Hall County Regional Planning Commission

Wednesday, September 3, 2014
Regular Meeting

Item F3

Amendment to Grand Island Comp Plan

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ENERGY ELEMENT

Energy Element

Energy usage in the early 21st Century is becoming a critical issue throughout Nebraska as well as the entire United States. Our dependency on energy sources that are not renewable has increased significantly over the past 100 years. Energy usage comes in several forms, such as:

- Lighting our homes and businesses
- Heating our homes and businesses
- Heating our water for homes and businesses
- Food preparation
- Transportation – both personal and business related
- Recreation and Entertainment – vehicular, computers, music, etc.

The 21st Century ushered in an increased concern for energy usage and its impacts on the environment. With the increased concern for the environment came an increased understanding of the carbon footprint generated by any one individual as well as striving towards modifying our behavior patterns in order to lessen that footprint. In addition, the phrase and concept of sustainability has become more widely used, even in the smaller communities of Nebraska and United States.

Energy and the issues connected to the different sources are becoming more critical every year. The need for the Energy Element in the Grand Island Comprehensive Development Plan was established by the Nebraska Unicameral and Governor when LB997 was passed and signed during the 2010 legislative session. All communities and counties, with the exception of villages, in Nebraska are required to have an energy element in their comprehensive development plan (if they have one) by January 1 of 2015. This additional requirement forces communities to look at their energy usage and needs and plan that into the future development of the community. This makes the comprehensive development plan more comprehensive and therefore more meaningful. The passage of LB 997 appears to be a first step toward new comprehensive plans addressing the entire issue of Sustainability.

Sustainability

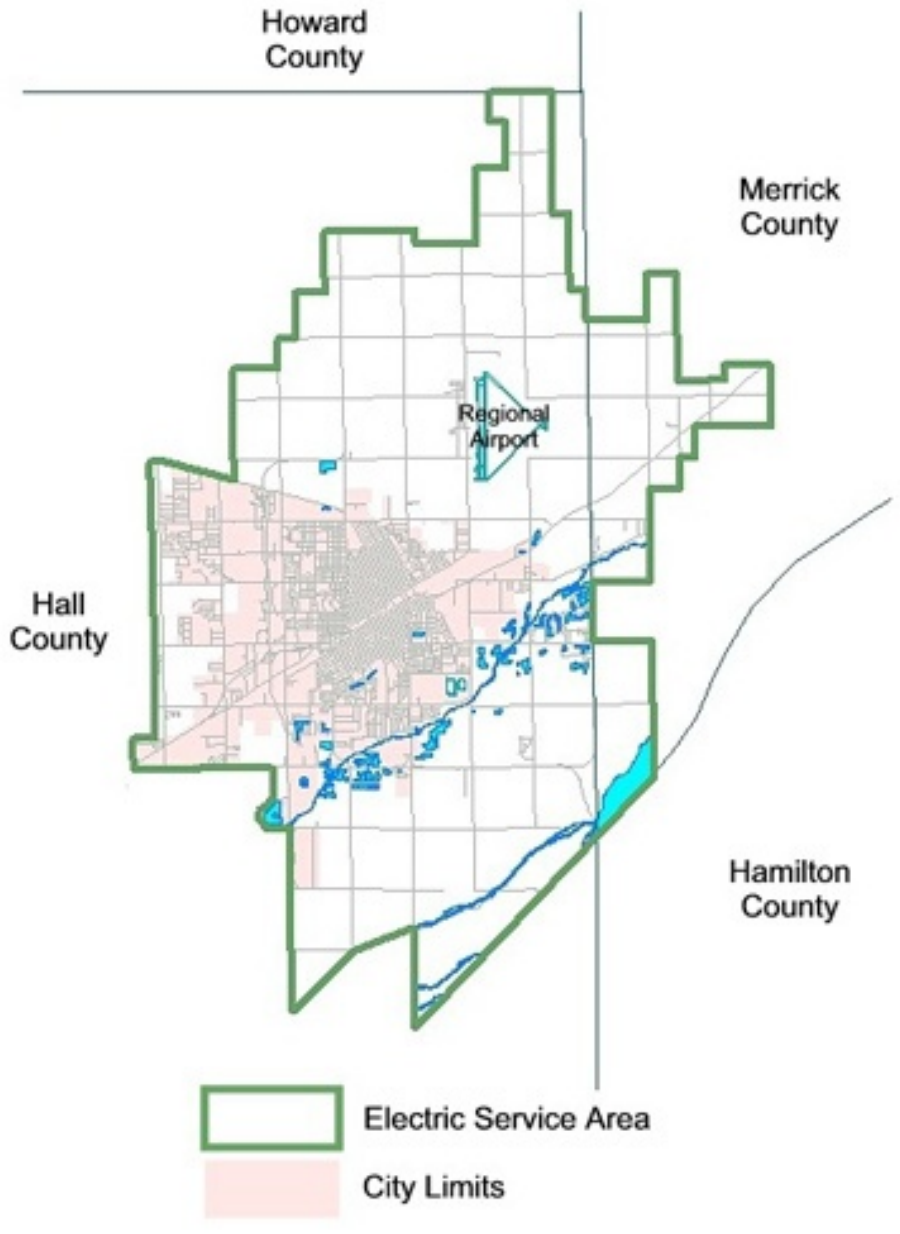
Sustainability, in today's discussions, has a number of meanings. According to Webster's Third International Dictionary, the verb "sustain" is defined as "to cause to continue...to keep up especially without interruption, diminution or flagging". However, the Brundtland Commission Report in 1987,[1] described sustainability as "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs". In other words, sustainability is the ability of the present

