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Labor Supply Issues Influencing Green Industry Development

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Executive Summary

This research compares the supply and demand for workers in green occupations in Nebraska, and the resulting implications for worker training. This is done by examining both the current workforce in green occupations, and the "potential" work force found in related occupations. Estimates of the current and potential workforce in green occupations are developed based on data available from the Nebraska and U.S. Departments of Labor. Estimates of labor supply are then compared to projections for growth in green employment that were prepared by the Nebraska Department of Labor (NDOL) through its Labor Market Information division (NDOL-LMI).

Such comparisons between labor supply and projected job growth within occupations have important implications for policy. In particular, the state or regions of the state may already possess a work force with a background that matches the education and skill requirements for certain types of green occupations. In such cases, training may focus on getting workers prepared for the "green aspects" of an occupation, rather focusing on bringing new workers into that occupation. However, it may be necessary to train new workers to enter occupations where projected job growth is large relative to current and potential labor supply.

We conduct such supply and demand analysis for 16 specific "green" occupations that include a wide variety of worker skills. While there are a few exceptions, in general we find that the size of the existing or potential work force is large relative to projected growth in green occupations. This implies that in many green occupations existing workers may need to retool and reapply their skills in new ways, but there may not be a need for special efforts to train new workers to enter these occupations. Such efforts to train workers for green aspects of their own occupation or a related occupation may occur at community colleges or at firms.

More generally, we find that Nebraskans are well positioned to take advantage of a new green economy. The state currently supports a large labor force of workers whose skills and talents are matched with the future demands for workers in green occupations. Training in specific skills may be required but the state already has the required occupational make-up. It must be said that this situation is the result of substantial, ongoing efforts by educators, Nebraska workers, and their employers. These ongoing efforts should be recognized and will need to continue.

Further, there are some exceptions to these general findings. We did identify a few occupations that might face staffing issues given increased demand for green workers. These occupations typically were composed of highly trained professionals, particularly in engineering fields. These problems may linger for several years into the future until market and training mechanisms guide new workers to these emerging employment opportunities.

I. Introduction

The last several decades have seen a persistent decline in manufacturing and blue collar jobs across the United States. Some believe that a new green economy and the accompanying green jobs will help reverse this trend. The American Reinvestment and Recovery Act specifically allocated funds to support research into green jobs and funds to support new green industries. This research attempts to analyze the importance of green jobs to Nebraska. More specifically, this research examines the potential need for training for workers in green occupations from a general perspective, that is, the study makes broad assessments of the potential role for training rather than describing specific training programs that may be required. This is done because a growing demand for workers in green occupations could generate a need for worker education and training to acquire the relevant skills for each occupation. But, the extent of training required will depend on the existing supply of skilled labor for green occupations.

A staring point would be the existing occupation profiles for Nebraska developed from industry-occupation employment matrices. Such a profile would represent the (estimated) current occupations of workers. However, it would not capture the "potential" occupation of workers based on skill and education background. In some cases, there may be a potential for workers to switch from an existing occupation to new occupations, including green occupations. This research identifies such potential workers for green occupations.

The size of the existing work force and the potential work force within an occupation relative to projected job growth has important implications for policy. In particular, the state or regions of the state may already possess a work force with a background that matches the education and skill requirements for certain types of green occupations. In such cases, training may focus on getting workers prepared for the "green aspects" of an occupation, rather than involved training to bring new workers into that occupation. Such limited training might be sufficient to fill the future demand for green occupation workers. However, long-term training to bring workers into these occupations may still be provided to some displaced workers facing extended unemployment spells from a social policy perspective.

Finally, labor supply analysis by necessity will focus on specific regions of the state. This is because particular green occupations will concentrate in specific areas of the state with an advantage for certain green employers. For example, regions of Nebraska with strong, sustained winds and good access to below-capacity transmission lines are the most appropriate location for wind power, and occupations required by wind power producers.

This research will proceed as follows. First we will review just what it takes to be considered a green job. Then we will determine how much of the Nebraska workforce can be considered green. Finally we will examine specific green occupations in Nebraska to assess

whether or not the Nebraska labor force will be able to meet the demands of the new green economy.

