INTRODUCTION

NARRATIVE BY KARENLEE SPENCER: In September 1984, my husband, Chuck, and I embarked upon a journey that was to take us to unexplored territory. We made a conscious decision to live "off the grid," since the property which Chuck’s family had purchased was a forested, unspoiled piece of land in east-central Illinois that did not have access to water, electricity, or gas.

A portion of the 136 acres (30 or so) had been farmed at one time, but the remainder of the property was heavily wooded. The terrain posed challenges as well. Quite hilly by Illinois standards, the ground marks the spot where glaciers stopped and spilled their remains many thousands of years ago. "Radiometric dating of wood and soil samples indicates that the Wisconsin glacier reached Illinois about 30,000 years ago and spread out to its maximum extent" (180 miles south of Chicago in central Illinois) about 23,000 years ago (Hansel and Johnson 1992, p. 18).

Chuck had started clearing 30 or so acres of the densely overgrown and uninhabitable ground that had been farmed many years earlier. He built a one-room cabin, using a gasoline powered generator to power his building tools, installed a very basic box stove for heating the place, used a Coleman two burner propane cook stove for food preparation, and a Coleman cooler with ice from the closest town, Charleston, Illinois.

I feel that I brought a wealth of knowledge about gardening, having been an active participant in my family’s backyard plot since childhood. I was not a complete stranger to the so-called "primitive way of life," and I spent a lot of time as a child and adolescent at some of the most archaic campgrounds in the Midwest and West.

However, I was not prepared to actually live this way, and I was certainly not prepared to live without a commode of any sort. Eventually, I initiated the construction of an outhouse that served our family well for many years.

Chuck and I built a greenhouse during our first winter together. Using recycled materials as much as possible, we were able to utilize operable crank-out windows salvaged from an area school and salvaged woods from salvaged barns to build the greenhouse. The south facing half of the roof was constructed of corrugated fiberglass sheets we purchased from a distributor in St. Louis, Missouri. Simple hand-built wooden shelves lined the north wall, while a low bench lined the entire south window wall of the structure. The floor was (and is still to this day) pea gravel. We invested in stove number two, a barrel stove which held a fire for almost 24 hours in the crucial early spring months when seedlings needed extra warmth in this Zone 5 region.

We continued to live quite simply as we explored the possibilities of making a living off the land. We also cultivated hard-shelled gourds and almost 50 different types of flowers and herbs for drying. We began painting the gourds and selling them at fine, juried craft shows throughout the Midwest. We harvested grapevine and attached the dried flowers and herbs, along with many types of wild plants that were harvested from the property.

Still without running water and committed to organic farming, there were many difficult periods for us. We persisted, buying a tank and a pump. Hauling water from town was the only answer at the time. We also hauled horse manure from the county fairgrounds, using the bucket on the little Ford tractor to turn the pile, thus creating a nutrient rich plant food for our ever expanding gardens.

I gave birth to two children, a daughter in 1989, and a son in 1994. Chuck and I had been interested in solar power for years and had been reading the literature voraciously. We had also dreamed of building a bigger house and turning our existing cabin into a studio for our blossoming art business. While discussing our needs, wants, and wishes, we calculated the cost of materials. Knowing we would do all of the labor ourselves, Chuck drafted a plan in 1994 for a 24’ x 32’ two story timber frame house, to be built on stilts, or posts, and powered completely by the sun.

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THE SOLAR POWERED HOUSE

The process was slow, but the energy efficient, solar powered house for this pioneering family of four was ready for a test drive in late 1995. The house was powered by 10 solar panels (four 120 watt panels and six 64 watt panels), which along with the 175 amp disconnect, inverter, and charge controller, were purchased at a cost of approximately $10,000.00 from Backwoods Solar in Idaho. The system utilized eight batteries (Trojan 395 amp HD batteries, which were purchased locally). If one is renovating or building a new home, he/she could “use green materials and solar energy to reduce 1000 to 6000 lbs. of carbon dioxide (Global Green USA n.d., para. 4). The couple decided to use AC power, because appliances and other electrical equipment were easier to obtain than DC equipment. They bought a large capacity Hitzer wood burning stove to heat the new solar home and spent the first year learning how to manage their new power.

