GREEN BUILDING- A BUSINESS REPORT OF THE COST AND BENEFITS FOR DEVELOPERS, INVESTORS AND OCCUPANTS

Rishabh Verma, Nikunj Kharvi,
Prof. Sushil Ade- Head of Civil Department,
Dilkap Research Institute of Engineering and Management, Neral
Email- rishabharunverma@gmail.com, sushilade@gmail.com, nikunjkharvi7@gmail.com

ABSTRACT

Many studies and reports have discussed various aspects of the "business case" for green buildings in recent years, but this report is an attempt to compile all reliable data from around the globe into a single, comprehensive resource that includes international examples and thought pieces from top experts.

The final section of this study explores the effects that a greener built environment can have on a macro scale as well as how this can be accomplished. This report examines the business costs and advantages of green building in essential categories. According to the research, there are a variety of compelling advantages to building sustainably that are enjoyed by various stakeholders over the course of a building's life. However, whether it is possible to put a monetary value on the advantages of green buildings has remained debatable. This is information that real estate lenders and the investment community need. Do green buildings command a higher price when it comes to buying and renting? Are tenants and occupants finding them more appealing?

KEY WORDS

Green building, business, developer, inverstor, building’s life, cost, consumption,
Productivity, mitigations, perfromances, industry, value etc.

KEY FINDINGS

The conclusions offered in this conference paper are a critical synthesis of the most recent and pertinent research, using peer-reviewed evidence as the basis for the analysis and under the direction of a steering committee of specialists from around the world.

The report's main body, which is required reading to comprehend the findings' applicability to local markets, offers insight into how these conclusions were arrived at as well as the study's backdrop.

INTRODUCTION

The green building business case has been the subject of numerous papers from the academic and industrial worlds, but this report is the first attempt to compile all reliable data into a single, authoritative reference work. Although the environmental advantages of green buildings are well known, there are also a number of compelling financial and social advantages that are discussed in this study in the order in which they were discovered. The debate first turns to the advantages that might be attained during the design and construction phase before moving on to the asset value and profits that investors and developers might realise. The operational advantages, such as cost savings, improved worker productivity, and risk reduction, which affects every stage of a building's economic life, come next. Since this has been the area of research's current focus, the majority of the evidence offered in this paper comes from relatively recent construction. To highlight each stage, the study includes a "life cycle wheel," and stakeholder icons further identify which area of the real estate and construction sector is taking the initiative at any particular time. It is intended to be immediately clear which portions apply to your specific function in the sector. At the same time, this research aims to do what the majority of other green building resources do not: it addresses both the tenants who drive market demand and the building developers, owners, and investors who are the final decision-makers when it comes to financing green building initiatives. The Business Case for Green Building speaks to these players rather than about them.

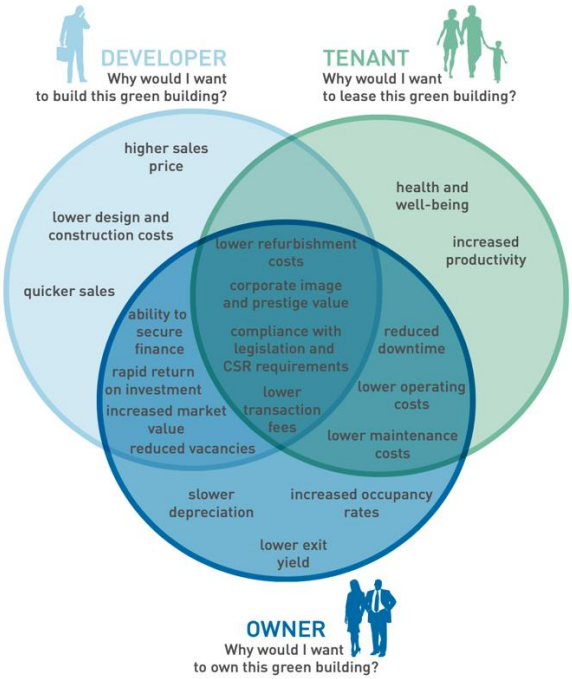
We made it a point to exclusively base our conclusions on peer-reviewed research in order to present a thorough and trustworthy report. We only occasionally refer to other kinds of documents, and when we do, it is explicitly stated in the text in the footnotes.

THE BUSINESS BENEFITS

DESIGN AND CONSTRUCTION COST

Soft costs are things or services that are required during the development process but do not end up in the finished construction. These expenses include those related to architectural and design fees, inspection and permit fees, legal and valuation fees, fees for environmental certification, interest from loans, accounting fees, fees for insurance and taxes, and expenses for project management. "Hard costs" are the expenditures associated with purchasing the site, the building's construction, finishes, materials, and landscaping in order to complete the project.

Numerous studies have demonstrated that green buildings do not necessarily have to be more expensive and that it is definitely possible to deliver green buildings within the budget of a traditional code-compliant construction.



Indeed, several studies offer case studies that are less expensive than certified structures.

In order to avoid more expensive bolt-on strategies, adopting green strategies and incorporating them into the budget early on, hiring experienced design and construction teams, and using an Integrated Design Process (IDP), from the pre-design phase through to post-occupancy, where clients take on a more active role and all consultants are engaged from the beginning, are some strategies that have been suggested by a number of authors. It is vital to keep in mind that these initial expenses are frequently offset by a reduction in long-term life cycle expenses, particularly in the case of green buildings that have high-performance façades and energy-efficient building systems. Delivering cost-effective structures is about taking the long view and turning it into short-term actions, especially for green building.

