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### **3. Research Topic – Building Efficiency for Developers**

#### *Problem Statement*

During the PACE Roundtable conference of the fall 2006, the recent trends in energy costs were identified and discussed as a critical issue facing the current construction industry. Increases over the past several years have added additional weight to many of the pre-construction decisions made about a building, especially those that directly affect the efficiency of the produced building. Since profit is their primary concern during a construction project, developers are particularly affected by these unpredictable and significant changes in the future operation costs of a new building.

#### *Research Goal*

The goal of this research analysis will be to identify the relationships between the leasing models used by a developer and the decisions that they make regarding building efficiency and sustainability. Construction projects for developers are driven by business models and the optimization of profit. The decisions that are made for a building being built for a developer rely heavily on the intended use for that facility and the types of leasing agreements to be used for the tenants of that building. This analysis will provide insight into the effects that energy costs are having on the decisions that developers are making about their building systems.

#### *Research Method*

The following steps have been taken to achieve the research goals set forth above. For the purpose of consistency, location dependent information has been focused on Washington, DC and its surrounding areas.

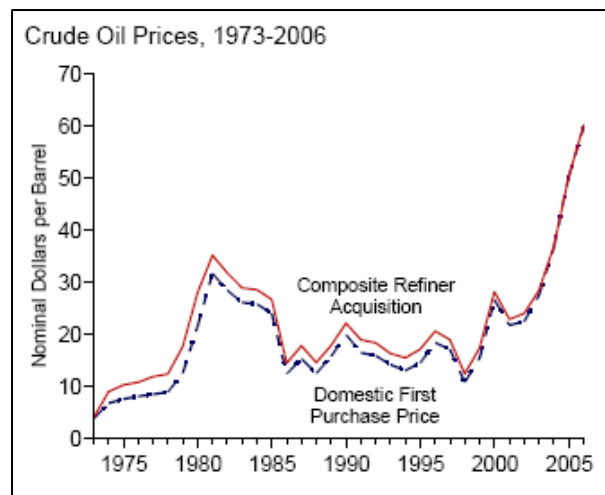
1. Collect information on energy costs and trends to gain perspective on the influence of these figures



2. Collect existing professional articles and documents relative to this research.
3. Develop and conduct interviews with developers and construction professionals to gain insight to current experiences related to the research topic.
4. Document interview responses for future reference.
5. Analyze collected data to find trends within the relationship between building efficiency/sustainability and development options.
6. Make recommendations for developers facing pre-construction decisions relating to the efficiency and sustainability of a building.
7. Draw conclusions and make predictions for the future of this issue in the construction industry.

### *Recent Trends in Energy Costs*

Costs to occupy any space whether it's an apartment, house, office, or a campus, have increased dramatically and fairly consistently over the past decade due to substantial escalation of the cost of different energy sources. Some of the most dramatic escalation is seen in the crude oil prices as seen in the chart on the right. The reasons for these increases range from political issues to simple supply and demand fluctuations. These cost increases are having direct impacts on every utility cost associated with the basic necessities of occupying homes and offices, with particular impact on the businesses that have little flexibility on their energy consumption habits to maintain business operation.





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Crude oil prices are an indirect source of the increases in utility costs. Building systems are powered mostly by electricity and natural gas, but these costs rely heavily on the cost of crude oil so escalation trends are pretty consistent between the different fuels. Building owners are left with no options other than to take any measure available to reduce their consumption of energy.

### *The Business of Building Efficiently*

This section of the analysis is focused on developers building long-term investment properties, and is not meant for developers that build and sell.

#### **Introduction**

Developers build buildings with the intention of serving the occupancy needs of specific demographics of potential tenants. These potential tenants range from families looking for houses or apartments to corporations looking for additional office space. The objective of the developer on a construction project is consistent across the board, to produce a building that will fill a void in the market and achieve a fully occupied and profitable building. While the market for rentable space may fluctuate, there are ways to create spaces that will always be in demand.

#### **Marketing Efficient Buildings**

The rental market in the past few years has experienced some changing trends for marketable traits of spaces. Utility billing and costs have become two of the top criteria for selection of a space by potential tenants, and the older buildings with less efficient systems are being forced to reduce their rental fees to compensate for high utility costs and prevent increases in vacancy rates. Whether the owner is paying the utility costs, or the tenant is paying them, the buildings with higher operating costs are not returning the same profits to the owner as more efficient buildings are.

