Inside this issue

**Green Jobs in Nebraska:** Employment, Wages, & Projected Growth

**Map Facts:** Wind Energy Production

**Fast Facts:** The Green Economy
## Feature Articles

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Employment in Nebraska’s Greenest Industry Subsectors</td>
</tr>
<tr>
<td>16</td>
<td>Green Jobs in Nebraska: Employment, Wages, &amp; Projected Growth</td>
</tr>
<tr>
<td>3</td>
<td>Openings &amp; Expansions</td>
</tr>
<tr>
<td>4</td>
<td>Map Facts: Wind Energy Production</td>
</tr>
<tr>
<td>8</td>
<td>Fast Facts: The Green Economy</td>
</tr>
<tr>
<td>22</td>
<td>Economic Indicators</td>
</tr>
</tbody>
</table>

Nebraska Workforce Trends is published by the Nebraska Department of Labor in cooperation with the U.S. Department of Labor, Bureau of Labor Statistics. This workforce product was funded by a grant awarded by the U.S. Department of Labor’s Employment and Training Administration. The product was created by the recipient and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership. This product is copyrighted by the institution that created it. Internal use by an organization and/or personal use by an individual for non-commercial purposes is permissible. All other uses require the prior authorization of the copyright owner.
## Openings & Expansions | February

*Kermit Spade, Research Analyst*

<table>
<thead>
<tr>
<th>Business Category</th>
<th>Business Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food &amp; Entertainment</strong></td>
<td>527 Brewhouse (Expansion)</td>
<td>Wayne</td>
</tr>
<tr>
<td></td>
<td>Runza</td>
<td>Chadron</td>
</tr>
<tr>
<td><strong>Health &amp; Fitness</strong></td>
<td>Pender Care Centre Apothecary (Expansion)</td>
<td>Emerson</td>
</tr>
<tr>
<td></td>
<td>Pender Care Centre Apothecary (Expansion)</td>
<td>West Point</td>
</tr>
<tr>
<td><strong>Retail/Sales</strong></td>
<td>Stitches by Kim</td>
<td>Norfolk</td>
</tr>
<tr>
<td><strong>Manufacturing</strong></td>
<td>Michael Foods (Expansion)</td>
<td>Wakefield</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>RailCrew Xpress (Expansion)</td>
<td>Alliance</td>
</tr>
</tbody>
</table>

**Source:**
Nebraska Department of Labor

Openings and expansions listed are a sampling of activity reported for that month. Some activity may have occurred outside the month. If you have an opening or expansion to report, contact us at LMI_NE@nebraska.gov.
The history of wind energy production in Nebraska is as old as the state itself. Windmills were used by early settlers to draw water from wells for use on homesteads, and quickly became vital tools in the construction of America’s first Transcontinental Railroad. (1) An 1899 study conducted by the University of Nebraska-Lincoln cataloged and classified windmills throughout the state. Seven classes and dozens of varieties were identified, ranging from the “Baby Jumbo” to the “Giant Battle-Ax.” Most early windmills were handmade for under $10, but larger and more complex wind turbines costing $100 or more were also used to provide water to urban areas. (2)
Today, wind energy production is a growing industry in Nebraska, generating both electricity and jobs. Nebraska ranks #17 in the nation in number of wind turbines, with 974 statewide, and #14 for installed wind capacity, which totaled 1,972 megawatts (MW) as of the fourth quarter of 2018. (3)

According to a report by the Clean Energy Trust, 534 Nebraskans were employed in the state’s wind energy industry in 2017. (4) When counting jobs supported indirectly by Nebraska’s wind projects, the American Wind Energy Association estimated that the number could be as many as 2,000 jobs statewide. (3) Between 2016 and 2026, the number of wind turbine service technicians employed in Nebraska is projected to increase by 90.8%, making it the #1 fastest-growing occupation in the state by total 10-year percent change. (5)

Wind energy can be generated for private or local use, referred to as “distributed” energy production, or can be generated at “utility-scale,” which is fed into the national energy transmission system. (6) The map on page 4 shows the percentage of each state’s utility-scale energy production that was generated by wind in 2018. Nebraska comes in at #13 in the United States, with 5,178 of its 36,809 total gigawatt hours (GWh) of energy production (14.1%) generated by wind, compared to 274,952 of 4,177,810 GWh (6.6%) nationwide. (7)

