

Green Building Technology & Energy Conservation

Buildings have a significant impact upon energy use, both in terms of the building envelope as well as building systems and infrastructure. As a result, the Green Building Technology working group has taken on the effort to identify ways to encourage energy conservation, implement green construction practices, suggest and identify potential funding opportunities, encourage “best practices”, and provide guidance for businesses and the community-at-large regarding green and sustainable design opportunities.

Green Building Technology Goal I

Educate all groups in the principles and practices of sustainable and energy-efficient design.

Reducing municipal energy can show the community how they too, can reduce their impact on the environment and save money in the process. Elgin can serve as a model of energy conservation and efficiency. Educational programs inform residents of alternative energy practices. Increased knowledge and interest will help spur future green projects and programs in the community.

Education is vital to implementing sustainable development. A sustainability plan can be enhanced or limited by the level of education attained by the local citizens. An educated community is key to moving beyond an unsustainable community.

This goal can be split into two major parts. The first part is to educate the community about becoming more sustainable and encouraging energy conservation. Seminars can be given and information disseminated that would educate and inform the general public. The second part educates municipal staff about ways to reduce energy and water consumption, which can reduce municipal utility costs.

Objective 1

Produce guidance in sharing with the community-at-large the City’s green buildings, including facts and figures relating to green building technology and energy efficiency.

Tasks/Metrics

1. Assemble list of current sustainable building efforts undertaken by the city of Elgin including all costs, savings as well as a list of materials and contractors used.
2. Post information on informational kiosks at public facilities, online and via government television access channel 17.

Objective 2

Develop a voluntary list identifying existing building stock that meets accepted “green standards.”

Tasks/Metrics

1. Adopt or develop a standard by which properties could be labeled as “green”
2. Develop an outreach mechanism asking building owners or renters to come for inclusion in green building list based on these standards.
3. Initiate discussions with other municipalities in Kane County and beyond to incorporate more regional examples of green building technology.

Foreseeable Challenges

Implementation of a list of existing building stock that meets some sort of “green” standard would be difficult until that “green” standard has been defined. Early on, using the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) guidelines for existing buildings and/ or energy audits is recommended.

Care should also be taken to communicate to users of this list that the city of Elgin is not recommending or providing reference for any of these contractors. Anyone using the list should independently research the contractors and make a selection based on their own research.

Objective 3

Establish a clearinghouse of contractors, grants and organizations, that can assist in educating the public on green building practices, recycling programs, sustainable building material listings and associations available in the Elgin area.

Tasks/Metrics:

1. Research public and private grants, loans, credits, “green” contractors, organizations that can assist in educating the public on green building practices, recycling programs, sustainable building material listings and associations available in the Elgin area.
2. Assemble research into an online database for public consumption and determine the feasibility of a physical location.
3. Disseminate information via web or mail inserts into local water bills.
4. Research private and public grants and credits could be used to aid in offsetting costs to the City and property owners.
5. Some of these funds should be allocated either through City budget or federal and state grants to address the need for education of public, private, and municipal participants. Additional funds should be allocated to encourage education and green job training that beginning as early as high school.

Foreseeable Challenges

Effectively verifying that contractors meet a “green” standard would be difficult. The City would need to rely on industry associations, which may have the contractor’s best interest ahead of the community’s.

Care would also have to be taken to ensure the City, in publishing a list of “green” contractors, remains impartial, not favoring one contractor over the other.

Objective 4

Train municipal staff to lower water and energy utility cost and consumption.

Tasks/Metrics

1. Engage municipal workers in training, ranging from reminding staff to turn off lights to sponsoring the certification of LEED Accredited Professionals.
2. Measure progress by the reduction in municipal utility costs and number of personnel trained in green codes or standards.
3. Make cost savings and procedures available online.

Objective 5

Encourage long-term green technology education at local colleges and high schools to include career training.

