# WHERE IS THE "GREEN" IN GREEN BUILDING? CONFRONTING THE NEW RISKS AND LIABILITIES OF ENVIRONMENTALLY SENSITIVE CONSTRUCTION METHODS

## I. DEFINING GREEN BUILDING DESIGN AND METHODS

### A. WHAT IS GREEN BUILDING?

Not too long ago, the concept of the **"green" building** was dismissed as impractical—something that might be good for nature's climate but necessarily for the business climate. To those in the business world, the word "green" itself invoked the "hippie" image of tie-dyed T-shirts, wind chimes and beads. But that mindset has changed. Green building is now about profitability—long range profitability in the design, construction and operation of commercial and residential real estate. Indeed, one can not open a magazine, newspaper or trade journal without seeing the word "green" regularly appear.

Buildings and conventional construction methods affect water quality, air quality, and ecosystems, impacting human health and quality of life. In addition to environmental impacts, buildings have a large economic footprint. Buildings represent more than 50 percent of the nation's wealth, and the U.S. construction market comprises 13% of U.S. GDP, and building-related fields employ 10 million people The U.S. construction market is also responsible for:

- 39% of total energy use;
- 39% of municipal solid waste;
- 35% of greenhouse gas emissions;

- 40% of all raw materials, including ;
- 25% of timber harvests;
- 12% of potable water withdrawal.

(Source: 2003 U.S. DOE Buildings Energy Data book.)

In contrast, green building is the practice of increasing the efficiency with which buildings and their sites use and harvest energy, water, and materials. The ultimate objective of green building methods is to reduce the impact of construction on human health and the environment through better site selection, design, construction, operation, maintenance, and deconstruction—the complete building life cycle. Green building is also called *sustainable building* or *environmental building.*

The practice of green building can lead to benefits including reduced operating costs by increasing productivity and using less energy and water, improved public and occupant health due to improved indoor air quality, and reduced environmental impacts by, for example, lessening storm water runoff and the heat island effect.

Practitioners of green building often seek to achieve not only ecological but aesthetic harmony between a structure and its surrounding natural and built environment. Despite the novelty of methods, the appearance and style of sustainable homes and buildings can be nearly indistinguishable from their less sustainable counterparts.

Today, an estimated 6% of commercial construction and development projects are certified as green building projects. Industry experts expect that the percentage could rise as high as 10% by 2010. These numbers speak only of new construction and do not take into account many more buildings that are being retrofitted with green building methods.

Three significant factors are shifting landowners toward green buildings. One is rising, unstable energy prices. Health is another factor. According to the Environmental Protection Agency (EPA), Americans spend 90 percent of their time indoors, where asthma and allergy attacks can be triggered by air pollutants whose levels may be two to five times higher than pollutants outside, if not more. Nationally recognized scientific studies have shown that improved ventilation systems reduce respiratory illness by nine to 20 percent, yielding a savings in the U.S. of $6 to $14 billion per year. Another benefit is faster recovery from illness, since views of the outdoors and connections to nature promote healing. In fact, it is partly for this reason that U.S. hospitals are becoming increasingly interested in green design. For example the nation's largest healthcare provider, Kaiser Permanente, has committed to a green building initiative.

A third factor is the growing public concern for the environment. Media images ranging from stranded Hurricane Katrina victims to Al Gore's *An Inconvenient Truth* has created a permanent impression of the effect of man-made climate change. The public at large now appreciates that human endeavors, like the construction industry, can be agents of change.

## B. AN OVERVIEW OF THE CONSTRUCTION PROCESS

### 1. Design and Materials

Green building brings together a vast array of practices and techniques to reduce and ultimately eliminate the impacts of buildings on the environment. On the aesthetic side of green architecture or sustainable design is the philosophy of designing a building that is in harmony with the natural features and resources surrounding the site. There are several key steps in designing sustainable buildings: specify 'green' building materials from local sources, reduce loads, optimize systems, and generate on-site renewable energy.

Building materials typically considered to be ‘green’ include rapidly renewable plant materials like bamboo and straw, lumber from forests certified to be sustainably managed, stone, recycled metal, and other products that are non-toxic, reusable, renewable, and/or recyclable. Building materials are routinely extracted and manufactured locally to the building site to minimize the energy embedded in their transportation.

Low-impact building materials are used wherever feasible: for example, insulation may be made from low VOC (volatile organic compound)-emitting materials such as recycled denim, rather than the insulation materials that may contain carcinogenic or toxic materials such as formaldehyde. To discourage insect damage, these alternate insulation materials may be treated with boric acid. Organic or milk-based paints may also be used.

Architectural salvage and reclaimed materials are used when appropriate as well. When older buildings are demolished, frequently any good wood is reclaimed, renewed, and sold as flooring. Many other parts are reused as well, such as doors, windows, mantels, and hardware, thus reducing the consumption of new goods. When new materials are employed, green designers look for materials that are rapidly replenished, such as bamboo, which can be harvested for commercial use after only 6 years of growth, or cork oak, in which only the outer bark is removed for use, thus preserving the tree. When possible, building materials may be gleaned from the site itself; for example, if a new structure is being constructed in a wooded area, wood from the trees which were cut to make room for the building would be re-used as part of the building itself.

## 2. Heating/Cooling Methods

To minimize the energy loads within and on the structure, it is critical to orient the building to take advantage of cooling breezes and sunlight. Day lighting with ample windows will eliminate the need to turn on electric lights during the day. Passive Solar can warm a building in the winter—but care needs to be taken to provide shade in the summer time to prevent overheating. Prevailing breezes and convection currents can passively cool the building in the summer. Thermal mass stores heat gained during the day and releases it at night minimizing the swings in temperature. Thermal mass can both heat the building in winter and cool it during the summer. Insulation is the final step to optimizing the structure. Well-insulated windows, doors, and walls help reduce energy loss, thereby reducing energy usage. With the advance of technology, these design features are financially feasible to construct and significantly reduce the energy needed to make the building comfortable.

Optimizing the heating and cooling systems by installing energy efficient machinery, commissioning, and heat recovery is also utilized. Compared to optimizing the passive heating and cooling features through design, the gains made by engineering are relatively expensive and can add significantly to the projects cost. However, thoughtful integrated design can reduce costs—for example, once a building has been designed to be more energy-efficient, it may be possible to downsize heating, ventilation and air-conditioning (HVAC) equipment, leading to substantial savings. To further address energy loss hot water heat recycling is used to reduce energy usage for domestic water heating. Ground source heat pumps are considered more energy efficient then other forms of heating and cooling.

Finally, onsite generation of renewable energy through solar power, wind power, hydro power, or biomass can significantly reduce the

environmental impact of the building. Power generation, however, is the most expensive feature to add to a building.

### 3. Deconstruction Methods

Green building methodology also reduces waste, of energy, water and materials. During the construction phase, one goal is to reduce the amount of material going to landfills. Well-designed buildings also help reduce the amount of waste generated by the occupants as well, by providing onsite solutions such as compost bins to reduce matter going to landfills.

### 4. Water Use

To reduce the impact on wells or water treatment plants, several options exist. "Greywater," wastewater from sources such as dishwashing or washing machines, can be used for non-potable purposes, e.g., to flush toilets, water lawns, and wash cars. Rainwater collectors are used for similar purposes, and some homes use specially designed rainwater collectors to gather rainwater for all water use, including drinking water.

In all, green building places its focus on the utilization of renewable resources as a foundation for design and construction.

## II. COMPLIANCE WITH CODES AND PROFESSIONAL STANDARDS

### A. An Overview of Applicable Standards

At the core of every green building project is compliance with existing standards that govern the definition and methods of green building. In simplest terms, if a construction project is going to be considered "green", it must abide by one of several voluntary codes that outline how construction will proceed and how, ultimately, the building will function. The codes

provide a rating system for sustainability—the "greener" the building, the higher the rating. What is particularly interesting about the current state of green building codes is that almost all of these regulations are voluntary and have been promulgated by private trade organizations. In those instances wherein a governmental entity has adopted standards to be applied in green building, they almost always incorporate by reference these voluntary guidelines.

Some of the professional standards and codes commonly utilized in green building include:

- **American Society of Heating, Refrigeration and Air Conditioning (ASHRAE)**
- **The Illuminating Engineering Society of North America (IESNA)**
- **Energy Star EPA Program**
- **Go Green Plus (Building Owners and Managers Association—Canada)**
- **Green Globes—Green Building Initiatives**

But, by far, the most widely recognized and applied standards for green construction is the "LEED" Rating Standard. The United States Green Building Council (USGBC) has developed **The Leadership in Energy and Environmental Design (LEED) Green Building Rating System**, which is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings. LEED gives building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality. Specific

versions of the LEED rating system have been developed to assist unique construction programs in achieving certification.

Some of the commercially available systems from the USGBC are:

- **LEED-NC: New Construction and Major Renovations (the most commonly applied-for LEED certification)**
- **LEED-CI: Commercial Interiors**
- **LEED-CS: Core/Shell**
- **LEED-EB: Existing Buildings**
- **LEED-Homes**

Other versions that are in the process of being drafted include codes applicable to specific types of construction, such as:

- **LEED-ND for Neighborhood Developments**
- **LEED for Schools**
- **LEED for Healthcare**
- **LEED for Laboratories**
- **LEED for Retail Establishments**

In addition to the promulgation of codes, the United States Green Building Council has instituted educational and training programs that allow construction professionals to become certified in the LEED and green building methodology.

