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The Sarpy County Energy Element outlines a series of goals and strategies for the County in the areas of urban form and transportation, energy generation, buildings, food and agriculture, county operations, and education as they relate to energy use. The Energy Element is a framework to guide the County when making energy-related decisions as a component of the existing Comprehensive Development Plan.

The Energy Element was created and developed through a collaborative effort, including a consultant team, County employees, and members of the public. A diverse group of community members were invited to participate in a Core Committee to help guide the development of the goals and strategies.

SUMMARY OF VISIONS AND GOALS

The vision and goals developed for the Energy Element are summarized below:

**URBAN FORM and TRANSPORTATION**

Vision: Sarpy County’s development patterns will support growth while being sensitive to the interaction of environmental sustainability, infrastructure efficiency, community wide energy costs and impacts, and market demands.

Goal UF 1: Reduce Vehicle Miles Travelled (per capita) by 10% by 2020 compared to 2008 (2008: 21.9; 2020: 19.7).

Goal UF 2: Reduce energy use per capita in Sarpy County by 5% by 2017 and 10% by 2022 compared to 2010.

**ENERGY GENERATION**

Vision: Sarpy County supports appropriate renewable forms of energy generation.

Goal EG 1: By 2020, the amount of energy generated by renewable energy systems will double compared to 2011.

Goal EG 2: By 2017, Sarpy County will have established a plan for the County’s use of renewable energy resources.

**FOOD and AGRICULTURE**

Vision: Sarpy County supports local food production while building community resilience and reducing energy costs.

Goal FA 1: Preserve farms and agricultural land

**BUILDINGS**

Vision: Sarpy County is a community leader in facilitating, promoting and demonstrating energy-efficient building design.

Goal BD 1: By 2020, double the number of buildings within Sarpy County built to the latest version of LEED or equivalent standards compared to 2011 (3 certified, 6 registered on USGBC website).

**COUNTY OPERATIONS**

Vision: Sarpy County’s operations actively manage energy consumption to reduce the financial and environmental impacts to the community.

Goal CO 1: Reduce County operations’ energy consumption by 5% by 2020 compared to 2010.

Goal CO 2: Reduce kBtus per square foot in county buildings by 10% by 2020 compared to 2010 (current: 247.1 kBtu/sf).

Goal CO 3: Reduce total miles travelled by Sarpy County fleet by 10% within 5 years compared to 2010.

Goal CO 4: Increase average efficiency of vehicle fleet by 5% within 5 years (MPG or GPH, whichever is applicable) compared to 2010.

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1 Renewable energy is defined as in Neb. Rev. Stat. § 77-27,235(2)(b) (“Eligible renewable resources means wind, moving water, solar, geothermal, fuel cell, methane gas, or photovoltaic technology.”).

2 “Built” to LEED standards does not require the expense of acquiring LEED certification.
Sarpy County began development of the Energy Element Plan in the spring of 2011 using funding from the American Recovery and Reinvestment Act of 2009. The Plan helps Sarpy County satisfy the requirement of Nebraska Legislative Bill 997 (passed in 2010), which requires cities and counties throughout the State to complete an Energy Element by January 2015. The Plan assesses energy infrastructure and energy use by sector, evaluates renewable energy sources, and promotes energy conservation measures that benefit the community. The Plan complements Sarpy County’s existing Comprehensive Development Plan by providing a specific set of goals and strategies related to energy efficiency and conservation.

A project team comprising local professionals from Lamp, Rynearson & Associates, Inc.; Steve Jensen Consulting; and Verdis Group completed the Energy Element on behalf of the County. The project team began in Spring 2011 by identifying and collecting the data needed to develop a baseline of energy use in the County. The team collected county-wide energy consumption and spending data broken down by sector (e.g., industrial, residential, commercial) as well as transportation-related data (e.g., vehicle miles travelled). The team also collected data on energy consumption and spending by Sarpy County in its own operations.

To put Sarpy County’s data in perspective, the team also gathered available information on energy consumption and spending at the state (Nebraska) and national levels. To provide additional context for Sarpy County, the project team researched energy-related trends, such as the current and historical costs of electricity and major fuels (e.g., gasoline, natural gas) as well as the economic implications of continuing current trends. Lastly, the team conducted a review of other community energy plans with the specific goal of highlighting the contents of similar communities’ plans.

Once the team had collected, organized, and analyzed the data, a Core Committee was engaged. The Core Committee as well as the community was invited to public kickoff meetings. The kickoff meetings allowed for public participation and comment on community issues and concerns related to County energy use. At the kickoff meeting, the team presented the energy use data and analyses as well as summaries of similar community plans. Members of the Core Committee and public also provided reactions and generated goals and strategies specifically related to urban form and transportation, energy generation, food and agriculture, buildings, and county operations. Ultimately, a category for education was also added to this list.

Using the input from the Core Committee and Public meetings, and cross-referencing other community plans, the project team developed a draft list of goals, strategies, and guiding principles as well as a vision statement for each of the five areas. The Core Committee met a second time to review the draft goals, strategies, principles, and vision statements. Subsequent to that meeting, the project team developed a process by which the Core Committee could prioritize the strategies. Simultaneously, the project team expanded the approved goals and strategies into a draft Energy Element Plan (this document), for approval by the Core Committee at its third meeting.