The chapter on "Operational Costs" in this paper discusses the implications of the long-term advantages of green building.

The project will also have long-term value in terms of bettering people's health and quality of life as well as increasing worker productivity in industrial and office settings. The minimum criteria for building codes are also increasing stronger, which means that the expenses and baseline needs associated with "business as usual" are also getting greater. As a result, the cost difference between code-compliant buildings and green buildings is getting less.

DECREASING COSTS FOR GREEN BUILDING OVER TIME

In general, projects frequently end up costing more than expected because of the addition of these non-integrated, bolt-on sustainable features and improvements. An efficient substitute for bolt-on devices added to an underperforming building is a more integrated design strategy that combines intelligent passive design,

thermally efficient building skins, and efficient space planning to reduce energy consumption as a first step. This is not unexpected because the construction sector has been progressively improving its capacity to produce green buildings, and supply chains around the world are also moving toward more developed stages, lowering costs and aiding the effective delivery of green structures. More experts are becoming prepared to design and certify green buildings as a result of growing awareness, acceptance, and education surrounding green building certification and assessment methods. Clients (i.e., investors, owners, and developers) are becoming more conscious of sustainability and energy challenges and are putting more of a demand on the sector and the collaborative teams that are assembled to deliver their projects for greater industry knowledge. As green building becomes more commonplace, the costs involved with obtaining certification have fallen and will continue to do so. This is due to the improvement in skills, tools, and supply chain maturity. The minimum criteria for building codes are also increasing stronger, which means that the expenses and baseline needs associated with "business as usual" are also getting greater. As a result, the cost difference between code-compliant buildings and green buildings is getting less.

ASSET VALUE

Market value, which is the projected price at which a building will transact in the market between a willing buyer and a willing seller, is the most typical definition of value. This in turn is related to the rental or capital amount that building occupiers (tenants or owner-occupiers) are willing to pay for owning or leasing a building in the case of investment-grade structures. For commercial structures, for instance, a building's location, reputation, leasing terms, running costs, and resulting working environment are all related to its worth.

Other crucial elements are the proximity to other environmentally friendly structures and the likelihood of future refurbishment. Value is defined by developers and owners as the potential market value of their properties, which is in turn impacted by how desirable a property is to potential tenants. Thus, the rental rate and occupancy rate have a direct impact on the market value of a property.

Green buildings typically have greater asset values than their conventional code-compliant equivalents, according to evidence from studies conducted over the previous decade, many of which were based on data acquired from LEED-certified office buildings in the United States.

The higher sale prices that are indicative of this disparity in asset value are linked to the following advantages: Higher rental/lease rates: Studies done on certified green buildings have found that there is frequently a rental rate premium. This is explained by the fact that green buildings are more appealing to potential tenants due to their superior internal environment, reduced running costs, and increased marketability. A slightly different idea is emerging in some regions where green buildings are increasingly commonplace: buildings that are not green have lower renting and leasing rates, or "brown discounts."

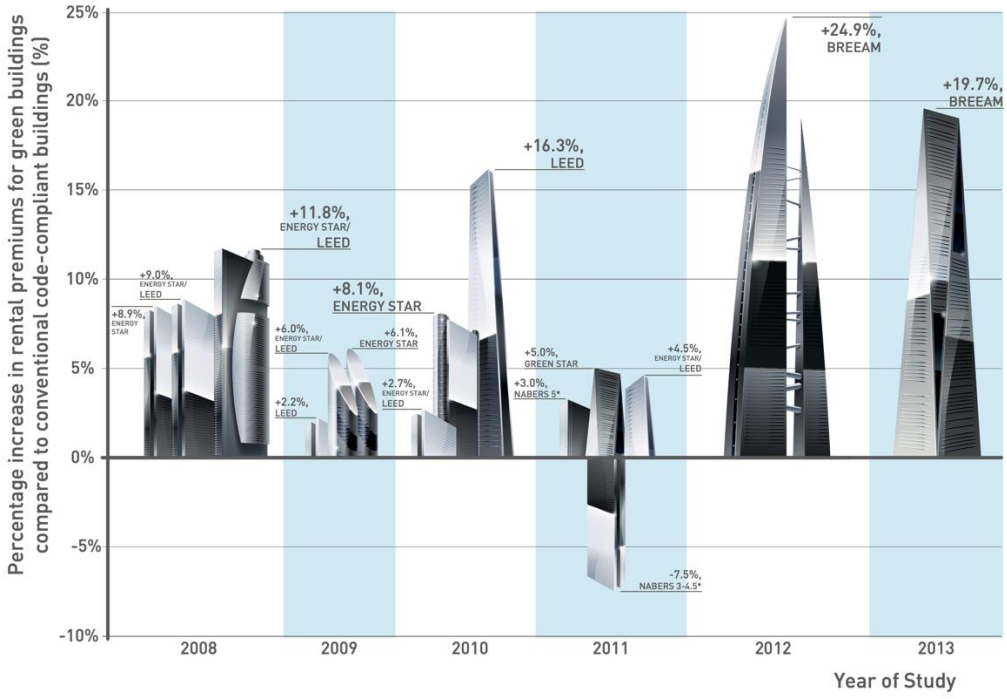
Lower operating costs: Certified green buildings typically use less energy and water, making them more affordable to own and operate. This makes them more appealing to potential tenants and owner-occupiers in areas where energy and water costs are a significant factor in overall costs, including rent.

Better occupancy rates: When compared to non-certified buildings, certified green buildings may be able to attain higher occupancy rates. This would give owners and developers the guarantee of a lower volatility in the rate of return.