## B. Applying LEED to the Construction Process

At the heart of every application of the LEED code to a green building project is a rating system that establishes a comprehensive evaluation at every step of the construction process. The categories in a typical evaluation may include:

- **Construction Activity Pollution Prevention**
- **Site Selection**

- **Development Density & Community Connectivity**
- **Brownfield Development**
- **Alternative Transportation Methods**
- **Site Development**
- **Storm Water Design**
- **Storm Water Management**
- **Heat Island Effect**
- **Light Pollution Reduction**
- **Water Efficiency**
- **Waste Water Technology**
- **Water Use**
- **Commissioning of the Building**
- **Energy Performance**
- **Renewable Energy methods**
- **Refrigerant Management**
- **Verification Procedures**
- **Green Power Methods**
- **Storage & Collection of Recyclables**
- **Re-use of Building Materials**
- **Construction Waste Management**
- **Use of Environmentally Sound Materials**
- **Indoor Environmental Quality**
- **Ventilation**
- **Construction Management Methods**
- **Chemical Emissions of Materials**
- **Pollution Control methods**
- **Lighting Systems**
- **Control of Thermal/Cooling Systems**
- **Use of Day Light for Illumination**
- **Utilization of Innovative Design Methods**

In the LEED system, each category is rated with a point and credit system applying objective criteria. The total accumulation of credits dictates whether the project can be accredited as a green project and provides a level of compliance (i.e. “Certified”, “Silver”, “Gold” and “Platinum”.

A summary of the LEED credit rating system is presented below:

## LEED Rating Systems

| | New Construction | Existing Building | Commercial Interior | Core & Shell |
|---|---|---|---|---|
| Sustainable Sites | 14 | 14 | 7 | 15 |
| Water Efficiency | 5 | 5 | 2 | 5 |
| Energy & Atmosphere | 17 | 23 | 14 | 16 |
| Materials & Resources | 13 | 16 | 14 | 11 |
| Indoor Environmental Quality | 15 | 22 | 15 | 13 |
| Innovation & Design Process | 5 | 5 | 5 | 5 |
| Total Possible Points | 69 | 85 | 57 | 65 |
| Platinum Level | 52 – 69 | 64 – 85 | 42 – 57 | 48 – 64 |
| Gold Level | 39 – 51 | 48 – 63 | 32 – 41 | 36 – 47 |
| Silver Level | 33 – 38 | 40 – 47 | 27 – 31 | 30 – 35 |
| LEED Certified Level | 26 – 32 | 32 – 39 | 21 – 26 | 24 – 29 |

A key component of the LEED rating system is documentation and verification of compliance at every step of the construction process. A formal application for certification must be filed with The United States Green Building Council before construction begins and follow up documentation must be provided to verify and confirm compliance during the building process. This requirement has made it critical for every green building project

to have qualified professionals and third-party consultants who are certified in the process.

### C. Putting LEED to Work: The Performance Plan

For the purposes of illustration and instruction, a sample of a LEED performance plan is included as a supplement at the end of these materials as Appendix "A". This plan, which was submitted in connection to the construction of an Emergency Assistance Unit for the City of New York, has been released as a public document to demonstrate and publicly encourage the method of completing LEED certification. Many governmental entities supporting and evaluating bids for a green building project have promulgated their own forms and checklists to be completed by the green building applicant. A second supplement located at the end of the materials as Appendix "B" provides the public certification form that is required by the City of Scottsdale, Arizona.

## III. THE FUTURE OF GOVERNMENTAL REGULATION

As with the growth of any technology or industry, the rapid advance of green building has inspired an equally intensive growth of governmental regulations, policies and programs that either support or oversee the process on both the federal and local political levels. Some programs or law have been in effect for years and have simply been applied to green building; others have blossomed in direct response to the expansion of the industry. What is unequivocally clear in both instances is that the future will see an exponential growth of governmental intervention in green building.

### A. Federal Laws and Regulations

On the federal level, laws and regulations that affect the green building industry include:

- **The National Environmental Policy Act (NEPA)**
- **The Clean Air Act**
- **The Resource Conservation and Recovery Act (RCRA)**
- **The Energy Policy Act**

The government has also issued a series of Executive Orders that has attempted to promote the growth of the green building industry. A common theme in each of these Executive Orders is the commitment on the part of government to utilize green building techniques in public construction projects:

- **Executive Order 13101**: Greening the Government through Waste Prevention, Recycling, and Federal Acquisition (requiring the EPA to designate items that can be made with recovered materials and to implement strategies for agencies to comply with procurement of these items)
- **Executive Order 13123**: Greening the Government through Efficient Energy Management (encourages the growth of green building in public projects and the reduction of energy usage over the next decade)
- **Executive Order 13134**: Developing and Promoting Biobased Products and Bioenergy (setting requirements to use biomass energy sources and reducing carbon emissions over the next decade)
- **Executive Order 13148**: Greening the Government through Leadership in Environmental Management (sets guidelines and mandates for federal agencies to pursue energy efficient methods)

Beyond regulations and executive orders, the federal government has endorsed several programs that have encouraged the growth of green building methods in a variety of contexts. These programs include:

- **Build America**
- **EPA Energy Star Program**
- **Federal Energy Management Program (FEMP)**
- **U.S. Department of Education's Healthy and High-Performance Schools Program**
- **Partnership for Advanced Technology in Housing (PATH)**
- **Rebuild America**
- **Department of Energy Zero Energy Home program**

## B. State and Local Green Building Programs

Tax credits and other incentives are part of a broader green building assistance programs offered by a growing number of state and local governments. Governmental entities that have developed green building programs include the States of California, Colorado, Maryland, New York, Pennsylvania and Wisconsin.

Local municipalities have also created a broad range of programs and regulations mandating and/or encouraging the use of green building methods. For example, in 2005 New York City passed Local Law 86 which will require a percentage of public projects to achieve a LEED rating of "Certified" or "Silver" and, in many cases, to use energy and water more efficiently than current codes require. Other local governments in New York such as Nassau and Suffolk Counties have adopted similar codes and requirements.

## IV. DEVELOPING AN EFFECTIVE GREEN BUILDING STRATEGY

For an owner, facility operator, contractor or design professional, the key to developing an effective and profitable green building strategy during construction and afterwards is twofold: (1) researching and pursuing the myriad of financial and tax incentives available for sustainable projects; and (2) developing a proactive risk management strategy that starts at the conception of the project and continues throughout the life span of the building.

### A. Governmental Incentives

Numerous sources of funding for green building are available at the national, state and local levels for homeowners, industry, government organizations and nonprofits. Over the last five years, there has been explosive growth in incentive programs aimed solely to encourage the growth of the green building industry. The complete list of resources on both the federal and local level available to assist green building projects is, literally, too vast to describe for the purposes of this presentation.

Before the initiation of any green building project, it is critical for the stakeholders and the design team to carefully research governmental programs that can provide technical and financial resources to the construction process. Retaining experienced consultants in this realm can be of invaluable help and, often enough, will quickly guide the construction team in identifying ideal governmental programs and incentive plans.

### B. Federal Incentives and Tax Programs

The section below outlines some of the larger federal incentive programs designed to enhance green building projects.[1] The chart includes a summary of the incentive, its legal source, its applicability and a synopsis of how it operates.

[1] Grateful acknowledgement is given to Ken Sandler, Co-Chairperson, EPA Green Building Workgroup, Washington, DC, for providing an outline and invaluable information describing the various programs contained in this section.

The information provided is derived from a number of governmental sources, and since tax codes are regularly revised and updated, original sources such as the Internal Revenue Service or other applicable agency should always be consulted:

| Business Energy Tax Credit | |
|---|---|
| **Incentive Type:** | Corporate Tax Credit |
| **Eligible Renewable/Other Technologies:** | Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaic's, Geothermal Electric, Fuel Cells, Solar Hybrid Lighting, Direct Use Geothermal, Micro turbines |
| **Applicable Sectors:** | Commercial, Industrial |
| **Amount:** | For equipment placed in service from January 1, 2006 until December 31, 2008, the credit is 30% for solar, solar hybrid lighting, and fuel cells, and 10% for micro turbines. The geothermal credit remains at 10%. |
| **Maximum Incentive:** | $500 per 0.5 kW for fuel cells; $200 per kW for micro turbines; no maximum specified for other technologies |
| **Eligible System Size:** | Micro turbines less than 2 MW; fuel cells at least 0.5 kW |
| **Authority 1:** | 26 USC § 48 |
| **Authority 2:** | IRS Form 3468 (Tax Year 2006) |

**Summary:**

The Energy Policy Act of 2005 (H.R. 6) expanded the business energy tax credit for solar and geothermal energy property to include fuel cells and micro turbines installed in 2006 and 2007, and to hybrid solar lighting systems installed on or after January 1, 2006. These provisions of the tax credit were later extended through December 31, 2008, by Section 207 of the Tax Relief and Health Care Act of 2006 (H.R. 6111). (A 10% federal energy tax credit was available to businesses that invested in or purchased solar or geothermal energy property in the United States prior to January 1, 2006.)

For eligible equipment installed from January 1, 2006, through December 31, 2008, the credit is set at 30% of expenditures for solar technologies, fuel cells and solar hybrid lighting; micro turbines are eligible for a 10% credit during this two-year period. For equipment installed on or after January 1, 2009, the tax credit for solar energy property and solar hybrid lighting reverts to 10% and expires for fuel cells and micro turbines. The geothermal credit remains unchanged at 10%.

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**Business Energy Tax Credit (cont.)**

The credit for fuel cells is capped at $500 per 0.5 kilowatt (kW) of capacity. The maximum micro turbine credit is $200 per kW of capacity. No maximum is specified for the other technologies.

Solar energy property includes equipment that uses solar energy to generate electricity, to heat or cool (or provide hot water for use in) a structure, or to provide solar process heat. Hybrid solar lighting systems are those that use solar energy to illuminate the inside of a structure using fiber-optic distributed sunlight. Geothermal energy property includes equipment used to produce, distribute, or use energy derived from a geothermal deposit. It does not include geothermal heat pumps. For electricity produced by geothermal power, equipment qualifies only up to, but not including, the electrical transmission stage. Energy property does not include public utility property, passive solar systems, or pool heating equipment.

To qualify, the original use of the equipment must begin with the taxpayer or it must be constructed by the taxpayer. The equipment must also meet any performance and quality standards in effect at the time the equipment is acquired. The energy property must be operational in the year in which the credit is first taken.