The project team also conducted a thorough review of the County’s Comprehensive Development Plan (CDP) to determine if any of the guiding principles, vision statements, goals, or strategies developed in the Energy Element process conflicted with the overall plan for the County. The project team found all of the references in the Comprehensive Development Plan related to energy to be compatible with the policies developed in the Energy Element. As a result, no modifications to the CDP were deemed necessary in order to ensure consistency between the plans.

[FUTURE] After approval by the Core Committee the Energy Element then went to the Sarpy County Planning Commission and County Board for final approval. The plan was finally approved on [DATE].

3 For the complete presentation of Sarpy County’s Energy data as presented at the Kick-off Core Committee meeting and Public Meeting, please visit: http://www.sarpy.com/planning/documents/SarpyCountyEnergyElementKickoffMeetingPresentation.pdf
The project team would like to thank the following organizations for their help in providing information and data needed to develop this plan:

Sarpy County Planning Department  
Sarpy County Facilities Management  
Sarpy County Fleet Management  
Black Hills Energy  
Emerging Terrain  
Metropolitan Utilities District  
Offutt Air Force Base and the 55th Wing  
Omaha Public Power District  
Nebraska Energy Office  
U.S. Census Bureau  
U.S. Energy Information Administration

CORE COMMITTEE MEMBERS

One of the most important elements to ensuring project success is community involvement. The Core Committee was created to include a diverse representation of the county’s citizens. Stakeholders such as planners, economic development specialists, environmentalists, and developers with both public and private sector experience were invited to participate on the committee. The Core Committee was the main sounding board for the development of the County’s goals and strategies.

Members of the Core Committee committed to attending three meetings as well as providing comments on draft documents. The Core Committee was also asked to disseminate information back to—and invite input and feedback from—their respective businesses and organizations.

Core Committee members included the following individuals:

Jerry Blasig  
Bellevue University
Scott Bovick  
Sarpy County Administration
Pat Clarke  
Sarpy County Fleet Services
Brian Craig  
City of Papillion
Dave DeBoer  
Metropolitan Utilities District
Bruce Fountain  
Sarpy County Planning, Economic Development
Amy Haase  
Planning Representation
Ron Handke  
Black Hills Energy
Tim Hemsath  
UNL Representation
Robin Hixon  
Metropolitan Community College
Jim Krist  
OPPD
Nick Limpach  
Mechanical/Electrical Engineering Representation
Donna Lynam  
City of Gretna
Sen. Heath Mello  
State Senator
Craig Mielke  
Environmental Representation
Jim Nekuda  
Sarpy County Board of Commissioners
Al Povondra  
Architectural Representation
Don Priester  
Green Bellevue
George Reese  
Sarpy County Energy Code Enforcement
Ross Richards  
Sarpy County Facilities Management
Tom Richards  
Sarpy County Board of Commissioners
Dave Sands  
Nebraska Land Trust
Kelly Shadden  
Metro Transit
Neil Smith  
Development Community
Mike Sotak  
Stormwater Representation
Doug Stringfield  
The Bellevue Medical Center
Mark Stursma  
City of Papillion
Jerry Torczon  
Sarpy County Planning Commission
Anne Trumble  
Urban Design/Landscape Architecture Representation
Tim Weander  
Nebraska Department of Roads
Rich Weber  
Sarpy County Public Works
Dennis Webster  
Midlands Hospital
Doug Whitfield  
Sarpy County Planning Commission
Denny Wilson  
Sarpy County Engineer
John Winkler  
Papio-Missouri River Natural Resources District
Greg Youell  
MAPA
OVERVIEW OF PLAN STRUCTURE

The Energy Element is organized as follows. First, it establishes the context for the Energy Element by providing an overview of energy policy in Nebraska. Then it acknowledges Sarpy County’s past work to conserve energy with an overview of past energy successes in Sarpy County’s operations. The next section sets the stage for the plan by providing a summary of the data collected to prepare the plan. The data leads into a set of guiding principles, which are intended to establish a framework within which the County can exercise discretion in implementing the plan. The guiding principles are followed by a summary of the goals contained in the plan, and detailed sections on each of the five areas: urban form and transportation, energy generation, food and agriculture, buildings, and county operations. These detailed sections also contain more specific and relevant data for each area. The plan also includes strategies for education that support the five main areas of the plan.

ENERGY POLICY IN NEBRASKA

Work on the Sarpy County Energy Element has not occurred in a vacuum. Both the State of Nebraska and the Omaha Metro region have increased their focus on energy in recent years. At the state level, Nebraska passed Legislative Bill 997 (LB 997) in April 2010. LB 997 modified Nebraska law to require public jurisdictions—including counties—in Nebraska to create an energy element when updating a comprehensive plan, or otherwise by January 2015. By creating an energy element to supplement its own comprehensive master plan, Sarpy County is complying with LB 997 (see Neb. Rev. Stat. § 23-114.02(3) (2011)).

Nebraska also maintains a state energy plan. The 2011 Nebraska Energy Plan (NEP) outlines more than a dozen strategies for the state. These strategies focus on increasing energy production from Nebraska’s natural resources, increasing use of alternative fuels, diversifying energy production, and improving energy security and reliability. Unlike LB 997, the NEP does not impose any specific requirements or set specific metrics for the state or local communities. Still, many of the NEP strategies support and echo strategies adopted in Sarpy County’s Energy Element.