Lower yields: Some research have shown that the yield at the time of sale is lower. Because of the lower yield (or capitalization/discount rate), transactions cost more money.

In a research by Yoshida and Sugiura on the worth of green condominiums in Tokyo, the authors discovered that constructing green actually lowered the value of the buildings by 5 to 10%. This is another example of a reduction rather than a gain in asset value. One of the possible explanations for why energy efficiency in building design was not perceived as a driver for value was because extremely efficient appliances and equipment are widely used in Japan. Long-life designs, on the other hand, were thought to increase value because of their slower depreciation. This is an intriguing illustration of a divergent market view in which lifespan and durability emerge as more important criteria for green buildings than energy efficiency.

EFFECTS ON RENTAL AND OCCUPANCY RATES



Energy Star, USA and Australia as LEED and Green Star-rated buildings often attract rental premiums, as documented in numerous studies over the past five years, according to evidence from the USA and indicates

the spectrum of rental premiums for workplaces in the Australia. 0% to 17.3%, with one research demonstrating an instance of a 9% rental savings. This

A research that identified a tendency towards higher rental rates from Australia, where lower NABERS scores (an energy-only rating) have premiums linked with greater degrees of certification, discovered that LEED-certified buildings have also demonstrated rental discounts. The study's findings showed that, on average, rent surcharges increased by 3% for every level of certification, in contrast to the results, which were connected to rental reductions. Though occupancy rates are rarely reported in research, several writers consider them as a key factor in determining the value of green structures. Based on data for LEED and Energy Star-rated workplaces in the United States in comparison to their code-compliant equivalents, it displays the stated occupancy rate increases from the available studies18, which range from 0 to 23.1%. There have been no statistics provided that show how green construction affects occupancy.

THOUGHT PIECE

Accurate valuations are essential to the operation of the real estate markets as they serve as the foundation for performance analysis, financing choices, transactions, development advice, dispute resolution, and taxation. The market value of a building is crucial to the construction and investment decision-making process. Therefore, a requirement for more sustainable real estate markets is to ensure that valuation specialists' competence extends to a profound respect and grasp of sustainability issues, many of which are currently unclear.

Despite this, we live and work in a paradoxical, uncertain, and ambiguous world where the traditional reliance on professional advice appears to be vanishing quickly. In its place, a litigious environment where the professional's judgement is scrutinised and contested forces the professional to only offer advice in relation to that which can be supported by hard data; advice based solely on opinion and experience is no longer sufficient. As a result, valuers may be tempted to base their recommendations on an examination of recent previous transactions and the assumption that things will continue to be the same in the future. Anything else, after all, entails some degree of speculative trend interpretation. However, this is incorrect since appraisals are about guidance for the future, which entails uncertainty.

What therefore is the valuer's response to the sustainability agenda, or rather what ought it to be? A significant improvement from 10 years ago is the fact that sustainability is on valuation professionals' and their clients' minds. Professional organisations are rightfully including consideration of it into their standards and recommendations. But how do we actually reconcile evidence and opinion, science and perception, and behave morally? While the capacity of present valuation procedures to reflect sustainability challenges exists, having standards for the process is one thing; having evidence to support changing advise and perhaps influencing

customers is quite another. The results of a multiple regression analysis of previous rental transactions suggest that certified buildings perform better than uncertified ones.

But is this enough to support the business case for designing or purchasing "green" buildings, and to allow valuation experts to counsel clients accordingly?

This is definitely overly simple. In many aspects, newly built and certified buildings are much the same as prime stock, although many prime buildings do not have that distinction for very long. Location and a building's capacity to evoke an emotional reaction in people—either as occupants or in terms of their fit with the surroundings—are factors that contribute to intrinsic value throughout time. Therefore, anything that initially satisfies the "green agenda" but does not address social needs may not be viable in the long run.

One of the biggest challenges for the profession is to comprehend and take into account the interactions and interdependencies between these more complex and frequently less tangible value-influencing sustainability factors, as well as to incorporate this knowledge into daily valuation theory and practise. The true contribution that buildings offer to their owners, the larger community, and the well-being of the earth should be recognised in our notion of value. It goes without saying that this would entail broadening, or even questioning, the conventional conceptions of value by moving beyond the idea that buildings are merely another type of financial asset class. For this, a far deeper and more comprehensive understanding is required, one that takes into account how some of the so-called sustainability aspects will function over time. The encouraging news is that there are already early indications that valuation experts are starting to carefully gather data pertaining to a number of sustainability factors. However, there is still a long way to go before this is fully examined and represented in valuations. If they choose not to use the data, valuation professionals are obviously more susceptible to legal action after they have it. And "business as usual" will not happen if this is not acknowledged.

NEXT STEPS OF THE INDUSTRY

Enhance transparency and consistency: In order to reduce any perceived risks of devaluation or a reduction in expected benefits from the inclusion of sustainability features on building projects, appraisers, or valuation experts, need to be involved in the process of accounting for sustainability measures in the development projects on which they advise.

Gather additional information: More evidence on the influence of certification or green measures on building value is required for different markets and certification levels. Data is especially needed on the impact of individual measures or tactics, as well as how they are regarded by valuers. Existing research, particularly on

rental and occupancy rates, are based on tiny sample sets and must be expanded to boost their reliability and robustness.

Understand the implications: The industry must also better understand the implications of changes in the ratio of certified versus non-certified buildings, the trend in legal requirements to upgrade buildings, fiscal incentives to offset capital costs, and other external factors related to political, economic, and environmental issues, all of which will have an impact on the asset value of both green and non-green buildings.