The children have their own rooms, which are separated by two stained glass windows that enable air to flow between the two rooms, maximizing north/south breezes. Numerous plants (No-VOC—volatile organic compounds) add warmth to this home, as well as provide the valuable service of cleaning and filtering the air. Plants with little or no VOC can eliminate eye, nose, and throat irritation along with more severe health threats (Global Green USA, n.d.).

The Spencer home is made with fiber cement siding, and 16 windows and four skylights use the sun’s natural light and heating qualities to maximum advantage. The placement of windows allowed for the

FIGURE 1. Chuck and Karenlee Spencer constructed cold frames to protect fragile gourds and vegetable seedlings in early spring.

FIGURE 2. The Spencers’ greenhouse was built using recycled materials and is heated by a wood stove. Note the 5 gallon buckets used to collect rainwater.

FIGURE 3. The original outhouse built by Chuck and Karenlee Spencer from reclaimed barn wood.
circulation of air flow, and ceiling fans further enhanced the heating and cooling of the compact living quarters. Research reveals that ceiling fans circulate cold and warm air, and they can “reduce the need for air conditioning at 1/10 of the price” (Global Green USA, n.d., para. 10).

Compact fluorescent bulbs are used in all light fixtures. Global Green USA (n.d.) denotes that if an individual replaces three incandescent bulbs with fluorescent bulbs in his/her home, nearly 300 lbs. of carbon dioxide could be eliminated, the bulbs will last longer, and they will burn less. Power strips are also utilized to insure that the children shut off radios, CD players, or other items they own. Lights are always turned on in an area for functional purposes and are never simply left on if not being used.

Karenlee and Chuck Spencer feel that their children thrived in this environment where television and common household appliances (e.g., toasters, blenders, irons, microwave ovens, hair dryers) were nonexistent and daily baths were taken by dipping water which had been heated on top of the wood stove. This family feels that they continue to reap the benefits and rewards of a simple, sustainable lifestyle in the woods of east central Illinois.

An ancient proverb states “We have not inherited the world from our forefathers—we have borrowed it from our children.” Preserving the world for future generations is at the forefront of societal issues and has become a part of the forecasting for areas such as interior design, architecture, furniture manufacturing, flooring, and construction. While the environmental movement may have begun in the 1970s, manufacturers and designers in contemporary society are held accountable for developing emerging opportunities to make homes and businesses energy efficient yet low maintenance and “hassle-free.” Various research points to a need for environmentalism on a range of levels that impact human beings’ natural habitat, and there is a need for manufacturers and designers to recognize these problems and continuously come up with new ideas to help preserve these natural habitats. Like the Spencers, households and businesses across the nation need to recognize green design and environmentalism as more than just a trend. Green design is a long-term commitment and a way of life.

**IMPACT OF GREEN LIVING**

Sloan-Allen, Jones, and Simpson (2004) state that “a true sustainable product mimics nature and designs in nature are based on recycling; nothing is wasted” (p. 403). Green living will play a role in protecting natural resources for individuals, families, and communities, as well as it will potentially impact their social-emotional and psychological well-being. Furthermore, fostering sustainability will increase the likelihood of a future that includes the preservation of internal resources in harmony with external natural resources. While the Spencers valued this balance, many individuals in contemporary society gasp at the thought of living without a television or microwave. In fact, nearly 70% of families that live in the United States have the television on while eating dinner (DeGaetano). While statistics vary, on average, children in the United States watch nearly 23 hours of television per week, which means that if these children reach the age of 70, they will have spent nearly a decade of their life watching television (American Academy of Pediatrics 1995). What does this have to do with green design? While their first goal was to conserve energy, Karenlee and Chuck Spencer felt that eliminating television from their home would have other benefits. Research reveals that the human brain needs exercise; this includes physical exercise to develop healthy hearts, lungs, muscle coordination, and tactile experiences (e.g., building blocks enhance the sensory motor system), and also includes mental challenges and stimulation for language develop-
ment, social-emotional development, and cognitive
growth (DeGaetano). Children who spend at least 20
of their waking hours per week watching television
will not have the same opportunities to optimize
their potential for physical, cognitive, and social-
emotional growth and development. This is one way
that green living could play a role in improving soci-
etal quality of life.