At the local level, the City of Omaha has recently developed its own Comprehensive Energy Management Plan (CEMP). The CEMP arose from the work done by Environment Omaha to create a comprehensive Environmental Element for Omaha’s Master Plan. Portions of Omaha’s Environmental Element (including urban form and transportation, resource conservation, and building construction) categorically correspond to goals and strategies in Sarpy County’s Energy Element. The City of Omaha and Sarpy County, as neighbors, should benefit from their complementary visions for energy policy in the Omaha Metro region.

In spite of the progress in the Omaha Metro Area, the NEP also acknowledges the potential for conflict—and the need for careful balance—between State and local energy plans. The State Plan notes that “investing in commercial, residential and municipal energy programs increase [sic] diversified portfolios, but could also add to utility challenges by reducing needed revenues and increasing costs.” (Nebraska Energy Office, 2011 Nebraska Energy Plan, p 2 (2011)) The NEP goes on to note that the state, local governments, and utilities need to work together to achieve a balance as energy diversity increases. Accordingly, Sarpy County expects to cooperate and coordinate with municipalities in the County, the region, and the state while working toward the goals of this Energy Element plan.
Sarpy County has pursued energy efficiency in internal operations for many years prior to development of the Energy Element. Past efforts have focused on increasing the efficiency of county-owned buildings and improving the operations of the county’s vehicle fleet.

Sarpy County has been installing energy management systems throughout its buildings for several years and is nearly complete with this effort. Energy management systems allow for automated and remote operation of building mechanical systems. This capability makes it easier to maintain building temperatures within desired set points and provides facility managers more control over building systems. Although data has not been collected to determine the energy and cost savings of the energy management systems, typical savings from such upgrades range from 5% to 20%.

The facilities management team has also been proactively replacing inefficient building equipment with more efficient equipment. For example, some air-handling units have been equipped with variable frequency drives. This modification allows the unit to use a variable amount of electricity to match the airflow needed for a desired environmental affect, rather than operate at a constant level always drawing the same high amount of energy.

Sarpy County has also recently installed a collection system at the landfill that collects landfill gas and burns it off with a flare. This prevents methane from entering the atmosphere and the County receives revenue from selling carbon credits on the open market. This new system also has the potential for a gas to energy project in the future.

Finally, Sarpy County made clear its commitment to energy efficiency in 2011 when it opened the new LEED certified 35,000 square-foot sheriff’s building. The building contains many energy efficient features such as abundant day lighting and heating and cooling systems that use ground source heat pumps. There are other valuable environmental features such as an underground cistern that captures storm water, which reduces runoff and reduces the use of purchased water for irrigation. The lessons from this new building will provide guidance as Sarpy expands its building stock in the future.

Sarpy’s vehicle fleet has also undergone changes to save energy. Energy Efficiency Block Grant funds were used to install a system that blends E85 fuel for Sarpy’s “flex fuel” vehicles. Using more ethanol in these vehicles reduces emissions, limits the amount of imported oil purchased in the county, and has kept fuel costs level while gasoline prices have climbed. The fleet maintenance team has itself also worked to improve the insulation of the maintenance building to save on heating and cooling energy. Finally, the fleet sells waste oil for use as heating oil, which reduces the amount of oil imported for heating applications.
The global demand for energy is constantly increasing, and could be 50 percent higher in the 2030’s than demand today (2010 Joint Operating Environment, United States Joint Forces Command). Rising demand for energy will impact all aspects of daily life. Consumers will feel the impact directly as the cost of fuels and electricity rise, and indirectly as the cost of goods and services rise because of higher costs for energy used in manufacturing and transportation. Energy demand also impacts our military forces. About one in eight soldiers killed or wounded in Iraq from 2003 to 2007 were protecting fuel convoys (CNN Money, see http://money.cnn.com/technology/storysupplement/cost_military_oil_addiction/?iid=EL).

In spite of the rising demand for energy, many experts believe that the technology exists today to flat line or reduce energy consumption. There is also a misconception that the energy supply is running out. Certain non-renewable resources, such as natural gas and oil are running out, but there is plenty of renewable energy to meet current and future demands. The graphic in Figure 1 illustrates this point.

According to Figure 1, the world doesn’t have an energy supply problem but has an energy availability problem. Presently non-renewable energy sources are the most readily available to us. However, non-renewable energy will become less affordable over time as the limited resources are consumed. If renewable energy can be made available easily and affordably, some of the social and economic challenges of scarce fossil fuels may be avoided.

**NON-RENEWABLE ENERGY**

Oil, natural gas, coal, and uranium are non-renewable energy resources. Once depleted, there is no more for future needs. Thus, as we use those resources the corresponding squares in Figure 1 will get smaller. As an example, every barrel of oil used will make the black square smaller the next year.

**RENEWABLE ENERGY**

Solar, wind, biomass, geothermal, ocean and wave, and hydro are renewable energy resources. As we use them, they replenish quickly enough that these resources are available to us every year. Compared to non-renewable energy sources, use of renewable sources does not affect the size of the corresponding square in Figure 1 from year to year. As an example, using a portion of the yellow solar energy square one year does not make that square smaller the next year.