Sources:
NEBRASKA WORKFORCE TRENDS

Employment Data | January

January 2019 County Rates

**January Non-farm Total Employment:** 1,009,954
**Manufacturing:** 98,837

**Nebraska** (smooth seasonally adjusted)
**January Unemployment Rate:** 2.8%
**Change (OTM):** 0.0
**Change (OTY):** -0.1

**Economic Region** (not seasonally adjusted)
- **Central:** 2.8%
- **Mid Plains:** 3.0%
- **Northeast:** 3.0%
- **Panhandle:** 3.2%
- **Sandhills:** 2.9%
- **Southeast:** 3.1%

**OMAHA MSA**
(Not Seasonally Adjusted)
**January Unemployment Rate:** 3.1%
**January Total Non-Farm:** 498,813
**Manufacturing:** 33,231

**LINCOLN MSA**
(Not Seasonally Adjusted)
**January Unemployment Rate:** 2.7%
**January Total Non-Farm:** 188,534
**Manufacturing:** 13,319

**GRAND ISLAND**
(Not Seasonally Adjusted)
**January Unemployment Rate:** 4.5%
**January Total Non-Farm:** 42,778
**Change (OTM):** -394 (-0.9%)
**Change (OTY):** NA

Over-the-month and over-the-year industry comparisons are not available for January due to the annual benchmarking revision process.

**Sources:**
February 2019 County Rates

OMAHA MSA
(Not Seasonally Adjusted)
February Unemployment Rate: 3.2%
February Total Non-Farm: 491,627
Manufacturing: 33,351

Largest OTM Increase (Private)
Education & Health Services: 934 (1.2%)
Mining & Construction: 446 (1.6%)

Largest OTY Increase (Private)
Mining & Construction: 2,394 (9.4%)
Leisure & Hospitality: 1,468 (3.1%)

GRAND ISLAND
(Not Seasonally Adjusted)
February Unemployment Rate: 3.3%
February Total Non-Farm: 41,756

Change (OTM): 74 (0.2%)
Change (OTY): -85 (-0.2%)

Sources:
Fast Facts
Rachel Stevens, Research Analyst

The Green Economy

The number of green goods and services (GGS) jobs in Nebraska in 2011, according to the most current data on the subject, produced in 2013 by the Bureau of Labor Statistics. GGS jobs are those that "primarily produce goods and provide services that benefit the environment or conserve natural resources." These GGS jobs accounted for 2.5% of overall employment in Nebraska, and 4.2% of total employment nationwide. (1)

22,392

The total amount of waste collected in Nebraska's municipal landfills in 2015. (2)

2,311,263 tons

The number of jobs created, on average, by recycling, reuse, & remanufacturing, compared to traditional methods of waste disposal. (4)

10x

The estimated number of jobs supported by recycling activities nationwide as of 2007, according to a 2016 EPA analysis. This is approximately 0.5% of all jobs in the U.S. economy, and accounts for about 0.6% of all wages paid. (5)

757,325

The number of jobs created by every 1,000 tons of materials recycled, according to the EPA’s 2016 Recycling Economic Information Report. This also translates to $76,030 in wages and $14,101 in tax revenues. (5)

1.57

The approximate time it takes for a recycled aluminum can to make it back on to a store shelf as a new product. (6)
#36
Nebraska’s 2016 ranking, out of the 50 states and Washington, D.C., in terms of total carbon dioxide emissions. Nebraska was responsible for less than 1% of all U.S. carbon dioxide emissions that year. (7)

18.6%
The percentage of Nebraska’s total 2016 energy consumption that was supplied by renewable sources of energy. (7)

14.0%
Nebraska’s share of total U.S. corn-based ethanol production in 2017. Nebraska ranked second in the nation in ethanol production capacity, just after Iowa. (7)

#11
Nebraska’s rank, out of the 50 states and Washington, D.C., for highest percentage of total energy consumption provided by renewable sources. (7)

44.0%
The percentage of Nebraska’s total energy consumption that went to fueling the state’s industrial activities (manufacturing, construction, mining, forestry, and agriculture) in 2016. (8)
The estimated number of clean energy jobs in Nebraska in 2017. This figure includes jobs providing goods and services related to renewable energy, alternative fuels, energy efficiency improvement, and power grid and transportation advancements. (9)