generation to live without jeopardizing the ability of future generations to sustain life as we know it today.

Our world's ability to stabilize and begin to make the switch to cleaner and more renewable resources will aid future generations with their quality of life. The more renewable energy sources become the norm for our world, the more likely these sources will be second nature and common place in the future.

Americans have grown to rely heavily on electricity. However, state and federal policies have been increasingly more insistent on curbing this reliance; especially, those sources that are produced by non-renewable fossil fuels such as oil and coal. Federal policy has set a goal that 20% of all electricity, by 2030, in the United States be from renewable sources. Renewable sources would include solar, wind, water, geothermal and any number of other sources that have not yet been discovered or brought to production levels.

Figure 1
Grand Island Electric Service Area



Source: http://www.grand-island.com/index.aspx?page=214

Energy infrastructure

Electrical Power

Electrical power in Grand Island is supplied by Grand Island Utilities. Grand Island supplements their local generation by wholesale purchases from the Western Area Power Administration, the Nebraska Municipal Power Pool (MEAN), NPPD, and others through a contract with the Southwest Power Pool.

Electrical Distribution

Overhead Division

The Grand Island Utilities Department consists of seven divisions. One of these divisions is the Overhead Division. This division is responsible for the maintenance of existing overhead lines and construction of new overhead lines. All electricity delivered to our customers travels through overhead lines through at least part of its journey to homes and/or businesses.

To get electricity to our customers we generate power at one of our power plants. The power from these plants are delivered to customers via overhead power lines. Electrical power that is delivered to our customer travels via a complex path of distribution Substations, Overhead lines, Circuit Breakers, Transformers, Capacitors, Switches, Underground lines and Meters. Most of our customers are connected to power via overhead lines while newer installations are connected via underground lines.

The Grand Island Utilities Department has an on-going program to update and maintain its power distribution system. The primary distribution system voltage is 13,800 volts. The system has been upgraded over the years to increase dependability and to be able to provide a more stable supply of electricity to our customers. Included in the system upgrades were consideration for ice storms, wind storms and lightning, as well as public safety and environmental concerns. A well-engineered, heavy duty distribution system that can withstand destructive weather and yet meet the needs of a growing community using increasing amounts of electricity is a priority for us.

The Grand Island Utilities Overhead Division is responsible for 410.53 miles of overhead power lines in the service area. This system includes a total of 4,127 transformers.

Underground Division

The Underground Division of the Grand Island Utilities Department is responsible for the maintenance of existing underground power lines and the construction of new underground power lines. Almost all new services are installed underground. This includes services to both residential and commercial.

As part of the Grand Island Utilities Department's on-going efforts to update its system and increase its dependability and safety, some of the older distribution systems are being replaced with updated underground distribution systems. The City is replacing the older overhead lines with new underground lines as time allows. This is being done to improve the appearance of the area as well as improve safety and reliability to customers in the downtown business district.

The Grand Island Utilities Underground Division is responsible for 154.26 miles of underground power lines in the service area. This system includes a total of 2,301 transformers.

Source: (http://www.grand-island.com/)

Electrical Generation

C.W. Burdick Station

The C.W. Burdick Station is Grand Island's second power generating facility. It was named after Clarence W. Burdick, who was commissioner of the Grand Island Water, Light & Ice Dept. from October 6th, 1920 to November 30th, 1960. Mr. Burdick was a very progressive yet conservative director of utilities. He realized the importance of adequate and

dependable supplies of electricity and water. Burdick Station became the central location where Grand Island's electricity was generated and distributed from 1956 to 1981. Burdick Station also became the central control center for the pumping and quality control of Grand Island's domestic water supply.