This report will refer to occupations by their specific SOC Code, a classification established by the United States Department of Labor's Bureau of Labor Statistics. The Standard Occupational Classification (SOC) system is used by Federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. All workers are classified into one of 840 detailed occupations according to their occupational definition. To facilitate classification, detailed occupations are combined to form 461 broad occupations, 97 minor groups, and 23 major groups. Detailed occupations in the SOC with similar job duties, and in some cases skills, education, and/or training, are grouped together.

In our analysis we also use a variety of data sources such as O*Net, an online program sponsored by of the US Department of Labor/Employment and Training Administration (USDOL/ETA); the Nebraska Department of Labor (NDOL) Short-Term Occupation Projections data set; Annual employment and wages data from the Occupational Employment Statistics (OES) survey sponsored by the United States Department of Labor: Bureau of Labor Statistics (BLS); and the Public Use Microdata Sample (PUMS) from the American Community Survey (ACS) sponsored by the U.S. Census Bureau.

II. Green Occupation Analysis

Preamble

The U.S. Department of Labor, using its O*Net classification system, developed a list of green occupations for the United States. As a starting point in our green occupation analysis, we estimated the number of workers in these green occupations in Nebraska based on current employment estimates developed by the NDOL. Our estimates for the State of Nebraska are shown in Table 1 below. Detailed information about these Nebraska estimates, and estimates by region of the state, are provided in Appendix 1.

Results in Table 1 indicate that approximately 23% of Nebraska employment is in green occupations. The largest share is found in "Green Increased Demand" occupations. These are existing green occupations that should grow as the economy grows but may not undergo significant changes in either occupational or worker activities. A similarly large share of green employment is found in "Green Enhanced Skills" occupations. These are existing green occupations that will be transformed with changes in skills, knowledge, and credentials, but little growth in demand is anticipated. Only 3.6% of employment is expected in "Green New and Emerging" occupations. These results show that training and education needs for green occupations will need to focus at least as much on upgrading the skills of existing occupations as in creating a large number of workers in new occupations.

Table 1
Green employment as a share of total statewide employment

O*NET Classification	**2009 estimated employment**	**2011 projected employment**
Green Increased Demand Occupations	10.3%	10.2%
Green Enhanced Skills Occupations	9.4%	9.4%
Green New and Emerging Occupations	3.6%	3.6%

Table 1: Nebraska wide percent of workers in occupations and projected employment of same.
Source O*NET: The Green Economy-- http://www.onetcenter.org/green.html?p=2

These estimates in Table 1 show a significant share of green employment in Nebraska. However, as described below, we utilized a more focused estimate of Nebraska green jobs as the basis of our research. In particular, we utilized a definition of green occupations developed by the NDOL-LMI, as part of its work with the Northern Great Plains and Rocky Mountain Consortium. This Nebraska-specific definition is most useful for the types of labor supply analysis which is the focus of our research.

Introduction

This research compares the supply and demand for workers in green occupations in Nebraska, and the resulting implications for worker training. We estimate labor supply by examining the number of workers in selected green occupations ("Current Employment") and related occupations ("Indirect Employment"), both at a statewide and regional level. We performed this analysis for 16 selected green occupations of interest for Nebraska. These reflect the diversity of green occupations in Nebraska in terms of education, skill, and training.

As noted above, we did not use the O*Net classification system in order to identify green jobs. Our analysis is tailored specifically to the Nebraska labor market and so we focused on occupations specifically designated as green by the NDOL-LMI. NDOL-LMI recently surveyed employers across the state and gathered information about green jobs in the state. Employers were asked to list occupations in which their employees perform green work. The formal definition of a green job used in this survey was:

> *"[A job] in which an employee produces a product of service that improves energy efficiency, expands the use of renewable energy, or supports environmental sustainability."*

A significant share of this effort is devoted to analyzing labor supply as discussed in the methodology section that follows. However, we also utilized net estimated job growth numbers calculated by NDOL-LMI in order to evaluate potential labor market stresses in these occupations.

Methodology

In our results section, we provide a detailed analysis of the labor supply and demand for each of our 16 selected occupations. This analysis includes an overview of worker characteristics in each occupation, an estimate of the Current Employment in that occupation, an estimate of employment in related occupations ("Indirect Employment"), and calculations utilizing labor demand estimates provided by NDOL-LMI. Below, we describe the methods we used to calculate these figures for each of the 16 occupations.

