] http://buildingsdatabook.eren.doe.gov/docs/3.3.1.pdf retrieved 3/21/2008

commercial buildings account for one-quarter of China's total energy consumption and around 27% of the country's electricity consumption. Overall, buildings are responsible for around 18% of energy-related carbon dioxide emissions in China.[6] In the United States 40% of energy consumption is in buildings and facilities.[7] The majority of this energy is derived from fossil fuels: in 2005, it was estimated that 40% of the US's energy came from petroleum, 23% from coal, and 23% from natural gas.[8]

In residential buildings the heating, ventilation and air conditioning (HVAC) consume 43% of the energy used by these buildings in the US.[9] In commercial buildings the HVAC consume 33.3% of the energy.[10] In total the HVAC systems consume 38.6% of the energy used by all the buildings in the US.[11]

The Scope

This thesis will attempt to provide a study of a series of business related background questions that can be used in developing a set of financially sound business reasons to utilize renewable energy with respect to the HVAC system. This study proposes a holistic approach to finding a solution to the stated problems of resource depletion and environmental pollution.

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[6] http://www.chinadialogue.net/article/show/single/en/1425-Why-building-energy-efficiency-matters retrieved 11/3/2007
[7] http://buildingsdatabook.eere.energy.gov/docs/1.1.3.pdf retrieved 11/3/2007
[8] http://www.eia.doe.gov/emeu/aer/pdf/pages/sec1_3.pdf retrieved 3/21/2008
[9] http://buildingsdatabook.eren.doe.gov/docs/1.2.3.pdf retrieved 3/21/2008
[10] http://buildingsdatabook.eren.doe.gov/docs/1.3.3.pdf retrieved 3/21/2008
[11] http://buildingsdatabook.eren.doe.gov/docs/1.1.4.pdf retrieved 3/21/2008

This thesis will compare and contrast responses from the building experts of the United States and China in order to support the hypothesis.

This thesis is not intended to provide every possible business reason to utilize renewable energy applications.

This thesis will not provide business reasons for any particular circumstance.

This thesis will not discuss in detail any particular renewable energy application.

This thesis will not discuss in detail any part of the heating ventilation and air-conditioning (HVAC) systems.

This thesis will not present any renewable energy application solution to any particular HVAC system.

The Hypothesis

Although the societies of the United States and China are dissimilar in many ways, the challenge of global warming and environmental pollution produces common business reasons to develop renewable energy solutions for the heating ventilation and air-conditioning systems (HVAC) systems in the buildings of each country.

The Reason for the Research

As human society advanced the demand for the earth's natural resources exponentially increased. The industrialized era and its accompanying world population explosion[12] further exacerbated the already dire situation of natural resource depletion with heavy pollution and ecological crises. A key factor in

[12] http://www.census.gov/ipc/www/idb/worldpopinfo.html 3/21/2008

both the demand for natural resources and pollution is the worldwide need for energy. While there is no single solution for the complex problem of global warming, a focus on the application of non-polluting renewable energy sources and their efficient use in assisting the HVAC systems with its high energy usage and corresponding greenhouse gas production in the major polluting countries of the United States and China, is a constructive approach to the solution.

A Synopsis of the Research Chapters

Chapter 3: Methodology

It is the primary goal of this chapter to convey the research strategy, the research questions and why they were chosen and the research methods used.

Chapter 4: Data Analysis Results and Findings

This chapter analyzes the data collected from China and the United States using bar graphs. The results are then scrutinized to determine the validity of the hypothesis.

Chapter 5: Conclusions

The results from the responses of professional experts in building management, ownership and maintenance from both countries are then evaluated for compatibility. Recommendations are made.

Chapter 3: Methodology

Introduction

This research is intended to discover business reasons for utilizing renewable energy applications in buildings to assist the HVAC systems and thereby help extend the life of these systems. It is designed to focus on gleaning information from building and environmental experts in the United States and China in order to provide insights to developing practical, financially feasible plans. This research can provide some guides as to the type of questions the decision makers should ask in order to develop fiscally sound business reasons. It is the primary goal of this chapter to convey the research strategy, identification of the experts, the research questions and why they were chosen and the research methods used.

Research Strategy

The primary strategy of this research is to treat the stated problems or challenges as a common business opportunity for cooperation between the United States and China. With this approach in mind responses of professional experts from both countries in the building ownership, maintenance and management arena were solicited in the form of a questionnaire.

Research Questions Design

The research questions were designed to:

- Determine the level of environmental awareness and interest in renewable energy.

  It is important that knowledge of the environmental impact of the energy demand of the HVAC system is well understood. This awareness engenders a sense of urgency necessary to craft an effective plan. If there is also interest in renewable energy then the researcher or decision maker can then proceed to develop solutions along these lines.

- Determine the expected capital outlay for a renewable energy system.

  As with most business decisions there are financial consequences. The expected capital layout helps to determine the extent and the type of the renewable energy solution.

- Gather information on peak demand periods.

  Some renewable energy solutions perform best during certain times of the day. If these times coincide with the peak demand periods then these solutions should be considered for best efficiency.

- Gather information on budgets.

  To help develop some financial parameters a percentage of capital, energy or maintenance budgets can be used. These questions might inspire others along these lines for the planners.

- Get estimates of all the operating costs of the HVAC as a percentage of budgets.

  These questions frame the challenge of the HVAC system in overall budgetary terms. Knowing these costs allows the planner to develop reasonable budgets for a renewable energy system. If the renewable energy system reduces the cost of operating the HVAC system, then an estimate of a capital outlay recovery period or payback period can be determined.

- Get estimates on acceptable expenditure on renewable energy systems as a percentage of budgets.

  Knowing the operating cost of the HVAC and the expected payback period of the proposed renewable energy system are ingredients in developing sound business reasons. Another is the relative cost of the proposed renewable energy system. The renewable energy system should not be acquired at the detriment of other important capital improvement or maintenance projects.

- Determine the awareness of the importance of using energy efficiently.

  The efficient use of energy should be a main topic when developing business reasons for the application of any renewable energy system. Energy savings through efficiency can reduce the necessary capacity and cost of the renewable energy system.

- Ascertain the relative importance of economic, social and environmental significance.

In developing business reasons to undertake a major project such as this, the corporation's or decision maker's philosophy or goals must be taken into consideration. Understanding this philosophy will nurture sound business reasons for the proposal, and present a better chance to be successful when presented to top management.

Research Questions

Figure 1: Research Questions

2. Has your company or organization done any research in the renewable energy field?	
Yes	
No	
Do not know	
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	
Operation of buildings has great impact on the environment	
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	
No	
Do not know	
QUESTIONS Page 2 of 6	
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	
No	
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	

Three (3) to five (5) years	
Greater than five (5) years	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	
Low interest long term loan guarantee	
Do not know	
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	
4 p.m. to 8 p.m.	
Other (please state):	
QUESTIONS Page 3 of 6	
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	

US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	
QUESTIONS Page 4 of 6	
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	
5% to 10%	

10% to 15%	
15% to 20%	
Over 20%	
Do not know	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
QUESTIONS Page 5 of 6	
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	
Not effective	
Not Applicable	

24. If your company has a plan for the efficient use of energy then:	
What were the major problems?:	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?:	
QUESTIONS Page 6 of 6	
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	

Research Methods

Data collection: Identification of the Experts

For this research the building industry experts are defined as that group of people involved in the ownership, management and maintenance of buildings. The selection process involved the targeting of knowledgeable people in specific industry groups, trade shows, business forums and government institutions.

The opinions of fifteen (15) experts from the United States and nine (9) from China were tabulated and analyzed. By soliciting opinions from a wide range of professional experts a broad based holistic solution to the stated problem of resource depletion and environmental pollution can be achieved.

The experts who chose to identify themselves include: facilities managers, directors of facilities, construction managers, building managers, maintenance directors, director of property services, regional director of facilities, general managers, project/budget managers and senior associates.

In the United States, expert opinions were solicited from members of the Building Owners and Managers Association (BOMA) and the International Facility Management Association (IFMA). These organizations were chosen in the quest for reliable information. The membership of these organizations

consists of knowledgeable professionals in the building ownership, maintenance and management field.

In China, solicitation of expert opinions was accomplished at a building and environmental conference in Suzhou, China. This conference was attended by professionals from Beijing, Jiaxing, Shanghai and Suzhou. Further opinions were solicited from government building officials in Chengdu and again in Beijing. These individuals were targeted because of their knowledge and professionalism.

The solicitation to the targeted groups began in October 2007 and continued until mid-February 2008.

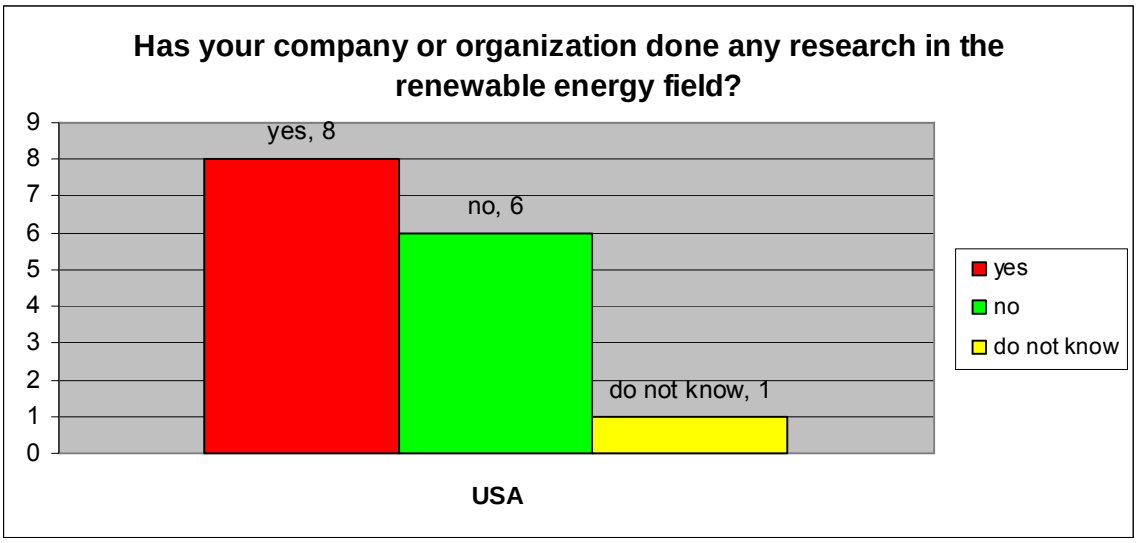
Chapter 4: Data Analysis Results and Findings

What follows are the answers from the responders from China and a comparison to the answers of the United States responders.

Has your company or organization done any research in the renewable energy field?

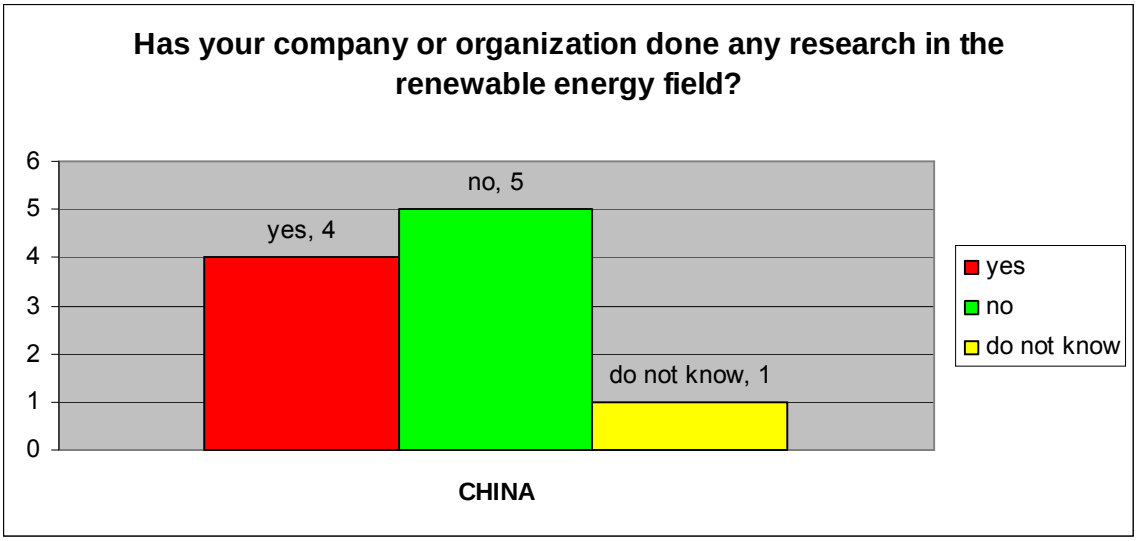
Fifty three percent (53%) of the US professionals indicated that their company or organization had done some research in renewable energy.

Figure 2: Has your company done any research in the renewable energy field? US answers



Similarly forty percent (40%) of the Chinese professionals stated that their organization had done research into renewable energy.

Figure 3: Has your company done any research in the renewable energy field? Chinese answers

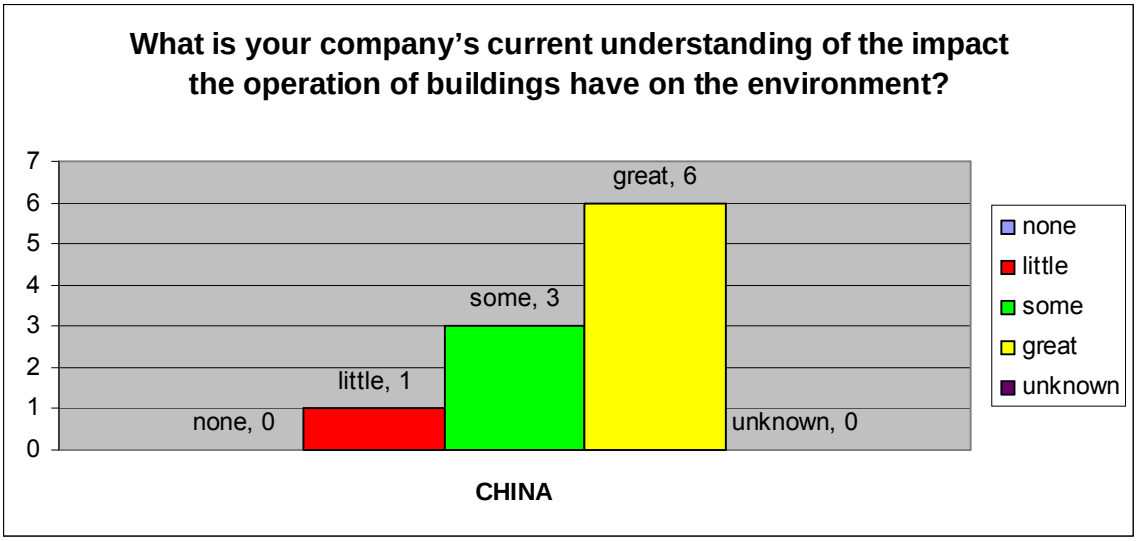


These results indicate that renewable energy is being studied by a majority of the combined professionals in China and the United States. It can also be inferred from these results that knowledge of renewable energy sources is a solid building block in developing a sound business case for its use to upper management.

What is your company's current understanding of the impact the operation of buildings have on the environment?

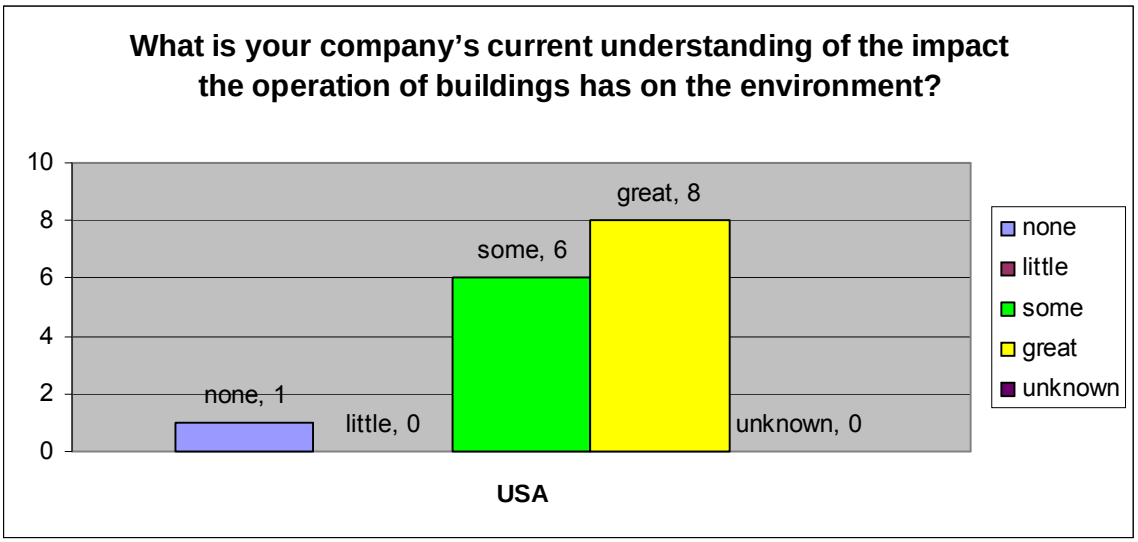
When asked about the impact the operation of buildings had on the environment 90% of the professionals from China answered some or great.

Figure 4: what is your company's current understanding of the impact the operation of buildings have on the environment? Chinese answers



Essentially the same result as the answers from the United States where fourteen out of fifteen or 93% responded some or great.

Figure 5: what is your company's current understanding of the impact the operation of buildings have on the environment? US answers



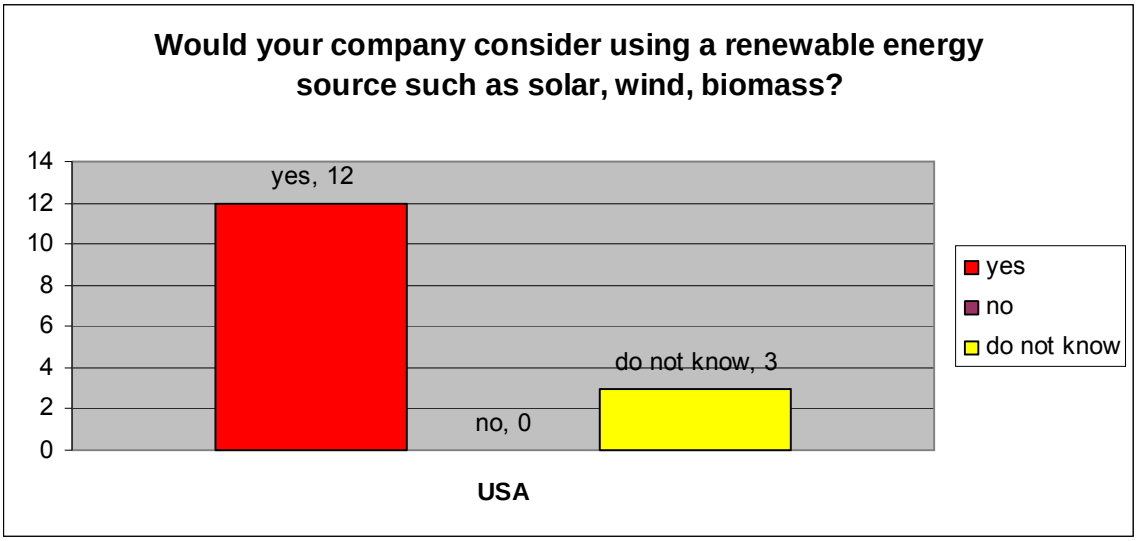
These results indicate that the level of awareness of the impact building have on the environment is equally pronounced in China and the US. This knowledge

pinpoints a common potential source of pollution to both countries. In so doing common business reasons can be presented to address the shared challenge of pollution caused by the operation of buildings.

Would your company consider using a renewable energy source such as solar, wind, biomass?

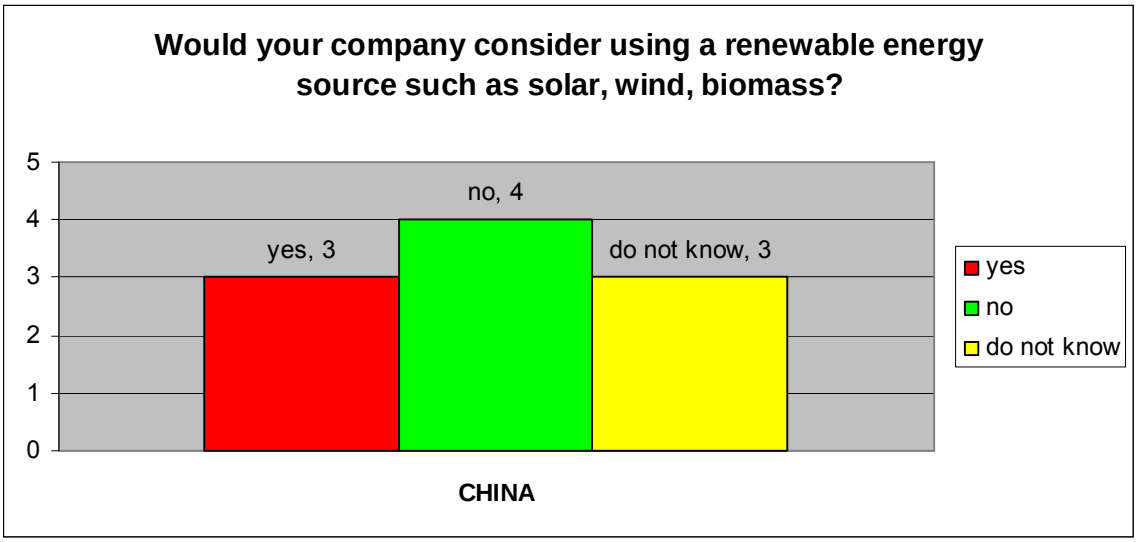
When asked if they would consider a renewable energy source none of the professionals from the United States responded negatively. Eighty percent (80%) of the responders would consider using a renewable energy source. This result seems to indicate that the responders in the United States inherently believe in the use of renewable energy.

Figure 6: Would your company consider using a renewable energy source such as solar, wind, biomass? US answers



When the Chinese professionals were asked whether their company would consider using a renewable energy source thirty percent (30%) said yes; forty percent (40%) said no and the remaining thirty (30%) said they did not know.

Figure 7: Would your company consider using a renewable energy source such as solar, wind, biomass? Chinese answers

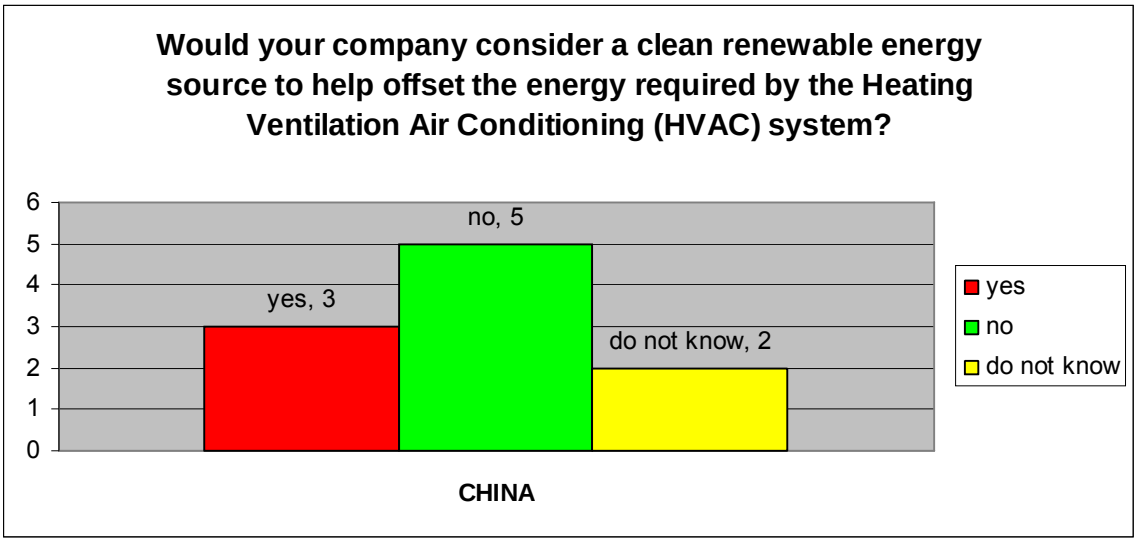


This is in sharp contrast to the responses from the United States where 80% said yes, 0% said no and 20% did not know. These results seem to indicate that the United States building industry professionals have a greater affinity for renewable energy. It should be noted however that a sizeable portion of the Chinese professionals were uncertain and are therefore open to persuasion given the proper facts. This is an interesting avenue for further study.

Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?

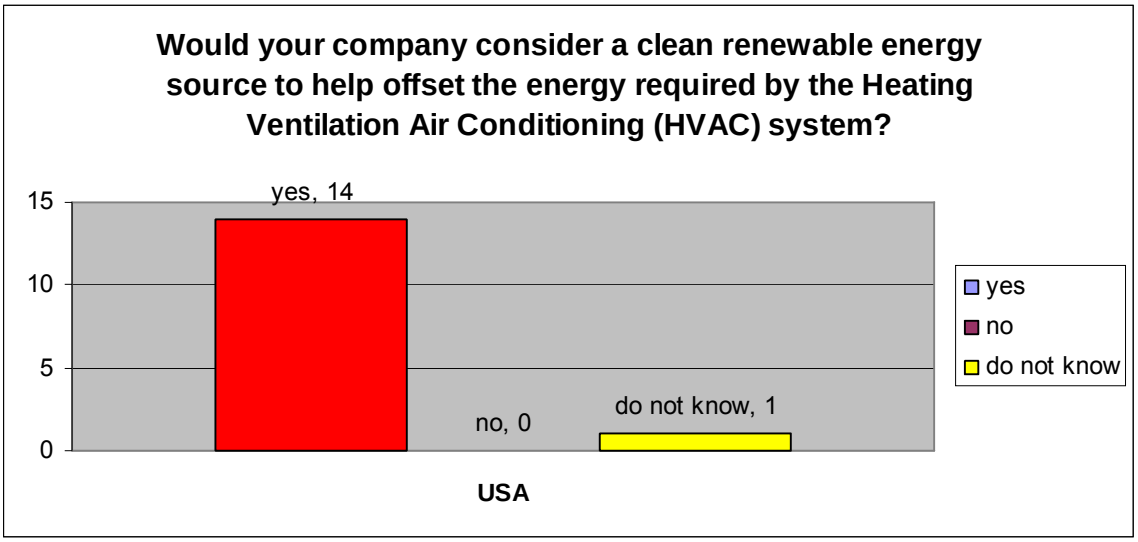
Similar responses were given when the Chinese professionals were asked if they would consider using renewable energy to offset the HVAC system. Fifty percent (50%) said no; thirty percent (30%) said yes and twenty percent (20%) did not know.

Figure 8: Would your company consider a clean renewable energy source to help offset the energy required by the HVAC system? Chinese answers



The US professionals by an overwhelming ninety three percent (93.33%) would consider a clean renewable energy source to offset the energy required to run their HVAC systems.

Figure 9: Would your company consider a clean renewable energy source to help offset the energy required by the HVAC system? US answers



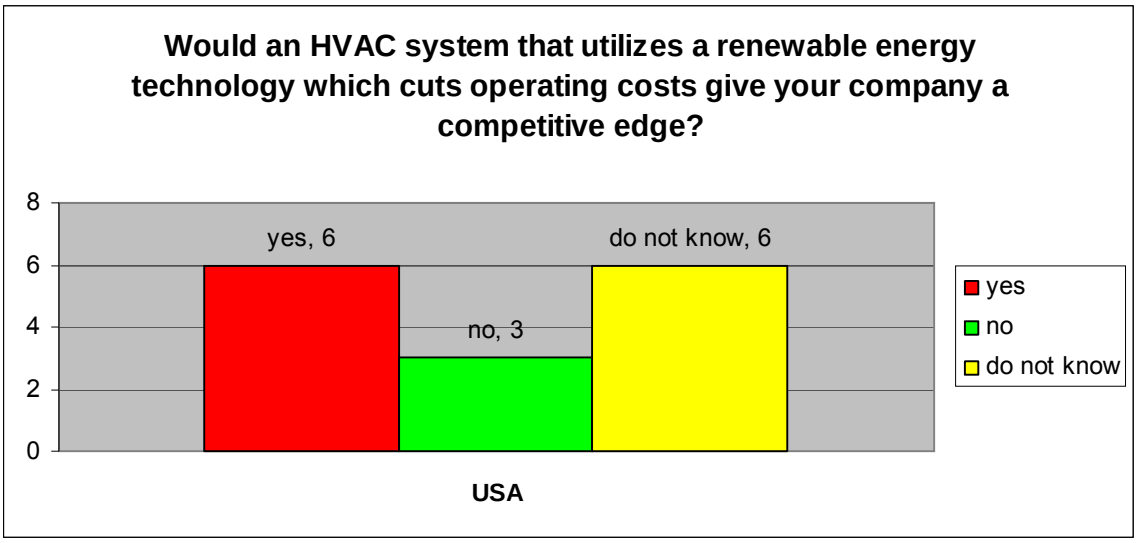
Here again these results show a noticeable difference between the Chinese and US building professionals. These conflicting answers between the US and China

may indicate that there would be different solutions developed by the two in regards to the energy demands of the HVAC system. A deeper understanding of these results is necessary as other mitigating factors such as a degraded environment not suitable for some renewable energy sources may be the underlying cause. This type of question should be asked by the planner in order to gauge the receptiveness of upper management towards a renewable energy solution.

Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?

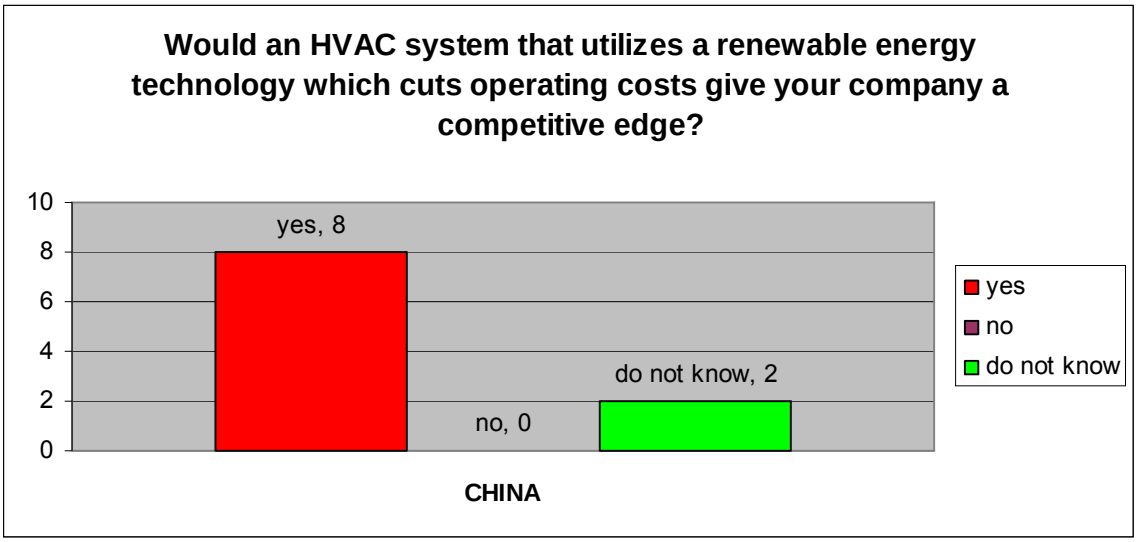
When asked if the use of a renewable energy source would give their corporations a competitive edge twenty percent (20%) of the US professionals answered negatively and forty percent (40%) were not sure. Given the answers to the previous question where 93% would use renewable energy, it seems that for the US building professionals renewable energy would be used even if it did not result in any competitive advantage.

Figure 10: Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge? US answers



Given the Chinese professionals' responses to previous questions with regards to the use of renewable energy, their responses when asked if the use of renewable energy would give a competitive edge were surprising. Paradoxically eighty percent (80%) said yes, and twenty percent (20%) did not know. This is a puzzling result as only 30% would consider using renewable energy. This result may indicate a practical approach by the Chinese wherein proofs of the benefits have to be provided before renewable energy applications are considered. This result may also indicate a very competitive Chinese society.

Figure 11: Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge? Chinese answers



In both the Chinese and US circumstances the topic of competitive advantage should be addressed in order to develop plausible business reasons.

What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in the previous question?

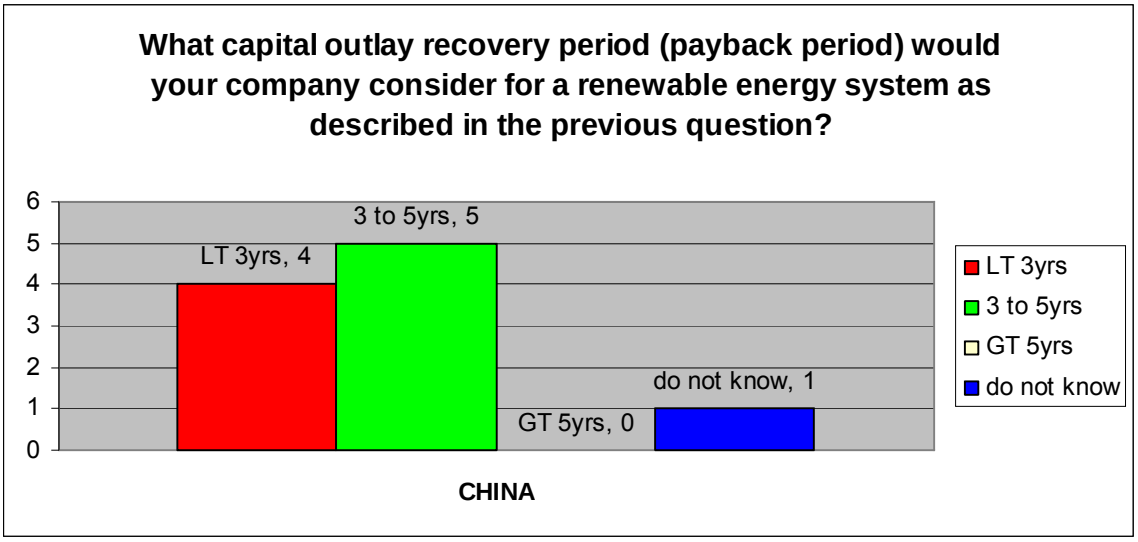
One of the major business reasons cited for the lack of utilization of renewable energy sources is the high capital cost of renewable energy technologies compared with conventional energy.[13]

With regards to an acceptable capital recovery period the Chinese responses were somewhat similar to that of the US. Fifty percent (50%) of the Chinese

[13] http://www.nrel.gov/docs/fy07osti/40116.pdf retrieved 3/22/2008

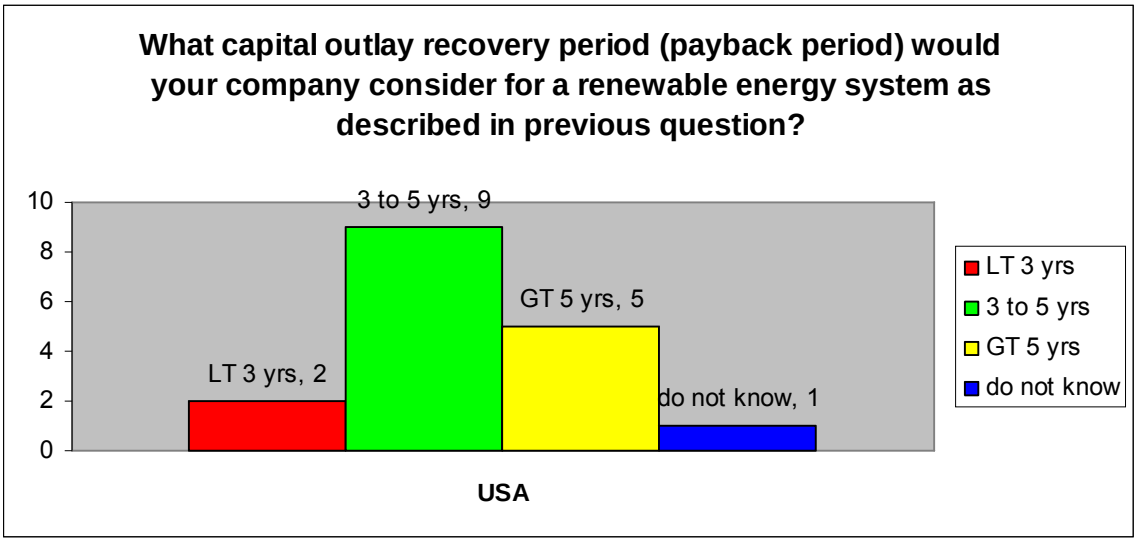
building professionals said three to five years and forty percent (40%) said less than three years.

Figure 12: What capital outlay recovery period would your company consider for a renewable energy system? Chinese answers



The US building professionals when asked about an acceptable capital recovery period eighty two percent (82.35%) answered more than three years. This suggests that these professionals took a long term view with regards to the use of renewable energy.

Figure 13: What capital outlay recovery period would your company consider for a renewable energy system? US answers

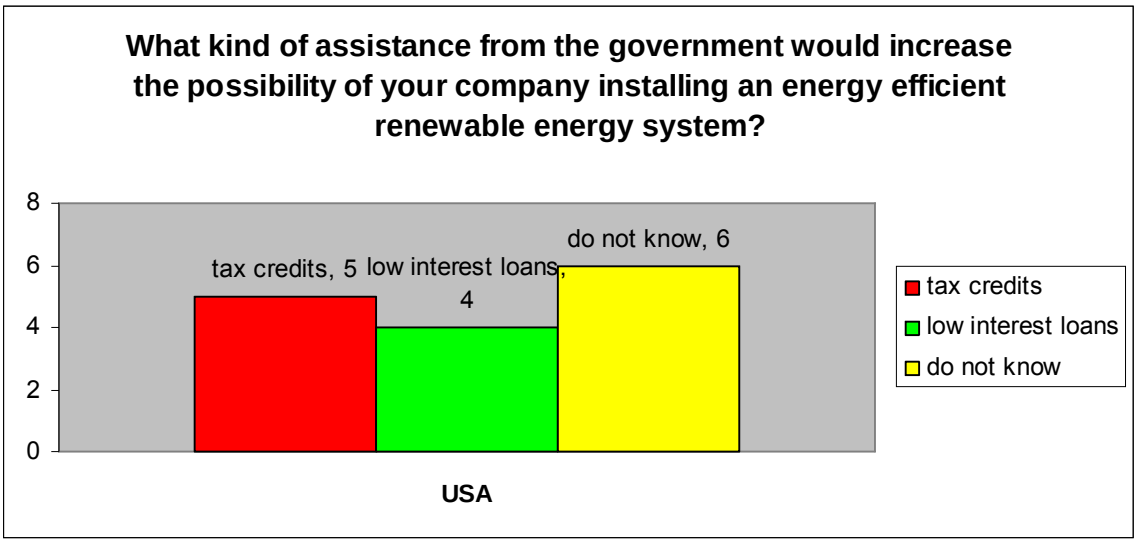


The majority of both US and Chinese professionals opted for the three to five year capital outlay recovery period. These results suggest that capital outlay recovery durations of three to five years should be quoted when developing business reasons for renewable energy applications.

What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?

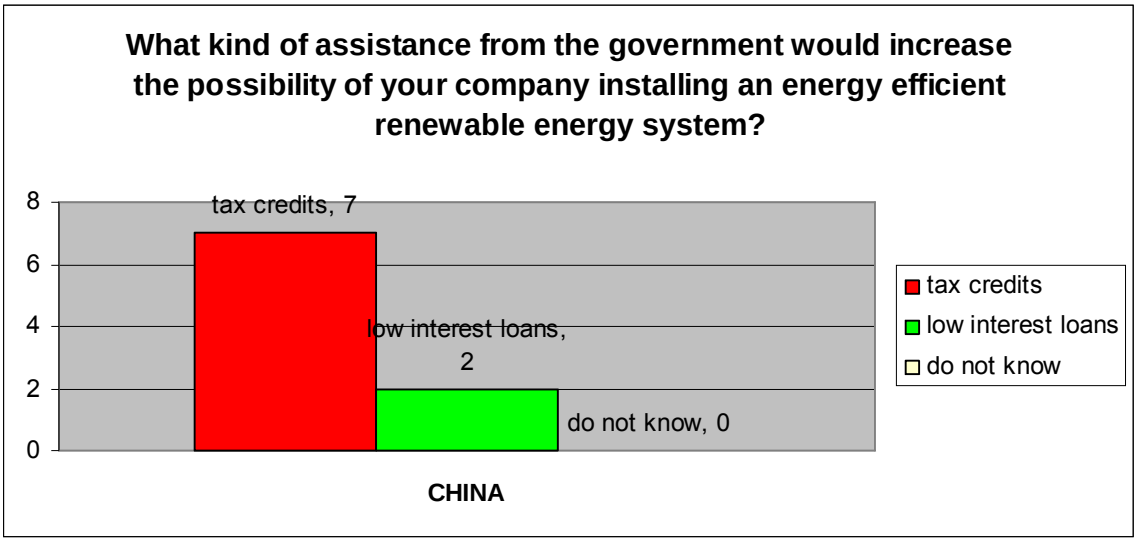
The question of government intervention with low interest guarantee or tax credit was posed in order to help determine if assistance from government was a viable business reason. Thirty three percent (33.33%) of US experts indicated tax credits and twenty seven percent (26.67%) indicated low interest loans were desirable.

Figure 14: What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system? US answers



When asked what kind of government assistance would be desirable seventy eight percent (77.78%) of the Chinese professionals said tax credits; twenty two percent (22.22%) said low interest loans.

Figure 15: What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system? Chinese answers



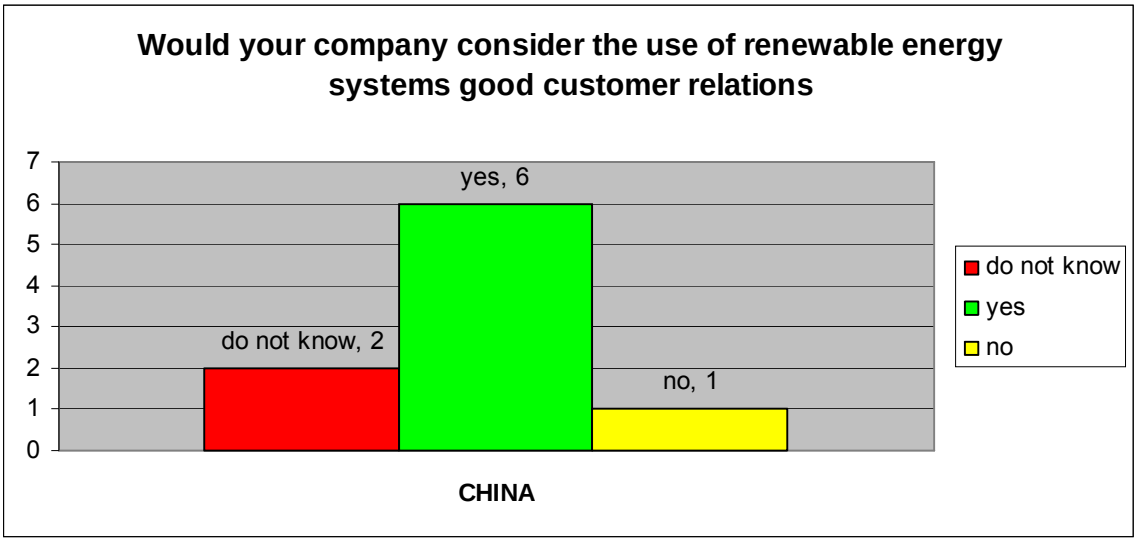
Given the difference in political systems, the difference in interaction with the government agencies and the difference in the extent of government involvement, the difference in the resulting answers were not totally unexpected. It should be noted however, that a majority of both the US and Chinese professionals saw that government intervention was necessary. Therefore business reasons can be developed stating all available government assistance.

Would your company consider the use of renewable energy system good customer relations?

In addition to economic reasons, good customer relations are essential in securing a vibrant, stable organization. Good customer relations often lead to satisfied customers and an improved business future.[14] Therefore projects that enhance good customer relations are well worth the effort.

When asked if the use of renewable energy source would enhance customer relations sixty seven percent (66.67%) of the Chinese professionals said yes; eleven percent (11.11%) said no and twenty two percent (22.22%) did not know.

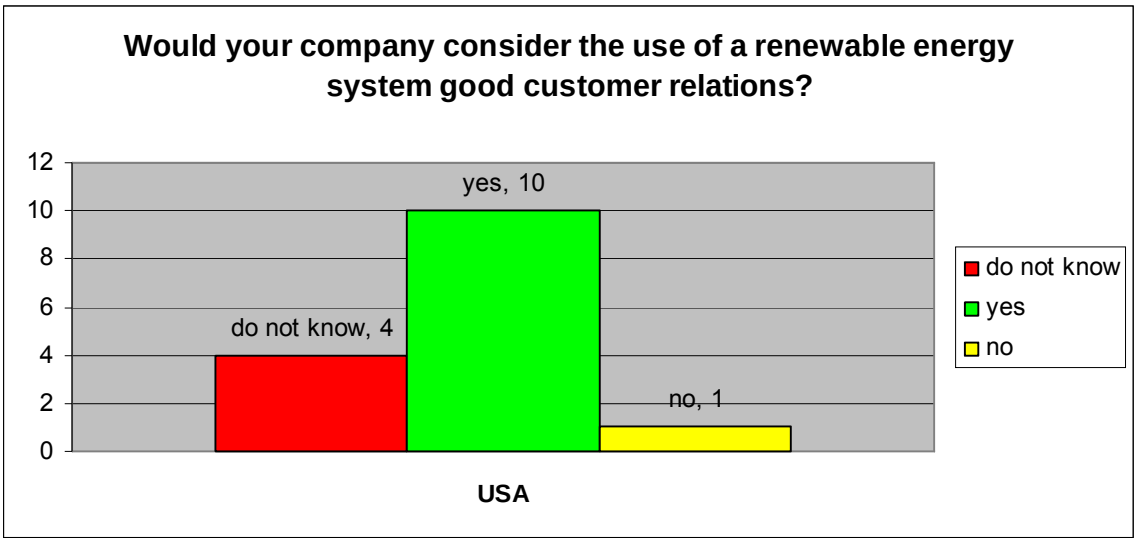
Figure 16: Would your company consider the use of renewable energy systems good customer relations? Chinese answers



[14] http://www.b-s-i.org/blog/?p=182 retrieved 3/22/2008

When asked about whether the use of renewable energy would improve customer relations sixty seven percent (66.67%) of the US professionals said yes, seven percent (6.67%) said no and twenty seven percent (26.67%) did not know.

Figure 17: Would your company consider the use of renewable energy systems good customer relations? US answers



Good customer relations as a result of utilizing renewable energy seem to be a strongly held belief for both the Chinese and United States building professionals. The results from the two countries were almost identical. The possibility of improved customer relations could therefore be included as a good business reason for utilizing renewable energy.

The Chinese responses to this question also bring into question their responses to previous questions as to whether they would consider using renewable energy. This quandary needs further in depth study.

What are the daily and seasonal peak demand periods for the HVAC system?

The daily and seasonal peak demand periods for HVAC usage can be targeted for energy efficiency planning and better application of renewable energy resources. These answers are important in determining size and type of renewable energy application targeted to the HVAC system.

In the United States the daily peaks are 12 to 4 p.m. and seasonal peaks are during the summer.