PERFORMANCE

OPERATING COSTS

The attainment of occupancy-related advantages in two key areas reduced operation and maintenance costs, as well as productivity and health benefits justifies any additional construction expenses for green buildings, as well as any gains in market value or rental premium. This chapter focuses on the operating cost reductions that green buildings may produce. The next chapter examines employee productivity and wellness. Decreased energy expenses for heating, cooling, lighting, and ventilation, as well as reduced water use, are the key advantages that directly connect to the design of green buildings. To fully benefit from the building's sustainable features in terms of other benefits, such as reduced operating expenses and maintenance needs, appropriate green building management practises must be put in place before the facility is occupied. Additionally, green buildings may provide indirect advantages by lowering property taxes, insurance premiums, and renovation expenses.

Energy Savings from Green Building Retrofits

The market for energy-efficient retrofits is expanding. In light of international energy reduction goals, the majority of nations are becoming more and more conscious of the energy inefficiency of their current building stock. As a result, the significance of energy efficiency retrofits is constantly increasing. Thermal envelope renovations, lighting upgrades, sub metering, enhanced controls, water-saving fixtures, renewable energy installations, and mechanical system upgrades including heat recovery systems and variable frequency drives for fan motors are a few examples of retrofit measures. According to the available data, energy savings for green building retrofits are nevertheless significant even though they are not as large as those for new construction. For instance, a study of Singaporean buildings shows that after retrofitting a sample of them, energy savings were achieved of 17%. The power costs on the buildings it manages that have undergone energy performance upgrades often decrease by 3% to 15%, according to Transwestern, a private real estate company from the United States.The relative advantages of energy efficiency will become more significant as energy prices increase, and the commercial case for energy-efficient structures and retrofits will get stronger.

Maintenance

Along with conserving resources, green buildings frequently emphasise the endurance and toughness of their systems and finishes.

In order to ensure that a material is "green" in every way, it is typically taken into account throughout its entire life cycle, in addition to its characteristics at the time of installation. This is done by using a cradle-to-cradle approach that considers embodied energy, toxicity and emissions, replacement cycles, and disposal. Long-term financial gain would result from fewer frequent replacement cycles, reduced cleaning and maintenance needs, and advantages associated to better indoor environments due to lower toxicity and emissions from a correctly selected palette of sustainable materials and building systems. Taking it a step further, materials that are genuinely cradle-to-cradle have an additional cycle of recycling and recovery at the end of their life, potentially producing a second source of revenue, albeit this procedure is still in its early stages.

Refurbishment

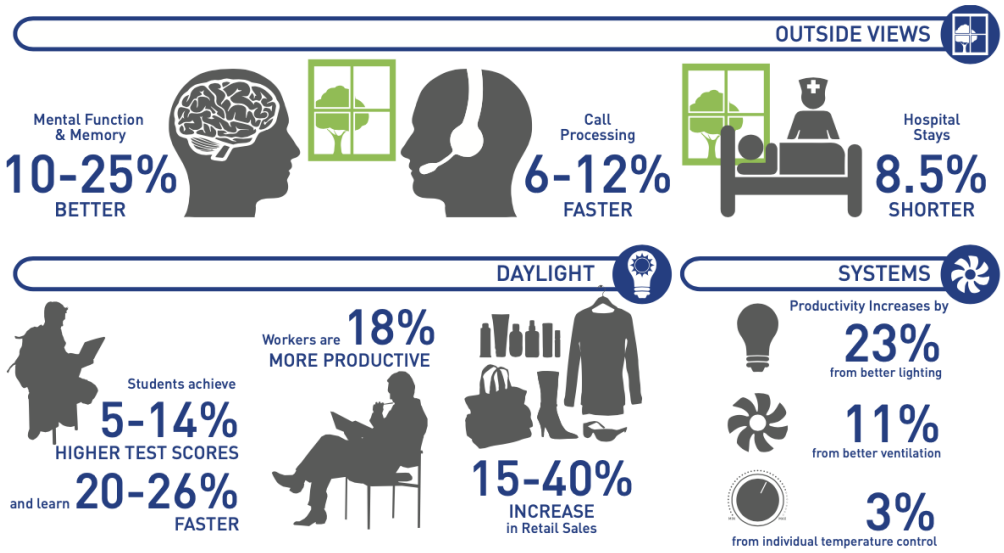
The flexibility, adaptability, and future-proofing of a building's design are further features that boost its financial viability and benefit both the owner and the occupant. Raised flooring and moveable walls are two examples of adaptable systems that are frequently used in green buildings. These features enable occupant movement and space reconfiguration without causing too much disturbance, downtime, or expense. According to 2019 statistics, the expected cost savings connected with the addition of raised floor systems in Canadian office buildings, for instance, amounted to US$9.31 per square metre annually. For owners, flexibility refers to how easily a space may be converted to a new use or reconfigured to accommodate shifting market demands. A building that is future-proofed in terms of flexible energy sources, data infrastructure, climatic change, and new methods of working assures that the building will remain a valuable asset for both the owner and the tenant for a very long time.

WORKPLACE PRODUCTIVITY AND HEALTH

Any company owner will tell you that the majority of operating costs related to owning an office facility are related to employee pay and related expenses. In actuality, wages and benefits account for over 85% of all workplace expenses, compared to less than 10% for rent and less than 1% for electricity.

According to research, organisations may gain more money by making even modest improvements to things like productivity, health, and well-being than they would by using resources more effectively when operating buildings. It is not unexpected that the corporate world is becoming more and more interested in the good effects that green building design can have on its workforce. Leading companies are increasingly asking themselves how much it will cost them to invest in green buildings rather than how much it will cost them to not do so.