The percentage of Nebraska's energy efficiency employers who reported that hiring qualified workers was "somewhat" or "very" difficult in 2018. The top three reasons given were lack of experience, training, or technical skills; location; and insufficient non-technical skills (e.g., work ethic, critical thinking, etc.). (10)

The percentage of Nebraska's clean energy employers made up by small businesses with fewer than 20 employees. (9)

Sources:
http://deq.ne.gov/Publica.nsf/pages/WAS057.
https://www.eia.gov/state/.
https://static1.squarespace.com/static/5a98cf80ec4eb7c5cd928c61/t/5c7f141744e17b642f18c6b31/1551843700924/Nebraska.pdf.
What is a green industry? This question can have many answers, as there is no one official definition, and the various definitions that are available are multifaceted and often differ from one another. However, in 2010, the Nebraska Department of Labor (NDOL) surveyed businesses across the state in order to identify green economic activities, and used the information collected to develop a definition of green industries. This article examines the current and predicted future trends for the top five green industry subsectors*, as determined by the results of the Nebraska Green Jobs Report. (1)

To determine whether a business was green, six different environmentally focused economic activities were identified. Businesses that participated in practices that fell into one or more of these categories were determined to be engaged in at least some green economic activity. By calculating the number of employees in each business's workforce that engaged in green economic activities, NDOL was able to rank industry subsectors by highest level of green employment. Definitions of each green economic activity category used in the NDOL study are provided in the chart below. (1)

### Nebraska Green Jobs Study Economic Activity Definitions

<table>
<thead>
<tr>
<th>Economic Activity</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Renewable Energy &amp; Alternative Fuels</td>
<td>Manufacturing, production, construction, design, research, delivery, operation, storage, and maintenance of wind, solar, biomass, hydro, alternative transportation fuels, geothermal, methane, and waste incineration as a fuel source.</td>
</tr>
<tr>
<td>2. Environmental Cleanup &amp; Remediation &amp; Waste Clean-up Mitigation</td>
<td>Environmental remediation, including the cleanup and disposal of pollution, waste, and hazardous materials; Superfund/Brownfield redevelopment; and landfill restoration.</td>
</tr>
<tr>
<td>3. Energy Efficiency &amp; Conservation</td>
<td>Manufacturing, construction, installation, and production of energy-efficient products (such as Energy Star–rated appliances or efficient lighting); energy-efficiency services; weatherization; building retrofitting/efficiency; energy-efficient production processes; energy distribution improvements (e.g., smart grid); transportation technology; and battery development and storage improvement.</td>
</tr>
<tr>
<td>4. Education, Regulation, Compliance, &amp; Training &amp; Energy Trading</td>
<td>Activities to educate the public, business, and government on energy efficiency, renewable energy, energy rating systems certifications, and efficient consumption of energy resources. Also includes efforts to inform appropriate parties about environmental/efficiency regulations and enforce compliance, promote state energy standards and plans, and provide training on effective use of energy-related products and processes. In theory, energy trading could include the buying and selling of power or fuels related to energy efficiency and renewable energy, as well as cap-and-trade activity to control pollution.</td>
</tr>
<tr>
<td>5. Pollution, Waste, &amp; Greenhouse Gas (GHG) Management, Prevention, &amp; Reduction</td>
<td>Activities and research related to controlling commercial, transportation, and industrial emissions and pollution; water treatment; recycling operations; waste product management and treatment; and controlling and reducing emissions of carbon dioxide or other greenhouse gases, waste water, and other pollutants.</td>
</tr>
<tr>
<td>6. Sustainable Agriculture &amp; Natural Resource Conservation</td>
<td>Products and services to conserve, maintain, and improve natural resources and environment, including low-carbon agriculture, land management, water management and conservation, wetlands restoration and mitigation, and environmental and wildlife conservation. Includes bio-science-related activities and research.</td>
</tr>
</tbody>
</table>

Table Source: Nebraska Department of Labor. Nebraska Green Jobs Report. (2010)

*Industry subsectors are defined at the three-digit North American Industry Classification System (NAICS) level.
Specialty Trade Contractors