Tasks/Metrics

1. Encourage initial and continuing education in sustainable technology and energy conservation. In doing so, Elgin will become more attractive to new industries that focus on sustainability and energy conservation.
2. Work with Economic Development and Healthy Living and Community Education group to further define this.

Green Building Technology Goal II**Develop and implement sustainable building polices**

Create sustainable building policies that promote green building practices and energy efficiency for new construction as well as the retrofitting of existing building structures. This can lead to substantial savings in both the short and long-term, leaving dollars that can be re-circulated in the Elgin area which help our community economic stability and job creation.

Foreseeable Challenges

The challenges are real both within the City and public agencies in infusing sustainability into the fabric of the City's operations. Success will help model adoption within the private community. Hopefully, technology costs can be reduced or discounted and financial mechanisms/bonding power will also become available.

Objectives 1 and 2

Objective 1: Develop and implement employee training workshop program(s) on sustainability.

Objective 2: Develop and implement a sustainability training plan within the next year to infuse an ongoing commitment to the City's projects, services and outreach contacts connected to the plan, including building and energy practices.

These objectives are interrelated. They establish a clear intent to implement and serve as a model for municipalities, public agencies, schools, business groups and their members, multi-family and individual groups. This should include reaching Elgin's numerous and diverse audiences.

These processes and action steps will encourage additional funding through public and private grants, tax credits or discounts as Elgin shows a willingness to build on an ongoing sustainability effort. The actual out-of-pocket dollar costs will be relatively small. There are examples in many states, including some within the Midwest, which can be drawn on for material and support (see additional resources).

Tasks/Metrics

1. Incorporate green building and energy efficiency elements into internal City policies and guidelines for all employees using the city of Elgin Sustainable City Master Plan Phase I document as a guide.
2. Invite stakeholders such as other public agencies and school districts in the area to incorporate similar policies.
3. As opportunities present themselves and are implemented, they should be documented with the benefits derived from being communicated to the community.

Objective 3

Provide information to the local business and development community to assist them in achieving their sustainable building and energy goals.

Tasks/Metrics

1. Provide examples of projects in the Elgin area to give interested parties real-life local examples to emulate. Information about projects in Elgin will be able to give local flavor regarding audits and contractors as building projects are completed and validated.

Objective 4

Review and evaluate Elgin's building code, energy code and standards to support green building technology and energy efficiency.

Code improvements strives towards better practices and higher standards that affect the quality of buildings in all sectors and lead to greater economic, environmental and community results for their owners over their life span.

Tasks/Metrics

1. Review of codes promulgated by ASRA, adopt codes when appropriate
2. Monitor the approval of International Green Construction Code (IgCC)
3. Consider using green building codes such as International Green Construction Code (IgCC) as a guide (especially in new homes or major retrofits which could easily and inexpensively ready the building for future technology installation)



Elgin Academy Rider Center, LEED Gold Certified
DLA Architects



THE National Bank, Elgin, LEED Gold Certified
DLA Architects



Grand Victoria Foundation, LEED Silver Certified
DLA Architects

Green Building Technology Goal III Developing Financial Programs for Sustainable Building and Energy Efficiency

Promoting financial incentive programs that pertains to all aspects of sustainable design and/or energy efficiency. Energy savings as well as lower manufacturing and construction costs, translate directly into money saved. These savings reduce operating costs, create, expand, and shape markets for green product and services, improve occupant productivity, and optimize life-cycle economic performance (US EPA). However, achieving these savings costs money in terms of setting up infrastructure and replacing old inefficient systems. Financial incentives to offset these costs would help home and business owners achieve these goals.

Offering affordable financing lowers the barriers for many property owners to make energy-efficiency improvements. However, financing alone cannot make up for the current high cost of some energy efficient materials without rebates. Until costs decrease, property owners will need to be moderate to high energy users in regions with significant rebates and inclining electricity rates, or they need to be willing to pay more for low-carbon electricity.