Today Burdick Station is used primarily as a standby power generating facility and continues to be the central control center for Grand Island's domestic water supply. Burdick Station frequently produces power in the summer months as Nebraska's heat and humidity increases the demand for electricity above what Platte Generating Station (PGS) can supply. PGS serves the Grand Island service area as its primary power generator, as PGS uses abundant, inexpensive, low sulfur coal, and Burdick burns expensive natural gas and No. 6 fuel oil. Burdick Station has three combustion turbine units that use natural gas to operate. Generation from Burdick steam units for 2013 were 445,300 MWh while the generation from the combustion turbines was 863,210 MWh

Metered Rates Per Month	Unit No. 1	Unit No. 2	Unit No. 3	Gas Turbine No. 1	Gas Turbine No. 2	Gas Turbine No. 3
Year placed in service	1957	1963	1972	1968	2003	2003
Rated generation	16.5 mw	22 mw	54 mw	15 mw	40 mw	40 mw
Fuel	Nat. gas / No. 6 fuel oil	Nat. gas / No. 6 fuel oil	Nat. gas / No. 6 fuel oil	Nat. gas / No. 2 fuel oil	Nat. gas / No. 2 fuel oil	Nat. gas / No. 2 fuel oil
Make of turbine	Allis/Chalmers	Allis/Chalmers	General Electric	General Electric	General Electric	General Electric

Source: Grand Island Utilities

The C.W. Burdick Station will serve the citizens of Grand Island into the foreseeable future as continued maintenance and upgrades to systems at the plant are planned. New digital control systems that help maximize power production efficiency and monitor plant emissions have been installed for Unit No. 3 and gas turbine No. 1, and control upgrades have been made to Units No. 1 and No. 2.

Platte Generating Station Location

Platte Generating Station is located in Grand Island at the corner of Wildwood Drive and South Locust Street. From Interstate 80, exit 314, travel north on Locust Street for two miles. At Wildwood Drive, turn west and travel 1/2 miles to the main entrance. Platte Generating Station is open to the public by appointment only during our regular business hours of Monday through Friday (except holidays) from 7 AM to 3 PM. All visitors must check into the office located on the north side of main building (plant) immediately upon entering the site. Anyone planning to enter the plant site after regular business hours should make prior arrangements.

Platte Generating Station (PGS) was commissioned in 1982 and has provided reliable, low-cost electrical power to the community during the ensuing years.

PGS produces electrical power for approximately 60 percent of the national average cost. According to the Utility Data Institute, Platte Generating Station was ranked the 11th lowest-cost electricity producer among 707 power plants nation-wide from 1989 through 1993. PGS is consistently among the top 25 most efficient plants year-to-year. Among Nebraska cities, Grand Island's electrical rates are in the lowest fifth. The City's electrical power rate increased in 1979 and a 15% rate decrease was accomplished in 1989. The last increase was in 2007.

PGS burns approximately 364,600 tons of low-sulfur coal per year to produce about 500,000 megawatts hours.

Efficient and reliable service is attained through the acquisition of low-cost coal, and effective operation and maintenance practices. PGS has a staff of experienced, well-trained employees who have produced an enviable long-term plant operating record. The plant operates and is staffed continuously, including all holidays.

At full capacity, PGS produces 100 megawatts of electrical power which is enough to illuminate one million, 100 watt light bulbs. During most of the year, PGS provides enough power to satisfy customer demand. However, during peak demand periods, additional power is generated at the Burdick Power Station or purchased from other power producers.

Electrical power is generated at PGS in strict compliance with local, state, and federal environmental regulations. In fact, PGS's air emissions remain well below required levels. In order to produce "clean" electrical power, low sulfur coal from Wyoming's Powder River Basin is burned. Low sulfur coal reduces the formation of air pollutants. Additionally, an electrostatic precipitator is used at PGS to remove more than 99 percent of the ash created during the coal combustion process. Since January 1, 1995, a continuous emissions monitor (CEM) has been in service which documents PGS's minute-by-minute compliance with clean air regulations.

Most water used at PGS is ultimately returned to the Platte River, following verification that acceptable water discharge standards have been met. Plant systems are designed for water conservation. For example, steam used in the turbine is condensed back into water and reused, and water used for transporting ash is returned to the plant for re-cycling.

Power Control
F. E. Phelps Control Center
The F. E. Phelps Control Center houses the Grand Island Utilities Departments power and water dispatch center as well as engineering and surveying departments of the Utilities Department. The center is named after past Utilities Director Frank E. Phelps.

