

## BEST PRACTICE AREA 8: BUILDING PRACTICES

### Vision

New buildings are right-sized, generating their own energy, located to take advantage of existing infrastructure and maintain neighborhoods, respecting natural habitat and productive agricultural land. Existing buildings are re-purposed and retrofitted to take advantage of embodied energy, and all new buildings surpass state energy codes enough to be net zero energy users. Secondary markets are available for recycling of construction waste materials.

### Background

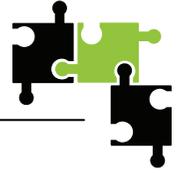
The application of sustainable principles and green building practices is central to how sustainability will be perceived, implemented and measured. Buildings consume nearly 70% of energy produced, and contribute up to 40% of greenhouse gas emissions, so ensuring that buildings are energy efficient and thereby reducing energy demand and greenhouse gas emissions must become the new standard. A variety of programs exist to address new construction (public and private) and existing buildings, and it is equally important to focus on education and training in order to build knowledge base within the community and garner support for implementing sustainable building practices.

**Energy Star** is a U.S. EPA program which applies to products and buildings. The website, [www.energystar.gov](http://www.energystar.gov) offers links to resources, with Energy Star rated products, and tools for homeowners wanting to improve energy efficiency of their residences.

**B3-MSBG (Buildings, Benchmarks and Beyond, Minnesota Sustainable Building Guidelines)**, developed in 1998 and revised in 2009, is a rating system developed through a partnership between the University of Minnesota, Architects, Engineers, and others, and is specific to building design in Minnesota. Version 2.1 is similar to LEED™ in intent, but is performance-based, and focuses on improving building performance and quality. If bond monies are received from the State of Minnesota for either a new or renovation project, the use of B3-MSBG rating system is required – there are few exceptions. Go to <http://www.msbg.umn.edu> for information and downloads.

The **LEED™** rating system was first issued by the U.S. Green Building Council (USGBC) in 2001, and has been through multiple revisions, most recently in 2009. It is a point-based, prescriptive system, and has been adopted as a standard by numerous cities across the U.S. [www.usgbc.org](http://www.usgbc.org)





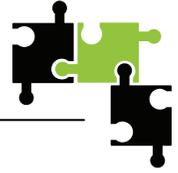
B3 and LEED are most useful for new building construction. The rating systems are most effective when they are implemented and agreed upon by all stakeholders in the project – client/owner, architect, interior designer, engineer, contractor, facility manager, and a cross-section of end users.

**MN GreenStar** is a residential-based green building standard and certificate point-based program with similar categories to LEED (Energy Efficiency, Resource Efficiency, Indoor Environmental Quality, Water Conservation, Site and Community Impacts). This program promotes healthy, durable, high performance homes. An online checklist is available for new homes as well as for residential remodeling projects. Third-party verification is fundamental to the rating system and assures homeowners that the new home or remodeling project performs as designed. The GreenStar rating system is supported by a mandatory green education program for architects, designers, builders and remodelers, as well as general education for homeowners, lenders, real estate agents, and public officials. [www.mngreenstar.org](http://www.mngreenstar.org).

## Goals

- A. Employ rating, benchmarking and monitoring systems for building performance, including Energy Star, B3 (Buildings, Benchmarks and Beyond), LEED, and the Sustainable Sites Initiative.
- B. Design buildings to facilitate their reuse.
- C. Educate building occupants and the general public about the energy savings inherent in efficient building performance and support education efforts with benchmarking and monitoring of building performance (see Goal A).
- D. Recognize and conserve the embodied energy within buildings and building materials. Encourage the use of both locally-produced and other environmentally preferable building materials as well as reduction and eventual elimination of construction waste through Construction Waste Management practices.
- E. Work to increase the amount of building materials that can be re-used and provide support to ease the process to certify re-use of structural materials.
- F. Support deconstruction of buildings as a method to salvage usable materials, and further reduce construction waste.
- G. Build on the activities of the private sector by engaging private sector volunteers to provide educational information on their innovative activities.



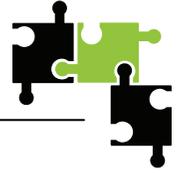


## Initiatives and Action Steps

The following three initiatives for initial action were identified through public input and reflect local stakeholders' views of which goals would have the most profound effect on moving the Joint Planning District toward sustainability. The three initiatives prioritized focus on documentation in order to set targets for improvement, education and public engagement to garner public support, and deconstruction for salvage and market potential for sale and reuse of materials.