If the project is financed in whole or in part by subsidized energy financing or by tax-exempt private activity bonds, the basis on which the credit is calculated must be reduced. (The formula is described in the tax credit instructions.) Subsidized energy financing means “financing provided under a federal, state, or local program, a principal purpose of which is to provide subsidized financing for projects designed to conserve or produce energy.” Therefore, a business must reduce the basis for calculating the credit by the amount of any such incentives received.

| Clean Renewable Energy Bonds (CREBs) | |
|---|---|
| **Incentive Type:** | Federal Loan Program |
| **Eligible Renewable/Other Technologies:** | Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Municipal Solid Waste, Small Irrigation Power |
| **Applicable Sectors:** | Local Government, State Government, Tribal Government, Municipal Utility, Rural Electric Cooperative |
| **Authority 1:** | IRS Notice 2007-26 |
| **Effective Date:** | 4/2/2007 |
| **Website:** | http://www.elpc.org/energy/farm/crebs.php |

**Summary:**

The Energy Tax Incentive Act of 2005, under Title XIII of the Energy Policy Act of 2005, established Clean Energy Renewable Bonds (CREBs) as a financing mechanism for public sector renewable energy projects. The Act originally allocated $800 million of tax credit bonds to be issued between January 1, 2006 and December 31, 2007. Over 786 applicants from 40 states applied for $2.5 billion funds.

Following the passage of the Tax Relief and Health Care Act of 2006, the Internal Revenue Service made an additional $400 million in CREBs financing authority available for 2008 through Notice 2007-26. The application deadline was July 13, 2007, and the CREBs must be issued by December 31, 2008. CREBS can be issued by cooperative electric companies, governmental bodies (states, territory, Indian tribal government, or any political subdivision thereof), or certain lenders. Of the $1.2 billion of total CREBs made available, $750 million is the maximum allocation for governmental bodies. The remainder is allocated to cooperative electric companies.

CREBs are issued with a 0% interest rate, the borrower pays back only the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest. Tax credit funds are allocated by the Secretary of the U.S. Treasury Department. The tax credit rate is set daily by the Secretary of the Treasury and can be taken quarterly on a dollar for dollar basis to offset the tax liability of the bondholder.

CREBs differ from traditional tax-exempt bonds since the tax credits issued through CREBs are treated taxable income for the bondholder. The tax credit can be taken each year the bondholder has a tax liability as long as the credit amount does not exceed the limits established by the Energy Policy Act of 2005.

| Energy Efficient Mortgage | |
|---|---|
| **Incentive Type:** | Federal Loan Program |
| **Eligible Efficiency Technologies:** | Yes; specific technologies not identified |
| **Eligible Renewable/Other Technologies:** | Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Photovoltaics, Delighting |
| **Applicable Sectors:** | Residential |
| **Website:** | http://www.resnet.us/ratings/mortgages/default.htm |

**Summary:**

Energy efficient mortgages (EEMs) can be used by homeowners to finance a variety of energy efficiency measures, including renewable energy technologies, in a new or existing home. The federal government supports these loans by insuring them through FHA or VA programs. This allows borrowers who might otherwise be denied loans to pursue energy efficient improvements, and it secures lenders against loan default and provides them with confidence in lending to customers whom they would usually deny.

The federal government also certifies private lenders to provide EEMs through the ENERGY STAR ® program, which does not provide the same security as the FHA or VA programs but offers ENERGY STAR ® certification. Other private lenders, like Fannie Mae and Freddie Mac, offer "conventional energy efficient mortgages" that may or may not require homes to meet Energy Star standards.

***Federal Housing Authority (FHA) Energy Efficient Mortgages***

The FHA allows lenders to add up to 100% of energy efficient improvements to an existing mortgage loan by insuring a loan of up to 5% of a home's appraised value or $4,000, whichever is greater, not to exceed $8,000. FHA mortgage limits vary by county/state and the number of units in a dwelling; see www.fha.com/lending_limits.cfm for more details.

Loan amounts cannot be greater than the projected savings of the energy efficient improvements. This loan can be combined with FHA 203 (h) mortgages made to victims of presidentially-declared disasters and with financing offered through the FHA 203 (k) rehabilitation program. FHA loan limits do not apply to the EEM. Homebuyers must submit a Home Energy Rating (HER), contractor bids, and a FHA B Worksheet. Up to

*continued*

**Energy Efficient Mortgage (cont.)**

***Federal Housing Authority (FHA) Energy Efficient Mortgages (cont.)***

$200 of the cost of the HER can be included in the mortgage, and borrowers can include closing costs and the up-front mortgage insurance premium in the total cost of the loan. The loan is available to anyone who meets the income requirements for FHA's Section 203 (b), provided they can make the monthly mortgage payments. New and existing owner-occupied homes of up to 2 units qualify for this loan. Cooperative units are not eligible. Homebuyers can submit applications to their local HUD Field Office through an FHA-approved lending institution, or they can apply directly online at http://www.fha.com/energy_efficient.cfm. See also www.hud.gov/offices/hsg/sfh/eem/energy-r.cfm.

***Department of Veterans Affairs (VA) Energy Efficient Mortgages***

The VA insures EEMs to be used in conjunction with VA loans for either the purchase of existing dwellings or refinancing loans secured by the dwelling. Homebuyers can borrow up to $3,000 if only documentation of improvement costs or contractor bids is submitted, or up to $6,000 if the projected energy savings are greater than the increase in mortgage payments. Loans may exceed this amount at the discretion of the VA. Applicants cannot include the cost of their own labor in the total amount. No additional home appraisal is needed but applicants must submit a HER, contractor bids, and other documentation. The VA insures 50% of the loan if taken by itself, but it may insure less if the total value of the mortgage exceeds a certain amount.

This mortgage is available to qualified military personnel, reservists and veterans (see www.homeloans.va.gov for more details). Applicants should secure a certificate of eligibility from their local lending office and submit it to a VA-approved private lender. If the loan is approved, the VA guarantees the loan when it is closed.

***ENERGY STAR Energy Efficient Mortgages***

These mortgages, unlike those insured by the FHA and VA, are not guaranteed by a particular federal agency. At the time of this writing, the Environmental Protection Agency's ENERGY STAR program listed 49 private lenders who offer homebuyer assistance, home energy rating assistance, special financing, and other assistance to

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**Energy Efficient Mortgage (cont.)**

***ENERGY STAR Energy Efficient Mortgages (cont.)***

applicants buying homes with the ENERGY STAR rating. The EPA requires ENERGY STAR-approved lenders who offer FHA EEMs to provide those to qualified borrowers. Borrowers should apply directly to those lenders listed on the ENERGY STAR website.

***Conventional Energy Efficient Mortgages***

Like ENERGY STAR, conventional mortgages are not backed by a federal agency. Private lenders sell loans to Fannie Mae and Freddie Mac, which in turn allow homebuyers to borrow up to 15% of an existing home's appraised value for improvements documented by a HER.

Fannie Mae also lends up to 5% for ENERGY STAR new homes. Fannie Mae EEMs are for single-family, owner-occupied units, and they provide EEMs to those whose income might otherwise disqualify them from receiving the loans by allowing approved lenders to adjust borrowers' debt-to-income ratio by 2%. The value of the improvements is immediately added to the total appraised value of the home.

Freddie Mac offers EEMs for 1-4 unit dwellings and also helps raise the effective income of the borrower to qualifying levels by allowing lenders to increase the borrower's income by a dollar amount equal to the estimated energy savings. Any energy efficiency improvements can qualify, and these mortgages can be combined with both fixed-rate and adjustable-rate mortgages.

| Modified Accelerated Cost-Recovery System (MACRS) | |
|---|---|
| **Incentive Type:** | Corporate Depreciation |
| **Eligible Renewable/Other Technologies:** | Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Wind, Geothermal Electric, Fuel Cells, Solar Hybrid Lighting, Direct Use Geothermal, Micro turbines |
| **Applicable Sectors:** | Commercial, Industrial |
| **Authority 1:** | 26 USC § 168 (2005) |
| **Effective Date:** | 1986 |

**Summary:**

Under the Modified Accelerated Cost-Recovery System (MACRS), businesses can recover investments in certain property through depreciation deductions. The MACRS establishes a set of class lives for various types of property, ranging from three to 50 years, over which the property may be depreciated. For solar, wind and geothermal property placed in service after 1986, the current MACRS property class is five years. With the passage of the Energy Policy Act of 2005, fuel cells, micro turbines, and solar hybrid lighting technologies are now classified as 5-year property as well. 26 USC § 168 references 26 USC § 48(a)(3)(A) with respect to classifying property as "5-year property" and EPAct 2005 added these technologies definition of energy property in § 48 as part of the business energy tax credit expansion.

For more information, see IRS Publication 946, IRS Form 4562: Depreciation and Amortization, and Instructions for Form 4562.

| Renewable Electricity Production Tax Credit | |
|---|---|
| **Incentive Type:** | Corporate Tax Credit |
| **Eligible Renewable/Other Technologies:** | Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Municipal Solid Waste, Refined Coal, Indian Coal, Small Hydroelectric |
| **Applicable Sectors:** | Commercial, Industrial |
| **Amount:** | 1.9¢/kWh for wind, geothermal, closed-loop biomass; 1.0¢/kWh for others. Applies to first 10 years of operation. |
| **Authority 1:** | 26 USC § 45 |
| **Date Enacted:** | 1992 |

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| Renewable Electricity Production Tax Credit (cont.) | |
|---|---|
| **Authority 2:** | The Working Families Tax Relief Act of 2004 (H.R. 1308) |
| **Date Enacted:** | 10/4/2004 |
| **Effective Date:** | 1/1/2004 |
| **Expiration Date:** | 12/31/2005 |
| **Authority 3:** | American Jobs Creation Act of 2004 (H.R. 4520)—Sec. 710 |
| **Date Enacted:** | 10/22/2004 |
| **Effective Date:** | varies by technology |
| **Expiration Date:** | 12/31/2008 for refined coal; 12/31/05 for others |
| **Authority 4:** | Energy Policy Act of 2005 (Section 1301) |
| **Date Enacted:** | 8/8/2005 |
| **Effective Date:** | 8/8/2005 |
| **Expiration Date:** | 1/1/2008 for renewables |
| **Authority 5:** | The Tax Relief and Health Care Act of 2006 (H.R. 6111) |
| **Date Enacted:** | 12/20/2006 |
| **Expiration Date:** | 12/31/2008 |
| **Website:** | http://www.irs.gov/pub/irs-pdf/f8835.pdf |

**Summary:**

The Renewable Electricity Production Credit (REPC) is a per kilowatt-hour tax credit for electricity generated by qualified energy resources. Enacted as part of the Energy Policy Act of 1992, the credit expired at the end of 2001, and was subsequently extended in March 2002 as part of the Job Creation and Worker Assistance Act of 2002 (H.R. 3090). The tax credit then expired at the end of 2003 and was not renewed until October 4, 2004, as part of H.R. 1308, the Working Families Tax Relief Act of 2004, which extended the credit through December 31, 2005. The Energy Policy Act of 2005 (H.R. 6) modified the credit and extended it through December 31, 2007. In December 2006, the credit was extended for yet another year (through December 31, 2008) by Section 207 of the Tax Relief and Health Care Act of 2006 (H.R. 6111).

