

High-Performance Buildings Around the Institute



National Institute of
BUILDING SCIENCES
*An Authoritative Source of Innovative Solutions
for the Built Environment*

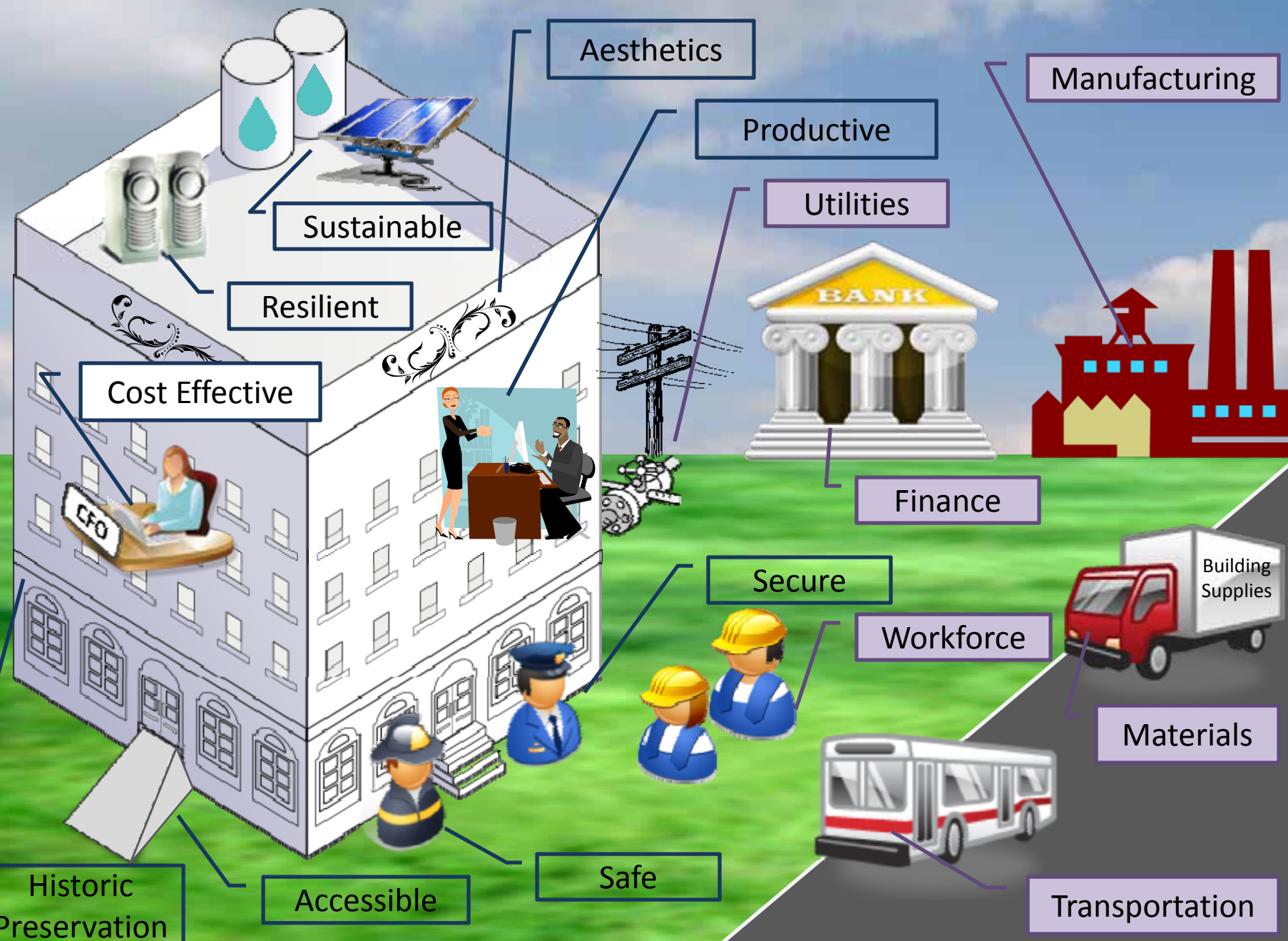
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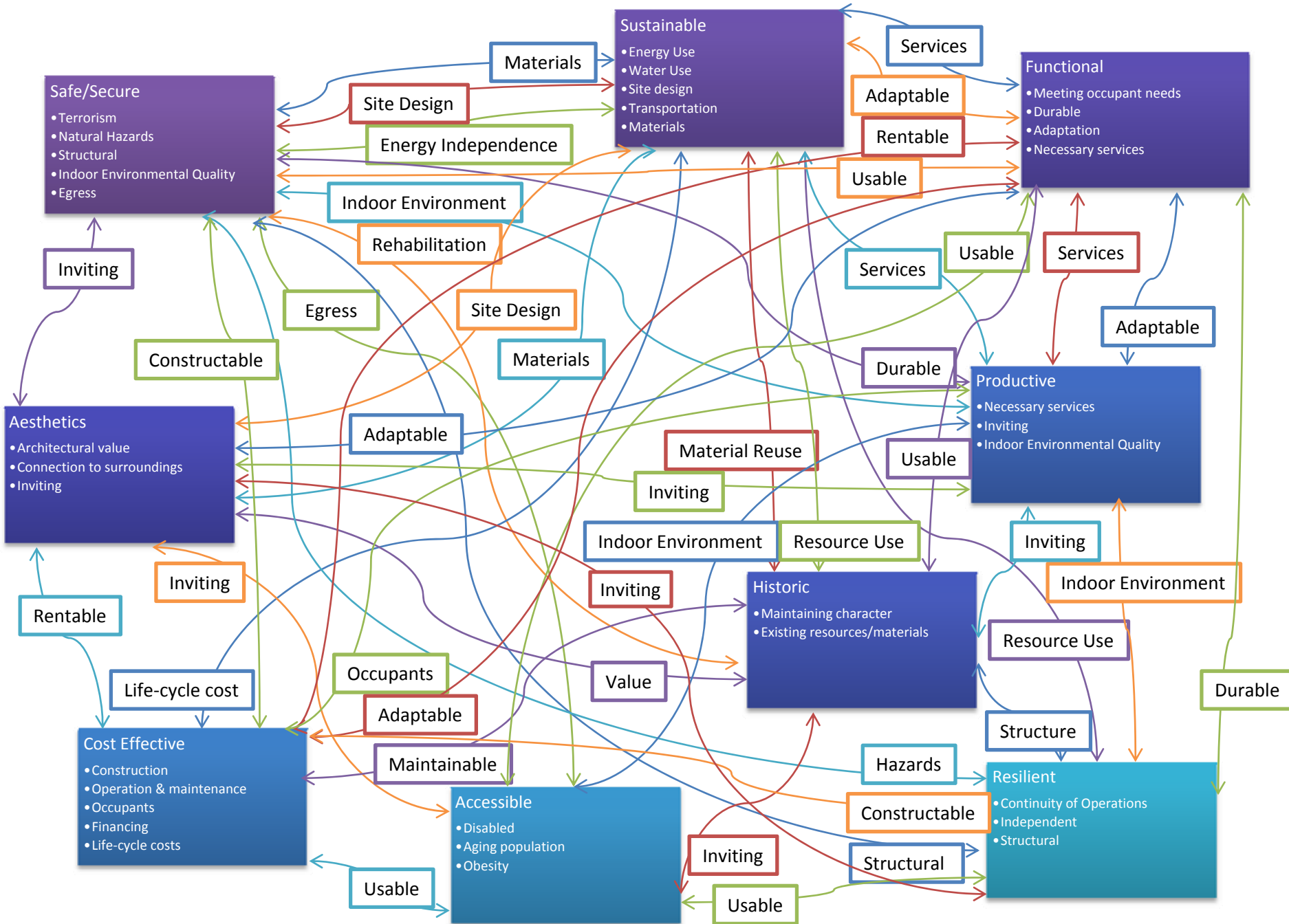
Attributes for High Performance



Just One Aspect of the High-Performance Picture



The Complex Interactions of High-Performance Building Attributes



Consultative Council

The Consultative Council assembles high-level building community representatives to make recommendations directly to the executive and legislative branches of government to improve our nation's buildings and infrastructure

- Congress authorized the Institute to bring together representatives of government, the professions, industry, labor and consumer interests to identify and resolve building process and facility performance issues
- Policymakers are making decisions impacting the entire building community—where possible, a united building community can influence the appropriate action
- The Institute is the unbiased forum for discussing issues and identifying opportunities within the building community
- The Consultative Council provides a forum for regular interaction and discussion among staff leaders of key organizations within the building community



National Institute of
BUILDING SCIENCES

Consultative Council Membership

- ASTM International
- American Institute of Architects
- American Society of Civil Engineers
- American Society of Heating, Refrigerating and Air-Conditioning Engineers
- Associated General Contractors
- Building Owners and Managers Association
- Construction Specifications Institute
- ESCO Institute
- Extruded Polystyrene Foam Association
- Glass Association of North America *
- Green Mechanical Council
- HOK*
- Illuminating Engineering Society
- International Association of Plumbing and Mechanical Officials
- International Code Council
- Laborers' International Union of North America*
- National Insulation Association
- National Opinion Research Center at the University of Chicago
- United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry

* New member in 2011

2010 Topics

- Defining High-Performance and Common Metrics
- Energy and Water Efficiency
- Codes and Standards Adoption and Enforcement
- Sustainability
- Education and Training



National Institute of
BUILDING SCIENCES

2010 ANNUAL REPORT TO THE PRESIDENT OF THE UNITED STATES



An Authoritative Source of Innovative Solutions for the Built Environment



Moving Forward Findings and Recommendations from the Consultative Council

Introduction

Buildings are complex systems embodying ideas, experiences, technologies and practices brought together by different disciplines, powers and needs. In forming the National Institute of Building Sciences and its Consultative Council in 1973, the U.S. Congress recognized this complexity and the importance of bringing these diverse actors together to improve building science and policy. Early in 2010, the Institute re-formed the Consultative Council to represent leading organizations within the building community. The Council was charged with identifying the high-level issues currently impacting the building community and offering findings and recommendations related to these issues.

The issues identified for 2010 include:

- Defining High-Performance and Common Metrics
- Energy and Water Efficiency
- Codes and Standards Adoption and Enforcement
- Sustainability
- Education and Training; and
- Existing Buildings

The Consultative Council established topical committees consisting of representatives from many organizations. Each committee prepared a report. With the exception of the Existing Buildings report (which will be produced at a later date), findings and recommendations from these reports are summarized below. The committee's full reports will be available in a separate document.

