Sustainable Building Sourcebook

Information on 50+ Green Building Topics

Purpose of the Sourcebook:
Austin Energy Green Building's™ Sourcebook contains information relevant to the Austin area, such as regulatory issues, climate, installation guidelines, and sources of assistance. It also provides pertinent information on various aspects of sustainable building strategies and possible implementation issues that may be found in less familiar approaches to building. The Sourcebook is designed to educate and inform all readers, but is directed specifically to those with knowledge of the building trades and terminology and to motivated laypersons.

Many topics discussed in the Sourcebook are subjects of entire books. Information is presented as briefly and succinctly as possible in order to help readers choose sustainable building options and pursue further study or find professional expertise in any given area. The Sourcebook does not present specific building details as found in a construction manual. Rather, it offers general building guidelines that reflect Austin's unique conditions and provides an overview of a variety of building approaches.

We welcome **feedback** from users of the Sourcebook, and will continue to keep it updated as new information develops. We hope the Sourcebook can serve everyone as an important networking tool with the goal of implementing safe, durable, livable, and environmentally responsible buildings for the citizens of Austin.

How to use the Sourcebook:
The Sourcebook contains the following Chapters:

- **Community**
- **Energy**
- **Health & Safety**
- **Materials**
- **Water**
- **Green Building Design Tools**

Within these chapters are specific topic sections, all of which contain the following organizational subsections:

- Introduction: Identifies the topic and its environmental relevance
- At-a-Glance Notes: A quick review of key points
- Guidelines: A more in-depth view of basic principles and implementation issues
- Resources: A listing of experienced local contacts, publications, suppliers, manufacturers, etc.; provides contact information, including web sites

The Sourcebook also contains a **Glossary** and a list of **Acronyms**.

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Chapter: Community

The physical qualities of a community affect all of its members. This chapter addresses neighborhood and site planning strategies and building design aspects that influence a community and have the potential to improve the quality of life for its members.

Topics discussed in this chapter:

- **Commercial Recycling**
- **Compost Systems**
- **Home Recycling**
- **Pervious Materials**
- **Site Protection**

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Chapter: Energy

Energy affects all facets of building design, construction, and operation, from drawing the initial plans to installing light bulbs, equipment, and appliances. Energy use over the lifespan of a building may be the single most important environmental and economic issue to address in building ownership. Excessive fossil-fuel energy use to heat, cool, light, and power buildings results in significant environmental impacts at a local as well as global scale, and unnecessarily increases the building's annual operating and maintenance costs. Energy efficiencies can be gained in the design, construction, and operation phases of a building's lifespan; this chapter contains sections that address each of these phases.

Topics discussed in this chapter:

- **Duct Work**
- **Earth-Sheltered Design**
- **Energy-Efficient Appliances**
- **Energy Recovery Ventilators**
- **Energy Saving Landscapes**
- **Insulation**
- **Lighting**
- **Natural Daylighting**
- **Passive Solar Design**
- **Photovoltaic Systems**
- **Radiant Barriers, Ridge, & Soffit Venting**
- **Solar Water Heating & Space Heating**
- **Ventilation Fans**
- **Water Heating**

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Chapter: Health and Safety

Health concerns have increased in prominence as buildings have become tighter and more energy-efficient. In addition, modern building materials and products are typically more processed and may contain chemical compounds that are irritants to some people when used under certain conditions. This chapter contains sections that deal with both internal and external sources of pollutants and contaminants and suggests alternative materials and methods to maintain the health and safety of building users.

Topics discussed in this chapter:

- **Air Filters**
- **Construction Adhesives**
- **Electromagnetic Fields**
- **Integrated Pest Management**
- **Paints & Primers**
- **Wood Treatment**

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Chapter: Materials

Introduction

Austin Energy Green Building™ has identified a set of considerations that should be taken into account when choosing building materials. Since many different definitions exist concerning what constitutes an environmentally friendly or green material, we use the following set of terms as factors in determining environmentally preferred materials and products.

BY-PRODUCT
Unused or waste material from one manufacturing or energy-producing process that can be used in another manufacturing or energy-producing process

Agricultural by-product: Unused or waste material from farming operations, several of which can be used in building products such as strawboard panels, soybean laminates, etc.

Industrial by-product: Unused or waste material from power plants or manufacturing operations, several of which can be used in building products, e.g. flyash concrete, synthetic gypsum, etc.