Section 710 of the "American Jobs Creation Act of 2004" (H.R. 4520), expanded REPC to include additional eligible resources—geothermal energy, open-loop biomass, solar energy, small irrigation power, landfill gas, municipal solid waste combustion, and refined coal—in addition to the formerly eligible wind energy, closed-loop biomass, and poultry-waste energy resources. The Energy Policy Act of 2005 (EPAct 2005) further expanded the credit to certain hydropower facilities and Indian coal (coal reserves owned

*continued*

**Renewable Electricity Production Tax Credit (cont.)**

by an Indian tribe or were held in trust by the U.S. for the benefit of an Indian tribe). Note that as a result of EPAct 2005, solar facilities placed into service after December 31, 2005, are no longer eligible for this incentive.
REPC now applies to the following resources:

wind
closed-loop biomass
open-loop biomass
geothermal energy
small irrigation power (150 kW–5 MW)
municipal solid waste
landfill gas
refined coal
hydropower
Indian coal

The REPC provides a tax credit of 1.5 cents/kWh, adjusted annually for inflation, for wind, closed-loop biomass and geothermal. Currently, the REPC for these technologies is 1.9 cents/kWh. Electricity from open-loop biomass, small irrigation hydroelectric, landfill gas, municipal solid waste resources, and hydropower receive half that rate—currently 1.0 cent/kWh.

The duration of the credit is 10 years. However, open-loop biomass, geothermal, small irrigation hydro, landfill gas, and municipal solid waste combustion facilities placed into service after 10/22/2004 and before enactment of the Energy Policy Act of 2005 (8/8/2005) are eligible for the credit for a five-year period. Refined-coal facilities will receive $4.375 per ton (indexed for inflation) for a 10-year term. Indian coal production facilities will receive an increase in tax credit during the 7-year period beginning January 1, 2006, in the amount of $1.50/ton through 2009, and $2.00/ton after 2009.

Note, however, that owners of geothermal projects who claim the federal business energy tax credit may not also claim this production tax credit.

A business can take the credit by completing Form 8835, “Renewable Electricity Production Credit,” and Form 3800, “General Business Credit.”

| Renewable Energy Production Incentive | |
|---|---|
| **Incentive Type:** | Production Incentive |
| **Eligible Renewable/Other Technologies:** | Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Geothermal Electric, Livestock Methane, Tidal Energy, Wave Energy, Ocean Thermal, Fuel Cells using Renewable Fuels |
| **Applicable Sectors:** | Tribal Government, Municipal Utility, Rural Electric Cooperative, State/local gov't that sell project's electricity |
| **Amount:** | 1.5 cents per kWh (indexed for inflation) |
| **Terms:** | 10 years |
| **Authority 1:** | 42 USCS § 13317 |
| **Date Enacted:** | 1992, amended 2005 |
| **Website:** | http://www.eere.energy.gov/wip/program/repi.html |

**Summary:**

The Renewable Energy Production Incentive (REPI) provides financial incentive payments for electricity produced and sold by new qualifying renewable energy generation facilities. Qualifying facilities are eligible for annual incentive payments of 1.5 cents per kilowatt-hour (1993 dollars and indexed for inflation) for the first ten year period of their operation, subject to the availability of annual appropriations in each Federal fiscal year of operation.

REPI was originally authorized under section 1212 of the Energy Policy Act of 1992 and had expired for new projects as of 9/30/03. However, Section 202 of the Energy Policy Act of 2005 (H.R. 6) reauthorized appropriations for fiscal years 2006 through 2026 and expanded the list of eligible technologies and facilities owners. See 42 USCS § 13317 above for the new REPI statute. New regulations established as a result of the new law will be posted when they become available.

Eligible electric production facilities include not-for-profit electrical cooperatives, public utilities, state governments, Commonwealths, territories, possessions of the U.S., the District of Columbia, Indian tribal governments, or a political subdivision thereof, or Native Corporations that sell the project's electricity to someone else.

Qualifying facilities must use solar, wind, geothermal (with certain restrictions as contained in the rulemaking), or biomass (except for municipal solid waste combustion), landfill gas, livestock methane, and ocean (including tidal, wave, current, and thermal) generation technologies. Fuel cells using hydrogen derived from eligible biomass facilities are also considered an eligible technology.

*continued*

**Renewable Energy Production Incentive (cont.)**

If there are insufficient appropriations to make full payments for electric production from all qualified facilities for a fiscal year, 60% of appropriated funds are to be assigned to facilities that use solar, wind, ocean (including tidal, wave, current, and thermal), geothermal, or closed-loop biomass technologies; and 40% of appropriated funds for the fiscal year to other projects.

REPI complements sections 1914 and 1916 of the Energy Policy Act of 1992, which provide tax incentives to certain private sector entities for certain types of new renewable energy generation facilities.

| Residential Energy Conservation Subsidy Exclusion (Corporate) | |
|---|---|
| **Incentive Type:** | Corporate Exemption |
| **Eligible Efficiency Technologies:** | Yes; specific technologies not identified |
| **Eligible Renewable/Other Technologies:** | Solar Water Heat, Solar Space Heat, Photovoltaics |
| **Applicable Sectors:** | Residential, Multi-Family Residential |
| **Amount:** | 100% of the subsidy |
| **Terms:** | Applies to energy conservation measures on dwelling units only |
| **Authority 1:** | 26 USC § 136 |
| **Website:** | http://www.irs.gov/publications/p525/index.html |

**Summary:**

According to Section 136 of the IRS Code, energy conservation subsidies provided by public utilities, either directly or indirectly, are nontaxable: "Gross income shall not include the value of any subsidy provided (directly or indirectly) by a public utility to a customer for the purchase or installation of any energy conservation measure."

Energy conservation measure includes installations or modifications that are primarily designed to reduce consumption of electricity or natural gas, or improve the management of energy demand.

Dwelling unit includes a house, apartment, condominium, mobile home, boat, or similar property. If a building or structure contains both dwelling and other units, any subsidy must be properly allocated.

Other types of utility subsidies that may come in the form of credits or reduced rates are also nontaxable. See IRS Publication 525.

| Residential Energy Conservation Subsidy Exclusion (Personal) | |
|---|---|
| **Incentive Type:** | Personal Exemption |
| **Eligible Efficiency Technologies:** | Yes; specific technologies not identified |
| **Eligible Renewable/Other Technologies:** | Solar Water Heat, Solar Space Heat, Photovoltaics |
| **Applicable Sectors:** | Residential, Multi-Family Residential |
| **Amount:** | 100% of subsidy |
| **Authority 1:** | 26 USC § 136 |
| **Website:** | http://www.irs.gov/publications/p525/index.html |

**Summary:**

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Dwelling unit includes a house, apartment, condominium, mobile home, boat, or similar property. If a building or structure contains both dwelling and other units, any subsidy must be properly allocated.

Other types of utility subsidies that may come in the form of credits or reduced rates may also be nontaxable: See IRS Publication 525

| Residential Energy Efficiency Tax Credit | |
|---|---|
| **Incentive Type:** | Personal Tax Credit |
| **Eligible Efficiency Technologies:** | Water Heaters, Furnaces, Boilers, Heat pumps, Air conditioners, Building Insulation, Windows, Doors, Roofs, Circulating fan used in a qualifying furnace |
| **Eligible Renewable/Other Technologies:** | Geothermal Heat Pumps |
| **Applicable Sectors:** | Residential |
| **Amount:** | 10% of cost of building envelope improvements; 100% for qualified energy property (heating, cooling, water heaters) |
| **Maximum Incentive:** | Varies by technology; no more than $500 credit for all energy property and envelope improvements for all tax years. |
| **Equipment/Installation Requirements:** | Equipment must be new and in compliance with all applicable performance and safety standards; performance and quality standards vary by technology |
| **Authority 1:** | 26 USC § 25C |
| **Date Enacted:** | 8/8/2005 |
| **Effective Date:** | 1/1/2006 |
| **Expiration Date:** | 12/31/2007 |
| **Website:** | http://www.irs.gov/newsroom/article/0,,id=154657,00.html |

**Summary:**

The Energy Policy Act of 2005 established tax credits for energy efficiency improvements in the building envelope of existing homes and for the purchase of high-efficiency heating, cooling, and water heating equipment. Efficiency improvements and/or equipment must be placed in service from January 1, 2006 through December 31, 2007 and must serve a dwelling in the United States owned and used by the tax payer as a primary residence. The maximum amount of homeowner credit for all improvements combined is $500 during the two-year period of the tax credit.

***Building Envelope Improvements***

Owners of existing homes can receive tax credits of up to 10% of the cost of upgrading the efficiency of the building's envelope. Components eligible for the credit include:

> insulation materials and systems designed to reduce a home's heat loss or gain; exterior doors and windows (including skylights); and pigmented metal roofs designed to reduce heat gain.

*continued*

**Residential Energy Efficiency Tax Credit (cont.)**

Credits for windows are not to exceed $200, and the total amount of credits for building envelope measures and other qualified energy property outlined below must not exceed $500.

