

# Re-Arch: The Initiative for Renewable Energy in Architecture

# Fact Sheet



## Technology: Integrated Whole-Building Design

### Common Uses:

This is the most effective method to obtain maximum value and performance from buildings and systems. Sustainable design and green building rating systems, such as LEED or Green Globes, advocate and in some cases require this approach, involving all stakeholders in a project at an early stage to develop and test a design against agreed-upon criteria.

### Site Considerations:

Sustainable site issues need to be addressed in the context of the overall project design. Minimizing parking footprints, using pervious surfaces, recycled rainwater or runoff for irrigation and neighbor-friendly exterior lighting all interface with a potential building design.

### Size Considerations:

Integrated design often involves a synergy between different design elements and can result in a tradeoff between improved or sophisticated building envelope configurations and the sizing of internal mechanical and electrical systems. In most cases, the incremental cost associated with building envelope improvements and daylighting strategies can be offset by reduced sizing and cost of space conditioning and lighting systems.

### Design Considerations:

The design approach should prioritize layout and orientation of building elements to take advantage of passive solar or daylighting possibilities, within the constraints of the building site. Opportunities for daylighting and views should be central to the overall design process. The performance characteristics of the building envelope should be reflected in the appropriate design of the internal systems.

### System Costs:

Integrated design often results in higher-performance at little or no additional cost. Energy savings of 30% or more for a typical building are readily achievable by following basic green building guidelines. Overall costs may actually be reduced, since that many issues are resolved early in the design phases, resulting in fewer change orders during construction. The value of even modest increases in productivity over the useful life of a building can more than pay back any initial capital cost premium for a high-performance design. Greater attention to detail and coordination during design phase may require higher design fees, which should be more than offset by operating savings. Any third-party certification program would have associated fees that would need to be included in a project budget.

### More Information:

There are several books and reference guides that outline basic principles of integrated design. In addition, there are several web-based sets of guidelines. Many of these have downloadable case studies and design briefs.

Books and Resources:

- The HOK Guidebook to Sustainable Design, Sandra Mendler, William Odell & Mary Ann Lazarus, Wiley, 2005, ISBN 978-0471696131
- Sustainable Construction: Green Building Design and Delivery, Charles Kibert, Wiley, 2005, ISBN 978-0471661139
- LEED-NC Reference Guide, U.S. Green Building Council, [www.usgbc.org](http://www.usgbc.org)

Websites:

- Minnesota Sustainable Buildings Guide [msbg.umn.edu](http://msbg.umn.edu) or [sustainabledesignguide.umn.edu](http://sustainabledesignguide.umn.edu)
- Minnesota Pollution control agency [pca.state.mn.us](http://pca.state.mn.us)
- Center for Sustainable Building Research [csbr.umn.edu.org](http://csbr.umn.edu.org)
- Whole Building Design Guide [wbdg.org](http://wbdg.org)
- U.S. DOE Energy Efficiency & Renewable Energy [eere.energy.gov](http://eere.energy.gov)
- Advanced Buildings [poweryourdesign.com](http://poweryourdesign.com)
- Energy & Environmental Building Association [eeba.org](http://eeba.org)
- Natural Resources Canada [advancedbuildings.org](http://advancedbuildings.org)
- New Buildings Institute [advancedbuildings.net](http://advancedbuildings.net)
- Building Design Advisor [gaia.lbl.gov](http://gaia.lbl.gov)
- Sustainable Buildings Industry Council [sbicouncil.org](http://sbicouncil.org)
- Northwest Energy Efficiency Alliance [betterbricks.com](http://betterbricks.com)
- Environmental Building News [buildinggreen.com](http://buildinggreen.com)
- LEED – U.S. Green Building Council [usgbc.org](http://usgbc.org)
- Green Globes – Green Building Initiative [greenglobes.com](http://greenglobes.com)

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