Figure 1: The squares in the graphic above represent the total potential amount of annual global energy available from known energy sources compared to annual global energy demand, represented by the small green square. (Source: GOOD Magazine Issue 24 Winter 2011)
SARPY COUNTY ENERGY CONSUMPTION

Nebraska is the only state with 100 percent public power. The Omaha Public Power District provides electricity in Sarpy County. Natural gas is provided throughout the County by both the Metropolitan Utilities District and Black Hills Energy. In some rural areas, residents use propane as well. When considering the major sectors of energy consumption: residential, commercial, industrial, and transportation, Sarpy County used an estimated 241 MMBtu (Million British Thermal Units) of energy per year per person in 2010.

Perhaps the most interesting point from Figure 2 is that per capita energy consumption at the local, state, and national levels decreased from 2008 to 2009 before increasing slightly in 2010. Although the reduction in energy consumption corresponds to an economic recession, it demonstrates an ability to reduce energy consumption with currently available resources and techniques. Thus, the goals of this plan are achievable regardless of any technological innovation or lack thereof in the next 10 to 15 years.

Figure 2: The graph above compares energy use per person in Sarpy County with Nebraska and the United States. Values for 2010 are estimated based on the most recent available data.
Figure 3 below further illustrates the magnitude of per capita energy consumption in the county by equating the energy used per person per year with barrels of crude oil and with human labor. Although access to this energy allows each person to be individually more productive, there is a real cost to this energy when considering the source is primarily fossil fuels.

Figure 3: To give a better sense of the amount of energy used per person per year in Sarpy County (241 MMBtu), the graphic illustrates 241 MMBtu as equivalent barrels of crude oil (42 barrels per year) and as equivalent physical human labor (48 workers per year).

Figure 4 provides a visual representation of the sources that feed into the electricity mix serving Sarpy County, more than three-fourths of which are fossil fuels.

Figure 4: The graph above illustrates the mix of resources that serve the Omaha Public Power District’s electricity customers.
The following guiding principles have been created to help guide the development and implementation of the Energy Element Plan. Sarpy County will…

- Build resiliency for our community through energy efficiency and conservation
- Be resilient to rising and fluctuating energy prices
- Support job creation through good energy policy
- Be recognized as a location of choice for investment in part because of its innovative energy strategy
- Ensure that major public investments visibly contribute to meeting the Energy Element goals
- Present opportunities to conserve energy through development and redevelopment patterns that support reduced energy consumption
- Pursue uniform and efficient growth policies in coordination with the municipalities in the County
- Promote energy planning with Sarpy County Plans including land use, zoning, site orientation, building, infrastructure, and transportation,
- Emphasize to the public through education and awareness campaigns the importance of energy efficiency, waste reduction, and other energy conservation strategies
- Empower individuals to take actions that support the Energy Element, and to act as examples for others in the community
- Support innovative ideas and not act as a deterrent to actions that support and advance the goals and principles of the Energy Element

GOALS AND STRATEGIES

This section outlines the goals and strategies in detail in six areas:

- Urban Form and Transportation (UF)
- Energy Generation (EG)
- Food and Agriculture (FA)
- Buildings (BD)
- County Operations (CO)
- Education

Each section contains a brief introduction including selected energy-related data. Following the presentation of the selected data, the section lists Sarpy County’s vision for each area. Lastly, each section lists the goals and strategies related to that area. In each section, there are strategies that Sarpy County will initially focus on considering what is feasible within the near future, while others will be considered on an ongoing periodic or future basis.
Getting around takes energy. The Urban Form and Transportation section of the plan deals with the movement of people and goods in and through Sarpy County. Vehicle miles travelled (VMT) (Figure 5) combined with the fuel efficiency of vehicles in Sarpy County directly relate to how much energy is used to get people and goods from one place to another.

![Vehicle Miles Traveled Per Day Per Person](image)

Figure 5: Sarpy County citizens were driving more and more every year until 2008, when high gas prices and an economic recession reduced miles driven. In 2008, vehicle miles travelled per capita in Sarpy County was 22 miles. Examples of a 22-mile trip in Sarpy County include La Vista to Offutt and back; Gretna to the Sarpy County Offices and back; and Bellevue to Cabela’s and back.

How we plan our space directly impacts how we get around and how far we have to go. By focusing on the reduction of VMT per capita, the strategies developed recognize that less energy is used when fewer miles are driven per person, per day. Lower VMT means less money spent on fuel which means more money to spend in the local economy. As shown in Figure 6, the rising price of fuel is likely to have a large financial impact on Sarpy County residents’ discretionary income.

![Comparing the Price of Gasoline to the Consumer Price Index](image)

Figure 6: From 2000 to 2010, inflation (black line) was over 26%. During the same period, the price of regular unleaded gasoline (green line) in the Omaha Metro rose 89%.
Figure 7 illustrates the amount of discretionary income Sarpy County residents lose as the price of fuel increases 50¢. In contrast Figure 8 illustrates an opportunity for discretionary income to be gained based on reducing Vehicle Miles Traveled Per Day Per Person per capita reduction.

There are a number of challenges related to urban form and transportation that may impede successful achievement of the goals. One major challenge is the behavioral inertia of people with respect to single occupancy vehicles. The personal automobile has been a cultural staple for decades, and changing that culture will take time. Another cultural shift that could slow progress of this plan is the land use patterns of the recent past. Completed subdivisions and suburban development involving acreages and large lot sizes will continue to present challenges just as it will be challenging to shift development patterns toward smaller lots, mixed uses, and greater connectivity. The strategies in this plan aim to augment and support the policies contained in the County’s Comprehensive Development Plan to overcome these challenges over time.
URBAN FORM AND TRANSPORTATION

VISION

Sarpy County’s development patterns will support growth while being sensitive to the interaction of environmental sustainability, infrastructure efficiency, community wide energy costs and impacts, and market demands.