The Phelps Control Center is manned 24 hours a day, seven days a week, including holidays. Primary electrical circuits that distribute power throughout Grand Island's Service Area is monitored and controlled from this location along with power that is sold to other utilities. In the event of a power outage within the Grand Island Utilities Department service area, customers call the Phelps control center to report the outage.

Electrical energy that is used in your home or business follows a complex system starting with an electric power generating plant or "power plant" located in Grand Island and other places here in Nebraska. The power plant sends power to high voltage power lines. These lines are controlled with large switches called circuit breakers. The power is then reduced to a lower voltage with large transformers, then passes through more circuit breakers. Before the power is distributed to your home or business, another transformer is used to reduce the voltage down to a usable level.

The Phelps Control Center coordinates this process from beginning to end and monitors power at various points throughout the power grid via computer. Operation of system circuit breakers are operated by computer from Phelps Control as well.

Substation supervision and engineering, electrical distribution engineering and design, and water distribution engineering and design for the Grand Island Utilities Department share offices with the dispatching center at the Phelps Control Center.

The previous three sections are direct excerpts taken from the Grand Island Utilities website
Source: (http://www.grand-island.com/)

Natural Gas Service
Natural gas is available in Grand Island is supplied by NorthWestern Energy.

Energy Use by Sector
This section analyzes the energy use by residential, commercial, and industrial and other users. This section will examine the different types of energy sources that are utilized by these different sectors.

Table 1 shows the overall electricity usage by all consumers in Grand Island. The categories are reflective of the ones established by the City. The categories are defined as:
Residential = all connections and demand by households in Grand Island
Commercial = all retail and office users within Grand Island
Industrial = all industrial users within Grand Island

Table 1: Total Electrical Usage
Grand Island 2010 through 2012

	2010	2011	2012
Residential kWH	217,745,672	216,330,992	216,200,092
Residential % of Total	30.6	30.3	29.5
Commercial kWH	176,787,889	178,453,418	182,384,334
Commercial % of Total	24.9	24.9	24.9
Industrial kWH	316,163,022	320,264,771	333,611,638
Industrial % of Total	44.5	44.8	45.6
TOTAL kWH	710,696,383	715,049,181	732,196,064
Annual Change		0.61%	2.40%
Customer by Class:			
Residential	20,071	20,152	20,278
Commercial	4,249	4,280	4,308
Industrial	84	87	92
TOTAL	**24,404**	**24,519**	**24,678**

Source: Grand Island Utilities

Table 1 shows the usage of electricity throughout the Grand Island corporate limits from 2010 through 2012. The data indicate the usage by residential, commercial and industrial uses for the time period. In addition, the Table indicates the number of customers per sector.

Overall, from 2010 to 2012, the total consumption increased by 2.4% while the customer base increased by 1.12%, which would indicate some of the newer customers added during this period had larger electric consumption or that some of the existing customers increased their usage through additional floor area (commercial or industrial) or there was an increase in the production levels (industrial).

Residential Uses

The data indicate the percent of total used by sector. The Table shows the overall percentage of the total electrical usage for residential customers went from 30.6% in 2010 to 29.5% in 2012; while the overall number of residential customers increased by 207 connections. From 2010 to 2012, the residential demand saw a decrease every year (-0.65% and -0.06% respectively).

The overall residential demand for this period decreased by -0.71%; however, the average per customer for the period saw a -1.71% change going from 10,848 kW in 2010 to 10,662 kW in 2012. These decreases would tend to suggest the following:

- More residential customers are becoming more conservation oriented
- More residential in turn are purchasing products which consume less energy
- More residential customers are making the switch between incandescent bulbs to Compact Fluorescent lights (CFL) or Light Diode Emitting bulbs (LED).
- Better energy efficiency measures are be implemented in construction and remodels.
- A combination of all these items.

Commercial Uses

Grand Island's commercial customers from 2010 to 2012 remained steady as to the proportion of the energy used, holding at 24.9% of the total consumption. Based upon the data from Grand Island Utilities, the overall commercial consumption increased by 3.17% while the total customer base increased by 1.39% during the time period indicated. These data indicate that the increased consumption was nearly double that of the increase in customer base. This indicates a couple of different dynamics may be occurring:

- Existing commercial customers are increasing the amount of electricity they require.
- Existing commercial customers have increased their space used to provide goods and services.
- The new commercial customers are higher than average electric consumers.
- A combination of all these items.

