or Homes

ED for Homes Point Categories

D for Homes voluntary rating system awards certification based on point totals in eight categories. ıd the checklist for point requirements.) The point categories and requirements are developed ı rigorous consensus-based process, including a period of member balloting.

ıtion & Design Process

ble design strategies and measures are constantly evolving and improving. New technologies are ly introduced to the marketplace, and up-to-date scientific research influences building design s. Occasionally, a strategy results in building performance that greatly exceeds that required in an .EED credit. Other strategies may not be addressed by any LEED prerequisite or credit but :onsideration for their sustainability benefits.

ɔme-building strategies and techniques are most effectively implemented as part of an integrated ·ocess, with input from individuals involved in each phase of the project. Good design can keep vn and ensure proper integration of green techniques and achievement of project goals.

ect of home design that is often overlooked is the assessment and mitigation of long-term risks to the home. Durability failures are a significant cost and cause of stress for both builders eowners, but many easy and low-cost strategies are often overlooked because builders do not durability in the up-front design.

vation & Design Process (ID) credit category encourages project planning and design to improve lination and integration of the various elements in a green home.

an be earned for innovative designs, exemplary performance or regional best-practices that can ı to produce quantifiable environmental and human health benefits.

ɛ Innovation & Design Process credits in the LEED for Homes Rating System are Integrated lanning, Durability Management Process and Innovative or Regional Design.

ɔp

on & Linkages

ilding projects have substantial site-related environmental effects, in terms of both the impact to

self and the impacts that stem from the location of the site. The Sustainable Sites credit category
e former, Location & Linkages addresses how builders can choose site locations that
onmentally responsible land-use patterns and neighborhoods.

nkages (LL) credits reward builders for selecting home sites that have more sustainable land-
rns and offer advantages over conventional developments. Land is used more efficiently,
the acreage needed for new housing. Fragmentation of farmland and forest and other natural
minimized. Well-sited developments need less infrastructure, especially roads and water and
es. And such developments promote a range of sustainable transportation options, including
cycling and mass transit, thereby reducing dependence on personal automobiles.

s can be earned in either of two ways:

1: LL 1, LEED for Neighborhood Development.

D for Neighborhood Development program certifies “smart-growth” housing development. The
se of this program is expected to conclude in late 2008, after which new projects can register and
redit for selecting a home site in a certified development.

2: LL 2–6.

that either cannot or choose not to participate in the LEED for Neighborhood Development
can earn points in this category by pursuing the following strategies:

L 2: Site Selection
L 3: Preferred Locations
L 4: Infrastructure
L 5: Community Resources
L 6: Access to Open Space

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nable Sites

ilding goes beyond the built structures because the use of the site and its natural elements can
gnificant environmental impact. The Location & Linkages category awards projects for choosing a
e site; the Sustainable Sites category awards projects for minimizing site impacts.

isions about how to incorporate the home into the site can have significant long-term effects on
regional ecosystems, as well as demand for water, chemicals and pesticides for site
nent. Good design decisions can result in attractive, easy-to-maintain landscaping that protects
ant and animal species and contributes to the health of local and regional habitats.

ng on how a home is integrated into the site, normal rainfall can be a problem, causing soil
nd run-off of chemicals and pesticides or an opportunity to offset potable water demand and
underground aquifers. Surrounding plants can be a burden, requiring regular upkeep, watering
nicals, or an enhancement that provides shade, aesthetic value, habitat for native species and a
sm for absorbing carbon and enriching the soil.

gn should take into consideration the aesthetic and functional preferences of the occupants, but
-term management needs, preservation principles and potential impacts on local and regional
ms.

ustainable Sites (SS) credits in the LEED for Homes Rating System:

ite Stewardship
andscaping

The 144 LEED-Certified homes in this neighborho save about 65% on their monthly utility bills.

PROJECT PROFILE
MORISSANIA HOMES BRONX, N.Y.
New York state's first LEE certified affordable housir project is stocked with 10 ENERGY STAR® appliar

PROJECT PROFILE
PLEASANT HILL HOME FREEPORT, MAINE
The Panish family's 2,25(square-foot LEED-Silver dream home is filled with modern amenities and co

OTHER RESOURC

ocal Heat Island Effects
urface Water Management
on-toxic Pest Control
ompact Development

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Efficiency

ited States, approximately 340 billion gallons of fresh water is withdrawn per day from rivers and s to support residential, commercial, industrial, agricultural and recreational activities. This for about one-fourth of the nation's total supply of renewable fresh water. Almost 65 percent of r is discharged to rivers, streams and other water bodies after use and, in some cases, treatment.

ılly, water is withdrawn from underground aquifers. In some parts of the United States, water these aquifers have dropped more than 100 feet since the 1940s.