**Goal UF 1**
Reduce Vehicle Miles Travelled (per capita) by 10% by 2020 compared to 2008 (2008: 21.9; 2020: 19.7).

**Goal UF 2**
Reduce energy use per capita in Sarpy County by 5% by 2017 and 10% by 2022 compared to 2010.

**STRATEGIES**

1. Support Active Transportation Alternatives and Encourage Multi-Modal Transportation Options:
   1.1. Collaborate with other regional government organizations to plan for regional transportation initiatives and expand public transportation options to residents of Sarpy County.
   1.1.1. Increase ridership.
      1.1.1.1. Coordinate with MAPA, Metro Transit, and local businesses to set up park & ride locations, possibly sharing a portion of under-utilized business parking lots.
      1.1.1.2. Encourage large employers to work with Metro Transit.
      1.1.1.3. Identify employment hubs that can be served by mass transit.
      1.1.1.4. Provide incentives for mass transit use such as transit passes for County employees, and ways to increase speed of transit.
   1.1.2. Increase service
      1.1.2.1. Collaborate with Metro Transit to establish more regular routes with more coverage in Sarpy County. Current routes that serve Sarpy County are 95, 98, and 48.
      1.1.2.2. Collaborate with Metro Transit to develop enhanced public transportation, such as Bus Rapid Transit, from Sarpy cities to downtown Omaha.
      1.1.2.3. Collaborate with MAPA and Metro Transit to integrate MetrO! Rideshare into Sarpy communities (includes Park ‘N’ Ride lots).
      1.1.2.4. Collaborate with other regional governmental organizations to ensure the evaluation of commuter rail from Sarpy cities to downtown Omaha.
   1.2. Increase use of multi-use trails, walking, and bicycling as alternative modes of transportation.
      1.2.1. Plan trails to connect larger neighborhoods and provide access to major employers and community facilities.
      1.2.2. Connect neighborhoods.
   1.3. Adopt complete streets policies in the County’s design standards.
      1.3.1. Coordinate street and road planning and design among communities to insure that complete streets policies are adopted throughout Sarpy County.
   1.4. Develop realistic information regarding the impacts of new development on the cost of providing public infrastructure and services.
   1.5. Collaborate with Sarpy County municipalities to develop and support policies that align with the County’s Vision for Urban Form and Transportation.
   1.6. Encourage infill development.
      1.6.1. Collaborate with Sarpy County municipalities and Sarpy County Economic Development Corp. to develop strategies to fill empty buildings in urban core areas (e.g., downtown Papillion).
   1.7. Encourage increased use of underutilized public infrastructure.
2. Ensure efficient utilization of land resources.

2.1. Connect neighborhoods.
   - 2.1.1. Encourage new development adjacent to existing development.
   - 2.1.2. Interconnect new development for active and vehicular transportation options.
   - 2.1.3 Increase density of walkable destinations (Transit-Oriented Development).
   - 2.1.4 Establish development guidelines or codes so that sites and site designs are friendly to active transportation modes.

2.2. Increase density
   - 2.2.1 Implement “build-through” design regulations for acreage developments in areas where urban services such as sanitary sewers and municipal water will be available in the future.

2.3. Promote mixed use development.

2.4. Develop employment centers within the County.
   - 2.4.1. Reduce travel time outside of community for basic services through community-based land use plans.
   - 2.4.2. Encourage municipalities and organizations to utilize all available tools and programs (e.g., tax incentives, utility rebate programs) and balance jobs/housing and promote economic development.
   - 2.5. Encourage and plan for diverse housing options/opportunities.

3. Encourage and promote development of charging stations and other infrastructure for alternative fuels.

4. Consider implementing a traffic light optimization program or study.
Sarpy County Energy Element

Nebraska is a public power state and Sarpy County is served by OPPD exclusively for its electricity needs. Energy Generation is primarily about generating electricity, but also includes the growing and processing of bio-based fuels such as bio-diesel and methane from landfill gas. Though Sarpy County does not have a direct impact on how OPPD generates electricity, (see Figure 3), the County can address distributed generation regulations and provide direction to move energy generation forward in the best interests of Sarpy County’s economic, environmental and social well-being.

Although evaluation of energy generation, and specifically renewable energy generation, is a stated goal of Legislative Bill 997, there are some barriers to more widespread use of renewable energy. There are many different sources of renewable energy that have potential to supplement our current supply and some technologies that are not realistic. According to the Nebraska Wind Potential map, Sarpy County does not have a strong potential for large-scale wind farms, though distributed smaller scale wind generation may work in select areas (Figure 9). Sarpy County has a better than average potential for solar energy based on the National Renewable Energy Laboratory’s solar potential map (Figure 10).

One hurdle is the public understanding of what constitutes a realistic renewable energy—both for electricity generation and biofuel production. Other barriers come from laws, regulations, codes, and policies. In some instances, these legal devices inhibit use of small-scale, distributed, or community-based renewable generation. One specific example of the impact of policies is shown in Figure 11 with how federal government energy subsidies favor fossil fuels over renewable energy.