The U.S. Census Bureau’s North American Industry Classification System (NAICS) defines the specialty trade contractors subsector as “establishments whose primary activity is performing specific activities (e.g., pouring concrete, site preparation, plumbing, painting, and electrical work) involved in building construction or other activities that are similar for all types of construction, but that are not responsible for the entire project.” (2)

NDOL's Green Jobs Report classified specialty trade contractors as a top green industry subsector primarily due to its involvement in business activities related to green category #3, energy efficiency and conservation. For example, workers in this subsector often install energy-efficient products, such as Energy Star–rated appliances, or provide weatherizing services to buildings. (1)

In 2017, there were 4,656 specialty trade contractor establishments in Nebraska, employing 34,188 workers, with an average of seven employees per establishment. This subsector comprised 3.5% of Nebraska’s total employment statewide. The average weekly wage for employees of specialty trade contractors was $918, which is higher than the overall statewide average of $862 per week. (3)

As outlined in the graph above, employment in Nebraska’s specialty trade contractors subsector grew by 23.1% between 2001 and 2017, and by 12.5% since 2007. (3) This subsector is expected to continue on this trend, growing by a projected 15.0% (4,993 new jobs) between 2016 and 2026. (4)

Professional, Scientific, & Technical Services

According to NAICS, “industries in the professional, scientific, and technical services subsector group establishments engaged in processes where human capital is the major input. These establishments make available the knowledge and skills of their employees, often on an assignment basis, where an individual or team is responsible for the delivery of services to the client.” (2)

Due to the diversity of businesses classified within this subsector, professional, scientific, and technical...
services establishments were found to be involved in a variety of work spanning all six green economic activity categories. Some examples included engineering green products, designing more energy-efficient buildings, and scientific research into biofuels. (1)

In 2017, there were 6,810 professional, scientific, and technical services establishments in Nebraska, together employing about 45,976 workers, for an average of seven employees per establishment. This subsector accounted for 9.4% of all business establishments in Nebraska, and 4.7% of total employment statewide. The average weekly wage for workers in the professional, scientific, and technical services subsector was $1,297, the highest of any green industry we analyzed. (3)

Employment in Nebraska’s professional, scientific, and technical services industry subsector grew by 30.9% from 2001 to 2017, as shown in the chart on the previous page. (3) It is projected to continue growing by 18.1% from 2016 to 2026, adding 7,976 new jobs to the state’s economy. (4)

Merchant Wholesalers - Durable Goods

According to NAICS, businesses in the merchant wholesalers of durable goods subsector “sell capital or durable goods to other businesses. Merchant wholesalers generally take title to the goods that they sell; in other words, they buy and sell goods on their own account.” Durable goods are defined as items that generally have a normal life expectancy of three years or more. Merchant wholesalers of durable goods, therefore, wholesale products “such as motor vehicles, furniture, construction materials, machinery and equipment (including household-type appliances), metals and minerals (except petroleum), sporting goods, toys and hobby goods, recyclable materials, and parts.” (2)

Merchant wholesalers of recyclable materials are classified within this subsector, which accounts for it being identified as a top green industry, according to the NDOL Green Jobs Report. (1)

As of 2017, there were 2,312 establishments in Nebraska’s merchant wholesalers of durable goods subsector, employing 20,110 workers statewide. With an average of nine employees per establishment, merchant wholesalers of durable goods accounted for 2.1% of total employment in Nebraska. The average weekly wage for workers in this subsector was $1,193, higher than the state’s overall average of $862. (3)

Employment in the merchant wholesalers of durable goods subsector remained relatively stable between 2001 and 2017, as depicted in the graph above, decreasing slightly (-2.9%) from 2001 to 2017. In the ten-year period from 2007 to 2017, however, employment in this subsector went up by 4.3%. (3) Merchant wholesalers of durable goods are expected to continue on this trend of slow and steady growth, with a 4.3% rise in employment (867 new jobs) projected between 2016 and 2026. (4)
Waste Management & Remediation Services

As defined by NAICS, “industries in the waste management and remediation services subsector group establishments engaged in the collection, treatment, and disposal of waste materials.” A significant share of businesses in this subsector engaged in work that was classified within one or more of NDOL’s six green activity categories. For example, recycling facilities are considered waste management and remediation services, as are businesses engaged in hazardous waste collection, treatment, and disposal or remediation. (2) Each of these activities fall into NDOL’s green economic activity category #5. (1)

