SEVEN WAYS to SAVE MONEY with GREEN DESIGN and CONSTRUCTION

Taking a sustainable approach to business is not just about money. It includes creating long-term value for the communities in which we live, and it involves protecting ecosystems by using natural resources in a responsible, sustainable way. By taking a sustainable approach to business, our working environments, and to building construction and renovation, we can meet our present needs without compromising those of future generations.

That said, making things work financially is essential for everyone involved in business. Well-designed green buildings typically repay the additional cost over the first 2 to 5 years of operation. And the overall savings, which begin immediately, greatly outweigh any added expense.

In the following pages, we explore the financial returns from investing in green building.

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1. Save 40% or More in Energy Costs over Conventional Construction Methods

The cost of energy is one of the greatest underlying expenses for any business and certain to increase in the years ahead. If you believe that "money saved is money earned," then being able to lock in substantial savings on energy costs month after month is similar to holding a long-term investment like a bond, which produces a fixed income stream and help pays for the underlying investment.

Well-designed green buildings typically use 40–50% less energy than conventional construction.

The example below shows the energy savings as compared to the utility company's estimates for traditional new construction.

Energy Savings of a Green Building Compared to Traditional Construction

2,808 square feet of office space

	Natural Gas	
Consumers Energy estimate:	1,404 CCF	Avg 50 cubic feet / sq ft / yr
Actual 2008 gas usage:	841 CCF	**40% reduction**
	Electric Utility	
Consumers Energy estimate:	44,928 kWh	Avg 16 kWh / sq ft / yr
Actual 2008 electrical usage:	23,061 kWh	**48% reduction**

How does green building result in greater energy efficiency? Here are some strategies used in the design and construction process:

- Passive solar design, including building orientation, light shelves, and advance glazing systems
- Optimum-performance thermal envelope using the most advanced materials and methods
- Advanced insulation and air sealing provides greater R values: R-50 for ceilings, R-21 or greater for exterior walls — eliminating drafts and cold spots
- Energy-efficient HVAC systems
- Energy Recovery Ventilator (ERV) provides continuous fresh air to the occupants
- Energy efficient lighting technologies to augment natural lighting

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2. As the Cost of Energy Increases, the Return on Investment Increases

It is almost certain that energy costs, especially those associated with fossil fuels, will increase over the next 20 or 30 years. Yet, as energy costs increase, the actual savings generated by a green building investment becomes even greater.

During the life of the structure, the green building will appreciate in value, too.

In short, assuming that energy prices rise, a green building will produce greater absolute savings in energy costs over time, as the building itself appreciates in value.

3. Work in Harmony with the Site

Working with the natural features of the site, instead of against them, can reduce the cost of building operations significantly.

Passive Solar Design Saves Energy

- Orienting a building to the south takes maximum advantage of the sun's light and heat. Incorporating passive solar design strategies such as light shelves allows occupants to take advantage of daylight and reduce energy demand for artificial lighting. Light shelves also allow direct solar heat gain in the winter, while shading solar gain in the summer.

Green Stormwater Strategies Reduce Infrastructure Costs

- On a typical building site, stormwater is considered a liability and is removed as quickly as possible. This is costly — not only in terms of needed infrastructure, but in terms of treatment by the local municipality and the damage it causes to local watersheds. By implementing strategies such as vegetative green roofs and rain gardens, stormwater becomes an asset rather than a liability. Rain gardens collect, naturally filter, and infiltrate stormwater back to the water table.

Benefits of Choosing an Urban Environment

- Choosing to construct a building, or to rehab an existing structure, in an urban setting takes advantage of the existing utility infrastructure. Choosing to build in the urban environment also allows occupants to use alternate transportation methods, reducing the costs associated with automotive commuting.

Passive solar design, green stormwater strategies, and choosing an urban environment all provide environmental and financial benefits.

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4. Healthy Air Means Healthy Occupants

Green buildings are designed to improve indoor air quality. This is achieved in various ways, including the following:

- Green buildings use sealed combustion mechanicals — specially designed furnaces, central air, water heaters, and fireplaces that eliminate backdrafts and minimize carbon dioxide hazards
- Green buildings use low-VOC paints and finishes — they contain minimal amounts of volatile organic compounds that can function as irritants, allergens, or toxins
- Controlled mechanical ventilation systems distribute fresh air through the building and exhaust stale air

By eliminating airborne irritants and toxins, occupant health is enhanced. Indoor air quality issues from molds and other contaminants are greatly reduced.