Figure 9: As shown on the wind potential map (developed by AWS TrueWind, LLC using MesoMap system and historical weather data) and considering other siting constraints, Sarpy County has limited opportunity to host large-scale wind generation. However, small-scale, distributed wind generation has more potential (depending on the site-specific characteristics).
Figure 10: This map from the National Renewable Energy Laboratory shows a better than average potential solar energy in Sarpy County, at 4.78–4.92 kWh/m²/day.
Figure 11: Graphic showing the federal government subsidization of various energy solutions. The graphic includes subsidies in the form of direct spending and tax breaks. The amount of subsidies for fossil fuels is greater than the combined subsidies for carbon capture and storage, renewable energy, and corn ethanol. (Source: GOOD Magazine Issue 24 Winter 2011)
VISON

Sarpy County supports appropriate renewable forms of energy generation.

Goal EG 1
By 2020, the amount of energy generated by privately owned renewable energy systems will double compared to 2011.

Strategies
1. In conjunction with County Extension Office and local educational institutions, inform citizens about the most practical renewable energy applications.
   1.1. Small wind
   1.2. Solar (photovoltaic)
   1.3. Solar hot water
   1.4. Geothermal
2. Remove unintended barriers for appropriate small-scale distributed energy generation.
3. Review, update, and improve the County’s existing regulations and policies regarding private pursuits of renewable energy generation.
   3.1. Solar
   3.2. Wind
   3.3. Ultra-clean fuels
   3.4. Net metering
   3.5. Small-scale biofuel production

Goal EG 2
By 2017, Sarpy County will have established a plan for the County’s use of renewable energy resources.

Strategies
1. Periodically reassess the feasibility of utilizing County landfill gas from both old and new landfills for energy generation.
2. Evaluate the feasibility of producing energy from future publicly owned and operated wastewater treatment facilities.
3. Identify, research, and assess likely locations for renewable energy production.
The food we eat takes energy to plant, grow, harvest, process, and transport to our tables. The type of soils and growing conditions as well as the distance from farm to table impacts how much energy is used in our food systems. Prime farmland is the highest classification land can be given for high quality growing conditions and Sarpy County has a relatively large amount of this valuable asset, as shown in Figure 12. Currently, the prime farmland is primarily used to grow commodity crops such as corn and soybeans (Figure 13). If just over half of the current corn and soybean land use was converted to vegetable and fruit production, Sarpy County could provide the entire Omaha Metropolitan region with food to meet its needs (Figure 14).

Strategies related to food and agriculture focus on use of prime farmland and whether the use is commodity farming, diverse food cultivation, development, or other purposes. The strategies below help give guidance to making the decision of how best to use such valuable food-growing land.

How and where the County chooses to balance urban development with preserving prime farmland is the biggest challenge facing the County related to food and agriculture energy use. Population and economic pressures are pushing into prime farmland. Both urban and rural development will impact the amount of energy use, community food resilience, and how much money will be devoted to energy throughout the County.

Figure 12: The graphic above illustrates that over half of agricultural land in Sarpy County is classified as “prime farmland” (dark green). (Source: Emerging Terrain).
Figure 13: The graphic above provides a visual representation of what is grown on cropland in Sarpy County. It is clear from this map that corn (yellow areas) and soybeans (green areas) are the major crops produced in the county. The next most abundant areas are pasture/grass (light green) and urban developed land (grey). (Source: Emerging Terrain).
Data Sources: Current land area cultivation data is taken from 2010 Nebraska Cropland Data Layer: USDA/NASS analysis of remote sensing satellite data. Estimated land area needed to grow enough of the selected fruits and vegetables for the current Omaha-Council Bluffs MSA is based on the following data: 2010 Census population 865,350; USDA-ERS total food availability data for each food type, 10-year average 2000-2009; and average organic crop yields per acre from ‘The Owner-Built Homestead’ by Ken & Barbara Kern and ‘Before You Start an Apple Orchard’ by the University of Minnesota.

Figure 14: In the graphic above, the top bar represents the approximate current use of cultivated land for growing primarily corn and soybeans. The bottom bar represents the cultivated land area needed to feed the current population of the Omaha Metro. The multiple colors in the bottom bar signify a diverse mix of 24 vegetables and fruits compared to the top bar with only two crops represented. (Source: Emerging Terrain).
FOOD AND AGRICULTURE

VISION

Sarpy County supports local food production while building community resilience and reducing energy costs.

Goal FA 1
By 2020, increase the percentage of locally produced food that is consumed in Sarpy County.

Strategies

1. Work with local experts and conduct any additional research necessary to determine the current amount of locally produced food that is consumed in Sarpy County.

2. Support best practices for “backyard” agriculture.
   2.1. Review existing/develop new codes for:
      2.1.1. Composting
      2.1.2. Urban “animal units”

3. Maintain a balance among agricultural, ecological, and urban land use within Sarpy County.
   3.1. Create agricultural conservation districts and ecological corridors in the county avoiding the “island effects” of isolated parcels.
   3.2. Sarpy County will assess the ecological and agricultural corridors in the county and give consideration to conservation easements and important habitats.

4. Transition ownership of prime farm land.
   4.1. Support foundations that support young farmers.
   4.2. Support policies that make farm ownership more affordable/attractive.