In 2017, there were 272 waste management and remediation services establishments in Nebraska, employing 2,728 workers, for an average of 10 employees per establishment. Of the green industries we analyzed, this was the smallest, accounting for 0.3% of Nebraska’s total employment. Average weekly wages for this industry subsector were $862, exactly matching the statewide average for all occupations. (3)

Employment in waste management and remediation services has been increasing in Nebraska, as exhibited in the graph above, with 46.7% growth between 2001 and 2017, and 26.3% growth since 2007. (3) This subsector is expected to continue to grow, with a projected increase of 14.1% between 2016 and 2026, for a total of 365 new jobs throughout the state. (4)
The transportation equipment manufacturing industry subsector includes businesses that "produce equipment for transporting people and goods." (2) It ranked among the top 5 greenest subsectors because it encompasses a large number of establishments that engaged in work classified within NDOL's green economic activity category #5: pollution, waste, and greenhouse gas (GHG) management, prevention, and reduction. For example, businesses in the transportation equipment manufacturing subsector might work to develop, design, or manufacture vehicles that produce fewer emissions than conventional transportation options. (1)

Nebraska had 83 transportation equipment manufacturing establishments as of 2017, which employed 8,350 workers statewide. This subsector had the highest average number of employees per establishment of the subsectors we examined, with 101 workers per establishment on average. However, transportation equipment manufacturers accounted for just 0.9% of Nebraska's total employment, and about 0.1% of all business establishments in the state. Average weekly wages were $966, above the overall statewide average of $862. (3)

Employment in Nebraska's transportation equipment manufacturing subsector fell substantially after hitting its peak in 2008, followed by a period of modest growth, as displayed in the graph above. Total employment was 5.6% higher in 2017 than it had been in 2001, but fell by 5.5% from 2007 to 2017. (3) This subsector is expected to work its way back to its earlier trend, with a projected 4.8% increase in employment between 2016 and 2026, equating to 396 additional Nebraska jobs. (4)

The Final Word

Nebraska’s top five greenest industry subsectors, as determined by the 2010 Nebraska Green Jobs Report, include a diverse variety of business establishments engaged in six different categories of green economic activity. An exploration of historical employment data within these subsectors and projections for their future reveals that even the most seemingly unlikely industries can offer valuable contributions to Nebraska’s green economy.

More information on the NDOL Green Jobs Report and the full details of its findings can be found on NEworks.
Arbor Day, an annual holiday encouraging Americans to plant and celebrate trees, began in Nebraska on April 10, 1872. J. Sterling Morton, a nature lover and pioneer who had moved into the Nebraska Territory in 1854, first proposed the holiday to encourage Nebraska residents to plant trees throughout the plains, which were largely treeless at that time, for beauty, windbreaks, food, and fuel. It was estimated that more than one million trees were planted throughout Nebraska during the first Arbor Day celebration. Today, Arbor Day is nationally recognized on the last Friday in April, and all 50 states have passed legislation adopting Arbor Day celebrations on various dates appropriate for tree planting in their local climate. In Nebraska, Arbor Day is an official state holiday, which will be celebrated this year on Friday, April 26. (1)

Also celebrated in April is Earth Day, which was founded on April 22, 1970 as a campaign to raise public awareness of environmental issues. Today, it is celebrated by more than a billion people worldwide each year, and has grown into the world's largest secular observance. (2)

With Arbor Day and Earth Day just around the corner, this month is the perfect time to highlight some green jobs in Nebraska. Green jobs play an important role in the state's economy, and can offer some great career opportunities for people who want to make a difference in their communities and our shared environment. To learn more about these environmentally focused occupations we'll look at ten years of wage data, as well as projections for what the future might hold for green jobs in Nebraska.

Every May and November, the Nebraska Department of Labor (NDOL) works with the U.S. Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES) program to collect occupational and wage data from businesses throughout Nebraska. The result is detailed information on occupations and wages that can be useful for both personal and business-related research. Nebraska's OES team produces a wage data each quarter, which is published and made available on NEworks.
What Are Green Jobs?