Improvements should be expected to remain in use for at least 5 years. Roofs with pigmented coatings must meet Energy Star requirements, and all other improvements must meet 2000 International Energy Conservation Code criteria, including supplements. Manufactured homes conforming to Federal Manufactured Home Construction and Safety Standards also qualify.

***Heating, Cooling, and Water Heating Equipment***

Purchasers of qualified energy efficient property are eligible for tax credits up to the total expenditures on such property. The credit can also be applied to labor costs for assembly and original installation of this property. Eligible property and maximum credit amounts are as follows:

electric heat pump water heaters [$300];
electric heat pumps [$300];
geothermal heat pumps [$300];
central air conditioners [$300];
natural gas, propane, or oil water heaters [$300];
natural gas, propane, or oil furnace or hot water boilers [$150]; and
advanced main air circulating fans [$50].

Performance and quality standards for tax credit eligibility vary by technology. See 26 USC § 25C above for details. In addition, the Internal Revenue Service (IRS) has provided the following interim guidance, pending the issuance of regulations, relating to the credit: IRS Notice 2006-26

| Residential Solar and Fuel Cell Tax Credit | |
|---|---|
| **Incentive Type:** | Personal Tax Credit |
| **Eligible Renewable/Other Technologies:** | Solar Water Heat, Photovoltaics, Fuel Cells, Other Solar Electric Technologies |
| **Applicable Sectors:** | Residential |
| **Amount:** | 30% |
| **Maximum Incentive:** | $2,000 for solar electric and solar water heating; $500 per 0.5 kW for fuel cells |
| **Carryover Provisions:** | Excess credit may be carried forward to succeeding tax year |
| **Eligible System Size:** | Not specified |
| **Equipment/Installation Requirements:** | Solar water heating property must be certified by SRCC or by comparable entity endorsed by the state. At least half the energy used to heat the dwelling's water must be from solar in order for the solar water heating property expenditures to be eligible. |
| **Authority 1:** | 26 USC § 25D |
| **Date Enacted:** | 8/8/2005 |
| **Effective Date:** | 1/1/2006 |
| **Expiration Date:** | 12/31/2008 |

**Summary:**

The Energy Policy Act of 2005 (H.R. 6, Sec. 1335) established a 30% tax credit up to $2,000 for the purchase and installation of residential solar electric and solar water heating property. An individual can take both a 30% credit up to the $2,000 cap for a photovoltaic system and a 30% credit up to a separate $2,000 cap for a solar water heating system. A 30% tax credit up to $500 per 0.5 kilowatt (kW) is also available for fuels cells. Initially scheduled to expire at the end of 2007, the tax credits were extended through December 31, 2008, by Section 206 of the Tax Relief and Health Care Act of 2006 (H.R. 6111).

Solar water heating property must be certified for performance by the Solar Rating Certification Corporation (SRCC) or a comparable entity endorsed by the government of the state in which the property is installed. Note that the tax credit does not apply to solar water heating property for swimming pools or hot tubs.

*continued*

**Residential Solar and Fuel Cell Tax Credit (cont.)**

The credit is calculated based on the individual's expenditures excluding subsidized energy financing, which is defined as "financing provided under a Federal, State, or local program a principal purpose of which is to provide subsidized financing for projects designed to conserve or produce energy." Consumers who receive other incentives are advised to consult with a tax professional regarding how to calculate this federal tax credit.

If the federal tax credit exceeds tax liability, the excess amount may be carried forward to the succeeding taxable year. Expenditures include labor costs for the onsite preparation, assembly, or original installation of the system and for piping or wiring to interconnect the system to the dwelling.

To be eligible for the credit, a system must be "placed in service" or activated on or after January 1, 2006, and on or before December 31, 2008. Expenditures with respect to the equipment are treated as made when the installation is completed. If the installation is on a new home, the "placed in service" date is the date of occupancy by the homeowner.

| Tribal Energy Program Grant | |
|---|---|
| **Incentive Type:** | Federal Grant Program |
| **Eligible Renewable/Other Technologies:** | Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Photovoltaics, Wind, Biomass, Hydroelectric, Geothermal Electric, Geothermal Heat Pumps |
| **Applicable Sectors:** | Tribal Government |
| **Amount:** | Varies |
| **Max. Limit:** | Varies |
| **Terms:** | Varies |
| **Website:** | http://www.eere.energy.gov/tribalenergy/ |

**Summary:**

DOE's Office of Energy Efficiency and Renewable Energy's Tribal Energy Program provides financial and technical assistance to tribes for feasibility studies and shares the cost of implementing sustainable renewable energy installations on tribal lands. This program seeks to promote tribal energy self-sufficiency and fosters employment and economic development on America's tribal lands.

*continued*

**Tribal Energy Program Grant (cont.)**

Tribal Energy Program funding is awarded through a competitive process. Each solicitation will include instructions on how to apply, application content, and the criteria by which applications will be selected for funding. Consult the program Web site above for current funding opportunities and past solicitations.

The program is managed by EERE's Weatherization and Intergovernmental Program, implemented by the DOE Goldern Field Office, and technical support is provided by Sandia National Laboratories and the National Renewable Energy Laboratory.

| **USDA Renewable Energy Systems and Energy Efficiency Improvements Program** | |
|---|---|
| **Incentive Type:** | Federal Grant Program |
| **Eligible Efficiency Technologies:** | Yes; specific technologies not identified |
| **Eligible Renewable/Other Technologies:** | Solar Water Heat, Solar Space Heat, Photovoltaics, Wind, Biomass, Geothermal Electric, Geothermal Heat Pumps, Hydrogen, Direct-Use Geothermal, Anaerobic Digestion, Renewable Fuels, Fuel Cells using Renewable Fuels |
| **Applicable Sectors:** | Commercial, Agricultural |
| **Amount:** | Grants: 25% of eligible project costs; Guaranteed loans: 50% of eligible project costs |
| **Max. Limit:** | Grants: $500,000 per renewable-energy project; Guaranteed loans: $10 million |
| **Authority 1:** | Farm Security And Rural Investment Act of 2002 (Sec. 9006) |
| **Date Enacted:** | 5/13/2002 |
| **Effective Date:** | FY 2003 |
| **Expiration Date:** | FY 2007 |
| **Authority 2:** | Renewable Energy Systems and Energy Efficiency Improvements Program (Final Rule: 7 CFR 42480)) |
| **Effective Date:** | 7/18/2005 |
| **Summary:** | |
| Current deadlines for applications: Grant Applications must be completed and submitted to the appropriate USDA Rural Development State Office no later than May 18, 2007. Guaranteed Loans and Combined Guaranteed Loans and Grants Applications must be | |

*continued*

**USDA Renewable Energy Systems and Energy Efficiency Improvements Program (cont.)**

completed and submitted to the appropriate USDA Rural Development State Office no later than July 2, 2007.

Section 9006 of the 2002 Farm Bill requires the U.S. Department of Agriculture (USDA) to create a program to make direct loans, loan guarantees, and grants to agricultural producers and rural small businesses to purchase renewable-energy systems and make energy-efficiency improvements. Funds were appropriated for FY 2002 through FY 2007. This program is known as the Renewable Energy Systems and Energy Efficiency Improvements Program.

The maximum grant award is 25% of eligible project costs up to $500,000 for renewable energy projects and up to $250,000 for energy efficiency improvements. Assistance to one individual or entity is not to exceed $750,000. The minimum grant request is $2,500 for renewable energy projects and $1,500 for efficiency projects. Eligible renewable energy projects include wind, solar, biomass and geothermal; and hydrogen derived from biomass or water using wind, solar or geothermal energy sources. Applications must be submitted to the appropriate Rural Development State Office.

Under the guaranteed loan option, funds up to 50% of eligible project costs (with a maximum project cost of $10 million) are available. The minimum amount of a guaranteed loan made to a borrower is $5,000. A combined grant and guaranteed loan under this program cannot exceed 50% of eligible project costs, and the applicant or borrower is responsible for having other funding sources for the remaining funds. The maximum percentage of guarantee ranges from 70% to 85% depending on the loan value; the percentage for a given project will be negotiated between the lender and the Rural Business-Cooperative Service. The interest rate will be negotiated between the lender and the applicant and the repayment term must not exceed 30 years for real estate, 20 years for machinery and equipment, and seven years for working capital.

The USDA has implemented this program through a Notice of Funds Availability (NOFA) for each of the last four years. The latest round of funding was made available in March 2007 and is available in the form of grants, guaranteed loans, and combined guaranteed loans and grant applications.

For FY 2007 there is approximately $11.4 million in funding for competitive grants and $176.5 million in authority for guaranteed loans. Any unused guaranteed loan funding as of August 1, 2007, may be pooled and revert to grant funding.

The USDA will determine each year if direct loan funds are available. If funds are available, a NOFA will appear in the Federal Register.

| USDA Renewable Energy Systems and Energy Efficiency Improvements Program | |
|---|---|
| **Incentive Type:** | Federal Loan Program |
| **Eligible Efficiency Technologies:** | Yes; specific technologies not identified |
| **Eligible Renewable/Other Technologies:** | Solar Water Heat, Solar Space Heat, Photovoltaics, Wind, Biomass, Geothermal Electric, Geothermal Heat Pumps, Hydrogen, Direct-Use Geothermal, Anaerobic Digestion, Renewable Fuels, Fuel Cells using Renewable Fuels |
| **Applicable Sectors:** | Commercial, Agricultural |
| **Amount:** | Grants: 25% of eligible project costs; Guaranteed loans: 50% of eligible project costs |
| **Max. Limit:** | Grants: $500,000 per renewable-energy project; Guaranteed loans: $10 million |
| **Authority 1:** | Farm Security And Rural Investment Act of 2002 (Sec. 9006) |
| **Date Enacted:** | 5/13/2002 |
| **Effective Date:** | 2003 |
| **Expiration Date:** | FY 2007 |
| **Authority 2:** | Renewable Energy Systems and Energy Efficiency Improvements Program (Final Rule: 7 CFR 42480) |
| **Effective Date:** | 7/18/2005 |

**Summary:**

Current deadlines for applications: Grant Applications must be completed and submitted to the appropriate USDA Rural Development State Office no later than May 18, 2007. Guaranteed Loans and Combined Guaranteed Loans and Grants Applications must be completed and submitted to the appropriate USDA Rural Development State Office no later than July 2, 2007.