Figure 18: What are the peak daily demand periods for the HVAC system? US answers

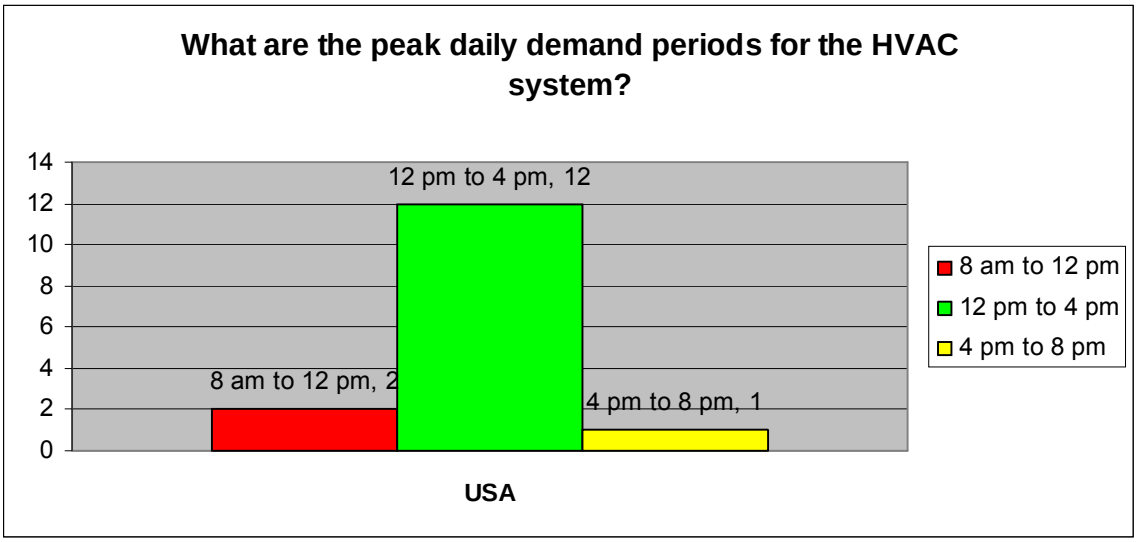
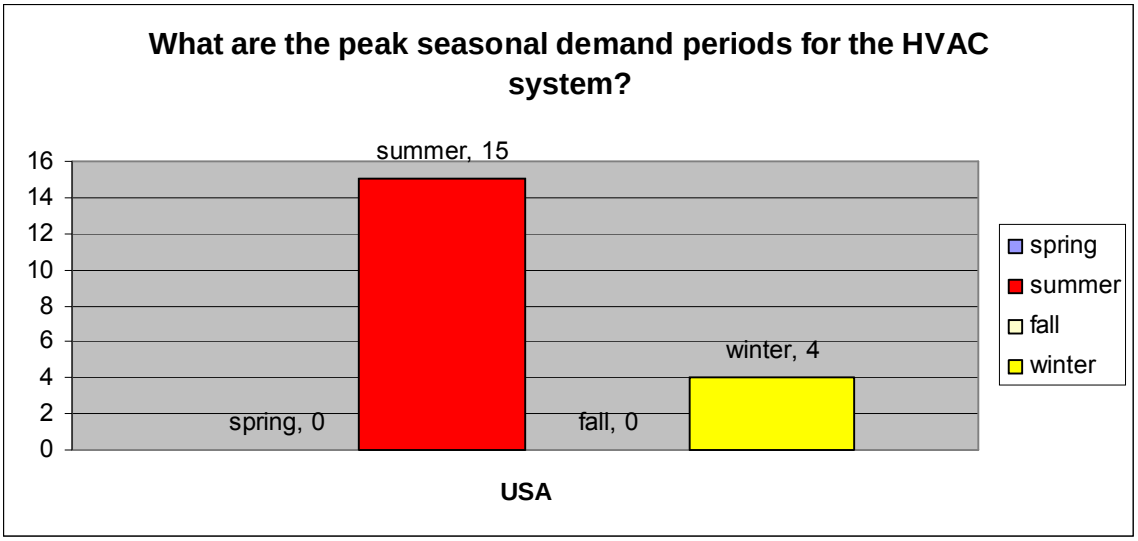


Figure 19: What are the peak seasonal demand periods for the HVAC system? US answers



In China the daily peaks are 8 a.m. to 12 p.m. and seasonal peaks are during the summer.

Figure 20: What are the peak daily demand periods for the HVAC system? Chinese answers

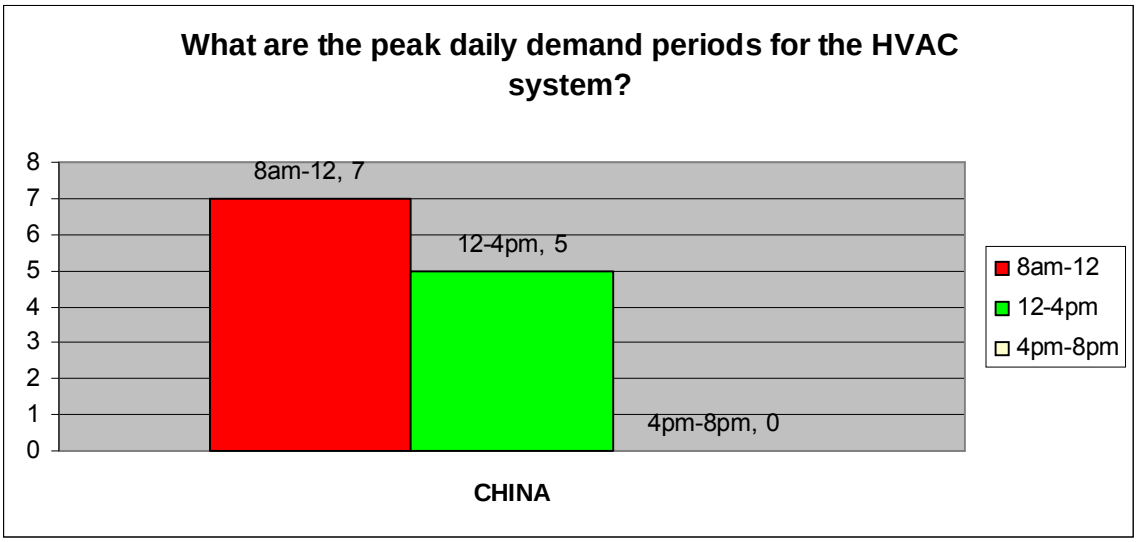
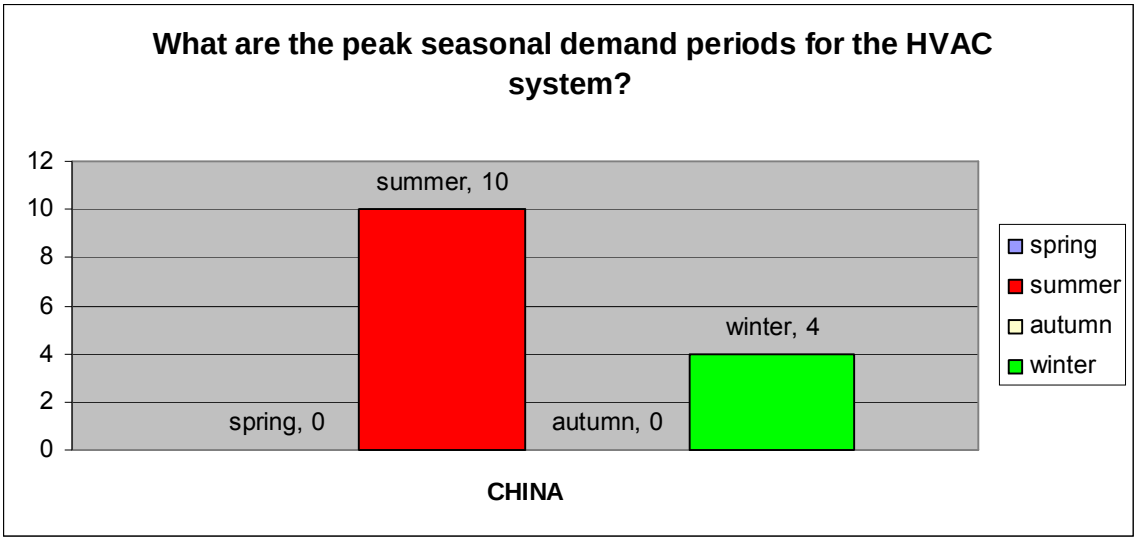


Figure 21: What are the peak seasonal demand periods for the HVAC system? Chinese answers



These results help to plan the efficient application of auxiliary renewable energy resources. For energy supplied through the electrical grid, the renewable energy resource can be employed during the peak demand periods to help reduce the overall load on the power grid. Some of the secondary benefits include a reduction in peak demand charges and a reduction of the necessity to build more power plants to meet the peak demand periods. These are possibly some business reasons.

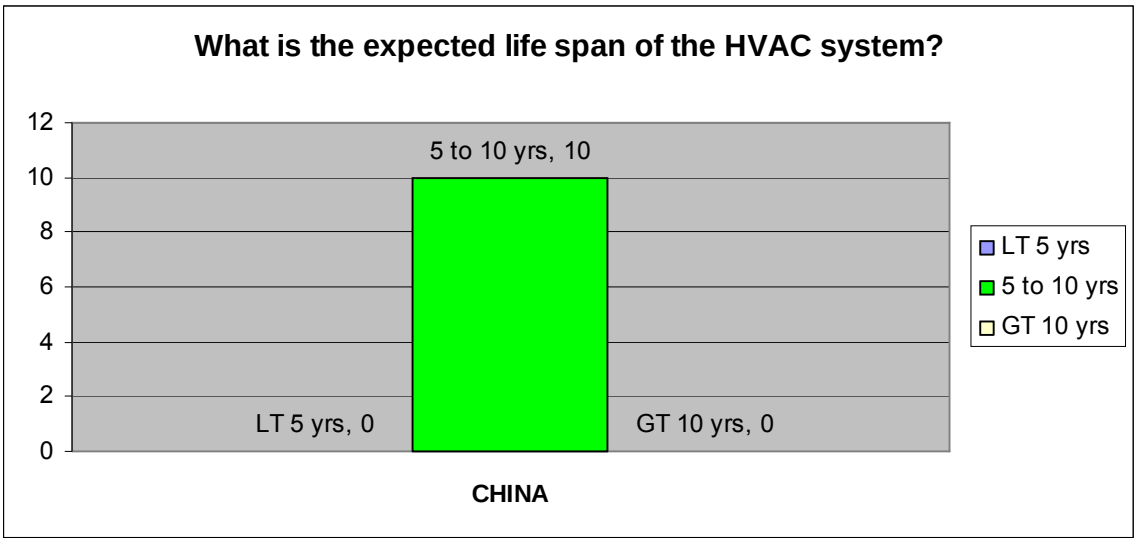
What is the expected life span of the HVAC system?

The life expectancy of the HVAC system has a cost associated with it and is a determining factor in its planned maintenance or replacement. These costs can be used to formulate a credible financially sound proposal for the upper management of any organization. Knowing the expected life expectancy of

HVAC system and the current age of the current HVAC system, will help to derive business reasons to utilize renewable energy.

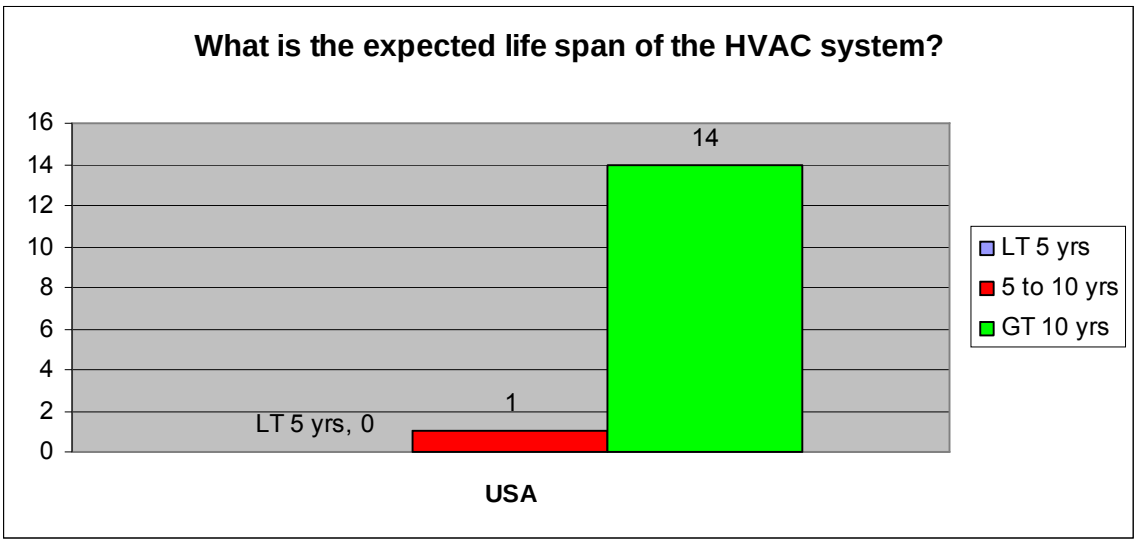
The Chinese responses were 100% in the 5 to 10 year time frame.

Figure 22: What is the expected life span of the HVAC system? Chinese answers



In the United States the responders stated overwhelmingly that the serviceable life of the HVAC system is over 10 years.

Figure 23: What is the expected life span of the HVAC system? US answers



What is your company's current annual electricity bill and maintenance expenses?

Knowing the annual energy cost is a crucial factor in crafting fiscally sound business reasons to acquire renewable energy. The annual building maintenance costs especially if the HVAC equipment can be identified puts into perspective potential capital expenditure savings that can be realized by the reduction of wear on the equipment.

The responses from the US building professionals for electric and maintenance bills are larger than expected. In this sense the numbers are instructive and can be used to garner approximate comparison figures.

Figure 24: What is your company's current annual electricity bill? US answers

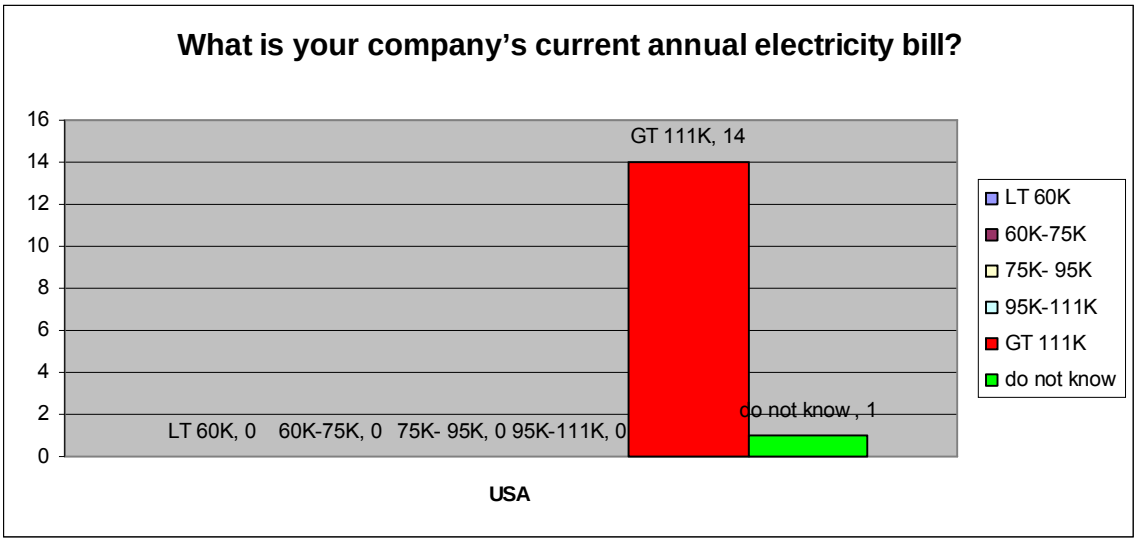
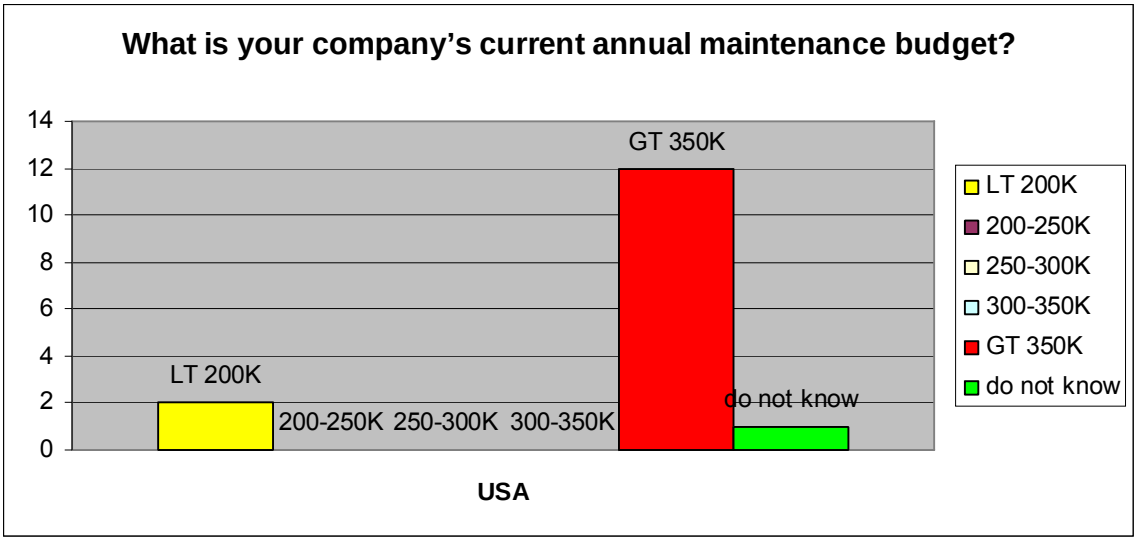


Figure 25: What is your company's current annual maintenance budget? US answers



The Chinese building professionals also reported larger than expected annual energy bill but a lower than expected annual maintenance bills.

Figure 26: What is your company's current annual electricity bill? Chinese answers

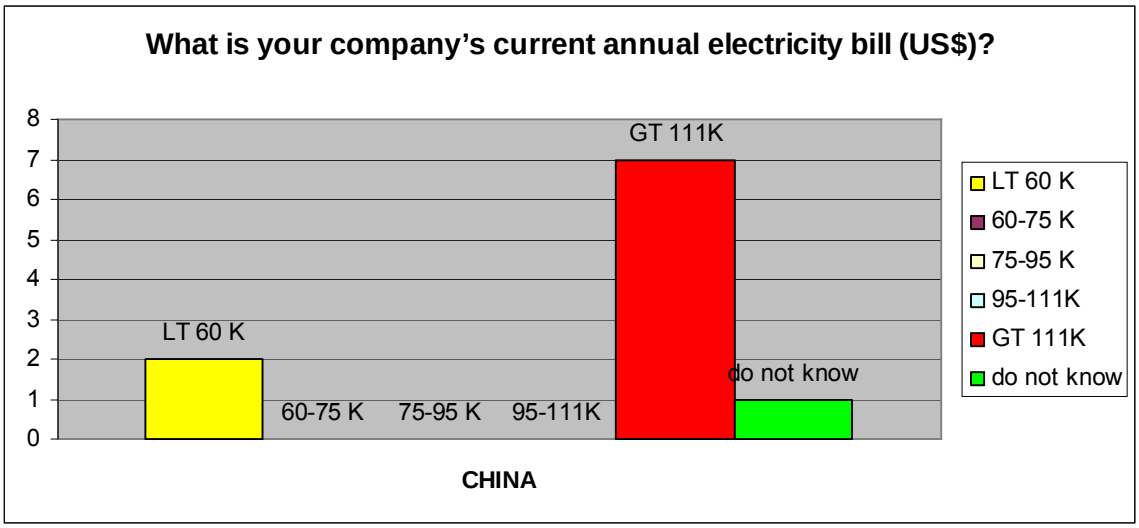
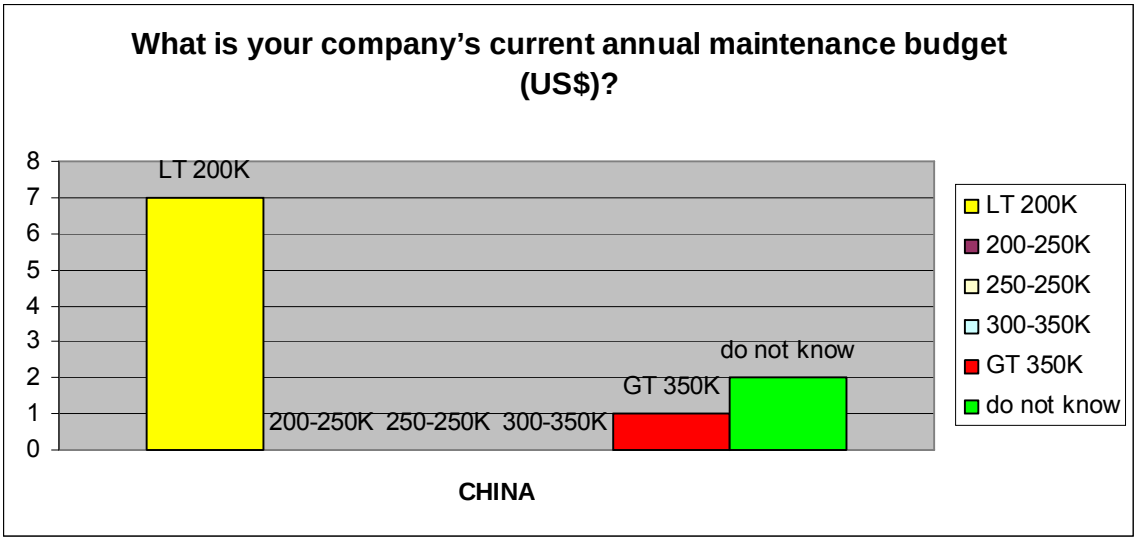


Figure 27: What is your company's current annual maintenance budget? Chinese answers



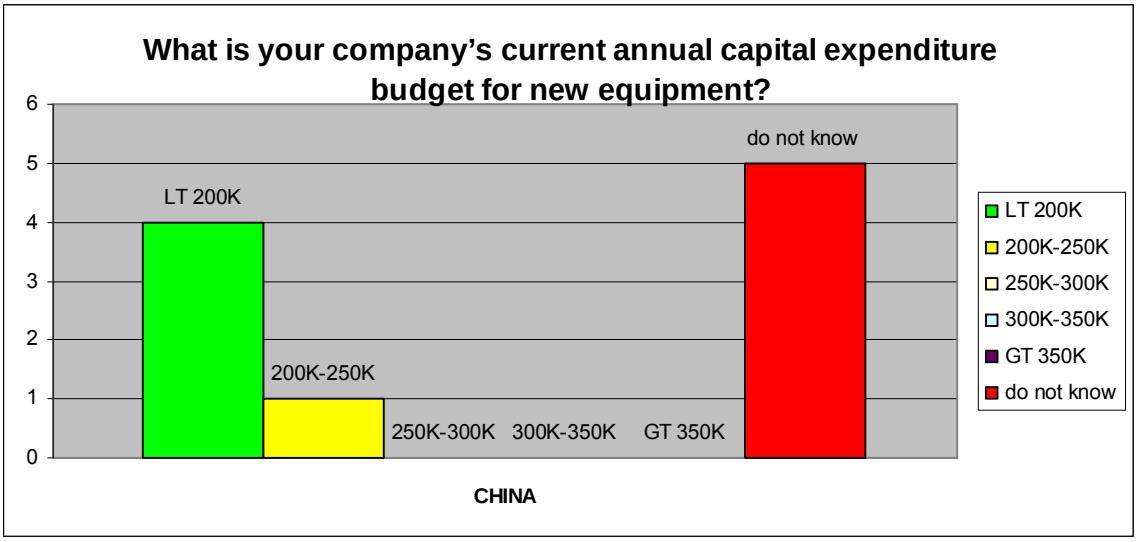
The annual energy bills results seem to indicate that huge increases have recently occurred in energy costs. These results in turn might present a business reason to utilize renewable energy.

What is your company's current annual capital expenditure budget for new equipment?

The purpose of this question is to determine the relative costs of new HVAC systems and thereby develop business reasons for funding levels with respect to renewable energy systems that assist the HVAC systems. The question as to the annual cost of new equipment is designed to determine the spending range of the responders. This spending range helps determine overall budget and gives the responders good reasons to seek alternatives to replacing the HVAC system.