Generally speaking, green jobs are jobs that are “related to preserving or restoring the environment.” The BLS defines green jobs as “jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources,” and “jobs in which workers’ duties involve making their establishment’s production processes more environmentally friendly or use fewer natural resources.” (3)

Conservation scientists and foresters, environmental engineers, soil and plant scientists, wind turbine service technicians, and zoologists and wildlife biologists are a diverse group of occupations, but each fits within the BLS green jobs criteria.

Conservation Scientists & Foresters

Conservation scientists and foresters “manage the overall land quality of forests, parks, rangelands, and other natural resources.” Typical job duties include planning and overseeing environmental conservation and habitat protection efforts, determining strategies for harvesting natural resources with minimal environmental damage, negotiating land-use contracts, and directing and participating in forest fire suppression activities. (4)

Conservation scientists and foresters typically require at least a bachelor’s degree in forestry or a related field, and tend to work for governments (federal, state, or local), in social advocacy organizations, or for private landowners with an interest in stewardship and compliance with environmental regulations, such as farmers, ranchers, and tree harvesters. (4)

Environmental Engineers

Environmental engineers “use the principles of engineering, soil science, biology, and chemistry to develop solutions to environmental problems.” They are often involved in recycling, waste disposal, public health, and pollution control projects. Their work may involve designing environmental protection systems (such as municipal water management or air pollution control), preparing environmental impact studies, conducting environmental quality control checks, inspecting industrial or municipal facilities to ensure compliance with environmental regulations, and advising companies or governments about procedures for avoiding environmental damage or cleaning up contaminated sites. Environmental engineers may work in offices alongside urban or regional planners and other engineers; provide consultations to businesses, policymakers, or lawyers; or work at outdoor sites where specific projects are taking place. (4)

Entry-level positions require a bachelor’s degree in environmental engineering or a related field, such as civil or general engineering. Advanced degrees may be required for higher-level positions. (4) To practice engineering in Nebraska, a person must also be licensed by the Nebraska Board of Engineers and Architects (NBEA). (5)

Soil & Plant Scientists

Soil and plant scientists “conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth.” They are often employed by governments, colleges and universities, research institutions, and industrial operations. (4) Most soil and plant scientists have at least a bachelor’s degree, but educational requirements vary by position. (4)
Wind Turbine Service Technicians

Wind turbine service technicians “install, maintain, and repair wind turbines” used for renewable energy production. They monitor and inspect turbine systems and conduct regular routine maintenance to ensure turbine equipment functions properly. When a turbine malfunctions, wind turbine service technicians are tasked with diagnosing and repairing the problem. Because the components that require servicing are typically located at the top of the turbine tower, wind turbine service technicians must often work at great heights, climbing tall ladders and rappelling to reach the part of the turbine that needs repairs. (4)

Most wind turbine service technicians learn their trade by completing a wind energy certificate program at a technical school or community college. Employers and turbine manufacturers also often provide extensive additional training after a new worker is hired. (4)

Zoologists & Wildlife Biologists

Zoologists and wildlife biologists “study animals and other wildlife and how they interact with their ecosystems. They study the physical characteristics of animals, animal behaviors, and the impacts humans have on the wildlife and natural habitats.” They may work in offices, in laboratories, or outdoors, observing animals in their natural habitats. While many zoologists and wildlife biologists conduct research in academic settings, such as colleges and universities, some also do applied work, such as advising policymakers and public officials, and developing and implementing programs for the conservation and management of wildlife populations. (4)

Entry-level jobs for zoologists and wildlife biologists usually require a bachelor’s degree, but a master’s degree or doctorate is usually necessary for most higher-level scientific positions, especially those in colleges or universities. (4)
Green Jobs’ Wages

Median hourly wages are shown in the chart below. Both conservation scientists and foresters saw a 15.4% increase in their median wages between 2009 and 2018.* Over the last ten years, the median wage for environmental engineers grew by 19.2%, while the median wage for soil and plant scientists was 19.1% higher in 2018 than in 2009. In the same time, the statewide median wage for zoologists and wildlife biologists increased by 19.3%. Wage information for wind turbine service technicians was not available for public release. ** (6)

Median Hourly Wages for NE Green Jobs, 2009 - 2018

---

* Conservation scientists and foresters are grouped together for many statistical purposes, but separate wage data is available for both.

** Wage data for wind turbine service technicians are not available for release due to the BLS confidentiality policy, which assures respondents that published figures will not reveal their identity or allow it to be inferred. To further protect confidentiality, the specific screening criteria used to make such determinations are also withheld from public release.