Occupation Overview

Occupation characteristics provided by O*Net were used to gather general information about each occupation in our study. This information includes the average age of workers within the occupations, as well as information about the educational attainment of the average worker. This information, however, is based on national employment statistics. We used the American Community Survey's (ACS) Public Use Micro Datasets (PUMS) to build similar worker profiles for each of the occupations we investigated. From this database we gathered age and educational

attainment information specific to Nebraska and its regions. This allows us to compare Nebraska worker characteristics to national characteristics. Information from the PUMS database is available for three geographical areas within the state: Omaha, Lincoln, and the non-metropolitan area of the state.

The ACS is a representative survey conducted by the Census Bureau on an annual basis. The survey produces detailed demographic and employment information on individuals and households across the United States. Because the survey is representative, every individual or household has a unique weighting factor associated with them. We use these weighting factors in combination with the demographic and employment information to construct a profile of the average worker in our selected occupations for Omaha, Lincoln, and non-metropolitan areas. Below, we explain how we arrived at our estimates for two of the more important personal characteristics: age and educational attainment.

A simple weighted average method was used to attain the weighted age for a specific SOC code in one of the three geographic regions. First, all the individual weights were summed. Then for each individual, the age was multiplied by the individual weight. All of these products were then summed. Finally, the sum of the products was divided by the sum of all the weights to yield the weighted age in years, which was then rounded to the nearest whole number.

To attain the weighted average education attainment for a specific occupation code in one of the three geographic regions, the first step was to remove any individuals under the age of 25. The next step was to sum all the individual weights. Then the data was grouped according to the education attainment levels: less than high school, high school diploma or GED, some college, associate's degree, bachelor's degree, master's degree, and professional degree beyond a master's degree. For each education attainment, the weights were summed. As an example, for the individuals listed as having a bachelor's degree, all of their individual weights were summed to provide the aggregate weight for all individuals meeting the desired condition. This figure was then divided by the sum of all the weights to yield the proportion of individuals, within each specific SOC code in one of the three geographic regions, having one of the aforementioned education attainments.

Current Employment

At the time of our analysis the best source of occupational employment information in Nebraska was the 2009 NDOL Short Term Occupation Projections. This data file allowed us to look at employment by occupation at both the state and economic region level. NDOL defines the regions as: the Omaha consortium (Nebraska portions of the Omaha MSA), the Lincoln MSA, the Southeast region, the Central region, the Mid Plains region, the Panhandle region, and the Northeast region. Appendix 2 lists the Nebraska counties included in each of these economic regions. No national data set allowed us to look at Nebraska employment in such rich detail. This

data allows us to get 2009 employment in each of our 16 selected occupations on a statewide and regional basis. This measure is presented as Current Employment.

Indirect Employment

For each of the 16 occupations, we also estimated 2009 employment in closely related occupations ("Indirect Employment"). Closely related occupations were identified by O*Net. O*Net also supplies skills information for each occupation. We cross-listed the skills of each related occupation with the skills of its respective green occupation in order to calculate the percentage of overlap.[1]

To calculate the total Indirect Employment, we gathered data in each of these related occupations at the state and regional level, again using 2009 NDOL Short Term Occupation Projections.[2] Employment in each related occupation was summed in order to determine Indirect Employment. This is our measure of the number of workers who could readily transition into a green occupation.

However, because some related occupations had a SOC code that was at a very detailed level (i.e. the decimal level in the SOC code system), we projected the Indirect Employment figures in to two categories: "narrow" and "wide." This was necessary because employment is not provided for these decimal level occupations. In our "narrow" definition, we simply exclude employment in these decimal level SOC codes. In our "wide" definition, we include employment in the more aggregate category which includes this decimal level SOC code, but also others which may not have been identified as related occupations.[3][4]

Potential Employment

The American Community Survey provides data on employment status for employed individuals. We had already used the dataset in order to develop the worker profiles outlined earlier. The ACS PUMS data also gives information about an individual's employment status. We had hoped to exploit this fact in order to build a profile of another potential labor pool.

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[1] Conversations with O*Net personnel revealed that the related occupations file was developed as a resource for workers who are re-entering the workforce and to guide them in identifying occupations where the requirements for knowledge, skills, abilities, and work activities are similar to their previous job. O*Net's related occupations were identified through an algorithm applied to analyst ratings on five O*NET domains combined into three dimensions: I-skills, abilities, general work activities, II-work context, and III-knowledge.