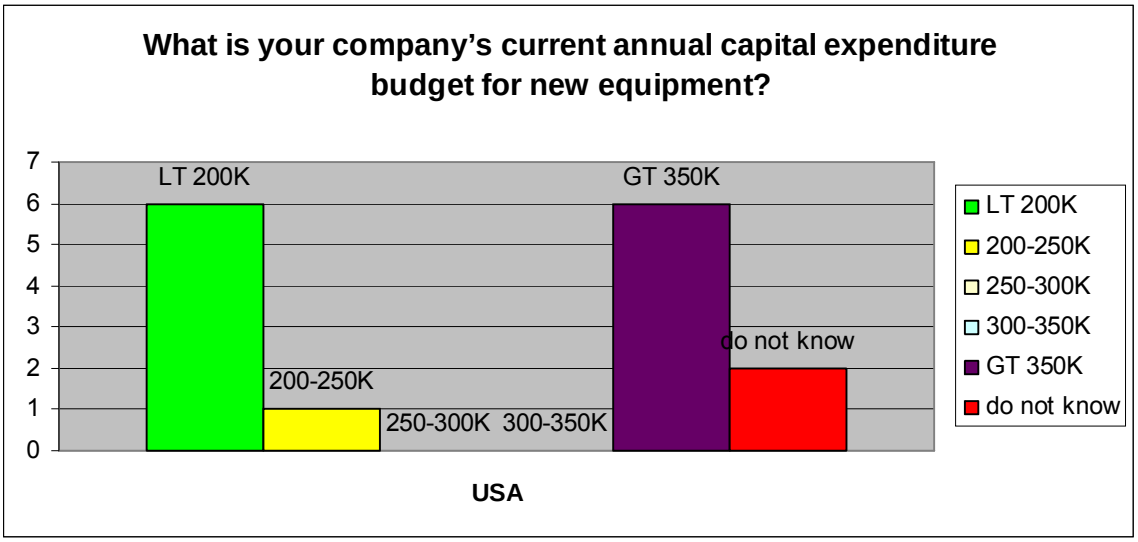
Fifty percent (50%) of the Chinese professionals did not know what their budgets were while forty percent (40%) said their budgets were less than US$200,000.

Figure 28: What is your company's current annual capital expenditure budget for new equipment? Chinese answers



Forty percent (40%) of the US professionals reported an annual capital expenditure of less than $200,000 and forty percent (40%) had annual expenditures greater than $350,000.

Figure 29: What is your company's current annual capital expenditure budget for new equipment? US answers

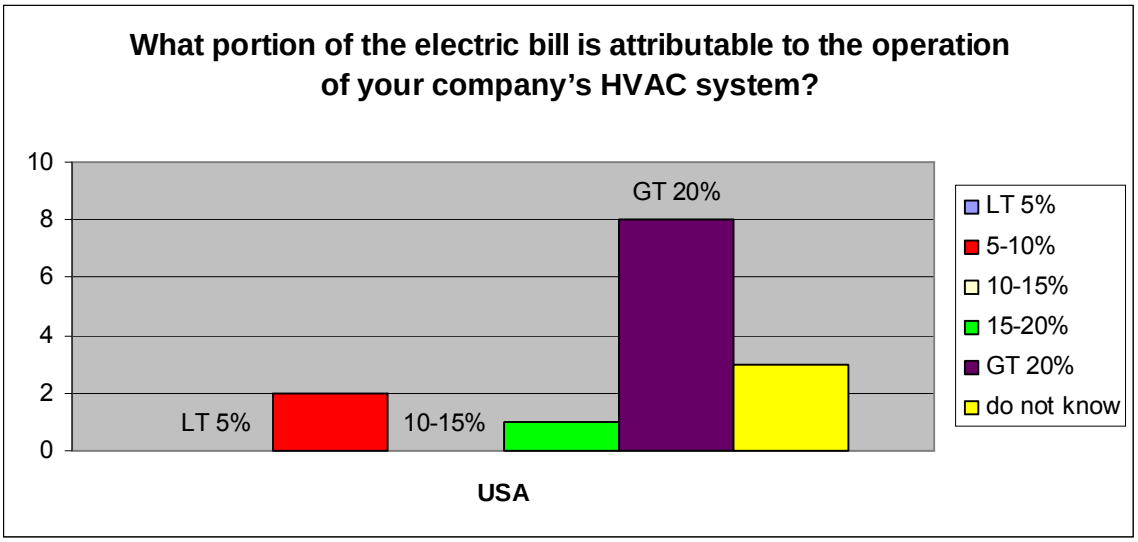


What portion of the electric bill is attributable to the operation of your company's the HVAC system?

The intent of this question is to determine the possible savings on the electric bills a renewable energy system would provide in assisting the HVAC system.

When asked about the effect of the HVAC had on the energy bills, fifty seven percent (57.14%) of the US professionals said more than 20% of the bill was attributable to the operation of the HVAC.

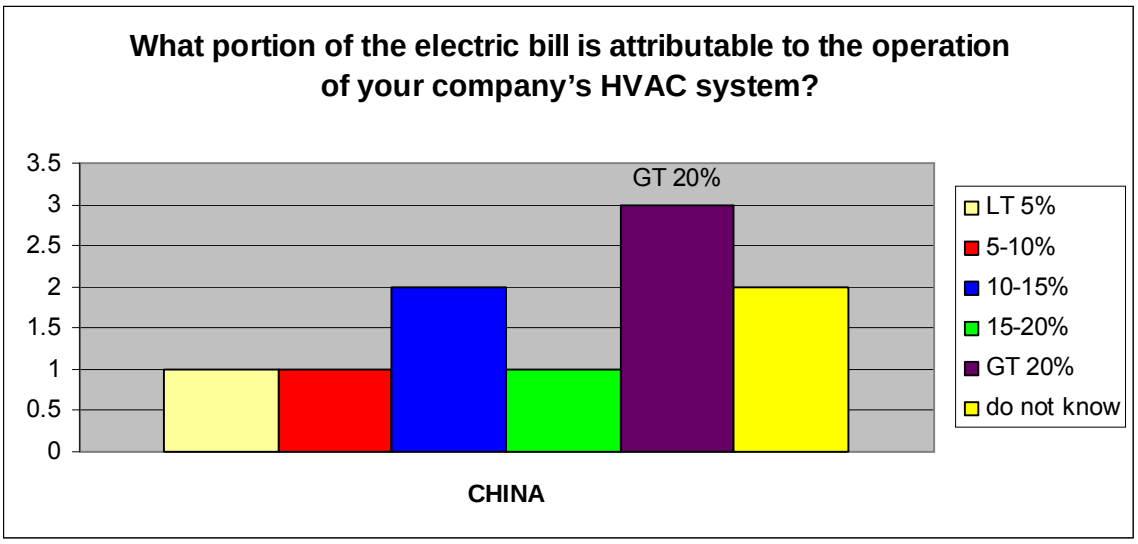
Figure 30: What portion of the electric bill is attributable to the operation of your company's HVAC system? US answers



When asked what percentage of the energy bill was attributable to the running of the HVAC system, the Chinese responses were evenly distributed. Thirty percent (30%) said the HVAC was responsible for more than 20% of the energy bills; 10% said less than 5%; 10% said 5 to 10%; 20% said 10 to 15%; 10% said

15 to 20% and 20% did not know. Again this question was intended to assist in setting financial parameters in order to develop fiscally sound business reasons for the utilization of a renewable energy system.

Figure 31: What portion of the electric bill is attributable to the operation of your company's HVAC system? China answers



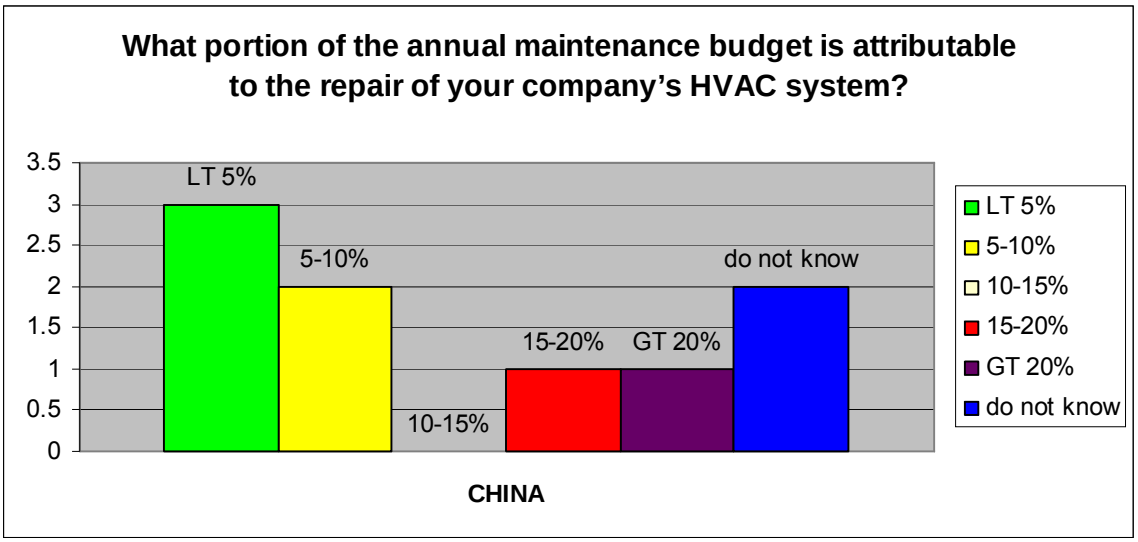
What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?

The intent of this question is to determine the possible savings on the annual maintenance repair bills a renewable energy system would provide in assisting the HVAC system.

The Chinese responses to the question on the effects the HVAC system has on the annual maintenance budget had a similarly evenly distributed result. Thirty three percent (33.33%) said less than 5%; twenty two percent (22.22%) said between 5 and 10%; eleven percent (11.11%) said between 15 and 20%; eleven

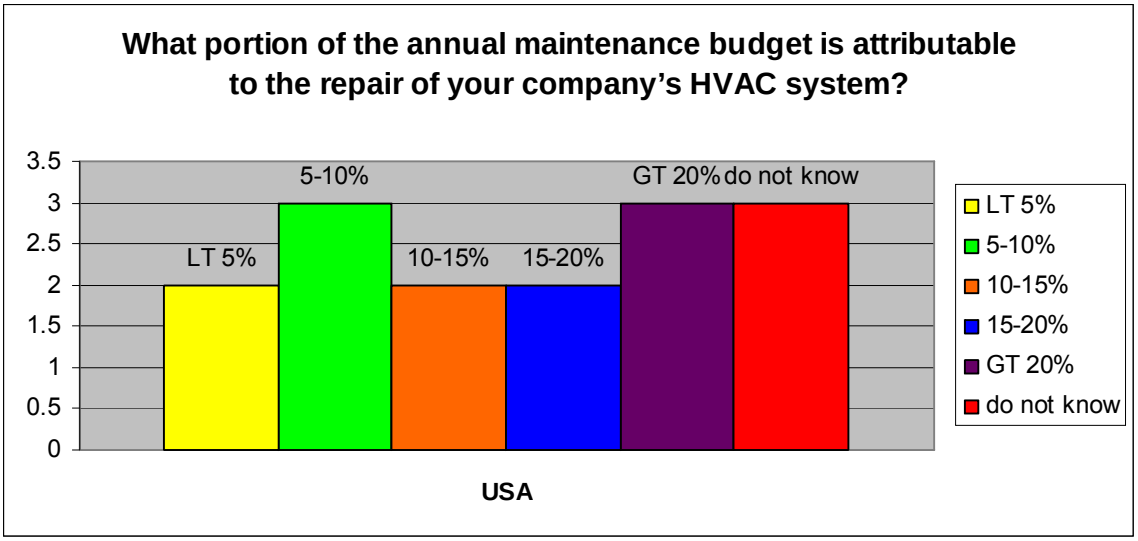
percent (11.11%) said greater than 20% and twenty two percent (22.22%) did not know. This type of question is designed to further help in defining financial parameters with regards to the HVAC systems being assisted be renewable energy sources.

Figure 32: What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system? Chinese answers



When asked the question of the relative repair cost with regards to the annual maintenance budget the US responses were similarly evenly distributed.

Figure 33: What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system? US answers

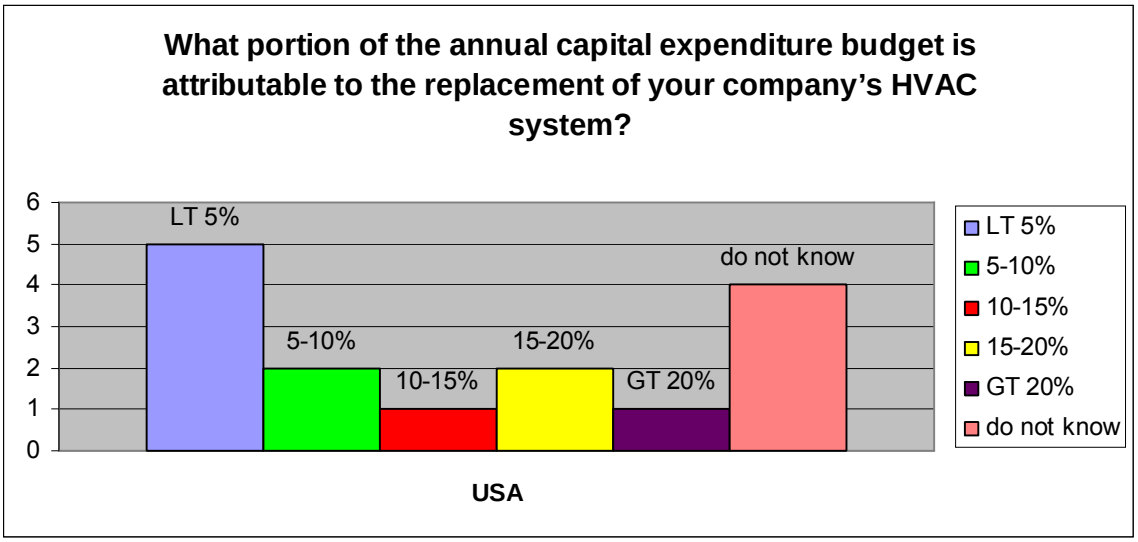


What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?

The question as to the portion of the annual capital expenditure used for the HVAC system is a crucial one. If the assistance provided to the HVAC by the use of renewable energy can postpone the replacement of the HVAC then additional business reasons can be derived.

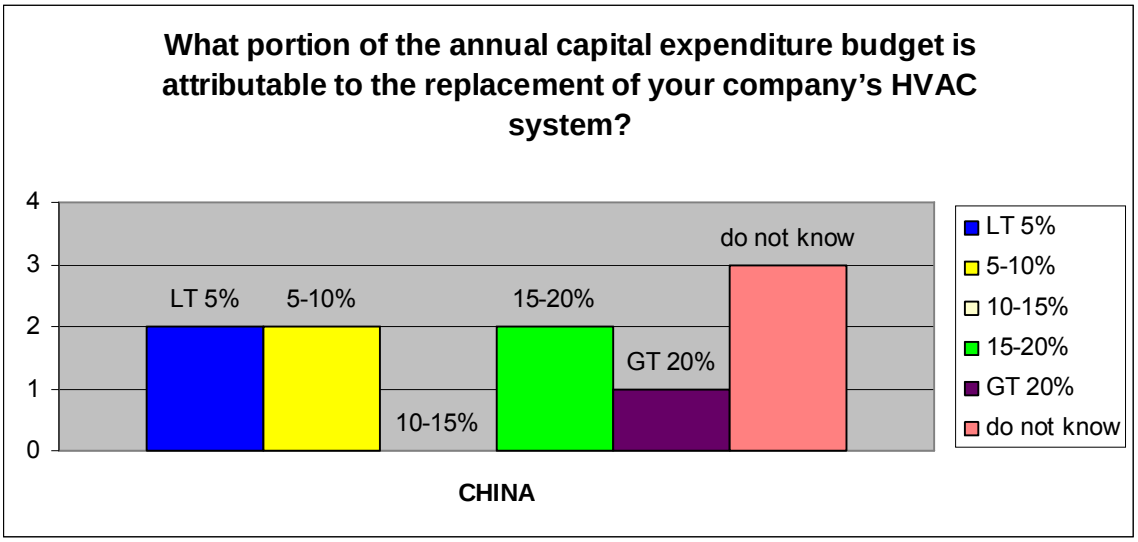
Thirty three percent (33.33%) state that HVAC replacement cost less than 5% annually. The inference that may be taken here is that if the renewable energy system cost more that 5% of the annual capital expenditure budget then 33% of the responders might consider replacing the HVAC rather than applying renewable energy technologies.

Figure 34: What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system? US answers



The Chinese responses as to the effect the replacement of the HVAC system on the annual capital expenditure budget were evenly distributed. Two of ten or 20% said less than 5%; 20% said 5 to 10%; 20% said 15-20%; 10% said greater than 20% and 30% did not know.

Figure 35: What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system? Chinese answers

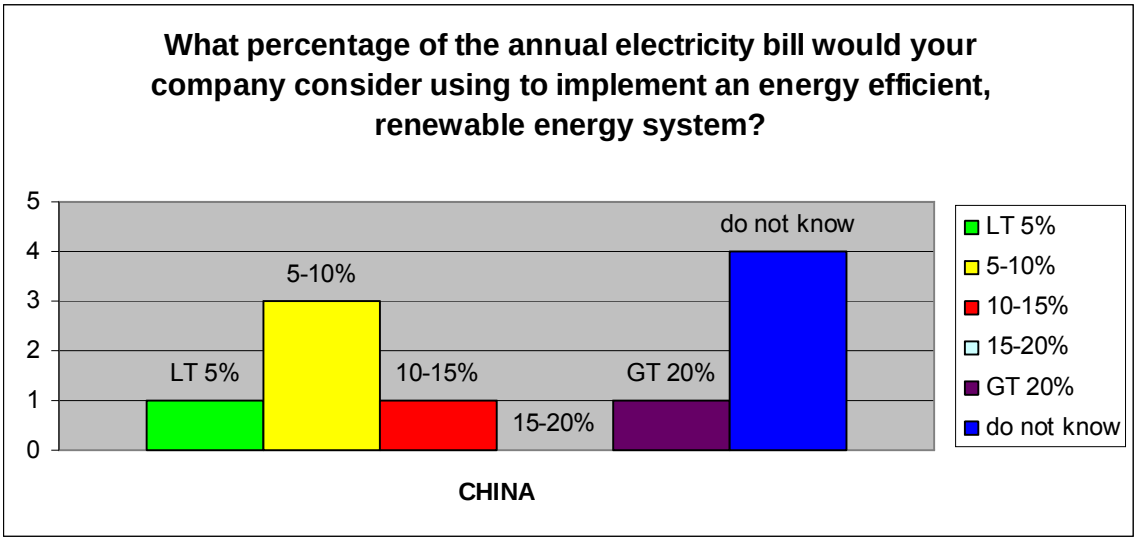


What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?

Now that some parameters have been defined with respect to the costs of the HVAC system the cost of a renewable energy system that assists the HVAC system can be quantified. Various cost based business reasons can now be derived. The following questions attempts to present guidelines for decision makers using the responses of some of their peers. Many renewable applications use no billable energy if generated and used locally, wind and solar being two such forms. The acceptable portion of the annual energy bill will help define a budget for the renewable energy application.

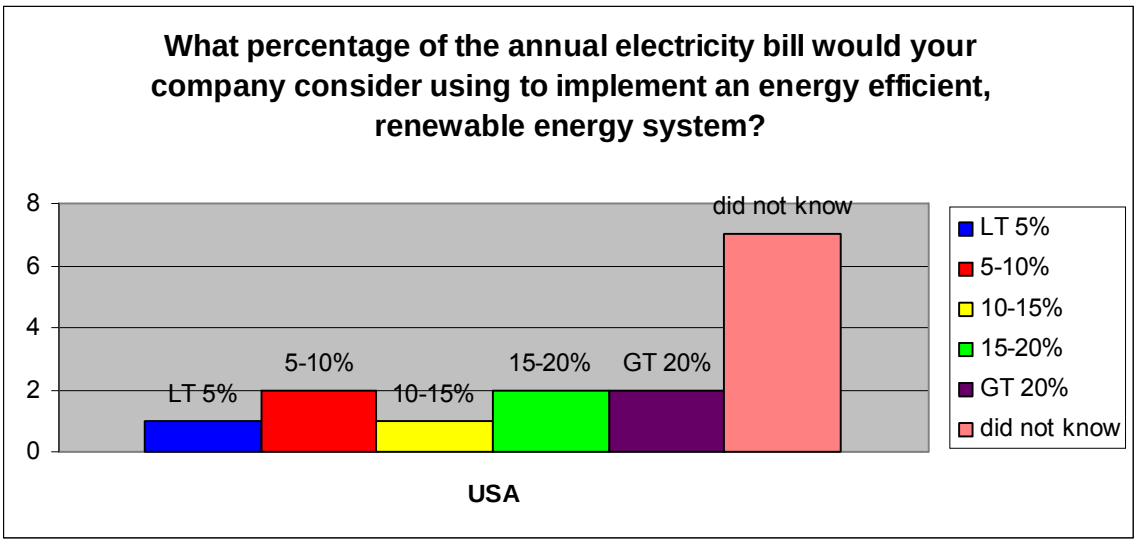
When the Chinese professionals asked what percentage of their energy bills they would allocate for a renewable energy system ten percent (10%) said less than 5%; thirty percent (30%) said 5 to 10%; ten percent (10%) said 10-15%; ten percent (10%) said greater than 20% and forty percent (40%) did not know.

Figure 36: What percentage of the annual electricity bill would your company consider using to implement an energy efficient renewable energy system? Chinese answers



When asked how much of the annual energy bill would you use to implement a renewable energy system, Forty seven percent (46.67%) did not know. Answering this question further present needed financial parameters necessary in developing acceptable business reasons to upper management. Fifty three percent (53%) of the US experts had some idea as to the expected costs.

Figure 37: What percentage of the annual electricity bill would your company consider using to implement an energy efficient renewable energy system? US answers

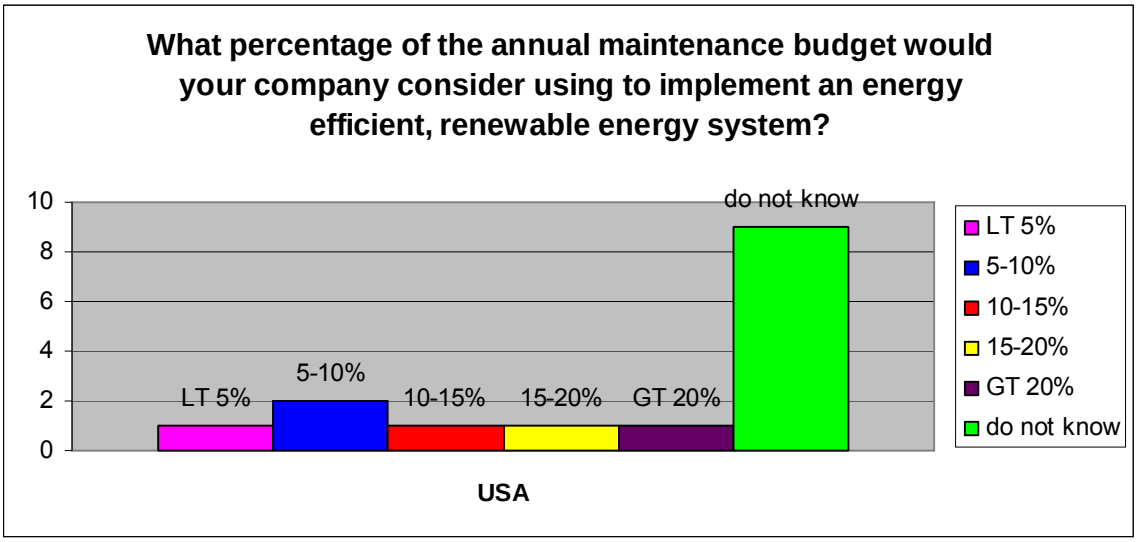


<u>What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?</u>

This again is another important question to answer as it helps in determining approximate dollar values for a budget. This question also helps to determine whether replacement or continued maintenance with assistance from an auxiliary renewable energy system is the correct financial solution.