---

Image by Rudy and Peter Skitterians from Pixabay
The Future of Green Jobs: 2016-2026 Projections

Every other year, NDOL produces long-term (ten-year) projections for industries and occupations in Nebraska, which are made available to the public on NEworks. As shown by the graph below, employment in Nebraska is projected to increase by 8.5% or more for all five green jobs analyzed in this article between 2016 and 2026. For comparison, overall employment for all occupations statewide is expected to grow by 8.9%. (7)

There were 265 conservation scientists and foresters in Nebraska in 2016, a number expected to grow to 294 by 2026, for a 10.9% increase. The number of environmental engineers employed throughout the state is projected to increase from 383 in 2016 to 436 in 2026, growing by 13.8% over ten years. For soil and plant scientists, employment in Nebraska is projected to increase by 12.3%, from 879 in 2016 to 987 in 2026. (7)

Significant growth in employment of wind turbine service technicians is expected between 2016 and 2026. The number of Nebraskans employed in this occupation is expected to skyrocket by 90.8% during this time period, from 120 to 229. In fact, in terms of percent change, wind turbine service technicians are projected to see faster employment growth in Nebraska than any other occupation from 2016 to 2026. (7)

Zoologists and wildlife biologists are expected to see the most modest increases of the five green occupations, with a projected increase of 8.5% between 2016 and 2026, from 176 to 191. (7)

As renewable sources of energy become more advanced, affordable, and common in the United States, there is likely to be increased demand for workers to create and maintain the infrastructure necessary to support these growing industries. According to nationwide occupational projections from the BLS, the two occupations expected to experience the fastest employment growth in the U.S. from 2016 to 2026 are solar photovoltaic installers (who install and maintain the systems used to generate solar energy) and wind turbine service technicians, which are projected to see increases of 104.9% and 96.3% respectively. In comparison, total nationwide employment is expected to increase by just 7.4%. The rapid growth anticipated for these occupations means that solar photovoltaic installers are projected to add an astounding 11,800 jobs nationally, and wind turbine service technicians are projected to add another 5,600 jobs over the next ten years. (8)

Employment in NE Green Jobs, 2016-2026 (Projected)

![Chart Source: NE Department of Labor. Long-Term Occupational Projections. (July 2018).]
The Nebraska Department of Labor classifies and ranks occupations as “H3” (high wage, high skill, high demand) based on comparisons of typical wages, skill and training requirements, and the projected level of future labor market demand. Because they offer a high probability that qualified workers will be able to secure employment and a competitive rate of pay, H3 occupations are typically considered excellent career options. (9)

Environmental engineers, soil and plant scientists, and wind turbine service technicians all qualified as H3 occupations in 2018. Each of these occupations is expected to have a large number of annual job openings through 2026, and each offers workers with the required skills the opportunity to earn a wage higher than the baseline for all occupations. (10)

To be considered H3, an occupation must meet the criteria required for all three designations: high wage, high skill, and high demand. An occupation that misses the mark in any category would be excluded. For example, zoologists and wildlife biologists must be highly skilled and typically receive high pay, but their work is too specialized to generate a high level of demand, so they would not qualify as H3. Jobs that are not considered H3 are therefore not necessarily bad career prospects, but job seekers looking for employment in these occupations may have a more difficult time finding open positions, and may face a high level of competition from other qualified applicants.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>High Wage?</th>
<th>High Skill?</th>
<th>High Demand?</th>
<th>H3?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation Scientists &amp; Foresters</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Environmental Engineers</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>★</td>
</tr>
<tr>
<td>Soil &amp; Plant Scientists</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>★</td>
</tr>
<tr>
<td>Wind Turbine Service Technicians</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>★</td>
</tr>
<tr>
<td>Zoologists &amp; Wildlife Biologists</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>

The Final Word

Green jobs are on the rise in Nebraska. As people become increasingly environmentally conscious and green technology continues to evolve, green jobs are expected to continue to cement their place in the state's economy. With rapid employment growth and competitive wages, these occupations can offer significant benefits to workers as well as the planet.