[2] In some cases, we needed to allocate Nebraska employment data into detailed occupations of interest based on national patterns. Such data was not available in detailed occupations for Nebraska due to confidentiality.

[3] Specifically, for related occupations that had SOC codes at the decimal level (e.g. .01 or .02) that were excluded from NDOL data, we estimated the number of people in those related occupations by going one level up in SOC codes within the NDOL data.

[4] As an example, marine architect (17-2121.02) is a related occupation to the green occupation civil engineers. Our "wide" estimate includes the NDOL Short Term Occupation Projection for 17-2121.00 (since 17-2121.02 is not listed). Our "narrow" estimate doesn't include marine architects in the total for indirect employment.

The data allows us to identify unemployed workers and also people we are outside the labor force. Some of these non-labor force individuals were retired but others were discouraged workers who had simply given up the search for work. These workers could potentially rejoin the labor force should sufficiently enticing job opportunities arise. We could identify individuals whose previous occupation was one of the green occupations we were analyzing.

We intended using a weighting procedure similar to the one used for extrapolating average age and education levels so that we could estimate this potential labor pool from the ACS PUMS data. Unfortunately, the sampling weights could not realistically be used in conjunction with employment status. The results we obtained were not helpful in the way we initially intended and therefore are not reported in the body of this report. We do, however, provide a summary of this analysis in Appendix 3.

Net Job Growth

The surveys collected by the NDOL-LMI asked employers about likely openings and elimination of green jobs in their firm over the next two years. NDOL-LMI applied weights to these survey results to generate data representative of employer demand statewide. Based on information provided by NDOL-LMI, we were able to estimate net job growth in green occupations. Net estimated job growth was calculated as the difference between job creation and job elimination within each occupation. These results yield demand estimates for green occupations in the state over the next two years.

The survey results are only available for the statewide level. Therefore, we calculated region estimates based on the proportion of current employment in that occupation in each region.

We now present detailed analysis for each of the 16 green occupations.

Specific SOC Code: Civil Engineers (17-2051)

Occupation Overview

Civil engineers is classified as a Green Enhanced Demand occupation by O*Net and also classified as a green job by NDOL-LMI. According to NDOL-LMI estimates, 50.9% of civil engineers were involved in green activities. Most workers in the occupation have a bachelor's degree and O*Net's Job Zone categorizes the occupation as "considerable preparation needed" (level four) in regards to obtaining employment in this occupation. Looking at occupation characteristics specific to Nebraska, we find that in the Omaha region civil engineers had an average age of 45 years old. The majority of individuals, 40%, attained a bachelor's degree, while 35% attained a master's degree and 16% of individuals had least some college education but no degree. In the Lincoln region, civil engineers had an average age of 30 years old and all individuals attained a bachelor's degree. For the non-metro region, civil engineers had an average age of 41 years old. Most individuals, 93%, had less than a high school diploma or GED, with the remaining 7% having only a high school diploma or GED.

The skills involved in being a civil engineer are: complex problem solving, critical thinking, judgment and decision making, mathematics, operations analysis, reading comprehension, active listening, speaking, science, and time management. Other occupations with much similarity in skills involved are landscape architects, aerospace engineers, marine engineers, and materials engineers. Skills in these four occupations contain 80% of the same skills involved in the civil engineer occupation. Mining and geological engineers, electrical drafters, mechanical drafters, and civil engineering technicians have a 70% skills overlap, while industrial safety and health engineers and petroleum engineers have a 60% match in skills. Workers in these occupations versus other occupations are likely to be able to transition easier into the civil engineer occupation.

Current Employment

Statewide, 1,805 civil engineers were employed in 2009 according to NDOL's Short-Term Occupation projections. To see how Nebraska's civil engineers are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 1,069 civil engineers were employed that year, in the Lincoln MSA there were 520 civil engineers, in the Southeast region 40, in the Central region 79, in the Mid Plains 34, in the Panhandle 21 and in the Northeast 69 civil engineers were employed.