Industrial Uses

Industrial electrical consumption in Grand Island went from 44.5% of the total consumption in 2010 to 45.6% in 2012. The data in Table 1 indicate that the total consumption increased by 5.52% between 2010 and 2012; while the total number of industrial customers increased by 9.5%. Therefore, the increasing consumption actually grew at a slower rate than the number of customers. This indicates several potential possibilities:

- The new industrial customers were low consumption businesses.
- A combination of new industrial customers and existing industrial customers implementing conservation measures.
- Existing customers implementing conservation measures
- A combination of all these items.

Short-term and Long-term Strategies

As the need and even regulatory requirements for energy conservation increases, residents of communities and even rural areas will need to:

1. Become even more conservative with energy usage
2. Make use of existing and future programs for retrofitting houses, businesses, and manufacturing plants
3. Increase their use of renewable energy sources.

Residential Strategies

There are a number of different strategies that can be undertaken to improve energy efficiency and usage in residences. These strategies range from simple (less costly) to complex (costly). Unfortunately not all of the solution will have an immediate return on investment. As individual property owners, residents will need to find strategies that fit into their ability to pay for savings at the present time.

There are several ways to make a residence more energy efficient. Some of the easiest include:

- Converting all incandescent light bulbs to Compact Florescent or LED bulbs
- Changing air filters more regularly
- Installing additional insulation in the attic
- Keeping thermostats set a cooler levels in the winter and higher levels in the summer
- Converting standard thermostats to digital/programmable thermostats
- Changing out older less efficient Air Conditioners and Furnaces to newer high-efficiency units
- Changing out older appliances with new Energy Star appliances

Some of the more costly ways to make a residence more energy efficient include:

- New insulation in exterior walls
- Addition of solar panels for either electrical conversion and/or water heater systems in cooperation with Grand Island Utilities and in compliance with the local zoning codes.
- Adding individual scale wind energy conversion systems in cooperation with Grand Island Utilities and in compliance with the local zoning codes.
- Installing geothermal heating and cooling system in cooperation with Grand Island Utilities and in compliance with the local zoning codes.
- Installation of energy-efficient low-e windows

Commercial and Industrial Strategies

Strategies for energy efficiency within commercial and industrial facilities can be more difficult to achieve than those for residential uses. Typically, these improvements will require a greater amount of investment due to the size of most of these facilities.

There are a number of different strategies that can be undertaken to improve energy efficiency and usage in residences. Again, not all of the solutions will have an immediate return on investment. As individual property owners, property owners will need to find strategies that will fit into their ability to pay for savings at the present time.

There are several ways to make a commercial business more energy efficient. Some of the easiest include:

- Converting all incandescent light bulbs to Florescent Lights, Compact Florescent Lighting, or LED on small fixtures
- Keeping thermostats set a cooler levels in the winter and higher levels in the summer
- Converting standard thermostats to digital/programmable thermostats
- Installing additional insulation in an attic space
- Changing out older less efficient Air Conditioners and Furnaces to newer high-efficiency units

Some of the more costly ways to make a business more energy efficient include:

- Installation of energy-efficient windows and/or storefronts
- New insulation in exterior walls, if possible
- Addition of solar panels for either electrical conversion and/or water heater systems in cooperation with Grand Island Utilities and in compliance with the local zoning codes.

- Adding individual scale wind energy conversion systems in cooperation with Grand Island Utilities and in compliance with the local zoning codes.
- Installing geothermal heating and cooling system in cooperation with Grand Island Utilities and in compliance with the local zoning codes.