Businesses are becoming more aware that better-supporting their employees leads to better organisational outcomes, but they are less convinced about how to best use buildings to have a beneficial influence on people. Additionally, many companies make changes to the environment only when it directly affects how well employees perform their jobs rather than being proactive and investigating how the environment can have a positive impact on productivity and well-being. This is because they hold the mistaken belief that people can adapt to any environment. While these green design features have proven benefits, they must be incorporated into a holistic design of the whole building, or they may have unwanted results. The most obvious example is daylighting, which must be incorporated into the design correctly in order to minimize glare and eliminate unwanted heat, both of which can have a negative impact on productivity. To shift our investments in the built environment from cost minimization to employee health and productivity maximisation will require a stronger empirical base. Employers could achieve this by seeing their physical spaces as vehicles for leveraging greater organisational performance and releasing considerable value. Investors and owners of buildings should be aware of the information currently available and take action based on it, keeping in mind that any design choices made today will affect employees over the course of the building's existence and, consequently, the long-term worth of their investment.



Corporations invest a lot of time, money, and effort into finding and keeping talented employees. Could the straightforward solution of offering a wholesome, sustainably-designed workplace that fosters productivity and well-being be one of the answers? Professionals in human resources are investigating this possible competitive edge more and more. Companies moving to green office space or greening their current space need to specifically track statistics on employee attraction and retention before and after the change in order to demonstrate the direct relationship between the sustainability of a workplace and the ability of a company to attract and retain key employees. In order to examine the green aspects of the work environment in relation to organisational commitment, human resource experts must agree on the sorts of data to be gathered,

including the pertinent units of measurement. But one thing is already clear: businesses, especially those with a highly-skilled or expert workforce, stand to benefit greatly from improved personnel attraction and retention strategies. Staff turnover costs companies a year or more in effective salaries. Companies overlook this significant advantage of green building at their risk since younger graduates are becoming more concerned with the sustainability of their workplaces.

CASE STUDY

Abu Dhabi's First Sustainable Mandate

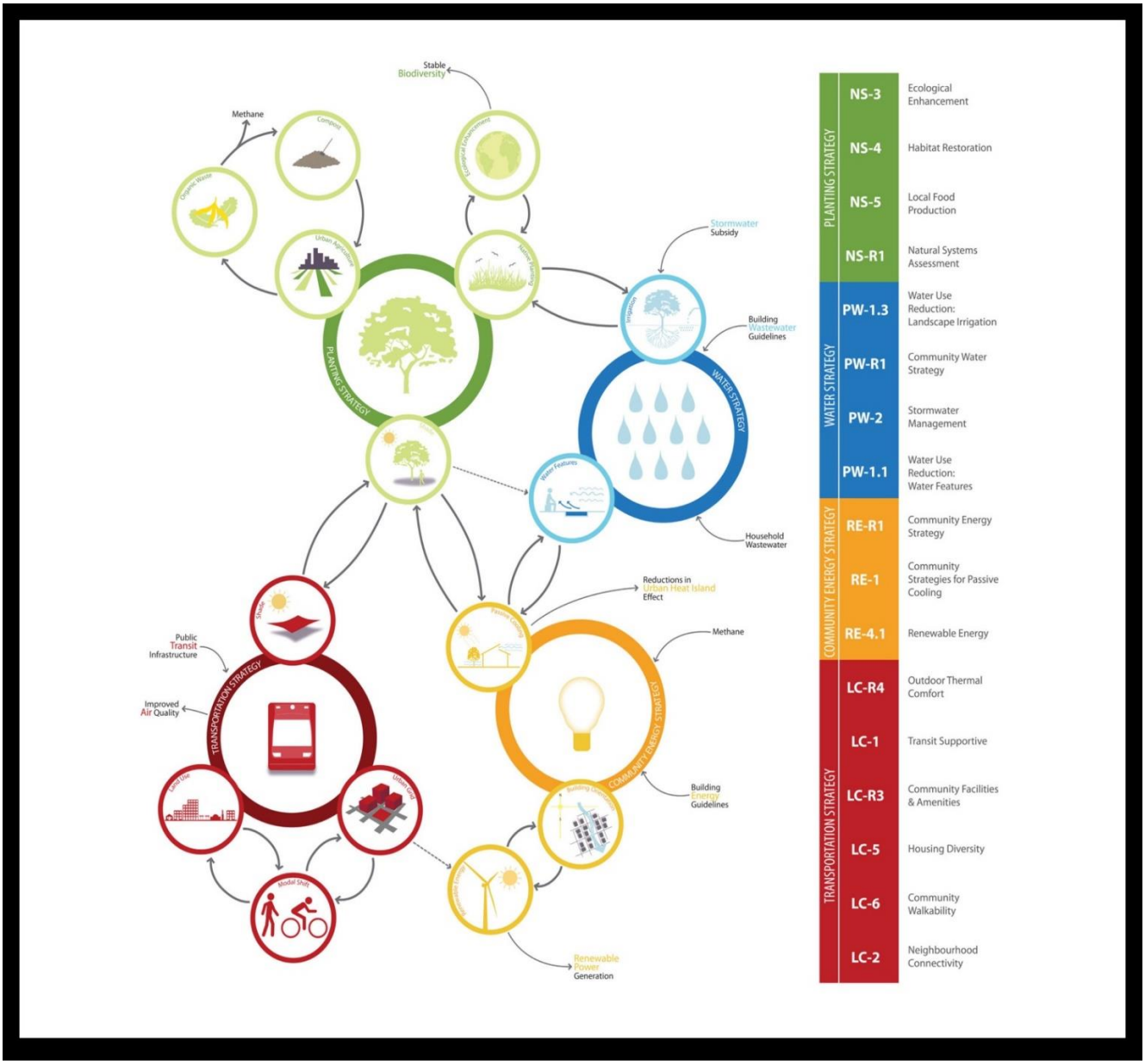
Abu Dhabi has undergone a rapid change in the last fifty years, with the economic rewards from oil and gas reserves propelling the city into the modern capital it is today.