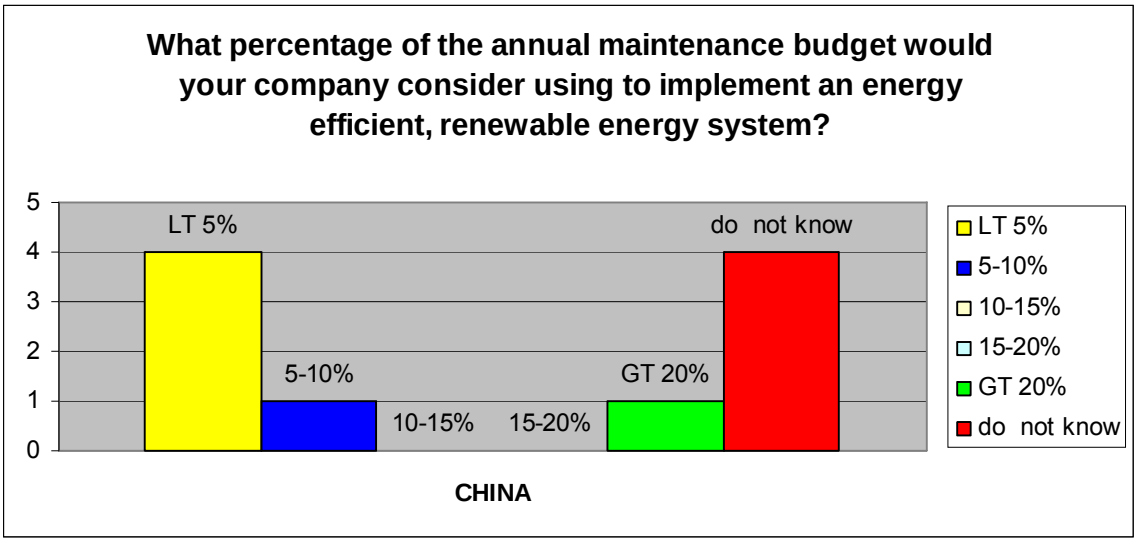
The same proportional question was asked in regards to the maintenance budget. Forty percent of the US professionals had some knowledge of the relative cost of the renewable energy system.

Figure 38: What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system? US answers



When asked the same question with respect to the percentage of the maintenance budget that would be used for a renewable energy system sixty percent (60%) of the Chinese professionals had a definitive answer.

Figure 39: What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system? Chinese answers

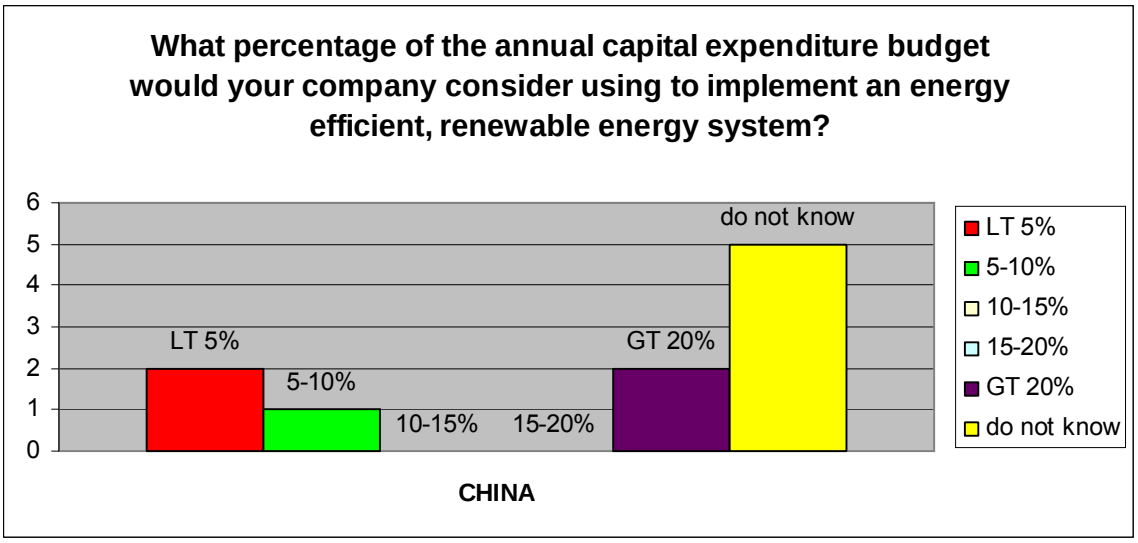


What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?

This question has probably the most direct effect on the acquisition of an HVAC auxiliary renewable energy system. While this study proposes a holistic approach in finding a solution the reality of the capital expenditure budget is a significant one.

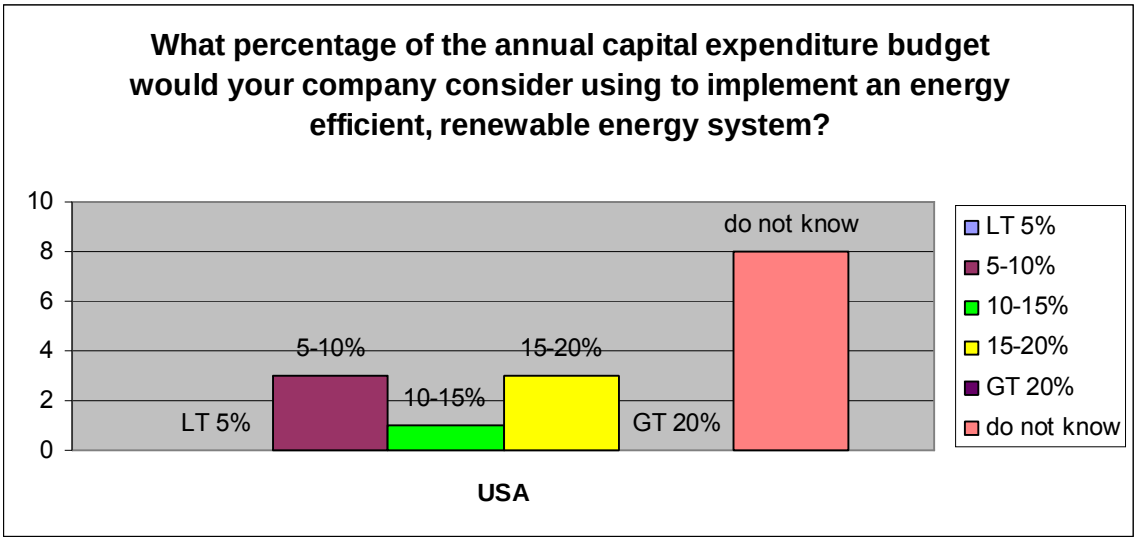
When asked what percentage of the capital expenditure budget would be utilized fifty percent (50%) of the Chinese professionals had a definite answer.

Figure 40: What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system? Chinese answers



Similarly when asked about the portion of the capital budget they would consider using in acquiring a renewable energy system, forty three (42.86%) percent of the US professionals had a definite answer.

Figure 41: What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system? US answers



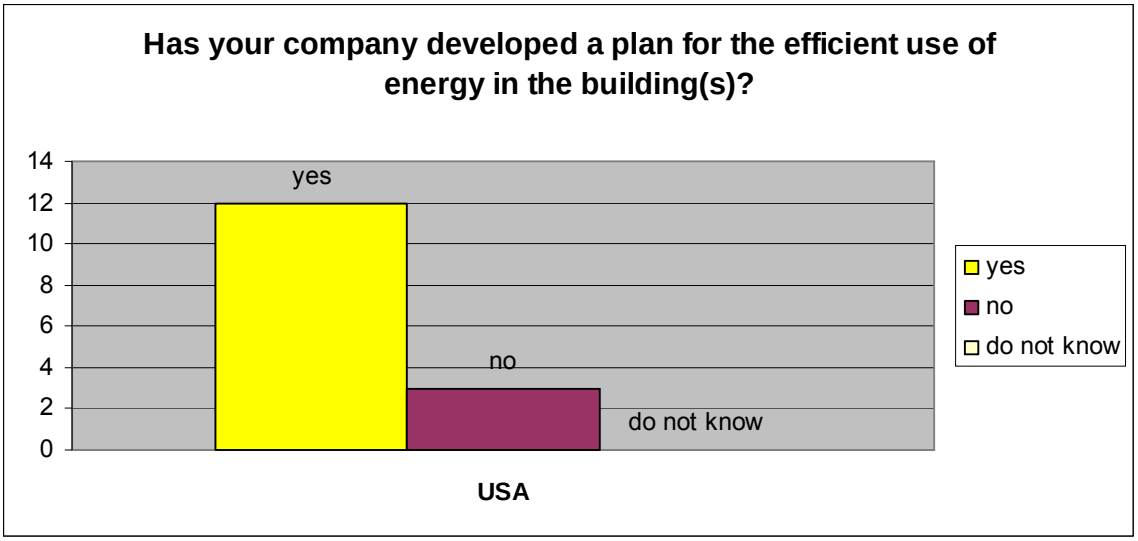
The previous six questions attempt to put fiscal parameters on acquiring a renewable energy system to assist the HVAC. In addition they attempt to indicate business reasons for the acquisitions.

The next five questions relate to the implementing of an energy efficiency plan. These questions are intended to encourage the professionals to consider this type of planning and make it a part of their holistic approach in their business solutions. A plan and execution of the efficient use of energy helps to properly size a renewable energy system which in turn allows budget planners to correctly assess the true cost of the system. This helps to define fiscally sound business reasons for implementing such renewable energy systems to upper management.

Has your company developed a plan for the efficient use of energy in the building(s)?

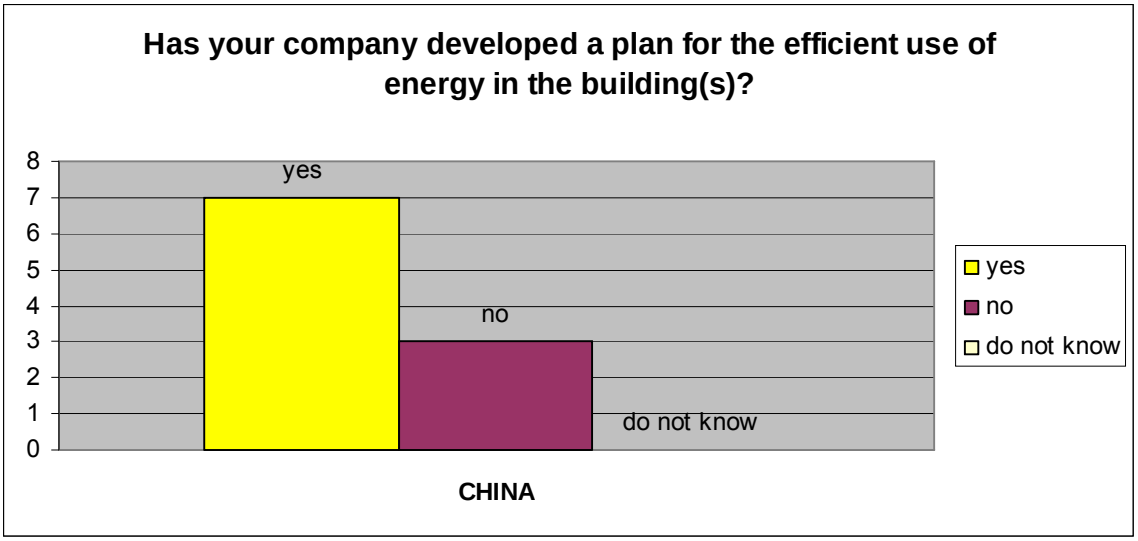
When asked if they had developed an energy efficiency plan eighty percent (80%) of the US professionals said they had. This indicates that the level of awareness of the responders in the United States as far as the efficient use of energy is high.

Figure 42: Has your company developed a plan for the efficient use of energy? US answers



Seventy percent (70%) of the Chinese professionals said they had developed energy efficiency plans. This matches the 80% of US responders who have developed such plans. An energy efficiency building plan is necessary in developing efficient and fiscally sound business plans for the installation of renewable energy applications.

Figure 43: Has your company developed a plan for the efficient use of energy? Chinese answers

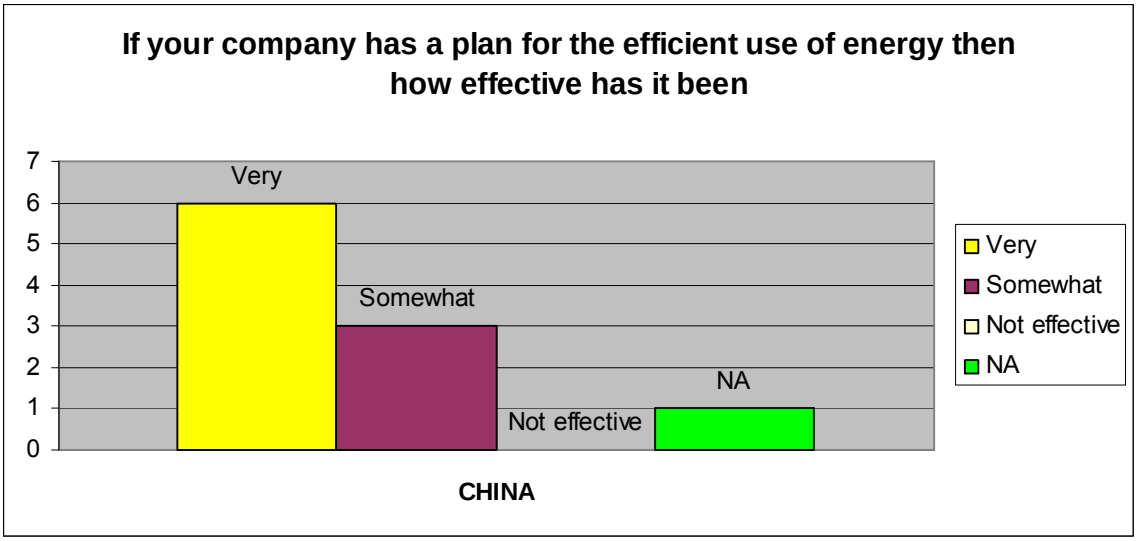


<u>If your company has a plan for the efficient use of energy then how effective has it been?</u>

This question is intended assist researchers in determining the effectiveness of actual renewable energy plans. This planning of course affects the financial aspect of the business reasons for utilizing a renewable energy system in order to help extend the life of the HVAC system.

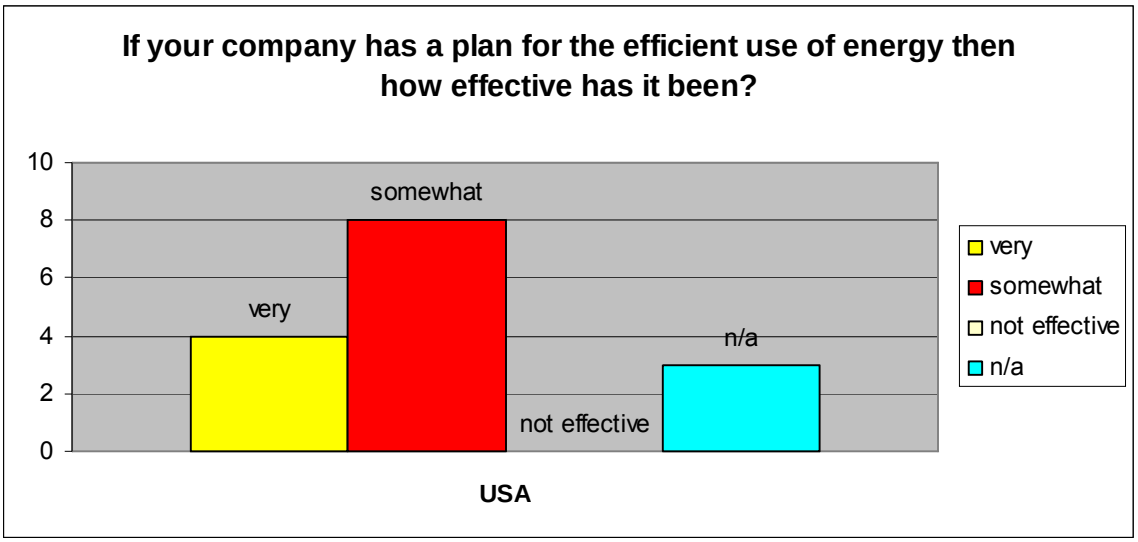
To help justify the resources needed to develop such efficiency plans the question of effectiveness was posed. Ninety percent (90%) of the Chinese professionals said the plan was very effective or somewhat effective.

Figure 44: If your company has a plan for the efficient use of energy then how effective has it been? Chinese answers



This compares with eighty percent (80%) of the US professionals who said the efficiency plans were very effective or somewhat effective.

Figure 45: If your company has a plan for the efficient use of energy then how effective has it been? US answers



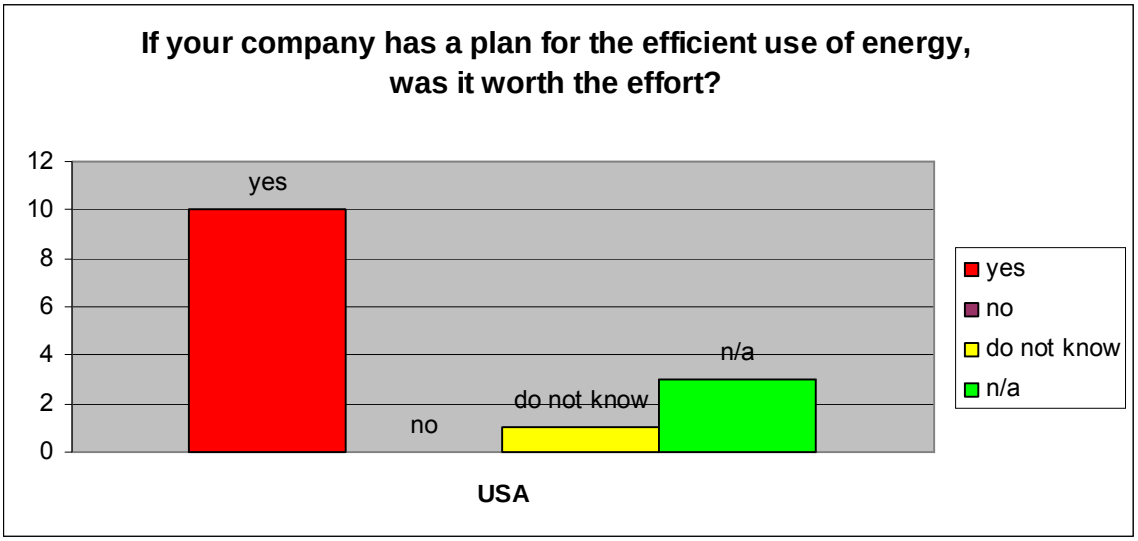
It is important to note that none of the professionals from China or the US who had energy efficiency plans, stated that it was not effective. This result should be encouraging to others contemplating energy efficiency planning.

If your company has a plan for the efficient use of energy, was it worth the effort?

With a holistic approach in mind, the effectiveness of the energy efficiency plan has to be tempered with the overall satisfaction delivered.

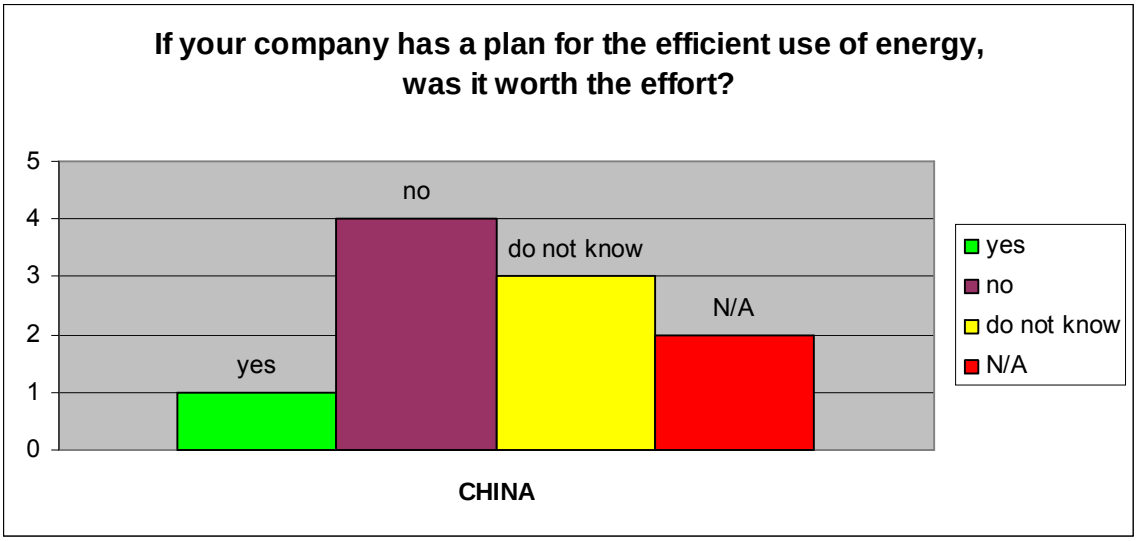
When asked if the energy efficiency planning was worth the effort ninety one percent (90.91%) of the US professionals said yes.

Figure 46: If your company has a plan for the efficient use of energy, was it worth the effort? US answers



Somewhat perplexing are the answers given by the Chinese responders to the question whether the effort in developing the efficiency plan was worth the effort. Even though ninety percent (90%) said the effort was very effective or somewhat effective, fifty percent (50%) said it was not worth the effort. This sharply contrasts with the US results. Here is another Chinese result that needs further study.

Figure 47: If your company has a plan for the efficient use of energy, was it worth the effort? Chinese answers



The following two questions are open-ended narrative questions for the edification of researchers. These answers present shared experiences that may be helpful to those interested in the creation of energy efficiency plans.

If your company has a plan for the efficient use of energy then, what were the major problems?
(USA responses)

- Funding - Budget
- We need a plan. Since we have 1895 buildings, it's not an easy proposition. Is there any advice you can offer to us?
- Older, less efficient T-12 fluorescent lamps and ballasts using more electricity than new lamps available for purchase
- What were the major problems?: Most HVAC control systems are driven by computer technology and are therefore subject to the problems associated with software controls. It is in this area that we experience the most problems. Our mechanical problems are statistically "normal" regarding repairs and maintenance.
- communicating to the employee population ways to Save by turning off lights, computers, etc.
- Competition for available capital
- Bringing "moth balled" systems back into use with new support or peripheral systems
- Savings not as high as expected

- The landlord does not want to upgrade the lighting systems.
- Demand of the people who use the space
- Continuing efforts to implement, track benefits, make an impact without significant costs

If your company has a plan for the efficient use of energy then what were the major problems?
(Chinese Responses)

Chinese	English
• 执行力不够	• Lack of execution
• 新建筑设计中采用环保节能设计，节省能源消耗	• You can save energy, if you introduce the environment protection and save energy module in new architecture design.
• 作为建筑施工企业，施工现场用电用水浪费现场严重。同时，办公室经常出现长明灯现象，人走后电脑、灯等用电设备不关。	• As a construction company, too much power and water were wasted in the construction site. In the meantime, the light and the computer were not turned off at the end of the work day.

If your company has a plan for the efficient use of energy then what were the major triumphs?
(Chinese Responses)

Chinese	English
• 节省开支	• Save expenses
• 从源头来降低能源消耗	• Reduce the energy consumption from the source.
• 临建房采用泡沫板，能重复使用，降低成品；同时在隔热方面起到了很好的作用	• Use the foam board in the temporary buildings, it can be reused and reduce cost. as well as a good performance in heat insulation

If your company has a plan for the efficient use of energy then, what were the major triumphs?
(USA Responses)

- Has support at the top
- Replacement of the T-12 lamps and ballasts with T-8 lamps and ballasts
- There have been no major triumphs, so to speak. We have seen that computer assisted controls, despite their vagaries; lend to much more efficient operation of the HVAC systems.
- Changing when our chillers were running and changing Out light fixtures and ballasts.

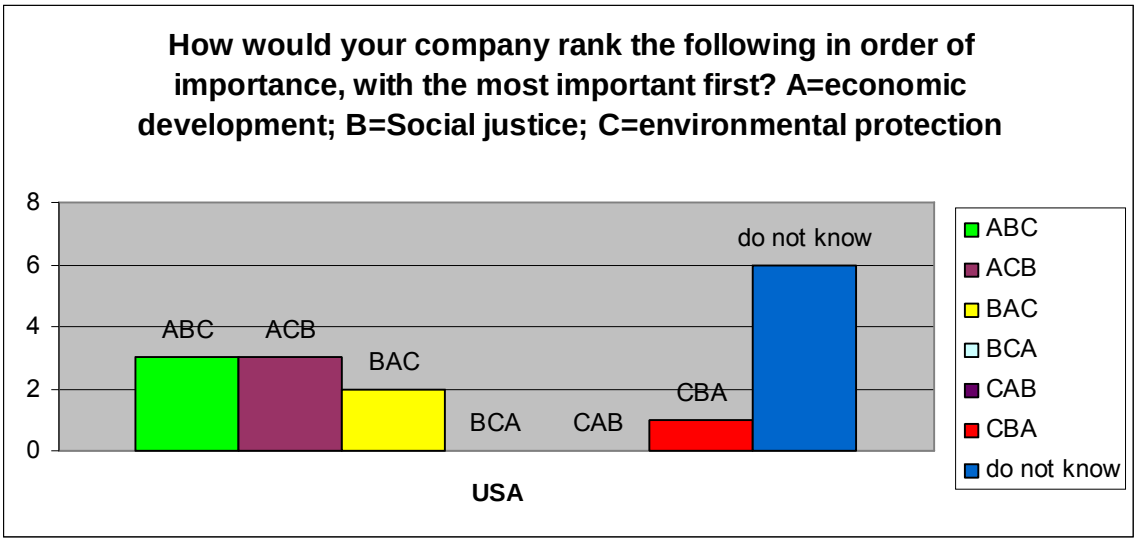
- Ability to better forecast and control utility costs
- reduced costs
- Gaining efficiencies through new equipment and controls with VFD's on all major motors. New operational sequences also gained efficiencies for us
- Energy efficient mech systems
- 9-11% reduction in energy use

How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection

The last question asked the experts to prioritize their organization's goals in terms of economic development, social justice or environmental protection. These answers will assist the responders in developing their individual company's business reasons to employ clean renewable energy. Economic development, social justice and environmental protection, are all enhanced by the utilization of clean renewable energy.