Renewable Energy Sources

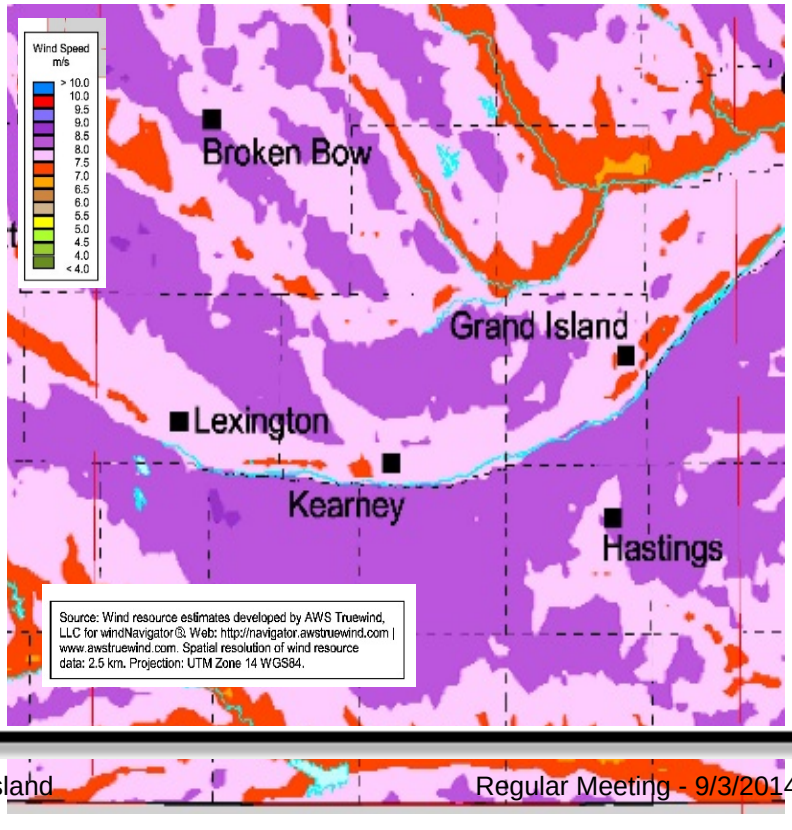
Renewable energy sources are those natural resources such as the wind, sun, water, the earth (geothermal), and even methane (from natural resources or man-made situations) that can be used over and over again with minimal or no depletion. The most common sources of renewable energy resources used in Nebraska is the wind, the sun, the water and/or the earth. The following are examples of how these renewable resources can be used to reduce our dependency on fossil fuels.

Wind

The wind is one of those resources that seem to be in abundance in Nebraska. Wind is not a new technology in Nebraska; the pioneers that settled in Nebraska used wind mills for power and to work the water wells on their farms and ranches.

Wind can be used to produce electricity through the construction of small-scale or utility/commercial grade wind conversion systems (wind turbines). However, not all areas of the state have the ideal levels needed to produce electricity on a utility or commercial level; but the use of small-scale wind turbines on homes and businesses will work in most parts of Nebraska.

Figure 3:
ANNUAL AVERAGE WIND SPEED AT 80 METERS
NEBRASKA



The wind quality in Grand Island and Hall County is average to above average, especially south of the Platte River and into Adams County. The darker purple areas are the more ideal locations for wind. However, any future wind development will be determined with the use of meteorological towers used to compile wind data for approximately a one year period prior to making any future decisions.

Solar

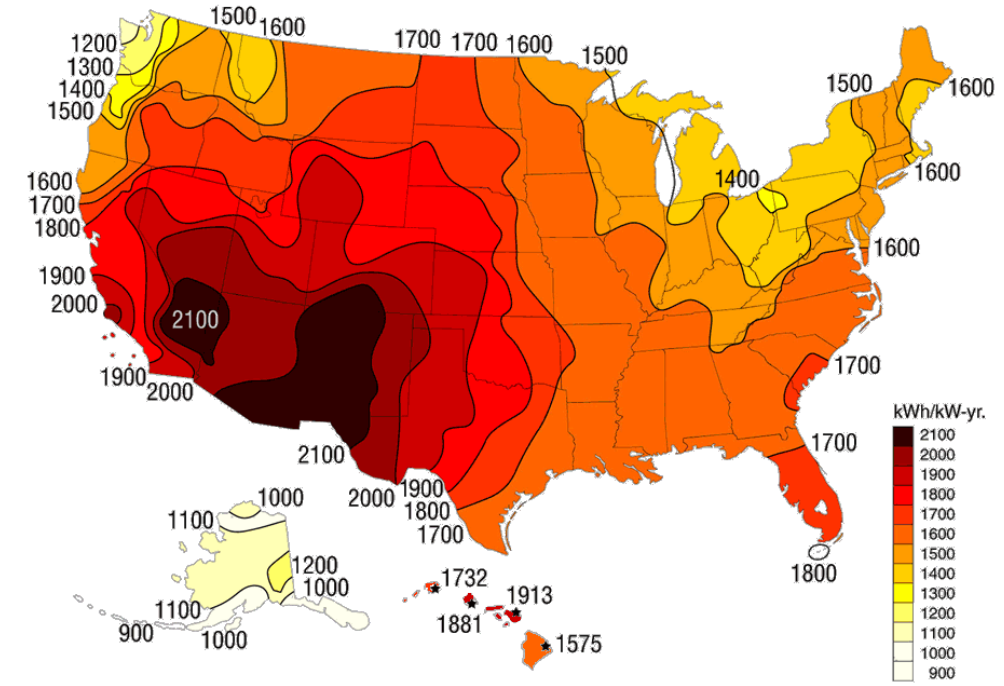
Solar energy has been around for decades and it last hit a high in popularity in the 1970's. However, today's solar energy design is much more efficient and are more aesthetically pleasing. Some of the aesthetic improvements have to do with the fact that today's systems are not as bulky as their ancestors. Today solar is being used much like wind turbines, on a small-scale level (home or business) or a much grander level (solar farms).