ınual basis, the water deficit in the United States is currently estimated at about 3,700 billion n other words, Americans extract 3,700 billion gallons per year more than they return to the ater system to recharge aquifers and other water sources.

domestic use may be delivered from a public supplier or be self-supplied isby a well. Self- domestic withdrawals are an estimated 3,590 million gallons per day.

gy Policy Act of 1992 mandated the use of water-conserving plumbing fixtures and fittings to ater use in residential, commercial and institutional buildings. Water efficiency measures in new an easily reduce water usage by 30% or more. In a typical home, savings of 30,000 gallons of ear can be achieved very cost-effectively. This results in average annual water utility savings of 00 per year.

ıunities grow, increased demand for water leads to additional maintenance and higher costs for l supply and treatment facilities. New homes that use water efficiently have lower water use fees ced sewage volumes. Many water conservation strategies involve either no additional cost or backs; biological wastewater treatment, rainwater harvesting and gray water plumbing systems, her hand, often involve more substantial investment.

er Efficiency (WE) category in the LEED for Homes Rating System has three kinds of credits:

/ater Reuse
rigation Systems
ıdoor Water Use

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y & Atmosphere

n the home-building industry indicate that close to 1.5 million new homes are built each year, and ıverage size of new homes has doubled in the past 50 years. As a result, total U.S. fossil energy mes has been steadily increasing. The average American consumes five times more energy than ıge global citizen, 10 times more than the average Chinese person, and nearly 20 times more average Indian.

onal fossil-based generation of electricity releases carbon dioxide, which contributes to global hange. Coal-fired electric utilities emit almost one-third of the country's anthropogenic nitrogen ıe precursor of smog, and two-thirds the sulfur dioxide, which causes acid rain. They also emit particulate material than any other activity in the United States. Because the human body is of clearing fine particles from the lungs, these emissions are contributing factors in tens of

ls of cancer and respiratory illness-related deaths annually. Natural gas, nuclear fission and ctric generators all have adverse environmental impacts as well. Natural gas is a major source of oxides and greenhouse gas emissions. Nuclear power increases the potential for catastrophic s and raises significant waste transportation and disposal issues. Hydroelectric generating plants atural water flows, resulting in disturbance of habitat and depletion of fish populations.

consume approximately 37% of the energy and 68% of the electricity produced in the United nually, according to the U.S. Department of Energy. In 2006, total emissions from residential were responsible for 1.2 billion metric tons of carbon dioxide (CO2) emissions, or 20% of the l.

s predict that left unchecked, emissions of CO2 and other greenhouse gases from human will raise global temperatures by 2.5ºF to 10ºF over the 21st century. The effects will be profound include rising sea levels, more frequent floods and droughts and increased spread of infectious . To address the threat of climate change, greenhouse gas emissions must be slowed, stopped rsed. Meeting the challenge will require dramatic advances in technologies and a shift in how the onomy generates and uses energy.

ignificant improvements in environmental performance, the residential building sector will be a ntributor of global CO2 emissions. Homes have a lifespan of 50 to 100 years, during which they ly consume energy and produce CO2 emissions. Further, the U.S. population and economy are l to grow significantly over the coming decades, increasing the need for new homes. To meet this approximately 12 million new homes are projected to be constructed by 2015.

green homes is one of the best strategies for meeting the challenge of climate change because ology to make substantial reductions in energy and CO2 emissions already exists. The average LEED home uses 30% to 40% less electricity and saves more than 100 metric tons of CO2 s over its lifetime. Modest investments in energy-saving and other climate-friendly technologies homes and communities that are healthier, more comfortable, more durable, energy efficient and entally responsible places to live.

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als & Resources

ce of building materials is important for sustainable homebuilding because of the extensive of extraction, processing and transportation they require. Activities to produce building materials ute the air and water, destroy natural habitats and deplete natural resources. Construction and n wastes constitute about 40% of the total solid waste stream in the United States. sign decisions, particularly in the framing of homes, can significantly reduce demand for framing , as well as the associated waste and embedded energy. Without even changing the home project can save framing materials and reduce site waste by planning appropriately and cating the design to the framing team through detailed framing documents and/or scopes of work.

should be evaluated when materials are selected for a project. Reclaimed (i.e., salvaged post- r) materials can be substituted for new materials, saving costs and reducing resource use. l-content materials reuse waste products that would otherwise be deposited in landfills. Use of erials supports the local economy and reduces the harmful impacts of long-distance transport. ird-party-certified wood promotes good stewardship of forests and related ecosystems. Use of ing materials will improve the indoor air quality in the home and reduce demand for materials with latile, toxic compounds.

asing number of public and private waste management operations have reduced construction lumes by recycling these materials. Recovery activities typically begin at the job site, with n into multiple bins or disposal areas. In some areas, regional recycling facilities accept led waste and separate the recyclable materials from those that must go to the landfill. These

can achieve waste diversion rates of 80% or greater.

