Investment Decision Tools for High Performance Building

to Promote High Performance Components, Flexible Infrastructures and Systems Integration for Sustainable Commercial Buildings and Productive Organizations

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High Performance / Sustainable Buildings

- Energy-efficient
- Comfortable and Healthy
- Individual productive
- Organizationally and technologically flexible
- Environmental sustainable
- Cost Effective
How to evaluate building environmental performance over a building’s life cycle

Green building rating systems in general focus on the following five categories of building design and life cycle performance:

- Sustainable Sites
- Water Efficiency
- Innovation in Design
- Indoor Environmental Quality
- Energy & Atmosphere
- Materials & Resources
Renewable Buildings are Mission critical

To remain competitive, organizations must continually renew their sources of advantage.

If your workplace does not allow for continuous organizational and technological renewal you are already behind.
Sustainable Buildings Support Human Capital

Human intellectual capital is our most important asset. Healthy, well-designed workplaces motivate people to achieve their full potential as members of a value-driven learning organization.

The sustainable workplace is a productivity tool for the value-driven organization.
Is Your Building a Net Positive Investment?

Does your company realize the economic added value of improved workplace quality?

Investments in quality work environments have higher ROIs than conventional high-yield corporate investments, due to gains in productivity, health, energy, management, waste and more.
Investments for Buildings are a small cost with major impact

Best known understanding of importance of workforce
International Baselines - Office Cost/Benefits

The Cost of Doing Business

Cost per person per year

- $45,000 Salary
- $18,500 Benefits
- $10,000 Technology
- $1,000 Connectivity (Forrester Group)
- $3,200 Rent/Mortgage
- $450 Energy
- $200 Churn

Potential Benefits of Quality Buildings

- 12.5% Productivity
- $5,300 Turnover
- $765 (1.7%) Absenteeism
- $244 Lower Respiratory
- $101 Asthma
- $95 Allergies
- $92 Back Pain
- $73 Headaches
- $68 Cold
- $17 MSD
- $19 Throat Irritation
- $18 Eye Irritation
- $18 Sinus Conditions

1/13/2013
Buildings are a small cost with major impact

Squeezed facilities budgets, by increasing density or reducing infrastructure quality for example, will save only modest dollars per employee yet have major cost implications - in productivity, health, technology, and other employee related expenses.
Buildings are a small cost with major impact

Indeed, strategically increasing facilities budgets would be the most cost effective strategy for ensuring that buildings support your knowledge workers and consistently serve the mission of your organization.
The real cost of doing business is over time, not in first construction costs.

“Cheap" buildings and infrastructures and "cheap" building delivery processes often result in major costs over time related to:

- Energy, Maintenance and Repair
- Organizational Renewal / Churn
- Technological Renewal / Churn
- Individual Productivity
- Organizational Effectiveness
- Employee Health
- Attraction / Retention
- Tax / Code / Litigation
- Obsolescence / Salvage / Waste
What are the quality differences between a:

$10,000 and $30,000 car?

$100 and $300/sq.ft. office building?

To ensure life cycle cost effectiveness, quality differences must be defined for components and subsystems
What building attributes matter the most?

Design options:

- Air
- Light
- Thermal Control
- Privacy and Interaction
- Ergonomics
- Access to Nature
- Land use and mobility

And let each design option be given dollars beyond the minimum, based on their economic value added.
### Necessary Accountabilities for Building Performance

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For example

Case studies reveal ergonomic furniture reduces MSD claims by 43-82% and improves productivity by 5-23%.
A case study on Air design option

**Increased Outside Air = Individual Productivity + Health**

**Tham et al 2003**

In a 2003 controlled field experiment at a call center in a tropical climate, Tham et al identify an **8.8% improvement in operator performance** (a reduction in talk time) and a **19.5% reduction in headache intensity** with an **outdoor air supply rate of 22.7 L/s/person**, as compared to an outdoor air supply rate of **9.8 L/s/person**, when indoor temperature is held constant at **24.5°C**.

- **First cost increase:** $64 / employee
- **Annual energy cost increase:** $9 / employee
- **Annual productivity savings:** $3,960 / employee
- **Annual health savings:** $14 / employee
- **ROI:** 3,105%

Building Investment Decision Support Tool (BIDS™)

There is a rich set of life cycle justification for investing in quality built environments = the three dimensions of the BIDS™/ Economic Value Added (EVA®) Matrix

- **Design Options**
  - Air
  - Temperature Control
  - Lighting Control
  - Network Access
  - Privacy and Interaction
  - Ergonomics
  - Access to Environment

- **Cost/Benefit Factors**
  - First cost
  - O & M, Energy
  - Organizational Churn
  - Technological Churn
  - Individual Productivity
  - Organizational Productivity
  - Health
  - Attraction/Retention
  - Taxes, Litigation, Insurance
  - Salvage and Waste

- **Organizational Scenarios**
  - Baseline
  - Globalization
  - Collaboration
  - Technological Dynamics
  - Organizational Dynamics
  - Gold-collar Orientation
  - Environmental Agendas
  - Merger/Divestment
  - Federal Government
Building Investment Decision Support Tool

a case-based decision support tool that calculates the economic value added of investing in high performance building systems, based on the findings of building owners and researchers around the world.