Solar energy includes solar water and space heating as well as taking solar photovoltaic panels to convert the sun's rays into electricity. Solar panels can typically produce between 100 and 200 watts per square meter at an installed cost of $7 to $9 per watt, but these costs are becoming less every year as more solar units are commissioned and new more cost effective technologies are developed.

Based upon the diagram to the right there is great solar potential in the state of Nebraska. A majority of the state lies within some of the better areas in the country for solar potential.

Figure 4:

SOLAR POTENTIAL CONTOURS



Source: Solar Energy Industries Association

Geothermal Energy

Geothermal energy includes a process where a series of pipes are lowered into vertical cores called heat-sink wells. The pipes carry a highly conductive fluid that either is heated or cooled by the constant temperature of the ground. The resulting heat exchange is then transferred back into the heating and cooling system of a home or other structure. This is call a geothermal heat exchange system or ground source heat pumps. The California Energy Commission estimates the costs of a geothermal system can earn net savings immediately when financed as part of a 30-year mortgage *(Source: American Planning Association, PAS Memo January/February 2009)*.

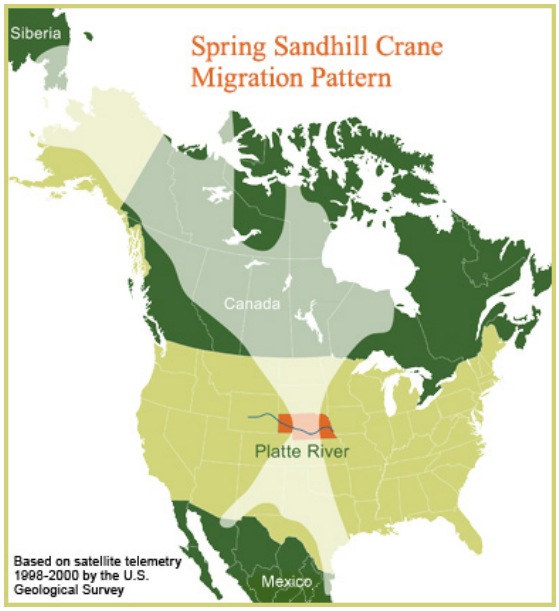
Renewable Energy in Hall County

Renewable energy in Grand Island and the Hall County area will be difficult now and into the future. The reasons for this difficulty is not rooted in the desire of the local residents or political reluctance but more due to nature itself. Nature and the lay of the land creates some very difficult situations for the use of wind energy or hydroelectric generation.

Wind generation will be difficult due to the migratory flyway that covers the Hall County area during a three to four month period in the spring and fall. Spring is the more critical period since the Hall County area is one of the major stopovers of the Sandhill Cranes and a limited number of Whooping Cranes. The Whooping Cranes are on the endangered species list and are protected. In addition, since the Whooping Cranes tend to fly north with the Sandhill Cranes, the Sandhill Cranes are afforded the same basic protections during this migratory period.

Any commercial or utility grade wind turbine development would likely need to be taken out of production during these periods. This shorter production time would likely harm the cost-effectiveness of most wind farms.

Figure 5:
SPRING SANDHILL CRANE MIGRATION PATTERN AND PRIMARY NEBRASKA LOCATIONS



Source: www.cranetrust.org and http://outdoornebraska.ne.gov/conservation/wildlife-viewing/SandhillCranes/where2watchCranes.asp

Hydroelectric generation in Grand Island and Hall County area is not practical and is nearly impossible due to the flatter topography found throughout the area. There are few to no areas that could be dammed up in order to create a large enough water reservoir to power the turbines.

Geothermal systems, due to the prevalence of a high water table and extensive industrial ground water contamination in and around Grand Island requires that caution, and good engineering controls should be implemented when considering geothermal installations.

However, the other types of renewable energy sources are possible within Hall County, including geothermal (with special engineering considerations), methane, and solar. Solar may create some issues closer to the primary migratory areas of Hall County.

Energy Programs in Nebraska

The following provides a basic history and description of some newer programs in Nebraska; interested parties should contact the State of Nebraska Energy Office or their local public power district.

The following information is an excerpt from the Database of State Incentives for Renewables & Efficiency.