Foreseeable Challenges

The current downturn in the economy has put a strain on a number of smaller governmental and non-profit agencies. These agencies depend heavily upon the federal stimulus funds for their operations. Also The resources available to government and consumers alike are still relatively new and un-implemented in most local economies.

Objective 1

Offer subsidized energy audits to property owners.

Encourage owners to have energy audits performed on their property by paying for a portion of that audit. Currently participants in Elgin's residential revolving loan program receive complimentary energy audits. This recommendation expands on that by offering citizens subsidized audit with or without participation in the program.

Tasks/Metrics

1. Determine the appropriate amount, using other communities as an examples.
2. Establish program specifications.
3. Define funding amounts.

Objective 2

Work with Elgin based suppliers to allow for homeowners to obtain sustainable building products at a discount.

This objective's intent is to advance the health and productivity benefits of green features such as the use of low-VOC emitting floor carpets, glues, paints and other interior finishes and furnishings. Other green features include: Organic fabrics, Forest Stewardship Council (FSC) certified wood and paper, permeable pavements, green roofs, cool roofs or solar reflective roofs that reduce indoor air temperatures, i.e. heat island effect etc.

Tasks/Metrics

1. Encourage owners to upgrade existing properties to become more sustainable and/or energy efficient by working with suppliers of hardware and/or building materials to offer reduced cost building materials or equipment.
2. Example: Partnering with Ace Hardware to offer discounted recycled building materials or reduced cost low flow toilets for Elgin citizens, with the city of Elgin reimbursing Ace Hardware for the discount.

Objective 3

Encourage property owners to use recycled building materials, keeping these materials out of landfills and explore the feasibility of sales tax incentives for green building materials.

Tasks/Metrics

1. Provide information on the quality and availability of recycled materials compared to regularly manufactured building materials.
2. Engage in discussions about using sales tax incentives to entice consumers, raising the possibility of purchasing sustainable materials.

Objective 4

Hold workshops on green building and energy efficiency financing mechanisms for all private properties.

Workshops will aid owners in understanding what incentives, programs, grants, etc. are available to them.

Tasks/Metrics

1. Develop a workshop for local business and homeowners on the programs offered by the city of Elgin and other organizations, how to apply for these programs, and how becoming more sustainable and energy efficient can save them money long term.
2. Work with local venues to hold at least 2 workshops per year. Presenters may come from other organizations.

Objective 5

Explore fast tracking building permits and/or reduced building permit fees for any property that is pursuing a LEED or Energy Star certification.

By allowing these projects to be fast tracked through the building permit process (essentially ahead of other projects), owners can get their property started quicker which can eventually save time and money.

Objective 6

Institute a “green” investment program which will encourage local green job creation, education and workforce training initiatives.

This program would invest in local green jobs, provide education to the public, students, and potential businesses and allow for the retrofitting of all public facilities.

Tasks/Metrics

1. Work with higher education institutions to implement such a program.

Green Building Technology Goal IV

Establish sustainability programs for future development of new and existing buildings, incorporating preservation, remodeling/ retrofit, design, deconstruction, disposal and construction best practices.

Environmentally sound building programs, practices and technologies protect the environment, pollute less and use resources in a more sustainable manner. Energy-saving technologies applied in buildings can result in enormous reductions in demand for fossil fuels and emissions of greenhouse gases. Better design and building practices can also help address environmental challenges such as natural resource depletion, waste disposal, air, water, and soil pollution. Green building a can also help achieve gains in human health and prosperity. Many green building materials also offer energy efficiency benefits.

Recommendations under this goal include sustainable and efficient site development, selection and land use, energy and resource assessment as well as demand reduction and conservation implementation. Improved Indoor air quality, green building practices including material conservation, reuse, recycling and resource conservation.

Objective 1

Retrofit lighting fixtures and replace bulbs with CFL's or LED's in public facilities where appropriate.

