Interior Design Materials

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Lecture Outline

Sustainable Design Principles

Sustainability Codes and Standards

Sustainable Materials

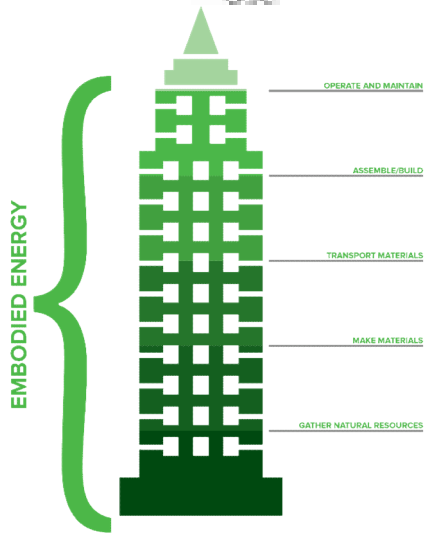
Product Certifications and Standards

Sustainable Design

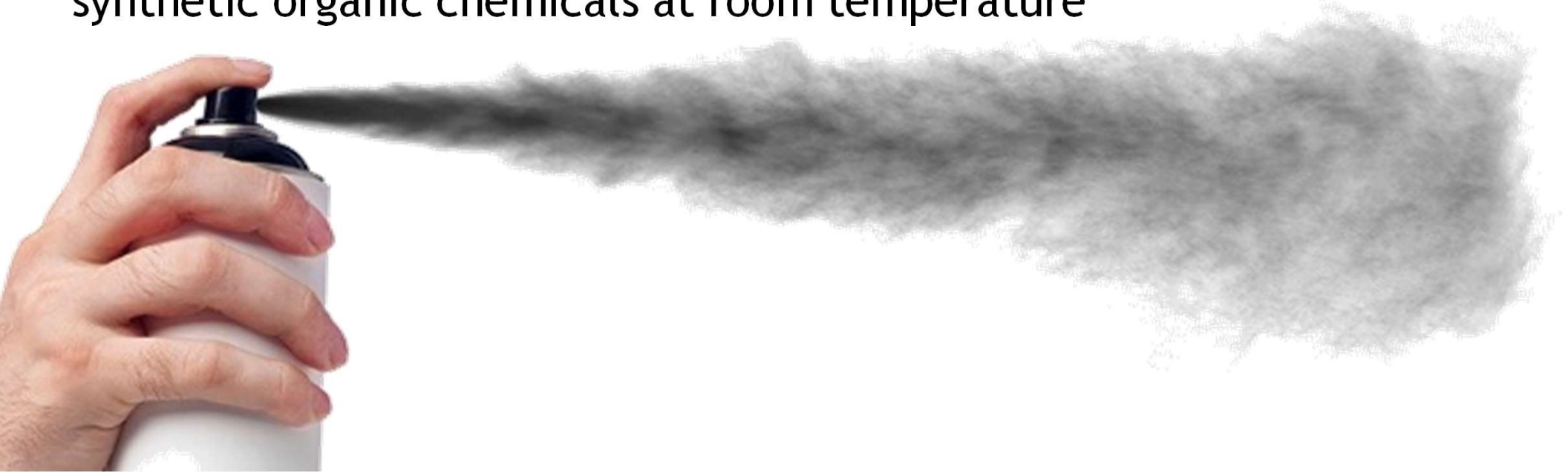
Environmental impacts related to the production of interior materials include resource use, embodied energy, water use, and greenhouse gas production.

Embodied energy is the energy that is used to obtain, process, fabricate, and transport a unit of building material.

For example, the embodied energy for wood includes the sunlight used for its growth as well as the fuel needed to cut, transport, and process wood products, and to install them at the site.



Volatile organic compounds (***VOCs***) are vapors and gases released by synthetic organic chemicals at room temperature