C-BED Program

In May 2007, Nebraska established an exemption from the sales and use tax imposed on the gross receipts from the sale, lease, or rental of personal property for use in a community-based energy development (C-BED) project. The Tax Commissioner is required to establish filing requirements to claim the exemption. In April 2008 L.B. 916 made several amendments to this incentive, including: (1) clarified C-BED ownership criteria to recognize ownership by partnerships, cooperatives and other pass-through entities; (2) clarified that the restriction on power purchase agreement payments should be calculated according to gross* and not net receipts; (3) added language detailing the review authority of the Tax Commissioner and recovery of exempted taxes; and (4) defined local payments to include lease payments, easement payments, and real and personal property tax receipts from a C-BED project.

A C-BED project is defined as a new wind energy project that meets one of the following ownership conditions:

- For a C-BED project that consists of more than two turbines, the project is owned by qualified owners with no single qualified owner owning more than 15% of the project and with at least 33% of the power purchase agreement payments flowing to the qualified owner or owners or local community; or
- For a C-BED project that consists of one or two turbines, the project is owned by one or more qualified owners with at least 33% of the power purchase agreement payments flowing to a qualified owner or local community.

In addition, a resolution of support for the project must be adopted by the county board of each county in which the C-BED project is to be located or by the tribal council for a C-BED project located within the boundaries of an Indian reservation.

A qualified C-BED project owner means:
- a Nebraska resident;
- a limited liability company that is organized under the Limited Liability Company Act and that is entirely made up of members who are Nebraska residents;
- a Nebraska nonprofit corporation;
- an electric supplier(s), subject to certain limitations for a single C-BED project; or
- a tribal council.

In separate legislation (LB 629), also enacted in May 2007, Nebraska established the Rural Community-Based Energy Development Act to authorize and encourage electric utilities to enter into power purchase agreements with C-BED project developers.
** LB 561 of 2009 established that gross power purchase agreement payments do not include debt financing if the agreement is entered into on or before December 31, 2011, and the qualified owners have a combined total of at least 33% of the equity ownership in the C-BED project.*

Local Government and Renewable Energy Policies
Local governments need to take steps to encourage greater participation in wind generation. Cities and counties can do a number of items to make these projects more attractive. Some of the things that could be done are:
- Develop or amend existing zoning regulations to allow small-scale wind turbines as an accessory use in all districts
- Develop or amend existing zoning regulations to exempt small-scale turbines from maximum height requirements when attached to an existing or new structure.
- Work with the local public power utility on ways to use wind turbines on small-scale individual projects or as a source of power for the community.

Net Metering in Nebraska
LB 436, signed in May 2009, established statewide net metering rules for all electric utilities in Nebraska. The rules apply to electricity generating facilities which use solar, methane, wind, biomass, hydropower or geothermal energy, and have a rated capacity at or below 25 kilowatts (kW). Electricity produced by a qualified renewable energy system during a month shall be used to offset any kilowatt-hours (kWh) consumed at the premises during the month.

Any excess generation produced by the system during the month will be credited at the utility's avoided cost rate for that month and carried forward to the next billing period. Any excess remaining at the end of an annualized period will be paid out to the customer. Customers retain all renewable energy credits (RECs) associated with the electricity their system generates. Utilities are required to offer net metering until the aggregate generating capacity of all customer-generators equals one percent of the utility's average monthly peak demand for that year.

State Law of Solar and Wind Easements
Nebraska's solar and wind easement provisions allow property owners to create binding solar and wind easements for the purpose of protecting and maintaining proper access to sunlight and wind. Originally designed only to apply to solar, the laws were revised in March 1997 (Bill 140) to include wind. Counties and municipalities are permitted to develop zoning regulations, ordinances, or development plans that protect access to solar and wind energy resources if they choose to do so. Local governing bodies may also grant zoning variances to solar and wind energy systems that would be restricted under existing regulations, so long as the variance is not substantially detrimental to the public good.

LB 568, enacted in May 2009, made some revisions to the law and added additional provisions to govern the establishment and termination of wind agreements. Specifically, the bill provides that the initial term of a wind agreement may not exceed forty years. Additionally, a wind agreement will terminate if development has not

commenced within ten years of the effective date of the wind agreement. If all parties involved agree to extend this period, however, the agreement may be extended.

Current Renewable Energy Programs and Funding Sources

Grand Island Utility Incentives
Grand Island Utilities has one incentive program available, which eliminates older refrigerators and freezers. By doing so the Utility will pay customers for removing these older appliances.

Low interest Loan Program
This program makes available low interest loans for residential and commercial energy efficiency improvements. The Nebraska Energy Office administers this program, which was created in 1990 using oil overcharge funds. Only improvements to existing buildings that are at least 5 years old are eligible for loan assistance. As of March 31, 2010, 25,618 loans have been made totaling $205.3 million and financing $210.8 million in eligible projects.