1. **Document Baseline and Set New Targets;** Employ rating, benchmarking and monitoring systems for building performance, including Energy Star, B3-MSBG (Buildings, Benchmarks and Beyond, Minnesota Sustainable Building Guidelines) , LEED, and the Sustainable Sites Initiative.
  - a. Calculate CO<sub>2</sub> emissions from individual public buildings, including publicly-owned recreational and utility buildings.
  - b. Audit (or re-commission) all buildings in the bottom third of the energy performance ranking and implement all energy efficiency opportunities that offer a payback under 5 years.
  - c. Enter yearly public building data into the Minnesota B3-MSBG database and rank buildings in regard to energy performance.
  - d. Calculate CO<sub>2</sub> emissions from wastewater treatment, water towers, and lift stations.
  - e. Work with local school districts to ensure that all schools are built to a green building standard.
  - f. Encourage private property owners (residential and commercial) to submit data to Energy Star.
2. **Educate and Engage Public:** Educate building occupants and the general public about energy savings inherent in efficient building performance and support education efforts with benchmarking and monitoring of building performance.
  - a. Encourage property owners/managers to incorporate signage that provides information on the energy efficiency features of buildings.
  - b. Encourage building managers to share information regarding building performance.
3. **Renovate First, Deconstruct and Sell Next, Demolish Not:** Recognize and conserve the embodied energy within buildings and building materials; encourage the use of both





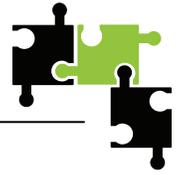
locally-produced and other environmentally preferable building materials as well as reduction and eventual elimination of construction waste through Construction Waste Management practices; support deconstruction of buildings as a method to salvage usable materials and further reduce construction waste.

Existing buildings represent a significant investment by the community in resources and materials, and demolition should be avoided. Buildings should be seen as an investment to be maximized, and should be evaluated for potential reuse, then renovated appropriately. Historic buildings in particular, serve an important role in the community, and maintain the historic connection to place-making. When demolition is unavoidable, a building should then be evaluated for potential to deconstruct, and salvage all usable materials. Construction and demolition waste accounts for 20% of the solid waste stream, so deconstruction can divert a large percentage of the building materials from the landfill.

Deconstruction has multiple positive effects: reclaiming materials for reuse reduces the need for virgin materials, which in turns reduces emissions and energy use from refining and manufacture of new materials. When done on a local level, transportation costs and emissions are reduced from transport of materials from suppliers. On the business-side of this equation, deconstruction can support the community by providing local jobs. There are models around the country that serve as examples of deconstruction operations, establishing markets for product in municipalities that have revised codes to allow the use of salvaged materials.

- a. Develop and adopt historic preservation ordinances that encourage adaptive reuse, with attention to energy and resource conservation, waste reduction and recycling of construction waste.
- b. Work with local schools to repurpose space into non-school uses, with attention to sustainable building design.
- c. Work with local school districts to ensure that all new or remodeled schools over a specified dollar amount are built to a green building standard.
- d. Provide incentives, such as density bonus, to builders who build to green building standards.
- e. Review and adapt building codes to accommodate reuse of salvaged material.
- f. Continue to explore options for making recycling of sheetrock cost-effective. (Noted problems with a potential start-up recycling business.)
- g. Educate residents, developers and builders to understand the value of building materials, based on life-cycle assessment.





- h. Require that municipal buildings receiving city financing over a specified dollar amount meet B3-MSBG standards.
- i. Consider establishing green building standards as a requirement or criteria for consideration of conditional use permit, variance or rezoning requests (this provides an opportunity for education).

### **General Actions**

- I. Offer incentives: to builders, homeowners and commercial markets to encourage sustainable building practices.
- II. Provide technical assistance: from college professors, professionals and builders in the building industry, and the sustainability committee. Make information and resources readily available and easy to find.
- III. Review barriers to see what regulatory institutions are limiting or impeding innovation in green/sustainable building.
- IV. Set voluntary green building targets and discuss mandatory requirements that could be reviewed annually for appropriate updates.
- V. Publicize challenges and successes of early adopters of voluntary green building targets. Use these examples to show what can be accomplished and how. Include links to products and information to help others act on similar ideas.
- VI. Capitalize on existing buildings and infrastructure which represent significant investments of resources and materials, and in many cases, are linked to community history. Always evaluate for reuse/repurpose opportunities. Take advantage of preservation tax credits, grants and incentives which can make projects economically feasible.
- VII. At the city level, evaluate and maintain existing stock of buildings by first making reduction of energy consumption a priority.