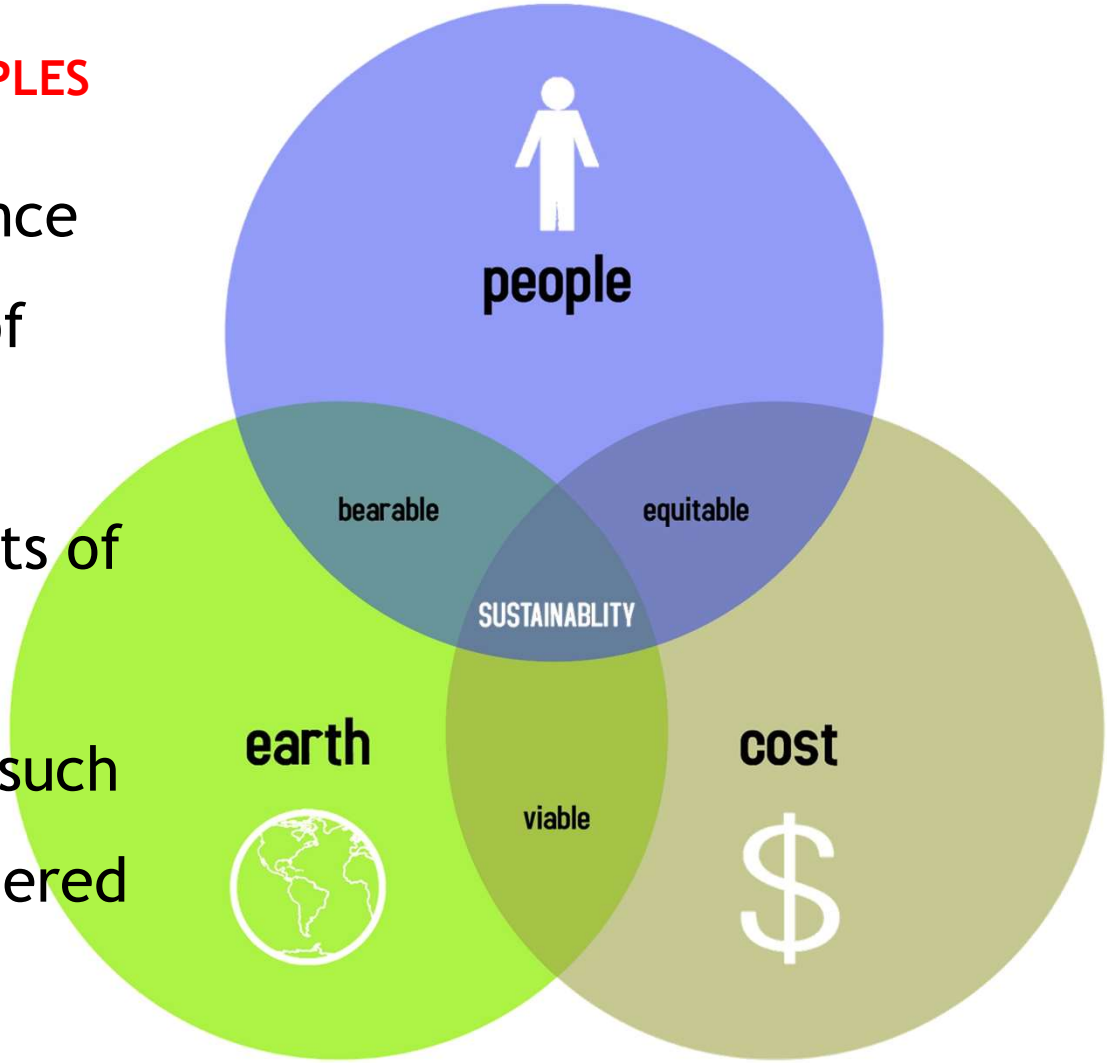


VOCs come from many different sources, including building materials, consumer products, and combustion sources such as heating systems.

The use of strong cleaning products, paints, and glues can intensify the problem.

SUSTAINABLE DESIGN PRINCIPLES

Sustainable design seeks to balance the needs of people with those of the environment. Not only first costs, but also the long-term costs of ownership, environmental stewardship, and human factors such as health and comfort are considered



3R Reduce, reuse, and recyc

1R-The designer should first look at ways to reduce the amount of materials needed for an interior space

2R-reuse elements such as partition walls, furniture, doors, and hardware that are already in the space.

3R-it is appropriate to consider selecting materials with high-recycled content and those materials that are easily recyclable at the end of their useful lives.

SUSTAINABILITY CODES AND STANDARDS

International Green Construction Code (IgCC)

for new and existing commercial buildings

ICC 700 National Green Building Standard

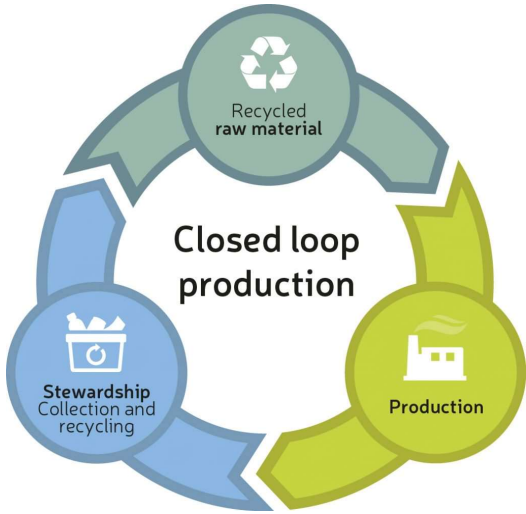
for new homes including high-rise multifamily buildings, home remodeling and additions, hotels, and motels, and their sites Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings (ASHRAE/USGBC/IES 189.1), a total building sustainability package as an option to IgCC

The IgCC requires performance analysis by **life cycle assessment (LCA)** of various building components.

