



Greensburg, Kansas

A Better, Greener Place to Live

“The biggest success story in Greensburg, to me, has been the resiliency and determination of our citizens to make a difference in their world. We’re new pioneers in the sustainability movement.”

— Greensburg Mayor
Bob Dixon

There’s No Place Like Home

Greensburg, Kansas is Midwestern farm country. Its 900 residents are hard-working people who love their home and their way of life. They simply will not give up when it comes to making their community a better place to live.

After the town was nearly wiped out by a massive tornado in May 2007, citizens saw the opportunity to make Greensburg something even better than it had been before. Living close to the land, they knew the value of solar and wind power and using water efficiently. When they rebuilt, they took those values to heart in a new way. The result: Greensburg is a truly green burg. It is a model of sustainable living and a standard for rural communities everywhere.



Courtesy of BNIM/PIX 16658

Blessed with a unique opportunity to create a strong community devoted to family, fostering business, [and] working together for future generations.

— Greensburg’s Community
Vision Statement

A Vision for the Future

Within months of the tornado, Greensburg residents came together to create a new vision for the future. They wanted to do more than rebuild. They turned disaster into opportunity—not just for themselves but for communities like theirs all over the world.



Courtesy of BNIM/PIX 16658

Buildings Tell a Story

Buildings are obvious evidence of Greensburg's commitment to sustainability. The 95-year-old Kiowa County Courthouse (Greensburg is the Kiowa County seat), one of the few structures left after the tornado, is being renovated with sustainable features designed to earn it a LEED Gold certification—an especially admirable goal, because the facility is being modified rather than replaced. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System recognizes performance in five key areas of human and environmental health. Its top three ratings are Silver, Gold, and Platinum (highest).

Greensburg residents have taken sustainability to heart and home. Owners of more than half the new homes built after the tornado volunteered to have their homes rated for energy savings. On average, these homes should use 40% less energy than standard homes built to code. Businesses such as banks, car dealerships, and funeral homes, along with churches and a lodge have rebuilt to save energy and water, and to use environmentally friendly materials. Some of Greensburg's new buildings are showcased in this publication. If you'd like to learn more about these buildings, visit the Greensburg Greentown Buildings Database at www.greensburg.buildinggreen.com.



John Charlton, Kansas Geological Survey (KGS)/PIX 16659



Lynn Billman, NREL/PIX 16650

Greensburg residents developed a Sustainable Comprehensive Master Plan for the town's next 20 years, and the plan was adopted by the City Council. As the plan itself states, "A truly sustainable community is one that balances the economic, ecological, and social impacts of development." This balance is visible in the community's goals as stated in the master plan—goals that clearly represent solid Midwestern values.

- Be progressive while remaining unassuming
- Open doors to newcomers while maintaining traditional cultural heritage
- Provide opportunities for young people—education, jobs, a future back home
- Value the natural environment, balanced with growth and economic development
- Build a variety of durable, healthy, energy-efficient houses and buildings
- Look to renewable sources of energy, such as Greensburg's plentiful wind
- Treat each drop of water as a precious resource
- Remain affordable.

Rebuilding with Energy

As the residents of Greensburg focused their energies on rebuilding, they also kept energy efficiency, renewable energy, and other sustainability goals squarely in mind. Others might call this a goal of becoming a "net zero energy community," or reducing a community's "carbon footprint," but to Greensburg, it's just seemed like the right way to live.

The City Council passed a resolution requiring all new city buildings larger than 4,000 square feet to meet U.S. Green Building Council LEED Platinum certification and reduce energy consumption by 42% as compared to standard buildings.

The city, which operates as a municipal utility, helped to develop, and will directly benefit from, a new 12-megawatt wind energy system expected to be installed near Greensburg. This system is projected to meet the pre-tornado electricity needs of the community. The city has entered into a power purchase agreement with a “green” power provider that has promised “100% renewable electricity, 100% of the time” from their wind, hydro, and other renewable energy electricity generation sources. With these accomplishments, Greensburg does become a true net-zero-energy community. That is, an energy-efficient community that generates as much electricity from renewable energy as it uses. This means the town will not use electricity generated from fossil fuels, such as coal.

Greensburg is the first city in the world to adopt these kinds of resolutions. It sets a new standard, not just for its own citizens, but for other rural and urban communities as well. Greensburg could not have envisioned or realized its vision without contributions and support from many organizations. Along with state agencies, innovative commercial firms, and nonprofit organizations, the U.S. Department of Energy and other federal agencies, including the U.S. Department of Agriculture and the Federal Emergency Management Agency, have been extensively involved with the rebuilding effort.

Why such a commitment? Sustainable communities such as Greensburg, with energy-efficient homes and buildings, and electricity and fuels from renewable energy sources have many advantages for our nation. They have a higher regard for human health, are easier on the natural environment, are well-poised for economic growth and job creation, and through energy security, contribute to our nation’s security. And, simply put, they are better places to live.

Clean, Green Medical Care

“Good building practices make sense,” says Mary Sweet, Administrator of the Kiowa County Memorial Hospital, noting that infections will be easier to control in the new building. The facility combines all medical services in a single, highly energy-efficient structure—striving to be the first critical access hospital in the United States to meet LEED Platinum standards.

The whole building has high “R-value” insulation, and features a dual ventilation system that prevents the exchange of air between the emergency and isolation rooms and the rest of the hospital, and seamless floors and countertops that make cleaning easier and more thorough.

An onsite wind turbine helps to power the facility, a rain filtration and storage system supplies recycled (gray) water to irrigate the property and flush the building’s toilets, and daylighting (natural light) illuminates 75% of the interior, reducing the use of electric lights.

“We’re a rural health clinic,” Sweet explained. “We provide basic lab work, X-rays, basic nursing, and ambulance service. We don’t do surgery or deliver babies.” But there is room to grow along with Greensburg. “There are ways we could take the clinic space and make it into surgical space. And the area of patient rooms is designed to allow us to add on.”





Courtesy of BNIMPX 16653

High-Performance School

“We had wonderful things before the tornado,” says Darin Headrick, Superintendent of Schools for the City of Greensburg, “We had a nice community, good kids, and good schools to attend.” In 2007, the year of the tornado, the high school received the Governor’s Award as one of the top 5% of the state’s schools.

With a brand new school, all of Greensburg students will learn in a high-performance building worthy of their own high academic performance. The new two-story, 120,000-square-foot facility consolidates grades K-12 in a single campus designed to be the state’s first LEED Platinum School. It includes state-of-the-art classrooms, a library, an interactive learning center, science labs, two gyms, a cafeteria and kitchen, art and music areas, courtyards, two playgrounds, a football stadium, and track and field facilities.

This new school replaces the total square footage of all the previous school buildings, combining all grade levels in a single facility. It will serve up to about 375 students (the school currently is serving about 220 students), allowing for the town’s future growth.

Key green features include the extensive use of daylighting (natural light) to ensure that artificial lighting is seldom necessary in most rooms. Heating and cooling are handled by geothermal heat pumps that take advantage of the difference between the earth’s and the air’s temperatures. The pumps circulate water from below the earth’s surface to warm interior air in winter and cool it in summer. The building is also highly insulated.

An onsite wind turbine meets part of the facility’s electricity needs. Rainwater is transported through the roof lines, stored in cisterns, and used to irrigate the grounds.

When completed, the school will be a great improvement over the one permanent campus structure, known as the “caf-a-gym-atorium” and the temporary classrooms the students have been in since the 2007–2008 school year.

“Before the tornado, if you asked most of the high school kids about their plans for the future, they’d say the same thing: ‘I’m going to go away to college and never come back.’ Now, they say, ‘I’m going to go to college and then come back.’ They see things here that they can impact.”

— School Superintendent
Darin Headrick

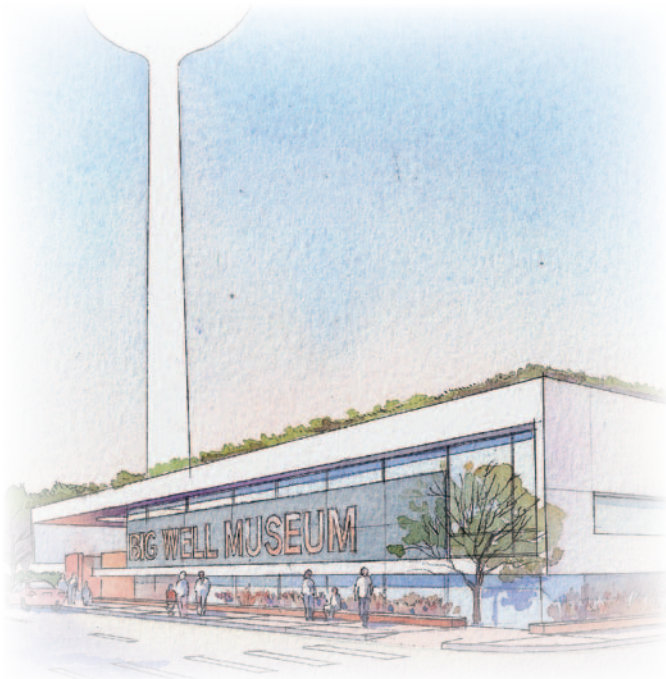
Children Today, Greensburg’s Leaders Tomorrow

If anything can forecast the lasting success of Greensburg’s bold vision, it’s the way the town’s young people envision their own futures. The town’s enthusiasm for going green has definitely inspired young people. Under the sponsorship of Greensburg GreenTown, a local nonprofit organization pivotal to the town’s rebuilding, Greensburg’s high school students established a Green Club.

Alexsis Fleener, a high school junior, is a member of the club as well as the youth representative on the Greensburg GreenTown Board of Directors. The green rebuilding program has “definitely” had an impact on her career and future plans. “My interest in environmental issues will not end with high school. I want to be in community planning and architecture,” she said. “My friends with the Green Club want to bring that to their careers too. We’d all love to come back to Greensburg.”



Courtesy of BNIMPX



Courtesy of BNIM

“Ultimately, sustainability relies on the ability to bring new, high-quality jobs to town.”
 — Greensburg Master Plan

Seeing Green for the Long Term

“We’d like to see Greensburg become the ecotourism capital of the world,” says Mayor Bob Dixon. “Companies can bring their customers here to see sustainable building products and all kinds of eco-friendly businesses. We want to be a living laboratory.”

Greensburg also hopes to attract companies that can draw on the resources of the prairie for a variety of green purposes, from research to entrepreneurial manufacturing.

One of the first new, green firms in town was BTI Wind Energy, which represents Canada’s Endurance Corporation, a manufacturer of wind turbines in the United States.

A Green Place to Grow

The two-story SunChips Business Incubator provides temporary, low-cost office space for as many as 10 small businesses rebounding from the tornado or starting from scratch. Like all structures owned by the City of Greensburg, the facility is built to LEED Platinum standards.

High-performance building materials provide maximum insulation and protection from high winds. Solar photovoltaic panels on the roof convert sunlight directly to electricity that meets about 10% of the building’s electricity requirements. A geothermal heating and cooling system taps into the earth’s temperature (warmer than outdoor air in winter and cooler in summer) to heat and cool the building.

Natural light provides most of the internal lighting, which minimizes the need for artificial lights. Water from sinks and showers is recycled and used to flush toilets. The recycled water (gray water) is supplemented by rainwater, which is collected and stored as it falls on the building.



Artist rendering of completed business incubator. Courtesy of BNIM



City of Greensburg; www.greensburgks.org/PIX 16660

A New and Better Way

Mike Estes of BTI-Greensburg, which owns and operates the local John Deere Dealership and Service Shop, says he had “only minimal interest in green building” before the 2007 tornado. “But when you have a chance to build back from scratch, you look for a new and better way.”

The dealership was one of the first businesses to rebuild. It is housed in a new, metal structure that covers 27,000 square feet and was designed to achieve LEED Platinum standards.

“No agricultural dealership has ever done anything like this—to our knowledge,” says Estes, whose family has owned BTI for four generations. Going green presented some challenges and involved some extra cost, “but we’ll see payback for pretty much everything we put in here.”

BTI’s focus on green attracted the attention of John Deere, and the corporation now uses the Greensburg facility as a standard for its dealerships. Estes says, “John Deere has a ‘Greensburg’ model that somebody can look at so they can replicate what they can use.”

The Greensburg dealership’s green features include highly insulated wall and roof systems, a highly energy-efficient heating and cooling system, and a network of skylights and mirrored reflectors that direct natural light where it is needed and reduce electricity use for lighting. Two onsite wind turbines provide electricity that offsets nearly 10% of the building’s total electricity needs.



Lynn Billman, NREL/PX 16661



Lynn Billman, NREL/PX 16651



Mike Estes and his brother established the company as a subsidiary of BTI-Greensburg, which owns the local John Deere dealership. In 2008, BTI purchased wind turbines from Endurance for its Greensburg facility and was so impressed with the quality and potential of the products that the Estes brothers chose to get into the green industry themselves.



Courtesy of BNIM

New businesses. New alternatives. New options for young people. Greensburg's future continues to unfold, providing an ongoing example of what is possible when the people of a community come together with common purpose. In the words of Mayor Dixon, "We've been blessed with opportunity here, and we have a tremendous obligation to offer hope to the world."

Creating a Green Showcase

"Green businesses, more than any other, rely on their reputation and integrity. Being connected to a community that has the same reputation they're looking to establish gives them a jump start."

— Daniel Wallach,
Greensburg GreenTown

Greensburg GreenTown is a nonprofit organization deeply involved in Greensburg's new green vision and dedicated to making the town a center for ecotourism, a showcase for the latest in green technology, and a drawing card for new green businesses.

Daniel Wallach, executive director, saw the potential for green rebuilding after the disastrous tornado struck the town, several miles from his own home. He established Greensburg GreenTown soon afterward and has been a leader in the town's redevelopment effort ever since.

Among the organization's many projects is the building of as many as 12 "eco homes," each with a unique design and story. All will be open to visitors for tours and overnight stays, supporting the city's strong interest in ecotourism.

One of the first eco homes is built around a silo-shaped core, a testament to the local silo that remained standing after virtually every other structure in town was leveled by the 2007 storm.



City of Greensburg; www.greensburgks.org/PIX_16662

First in Green Lighting

One of the town's first completed green projects illuminates the downtown sidewalks and streets every night. Greensburg is the first city in the United States to use light-emitting diode (LED) lamps for 100% of its street lighting.

By replacing the old sodium vapor lights—all 303 of them—with LED fixtures, Greensburg improved outdoor lighting energy efficiency by 40% and reduced the cost of related energy and maintenance by an estimated 70%. As an added bonus, the new lamps reduce nighttime light pollution by focusing light where it is needed: on the ground rather than in the night sky.



For Additional Information

Greensburg GreenTown
204 West Florida
Greensburg, KS 67054
620-723-2790 or 620-549-3752
www.greensburggreentown.org

The Official Web Site of Greensburg, Kansas
www.greensburgks.org

This document is one in a series of documents outlining the options for and benefits of rebuilding green after a disaster. The series draws on lessons learned by teams from the U.S. Department of Energy and its National Renewable Energy Laboratory as they helped the townspeople of Greensburg, Kansas, rebuild green after a devastating tornado. To see the other documents in this series, visit www.buildings.energy.gov/greensburg/.

Greensburg would like to acknowledge and thank the U.S. Department of Energy and its National Renewable Energy Laboratory for the assistance provided to produce this brochure.

For Additional Information, Please Contact:
Energy Efficiency and Renewable Energy Information Center
1-877-EERE-INF (1-877-337-3463)
www.eere.energy.gov

Prepared by the National Renewable Energy Laboratory (NREL)
NREL is a national laboratory of the U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Operated by the Alliance for Sustainable Energy, LLC
DOE/GO-102009-2765 • Revised October 2009

Printed with a renewable-source ink on paper containing at least 50% wastepaper, including 10% post consumer waste

Green Where They Live

“Many Prairie Pointe residents have a better living situation now than before the storm.”

— Laura Stoltenberg,
Director of the Kiowa
County Housing Authority

The people of Greensburg are green where it counts the most: at home. As with business and government structures, housing in the community is being built with the greatest possible attention to sustainability. The Prairie Pointe Townhomes complex is a case in point.

Completed in 2008, Prairie Pointe provides affordable housing (residents' incomes may be no higher than 60% of the Kiowa County median income) in three structures with a total of 16 rental units. One building contains eight apartments; each of the remaining buildings has four units each. Eight of the 16 units received the first residential LEED platinum rating in Kansas. A single structure was submitted for rating to limit the cost of the process; all units were built to the same specifications.

Laura Stoltenberg, Director of the Kiowa County Housing Authority and Manager of Prairie Pointe, said that many Prairie Pointe residents have a better living situation now than before the storm. Rental property was limited in the past, she explained, and consisted mostly of older homes that were not energy efficient.



U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