5. A More Productive Work Environment Boosts the Bottom Line

A well-designed workspace improves work quality and productivity. Green buildings are healthy buildings, where better indoor air quality and access to daylight and views means less sick days. Studies have shown up to a 16% increase in profit due to less absenteeism and improved work quality. Extra productivity is like having extra staff, at no additional cost, and compounds value for a company over time.

In a major study, *Green Value: Green Buildings, Growing Assets*, the authors note:

> *"Enormous cost savings are being made in 'soft benefits' such as increased productivity, better health and well-being, higher academic performance, improved morale and lower absenteeism. These have a financial benefit, which is becoming a cornerstone of the benefits of green building. In commercial buildings, employee overhead is the highest cost, so improving their productivity and reducing their turnover and absenteeism may be a green building's most significant economic contributions to a business." (p. 20)*

Studies now show up to a 16% increase in profit due to less absenteeism and improved work quality for employees working in green buildings.

Don't overlook the value that increased employee morale, commitment, and loyalty can bring to a company. When working in a green building, employees feel that they are "part of the solution." They feel that they work for a company that "gets it," a company that is socially and environmentally responsible. Employees who believe in their work bring a higher level of energy and engagement to the workplace. Offering employees a optimum-performance green workspace can help a company to attract and retain a top-quality workforce.

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6. Use Green Design to Lower Ongoing Costs

Every building owner knows that replacing building systems that wear out over time can be costly. With careful design consideration, the systems can enjoy a longer lifespan.

- By installing an efficient thermal envelope, a building owner can reduce the size of the HVAC equipment and the corresponding reserves for replacement.
- Most roofing failures are due to heat, shrinkage of the membrane, and UV degradation. By including a vegetative green roof as a part of the stormwater management system, life of the roofing membrane can be extended for many years. A typical, extensive vegetative green roof has 4 inches of soil that shades the roofing membrane from the factors that cause it to deteriorate.
- Accurate calculations made by the design team, rather than using common rules of thumb, will ensure that proper-size heating and cooling systems are installed. This will help save energy and reduce operational costs.

7. Less Time on the Market Makes for a Better Investment

An energy-efficient, optimum-performance green building provides greater value—not only as a company workplace, but also if the owner decides to rent or sell the structure. State-of-the art green buildings are more marketable, and easier to rent, because of the energy savings they deliver, and because green buildings are healthier, more efficient places to work and live.

For example, in a depressed real estate market following the September 11 terrorist attacks, the Brewery Blocks, a green-built, mixed-use redevelopment project in Portland, Oregon, leased a half-million square feet of space. Dennis Wilde, senior project manager with Gerding/Edlen Development, said,

> *"Our market was very depressed, we have one of the highest jobless rates in the country, and we leased out 500,000 square feet in two years. The same market lost over 1 million square feet over the same time."*

Approximately 85% of the development was leased in the first year, at higher-than-market rates. (See Brewery Blocks Case Study, 1–2)

In nearly every case studied by the Green Value project, "landlords and developers cited shorter lease-up periods as a sustainable benefit of green building. Similarly, owner/occupiers and tenants said green building brought them positive media/marketing gains."

"I would say that our units are easier to rent. The utilities are separate, and we advertise that you will be able to save 40% on your utilities, which is a really conservative estimate, and I think that's a good selling point."

Jeremy Whiddon,
Full Circle Townhomes, Allendale, Michigan

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Financial Benefits of Green Building: Some Online Resources

Brewery Blocks Case Study (2 pages)

http://www.buildgreennw.com/resource/CaseStudy_BreweryNW.pdf

The Costs and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force (139 pages)

http://www.ciwmb.ca.gov/greenbuilding/Design/CostBenefit/Report.pdf

Green Value: Green Buildings, Growing Assets (58 pages)

http://www.rics.org/NR/rdonlyres/93B20864-E89E-4641-AB11-028387737058/0/GreenValueReport.pdf

Green Value Case Studies (127 pages)

http://www.rics.org/NR/rdonlyres/4CB60C80-C5E9-46F4-8D0A-D9D33B7A2594/0/GreenValueCaseStudies.pdf

High-Performance Buildings Case Studies (Website with downloads)

http://www.eere.energy.gov/buildings/highperformance/research_case_studies.html

United States Green Building Council Publications (Links and downloads, including economic analyses)

http://www.usgbc.org/DisplayPage.aspx?CMSPageID=77

About Bazzani

Founded in 1983, Bazzani is West Michigan's recognized leader in green design, building, and historic preservation. Green building is all we do, and our firm has made significant contributions to the sustainable building field, including the design and construction of the first LEED double-Gold certified building in the world, and the first two urban infill, zero storm water discharge sites in Michigan.

To learn more about Bazzani, our projects, and how we can help you, please contact us or visit our website at www.bazzani.com.

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