While the consequences of adults and children
watching excessive television are evident, some find it
difficult to screen, predict, or manage the television
e.g., watching in moderation) or other technological
devices found in many homes across the United
States. While developments in contemporary society
do have some social and economic benefits, many
individuals believe that the impact of technological
developments depends on the type and/or quantity.
Recent research reveals that along with the aforemen-
tioned underlining consequences, there may be seri-
ous health consequences to children who are exposed
to electromagnetic field technologies and communi-
cations (Kheifets, Repacholi, Saunders, and Van De-
venter 2005). According to Kheifets et al., “with
rapid advances in electromagnetic field (EMF) tech-
nologies and communications, children are increas-
ingly exposed to EMFs at earlier and earlier ages, and
consistent epidemiologic evidence of an association
between childhood leukemia and exposure to ex-
tremely low frequency (ELF) magnetic fields has led
to their classification by the International Agency for
Research on cancer as a ‘possible human carcinogen’
(para. 1). Chuck and Karenlee Spencer feel that their
“radical” style of green living would limit the electro-
magnetic frequencies in their home while fostering a
lifestyle where physical activity and esteemed family
time are expected.

One Spencer family pastime is maintaining the
family land, which Chuck originally made habitable
by putting the ground to work and planting many
vegetables and fruits e.g., strawberries, grapes, mel-
on, apples, tomatoes, potatoes, beans, and more).
The Spencers valued organically grown foods and
continue to reap the rewards of organic farming. Ac-
cording to Byrum (2003), “Fruits and veggies grown
organically show significantly higher levels of cancer-
fighting antioxidants than conventionally grown
foods, and this research suggests that pesticides and
herbicides actually thwart the production of certain
chemicals which act as a plant’s natural defense and
also happen to be good for our health” (para. 1).
Meanwhile, Byrum notes that fertilizers seem to
boost the levels of anti-cancer compounds. There-
fore, while producing organically grown foods
through green design and green living is cost effi-
cient, it also has a positive impact on consumers’
overall health and overall well-being.

While some may consider the Spencers’ lifestyle
extreme environmentalism, the Spencers attest that
their lifestyle played a role in their good health and
minimal doctor visits. Karenlee and Chuck claim
that they have enjoyed the benefits of healthy eating
and breathing clean, unpolluted air along with the
calming effects of living “off the grid.”

SUSTAINABILITY AND WHAT PEOPLE
ARE DOING
Sustainable development, as defined by the World
Commission on Environment and Development (or
the Brundtland Commission) is “the capacity to
meet the needs of the present without compromising
the ability of future generations to meet their own
needs” (United Nations General Assembly 1987).
True green products are environmentally friendly
and provide for the sustainability of the natural envi-
rnoment. Sustainability is a social responsibility, and
individuals on numerous levels are striving to limit
waste. While individual efforts are time consuming,
individuals may also feel that they are not making a
difference. However, one can see by examining ef-
forts such as those of Chuck and Karenlee Spencer
that individuals do make a difference.
Individuals, who are looking to green their home
or business may explore options with landscaping
while examining other interior/exterior factors.
According to the Albuquerque Bernalillo County
Water Utility Authority (n.d.), “A philosophy of con-
servation of water through creative landscaping has
engendered the new term, xeriscaping. The term xeri-
scape is derived from the Greek word xeros meaning
dry, combined with landscaping, thus xeriscaping”
(para. 1).