Lighting generally makes up the largest portion of a commercial building's electricity bill, accounting for more than a third of the electricity used. Inefficient lighting also produces large amounts of waste heat, or "heat gain." By reducing heat gain, efficient lighting also reduces a building's cooling requirements. With good design, the energy consumed by lighting in most buildings can be cut at least in half while maintaining or improving lighting quality.

Tasks/Metrics

1. Study all public lighting fixtures and implement retrofit program allowing for proper disposal of old fixtures and bulbs.
2. Implement secondary energy efficient lighting retrofit program across government, private, public, leased and owned buildings.

Objective 2

Promote and standardize a building material salvage, reuse and recycling program available to everyone in the region.

Tasks/Metrics

1. Create a clearing house for all building material salvage, reuse & recycling programs and coinciding practices.
2. Develop a plan to create any additional necessary programs. This may be created in possible collaboration with Waste Management, Restore/Habitat for Humanity as well as any pre-consumer and post-consumer industry opportunities.

Objective 3

Educate building owners and occupants in retrofitting, remodeling, and building greener homes.

Tasks/Metrics

1. Supply the tools necessary to increase awareness on the added value gained through increased energy efficiency, water conservation, green building principles while also increasing health and economic benefits with improved (IAQ) indoor air quality.
2. Conduct public awareness campaigns on local TV and radio channels, door to door, in schools and all public spaces. Focus on the need to refurbish existing buildings for energy efficiency, water conservation and indoor air quality improvements.
3. Increase awareness of green building principals, practices and the numerous benefits to human health, productivity and wealth from green features and technologies.

Objective 4

Encourage home energy reduction and efficiency by distribution of energy efficiency and resource conservation kits.

Kits would be distributed to homeowners for self-installation, or a list of approved contractors would be available for those that need assistance. Kits would reduce energy demand and improve energy efficiency buildings and are inexpensive. The components of these kits can be acquired as donations and or sponsorships from home improvement dealers, manufacturers, and other suppliers Educational materials will also be included with various tips such as optimizing free energy such as day-lighting, increased natural air ventilation, and moisture reduction, including the use of low-emitting floor carpets, interior finishes and furnishings to improve indoor air quality.

Tasks/Metrics

1. Build and distribute "Home Conservation Kits" which could include: energy efficient light bulbs, electrical plate insulators, lighting sensors, smart electric strips, hot water heater blankets, air leak sealant, weather strip eco-friendly caulk, air filter and insulation coupons. Water/energy conserving items may include: faucet aerators, low flow shower heads, toilet bladders, and irrigation system coupons.

Objective 5

Develop Project: "Elgin Green Home", a fully preserved and retrofitted historical home open to the public showcasing all green building principles honored and or established by the city of Elgin and the Sustainability Action Plan.

Tasks/Metrics

1. Create Project "Elgin's Green Home" by collaborating with local designers, builders, landscapers, material manufacturers, renewable energy sources etc. to redesign and retrofit an existing row house in Elgin, creating a public space open for use as an educational and visual tool for our local and regional communities.
2. Video tape the entire process and make available as a public learning tool. After completion outfit the home with educational displays and tour guides trained in the environmental and technological advancements implemented in the home.
3. Establish Green Cleaning, toxic free Integrated Pest management Program and Organic landscape program.

Objective 6

Develop Project: “Elgin’s Green School” a completed retrofitted public school effective as a learning tool to the community and students.

Tasks/Metrics

1. Create Project “Elgin’s Green School” by collaborating with stakeholders to redesign and retrofit an existing public school in Elgin. Further establishing and fortifying the connection between family, community, education and our sustainable future.
2. Integrate curriculum and tools for building energy efficiency and environmental responsibility.
3. Open the school for public tours on weekends and certain evenings, showcasing all green school building principles honored and or established by the city of Elgin and the Sustainability Action Plan
4. Establish Green Cleaning, toxic free Integrated Pest Management Program (IPM) and organic landscape program in this and all possible public schools.