Section 9006 of the 2002 Farm Bill requires the U.S. Department of Agriculture (USDA) to create a program to make direct loans, loan guarantees, and grants to agricultural producers and rural small businesses to purchase renewable-energy systems and make energy-efficiency improvements. Funds were appropriated for FY 2002 through FY 2007. This program is known as the Renewable Energy Systems and Energy Efficiency Improvements Program.

*continued*

**USDA Renewable Energy Systems and Energy Efficiency Improvements Program (cont.)**

The maximum grant award is 25% of eligible project costs up to $500,000 for renewable energy projects and up to $250,000 for energy efficiency improvements. Assistance to one individual or entity is not to exceed $750,000. The minimum grant request is $2,500 for renewable energy projects and $1,500 for efficiency projects. Eligible renewable energy projects include wind, solar, biomass and geothermal; and hydrogen derived from biomass or water using wind, solar or geothermal energy sources. Applications must be submitted to the appropriate Rural Development State Office.

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For FY 2007 there is approximately $11.4 million in funding for competitive grants and $176.5 million in authority for guaranteed loans. Any unused guaranteed loan funding as of August 1, 2007, may be pooled and revert to grant funding.

The USDA will determine each year if direct loan funds are available. If funds are available, a NOFA will appear in the Federal Register.

## C. State and local incentive programs

Beyond federal incentive programs, state and municipal governmental entities across the country have created an equally vast spectrum of tax credit and financial packages designed to enhance the green building design and construction process. Many of these programs are surprisingly sophisticated and, in some, provide greater incentives than the federal venue. Again, careful research should be conducted at the planning stage of every green building project in order to assess these resources.

By way of example, in the State of California, which has traditionally taken the lead in encouraging the green building industry, there are literally hundreds of grant and incentive programs designed to assist green building projects. These programs afford an opportunity to access a menu of grants, loans rebates and financial incentives. Just a few of the programs currently available include:

- ***Marin County—Marin's BEST! Energy Incentive Program***
- ***San Diego County—Green Building Program***
- ***Santa Monica—Building Permit Fee Waiver for Solar Projects***
- ***Santa Monica—Expedited Permitting for Green Buildings***
- ***Santa Clara Water & Sewer—Solar Water Heating Program***
- ***Santa Monica—Green Building Grant Program***
- ***Marin County—Solar Rebate Program***
- ***Tax Deduction for Interest on Loans for Energy Efficiency***
- ***SCE—Biomass Standard Contract***
- ***Supplemental Energy Payments (SEPs)***
- ***Property Tax Exemption for Solar Systems***
- ***Energy Efficiency Financing Program***
- ***California Solar Initiative Incentives***
- ***Emerging Renewables Program***
- ***Self-Generation Incentive Program***
- ***Alameda Power and Telecom—Key Account Energy Efficiency Grant Program***

- ***Alameda Power and Telecom—Weatherization Cash Grant Energy Efficiency Program***
- ***Anaheim Public Utilities—Residential Energy Efficiency Grant Program***
- ***Burbank Water & Power—Business Bucks Energy Efficiency Grant Program***
- ***Riverside Public Utilities—Energy Efficiency Technology Grant Program***
- ***Alameda Power and Telecom—Commercial Energy Efficiency Loan Program***
- ***IID Energy—Residential Energy Efficiency Loan Program***
- ***LADWP—Non-Residential Efficiency Wise Loan Program***
- ***Pacific Power—Energy FinAnswer***
- ***Roseville Electric—Residential HVAC Financing Program***
- ***SDG&E—Non-Residential On-Bill Financing Program***
- ***SMUD—Commercial Energy Efficiency Loan Program***
- ***SMUD—Residential Energy Efficiency Loan Program***
- ***SMUD—Residential Solar Loan Program***
- ***SoCalGas—Non-Residential On-Bill Financing Program***
- ***Alameda Power and Telecom—Commercial Energy Efficiency Rebate Program***
- ***Anaheim Public Utilities—Green Building Rebate Program***
- ***Anaheim Public Utilities—Greener Cleaners Energy Efficiency Incentive Program***
- ***Anaheim Public Utilities—New Construction Energy Efficiency Incentives Program***
- ***Anaheim Public Utilities—PV Buydown Program***
- ***Anaheim Public Utilities—Residential Home Efficiency Rebate Program***
- ***Anaheim Public Utilities—Small Business Energy Management Assistance Program***
- ***Burbank Water & Power—Business Energy Efficiency Rebate Program***
- ***Burbank Water & Power—Green Building Incentive Program***
- ***Burbank Water & Power—Residential & Commercial Solar Support Program***
- ***Burbank Water & Power—Residential Energy Efficiency Rebate Program***
- ***City of Lompoc Utilities—Commercial Lighting Program***

- ***City of Lompoc Utilities—Residential Energy Efficient Appliance Rebate Program***
- ***City of Lompoc Utilities—Residential Refrigerator Energy Efficiency Programs***
- ***Colton Public Utilities—PV Rebate Program***
- ***Glendale Water and Power—Medium and Large Business Energy Efficiency Solutions***
- ***Glendale Water and Power—Peak Hogs Energy Efficiency Rebate Program***
- ***Glendale Water and Power—Residential Energy Efficiency Rebate Program***
- ***Glendale Water and Power—Small Business Energy Efficiency Rebate Program***
- ***Glendale Water and Power—Solar Solutions Program***
- ***Hercules Municipal Utility—PV Rebate Program***
- ***Hercules Municipal Utility—Residential Energy Efficiency Rebate Program***
- ***IID Energy—PV Solutions Rebate Program***
- ***IID Energy—Residential Energy Efficiency Rebate Program***
- ***LADWP—Non-Residential Energy Efficiency Rebate Program***
- ***LADWP—Residential Energy Efficiency Rebate Program***
- ***LADWP—Solar Incentive Program***
- ***Lassen Municipal Utility District—Public Benefit Energy Efficiency Program***
- ***Lassen Municipal Utility District—Residential Energy Efficiency Rebate Program***
- ***Lodi Electric Utility—Residential Energy Efficiency Rebate Program***
- ***Modesto Irrigation District—Commercial Power Saver Rebate Program***
- ***Modesto Irrigation District—Custom Commercial Power Saver Rebate Program***
- ***Modesto Irrigation District—Residential Power Saver Plus Rebate Program***
- ***Pacific Power—Irrigation Initiative***
- ***Palo Alto Utilities—Commercial Advantage Energy Efficiency Program***
- ***Palo Alto Utilities—PV Partners***
- ***Palo Alto Utilities—Smart Energy Rebate Program***

- ***Pasadena Water and Power—Residential Energy Efficiency Rebate Program***
- ***Pasadena Water and Power—Solar Power Installation Rebate***
- ***PG&E—Non-Residential Energy Efficiency Rebates***
- ***PG&E—Residential Energy Efficiency Rebate Programs***
- ***Plumas-Sierra REC—Residential Energy Efficiency Rebate Program***
- ***Redding Electric—Earth Advantage Rebate Program***
- ***Redding Electric—Residential and Commercial Energy Efficiency Rebate Program***
- ***Riverside Public Utilities—Commercial Energy Efficiency Rebate Program***
- ***Riverside Public Utilities—Energy Efficiency Construction Incentive***
- ***Riverside Public Utilities—Residential Energy Efficiency Rebate Program***
- ***Riverside Public Utilities—Residential PV Incentive Program***
- ***Roseville Electric—Commercial Energy Efficiency Rebate Program***
- ***Roseville Electric—New Commercial Construction Energy Efficiency Rebate Program***
- ***Roseville Electric—PV Buy Down Program***

While the above partial listing may seem like overkill, it clearly demonstrates the willingness of local government to assist and encourage the principles espoused by green building.

On the local municipal level, many jurisdictions have advanced equally sophisticated programs invoking a "grassroots" approach to assisting green building projects. Indeed, some of these local programs, such as those found in Arlington, Virginia; Austin, Texas, King County, Washington; and Seattle, Washington have received national recognition for their innovation and commitment to getting green building projects off the ground.

## D. Developing a Proactive Risk Management Strategy

Achieving profit in sustainability and avoiding liability in green building requires a carefully orchestrated risk management strategy that is developed at

the beginning of the construction process and continues after completion. Risk management is not simply addressing liability and avoiding losses. In its purest form, the fundamental philosophy of risk management is *to set into motion a set of actions used to contribute towards the likelihood of achieving and surpassing planned objectives over a defined timeframe.* Risk management within the green building process follows this track. The key to a successful risk management strategy is careful planning and coordination from the inception of the project, through design and construction, and finally, throughout the functional life of the site. Each phase of the construction process raises unique issues to be incorporated within the overall risk management of the project.

It is impossible to provide a comprehensive formula for risk management, because each green building project is unique. There are, nevertheless, recurring issues and concerns that should serve as a foundation for planning. These arise at different phases of construction.

**1. Site Selection**

While "location, location, location…" is the resounding mantra in the real estate market, site selection plays a critical role in the process of planning and designing in green building. There are several critical factors that should be incorporated within the site selection process in every green building project:

***Secure a comprehensive and legal survey***

While this may sound academic, surprisingly many projects are initiated without a comprehensive and legally recognized survey of the site. This often creates problems down the road—particularly in environmentally sensitive projects that suddenly face unexpected issues arising from the nature of the site. A

comprehensive survey is critical to a green building project. Ideally, it should include the surrounding 3,000 foot radius of the site so that potential issues arising from adjacent property owners can be anticipated, as well governmental and zoning issues. The survey should be updated and certified by the appropriate surveying professional.

***Develop a comprehensive inventory of the site's physical and natural resources***

Review the proposed site and investigate its physical resources thoroughly. Include in your investigation features such as: Site Topography; Flood Zones; Wetlands; Geotechnical Factors; Land Use History; and Zoning History.