Previously, the region was a predominantly nomadic herding, fishing and pearl diving culture, with date and vegetable plantations contributing to the local economy. Bedouin life, while hard and without many of today's creature comforts, required little from the land and made little impact in return; wasting nothing, the Bedouin way of life was truly sustainable.

Today, Abu Dhabi and the United Arab Emirates have some of the highest resource consumption rates and per capita carbon emissions in the world. In part, this is due to the environment. The Middle East is challenged with one of the world's harshest climates; hot summers of up to 50°C (120°F) in the shade and hyper-arid conditions pervade each year. The precious water used for drinking, agriculture and industry requires significant fossil fuel resources due to the dependence on the desalination of seawater sourced from the Arabian Gulf. At the same time, utility tariffs are heavily subsidized by the government; the electricity subsidy in residential buildings ranges from 55 to 90% and the water subsidy ranges from 79 to 100%. In recent years, the number of government-funded projects, which includes housing for its citizens, represents 72% of all new development. The total cost to government for these projects includes both the initial capital and a significant proportion of operational expenditure as a result of the substantial subsidies. Reducing consumption and government costs is therefore a key factor supporting the business case for sustainable development in Abu Dhabi. To respond to these challenges, the Abu Dhabi leadership identified and committed to the need for a sustainability framework to guide development of the city at every level. The Abu Dhabi Urban Planning Council (UPC) has developed 'Vision 2030' - a plan to evolve the city into a vibrant metropolis complete with world-class industry, commerce, education, healthcare, transport and tourism.

Vision 2030 was developed to respond to the local climate, way of life and values of the people and is based around four key pillars: social, cultural, economic and environmental. This framework is called Estidama - the Arabic wordfor sustainability. Every new building and community must adhere to the system's minimum requirements, with higher levels of sustainable achievement encouraged to promote positive change and

competition. Unique features of the system include the integration of cultural, religious and social values combined with an emphasis on both energy and water saving in the scoring system to reflect the strain placed on the nation's natural resources and fragile ecosystem. To improve efficiency of the construction process and to keep costs down, audits are carried out at four stages of the construction period, and on-site testing reduces defects and liability issues and removes instances of non- compliance. The Pearl Operational Rating System ensures continuity of building performance and efficiency through mandating operational maintenance protocols, extending both building and system lifetimes. Implementation of the Estidama program has been provided free to industry by the government to ensure all new projects are included and supported. Comprehensive training has accelerated the spread of awareness through the construction industry and wider population.



CONCLUSION

By 2050, it is expected that the population of our major cities will have doubled. With this task in front of us, the property sector needs to be bold and creative if it wants to design and manage communities, towns, and buildings that are not just environmentally friendly, but also enhance the quality of life for everyone who enters them.

REFERENCES

RICS. (2010). Is Sustainability Reflected in Commercial Property Prices: An Analysis of the Evidence Base. Research Report.

www.investopedia.com

www.greenresourcecouncil.org

Brooks, M.S. (2008). Green Leases and Green Buildings. REALpac.

www.wbdg.org

www.usgbc.org

Addae-Dapaah, K & Chieh, S.J. (2011) Green Mark Certification: Does the Market Understand? Journal of Real Estate. Vol.3 No.1, pp. 162-191.

American Chemistry Council. (2003) "Analyzing the Cost of Obtaining LEED Certification." Arlington, VA., as cited in Jackson, J. (2009) How Risky Are Sustainable Real Estate Projects? An Evaluation of LEED and ENERGY STAR Development Options. Journal of Sustainable Real Estate. Vol 1 No 1, pp. 91-106.

Apte, M.G; Fisk, W. & Daisey, J.M. (2000) Associations between Indoor CO2 Concentration and Sick Building Syndrome Symptoms in US Office Buildings: An Analysis of the 1994-1996 Base Study Data. Indoor Air. Vol 10 No 4, pp. 246-57.

Bauer, R., Eichholtz, P.M., Kok, N. & Quigley, J.M. (2011). How green is your property portfolio? The global real estate sustainability benchmark. Rotman International Journal for Pension Management. Vol 4, pp. 34–43.

BCA Singapore. (2008) The Business Case for Green Buildings in Singapore. Berlin Energy Agency. "Attractive funding for solar thermal in Berlin." Available at: http://berliner-e-agentur.de/en/node/2384

Berman, A. (2001) Green Buildings: Sustainable Profits from Sustainable Development, as cited in Kats, G. (2003) "Green Buildings Costs and Financial Benefits." Boston: Massachusetts Technology Collaborative.

Bernstein, H.M. and Russo, M.A. Business Case for Energy Efficient Building Retrofit and Renovation. McGraw Hill Construction SmartMarket Reports Better Building Partnership. (2010) Green Lease Toolkit. Working together to improve sustainability, pp.1-2.

Bodeker, C., Vidgen, R., Meagher K., Cogin, J., Mouriten, J. & Runnalls, J.M. (2011) "Leadership, Culture and Management Practices of High Performing Workplaces in Australia: The High Performing Workplaces Index." Society for Knowledge Economics.