Mrs. Patti Stratton, Foundations Executive Officer
of the Neal Welcome Center, took the initiative to
make changes and has potentially saved the Founda-
tion $2,500 in the 2007/2008 fiscal year. The Founda-
tion is a private not-for-profit corporation, which pro-
vides support to Eastern Illinois University in Charleston, Illinois, and the region in which the university serves; they are able to do this through volunteerism and philanthropy among alumni. Mrs. Stratton suggested that the Foundation invest in a 1,000 gallon cistern as a means of cutting down on the Foundation’s operations budget while avoiding pumping perfectly good spring water into the city sewers, and then paying the city for treated drinking water to irrigate the lawn (P. Stratton, personal communication, May 13, 2007). Because the irrigation system runs every other day, there is one day in between that can refill the cisterns. If there is too much water coming from the sump pumps, the excess will overflow to the city sewer, but that means there are still 2,000 gallons available. If they run dry, the system will automatically change over to city water for irrigation until there is water in the tanks again. The total cost for installation, dirt removal and repair of the lawn was $6,500, which according to Stratton should be easily recovered in three years.

Rainwater harvesting is also becoming more popular. If 15% of U.S. homes utilized rainwater to irrigate their landscapes, an estimated one billion gallons of water would be saved per day (LeBlanc).

At the university level, Eastern Illinois University (EIU) in Charleston, Illinois, made what seemed to many like minor changes, but had city officials on their steps in disbelief because the results were major. EIU entered into an Energy Services Contract with Honeywell, Inc. in October 2001. According to Tom Rennels, Plumbing Foreman at EIU, “during the next calendar year, Honeywell will supervise the installation of nearly 11 million dollars worth of energy conservation measures on campus [and]... Honeywell then guarantees an amount of utility and energy cost

**FIGURE 5.** A large scale rain barrel/cistern system adapted from Experiments in Sustainable Urban Living and the Low Impact Developmental Center, Inc. Retrieved http://www.lid-stormwater.net.
avoidance over the next 10 years at least equal to this amount” (T. Rennels, personal communication, May 9, 2007). The benefits of this arrangement include the initial energy savings, the reduction in consumption of non-renewable energy sources such as coal and oil, and a reduction in maintenance costs for the outdated systems and equipment being replaced.

The first phase of the energy conservation and “Esco Performance Contract” involved the installation of the energy conservation measures, which included: 10,525 energy efficient lighting upgrades, 697 variable air-volume dampers, 39 variable speed motors, 1,095 additional building automation points, and minor steam and electric metering (T. Rennels, personal communication, May 9, 2007). Honeywell guaranteed EIU an annual savings of $533,000 (for 10 years) for this phase of this project, and EIU expected an annual savings of $656,000.

Phase II of the Esco project at EIU was a $10.8 million project of which the following energy conservation measures were installed: 18,363 energy efficient lighting upgrades, 810 water conservation shower heads (from 2.5 gallons per minute [GPM] to 1.5 GPM), 1,117 low water consumption toilets (from 3.5 gallon tank to 1.6 gallon), 1,469 faucet aerators (from 1.5 GPM to .5 GPM), 118 energy efficient washing machines, speed pump and fan upgrades, electric motor replacements, pipe insulation, upgrades to building automation controls, replacement of the pool filtration system, replacing 5 chillers, and the expansion of the campus chilled water loop (T. Rennels, personal communication, May 9, 2007). According to Rennels, EIU Esco project managers expect to save $1,332,000 annually, and Honeywell has guaranteed that the University will save $1,200,000 each year for 10 years.

While EIU was reducing their maintenance costs for outdated systems in Phase II, they were also reducing their water bill (T. Rennels, personal communication, May 9, 2007). After the initial installation, they appeared to be saving approximately $20,000 each month. After a few months, Charleston city officials brought this to the University’s attention; they judged that by drastic changes in the water bill, a mistake had been made. However, after examining procedures, the city found that this savings to EIU was coming from the changes in the water flow.