Sixty percent (60%) of the US professionals were able to prioritize their organization's goals. Of those that were able to prioritize their goals sixty-seven percent (66.67%) listed economic development first. This seems to indicate that environmental protection is not a key issue when developing business reasons for the utilization of renewable energy. A key issue seems to be economic development.

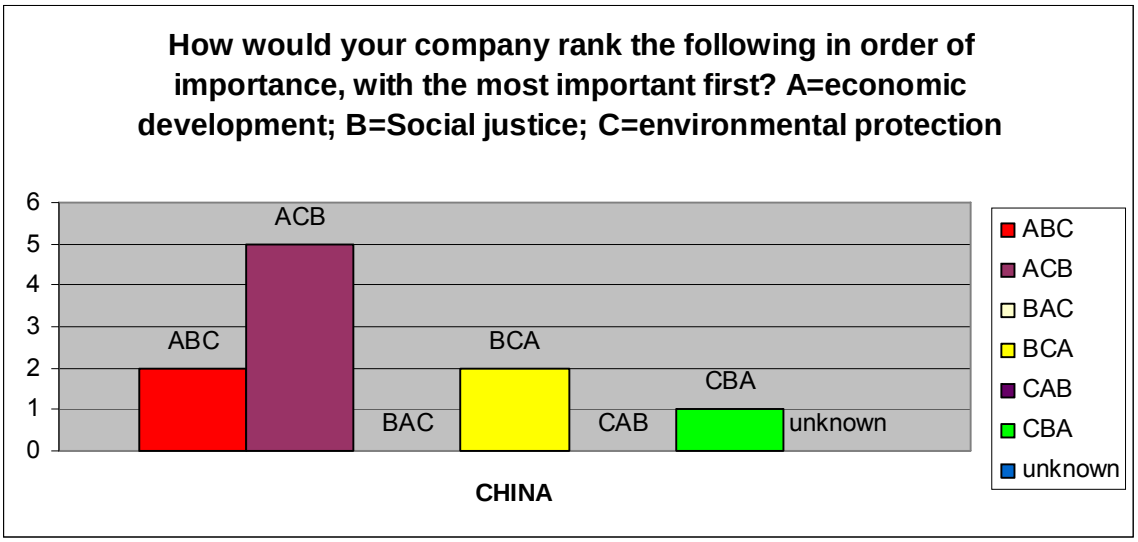
Figure 48: How would your company rank the following in order of importance, with the most important first? A=economic development; B=social justice; C=environmental protection - US responses



When asked economic development, social justice and environmental protection

70% of the Chinese experts put economic development first.

Figure 49: How would your company rank the following in order of importance, with the most important first? A=economic development; B=social justice; C=environmental protection - Chinese responses



Conclusions from the Data Analysis

The research questions were designed to engender an integrated holistic approach to solving the identified problems. The assumption that there are many common business reasons for using renewable energy in China and the US was proved by the results from the data.

There were general agreement between China and the US in the following areas:

- 53% of the US experts and 40% of the Chinese experts had done research in renewable energy.
- 90% of the experts from China and 93% of the experts from the US stated the operations of buildings have some or great impact on the environment.
- Of the experts who had an answer 67% of the US experts and 100% of the Chinese experts agreed that a competitive edge can be gained by use of renewable energy.
- 67% of both the Chinese and US experts stated that the use of renewable energy was good for customer relations.
- 50% of the Chinese experts and 83% of the US experts agreed on a 3 to 5 year capital outlay recovery period.
- 60% of the US experts and 100% of the Chinese experts agreed that government assistance through tax credits or low interest loan guarantees were helpful.
- The experts from both countries defined their peak demand periods as being during the daytime in summer.

- The experts from both countries relatively high impact the operation of the HVAC system has on the energy bills.
- 70% of the Chinese experts and 80% of the US experts had developed energy efficiency plans for their buildings.
- 70% of the Chinese experts and 67% of the US experts listed economic development as first priority over social justice and environmental protection.

With respect to the social priorities the responses by both countries were revealing. More than two thirds of the experts from both the US and China ranked economic development the highest. The above listed results tend to reinforce the hypothesis that both countries have much in common when applied to practical business reasons. This makes a sound fiscal approach to developing reasons for utilizing renewable energy an imperative for success.

Validity Threats

Sampling of Expert Responses

A sampling of expert responses can only approximate the total population. The experts were selected based on non-probabilistic sampling and as such can not depend on the rationale of probability theory. However taken in total the sampling represent a broad range of thoughtful responses from experts as to the background business reasons for the utilization of renewable energy to assist with HVAC systems.

Veracity of the Responses

How do we determine if the responses are truthful? In the United States the promise of confidentiality normally solicits honest answers. In China anonymity and the government's new focus on renewable energy[15] should elicit more honest answers. Chinese culture however, still dictates that responses to foreigners be polite and non-threatening. To overcome this cultural difference, Chinese persons were used to solicit the opinions from experts. Any other solutions for the cultural differences are not within the scope of this research.

English Questions Correctly Translated into Chinese

There is a long standing truism that translations lose some of the essence captured within the original words. To help mitigate this threat to the survey's validity the translated questions were checked by four different independent translators.

[15] http://english.peopledaily.com.cn/90001/90780/91345/6274841.html retrieved 11/3/2007

Chapter 5: Conclusion

This research of expert opinions was created to help find practical approaches to an environmental and economic problem. The literature and study shows that private industry will provide solutions to the global pollution and resource depletion if presented with economically sound business reasons.

The primary goal of this research was to determine the business reasons for utilizing renewable energy applications in heating ventilating and air conditioning systems. The secondary goal was to compare the responses between the United States and China.

The stated hypothesis has been supported by the research data. The US and China share many common business reasons to develop renewable energy solutions for their HVAC systems. The knowledge gleaned from these studies will add to the wealth of knowledge relating to business reasons to utilize a renewable energy system.

Recommendations

A Suggested Renewable Energy HVAC System

It was never the intent of this research to develop a specific solution. There are however common reasons that come from the answers to the research questions. Here are some suggestions:

- A plan detailing the efficient use of energy should be designed.
- A plan to implement the energy efficiency plan satisfactorily

- Select renewable energy systems that can be integrated into the buildings that allow the selected systems to deliver temporary heating, ventilation or air conditioning during the daytime in summer.
- The selected systems should have at least a three to five year capital outlay recovery period.
- The recovery period can be determined by calculating the accumulated savings in lower maintenance costs and electric bills.

It should be remembered that renewable energy solutions are quite often limited by local conditions. An example of this would be locations that have so much air pollution that sunlight is dimmed. This area would not be the ideal location for solar panels as a renewable energy source.

Future Research

Some responses by the Chinese professionals were puzzling. One hand the many would not consider the use of renewable energy. However they felt that the use of renewable energy would give them a competitive advantage and would improve customer relations. Also when asked about energy efficiency planning they responded that they had done this and that it was effective. They did not indicate however that the effort was worth it. These anomalies need clarification with future research.

Appendixes

TIMETABLE

1. Submit proposal to Professor Thomas for review Sept. 10, 2007
2. Review literature Sept 12 to 19, 2007
3. Review questions Sept 20, 2007
4. Locate companies Chinese and American to send research question to or to interview. Target facilities managers and property managers. Sept 27, 2007
5. Submit format of questionnaire to Dr. Thomas Sept. 29, 2007
6. Send out research questions October 8, 2007
7. Submit new degree petition for Spring 2008, October 10, 2007
8. Follow up on research questions October 18 to 25, 2007
9. Submit thesis outline to Prof. Thomas Nov. 7, 2007
10. Begin writing thesis Nov. 14, 2007
11. Begin collecting data from China Dec. 3, 2007
12. Continue to refine theory and goals and possibly follow up questions Dec 3 to 26, 2007
13. Travel to China Dec. 26, 2007
14. Complete draft including bibliography end of mid February 2008
15. Submit draft to Dr. Thomas for review end of February 2008
16. Return to Atlanta mid-March 2008
17. Initial format check March 20, 2008
18. Submit Thesis and required forms April 2, 2008

RESOURCES

1. Business associates in the People's Republic of China and the United States
2. Facilities managers/ property managers in both the United States and the People's Republic of China
3. Fundamentals of Statistical Analysis by David Cope
4. Statistical Analysis with Excel by Joseph Schmuller
5. Basic Statistical Analysis by Richard c. Sprinthall
6. The Craft of Research (2003) by Booth, Colomb & WIliams
7. Qualitative Research Design an Interactive Approach by Joseph A. Maxwell
8. Research Methods for Business Students by Saunders, Lewis & Thornhill
9. Green cities, growing cities, just cities?: Urban planning and the contradictions of sustainable development *Campbell, Scott*. American Planning Association. Journal of the American Planning Association. Chicago: Summer 1996. Vol. 62, Iss. 3; pg. 296, 17 pgs
10. Literature from the various internet bases sources including libraries, databases, electronic books, professional journals, news releases, US and Chinese government research data

RESEARCH QUESTIONS IN ENGLISH

QUESTIONS	Page 1 of 6
Name (optional):	
Title (optional):	
Organization/Company (optional):	
Date:	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	
No	
Do not know	
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	
Operation of buildings has great impact on the environment	
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	
No	
Do not know	

QUESTIONS	Page 2 of 6

6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	
No	
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	
Greater than five (5) years	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	
Low interest long term loan guarantee	
Do not know	
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	
4 p.m. to 8 p.m.	
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?:	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?:	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	

RESEARCH QUESTIONS IN CHINESE

推广清洁可再生能源利用的商业动机调研

尊敬的女士/先生:

随着全球能源的日益紧缺，清洁可再生能源的商业竞争力也逐渐增强。本次调研旨在考察使用清洁可再生能源来延长空调系统寿命的可行性，并为行业主管部门在投资预算方面提供决策依据。本次问卷调查由美国亚特兰大佐治亚理工学院建筑学院研究生Glendon Thompson先生统筹规划与制作。如果您能提供联系方式我们将很乐意在调研结束后与您分享调研成果。

请完成这份答卷，您定会从中受益。贵公司的信息我们会妥善保管。

谢谢您的支持！

Glendon Thompson
美国佐治亚理工学院建筑学院
电话: 1-404-444-1372
传真: 1-770-971-6778
Email: gthompson3@gatech.edu 或者 gthompson@arcomgroup.net
邮寄地址: 4205 Parnell Road, Marietta, Georgia 30062, USA

调查问卷	第一页共六页
姓名(非必填项):	
职位(非必填项):	
公司/机构名(非必填项):	
日期	
1. 您目前工作所在的国家是:	
中国	
牙买加	
美国	
其他	
2. 你目前所在的公司/工作机构有进行关于可再生能源利用的研究吗?	
有	
没有	
不清楚	
3. 请问贵公司对于建筑运行对自然环境影响的认识理解是:	
没有影响	
影响很小	
有一些影响	
影响很大	
不清楚	
4. 贵公司有计划使用某种清洁可再生能源，例如太阳能，风能，生物质能吗?	
是	
否	
不清楚	
5. 贵公司曾考虑使用某种清洁可再生能源来降低其空调系统用电量吗?	
是	

否	
不清楚	

6. 如果有一种空调系统使用可降低运行费用的再生能源科技，您认为安装这种空调系统会提高贵公司的竞争力吗？	
是	
否	
不清楚	
7. 多短的投资回报期会促使贵公司考虑使用问题6所描述的再生能源系统？	
少于3年	
3到5年	
多于5年	
不清楚	
8. 您认为政府部门应该推行什么政策来提高大众购买使用可再生能源的设备的积极性？	
税收减免	
长期低息贷款保障	
不清楚	
其它(请注明):	
9. 您认为使用可再生能源有助于增进公司与客户之间的关系吗？	
不知道	
是	
否	
非必填 – 请注明回答是/否的原因:	
10. 贵公司空调系统目前运行的每日最大负荷发生在:	
早上8点到中午12点	
中午12点到下午4点	
下午4点到晚上8点	
其他(请注明):	

调查问卷	第三页共六页
11. 您认为什么季节贵公司的空调系统达到它的最大负荷?	
春季	
夏季	
秋季	
冬季	
不清楚	
12. 贵公司空调系统的平均使用寿命是:	
少于5年	
5 到10年	
多于10年	
不清楚	
13. 贵公司目前的年度用电费用大概是:	
少于45万元人民币	
45 万到56万元之间	
56万到71万元之间	
71万到83万元之间	
超过83万元	
不清楚	
14. 贵公司目前每年的空调系统维修维护预算是:	
少于150万元	
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	
15. 贵公司目前计划用在购买新式空调设备的年度预算是:	
少于150万元	
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	

16. 贵公司空调系统用电占公司总用电量的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	
不清楚	
17. 贵公司空调系统维修费用占公司总年度维护/维修预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	
不清楚	
18. 贵公司用于更新空调设备的费用占其年度资本支出预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	
19. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度总用电费用的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	

20. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度修缮/维护费用预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	
21. 贵公司预算在引进可持续性能源系统的资金占其年度总资金预算的百分比是:	
少于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	
22. 贵公司目前有出台/实行任何建筑节能方案/策略吗?	
是	
否	
不清楚	
23. 如果贵公司目前有采用任何节能策略，您认为该节能策略在帮助公司节约能源利用方面:	
非常有效	
效用一般	
无效	
没有节能策略	
24. 如果贵公司目前有采用任何节能策略，	
该节能策略存在的主要问题是:	
25. 如果贵公司目前有采用任何节能策略，	
该节能策略的主要成功之处是:	

调查问卷 第六页/共六页	
26. 如果贵公司目前有采用任何节能策略，相比较于投入的资源和精力，您对其成效满意吗？	
满意	
不满意	
不清楚	
没有节能策略	
27. 请将下面A, B, C三项依其在您(公司)心目中的重要性排序，最重要的排第一，然后依次递减。A=经济发展; B=社会正义; C=环境保护	
A-B-C	
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
不清楚	

Responses

Business Reasons for Utilizing Renewable Energy Applications

Responses from the United States of America

QUESTIONS	**Page 1 of 6**
Name (optional): Peter Dalva	
Title (optional): Director of Facilities	
Organization/Company (optional): Habitat for Humanity International	
Date: 10/25/07	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	

Yes	
No	
Do not know	X
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	X
Operation of buildings has great impact on the environment	
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	X
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	
No	X
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	X
Greater than five (5) years	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	X
Low interest long term loan guarantee	X
Do not know	
Other (please state):	
Being able to sell the tax credits would help as well- similar to LIHTC's	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	X
Yes	
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	X
4 p.m. to 8 p.m.	
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	X
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	X
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	X
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	X
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	X
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?: Continuing efforts to implement, track benefits, make an impact without significant costs	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?:	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	
No	
Do not know	x
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	
B-A-C	x
B-C-A	
C-A-B	
C-B-A	
Do not know	

QUESTIONS	Page 1 of 6
Name (optional): Glenn Bellamy	
Title (optional): Sr. Associate	
Organization/Company (optional): Heery International	
Date: 10/31/07	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	X
No	

Do not know	
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	
Operation of buildings has great impact on the environment	X
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	X
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	
No	
Do not know	X
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	X
Greater than five (5) years	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	X
Low interest long term loan guarantee	X
Do not know	
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	X
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	X
4 p.m. to 8 p.m.	
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	X
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	X

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	X
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	X
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	X
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?:	
The landlord does not want to upgrade the lighting systems.	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?:	
Energy efficient mech systems.	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	X
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	X
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	

QUESTIONS	Page 1 of 6
Name (optional): Sharon Jaye	
Title (optional): Project/Budget manager	
Organization/Company (optional): Agnes Scott College	
Date: 10-29-07	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	X
No	
Do not know	

3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	X
Operation of buildings has great impact on the environment	
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	
No	
Do not know	X
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	X
No	
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	X
Greater than five (5) years	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	
Low interest long term loan guarantee	
Do not know	X
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	X
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	X
4 p.m. to 8 p.m.	
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	X
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	X
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	X
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	X
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?: Demand of the people who use the space	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?: 9-11% reduction in energy use	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	X
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	X

QUESTIONS	Page 1 of 6
Name (optional): Tim Shea	
Title (optional): 2nd Vice President Facilities, Purchasing and Contracting	
Organization/Company (optional): National Life Group	
Date: 11/5/2007	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	X
No	
Do not know	

3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	
Operation of buildings has great impact on the environment	X
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	X
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	
No	
Do not know	X
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	
Greater than five (5) years	X
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	X
Low interest long term loan guarantee	
Do not know	
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	X
Yes	
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	X
4 p.m. to 8 p.m.	
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	X
15% to 20%	
Over 20%	
Do not know	
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	X
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	X
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?: communicating to the employee population ways to	
Save by turning off lights, computers, etc.	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?: changing when our chillers were running and changing	
Out light fixtures and ballasts.	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	X
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	X
Do not know	

QUESTIONS	Page 1 of 6
Name (optional): Richard Gleave	
Title (optional): Regional Director of Facilities	
Organization/Company (optional): Knowledge Learning Corporation	
Date: 11-26-07	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	
No	X

Do not know	
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	X
Operation of buildings has great impact on the environment	
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	X
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	
No	
Do not know	X
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	X
Greater than five (5) years	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	
Low interest long term loan guarantee	
Do not know	X
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	X
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	X
4 p.m. to 8 p.m.	
Other (please state): We have 1895 buildings or varying type. Our typical load is 12 noon	
To 4pm but in the western states it stretches to 6 or 7pm at times.	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	X
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
** This varies depending on the location and size of the building.	X
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
** This varies depending on the location and size of the building.	X
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
** This varies depending on the location and size of the building.	X
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	

** This varies depending on the location and size of the building.
X

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	
No	X
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?: We need a plan. Since we have 1895 buildings, it's not an easy proposition. Is there any advice you can offer to us?	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?:	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	
No	
Do not know	
Not Applicable	X
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	X
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	

QUESTIONS	Page 1 of 6
Name (optional):Eddie Alsobrook	
Title (optional):Maintenance Director	
Organization/Company (optional):Sadie G. Mays Health & Rehab Center	
Date:November 12, 2007	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable	

energy field?	
Yes	
No	X
Do not know	
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	X
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	
Operation of buildings has great impact on the environment	
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	X
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	X
No	
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	

Greater than five (5) years	X
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	
Low interest long term loan guarantee	X
Do not know	
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	
No	X
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	X
4 p.m. to 8 p.m.	
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	X
More than 10 years	

Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	X
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	X
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	

16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	

Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	

10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	
No	X
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	
Not effective	
Not Applicable	X
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?:	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?:	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	
No	
Do not know	
Not Applicable	X
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	

A-B-C	X
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	

QUESTIONS	**Page 1 of 6**
Name (optional): Greg Goeke	
Title (optional): Director of Property Services	
Organization/Company (optional):City of Minneapolis	
Date:11-26-2007	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	X
No	
Do not know	
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	
Operation of buildings has great impact on the environment	X
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	X
No	

Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	X
No	
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	
Greater than five (5) years	X
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	
Low interest long term loan guarantee	X
Do not know	
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	X
No	
Optional - If yes/no please state why: We see our role is to provide leadership in the area of renewable energy development and use.	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	X
4 p.m. to 8 p.m.	
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	X
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	X
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	X
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?: Funding - Budget	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?: Has support at the top.	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	X
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	

QUESTIONS	Page 1 of 6
Name (optional):	
Title (optional):	
Organization/Company (optional):	
Date: 11/30/07	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	
No	X
Do not know	
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	

Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	
Operation of buildings has great impact on the environment	X
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	X
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	**Page 2 of 6**
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	X
No	
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	X
Greater than five (5) years	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	
Low interest long term loan guarantee	
Do not know	X
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	

Do not know	
Yes	X
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	X
4 p.m. to 8 p.m.	
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	
US$200,001 to US$250,000	X
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	X
Over 20%	
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	X
Over 20%	
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	X
Over 20%	
Do not know	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	X
15% to 20%	
Over 20%	
Do not know	

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	X
15% to 20%	
Over 20%	
Do not know	
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	X
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	X
Somewhat effective	
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?: Getting teachers to turn out lights and turn off computers	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?: Significant savings through better management of HVAC systems	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	X
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	X
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	

QUESTIONS	Page 1 of 6
Name (optional):	
Title (optional):	
Organization/Company (optional):	
Date:	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	
No	X
Do not know	

3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	X
Operation of buildings has great impact on the environment	
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	X
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	**Page 2 of 6**
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	
No	X
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	X
Greater than five (5) years	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	
Low interest long term loan guarantee	
Do not know	
Other (please state): *We are a non-profit and therefore are not driven by tax incentives*.	
We do not typically rely on government intervention in our business affairs.	

9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	X
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	X
4 p.m. to 8 p.m.	
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	X
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	X
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	X
15% to 20%	
Over 20%	
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	X
Over 20%	
Do not know	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	X
Over 20%	
Do not know	
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	X
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	X
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?: *Most HVAC control systems are driven by computer*	
technology and are therefore subject to the problems associated with software controls.	
It is in this area that we experience the most problems. Our mechanical problems are	
statistically "normal" regarding repairs and maintenance.	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?: *There have been no major triumphs, so to speak. We*	

have seen that computer assisted controls, despite their vagaries, lend to much more
efficient operation of the HVAC systems.

QUESTIONS	**Page 6 of 6**
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	X
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	
B-A-C	
B-C-A	X
C-A-B	
C-B-A	
Do not know	

QUESTIONS	Page 1 of 6
Name (optional):	
Title (optional):	
Organization/Company (optional):	
Date:	
31 – Oct - 2007	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	x
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	x
No	
Do not know	
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	
Operation of buildings has great impact on the environment	x
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	x
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	x
No	
Do not know	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	x
No	
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	x
Greater than five (5) years	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	
Low interest long term loan guarantee	
Do not know	
Other (please state):	
None X	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	x
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	x
4 p.m. to 8 p.m.	
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	x
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	x
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	x
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	x
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	x
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	x
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	x
Over 20%	
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	x
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	x
Over 20%	
Do not know	

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	x
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	x
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	x
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	x
Somewhat effective	
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?:	
Competition for available capital	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?:	
Ability to better forecast and control utility costs	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	x
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	x

QUESTIONS	Page 1 of 6
Name (optional): Mike Destro	
Title (optional): General Manager	
Organization/Company (optional): Portman Management Company	
Date: November 5, 2007	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	
No	X
Do not know	

3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	X
Operation of buildings has great impact on the environment	
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	X
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	X
No	
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	
Greater than five (5) years	
Do not know	X
WE STRIVE FOR LESS THAN 3, BUT GREATER THAN 5 MIGHT BE ACCEPTABLE IN SOME CASES.	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	
Low interest long term loan guarantee	
Do not know. ***IT DEPENDS ON WHAT THE BUILDINGS' OWNERS WANT.***	X
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	X
No	
Optional - If yes/no please state why: Many of the approximately 5,000 occupants of our 2 buildings are very concerned about the increasing cost of energy, the eventual depletion of fossil fuels and global warming.	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	
4 p.m. to 8 p.m.	
Other (please state): **10 a.m. – 2 p.m**.	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	X
I DO NOT KNOW WHAT YOU HAVE IN MIND BY MAINTENANCE. FOR EXAMPLE CHANGING LIGHT BULBS AND VACUUMING THE CARPET IN TENANT OFFICES IS CONSIDERED MAINTENANCE.	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	
I DO NOT KNOW WHAT YOU HAVE IN MIND BY NEW EQUIPMENT. DO YOU MEAN ONLY HVAC-RELATED EQUIPMENT OR ALL EQUIPMENT SUCH AS COMPUTERS TO	X

MANAGE TENANT CARD ACCESS INTO THE BUILDING?	