BRE (2007) "Costing Sustainability: How much does it cost to achieve BREEAM and EcoHomes ratings?" Information Paper. BRE Trust (2005) Putting a Price on Sustainability. BRE: Watford.

Brounen, D. & Kok, N. (2011) On the Economics of Energy Labels in the Housing Market. Journal of Environmental Economics and Management. Vol 62 No 2, pp.166-79.

Building Design & Construction (2003) White Paper on Sustainability.

Building Design and Construction (2007) Green Building Research White Paper. Fifth in a Series of Annual Reports on the Green Building Movementpp.

Bureau of Environment (2012) "Tokyo Cap and Trade." Available at: http://www.kankyo.metro.tokyo.jp/en/climate/cap_and_trade.html

Cajias, M., & Bienert, S. (2011) Does Sustainability Pay off for European Listed Real Estate Companies? The Dynamics between Risk and Provision of Responsible Information. Journal of Sustainable Real Estate. Vol 3 No 1, pp. 211-231.

Carmody, C. (2010) Sustainable Practices Important to Retention, Attraction of Younger Workers. Green Plus News. Available at: http://gogreenplus. org/latest-news/sustainable-practices-important-to-retention-attraction-of-younger-workers.

CBRE. (2009) Who pays for green? The economics of sustainable buildings. EMEA Research. Chegut, A., Eichholtz, P. & Kok, N. (2012) Supply, Demand, and the Value of Green Buildings. RICS Research.

City of Chicago. (2010) "Overview of Green Permit Program." Available at: https://www.cityofchicago.org/city/en/depts/bldgs/supp_info/overview_ of_the_greenpermitprogram.html

City of Chicago (2010) "Retrofit Chicago Initiative." Available at: http://www.cityofchicago.org/city/en/progs/env/retrofit_chicago.html

City of Houston (2009) "City of Houston Tax Abatement Program." Ordinance No. 2009-858.

City of Melbourne. "1200 Buildings : Getting stated – funding." Available at: http://www.melbourne.vic.gov.au/1200buildings/Pages/Funding.aspx

City of Sydney. "Programs for Businesses." Available at: http://www.cityofsydney.nsw.gov.au/environment/EnergyAndEmissions/BusinessPrograms.asp.

Colliers International. (2012) Alternative Workspace Strategies – The Next Evolution. Office Tenant Survey.

Colliers International (2012) Building Choice Crucial to Attracting Retaining Quality Office Staff. Available at: http://geelong.colliers.com.au/News/ News-details.aspx?NewsId={8535F514-8A5D-46B7-B094-7C2EA0C6FD60

The David and Lucille Packard Foundation. (2002) Building for Sustainability: Six Scenarios for the Los Altos Project, as cited in Lucuik, M., Trusty, W., Larsson, N. & Charette, R. (2005). "A Business Case for Green Buildings in Canada." Ottawa: Morrison Hershfield.

Davis Langdon. (2007)"The Cost and Benefit of Achieving Green Buildings."Sydney.

Deng, Y., Zhiliang, L., & Quigley, J.M. (2012) Economic Returns to Energy-Efficient Investments in the Housing Market: Evidence from Singapore. Regional Science and Urban Economics. Vol 42 No 3, pp. 506-15.

Dermisi, S. & McDonald, J. (2011) Effect of 'Green' (LEED and ENERGY STAR) Designation on Prices/sf and Transaction Frequency: The Chicago Office Market. Journal of Real Estate Portfolio Management. Vol 17 No 1, pp.39-52.

Dorgan, C., Cox, R., & Dorgan, C. (2002) The Value of the Commissioning Process: Costs and Benefits. Farnsworth Group, Madison Wisconsin. US Green Building Council Conference, Austin, Texas, as cited in Kats, G., Alevantis, L., Berman, A., Mills, E. & Perlman, J. (2003) The Cost and Financial Benefits of Building Green: A Report to California's Sustainable Building Task Force.

Edwards, l. & Torcelli, P. (2002) "A literature Review on the Effects of Natural light on Building Occupants." National Renewable Energy laboratory. NREl/ TP- 550-30769. Golden, Colorado.

Eichholtz, P., Kok, N., Quigley, J.M. (2010) Doing well by doing good? Green office buildings. American Economic Review. Vol 100 No 5, pp. 2491-2509.

Eichholtz, P., Kok, N., Quigley, J.M. (2010) Sustainability and the dynamics of green building: New evidence of the financial performance of green office buildings in the USA. Research Report. RICS Research.

Ellison, L., Sayce, S. & Smith, J. (2007) Socially Responsible Property Investment: Quantifying the Relationship between Sustainability and Investment Property Worth. Journal of Property Research. Vol.24, No.3, pp.191-219

Figueiro, M.G., Brons, J., Rea, M.S., Plitnick, B., Leslie, R. & Rea, M. (2010) Quantifying the impact of daylighting and electric lighting on student alertness, performance, and well-being in K-12 schools. Neuro-endocrine Letters. Vol 3 No 1, as cited in Heerwagen, J. (2010) "Healthy Buildings: A Proposal for a Research Initiative on Health and Indoor Environments." National Institutes of Health.

Fitz-enz, J. (1997) It's costly to lose good employees. Workforce. Vol 76, pp. 50-51. Fitz-enz, J. (2009) "The ROI of Human Capital: Measuring the Economic Value of Employee Performance." 2nd ed. New York.