Sources:
Crude oil is “a mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs,” which “is refined to produce a wide array of petroleum products, including heating oils, gasoline, diesel and jet fuels…and many other products used for their energy or chemical content.” In 2017, U.S. refineries “produced an average of about 20 gallons of motor gasoline and about 11 gallons of ultra-low sulfur distillate fuel oil,” most of which is sold as diesel fuel, from each 42-gallon barrel of crude oil. (1; 2)

West Texas Intermediate (WTI) is one variety of crude oil, produced in Texas and southern Oklahoma, “which serves as a reference or ‘marker’ for pricing.” Its spot price—“the price for a one-time open market transaction for immediate delivery of a specific quantity of product at a specific location where the commodity is purchased ‘on the spot’ at current market rates”—is taken from trades that occur in the domestic spot market in Cushing, Oklahoma. The Cushing spot price for WTI serves as a primary benchmark for oil pricing in the United States. (1)

Crude oil prices can be influenced by a variety of factors. As the U.S. Energy Information Administration (EIA) explains, “prices can be affected by events that have the potential to disrupt the flow of oil and products to market, including geopolitical and weather-related developments. These types of events may lead to actual disruptions or create uncertainty about future supply or demand, which can lead to higher volatility in prices.” (3)
Financial markets also play a role in influencing oil prices, as “market participants not only buy and sell physical quantities of oil, but also trade contracts for the future delivery of oil and other energy derivatives.” The relationship between crude oil and financial activities is complex, influenced by a broad range of global factors, and often takes place in portions of the market that are not fully transparent to outside observers. As such, “analysts continue to work to better understand the connections between these markets.” (4)

In February 2019, WTI prices rose to $54.95 per barrel, a 6.9% increase from $51.38 per barrel in January. Price per barrel decreased on the year, down from $62.23 in February 2018. The highest recorded monthly average spot price for WTI was $133.88 per barrel in June 2008. (5)

Sources:
### Change Over Last Quarter/Month

<table>
<thead>
<tr>
<th>Metric</th>
<th>Current Time Period</th>
<th>United States</th>
<th>Midwest Region</th>
<th>Nebraska</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Weekly Manufacturing Hours</td>
<td>February, 2019</td>
<td>-0.2</td>
<td></td>
<td>-1.2</td>
</tr>
<tr>
<td>Initial Unemployment Claims</td>
<td>February, 2019</td>
<td>+5.0%</td>
<td></td>
<td>-30.3%</td>
</tr>
<tr>
<td>Value of Manufacturers’ New Orders for Consumer Goods</td>
<td>December, 2018</td>
<td>-1.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISM Manufacturing: New Orders Index®</td>
<td>February, 2019</td>
<td>-4.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value of Manufacturers’ New Orders: Nondefense Capital Goods Excluding Aircraft</td>
<td>December, 2018</td>
<td>+0.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S&amp;P 500®</td>
<td>February, 2019</td>
<td>+5.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Year Treasury Constant Maturity Minus Federal Funds Rate</td>
<td>February, 2019</td>
<td>+0.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of Michigan, Consumer Sentiment Index</td>
<td>February, 2019</td>
<td>+2.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumer Price Index, not seasonally adjusted</td>
<td>February, 2019</td>
<td>+0.4%</td>
<td>+0.7%</td>
<td></td>
</tr>
<tr>
<td>Employment Cost Index</td>
<td>4th Quarter, 2018</td>
<td>+0.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Producer Price Index: All Commodities</td>
<td>February, 2019</td>
<td>+0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment Rate, seasonally adjusted</td>
<td>January, 2019</td>
<td>+0.1%</td>
<td>+/-0.0%</td>
<td>+/-0.0%</td>
</tr>
<tr>
<td>Real GDP, billions of chained 2009 dollars</td>
<td>4th Quarter, 2018</td>
<td>+2.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Taxable Sales</td>
<td>December, 2018</td>
<td>+15.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrel of Crude Oil, WTI-Cushing, Spot Price</td>
<td>February, 2019</td>
<td>+$3.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Account Balance (millions of dollars)</td>
<td>3rd Quarter, 2018</td>
<td>+23.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leading Economic Index</td>
<td>December, 2018</td>
<td>+2.7%</td>
<td>+0.9%</td>
<td></td>
</tr>
</tbody>
</table>

* State-level data release schedule lags national data by one month; January 2019 data for Nebraska reflects activity from December 2018.

### Sources:
