

NDCEE

National Defense Center for Environmental Excellence



DoD Executive Agent

Office of the
Assistant Secretary
of the Army
(Installations and
Environment)

Decision Support Tools for Green Building: Facilitating Selection Among New Adopters on Public Sector Projects

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The NDCEE is operated by:  *Concurrent Technologies Corporation*

Technology Transfer—Supporting DoD Readiness, Sustainability, and Transformation

Presentation Purpose

- Present results of research
 - Inventory green building tools
 - Develop framework for organizing
 - Create user-friendly database
 - Ranking based on innovation theory
 - Mapping of Inventory

Primary Driver:

Army's LEED™ Silver for new construction FY08

Main Findings

- Wide range of tools freely available on the web
 - Free = high “trialability”
- But not necessarily linked to LEED
 - Help achieving LEED™ points = high “relative advantage”
- Helps explain why green building novices are overwhelmed: “too much information”
- Database available in Microsoft Excel format for easy distribution and updating

Green Building (OFEE, 2003)

- Increasing the efficiency with which buildings and their sites use energy, water, and materials, and
- Reducing the building impacts in human health and the environment, through better siting, design, construction, operation, maintenance, and removal – the complete building life cycle

Decision Support Tools (DSTs)

- Any tool that “informs the decision-making process by helping actors understand the consequences of different choices” (Kapelin, et al, 2005)
 - Website
 - Publication
 - Software
 - Database
 - Checklist/Matrix

For this research:

DSTs readily accessible via the internet

Regulatory and Policy Drivers

- *The Army Strategy for the Environment*
- United States Green Building Council's (USGBC) LEED™ Silver rating is now the standard for all Army new construction beginning in Fiscal Year 2008
- Energy Policy Act of 2005 (EPAAct)
- Army installation sustainability goals
- Executive Order 13423: *Strengthening Federal Environmental, Energy, and Transportation Management*
- *Federal Leadership in High Performance and Sustainable Buildings* Memorandum of Agreement

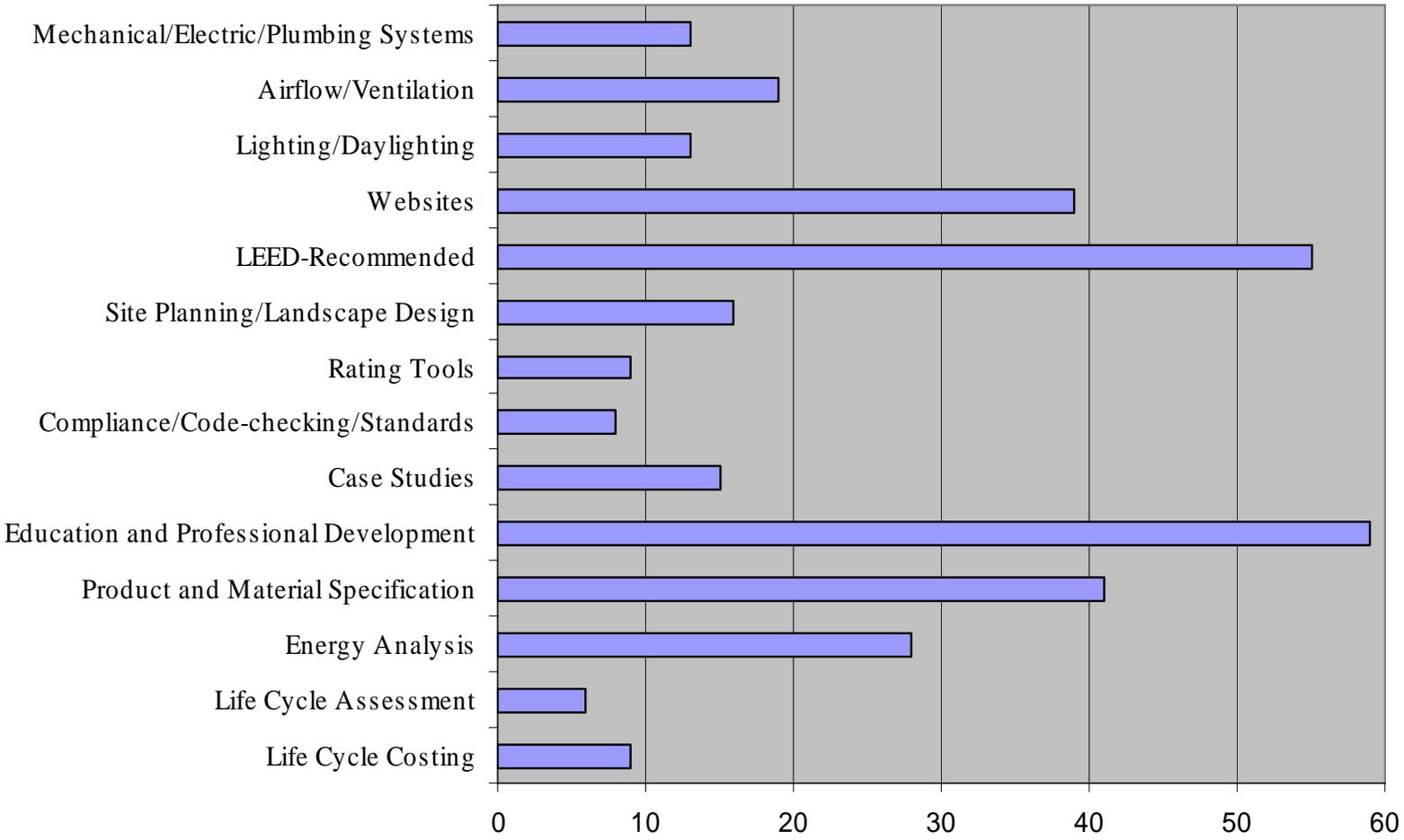
Target Audience

- A/E Design Professionals that:
 - Have little or no formal project experience with green buildings, but are expected to meet green building goals and requirements
 - Have little or no experience in using sustainability DSTs on past projects
 - May or may not be formally held accountable for building performance outcomes
 - Operating in a time and budget constrained context with multiple objectives

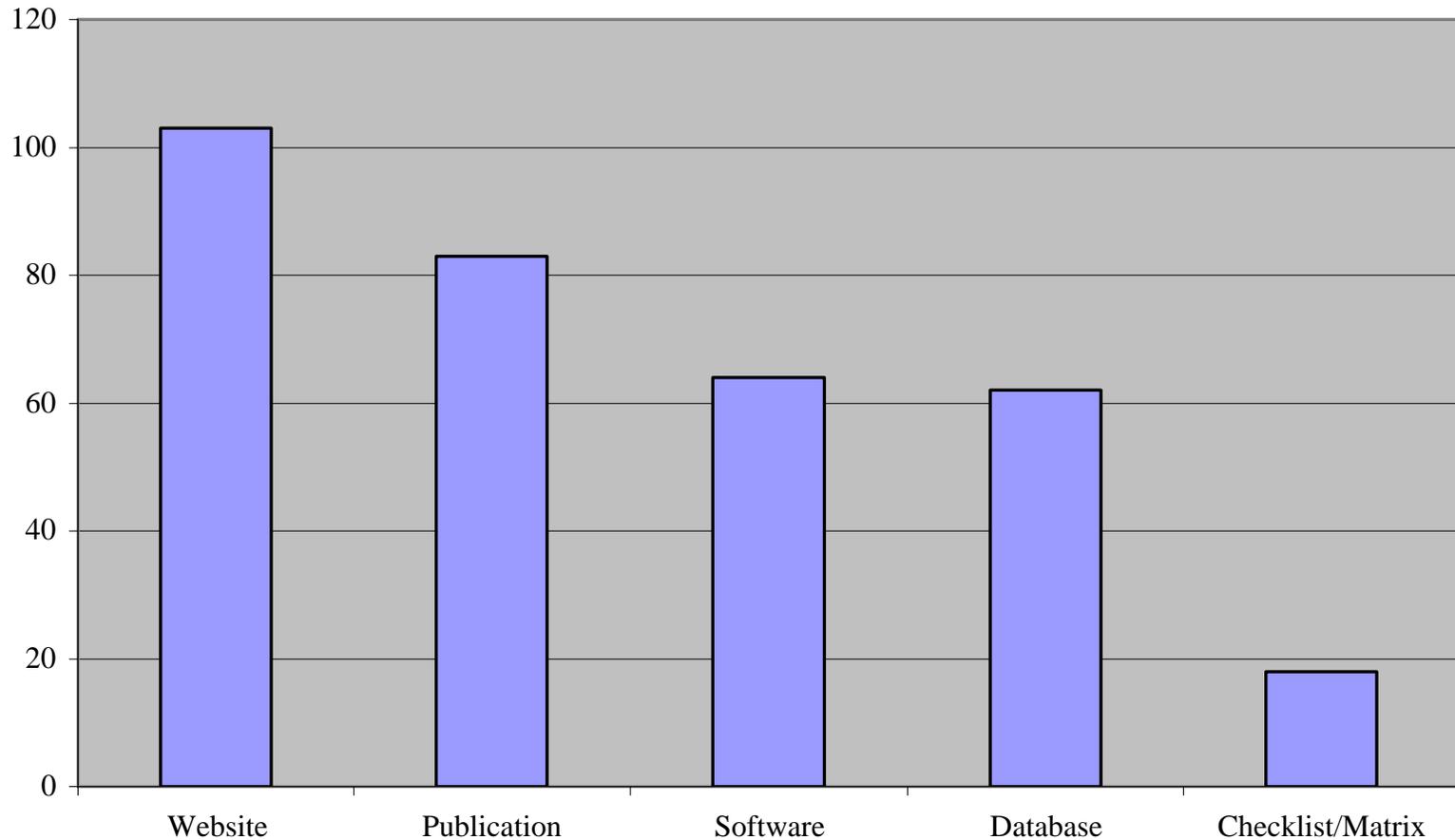
Hybrid Organizing Framework

- Restrict number of tools in any given category
- Easy to find applicable tool
- Topical Areas (energy, sites, lighting, airflow, etc.)
- Purpose (Life Cycle Costing, Life Cycle Assessment, compliance, product & material specification, LEED™ points)
- Tool Type (case studies, rating tools, websites, etc.)

Wide Range of Tools, 275 Identified



Occurrences by Tool Type



Additional Sorting and Ranking

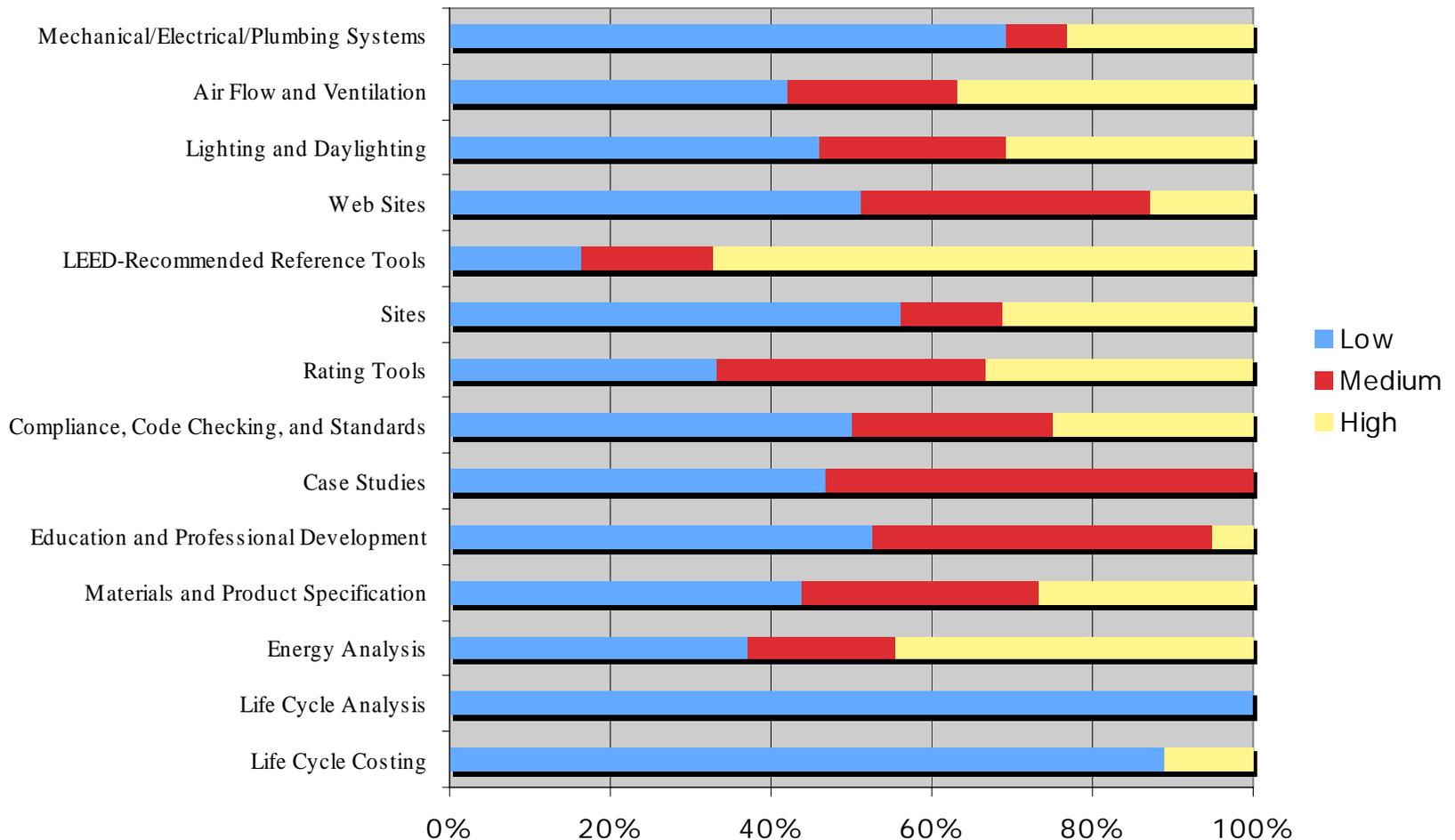
- The primary metric of success for new adopters is whether or not their design is able to meet LEED™ requirements
 - LEED™ is the standard for the Army beginning in 2008
 - Interpretation of innovation attributes used the LEED™ standard.

Measuring Innovation Attributes

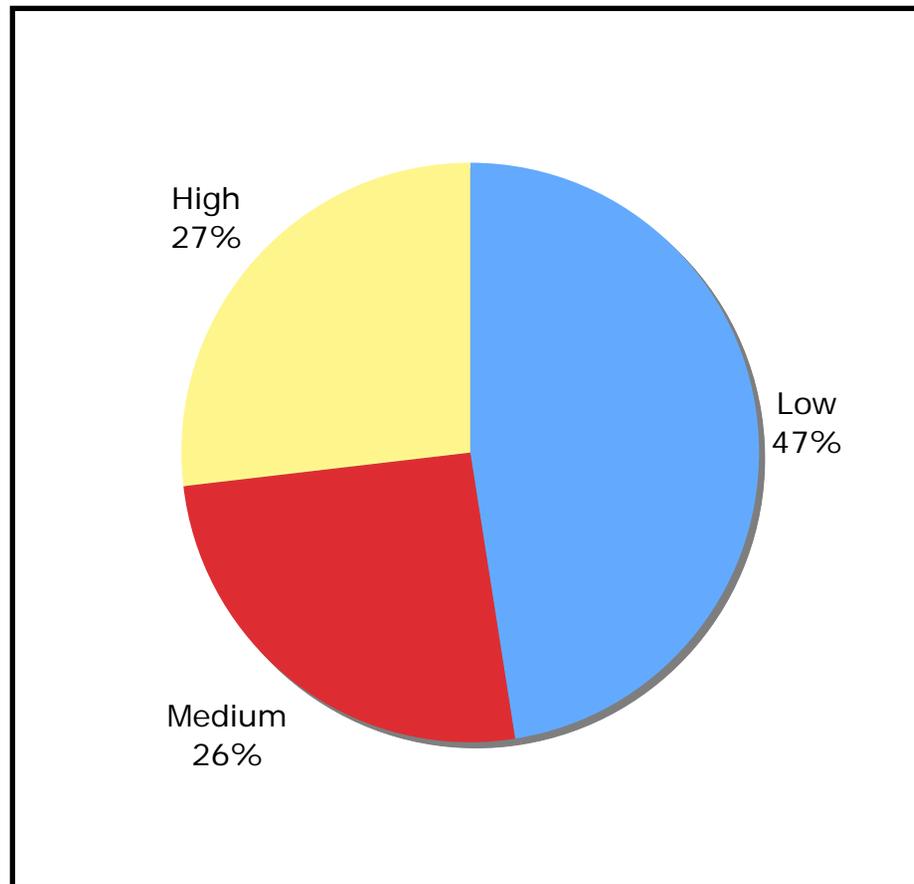
Attribute	High	Medium	Low	Interpretation
Relative Advantage	Directly results in LEED credit knowledge	Indirectly results in LEED knowledge	Completely general information; considerable processing required to get to LEED knowledge	Immediate practicability of information provided relative to objectives
Trialability	Free	\$1 - \$250	> \$250	Cost

Categories base on Everett Rogers (2004), *Diffusion of Innovation*

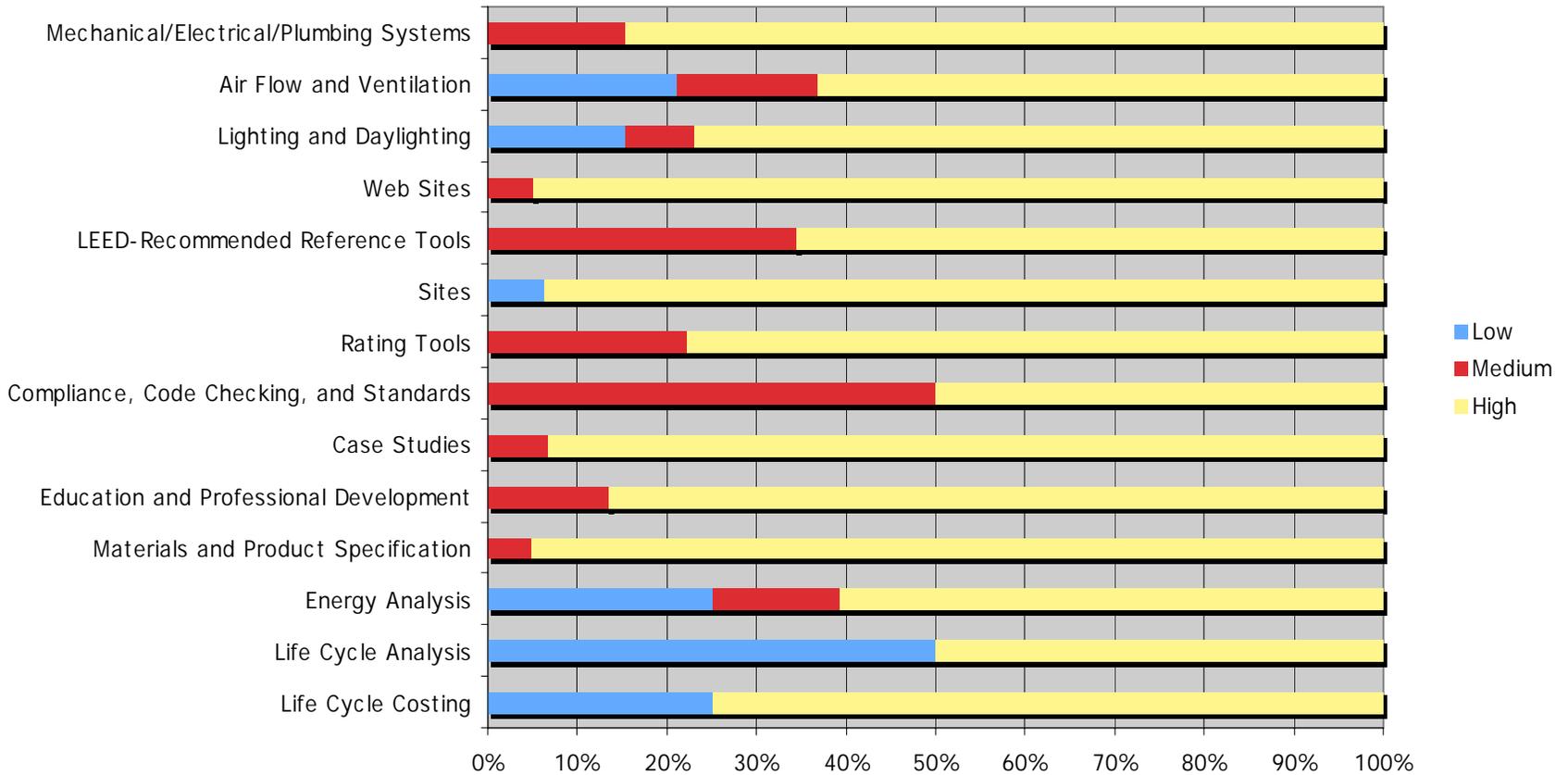
Relative Advantage of Tools for Obtaining LEED™ Credits



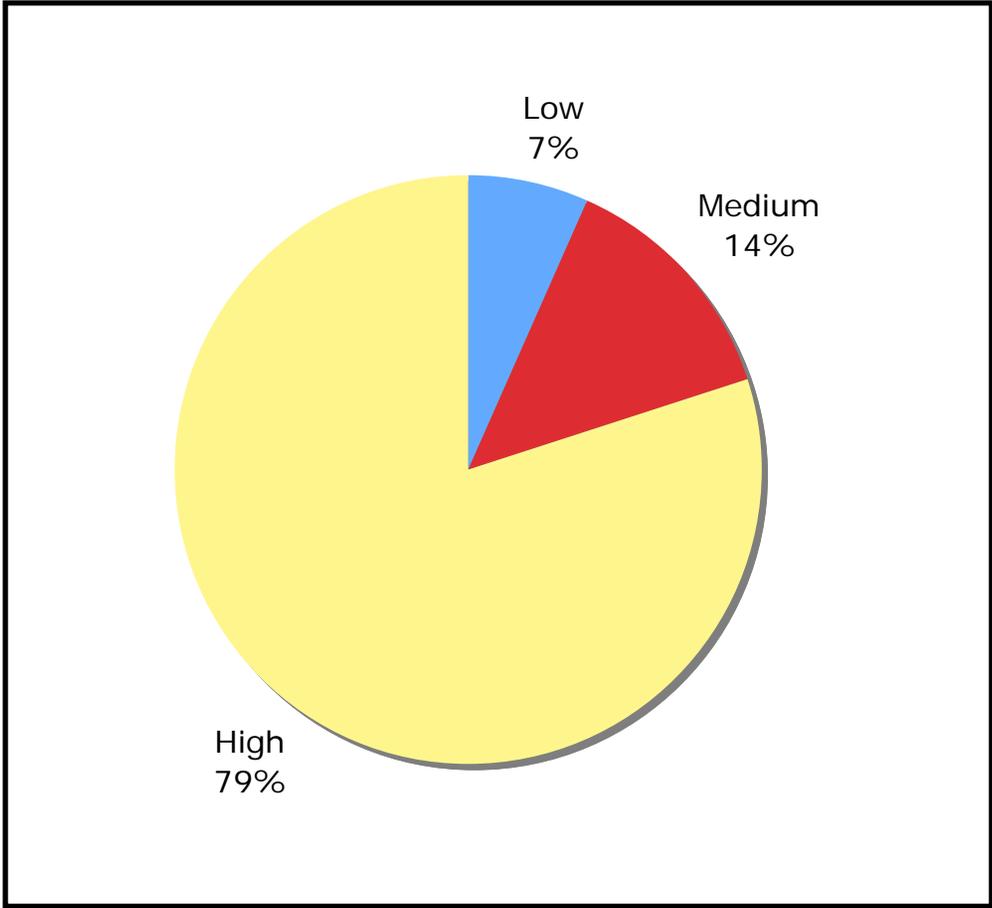
Proportions of Tools Rated by Relative Advantage



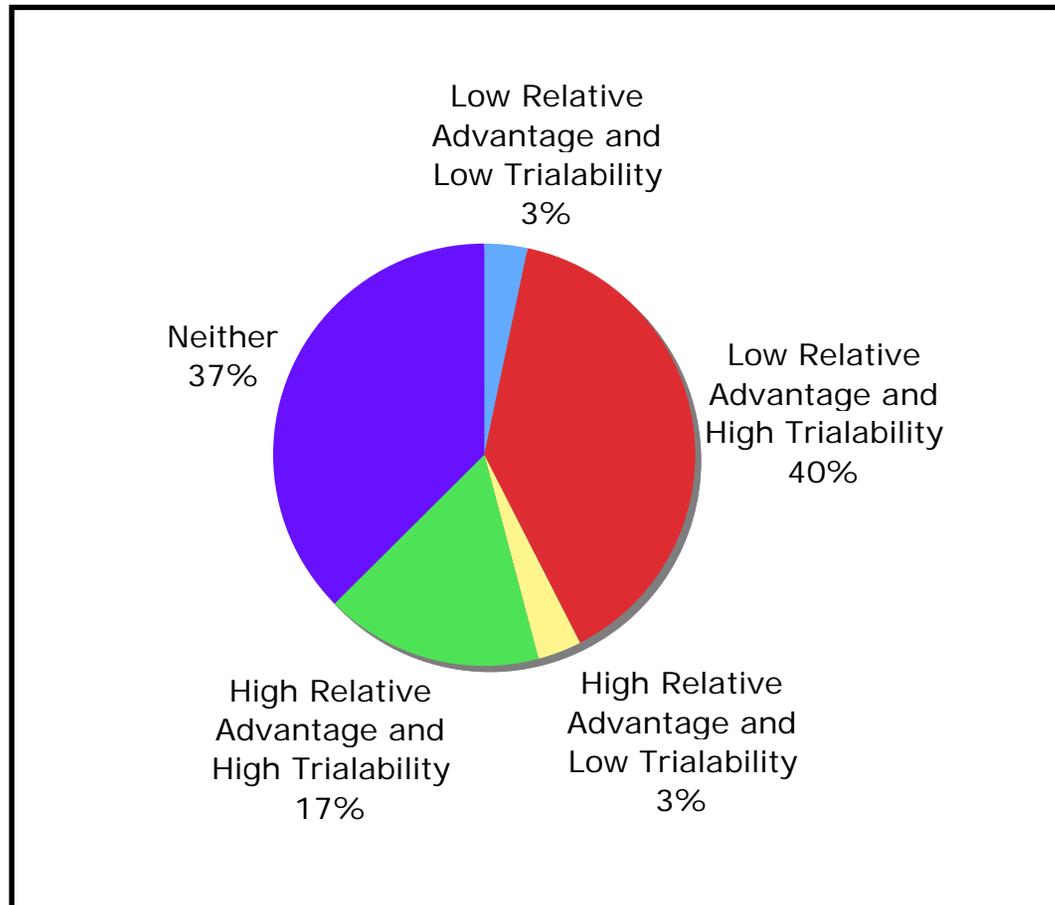
Trialability of Tools Based on Cost



Proportions of Tools Rated by Trialability



Distribution of Tools Based on Combined Factors



Conclusions

- Wide range of tools freely available on the web
- Not necessarily linked to LEED™
- Snapshot in time, field of green building and DSTs in constant state of flux
- Additional research *NEED USER INPUT*
 - Ranking by other innovation attributes (complexity, compatibility, observability of results)
 - Usability testing of organizing framework
 - Investigation of different delivery/dissemination approaches
 - Understanding fit between design tools and their context of application

Next Steps

- Database to be made available
- Database will need continual updating
- Submittal of article to *Journal of Green Building*

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Questions?

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