***Perform a thorough review of the infrastructure***

Again, this appears to be an academic issue, but in green building development, a key consideration will be the impact fees and profitability of the design. Thus auditing the availability, capacities and economics of the site's gas, electricity, water, sewerage, vehicle, telecommunications is critical.

***Know the political atmosphere of the site beforehand***

Knowing your political friends and enemies within the community can be of great assistance in developing a green building project. Assess and investigate the attitudes of the community towards your project. Evaluate potential areas of support including local special interest groups, planning and zoning boards and political leaders. Also analyze the governmental layers of authority and review that you will have to encounter along the process.

***Seek assistance from the appropriate professional and "think outside the box"***

Using professionals with specialized knowledge and skills can make the process far more appealing and easier to coordinate. Consider specialties such as: Corporate Relocation Planners; Space Planners; Landscape Architects; Civil Engineers; Biologists; and Traffic Planners.

***Develop a checklist to assist in the process***

A comprehensive review of how the site will function will often guide the design process. As part of your site evaluation, include a consideration of:

- **The purpose of the proposed facility**
- **The number of units**
- **The hours and intensity of operation**
- **The market to be served by the facility**
- **If manufacturing is involved, evaluate the manufacturing and distribution process such as the transport of supplies, materials and inventory;**
- **Personnel including executive and support staff**
- **Building area required (including future expansion)**
- **Building types**
- **Building requirements (i.e. loading, floors, special requirements)**
- **Building environment requirements**
- **Access and site requirements**
- **Utility requirements**
- **Water requirements**
- **Sewage and Waste Requirements**

- **Mitigation procedures for hazardous operations or materials**
- **Fire & Safety requirements**
- **Communication requirements**
- **Security risks**

2. **Pre-Construction Phase**

Sustainability is not a tangible item, material or product that can be purchased for a green building project. It is the ultimate benefit that you can achieve by pursuing a wise and careful process of design, construction and operation of a building. The risk management process begins with setting the goals and objectives of the green building project—and equally important—recognizing its limitations.

During the pre-construction phase, a good risk management strategy will include the following:

- **Identify the players that will be needed to make authoritative decisions on the goals of the project;**
- **Establish definitive financial goals and objectives for the project and make sure that they are well researched and documented;**
- **In addition to financial goals, identify the collateral goals that need to be achieved with the construction process. For example, will the project seek specialized certification such as a LEED rating? Are there public relations issues that can foster and improve the project process?**
- **Beyond the collateral goals, it is often necessary to identify community environmental goals and objectives as well.**
- **Focus on securing a consensus of philosophy with all the critical team members on the green building process. Make**

**sure that stakeholders appreciate the investment required both in planning, added expense and the need for specialized knowledge and skills.**

- **Identify and establish a comprehensive plan for the economic performance of the building project including a long range investment strategy, discount rate and tax rates.**
- **Identify an exit strategy for the project.**
- **Identify potential governmental programs and incentives for the project and appoint a member of the construction team as the key player to utilize these programs.**
- **Identify cost budget issues for the construction process and ensure that minimum acceptable return on investment standards have been appropriately set.**
- **Consider alternative budget/cost scenarios that may be required in order to meet green project design criteria.**
- **Identify design objectives on renewable energy sources in quantifiable terms.**
- **Identify all of the potential funding sources for the project.**
- **Confirm that the appropriate design team members have been selected. This includes confirmation of the appropriate certifications and experience in green building design. Set a goal that at least one managing member of the design/planning team is an accredited LEED professional.**
- **If key members of the team lack appropriate skills in green building design and construction, consider additional training for these members such as workshops and seminars.**

### 3. Programming Phase

Beyond the initial pre-construction phase, a good risk management strategy will incorporate the considerations presented above into the programming phase of the process. The strategy will also:

- **Identify the requirements for space in the building breaking down these areas as gross, rentable and usable square footage. Consider the green building processes and systems that can best enhance the sustainability of each parcel.**
- **Identify and utilize factors that will permit the design to be flexible to adapt to changes in use and occupancy.**
- **Identify civic and governmental plans and criteria applicable to the programming of the building.**
- **Identify end-users that may assist in the planning and programming of the building during the early stages of construction and design. Can these end-users be educated as well on the green building process?**
- **Identify maintenance issues during the programming stage. Will the green building process create unique circumstances that will necessitate additional maintenance?**
- **Consider the potential turnover of occupancy of the building over an extended time period. Identify whether this will affect the choice of green building design methods.**

## 4. Conceptual and Design Phase

A risk management strategy will also assist the design process. In green building, the design process is critical to an effective and sustainable result. Thus, a risk management strategy should:

- **Identify clear objectives on how "green" the building design will be. Will the building concept trumpet the green building process itself or play a subtle role aimed at enhancing operation and sustainability?**
- **Determine whether the utilization of the green building process raise marketing issues that can benefit the project.**
- **Determine whether natural resources at the site will be incorporated into the green building process. For example, is there unique foliage and wildlife at the general site that can benefit from the green design?**
- **Identify water use and storm water management issues. These issues may include: the management of storm water; the storage of storm water such as the use of bioswales; the use of roofing and paving materials that will mitigate storm water runoff; the use of treatment systems that will mitigate sediment and chemical accumulation; the use of "grey water" for bathroom and irrigation purposes.**
- **Determine whether the design incorporates the unique features of the natural state of the site. This issue may incorporate a wide variety of concerns such as: the use of vegetation to act as a cooling method; orientating the building to take advantage of the sites natural lighting and to optimize passive solar heating methods; the topography of the site, including wind and thermal patterns.**

- **Ensure that a variety of green building methods will be considered and/or incorporated into the design process, including:**

    - **Green roof methodology**
    - **Natural Lighting Sources**
    - **Energy Conservation methods**
    - **HVAC Compliance with suggested codes**
    - **Conforming conservation procedures with 1992 Energy Policy Act including establishing a baseline for potable water consumption**
    - **Recycled steel structures**
    - **Use of green power methods**
    - **Ventilation standards conforming to ASHRAE Standard 55-1992**
    - **Mechanical systems**

During the design phase, it is critical that a risk management strategy coordinates the explicit green goals and expectations that were formulated with the inception of the project. The communication of expectations is particularly important between and among the stakeholders in the green building process. These expectations include the financial feasibility of the construction materials, methods and processes utilized. If recycled, reclaimed or salvaged materials are being incorporated into the green building process, then this factor should be carefully assessed and reviewed with stakeholders.

It is equally critical for the risk management strategy to document compliance with applicable green building standards and governmental codes. This includes incorporating a reliable third-party certification process during the design phase. A qualified third-party can provide

invaluable assistance in coordinating the green design aspects of the project. An independent commissioning agent should complete a focused review of design intent at the completion of the conceptual process.

**5. Bidding and Negotiation Phase**

The green building process requires a carefully drawn risk management strategy during bidding and negotiation. This is particularly true in the drafting of construction documents and communicating with contractors. While this requirement exists in every construction process, in successful green building, the devil is particularly in the details.

Contract documents must clearly explain the sustainability goals of the project. The specifications should incorporate the governing standards that will apply to the project. These standards should be explicitly incorporated within the contract documents. For any materials, systems or processes that may be interpreted by bidding as unconventional, the contract documents should address the availability of specific items, and provide additional sources of information that will enable a contractor to make an intelligent and reliable assessment.

The contract documents should also address:

- **The required levels of energy efficiency and the detailed expectations of performance for the building**
- **Provide third party verification of methods to be employed by contractors**
- **Provide detailed specifications for critical green building systems such as HVAC and ventilation, lighting, electrical consumption, interior materials, water usage and heat/cooling conservation methods.**

- **If unique, salvaged or reclaimed materials are to be utilized, then these should be specified in the documents including provisions that the materials be certified by a third party, if applicable.**
- **Requirements that the general contractor develop and implement a construction waste plan and to certify recycling methods.**
- **The documentation that will be required to be produced to establish compliance with governmental incentive programs.**
- **The manner in which alterations, substitutions and amendments to the green building process will be made.**
- **Requirements for coordination of the construction process with the design team**

In all, specifications within the contract documents should provide enough detailed information to ensure that contractors will bid on the work intelligently rather than applying a vague (and costly) "green premium" to the project.

Bidding and negotiation also requires vigilance in green building. The design team should have in place a procedure for identifying and recruiting builders, suppliers, trades and craftsmen that have validated experience and skills in green building. A pre-bidding conference can often weed out undesirable contractors by emphasizing the objectives of the project and the expectations of the design team. An objective criteria should be established to perform an evaluation of potential bidders paying close attention to a particular candidates past history in green building. Bid documents should also be carefully assessed to ensure that they have, in effect, fully complied with the specifications and contract documents.

During the bidding process, it can be valuable to permit bidding contractors an opportunity to provide input into the building methods selected. Bidders should be encouraged to provide alternative ideas and methods if appropriate. If such alternatives are considered, however, they should undergo the same vigorous analysis that any other design aspect has faced.

**6. Construction phase**

During the active construction phase, in addition to the routine risk management issues presented during any project, the green building process will attract additional issues. At the inception of the project, it is essential that the green elements of the project and the proposed certification process be addressed with each contractor and subcontractor.

It also critical that an ongoing system for collecting data and documentation for third party validation be established. As the construction process proceeds, there should be regularly scheduled review of the documentation and continued compliance with LEED directives. As construction matures, a Systems and Operations manual should be developed that will ultimately be required for LEED credit at the time of Commissioning. Regular and systematic reviews to validate key energy and water systems should be implemented as the construction progresses.

Finally, and most importantly, a timeline should be established to ensure that required documentation, testing, and evaluations are completed appropriately for third party validation.

## 7. Insurance Issues

It is without dispute that there are benefits of going green in the construction, development and operation of buildings, but with the benefits come risks specific to the sustainable building industry—many of which may not be covered by a conventional insurance policy. It is critical from an insurance coverage perspective that these risks are identified, and to take the necessary steps to mitigate risk. Green builders and operators have the added duty of ensuring that the facility and its green components are properly insured.