erials & Resources (MR) category in the LEED for Homes Rating System has three components:

laterial-Efficient Framing
nvironmentally Preferable Products
/aste Management

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Environmental Quality

ıs spend on average 90% of their time indoors, where levels of pollutants may run two to five and occasionally more than 100 times — higher than outdoors, according to the U.S. ıental Protection Agency. Similarly, the World Health Organization reported in its Air Quality es for Europe that most of an individual's exposure to many air pollutants comes through ı of indoor air. Many of the pollutants found indoors can cause health reactions in the estimated ı Americans who suffer from asthma and 40 million who have allergies, contributing to millions of ent from school and work.

ners are just beginning to realize the link between their health and their homes. Hazardous d pollutants may include carbon monoxide, radon, formaldehyde, mold, dirt and dust, pet dander, lue from tobacco smoke and candles. Many homeowners also store various chemicals inside their s well, including pesticides, fertilizers, solvents, grease, oils, degreasers, gasoline, antifreeze, tergents, thinners and oil-based paints.

past 20 years, research and experience have improved our understanding of what is involved in high indoor environmental quality and revealed manufacturing and construction practices that can roblems from arising. Preventing indoor air quality problems is generally much less expensive tifying and solving them after they occur. Generally, there are three types of strategies: source source control and dilution.

emoval is the most practical way to ensure that harmful chemical compounds are not brought into . Evaluating the properties of adhesives, paints, carpets, composite wood products and furniture cting materials with low levels of potentially irritating off-gassing can reduce occupant exposure. ıg deliveries and sequencing construction activities can reduce exposure of materials to moisture rption of off-gassed contaminants. (Low-emissions materials are addressed under Materials & es.)

ontrol strategies focus on capturing pollutants that are known to exist in a home. For example, ıe supply air stream removes particulates that would otherwise be continuously recirculated he home. Protection of air-handling systems during construction and a building flushout prior to y further reduce the potential for problems.

nvolves the use of fresh outside air to ventilate a home and exhaust pollutants to the outdoors. also help control moisture within the home. Most new homes in the United States do not have cal fresh-air ventilation systems. The typical air-handling systems in new homes merely e the air within the home, continuously pumping indoor pollutants through the home rather than ıg them.

aspect of indoor air quality is occupant comfort. The proper installation of automatic sensors and o maintain proper temperature, humidity and ventilation in occupied spaces helps maintain ir quality. Surprisingly, sensors to alert a home's occupants to deadly carbon monoxide ations are frequently not required by current codes but should be included in all new homes. ccupants fully and effectively control their thermal environment can reduce hot-cold complaint generally raise satisfaction levels.

or Environmental Quality (EQ) credit category encourages builders to prevent air pollution and air quality and comfort in the homes they build.

ve Compliance Pathways

parallel pathways through the 10 EQ credits in the LEED for Homes Rating System are illustrated 1 and summarized below.

1: ENERGY STAR with Indoor Air Package

that participate in the U.S. Environmental Protection Agency's ENERGY STAR with Indoor Air initiative automatically qualify for 13 points. Up to 7 additional points are available if the following e also completed:

Q 4.2: Enhanced Outdoor Air Ventilation
Q 5.2: Enhanced Local Exhaust
Q 5.3: Third-Party Testing
Q 7.2 or 7.3: Better or Best Air Filters
Q 8.2: Indoor Contaminant Control

2: Prescriptive Approach

wing strategies can earn points in this credit category:

Q 2: Combustion Venting
Q 3: Moisture Control
Q 4: Outdoor Air Ventilation
Q 5: Local Exhaust
Q 6: Distribution Systems
Q 7: Air Filtering
Q 8: Contaminant Control
Q 9: Radon Protection
Q 10: Garage Pollutant Protection

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ness & Education

D for Homes Rating System addresses the design and construction of new green homes — roles he responsibility of the home designer and the builder, respectively. But the environmental impact e continues throughout its life-cycle, well beyond the initial design and construction decisions. homes are expected to last 50 to 100 years, during which the occupants will consume energy, d other resources. They therefore play a substantial role in the resource use of a home over its

mebuyers may know very little about green home construction. They may be unaware of the atures in the home, or they may be unfamiliar with how to use and maintain them. Without training, the full benefits of the LEED measures likely will not be achieved.

lit category promotes broad awareness among homebuyers and tenants that LEED homes are rently and need to be operated and maintained accordingly. Because the operations and nce tasks in multifamily buildings may be performed by a building manager, this credit also s the need for appropriate education of building managers.

Awareness & Education (AE) categories in the LEED for Homes Rating System are Education of eowner or Tenant and Education of the Building Manager.

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