DIVERSION
Avoidance of landfill disposal of a material or product through reuse or recycling

EMBODIED ENERGY
All of the energy required in the raw material extraction, manufacturing, distribution, and transport of a material product up to its point of use

GLOBAL WARMING POTENTIAL (GWP)
Possible climate warming effect caused by the manufacture and/or use of a material or product compared to that of carbon dioxide (CO2), which has a GWP of 1.0

INDOOR AIR QUALITY (IAQ)
Condition of air inside buildings with respect to harmful concentrations of contaminants, volatile organic compounds (VOCs), and particulates

LIFE CYCLE
All stages of production, including raw material extraction, manufacturing, distribution, use, maintenance, reuse or recycling, disposal, and all transportation

MATERIAL SAFETY DATA SHEET (MSDS)
Information required from manufacturers listing hazardous material content of products, human exposure limits, and handling precautions

OFF-GASSING
Releasing of gases or vapors into the air

OZONE DEPLETING POTENTIAL (ODP)

Relative measure of the potency of chemicals in depleting stratospheric ozone, depending primarily on chlorine and bromide content, and lifetime of the chemical compared to CFC-11, which is designated 1.0 ODP

RAPIDLY RENEWABLE
Materials that are replenished relatively quickly, usually in less than 10 years, such as bamboo, sisal, flax, and other plant fibers

RECYCLABLE
Having the potential for being recycled by possessing such traits as highly recoverable, easily separated from other materials, not contaminated by toxic coatings, etc.

RECYCLED CONTENT
Portion of a material or product that is made from recovered material

Post-consumer recycled content: The recovered material has served its intended consumer use, has been collected and separated from other materials, and has been reused in the manufacturing of another material or product rather than been disposed

Post-industrial recycled content: The recovered material is from the manufacturing process or facility

REUSED OR SALVAGED MATERIALS
Materials or products from building deconstruction or demolition that are reused 'as-is' with little or no processing or modification

SOLID WASTE
Material or product, typically long lasting and not biodegradable, disposed of in landfills or incinerators

SOURCE SEPARATION
Separation of waste materials by material type at the point of use to facilitate recycling

THIRD-PARTY CERTIFIED
Materials or products that are monitored by independent organizations for compliance with recognized environmental standards

VOLATILE ORGANIC COMPOUNDS (VOCs)
Chemicals that contain carbon molecules and vaporize from material surfaces into indoor air at normal room temperatures; they often react with other chemical vapors and gases to cause eye and respiratory irritation

Quite often, it is extremely difficult to accurately assess the environmental performance of a building material or product over its entire life cycle. In many cases, we rely on third-party certification organizations to accomplish this task. For example, the Forest Stewardship Council (FSC) certifies wood products that come from sources that follow a set of FSC sustainable forest management practices. Other recognized third-party certification organizations include Green Seal, Green Cross, and Energy Star.

Topics discussed in this chapter:

- Cabinets
- Certified Wood
- Concrete Finish Floors
- Construction Waste Management
- Dimensional Lumber
- Doors & Windows
- Earth Construction
- Engineered Sheet Materials
- Engineered Siding & Trim
- Engineered Structural Products
- Finger-Jointed Wood
- Flashing
- Floor Coverings
- Flyash Concrete
- Insulated Concrete Forms
- Optimum Value Engineering
- Outdoor Decking Materials
- Roofing
- Straw Bale Construction
- Structural Insulated Panels
- Wood Flooring

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Chapter: Water

Water use in the Austin metropolitan region has dramatically increased with the rapid growth of the area's population. Water use has reached near capacity levels during several summers over the past decade. In addition, water quality issues have entered the limelight as development moves into the outskirts of Austin into environmentally sensitive areas. This chapter focuses upon techniques and products that help lower buildings' water consumption.

Topics discussed in this chapter:

- **Alternative Stormwater Quality Controls**
- **Composting Toilets**
- **Greywater Reuse**
- **Indoor Water Conservation**
- **Rainwater Harvesting**
- **Waterwise Landscaping**

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Chapter: Green Building Design Tools

This chapter is a general overview of resources and tools for those interested in green building. By no means comprehensive, its purpose is simply to introduce professionals and interested laypersons alike to existing resources presented in a variety of media.

Topics discussed in this chapter:

- **Design & Specifications**
- **Online Information & Resources**
- **Helpful Books & Magazines**
- **National Research Laboratories**
- **Energy Calculation Programs**

Environmental Building News

(A must for all building professionals--and anyone interested in Green Building!)

This bi-monthly newsletter for builders and architects is recognized as the leading publication on environmentally responsible design and construction. The content is clear and objective. The publication is subscription-funded instead of manufacturer-funded, insuring an unbiased position, and considering all points of view to allow readers to make their own decisions. They have indexed all articles. They also have a product catalogue-- **EBN Product Catalog** , featuring building product information.

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