The Phase II enhancement of the EIU Esco Project was projected at $2.6 million (T. Rennels, personal communication, May 9, 2007). This involved the following energy conservation measures: replacement of chiller, lighting upgrades in the student union, upgrading to building automation systems, energy efficient exit lights, replacement of chilled water coils, and optimizing fan operating schedules. Honeywell guaranteed an annual savings of $295,000 (for 10 years) for this phase of the project, and EIU expects to save $315,000.

Winchip (2003) stated that “the challenge of green design is to change traditional objectives, designs, products, processes, and attitudes” (p. 27). University administration and personnel, such as those at Eastern Illinois University, executives, such as Mrs. Stratton, and individual households such as that of Karenlee and Chuck Spencer, who have the ability to think outside of the box have been prepared to face these challenges. In turn, they are playing a role in sustainability and future attitudes about green design. Sustainable development coupled with education and, in turn, smart consumerism may play a major role in the overall effectiveness of green living.

**MARKETING GREEN DESIGN**

When encouraging green living and attempting to illustrate its benefits, a person needs to consider to whom they are “selling.” For example, the Traditionalists, or “Can-do’s” (born 1901–1924) or someone remodeling a home for this population may appreciate the draft-free, well-insulated low-emissivity (Low-e) windows (Built Green). Avoiding the transfer of cold air would be important for maintaining

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<td>Phase I</td>
<td>Phase II</td>
<td>Phase II Enhancement</td>
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<tr>
<td>Electrical: 6,562,000 kWh</td>
<td>Electrical: 7,824,000 kWh</td>
<td>Electrical: 2,496,000 kWh</td>
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<tr>
<td>Steam: 86 billion BTU</td>
<td>Steam: 226 billion BTU</td>
<td>Steam: 32 billion BTU</td>
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<td>Water: 72,000,000 gallons</td>
<td>Water: 5,300,000 gallons</td>
<td>Water:</td>
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<tr>
<td>Estimated Annual Savings: $656,000</td>
<td>Estimated Annual Savings: $1,332,000</td>
<td>Estimated Annual Savings: $315,000</td>
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good health, and this may be especially important to someone of this generation, whereas some of the Generation Xers (born 1961–1981) may have small children and be more concerned about options for buying carpets made from recycled materials or less toxic materials. According to Build Green, these carpets look great, wear like iron, and improve the quality of air individuals breathe every day.

Baby Boomers (born 1946–1964) make up 29% of the total population in the United States (Gillon 2004). Some of the characteristics associated with Baby Boomers include wealth, creativity, seekers of change, and innovation. This group is also approaching retirement in record numbers. While they may be viewed as the richest group, watching their pennies may become more significant as they seek to retire. Therefore, when working with individuals from this generation, a selling point of green design may be cost efficiency.

According to Sloan-Allen et al. (2004), “clients are better educated than in the past and are asking more questions [and] . . . the aging population is aware of the need for accessible housing and buildings” (p. 400). Also, more people are working at home, offices are becoming portable, and the security of business locations is taking precedence over other marketing factors. It is important to know the clients and to be able to assess their needs and wants, and it is just as important to understand all of the benefits of green design before trying to “sell” it to the client. When various groups are able to see the instantaneous advantages, they will be more likely to appreciate the gradual, or long-term, benefits and more willing to adapt to change. The factors associated with various populations have played a role in the emerging careers in the health care industry and the practice of gerontology. Now, adding the “green living trend” to the mix has career forecasters believing that a career in innovative design solutions and design technology will be prosperous in the next few decades (Allen et al. 2004).