Defining High Performance and Common Metrics

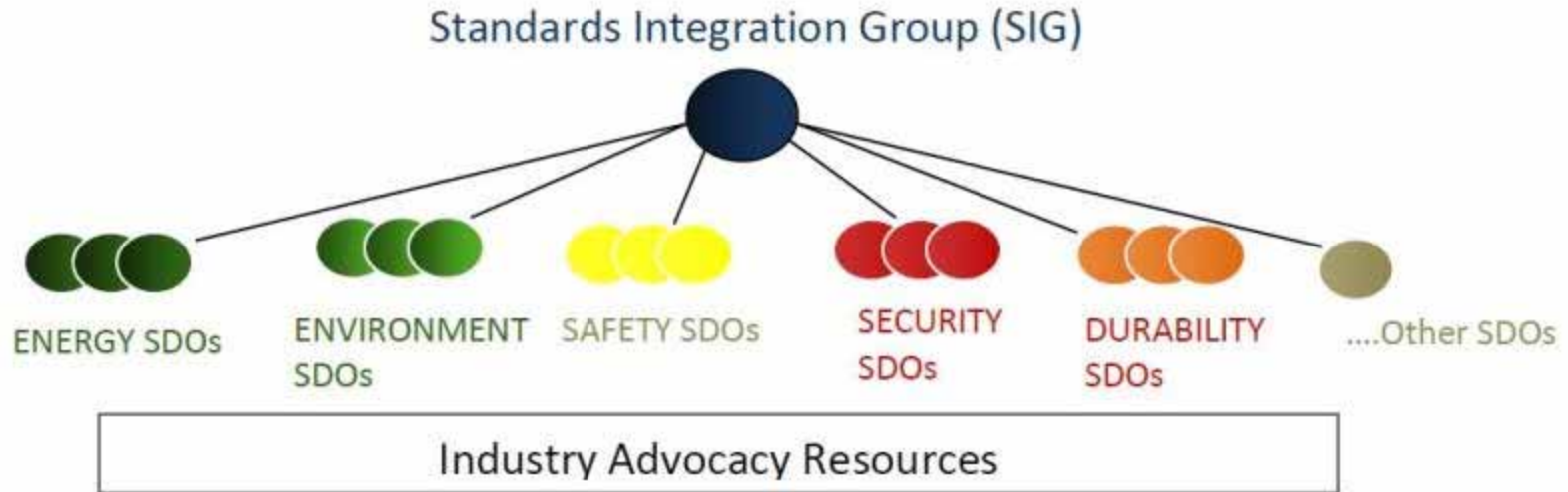
Findings & Recommendations

- **Definition:** Add the following sentence to the Energy Independence and Security Act (EISA) 2007 definition of high performance building: "A building will have achieved optimization on a life-cycle basis when its measured needs most or improve upon legislative benchmark standards that define high performance."¹
- The Institute's High Performance Building Council should form a Standards Integration Group (SIG) to perform necessary gap analysis (to identify gaps in information where additional work is needed) and coordinate consensus standards and measure development throughout the industry.
- Standards Development Organizations (SDOs) should

- develop standards that address attributes of a high-performance building as identified by the SIG's gap analysis. Where practical, SDOs are encouraged to engage in Alliance Groups to discuss the establishment and use of consensus metrics.
- Industry-wide performance-based standards should address the following four measures: Baseline, Benchmark, Measured Results and Performance Results Index (PRI).
- Owner and project delivery (production) teams should implement a high-performance building practice that measures both the project and completed facility metrics according to the standards of accredited SDOs.
- The Institute's High Performance Building Council should provide the leadership and roadmap to implement these recommendations.

¹The Energy Independence and Security Act (EISA) of 2007 (Title IX) Energy Savings in Buildings and Industry, Section 601, Definitions, definition of a "high performance building" is as follows: "A building that integrates and optimizes at a life-cycle basis all major high performance building practices, including energy conservation, sustainable, safety security, durability, cost-effectiveness, performance, sustainability and operational excellence."

Defining High-Performance & Common Metrics



- Attribute Groups consisting of relevant SDOs to discuss and establish common metrics
- Standards Integration Group to coordinate work of Attribute Groups, lead gap analysis



Defining High-Performance & Common Metrics

- Establish common definitions to guide measurement and expression of actual performance:
 - Baseline
 - Ends Goal
 - Benchmark
 - Target Value
 - Measured Results
 - Performance Results Index
- HPBC should form Leadership Council to prepare roadmap for organization and funding development of SDO Attribute Groups
- Leadership Council should convene a forum to produce recommendations on definitions, metrics, and establishing standards for thresholds



Council on Finance, Insurance & Real Estate

- These sectors have great impact on how buildings are procured, designed and constructed
- Often, they are outside the discussion on achieving high-performance but can offer significant incentives/dis-incentives
- Recognition of the need for a comprehensive, whole building approach to high-performance



High-Performance Building Data Collection Initiative

- Commercial Building Energy Consumption Survey (CBECS) conducted by Energy Information Administration (EIA)
 - 2007 survey statistically inadequate
 - 2011 survey postponed due to budgets
 - 2003 is latest available
- CBECS serves as basis for key building community programs
 - Energy Star
 - LEED
 - Green Globes
 - 2030 Challenge
 - BOMA 360
 - ASHRAE buildingEQ
 - State & local disclosure programs
 - Code & standard development



High-Performance Building Data Collection Initiative

- What data do we need to achieve high-performance (beyond just energy)?
- What datasets already exist?
- How do we collect/disseminate the desired data?
- How can we understand interactions across attributes?



Establishing a Pathway to Outcome-Based Codes

- Sponsored a Summit with New Buildings Institute to examine the issues and opportunities to implementation of outcome-based policies
- Aimed at verifying desired performance is actually achieved
- Resulting report to be released soon

Whole Building Design Guide



Participating Agencies



- The largest online portal for building sciences in the world. A comprehensive, internet-based portal that provides access to a wide range of federal and private sector, building-related guidance, criteria and technology.
- In March, for the first time ever, the site surpassed four million document downloads in one month (4,264,604 to be exact).



Designing for a Resilient America:
A Stakeholder Summit on High Performance Resilient Buildings and Related Infrastructure
November 30–December 1, 2010
Washington, DC

 **Homeland Security**

Science and Technology

High-Performance Building Week