SUSTAINABLE MATERIALS

Sustainable materials are renewable or regenerative materials that can be acquired without ecological damage and used at a rate that does not exceed the natural rate of replenishment.

Closed-loop models for the use of materials treat waste material as raw material for new products. A closed loop recycling process is one in which a manufactured product is recycled back into the same or a similar product without significant deterioration of quality of the product



Environmentally preferable products (EPPs)

are defined as products that have a lesser or reduced effect on human health and the environment when compared to competing products that serve the same purpose. EPPs are not necessarily fully sustainable, but are considered better than other readily available materials.

Green products

are those considered to be environmentally preferable or to have low impact on the environment. This is an informal designation that is often used in marketing. However, the term's use is not regulated, and it is sometimes used for products with minimal environmental benefits.

Sustainable Material Considerations

Criteria	Considerations
Raw materials sources	Avoid strip mining, dredging, or clear-cutting. Avoid finite, virgin materials wherever possible
Salvaged, reused materials	Divert material from the solid waste stream and reduce environmental impacts of producing new construction and product materials
Recycled content	Helps reduce solid waste stream; may reduce carbon footprint of material. Post-consumer is preferable to pre-consumer recycled content
Certified wood	Specify Forest Stewardship Council (FSC) certified wood wherever possible
Local materials	Extracted and manufactured within 500 miles of the project site
Rapidly renewable materials	Replenish themselves faster than traditional extraction (within a 10- year cycle) without biodiversity loss, increased erosion, or air quality changes
Low emitting materials	Avoid adding VOCs to the air; do not encourage growth of molds, mildew, or other microbes

PRODUCT CERTIFICATIONS AND STANDARDS

Increasingly, interior building products are undergoing certification to meet sustainable design standards. This is often part of the documentation for Leadership in Energy and Environmental Design (LEED) project certification.

Product Certification Systems

There are many different certification and rating systems for products.

Some examples are single attribute certifications, such as

GREENGUARD

ENERGY STAR

CRI Green Label Plus,

while others look at multiple attributes, such as

BIFMA level®

SMART©

C2C Certification.

Verification of product information is classified as first-, second- or third party.

First-party certification is self-declared and uses self-reported information that is not verified by an outside party.

Second-party certification indicates that an entity with critical involvement in the certification process profits from it financially.

Third-party certification All aspects of a third-party certification program are conducted by an independent body that receives only a fee for assessment services from the manufacturer or industry.

The LEED System

The nonprofit U.S. Green Building Council (USGBC) has created a comprehensive system for sustainable design methods called LEED, short for Leadership in Energy and Environmental Design.

LEED provides investors, architects, designers, construction personnel, and building managers with information on environmentally preferred building techniques and strategies.

LEED also certifies buildings that meet the highest standards of economic and environmental performance, and offers professional education, training, and accreditation.

Table 2.5: Interior Materials Related LEED Programs

LEED Program	Description
LEED for Commercial Interiors (LEED-CI)	Primarily commercial and institutional tenant spaces and their interior systems
LEED for Health Care (LEED-HC)	Inpatient, outpatient, and long term care facilities, medical offices, assisted living facilities, medical education/research centers
LEED for Schools	For school spaces
LEED for Retail	Design and construction of retail spaces
LEED for Homes	Design and construction of residences

. Check for the latest information on LEED credits at www.usgbc.org/LEED.

Green Globes

Green Globes is a building rating and certification system with an environmental analysis and assessment process for green building certification.

It assesses environmental impacts on a 1000-point scale in the categories of

energy
indoor environment
site
water
resources,
emissions
project/environmental management.

GREEN GLOBES

The Green Globes system originated in Canada and spread to the U.S. in 2004, where the two programs diverged. In the U.S., Green Globes is owned and operated by the Green Building Institute (GBI). Green Globes programs in the U.S. include Green Globes for New Construction and Green Globes for Continual Improvement of Existing Buildings.

Information on Green Globes in Canada can be accessed at

www.greenglobes.com
www.thegbi.org.