5. Support local food production.
   5.1. Support markets for local food (e.g., farmers’ markets).
   5.2. Encourage and support the creation of edible landscapes (e.g., fruit/nut orchards).
   5.3. Encourage seed and crop diversity.

6. Provide a framework of parkways, open space and greenways (Sarpy County Plan).
   6.1. Leave open space in new developments for urban agriculture where appropriate.

7. Education
   7.1. Encourage community education and dialog.
   7.2. Encourage “how to farm” education & property stewardship.
      7.2.1. Increase soil health.
         7.2.1.1. Rehabilitate the soil.
         7.2.1.2. Use permaculture.
         7.2.1.3. Assist farmers with organic soil rehabilitation.
Buildings use energy for heating and cooling and to run machines, lights, computers, and other electronics. Couple building energy use with the fact that buildings are around for decades if not hundreds of years, and you realize that the energy used over the life of the building can far exceed the energy used in the materials and construction of the building. Figure 15 shows that in 2008, buildings accounted for 76% of energy used in Sarpy County. This section addresses all buildings in Sarpy County, including residential, commercial, and industrial buildings. Some strategies are focused on energy used in existing buildings and others are focused on buildings yet to be built. The strategies below deal with how we design, build, and renovate our buildings because of the direct impact on the amount of energy Sarpy County uses and the cost to its citizens. Figure 16 shows how the cost of energy impacts average households in several Sarpy County communities.

Similar to the challenges in urban form and transportation, the challenges related to building energy efficiency are cultural and based on perceptions. There is a common perception that energy-efficient buildings are more expensive to build. Regardless of whether that is true or not, it is a cultural fact that prevents some from even considering designing or building a more efficient building. Another possible challenge is the large number of “green” building standards available. There are many: U.S. Green Building Council’s LEED system, the U.S. Environmental Protection Agency’s ENERGY STAR system, the federal HOME STAR program, net zero buildings, passive buildings, the Living Building Challenge, and so on. Regardless of what program or standards are used, designers and builders can make use of these standards to help make energy efficient buildings more prevalent. Brief descriptions of LEED and ENERGY STAR are provided below.

Figure 15: The pie charts above compare energy use by sector in Sarpy County, the state of Nebraska, and the United States. When taking into account Offutt Air Force Base’s transportation fuel use, Sarpy County’s transportation energy use is slightly higher than Nebraska but slightly lower than the U.S. While the Nebraska and U.S. data includes agriculture with industrial, OPPD groups agricultural electricity use with the commercial category for Sarpy County.
DEFINITIONS


**ENERGY STAR:** An ENERGY STAR certified facility meets strict energy performance standards set by the U.S. Environmental Protection Agency and uses less energy, is less expensive to operate, and causes fewer greenhouse gas emissions than its peers. To qualify for the ENERGY STAR, a building or manufacturing plant must earn a 75 or higher on EPA's 100-point energy performance scale, indicating that the facility performs better than at least 75 percent of similar buildings nationwide. The ENERGY STAR energy performance scale accounts for differences in operating conditions, regional weather data, and other important considerations.

**Net Zero Energy Building (ZEB):** A site zero energy building produces at least as much energy as it uses in a year, when accounted for at the site.
VISION

Sarpy County is a community leader in facilitating, promoting and demonstrating energy-efficient building design.

Goal BD 1
By 2020, double the number of buildings within Sarpy County built* to the latest version of LEED or equivalent standards compared to 2011 (3 certified, 6 registered on USGBC website).

Strategies
1. Review and evaluate codes that exceed the minimums required by the State of Nebraska with regard to energy efficiency upgrades in residential, commercial, and industrial buildings.

2. Improve accountability and education.
   2.1. Collaborate with educational institutions to educate homeowners regarding practical energy efficiency measures, including the Energy Star system.
   2.2. Educate County staff on latest and progressive energy codes and systems.
   2.3. Support and encourage meeting current LEED standards for all new buildings and renovations throughout the county.

3. Partner with utilities to enhance the County’s efforts to understand:
   3.1. Energy use patterns.
   3.2. Time-of-use rates.
   3.3. Incentive-based rates.
   3.4. Energy efficiency incentives.
   3.5. Benefits of participation in utilities’ demand response programs.

4. Promote best practices in energy efficient building programs.
   4.1. Support the use of the most-efficient building systems.
      4.1.1. Encourage residential and commercial energy evaluations and upgrades.
   4.2. Develop criteria for the prioritization of retro-commissioning existing buildings.
   4.3. Encourage energy conservation through effective siting of buildings and landscaping.
   4.4. Encourage increased use of green roofing systems.
   4.5. Promote the integration of renewable energy sources into buildings (see Energy Generation Above).
      4.5.1. Provide information regarding available renewable energy generation.
      4.5.2. Explore demonstration projects utilizing renewable energy generation.

5. Identify, evaluate, and remove impediments to Net Zero buildings.

* “Built” to LEED standards does not require the expense of acquiring LEED certification.
County operations encompass any and all of Sarpy County’s administrative operations and services. This primarily includes all buildings owned or leased by the County and the County’s vehicle fleet. As Figure 17 and Figure 18 below show, more than half of the energy consumed by the County is in the form of electricity, which refers to County buildings. In contrast the graphs also show that almost half of the County’s energy expenses pay for transportation fuel. Therefore the goals and strategies focus on these areas of Sarpy’s operations.

The primary challenge for the County is finding the funds to carry out energy efficiency and conservation improvements. Moreover, the relatively low cost of electricity and natural gas impact the payback period of such improvements. Nonetheless, the County is dedicated to making incremental changes over time that gradually decrease the amount of energy consumed by the county as well as decrease the long-term cost of its buildings and vehicles.

Figure 17: The graph above shows that more than half of the energy consumed by the County is in the form of electricity, indicating that buildings are the primary energy consumer for Sarpy County.

Figure 18: The graph above shows that even though Sarpy County uses the least amount of energy for transportation, the cost of energy for transportation is the largest energy expense.
## VISION

Sarpy County’s operations actively manage energy consumption to reduce the financial and environmental impacts to the community.

### Goal CO 1

**Reduce energy consumed in County operations by 5% within 5 years, and by 10% within ten years compared to 2010.**

### Goal CO 2

**Reduce energy consumption by county buildings by 10% within 10 years (current: 247.1 kBtu/sf) compared to 2010.**

### Strategies

1. Incorporate energy efficiency improvements to buildings and building systems.
   1.1. Conduct energy efficiency upgrades to building HVAC systems.
   1.2. Automate building systems for highest efficiency and comfort settings.
   1.3. Purchase or implement a system for automating building system maintenance.
   1.4. Manage peak demand.
     1.4.1. Air conditioner cycling programs.
   1.5. Ensure building temperature set points are within an established range that supports comfort and efficiency.
   1.6. Replace indoor lighting in county buildings with energy efficient lighting.
   1.7. De-lamp buildings where appropriate by removing one or more lamps from multiple-lamp fixtures.
   1.8. Install solar water heaters in county facilities such as the jail.
   1.9. Reduce the use of employee convenience items that draw “vampire” or “phantom” loads while plugged in and not in use (e.g., space heaters, phone chargers, VCRs, TVs, coffee pots, microwaves and microfridges).
   1.10. Sleep or shut down computers every night and on the weekends.
   1.11. Use EPA’s ENERGY STAR program to benchmark and track building energy performance.

2. Provide feedback to facility managers on energy consumption.
   2.1. Conduct building energy audits on priority county buildings to identify energy retrofit and improvement opportunities.

3. County will demonstrate a commitment to energy efficiency buildings by implementing progressively more efficient building pilot projects.
   3.1. Improve the County’s renewable energy portfolio through an increase of on-site renewable energy application in appropriate County facilities and projects.

4. Research Energy Service Companies (ESCOs) for potential implementation of energy efficiency upgrades.

5. Research revolving loan fund opportunities to finance energy efficiency improvements.

6. Provide education/incentives for County employees in the use of conservation methods.
   6.1. Provide real-time resource use feedback to building occupants.
   6.2. Implement a program to remind occupants to turn off lights in unoccupied rooms such as conference rooms, break rooms, and copy rooms.
<table>
<thead>
<tr>
<th><strong>Goal CO 3</strong></th>
<th><strong>Goal CO 4</strong></th>
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<tr>
<td><strong>County Operations</strong></td>
<td><strong>Goal CO 4</strong> Increase average efficiency of vehicle fleet by 5% within 5 years (MPG or GPH, whichever is applicable) compared to 2010.</td>
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</tbody>
</table>

### Strategies

1. **Improve efficiency and reduce use of vehicle fleet.**
   1.1. Provide training to county employees on efficient driving techniques.
   1.2. Implement a no-idling policy and other policies to save fuel.
   1.3. Create a purchasing policy to infuse more efficient vehicles into the fleet over time.
   1.4. Develop a fleet maintenance/management education program.
   1.5. Pilot a program using biofuels in existing fleet vehicles.
   1.6. Encourage more telecommunication, trip-chaining, and trip aggregation.
      1.6.1. Develop and encourage the use of video and tele-conferencing infrastructure to reduce vehicle miles travelled for meetings.

2. **Provide incentives for employees using conservation methods.**
   2.1. Provide incentives for employee carpooling and transit use, such as reserved parking spots for carpooling, before-tax payroll withdraw for transit costs, other financial incentives, or any combination of the above.
Education is a critical component of any successful energy plan. Every citizen, business, and building in Sarpy County can make changes that save energy and money which in turn support a healthy and flourishing economy. This section highlights strategies for keeping everyone informed on what the County is doing to be an energy leader as well as ways to share information for people to make their own changes. The strategies below support multiple other categories and the overall success of the Energy Element.

<table>
<thead>
<tr>
<th>Strategies</th>
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<tbody>
<tr>
<td>1. Implement education, outreach and citizen engagement strategies to prepare staff, developers, and the community for County actions.</td>
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<tr>
<td>1.1 Establish a webpage where Sarpy County can inform citizens of its energy saving and energy efficiency efforts both prior to and in accordance with the Energy Element.</td>
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<td>2. Raise Sarpy County residents’ awareness of the wise use of energy.</td>
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<td>2.1. Encourage and promote HomeStar Score or equivalent.</td>
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<td>2.2. Report results of energy efficiency measures to the public.</td>
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<tr>
<td>3. Recognize innovative projects that support and advance the goals and principles of the Energy Element.</td>
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<tr>
<td>4. Leverage recycling education to increase the amount of recycling across the county and consequently reduce energy used to process raw materials and land used for landfill.</td>
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