Technology and innovation in design for recent new construction projects have added many options to the ways in which buildings are designed and built. Many of these

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innovations are focused on reducing the energy consumed by buildings while maintaining the comfort and aesthetics of a modern building. Developers in particular should take advantage of these efficient design techniques. With proper planning of leasing structures and utility billing for a building, a developer can increase their yearly net earnings from a property through savings in energy costs alone. Efficient buildings can also help attract tenants and keep vacancy low. If the tenant will be responsible for paying the utilities for their rented space, then efficient building systems can be used as a selling point, and rental fees can fall above the averages since energy cost will be low. If the owner is taking the responsibility for the utilities, then the cost to rent can fall slightly below the averages to keep occupancy but high enough that the owner is profiting from the savings in utility cost. Any way that the operation costs for a building are distributed, the owner and the tenant both stand to gain from the use of efficient building systems and materials.

### **Marketing Sustainable Buildings**

There has been much research done about the benefits to the occupants of sustainable buildings. Aspects like day-lighting, improved indoor air quality and increased use of vegetation all add a distinct appeal to any space. Consistent across all research is the fact that sustainable buildings are more desirable to all types of tenants.

Research specific to office spaces has further outlined the benefits of sustainability for occupants. Statistics about employee productivity have been collected for typical office space and for office spaces with designed improvements in indoor air quality and energy efficiency. The workers in the sustainable spaces showed significant improvements in productivity, translating into substantial savings for the corporation paying those employees. Other research and observations have shown reduced sick days for employees working in the sustainable designed buildings, which also translates into substantial savings for the companies.



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With just the above statistics alone, which are only partial reports of all of the research done, a company looking to rent a new space would be attracted to a building that utilizes sustainable design practices. Not only can the tenant save money from the added energy efficiency of sustainable spaces, but they can also have more productive employees and less absenteeism.

Sustainable designs have also become a desired status symbol for many higher end clients. With the increasing prevalence of environmental issues in politics and media, many companies are willing to spend money simply to obtain the status and popular appeal of a sustainable building.

## **Conclusions**

There are many arguments for building a more efficient building when you are the owner and tenant of the building, like a single-family home, but traditionally developers are thought to cut first costs at any expense to the building performance and then let the tenant suffer the consequences. With the constantly increasing energy costs in this country, developers building inefficient buildings are going to have an increasingly hard time occupying those buildings. The old methods of cutting upfront costs to make more money are no longer the only options for increasing earnings from an investment. These methods of marketing efficiency and managing utility costs offer developers a chance to increase the bottom line on any new building.

## *Summary and Interpretation of Interview Results*

*(See Appendix 2.1-2.2 for full Interview Responses)*

## **Intent of Interview Process**

To gain a perspective of the ways that current developers deal with building efficiency and sustainability decisions, several professionals currently active in development in the Washington, DC area were interviewed. Their experience offers the

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best insight into the way in which this energy issue is affecting the business end of the construction market.

### **Interview Results**

Developers building in the DC market are placing more and more emphasis on the efficiency of the building they are constructing. This emphasis is coming from the growing demand of all types of renters in this area to gain savings through efficient building systems and materials. Inefficient buildings have even been known to lead to law suits and disputes between tenants and building owners. Other demands for building efficiency are coming from the owner's desire to maximize resale value of their building, and outdated or inefficient building systems drastically reduce the value of any property.

Sustainable design is also gaining significant momentum in the DC developer market. These developers are almost always open to sustainable ideas as it can be used a marketing tool for their property. Sustainable practices are also moving towards becoming a requirement for new construction projects in the DC area. However, government agencies are a little slower to embrace sustainable concepts since they do not have opportunity to use it for marketing, but building efficiency does remain a main concern for government work.

The recent changes in energy costs have not necessarily had an impact on the way in which developers make decisions about building efficiency, but have definitely had an impact on the decisions that are being reached. Developers continue to make decisions based on optimized first cost versus life-cycle costs, but these methods may start to change with the increased popularity of sustainable buildings and the marketability of those features.

As sustainable and efficient designs progress and aspects from these designs become more popular and affordable, the buildings that are being built will follow with increased popularity of efficient systems and sustainable elements. Prevailing focus for

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developers will remain with the same business models that optimize first cost and operation costs.

### *Conclusions*

Through both research of current studies and the interviewing of professionals involved in development, the same conclusions can be drawn about the current and future trends in building efficiency and business models. Energy costs are contributing to a gradual change in the way developers are building, but in combination with sustainable trends these design practices are having a major impact on the way that developers are marketing what they build. Building efficiency and sustainability are very appealing to any customer looking for a rental property. The direct savings on utilities, indirect savings on improved quality of spaces, and the status from having the most recent trend in building construction all appeal to a wide and all inclusive variety of tenants. As design processes continue to evolve and environmental concerns continue to grow, this movement towards a more efficient development market will continue. Developers can now and will continue to be able to build more efficient and more responsible buildings without sacrificing earnings from their investments.