Green building initiatives apply to enterprise risk management. There are the risk factors associated with green initiatives, such as potentially increasing cost of construction, adding technical complexity of systems, ensuring replacement parts and systems are compatible with existing systems, and taking on the basic risk of new technologies.

These unique risk management issues have piqued the interest of the insurance industry. Despite the benefits of green buildings, there are some distinct risks that must be insured. A singular challenge to managing a green operation may be encountered if facilities experience a structural property loss such as a catastrophic fire. Suddenly an owner or facility operator is faced with the dilemma of whether insurance adequately protects the sustainability features of the building. Property insurance in the green building context should cover the loss to property, the resulting loss of income, enable business continuity, and help manage unexpected outcomes of the loss. Addressing these issues after the loss is too late. Routinely, every part of a business must be insured, from HVAC to maintenance to employee practices. If business practices are going green, it becomes imperative for insurance coverage to account for—and to cover—these new sets of risks. When a construction process involves

green building, some of the insurance issues to be considered by the risk management team may include:

- **Are current limits of insurance adequate? Green materials and components can be more expensive than their traditional counterparts. If the company suffers a loss, will the policy limits provide enough to bring operations back to what they were?**

- **Is Replacement Cost coverage or Actual Cash Value coverage being purchased? Replacement Cost pays to replace lost or damaged property with "like kind and quality serving the same purpose." Actual Cash Value reduces the valuation by considering depreciation.**

- **What "perils" are covered? Is coverage broad enough to meet predetermined green risk management objectives?**

- **Does the insurance policy offer any green upgrade coverage? Some companies may allow the insured to replace lost or damaged standard property with green alternatives.**

- **Is there coverage for HVAC re-commissioning expense? If an HVAC system is damaged, will the replacement components perform as intended? They may not, without re-commissioning the balance. Indoor air quality could be degraded and energy costs may increase.**

- **Does the insurance carrier offer specialized services such as Crisis Management Coverage to assist with public relations needs following the loss? If an organization is branding itself as**

**green and something goes wrong that negatively affects the environment, it can be critical to have professional advice to assist in the maintenance of brand and reputation.**

Recognizing the unique risks presented in green building, insurance companies are now starting to offer specialized products designed to address green building construction and operation of the facility post-construction. For example, in 2006, Fireman's Fund Insurance Company introduced coverage specifically designed for the unique physical characteristics of a green building. The policy provides protection for building features that may not be fully covered by traditional property insurance policies such as vegetative roofs, alternative power equipment and water systems. The coverage form also includes insurance to divert debris from landfills following a loss and costs to completely flush out the building following post-loss reconstruction. Many green buildings use their alternative power generation equipment to sell excess power back to the grid; the new policy provides coverage for the loss of this income if the equipment is damaged in a loss as well as the cost to purchase replacement power while the equipment is being replaced.

What is particularly attractive about the new green building policy is that coverage premiums are somewhat reduced because of the stringent code reviews and certification process incorporated within the green building process. Moreover, in the event of a loss requiring replacement and commissioning of a new building system, the policy will provide Building Commissioning Expense coverage allowing the building stakeholder to retain engineering services for the certification process.

Other carriers, such as Traveler's and Argo, have also developed similar products. Currently, regulatory authorities in at least 36 states thus far

have approved this new form of coverage, and undoubtedly, the future holds bright promise for insurance products of this nature.

## 8. Allocating Risk during the Green Building Process

Green business risks are real but largely unexplored. Because of the added parameters of a green building project, parties to the construction process—owner, contractor and design professionals—face potential risk in ways that would not ordinarily be encountered in conventional projects. Indeed, at this point in time, the potential liabilities that may arise during a green building project are still being identified, and the ultimate legal resolution of these risks are still to be seen. For this reason, it is critical for the design team and stakeholders to discuss the fair allocation and management of project risks—with risk generally allocated to those in the best position to control it.

As suggested earlier, risk management begins with finding ways to minimize or transfer risk. Then, should potential risk become reality in the green building process, it becomes a matter of absorbing or funding the resulting liability. But the ability to absorb liability is not equal among the respective parties in a green building project. The contract documents should make every attempt to anticipate potential liabilities that may arise in the green building setting and strike a balance at controlling risk.

One strategy for spreading risk among all parties within the green building setting is insurance and the utilization of hold harmless agreements in the construction contract. As a form of indemnification, insurance shifts risk from one party to another. As a result, insurers assume liability in the event of a loss, but, in order to do so, the claimed loss must fall within the coverage protections afforded by the applicable insurance policy. Within

the green building context, this can raise difficult questions, for which, a final answer is yet to be determined.

For example, the strict requirements and standards evoked by a LEED rating for a green building project, and, which is often required in governmentally sponsored projects, may lead the parties and design professionals to enter into guarantees regarding the sustainability of the building in both design and performance. While a contractor or owner may be able to secure coverage protection for an agreement of this nature under builder's risk insurance or a bonding process, an architect's professional liability policy may not necessarily cover a breach of a guarantee of this nature.

A contractor's control over the outcome of a construction project is far more extensive than the design professional. The contractor physically takes control of the owner's property during the construction and builds an improvement, exercising command over the materials, means, methods and sequences used to accomplish the task. Thus, the contractor can be held responsible for damages caused by faulty workmanship and safety concerns while both property and improvement are in its hands. To address this liability, contractors are in a position to provide broad indemnification to the owner through provisions in their contract. In simplest terms, the contractor is in the best position to manage risk and to transfer risk to subcontractors or insurers.

Conversely, design professionals, such as the architect, render specialized services that do not invoke control of the owner's property. Their duty lies in providing competent professional service in a non-negligent manner. They are generally not required to indemnify damages created by third parties. Moreover, design or architectural services are not products subject

to guarantees or warranties. There is no legal obligation on the design professional's part to guarantee performance.

Thus, because of the added factors of green certification, supplemental costs and novelty of method, in green building projects there may be a temptation to require a guarantee from the design professional that far exceeds any duty under law or under a professional liability policy. Design professionals' professional liability insurance policy provides payment for all sums, in excess of the deductible, for which they become legally obligated to pay as damages and claims expenses as a result of an act, error or omission (negligence) in the performance of their professional services. The professional liability policy is unique, specialized and carefully tailored to remain within the limits of the design professional's obligations under the law—nothing more, nothing less.

All professional liability insurance policies on the market today contain similar exclusion provisions with wording to the effect that "the insurance does not apply to liability assumed by the professional under any contract unless the professional would have been liable in the absence of such contract, due to his own error, omission or negligent act." In other words, if the design professional, by contract, assumes the risk of another, and liability is incurred, the insurer is excused from the requirement for coverage. This provision specifically makes all but the narrowest of indemnification clauses effectively uninsurable.

More specifically, in regard to guarantees, a second provision similarly found contains wording that excludes "express warranties or guarantees." The intent is clear and unmistakable, and is again derived by exposure that the professional assumes by contract, which is in excess of what is required by law.

In drafting indemnification and hold harmless agreements in green building contracts, then, a careful line must be drawn between what can be legally enforced and insured and what effectively may amount to an empty promise. Indemnification and guarantee provisions in a professional services agreement between an owner and design professional must be drafted with a sense of balance and to protect the insurability of the green project. Design professionals should ensure that language in green building contracts for professional services clearly indicates that the signing of submittal templates (e.g. LEED certification documents) is solely for the satisfaction of the particular rating system credit and does not constitute any warranty or guarantee on behalf of the design professional.

Construction documents that allocate risk within the green building setting should attempt to "think outside the box" and not just follow the route covered by conventional indemnification clauses. Contract documents should anticipate potential liability scenarios that may take shape at each phase of the process. Some scenarios, like the failure to achieve LEED certification, are self evident. Others, however, may require careful foresight to identify and consider. For example, while there are only a small number of lawsuits in green building projects filed nationwide thus far, the following issues should be entertained when making determinations on the allocation of risk within the construction document:

- **Are guarantees being made by the players or stakeholders that exceed reasonable industry expectations or insurance coverage protections?**
- **Are there novel design aspects to the construction which are untested or may create unique damages if improperly manufactured, installed, or found to be defective? For**

**example, will be a green roof be utilized that may cause water damage or infiltration?**

- **Are there conventional green building design aspects which can, nevertheless, create damages from their very nature? For example, will materials be used that are more sensitive to moisture and which can create the potential for mold exposure? Will acceptable green building methods to be used at the site create collateral issues that impair the business and function of the building itself?**
- **Are there design methods that will be utilized that may be proprietary or subject to intellectual property protection?**
- **Are there design methods or materials or unusual construction procedures that may create a delay in the performance schedule?**
- **Are there confidentiality issues among the respective parties to the contract? Will the design professional or contractor be exposed to proprietary business secrets or procedures that require additional fiduciary duties?**
- **Are there potential revisions or changes to existing green building standards underway that may adversely affect the construction process after work commences?**
- **Will the contract documents encompass the entire universe of conditions and obligations among all principal players or will there be a group of contracts between parties depending on their relationship? Will the contract documents incorporate by reference other agreements or specifications that each party may not have necessarily negotiated?**
- **Do the contract documents attempt to expand the function or duties of any player beyond what is ordinarily found in industry custom and practice?**

- **Do the contract documents provide for methods to address substitution of parties, subcontractors or methods if a problem arises?**
- **Do the contract documents provide for methods of publicizing the project and the respective obligations of each party involved in the publication process?**
- **Do the contract documents create unintended vicarious liability?**
- **Do the contract documents address potential claims and liabilities that may arise from fraud or negligent misrepresentation?**
- **Do the contract documents address cost and budget issues and the respective responsibilities of each party in this regard?**
- **Do the contract documents carefully specify sustainable products and methods by incorporating valid technical data from the manufacturer and address the potential failure to exercise green building due diligence?**
- **Do the contract documents provide a method for resolving disputes in a competent forum, i.e. arbitration, mediation, and utilizing objective neutrals that are skilled and knowledgeable in the green building field?**
- **Have the contract documents been reviewed by counsel knowledgeable in green building matters?**