Frazer, H. T. (1998) RMs can curb indoor-air problems. National Underwriter Property & Casualty-Risk Benefits Management. Vol 102 No 23, pp. 78; as cited in Danna, K. & Griffin, R.W. (1999) Health and Well-Being in the Workplace: A Review and Synthesis of the Literature. Journal of Management. Vol 25 No 3, pp. 357-84.

Fuerst, F. & McAllister, P. (2008) Green Noise or Green Value? Measuring the Price Effects of Environmental Certification in Commercial Buildings. Working Paper.

Fuerst, F. & McAllister, P. (2011) The impact of energy performance certificates on the rental and capital values of commercial property assets. Energy Policy. Vol 39 No 10, pp.6608-6614.

Fullbrook, D. & Jackson, Q. (2006) Value case for sustainable building in New Zealand. Ministry for the Environment.

Galuppo, L.A. & Tu, C. (2010) Capital Markets and Sustainable Real Estate: What are the Perceived Risks and Barriers? Journal of Sustainable Real Estate. Vol 2 No 1, pp. 144-59.

General Services Administration. (2004) LEED Cost Study Final Report, as cited in Jackson, J.(2009). How Risky Are Sustainable Real Estate Projects? An Evaluation of LEED and ENERGY STAR Development Options. Journal of Sustainable Real Estate. Vol 1 No 1, pp. 91-106.

Gomez, S. (2008). "Is the Client Willing to Pay to Occupy a Greener Building?" Improving Energy Efficiency in Commercial Buildings Conference. Gov HK. (2013) "Green Buildings." Available at: http://www.gov.hk/en/residents/environment/sustainable/buildings.htm

Heerwagon, J.H., Heubach, J.G., Montgomery, J. & Weimer, W.C. (1995) Environmental Design, Work and Well Being. Managing Occupational Stress Through Changes in the Workplace Environment. AAOHN Journal. Vol 43 No 9, pp.458-467.

Heerwagen, J. (1998) Design, Productivity and Well Being: What are the Links? Paper presented at: The American institute of Architects. Ohio, 12-14 March 1998

Heerwagen, J. (2010) Healthy Buildings: A Proposal for a Research Initiative on Health and Indoor Environments. Seattle; University of Washington

Heschong Mahone Group (1999) "Daylighting in Schools: An Investigation into the Relationship Between Daylighting and Human Performance." California Energy Commission: Pacific Gas and Electric Company. Fair Oaks, California.

Heschong Mahone Group (2003) Daylight and Retail Sales. Technical Report. California Energy Commission.

Heschong Mahone Group (2003) Windows and Offices: A Study of Office Worker Performance and the Indoor Environment. California Energy Commission.

Jackson, J. (2009) How Risky are Sustainable Real Estate Projects? An Evaluation of LEED and ENERGY STAR Development Options. Journal of Sustainable Real Estate. Vol. 1 No. 1, pp.91-106

Kahn, P.H., Friedman, B., Gill, B., Hagman, J., Severson, R.L., Freier, N.G., Feldman, E.N., Carrere, S. & Stoylar, A. (2007) A plasma display window? The shifting baseline problem in a technologically mediated natural world. Journal of Environmental Psychology. Vol. 28, pp.192-199

Kaplan, R. (1992) "Urban Forestry in the Workplace" in Gobster, P.H. ed. Managing Urban and High-Use Recreation Settings. USDA Forest Service, General Technical Report NC-163. Chicago, IL; North Central Forest Experiment Station, as cited in Heerwagen, J.H. (1998) "Design, Productivity, and Well-Being: What Are the Links?" American Institute of Architects Conference on Highly Effective Facilities. Cincinnati, Ohio.

Kats, G. (2003) "Green Buildings Costs and Financial Benefits." Boston: Massachusetts Technology Collaborative. Kats, G. (2006) "Greening America's Schools: Costs and Benefits." Capital E. Kats, G. (2009) "Greening Buildings and Communities: Costs and Benefits." Good Energies. Kats, G. (2010) "Greening Our Built World: Costs, Benefits and Strategies." Washington D.C.: Island Press.

Janda, K.B. (2011) Buildings don't use energy: people do. Architectural Science Review. Vol 54 No 1, pp.15-22. Lockwood, C. (2008). The Dollars and Sense of Green Retrofits. Deloitte.

Loftness, V., Hartkopf, V., Gurtekin, B., Hansen, D. & Hitchcock, R. (2003) Linking Energy to Health and Productivity in the Built Environment. Evaluating the Cost-Benefits of High Performance Building and Community Design for Sustainability, Health and Productivity. Greenbuild Conference

Lucuik, M., Trusty, W., Larsson, N. & Charette, R. (2005) A Business Case for Green Buildings in Canada. Ottawa: Morrison Hershfield.

M Moser Associates. The Business Case for Sustainable Workplace Design. Available at: http://www.mmoser.com/pdf/features/Sustainable_workspace_design.pdf

Mapp, C., Nobe, M.C. & Dunbar, B. (2011) The Cost of LEED – An Analysis of the Construction Costs of LEED and Non-LEED Banks. Journal of Real Estate. Vol. 3 No.1, pp. 254-273

Matsumura, E.M., Prakash, R., Vera-Munoz, S.C. (2010). Carbon Emissions and Firm Value. Matthiessen, L.F. & Morris, P. (2004) "Costing Green: A Comprehensive Cost Database and Budgeting Methodology." Davis Langdon.

Matthiessen, L.F. & Morris, P. (2007) "Cost of Green Revisited: Reexamining the Feasibility and Cost Impact of Sustainable Design in the Light of Increased Market Adoption." Davis Langdon.