QUESTIONS	**Page 4 of 6**
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
IT DEPENDS ON YOUR MEANING OF MAINTENANCE. DO YOU MEAN REPAIR BECAUSE IT IS BROKEN? DOES REPAIR INCLUDE REPLACING DIRTY FILTERS? DOES REPAIR INCLUDE THE COST OF STAFF WHO REPAIR BROKEN EQUIPMENT AND PERFORM PREVENTIVE MAINTENANCE?	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
IT VARIES FROM $0 IN SOME YEARS TO ALL OF THE ABOVE %S IN OTHER YEARS.	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X

QUESTIONS	**Page 5 of 6**

20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
IT DEPENDS ON THE MEANING OF MAINTENANCE BUDGET.	
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
MY ANNUAL CAPITAL BUDGET VARIES FROM A FEW HUNDRED THOUSAND DOLLARS TO SEVERAL MILLION DOLLARS.	
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	X
No	
Do not know	
THIS IS AN ONGOING PROCESS.	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	X
Somewhat effective	
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?: **OLDER, LESS EFFICIENT T-12 FLORESCENT LAMPS AND BALLASTS USING MORE ELECTRICITY THAN NEW LAMPS AVAILABLE FOR PURCHASE.**	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?: **REPLACEMENT OF THE T-12 LAMPS AND BALLASTS WITH T-8 LAMPS AND BALLASTS.**	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	X
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	X
WE NEED TO "FIX" WHICHEVER OF A, B OR C IS THE MOST "BROKEN".	

QUESTIONS	Page 1 of 6
Name (optional): Steve Bender	
Title (optional): Director – Facilities Management	
Organization/Company (optional): Kimberly-Clark	
Date: 10/26/2007	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	X
No	
Do not know	

3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	X
Operation of buildings has great impact on the environment	
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	X
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	
No	X
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	X
Greater than five (5) years	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	X
Low interest long term loan guarantee	
Do not know	
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	X
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	
4 p.m. to 8 p.m.	X
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	X
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	X
Do not know	

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	X
Over 20%	
Do not know	
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	X
Over 20%	
Do not know	
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	X
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	X
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?:	
Savings not as high as expected.	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?:	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	X
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	X
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	

QUESTIONS	Page 1 of 6
Name (optional): Shane	
Title (optional): Facilities Manager	
Organization/Company (optional):	
Date: 10/30/07	
1. In what country does your company own the building you are using to answer the questions?	
USA	
2. Has your company or organization done any research in the renewable energy field?	
Yes	
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	

Operation of buildings has great impact on the environment	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Do not know	
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Do not know	
9. Would your company consider the use of a renewable energy system good customer relations?	
Yes	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Summer	
Winter	
12. What is the expected life span of the HVAC system?	
More than 10 years	
13. What is your company's current annual electricity bill?	
Over US$111,000	
14. What is your company's current annual maintenance budget?	
Over US$350,000	
15. What is your company's current annual capital expenditure budget for new equipment?	
Over US$350,000	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
10% to 15%	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Do not know	

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Do not know	
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Do not know	
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	
23. If your company has a plan for the efficient use of energy then:	
Somewhat effective	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?:	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?: reduced cost	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
Do not know	

QUESTIONS	Page 1 of 6
Name (optional):Mike Huey	
Title (optional):Building Manager	
Organization/Company (optional):	
Date:	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	X
No	
Do not know	
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	

Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	
Operation of buildings has great impact on the environment	X
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	X
No	
Do not know	
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	X
No	
Do not know	

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	
No	
Do not know	X
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	
Three (3) to five (5) years	
Greater than five (5) years	X
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	
Low interest long term loan guarantee	
Do not know	X
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	X
No	
Optional - If yes/no please state why: We are an electrical utility with strong commitments to the environmental impact of doing business.	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	
12 noon to 4 p.m.	X
4 p.m. to 8 p.m.	
Other (please state):	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	X
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	
Do not know – we are an electric utility and do not charge ourselves.	N/A
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	X
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	N/A
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	
5% to 10%	
10% to 15%	X
15% to 20%	
Over 20%	
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	X
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know – HAVE REPLACED MAJOR EQUIPMENT OVER THE LAST 10 YEARS SO CURRENTLY IT IS LESS THAN 5%	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	X
No	
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	X
Somewhat effective	
Not effective	
Not Applicable	
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?: Bringing “moth balled” systems back into use with new support or peripheral systems	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?: Gaining efficiencies through new equipment and controls with VFD’s on all major motors. New operational sequences also gained efficiencies for us	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	X
No	
Do not know	
Not Applicable	
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
Do not know	X

QUESTIONS	Page 1 of 6
Name (optional):Alexander (Alex) Stadler	
Title (optional):Facilities Manager	
Organization/Company (optional): Drew, Eckl & Farnham, LLP	
Date:11-1-07	
1. In what country does your company own the building you are using to answer the questions?	
China	
Jamaica, West Indies	
USA	X
Other	
2. Has your company or organization done any research in the renewable energy field?	
Yes	
No	X

Do not know	
3. What is your company's current understanding of the impact the operation of buildings have on the environment?	
Operation of buildings has no impact on the environment	
Operation of buildings has little impact on the environment	
Operation of buildings has some impact on the environment	
Operation of buildings has great impact on the environment	X
Do not know	
4. Would your company consider using a renewable energy source such as solar, wind, biomass?	
Yes	
No	
Do not know	X
5. Would your company consider a clean renewable energy source to help offset the energy required by the Heating Ventilation Air Conditioning (HVAC) system?	
Yes	
No	
Do not know	X

QUESTIONS	Page 2 of 6
6. Would an HVAC system that utilizes a renewable energy technology which cuts operating costs give your company a competitive edge?	
Yes	
No	
Do not know	X
7. What capital outlay recovery period (payback period) would your company consider for a renewable energy system as described in question 6?	
Less than three (3) years	X
Three (3) to five (5) years	X
Greater than five (5) years	
Do not know	
8. What kind of assistance from the government would increase the possibility of your company installing an energy efficient renewable energy system?	
Tax credits	X
Low interest long term loan guarantee	
Do not know	
Other (please state):	
9. Would your company consider the use of a renewable energy system good customer relations?	
Do not know	
Yes	X
No	
Optional - If yes/no please state why:	
10. What are the peak daily demand periods for the HVAC system?	
8 a.m. to 12 noon	X
12 noon to 4 p.m.	X
4 p.m. to 8 p.m.	
Other (please state): It is dependant on the weather. In the winter, it is the morning. In the summer, it is in the afternoon.	

QUESTIONS	Page 3 of 6
11. What are the peak seasonal demand periods for the HVAC system?	
Spring	
Summer	X
Autumn	
Winter	
Do not know	
12. What is the expected life span of the HVAC system?	
Less than 5 years	
5 to 10 years	
More than 10 years	X
Do not know	
13. What is your company's current annual electricity bill?	
Less than US$60,000	
US$60,001 to US$75,000	
US$75,001 to US$95,000	
US$95,001 to US$111,000	
Over US$111,000	X
Do not know	
14. What is your company's current annual maintenance budget?	
Less than US$200,000	
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	X
Do not know	
15. What is your company's current annual capital expenditure budget for new equipment?	
Less than US$200,000	X
US$200,001 to US$250,000	
US$250,001 to US$300,000	
US$300,001 to US$350,000	
Over US$350,000	
Do not know	

QUESTIONS	Page 4 of 6
16. What portion of the electric bill is attributable to the operation of your company's the HVAC system?	
Less than 5%	
5% to 10%	X
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
17. What portion of the annual maintenance budget is attributable to the repair of your company's HVAC system?	
Less than 5%	X
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
18. What portion of the annual capital expenditure budget is attributable to the replacement of your company's HVAC system?	
Less than 5%	X
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	
19. What percentage of the annual electricity bill would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X

QUESTIONS	Page 5 of 6
20. What percentage of the annual maintenance budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
21. What percentage of the annual capital expenditure budget would your company consider using to implement an energy efficient, renewable energy system?	
Less than 5%	
5% to 10%	
10% to 15%	
15% to 20%	
Over 20%	
Do not know	X
22. Has your company developed a plan for the efficient use of energy in the building(s)?	
Yes	
No	X
Do not know	
23. If your company has a plan for the efficient use of energy then:	
How effective has it been?	
Very effective	
Somewhat effective	
Not effective	
Not Applicable	X
24. If your company has a plan for the efficient use of energy then:	
What were the major problems?: N/A	
25. If your company has a plan for the efficient use of energy then:	
What were the major triumphs?: N/A	

QUESTIONS	Page 6 of 6
26. If your company has a plan for the efficient use of energy, was it worth the effort?	
Yes	
No	
Do not know	
Not Applicable	X
27. How would your company rank the following in order of importance, with the most important first? A=economic development; B=Social justice; C=environmental protection	
A-B-C	
A-C-B	
B-A-C	X
B-C-A	
C-A-B	
C-B-A	
Do not know	

Responses from the People's Republic of China

调查问卷	第一页共六页
姓名(非必填项):	
职位(非必填项):	
公司/机构名(非必填项):	
日期	
1. 您目前工作所在的国家是:	
中国	x
牙买加	
美国	
其他	
2. 你目前所在的公司/工作机构有进行关于可再生能源利用的研究吗?	
有	x
没有	
不清楚	
3. 请问贵公司对于建筑运行对自然环境影响的认识理解是:	
没有影响	
影响很小	
有一些影响	
影响很大	x
不清楚	
4. 贵公司有计划使用某种清洁可再生能源, 例如太阳能, 风能, 生物质能吗?	
是	
否	
不清楚	x
5. 贵公司曾考虑使用某种清洁可再生能源来降低其空调系统用电量吗?	
是	
否	x
不清楚	

调查问卷	第二页共六页
6. 如果有一种空调系统使用可降低运行费用的再生能源科技，您认为安装这种空调系统会提高贵公司的竞争力吗？	
是	x
否	
不清楚	
7. 多短的投资回报期会促使贵公司考虑使用问题6所描述的再生能源系统？	
少于3年	
3到5年	x
多于5年	
不清楚	
8. 您认为政府部门应该推行什么政策来提高大众购买使用可再生能源的设备的积极性？	
税收减免	
长期低息贷款保障	x
不清楚	
其它(请注明):	
9. 您认为使用可再生能源有助于增进公司与客户之间的关系吗？	
不知道	
是	x
否	
非必填 – 请注明回答是/否的原因:	
10. 贵公司空调系统目前运行的每日最大负荷发生在:	
早上8点到中午12点	x
中午12点到下午4点	
下午4点到晚上8点	
其他(请注明):	

调查问卷	第三页共六页
11. 您认为什么季节贵公司的空调系统达到它的最大负荷?	
春季	
夏季	x
秋季	
冬季	
不清楚	
12. 贵公司空调系统的平均使用寿命是:	
少于5年	
5 到10年	x
多于10年	
不清楚	
13. 贵公司目前的年度用电费用大概是:	
少于45万元人民币	
45 万到56万元之间	
56万到71万元之间	
71万到83万元之间	
超过83万元	x
不清楚	
14. 贵公司目前每年的空调系统维修维护预算是:	
少于150万元	x
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	
15. 贵公司目前计划用在购买新式空调设备的年度预算是:	
少于150万元	
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	x

调查问卷	第四页共六页
16. 贵公司空调系统用电占公司总用电量的百分比是:	
低于5%	
5% 到10%	
10% 到15%	x
15% 到20%	
高于20%	
不清楚	
17. 贵公司空调系统维修费用占公司总年度维护/维修预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	
不清楚	x
18. 贵公司用于更新空调设备的费用占其年度资本支出预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	x
19. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度总用电费用的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	x

调查问卷	第五页共六页
20. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度维修/维护费用预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	x
21. 贵公司预算在引进可持续性能源系统的资金占其年度总资金预算的百分比是:	
少于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	x
22. 贵公司目前有出台/实行任何建筑节能方案/策略吗?	
是	x

否	
不清楚	
23. 如果贵公司目前有采用任何节能策略，您认为该节能策略在帮助公司节约能源利用方面：	
非常有效	x
效用一般	
无效	
没有节能策略	
24. 如果贵公司目前有采用任何节能策略，	
该节能策略存在的主要问题是：	
25. 如果贵公司目前有采用任何节能策略，	
该节能策略的主要成功之处是：	

调查问卷	第六页共七页
26. 如果贵公司目前有采用任何节能策略，相比较于投入的资源和精力，您对其成效满意吗？	
满意	
不满意	x
不清楚	
没有节能策略	
27. 请将下面A, B, C三项依其在您(公司)心目中的重要性排序，最重要的排第一，然后依次递减。A=经济发展; B=社会正义; C=环境保护	
A-B-C	
A-C-B	x
B-A-C	
B-C-A	
C-A-B	
C-B-A	
不清楚	

调查问卷	第一页共七页
姓名(非必填项):	
职位(非必填项):	
公司/机构名(非必填项):	
日期	
1. 您目前工作所在的国家是:	
中国	x
牙买加	
美国	
其他	
2. 你目前所在的公司/工作机构有进行关于可再生能源利用的研究吗？	
有	x
没有	
不清楚	
3. 请问贵公司对于建筑运行对自然环境影响的认识理解是:	
没有影响	
影响很小	
有一些影响	
影响很大	x
不清楚	
4. 贵公司有计划使用某种清洁可再生能源，例如太阳能，风能，生物质能吗？	
是	
否	x

不清楚	
5. 贵公司曾考虑使用某种清洁可再生能源来降低其空调系统用电量吗?	
是	
否	
不清楚	x

调查问卷	第二页共六页
6. 如果有一种空调系统使用可降低运行费用的再生能源科技，您认为安装这种空调系统会提高贵公司的竞争力吗?	
是	x
否	
不清楚	
7. 多短的投资回报期会促使贵公司考虑使用问题6所描述的再生能源系统?	
少于3年	
3到5年	x
多于5年	
不清楚	
8. 您认为政府部门应该推行什么政策来提高大众购买使用可再生能源的设备的积极性?	
税收减免	x
长期低息贷款保障	
不清楚	
其它(请注明):	
9. 您认为使用可再生能源有助于增进公司与客户之间的关系吗?	
不知道	
是	x
否	
非必填– 请注明回答是/否的原因:	
10. 贵公司空调系统目前运行的每日最大负荷发生在:	
早上8点到中午12点	x
中午12点到下午4点	
下午4点到晚上8点	
其他(请注明):	

调查问卷	第三页共六页
11. 您认为什么季节贵公司的空调系统达到它的最大负荷?	
春季	
夏季	x
秋季	
冬季	x
不清楚	
12. 贵公司空调系统的平均使用寿命是:	
少于5年	
5 到10年	x
多于10年	
不清楚	
13. 贵公司目前的年度用电费用大概是:	
少于45万元人民币	
45 万到56万元之间	
56万到71万元之间	
71万到83万元之间	
超过83万元	
不清楚	X
14. 贵公司目前每年的空调系统维修维护预算是:	
少于150万元	
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	x
15. 贵公司目前计划用在购买新式空调设备的年度预算是:	
少于150万元	
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	x

16. 贵公司空调系统用电占公司总用电量的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	x
不清楚	
17. 贵公司空调系统维修费用占公司总年度维护维修预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	x
不清楚	
18. 贵公司用于更新空调设备的费用占其年度资本支出预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	x
不清楚	
19. 贵公司考虑用于引进高效节能，使用可再生能源设备的预算占其年度总用电费用的百分比是:	
低于5%	
5% 到10%	
10% 到15%	x
15% 到20%	
超过20%	
不清楚	

20. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度维修/维护费用预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	x
21. 贵公司预算在引进可持续性能源系统的资金占其年度总资金预算的百分比是:	
少于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	x
不清楚	
22. 贵公司目前有出台/实行任何建筑节能方案/策略吗?	
是	x
否	
不清楚	
23. 如果贵公司目前有采用任何节能策略，您认为该节能策略在帮助公司节约能源利用方面:	
非常有效	x
效用一般	
无效	
没有节能策略	
24. 如果贵公司目前有采用任何节能策略，	
该节能策略存在的主要问题是:	
执行力不够	
25. 如果贵公司目前有采用任何节能策略，	
该节能策略的主要成功之处是:	
节省开支	

调查问卷	第六页共六页
26. 如果贵公司目前有采用任何节能策略，相比较于投入的资源和精力，您对其成效满意吗？	
满意	
不满意	x
不清楚	
没有节能策略	
27. 请将下面A, B, C三项依其在您(公司)心目中的重要性排序，最重要的排第一，然后依次递减。A=经济发展; B=社会正义; C=环境保护	
A-B-C	
A-C-B	
B-A-C	
B-C-A	x
C-A-B	
C-B-A	
不清楚	

调查问卷	第一页共六页
姓名(非必填项):	
职位(非必填项):	
公司/机构名(非必填项):	
日期:	
1. 您目前工作所在的国家是:	
中国	x
牙买加	
美国	
其他	
2. 你目前所在的公司/工作机构有进行关于可再生能源利用的研究吗？	
有	X
没有	
不清楚	
3. 请问贵公司对于建筑运行对自然环境影响的认识理解是:	
没有影响	
影响很小	
有一些影响	
影响很大	X
不清楚	
4. 贵公司有计划使用某种清洁可再生能源，例如太阳能，风能，生物质能吗？	
是	
否	
不清楚	X

5. 贵公司曾考虑使用某种清洁可再生能源来降低其空调系统用电量吗?	
是	X
否	
不清楚	

调查问卷	第二页共六页
6. 如果有一种空调系统使用可降低运行费用的再生能源科技，您认为安装这种空调系统会提高贵公司的竞争力吗?	
是	X
否	
不清楚	
7. 多短的投资回报期会促使贵公司考虑使用问题6所描述的再生能源系统?	
少于3年	X
3到5年	
多于5年	
不清楚	
8. 您认为政府部门应该推行什么政策来提高大众购买使用可再生能源的设备的积极性?	
税收减免	
长期低息贷款保障	X
不清楚	
其它(请注明):	
9. 您认为使用可再生能源有助于增进公司与客户之间的关系吗?	
不知道	X
是	
否	
非必填 – 请注明回答是/否的原因:	
10. 贵公司空调系统目前运行的每日最大负荷发生在:	
早上8点到中午12点	
中午12点到下午4点	X
下午4点到晚上8点	
其他(请注明):	

11. 您认为什么季节贵公司的空调系统达到它的最大负荷?	
春季	
夏季	X
秋季	
冬季	
不清楚	
12. 贵公司空调系统的平均使用寿命是:	
少于5年	
5 到10年	X
多于10年	
不清楚	
13. 贵公司目前的年度用电费用大概是:	
少于45万元人民币	
45 万到56万元之间	
56万到71万元之间	
71万到83万元之间	
超过83万元	X
不清楚	
14. 贵公司目前每年的空调系统维修维护预算是:	
少于150万元	
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	x
15. 贵公司目前计划用在购买新式空调设备的年度预算是:	
少于150万元	
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	X

调查问卷	第四页共六页
16. 贵公司空调系统用电占公司总用电量的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	
不清楚	X
17. 贵公司空调系统维修费用占公司总年度维护/维修预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	
不清楚	X
18. 贵公司用于更新空调设备的费用占其年度资本支出预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	X
19. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度总用电费用的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	X

调查问卷	第五页共六页
20. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度维修/维护费用预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	X
21. 贵公司预算在引进可持续性能源系统的资金占其年度总资金预算的百分比是:	
少于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	X
22. 贵公司目前有出台/实行任何建筑节能方案/策略吗?	
是	X

否	
不清楚	
23. 如果贵公司目前有采用任何节能策略，您认为该节能策略在帮助公司节约能源利用方面：	
非常有效	
效用一般	X
无效	
没有节能策略	
24. 如果贵公司目前有采用任何节能策略，	
该节能策略存在的主要问题是：	
25. 如果贵公司目前有采用任何节能策略，	
该节能策略的主要成功之处是：	
VFD	

调查问卷	第六页共六页
26. 如果贵公司目前有采用任何节能策略，相比较于投入的资源和精力，您对其成效满意吗？	
满意	
不满意	
不清楚	X
没有节能策略	
27. 请将下面A, B, C三项依其在您(公司)心目中的重要性排序，最重要的排第一，然后依次递减。A=经济发展; B=社会正义; C=环境保护	
A-B-C	
A-C-B	X
B-A-C	
B-C-A	
C-A-B	
C-B-A	
不清楚	

调查问卷	第一页共六页
姓名(非必填项):	
职位(非必填项):	
公司/机构名(非必填项):	
日期	
1. 您目前工作所在的国家是:	
中国	X
牙买加	
美国	
其他	
2. 你目前所在的公司/工作机构有进行关于可再生能源利用的研究吗？	
有	
没有	X
不清楚	
3. 请问贵公司对于建筑运行对自然环境影响的认识理解是:	
没有影响	
影响很小	
有一些影响	X
影响很大	
不清楚	
4. 贵公司有计划使用某种清洁可再生能源，例如太阳能，风能，生物质能吗？	
是	
否	X

不清楚	
5. 贵公司曾考虑使用某种清洁可再生能源来降低其空调系统用电量吗?	
是	
否	X
不清楚	

6. 如果有一种空调系统使用可降低运行费用的再生能源科技, 您认为安装这种空调系统会提高贵公司的竞争力吗?	
是	X
否	
不清楚	
7. 多短的投资回报期会促使贵公司考虑使用问题6所描述的再生能源系统?	
少于3年	X
3到5年	
多于5年	
不清楚	
8. 您认为政府部门应该推行什么政策来提高大众购买使用可再生能源的设备的积极性?	
税收减免	X
长期低息贷款保障	
不清楚	
其它(请注明):	
9. 您认为使用可再生能源有助于增进公司与客户之间的关系吗?	
不知道	
是	
否	
非必填 – 请注明回答是/否的原因: 不一定	
10. 贵公司空调系统目前运行的每日最大负荷发生在:	
早上8点到中午12点	X
中午12点到下午4点	
下午4点到晚上8点	
其他(请注明):	

调查问卷	第三页共六页
11. 您认为什么季节贵公司的空调系统达到它的最大负荷?	
春季	
夏季	X
秋季	
冬季	
不清楚	
12. 贵公司空调系统的平均使用寿命是:	
少于5年	
5 到10年	X
多于10年	
不清楚	
13. 贵公司目前的年度用电费用大概是:	
少于45万元人民币	
45 万到56万元之间	
56万到71万元之间	
71万到83万元之间	
超过83万元	X
不清楚	
14. 贵公司目前每年的空调系统维修维护预算是:	
少于150万元	X
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	
15. 贵公司目前计划用在购买新式空调设备的年度预算是:	
少于150万元	X
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	

调查问卷	第四页共六页
16. 贵公司空调系统用电占公司总用电量的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	X
不清楚	
17. 贵公司空调系统维修费用占公司总年度维护/维修预算的百分比是:	
低于5%	
5% 到10%	X
10% 到15%	
15% 到20%	
高于20%	
不清楚	
18. 贵公司用于更新空调设备的费用占其年度资本支出预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	x
超过20%	
不清楚	
19. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度总用电费用的百分比是:	
低于5%	
5% 到10%	X
10% 到15%	
15% 到20%	
超过20%	
不清楚	

调查问卷	第五页共六页
20. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度维修/维护费用预算的百分比是:	
低于5%	
5% 到10%	X
10% 到15%	
15% 到20%	
超过20%	
不清楚	
21. 贵公司预算在引进可持续性能源系统的资金占其年度总资金预算的百分比是:	
少于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	X
22. 贵公司目前有出台/实行任何建筑节能方案/策略吗?	
是	X

否	
不清楚	
23. 如果贵公司目前有采用任何节能策略，您认为该节能策略在帮助公司节约能源利用方面：	
非常有效	X
效用一般	
无效	
没有节能策略	
24. 如果贵公司目前有采用任何节能策略，	
该节能策略存在的主要问题是：	
25. 如果贵公司目前有采用任何节能策略，	
该节能策略的主要成功之处是：	

调查问卷	第六页共六页
26. 如果贵公司目前有采用任何节能策略，相比较于投入的资源和精力，您对其成效满意吗？	
满意	X
不满意	
不清楚	
没有节能策略	
27. 请将下面A, B, C三项依其在您(公司)心目中的重要性排序，最重要的排第一，然后依次递减。A=经济发展; B=社会正义; C=环境保护	
A-B-C	
A-C-B	
B-A-C	
B-C-A	X
C-A-B	
C-B-A	
不清楚	