Objective 7

Initiate momentum towards Green remodeling, redesign, retrofit and building citywide, including all building stock existing as well as new owned and leased property.

Tasks/Metrics

1. Support and establish partnerships with local workforce training programs to provide training for participants involved in building design, construction, remodeling waste management
2. Offer training for professionals and trades-people working in the building sector and educate the next generation of professionals to implement sustainable building principles and practices.
3. Training should include positive environmental deconstruction and construction practices beginning with reuse/salvage of existing building structure, existing walls, floors, roof, and other building material.
4. Review the applicability of life cycle based approaches in the building sector. These help to minimize construction Impacts and environmental risks and impacts over time.
5. Encourage the use of product stewardship agreements, products approved by relevant certification schemes, items with re-used, recycled or certified content and items produced by organizations with a certified environmental management system.
6. Consider material resource use, embodied energy, embodied pollution, recyclability, material efficiency, product life producer responsibility and the labeling of products.
7. Encourage proper material quantity use before, during and after construction.
8. Encourage the use of minimum packaging and the separation of materials.
9. Work to give priority to optimizing energy efficiency during use and in the on-going maintenance of buildings.
10. Design “process education” essentials including sustainable site aspects of proper land use, storm water management, and habitat protection, walkability, proximity to transit and community connectivity, building orientation and scale efficiency.
11. The focus on interior redesign, remodel and renovation should reduce consumption and waste of materials caused by frequent replacement of interior elements and fabrication purchases.

Additional Resources/Best Practices

Berkeley FIRST

<http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=22196>

Building recycling brochure

www.epa.gov/osw/conserve/rrr/imr/pdfs/recy-bldg.pdf

City of San Francisco

www.sfenvironment.org

Department of Energy

The Office of Energy Efficiency and Renewable Energy (EERE) works to increase the use of renewable energy and energy efficiency technologies. EERE offers financial assistance opportunities for their development and demonstration. For: Government, Consumers, Industry, Nonprofits

Eco-friendly composed products

www.wbdg.org/design/env_preferable_products.php

Eco-labeling

www.eco-labels.org

Education for Sustainable Development Toolkit

<http://www.esdtoolkit.org/discussion/default.htm>

Energy Efficient Appliances

www.energystar.gov

Environment Magazine, Towards a Low Carbon Economy

<http://www.environmentmagazine.org/Archives/Back%20Issues/January-February%202009/FullerPortisKammen-full.html>

Forest Stewardship Council wood and paper products

www.fsc.org

Green building supplies and various other health and home items

www.ecologo.org

Green building supplies and various other items

www.greenseal.org

Green building supplies and various other items

www.greeguard.org

Green cleaning products and office products

www.epa.gov/dfe

Green Building Technology & Energy Conservation

Hillsborough Township, New Jersey

www.sustainablehillsborough.com

Home products and building/construction products

www.epa.gov/WaterSense

Institute for Sustainable Communities,

Community-based approach to education for sustainability, developing a new generation of leaders through school-based programs linked to community issues.

http://www.iscvt.org/who_we_are/publications/Education%20for%20Sustainability%20Guidebook.pdf

Local, state, and federal government grants, tax credits, Manufacturer's rebates

www.dsireusa.org

Organic ingredients

www.ams.usda.gov

Organic ingredients

www.ecocert.com

Sustainable news sites

www.thedailygreen.com

www.treehugger.com

www.350.org

www.onesky.com

United Nations Educational, Scientific and Cultural Organization, Educating for a Sustainable Future: A Transdisciplinary Vision for Concerted Action

<http://unesdoc.unesco.org/images/0011/001106/110686eo.pdf>

Williamson, New York Sustainability Report

<http://town.williamson.ny.us/Williamson%20FINAL%20Draft%20Report%205%2024%2010.pdf>

Workforce Management, Jobs of the Future: A New Green World

<http://www.workforce.com/section/hr-management/feature/jobs-future-new-green-world/>