Sloan-Allen et al. (2004) state that “in residential design, owners want homes with high energy efficiency, low maintenance, labor-saving devices, and water saving appliances, especially dishwashers, toilets, and shower heads” (p. 400). According to Goldsmith (2005), “The average U.S. household uses 350 gallons of water a day [and] . . . the greatest water use is in the bathroom” (toilets being the highest at 27% with showers at 17%) (p. 327). Assessing indoor and outdoor water use is important when exploring ways to preserve this limited natural resource.

In commercial design, more clients are on a quest for green products to ensure indoor air quality and sustainable building materials (Sloan-Allen et al. 2004). Businesses see the value of green design, as well as recognize that others see them as leaders in their industry and will hold them accountable. According to Sloan-Allen et al., these demands in commercial design have opened doors for those looking for careers in design technology and sustainable green design.

TIPS AND RESOURCES FOR A GREENING PUBLIC PHILOSOPHY

According to the United States Green Building Council (2007), “The Leadership in Energy and Environmental Design (LEED) Green Building Rating System is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings (para. 1). LEED evaluates buildings in water efficiency, energy and atmosphere, materials and resources, and other credit areas, where “project points” are awarded. The LEED Green Building Rating System may be used as a tool for interior designers, project developers, operations managers, or other individuals examining ways to foster sustainability. While the United States Green Building Council has been used by many (e.g., The Homeland Security Building in Omaha Nebraska or the Logan Airport Terminal in Boston, Massachusetts) as a resource and guide for green design, other resources include the Harvard Green Campus Initiative, the Environmental Protection Agency, or the U.S. Department of Energy. Integrating conventional design, environmental considerations, and manufacturing processes is at the core of green design. While research has been conducted and systems have been implemented to minimize the complexity of green design and green living, altering existing perceptions of the “American way of life” may be complex.

Environmentalists foster ways to simplify green design and empower individuals to understand the value of green living. The Global Green USA website gives suggestions for green design in an article titled, “Ten Tips for Greening Your Home.” Some of these tips include: buying Energy Star refrigerators and
other appliances to save money and 1,000 lbs. of carbon dioxide each year; buying low-flow toilets to save nearly 22,000 gallons of water annually for a family of four; and buying plants with little or no volatile organic compounds.

Tips such as buying the right plants, may seem insignificant. However, the environment affects humans risks, fears, stress levels, and overall well-being in a variety of ways (Kopec 2006). Therefore, it is imperative that individuals examine even the “small things” that impact the human-environment relationship. Kopec listed some factors related to air, odor, noise, and toxic construction where furnishing materials could be linked to “negative physical and behavioral outcomes [and]. . . . design is key to ensuring the physical and psychological safety of the occupants of built environments; it has been proven to influence neurochemical responses within the brain and, subsequently, cognitive perception” (p. 115).

**CONCLUSION**

Kopec (2006) said that it is crucial for designers to have the working knowledge to implement appropriate measures to preserve natural resources while ensuring opportunities for optimal health, safety, and well-being for all. It is a social responsibility for individuals to recognize and confront environmental issues. The Wilderness Society notes (as cited by Charles Lindbergh, 1971) that “our ideals, laws and customs should be based on the proposition that each generation, in turn, becomes the custodian rather than the absolute owner of our resources and each generation has the obligation to pass this inheritance on to the future” (para. 4). With regard to green design, individuals in contemporary society need to know and understand the respective roles of individuals, families, communities, policy makers, and civil society—at large. Sustainability plays a key role in the future of the world.

**REFERENCES**


**TABLE 2.** Listed here are tips for “greening your home” from Global Green USA. Consumer and designers need to know how to take appropriate measures for preserving natural resources. This information is adapted from http://competition.globalgreen.org.

1. LIGHT UP
2. RECYCLE
3. PURCHASE GREEN POWER
4. BUILD GREEN & USE SOLAR POWER.
5. TURN IT DOWN, TURN IT UP
6. WASH COOL
7. STORE SMARTLY, SAVE MONEY
8. BE WATER WISE
9. USE GREEN PAINTS
10. FAN IT