调查问卷	第一页共六页
姓名(非必填项):	
职位(非必填项):	
公司/机构名(非必填项):	
日期	
1. 您目前工作所在的国家是:	
中国	X
牙买加	
美国	
其他	
2. 你目前所在的公司/工作机构有进行关于可再生能源利用的研究吗？	
有	
没有	X
不清楚	
3. 请问贵公司对于建筑运行对自然环境影响的认识理解是:	
没有影响	
影响很小	
有一些影响	X
影响很大	
不清楚	
4. 贵公司有计划使用某种清洁可再生能源，例如太阳能，风能，生物质能吗？	
是	
否	X

不清楚	
5. 贵公司曾考虑使用某种清洁可再生能源来降低其空调系统用电量吗?	
是	
否	X
不清楚	

调查问卷	第二页共六页
6. 如果有一种空调系统使用可降低运行费用的再生能源科技，您认为安装这种空调系统会提高贵公司的竞争力吗?	
是	X
否	
不清楚	
7. 多短的投资回报期会促使贵公司考虑使用问题6所描述的再生能源系统?	
少于3年	X
3到5年	
多于5年	
不清楚	
8. 您认为政府部门应该推行什么政策来提高大众购买使用可再生能源的设备的积极性?	
税收减免	X
长期低息贷款保障	
不清楚	
其它(请注明):	
9. 您认为使用可再生能源有助于增进公司与客户之间的关系吗?	
不知道	
是	X
否	
非必填– 请注明回答是/否的原因:	
10. 贵公司空调系统目前运行的每日最大负荷发生在:	
早上8点到中午12点	X
中午12点到下午4点	
下午4点到晚上8点	
其他(请注明):	

11. 您认为什么季节贵公司的空调系统达到它的最大负荷?	
春季	
夏季	X
秋季	
冬季	
不清楚	
12. 贵公司空调系统的平均使用寿命是:	
少于5年	
5 到10年	X
多于10年	
不清楚	
13. 贵公司目前的年度用电费用大概是:	
少于45万元人民币	
45 万到56万元之间	
56万到71万元之间	
71万到83万元之间	
超过83万元	X
不清楚	
14. 贵公司目前每年的空调系统维修维护预算是:	
少于150万元	X
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	
15. 贵公司目前计划用在购买新式空调设备的年度预算是:	
少于150万元	
150万到187.5万元之间	X
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	

16. 贵公司空调系统用电占公司总用电量的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	X
高于20%	
不清楚	
17. 贵公司空调系统维修费用占公司总年度维护维修预算的百分比是:	
低于5%	X
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	
不清楚	
18. 贵公司用于更新空调设备的费用占其年度资本支出预算的百分比是:	
低于5%	
5% 到10%	X
10% 到15%	
15% 到20%	
超过20%	
不清楚	
19. 贵公司考虑用于引进高效节能，使用可再生能源设备的预算占其年度总用电费用的百分比是:	
低于5%	
5% 到10%	X
10% 到15%	
15% 到20%	
超过20%	
不清楚	

20. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度维修/维护费用预算的百分比是:	
低于5%	X
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	
21. 贵公司预算在引进可持续性能源系统的资金占其年度总资金预算的百分比是:	
少于5%	
5% 到10%	X
10% 到15%	
15% 到20%	
超过20%	
不清楚	
22. 贵公司目前有出台/实行任何建筑节能方案/策略吗?	
是	
否	X
不清楚	
23. 如果贵公司目前有采用任何节能策略，您认为该节能策略在帮助公司节约能源利用方面:	
非常有效	X
效用一般	
无效	
没有节能策略	
24. 如果贵公司目前有采用任何节能策略，	
该节能策略存在的主要问题是:	
25. 如果贵公司目前有采用任何节能策略，	
该节能策略的主要成功之处是:	

调查问卷	第六页共六页
26. 如果贵公司目前有采用任何节能策略，相比较于投入的资源和精力，您对其成效满意吗？	
满意	
不满意	
不清楚	X
没有节能策略	
27. 请将下面A, B, C三项依其在您(公司)心目中的重要性排序，最重要的排第一，然后依次递减。A=经济发展; B=社会正义; C=环境保护	
A-B-C	
A-C-B	X
B-A-C	
B-C-A	
C-A-B	
C-B-A	
不清楚	

调查问卷	第一页共六页
姓名(非必填项):	
职位(非必填项):	
公司/机构名(非必填项):	
日期	
1. 您目前工作所在的国家是:	
中国	X
牙买加	
美国	
其他	
2. 你目前所在的公司/工作机构有进行关于可再生能源利用的研究吗？	
有	X
没有	
不清楚	
3. 请问贵公司对于建筑运行对自然环境影响的认识理解是:	
没有影响	
影响很小	X
有一些影响	
影响很大	
不清楚	
4. 贵公司有计划使用某种清洁可再生能源，例如太阳能，风能，生物质能吗？	
是	X
否	

不清楚	
5. 贵公司曾考虑使用某种清洁可再生能源来降低其空调系统用电量吗?	
是	
否	X
不清楚	

6. 如果有一种空调系统使用可降低运行费用的再生能源科技，您认为安装这种空调系统会提高贵公司的竞争力吗?	
是	
否	
不清楚	X
7. 多短的投资回报期会促使贵公司考虑使用问题6所描述的再生能源系统?	
少于3年	
3到5年	
多于5年	
不清楚	X
8. 您认为政府部门应该推行什么政策来提高大众购买使用可再生能源的设备的积极性?	
税收减免	x
长期低息贷款保障	
不清楚	
其它(请注明):	
9. 您认为使用可再生能源有助于增进公司与客户之间的关系吗?	
不知道	
是	X
否	
非必填– 请注明回答是/否的原因:	
10. 贵公司空调系统目前运行的每日最大负荷发生在:	
早上8点到中午12点	X
中午12点到下午4点	X
下午4点到晚上8点	
其他(请注明):	

11. 您认为什么季节贵公司的空调系统达到它的最大负荷?	
春季	
夏季	X
秋季	
冬季	
不清楚	
12. 贵公司空调系统的平均使用寿命是:	
少于5年	
5 到10年	X
多于10年	
不清楚	
13. 贵公司目前的年度用电费用大概是:	
少于45万元人民币	
45 万到56万元之间	
56万到71万元之间	
71万到83万元之间	
超过83万元	X
不清楚	
14. 贵公司目前每年的空调系统维修维护预算是:	
少于150万元	X
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	
15. 贵公司目前计划用在购买新式空调设备的年度预算是:	
少于150万元	
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	X

16. 贵公司空调系统用电占公司总用电量的百分比是:	
低于5%	X
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	
不清楚	
17. 贵公司空调系统维修费用占公司总年度维护维修预算的百分比是:	
低于5%	X
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	
不清楚	
18. 贵公司用于更新空调设备的费用占其年度资本支出预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	X
19. 贵公司考虑用于引进高效节能，使用可再生能源设备的预算占其年度总用电费用的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	X

20. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度修缮维护费用预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	X
21. 贵公司预算在引进可持续能源系统的资金占其年度总资金预算的百分比是:	
少于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	X
22. 贵公司目前有出台/实行任何建筑节能方案/策略吗?	
是	X
否	
不清楚	
23. 如果贵公司目前有采用任何节能策略，您认为该节能策略在帮助公司节约能源利用方面:	
非常有效	
效用一般	X
无	
没有节能策略	

24. 如果贵公司目前有采用任何节能策略，
该节能策略存在的主要问题是:
新建筑设计中采用环保节能设计，节省能源消耗
25. 如果贵公司目前有采用任何节能策略，
该节能策略的主要成功之处是:
从源头来降低能源消耗

调查问卷	第六页共六页
26. 如果贵公司目前有采用任何节能策略，相比较于投入的资源和精力，您对其成效满意吗？	
满意	
不满意	X
不清楚	
没有节能策略	
27. 请将下面A, B, C三项依其在您(公司)心目中的重要性排序，最重要的排第一，然后依次递减。A=经济发展; B=社会正义; C=环境保护	
A-B-C	
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	X
不清楚	

调查问卷	第一页共六页
姓名(非必填项):	
职位(非必填项):	
公司/机构名(非必填项):	
日期	
1. 您目前工作所在的国家是:	
中国	X
牙买加	
美国	
其他	
2. 你目前所在的公司/工作机构有进行关于可再生能源利用的研究吗？	
有	
没有	X
不清楚	
3. 请问贵公司对于建筑运行对自然环境影响的认识理解是:	
没有影响	
影响很小	
有一些影响	X
影响很大	
不清楚	
4. 贵公司有计划使用某种清洁可再生能源，例如太阳能，风能，生物质能吗？	
是	
否	X

不清楚	
5. 贵公司曾考虑使用某种清洁可再生能源来降低其空调系统用电量吗?	
是	
否	X
不清楚	

调查问卷	第二页共六页
6. 如果有一种空调系统使用可降低运行费用的再生能源科技，您认为安装这种空调系统会提高贵公司的竞争力吗?	
是	
否	
不清楚	X
7. 多短的投资回报期会促使贵公司考虑使用问题6所描述的再生能源系统?	
少于3年	
3到5年	X
多于5年	
不清楚	
8. 您认为政府部门应该推行什么政策来提高大众购买使用可再生能源的设备的积极性?	
税收减免	X
长期低息贷款保障	
不清楚	
其它(请注明):	
9. 您认为使用可再生能源有助于增进公司与客户之间的关系吗?	
不知道	
是	X
否	
非必填– 请注明回答是/否的原因:	
10. 贵公司空调系统目前运行的每日最大负荷发生在:	
早上8点到中午12点	
中午12点到下午4点	X
下午4点到晚上8点	
其他(请注明):	

调查问卷	第三页共六页
11. 您认为什么季节贵公司的空调系统达到它的最大负荷?	
春季	
夏季	X
秋季	
冬季	X
不清楚	
12. 贵公司空调系统的平均使用寿命是:	
少于5年	
5 到10年	X
多于10年	
不清楚	
13. 贵公司目前的年度用电费用大概是:	
少于45万元人民币	
45 万到56万元之间	
56万到71万元之间	
71万到83万元之间	
超过83万元	X
不清楚	
14. 贵公司目前每年的空调系统维修维护预算是:	
少于150万元	X
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	
15. 贵公司目前计划用在购买新式空调设备的年度预算是:	
少于150万元	X
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	

16. 贵公司空调系统用电占公司总用电量的百分比是:	
低于5%	
5% 到10%	X
10% 到15%	
15% 到20%	
高于20%	
不清楚	
17. 贵公司空调系统维修费用占公司总年度维护维修预算的百分比是:	
低于5%	X
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	
不清楚	
18. 贵公司用于更新空调设备的费用占其年度资本支出预算的百分比是:	
低于5%	X
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	
19. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度总用电费用的百分比是:	
低于5%	X
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	

调查问卷	第五页共六页
20. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度维修/维护费用预算的百分比是:	
低于5%	X
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	
21. 贵公司预算在引进可持续性能源系统的资金占其年度总资金预算的百分比是:	
少于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	X
22. 贵公司目前有出台/实行任何建筑节能方案/策略吗?	
是	
否	X
不清楚	
23. 如果贵公司目前有采用任何节能策略，您认为该节能策略在帮助公司节约能源利用方面:	
非常有效	X
效用一般	
无效	
没有节能策略	
24. 如果贵公司目前有采用任何节能策略，	
该节能策略存在的主要问题是:	
25. 如果贵公司目前有采用任何节能策略，	
该节能策略的主要成功之处是:	

调查问卷	第六页共六页
26. 如果贵公司目前有采用任何节能策略，相比较于投入的资源和精力，您对其成效满意吗？	
满意	
不满意	
不清楚	X
没有节能策略	
27. 请将下面A, B, C三项依其在您(公司)心目中的重要性排序，最重要的排第一，然后依次递减。A=经济发展; B=社会正义; C=环境保护	
A-B-C	
A-C-B	X
B-A-C	
B-C-A	
C-A-B	
C-B-A	
不清楚	

调查问卷	第一页共六页
姓名(非必填项):	
职位(非必填项):	
公司/机构名(非必填项):	
日期	
1. 您目前工作所在的国家是:	
中国	X
牙买加	
美国	
其他	
2. 你目前所在的公司/工作机构有进行关于可再生能源利用的研究吗？	
有	
没有	X
不清楚	
3. 请问贵公司对于建筑运行对自然环境影响的认识理解是:	
没有影响	
影响很小	
有一些影响	
影响很大	X
不清楚	
4. 贵公司有计划使用某种清洁可再生能源，例如太阳能，风能，生物质能吗？	
是	X
否	

不清楚	
5. 贵公司曾考虑使用某种清洁可再生能源来降低其空调系统用电量吗?	
是	X
否	
不清楚	

调查问卷	第二页共六页
6. 如果有一种空调系统使用可降低运行费用的再生能源科技，您认为安装这种空调系统会提高贵公司的竞争力吗?	
是	X
否	
不清楚	
7. 多短的投资回报期会促使贵公司考虑使用问题6所描述的再生能源系统?	
少于3年	
3到5年	X
多于5年	
不清楚	
8. 您认为政府部门应该推行什么政策来提高大众购买使用可再生能源的设备的积极性?	
税收减免	X
长期低息贷款保障	
不清楚	
其它(请注明):	
9. 您认为使用可再生能源有助于增进公司与客户之间的关系吗?	
不知道	X
是	
否	
非必填– 请注明回答是/否的原因:	
10. 贵公司空调系统目前运行的每日最大负荷发生在:	
早上8点到中午12点	X ---- Winter
中午12点到下午4点	X---- Summer
下午4点到晚上8点	
其他(请注明):	

11. 您认为什么季节贵公司的空调系统达到它的最大负荷?	
春季	
夏季	X
秋季	
冬季	
不清楚	
12. 贵公司空调系统的平均使用寿命是:	
少于5年	
5 到10年	X
多于10年	
不清楚	
13. 贵公司目前的年度用电费用大概是:	
少于45万元人民币	X
45 万到56万元之间	
56万到71万元之间	
71万到83万元之间	
超过83万元	
不清楚	
14. 贵公司目前每年的空调系统维修维护预算是:	
少于150万元	X
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	
15. 贵公司目前计划用在购买新式空调设备的年度预算是:	
少于150万元	X
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	

16. 贵公司空调系统用电占公司总用电量的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	X
不清楚	
17. 贵公司空调系统维修费用占公司总年度维护维修预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	X
高于20%	
不清楚	
18. 贵公司用于更新空调设备的费用占其年度资本支出预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	X
超过20%	
不清楚	
19. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度总用电费用的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	X
不清楚	

20. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度维修/维护费用预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	X
不清楚	
21. 贵公司预算在引进可持续性能源系统的资金占其年度总资金预算的百分比是:	
少于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	X
不清楚	
22. 贵公司目前有出台/实行任何建筑节能方案/策略吗?	
是	X
否	
不清楚	
23. 如果贵公司目前有采用任何节能策略，您认为该节能策略在帮助公司节约能源利用方面:	
非常有效	X
效用一般	
无效	
没有节能策略	
24. 如果贵公司目前有采用任何节能策略，	
该节能策略存在的主要问题是:	
25. 如果贵公司目前有采用任何节能策略，	
该节能策略的主要成功之处是:	

调查问卷	第六页共七页
26. 如果贵公司目前有采用任何节能策略，相比较于投入的资源和精力，您对其成效满意吗？	
满意	
不满意	
不清楚	N/A
没有节能策略	
27. 请将下面A, B, C三项依其在您(公司)心目中的重要性排序，最重要的排第一，然后依次递减。A=经济发展; B=社会正义; C=环境保护	
A-B-C	X
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
不清楚	

调查问卷	第一页共七页
姓名(非必填项):	
职位(非必填项):	
公司/机构名(非必填项):	
日期	
1. 您目前工作所在的国家是:	
中国	X
牙买加	
美国	
其他	
2. 你目前所在的公司/工作机构有进行关于可再生能源利用的研究吗？	
有	
没有	X
不清楚	
3. 请问贵公司对于建筑运行对自然环境影响的认识理解是:	
没有影响	
影响很小	
有一些影响	
影响很大	X
不清楚	
4. 贵公司有计划使用某种清洁可再生能源，例如太阳能，风能，生物质能吗？	
是	X
否	

不清楚	
5. 贵公司曾考虑使用某种清洁可再生能源来降低其空调系统用电量吗?	
是	X
否	
不清楚	

6. 如果有一种空调系统使用可降低运行费用的再生能源科技，您认为安装这种空调系统会提高贵公司的竞争力吗?	
是	X
否	
不清楚	
7. 多短的投资回报期会促使贵公司考虑使用问题6所描述的再生能源系统?	
少于3年	
3到5年	X
多于5年	
不清楚	
8. 您认为政府部门应该推行什么政策来提高大众购买使用可再生能源的设备的积极性?	
税收减免	X
长期低息贷款保障	
不清楚	
其它(请注明):	
9. 您认为使用可再生能源有助于增进公司与客户之间的关系吗?	
不知道	
是	X
否	
非必填– 请注明回答是/否的原因:	
10. 贵公司空调系统目前运行的每日最大负荷发生在:	
早上8点到中午12点	X
中午12点到下午4点	
下午4点到晚上8点	
其他(请注明):	

11. 您认为什么季节贵公司的空调系统达到它的最大负荷?	
春季	
夏季	x
秋季	
冬季	
不清楚	
12. 贵公司空调系统的平均使用寿命是:	
少于5年	
5 到10年	X
多于10年	
不清楚	
13. 贵公司目前的年度用电费用大概是:	
少于45万元人民币	X
45 万到56万元之间	
56万到71万元之间	
71万到83万元之间	
超过83万元	
不清楚	
14. 贵公司目前每年的空调系统维修维护预算是:	
少于150万元	X
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	
15. 贵公司目前计划用在购买新式空调设备的年度预算是:	
少于150万元	X
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	

16. 贵公司空调系统用电占公司总用电量的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	
不清楚	X
17. 贵公司空调系统维修费用占公司总年度维护维修预算的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
高于20%	
不清楚	
18. 贵公司用于更新空调设备的费用占其年度资本支出预算的百分比是:	
低于5%	
5% 到10%	X
10% 到15%	
15% 到20%	
超过20%	
不清楚	
19. 贵公司考虑用于引进高效节能，使用可再生能源设备的预算占其年度总用电费用的百分比是:	
低于5%	
5% 到10%	X
10% 到15%	
15% 到20%	
超过20%	
不清楚	

20. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度维修/维护费用预算的百分比是:	
低于5%	X
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	
21. 贵公司预算在引进可持续性能源系统的资金占其年度总资金预算的百分比是:	
少于5%	X
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	
22. 贵公司目前有出台/实行任何建筑节能方案/策略吗?	
是	
否	X
不清楚	
23. 如果贵公司目前有采用任何节能策略，您认为该节能策略在帮助公司节约能源利用方面:	
非常有效	
效用一般	
无效	
没有节能策略	X
24. 如果贵公司目前有采用任何节能策略，	
该节能策略存在的主要问题是:	
25. 如果贵公司目前有采用任何节能策略，	
该节能策略的主要成功之处是:	

调查问卷	第六页共六页
26. 如果贵公司目前有采用任何节能策略，相比较于投入的资源和精力，您对其成效满意吗？	
满意	
不满意	
不清楚	
没有节能策略	X
27. 请将下面A, B, C三项依其在您(公司)心目中的重要性排序，最重要的排第一，然后依次递减。A=经济发展; B=社会正义; C=环境保护	
A-B-C	X
A-C-B	
B-A-C	
B-C-A	
C-A-B	
C-B-A	
不清楚	

调查问卷	第一页共六页
姓名(非必填项):胡华荣（huaronghu）	
职位(非必填项):施工管理人员	
公司/机构名(非必填项):中国建筑第三工程局第一建设工程责任有限公司（中建三局	
日期2008年1月17日	
1. 您目前工作所在的国家是:	
中国	√
牙买加	
美国	
其他	
2. 你目前所在的公司/工作机构有进行关于可再生能源利用的研究吗？	
有	
没有	
不清楚	√
3. 请问贵公司对于建筑运行对自然环境影响的认识理解是:	
没有影响	
影响很小	
有一些影响	
影响很大	√
不清楚	
4. 贵公司有计划使用某种清洁可再生能源，例如太阳能，风能，生物质能吗？	
是	
否	
不清楚	√

5. 贵公司曾考虑使用某种清洁可再生能源来降低其空调系统用电量吗?	
是	
否	
不清楚	√

6. 如果有一种空调系统使用可降低运行费用的再生能源科技，您认为安装这种空调系统会提高贵公司的竞争力吗?	
是	√
否	
不清楚	
7. 多短的投资回报期会促使贵公司考虑使用问题6所描述的再生能源系统?	
少于3年	√
3到5年	
多于5年	
不清楚	
8. 您认为政府部门应该推行什么政策来提高大众购买使用可再生能源的设备的积极性?	
税收减免	
长期低息贷款保障	
不清楚	
其它(请注明): 从技术上保证能在最短的时间内得到回报，然后降低可再生能源的设备的价格.	
9. 您认为使用可再生能源有助于增进公司与客户之间的关系吗?	
不知道	
是	
否	√
非必填 – 请注明回答是/否的原因:	
10. 贵公司空调系统目前运行的每日最大负荷发生在:	
早上8点到中午12点	
中午12点到下午4点	√
下午4点到晚上8点	
其他(请注明):	

调查问卷	第三页共六页
11. 您认为什么季节贵公司的空调系统达到它的最大负荷?	
春季	
夏季	√
秋季	
冬季	√
不清楚	
12. 贵公司空调系统的平均使用寿命是:	
少于5年	
5 到10年	√
多于10年	
不清楚	
13. 贵公司目前的年度用电费用大概是:	
少于45万元人民币	
45 万到56万元之间	
56万到71万元之间	
71万到83万元之间	
超过83万元	
不清楚	√
14. 贵公司目前每年的空调系统维修/维护预算是:	
少于150万元	
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	√
不清楚	
15. 贵公司目前计划用在购买新式空调设备的年度预算是:	
少于150万元	
150万到187.5万元之间	
187.5 万到225万元之间	
225万到263万元之间	
超过263万元	
不清楚	√

调查问卷	第四页共六页
16. 贵公司空调系统用电占公司总用电量的百分比是:	
低于5%	
5% 到10%	
10% 到15%	√
15% 到20%	
高于20%	
不清楚	
17. 贵公司空调系统维修费用占公司总年度维护/维修预算的百分比是:	
低于5%	
5% 到10%	√
10% 到15%	
15% 到20%	
高于20%	
不清楚	
18. 贵公司用于更新空调设备的费用占其年度资本支出预算的百分比是:	
低于5%	√
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	
19. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度总用电费用的百分比是:	
低于5%	
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	√

调查问卷	第五页共六页
20. 贵公司考虑用于引进高效节能、使用可再生能源设备的预算占其年度维修/维护费用预算的百分比是:	
低于5%	√
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	
21. 贵公司预算在引进可持续性能源系统的资金占其年度总资金预算的百分比是:	
少于5%	√
5% 到10%	
10% 到15%	
15% 到20%	
超过20%	
不清楚	
22. 贵公司目前有出台/实行任何建筑节能方案/策略吗?	

是	√
否	
不清楚	
23. 如果贵公司目前有采用任何节能策略，您认为该节能策略在帮助公司节约能源利用方面：	
非常有效	
效用一般	√
无效	
没有节能策略	
24. 如果贵公司目前有采用任何节能策略，	
该节能策略存在的主要问题是：作为建筑施工企业，施工现场用电用水浪费现场严重，同时，办公室经常出现长明灯现象，人走后电脑，灯等用电设备不关。	
25. 如果贵公司目前有采用任何节能策略，	
该节能策略的主要成功之处是：临建房采用包沫板，能重复使用，降低成品；同时在隔热方面起到了很好的作用	

26. 如果贵公司目前有采用任何节能策略，相比较于投入的资源和精力，您对其成效满意吗？	
满意	
不满意	√
不清楚	
没有节能策略	

27. 请将下面A, B, C三项依其在您(公司)心目中的重要性排序，最重要的排第一，然后依次递减。A=经济发展; B=社会正义; C=环境保护	
A-B-C	
A-C-B	√
B-A-C	
B-C-A	
C-A-B	
C-B-A	
不清楚	

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