



GREEN BUILDING FACTS

The overall green building market (both non-residential and residential) is likely to more than double from \$36-49 billion in 2009 to \$96-140 billion by 2013¹

The construction market accounts for 13.4% of the \$13.2 trillion U.S. GDP²

Market Impact

- The green market was 2% of non-residential construction starts in 2005; 10-12% in 2008; and will grow to 20-25% by 2013³.
- Comprises 13.4% of the \$13.2 trillion U.S. GDP. This includes all commercial, residential, industrial and infrastructure construction. New commercial and residential building construction constitutes 6.1% of the GDP⁴.
- Green building will support 7.9 million U.S. jobs and pump \$554 million into the American economy over the next four years (2009-2013)⁵.

Energy

- Buildings represent 38.9% of U.S. primary energy use (includes fuel input for production)⁶.
- Buildings are one of the heaviest consumers of natural resources and account for a significant portion of the greenhouse gas emissions that affect climate change. In the U.S., buildings account for 38% of all CO2 emissions⁷.
- Buildings represent 72% of U.S electricity consumption⁸.

Water

- Buildings use 13.6% of all potable water, or 15 trillion gallons per year⁹.

Materials

- Buildings use 40% of raw materials globally (3 billion tons annually)¹⁰.
- The EPA estimates that 170 Million tons of building-related construction and demolition (C&D) debris was generated in the U.S. in 2003, with 61% coming from nonresidential and 39% from residential sources¹¹.
- The EPA estimates that 209.7 million tons of municipal solid waste was generated in the U.S. in a single year¹².

Sectors Expected to Have Green Building Growth¹³

- | | |
|--------------|---------------|
| • Education | • Healthcare |
| • Government | • Hospitality |
| • Industrial | • Retail |
| • Office | |

What's Driving Green Building?

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These factors are expediting the growth of green building¹⁴:

1. Unprecedented level of government initiatives
2. Heightened residential demand for green construction
3. Improvements in sustainable materials.

Why Build Green? *Building green saves money*

- The cost per square foot for buildings seeking LEED certification falls into the existing range of costs for buildings not seeking LEED certification¹⁵.
- An upfront investment of 2% in green building design, on average, results in life cycle savings of 20% of the total construction costs – more than ten times the initial investment¹⁶.
- Building sale prices for energy efficient buildings are as much as 10% higher per square foot than conventional buildings¹⁷.
- Real estate and construction professionals overestimate the costs of green building by 300%¹⁸.
- Perceived cost benefits of green building¹⁹:
 - Operating costs decrease 8-9%
 - Building value increases 7.5%
 - Return on investment improves 6.6%
 - Occupancy ration increases 3.5%
 - Rent ratio increases 3%

Why Build Green? *Green buildings consume less energy and fewer resources*

- In comparison to the average commercial building²⁰:
 - Green buildings consume 26% less energy
 - Green buildings have 13% lower maintenance costs
 - Green buildings have 27% higher occupant satisfaction
 - Green buildings have 33% less greenhouse gas emissions

Why Build Green? *Green building occupants are more productive*

- An experiment identifies a link between improved lighting design and a 27% reduction in the incidence of headaches, which accounts for 0.7% of overall employee health insurance cost at approximately \$35 per employee annually²¹.
- Sales in stores with skylights were up to 40% higher compared to similar stores without skylights²².
- Students with the most daylighting in their classrooms progressed 20% faster on math tests and 26% faster on reading tests in one year than those with less daylighting²³.
- Corporate perception of whether green fosters innovation: 57% agree; 28% neutral and 15% disagree²⁴.
- Improvements in indoor environments are estimated to save \$17-48 billion in total health gains and \$20-160 billion in worker performance²⁵.

Why Build Green? *Green building occupants are healthier*

- People in the U.S. spend about 90% of their time indoors²⁶.
- EPA studies indicate indoor levels of pollutants may be up to ten times higher than outdoor levels²⁷.
- Significant associations exist between low ventilation levels and higher carbon dioxide concentrations – a common symptom in facilities with sick building syndrome²⁸.

¹ McGraw Hill Construction (2009). Green Outlook 2009: Trends Driving Change.

² Department of Commerce (2008). Annual Value of Construction Put in Place.

³ McGraw Hill Construction (2009). Green Outlook 2009: Trends Driving Change.

⁴ Department of Construction (2008). Annual Value of Construction Put in Place.

⁵ Booz Allen Hamilton and U.S. Green Building Council (2009). Green Jobs Study.

⁶ Environmental Information Administration (2008). EIA Annual Energy Outlook.

⁷ Energy Information Administration (2008). Assumptions to the Annual Energy Outlook.

⁸ Environmental Information Administration (2008). EIA Annual Energy Outlook.

⁹ U.S. Geological Survey (2000). 2000 data.

¹⁰ Lenssen and Roodman (1995). Worldwatch Paper 124: A Building Revolution: How Ecology and Health Concerns are Transforming Construction. Worldwatch Institute.

¹¹ U.S. Environmental Protection Agency (2009). Estimating 2003 Building-Related Construction and Demolition Materials Amounts.

¹² U.S. Environmental Protection Agency (1997). Characterization of Municipal Solid Waste in the United States. Report No. EPA 530/R-98-007.

¹³ McGraw Hill Construction (2008). Global Green Building Trends SmartMarket Report.

¹⁴ FMI (2008). U.S. Construction Overview.

¹⁵ Davis Langdon (2007). Cost of Green Revisited: Reexamining the Feasibility and Cost Impact of Sustainable Design in the Light of Increased Market Adoption.

¹⁶ Kats, G. (2003). The Costs and Financial Benefits of Green Buildings: A Report to California's Sustainable Building Task Force.

¹⁷ Miller, N., Spivey, J. & Florance, A. (2007). Does Green Pay Off?

¹⁸ World Business Council for Sustainable Development (2008). Energy Efficiency in Buildings.

¹⁹ McGraw Hill Construction, Green Building SmartMarket Report, 2006

²⁰ GSA Public Buildings Service (2008). Assessing Green Building Performance: A Post Occupancy Evaluation of 12 GSA Buildings.

²¹ Aaras, A. et al. (1998) Musculoskeletal, Visual and Psychosocial Stress in VDU Operators Before and After Multidisciplinary Ergonomic Interventions. Applied Ergonomics, p. 335-354.

²² Heschong Mahone Group (1999). Skylighting and Retail Sales: An Investigation into the Relationship Between Daylighting and Human Performance.

²³ Heschong Mahone Group (1999). Daylighting in Schools: An Investigation into the Relationship Between Daylighting and Human Performance.

²⁴ McGraw-Hill Construction (2007) Greening of Corporate America SmartMarket Report.

²⁵ Fisk, W. (2000) Health and productivity gains from better indoor environments and their relationship with building energy efficiency. Annual Review of Energy and the Environment: 25, 537-66.

²⁶ Environmental Protection Agency (1987). The Total Exposure Assessment Methodology (TEAM) Study.

²⁷ Environmental Protection Agency (2008). An Introduction to Indoor Air Quality. Accessed via: <http://www.epa.gov/iaq/voc.html>.

²⁸ Lawrence Berkeley National Laboratory (2002). Indoor Carbon Dioxide Concentrations and Sick Building Syndrome Symptoms in the Base Study Revisited: Analyses of the 100 Building Dataset.