Indirect Employment

Statewide, 2,248 workers are employed in occupations with closely related skills listed above in the occupation overview of: landscape architects, aerospace engineers, materials engineers, mining and geological engineers, petroleum engineers, mechanical drafters and civil

engineering technicians. These occupations are not all of the related occupations that O*Net lists for civil engineers. Rather, these related occupations have SOC codes that are not at a decimal level. We label the group of related occupations at a whole number level the "narrow" category. To include related occupations at the most detailed level, those with SOC codes with a decimal place value, we develop a "wide" group of related occupations. This category of indirect employment encompasses all related occupations defined by O*Net, both at the whole number SOC level and a decimal place level. In the wide category of related occupations for civil engineers, 2,489 workers were employed in Nebraska in 2009. In conclusion, over 2,000 workers could potentially easily switch from their current occupation to fulfill demand in civil engineering occupations in the state.

Narrowly defined, at the economic region level related occupations in the Omaha consortium employed 985 workers that year, in the Lincoln MSA 573, in the Southeast region 41, in the Central region 254, in the Mid Plains 64, in the Panhandle 62 and in the Northeast 234 were employed. More widely defined, at the economic region level related occupations in the Omaha consortium employed 1,063 workers that year, in the Lincoln MSA 610, in the Southeast region 50, in the Central region 276, in the Mid Plains 68, in the Panhandle 66, and in the Northeast 258 were employed.

Job Growth

It is estimated that 156 green jobs for civil engineers will be created over the next two years and that no green jobs will be eliminated. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Lincoln MSA.

Conclusions

Given that projected net green job growth over a two year period is nearly 10% of Current Employment (and around 5% of Current plus Indirect Employment), there is reason for concern that the supply of workers in the civil engineer occupation may fall short of demand growth for green workers. This is particularly true given the high educational and experience requirements for civil engineers. However, we do not believe the Nebraska labor market will have lasting problems supplying the necessary workers in the future. In the short-run, there may be potential to attract civil engineers to high paying opportunities in Nebraska. In the long-run, more students may choose this career option during their undergraduate studies.

Civil Engineers (17-2051)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	1,805	2,489	2,248	156
Regions				
Omaha Consortium	1,069	1,063	985	92
Lincoln MSA	520	610	573	45
Southeast Region	40	50	41	3
Central Region	79	276	254	7
Mid Plains Region	34	68	64	3
Panhandle Region	21	66	62	2
Northeast Region	69	258	234	6

Specific SOC Code: Electrician
(47-2111)

Occupation Overview

Electricians is classified as a Green Increased Demand occupation by O*Net. NDOL has also identified this occupation as a green job. According to NDOL-LMI estimates, 26.6% of electricians were involved in green activities. However, this large occupation is ranked second in Nebraska in terms of the absolute number of green workers. Most workers in the occupation have some college experience but no educational degree and O*Net's Job Zone categorizes the occupation as "medium preparation needed" (level three) in regards to obtaining employment in this occupation. For the Omaha region, electricians had an average age of 31 years old and 44% of individuals had a high school diploma or GED, about 43% had some college but no degree, and 13% had an associate's degree. In the Lincoln region, electricians had an average age of 29 years old. Most individuals, 72%, had a high school diploma or GED with the remaining 28% having an associate's degree. Electricians in the non-metro had an average age of 43 years old and 31% had an associate degree, 22% had some college but no degree, and 17% of individuals had a high school diploma or GED.

The skills involved in being an electrician are: troubleshooting, repairing, active listening, critical thinking, operation monitoring, quality control analysis, active learning, complex problem solving, equipment maintenance, and judgment and decision making. Other occupations with much similarity in skills involved are avionics technicians, electrical and electronics. Skills in these two occupations contain 80% of the same skills involved in the electrician occupation. Computer, automated teller, and office machine repairers have a 70% skills overlap, model makers, metal and plastic have a 60% match, electronic drafters have a 50% match while electronics engineering technicians and electrical and electronic equipment assemblers have a 30% match in skills. Workers in these occupations versus other occupations are likely to be able to transition easier into the electrician occupation.

Current Employment

Statewide, 5,325 electricians were employed in 2009 according to NDOL's Short-Term Occupation projections. To see how Nebraska's electricians are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 2,680 electricians were employed that year, in the Lincoln MSA there were 926 electricians, in the Southeast region 219, in the Central region 389, in the Mid Plains 208, in the Panhandle 171, and in the Northeast 649 electricians were employed.

Indirect Employment

Statewide, 2,745 workers are employed in occupations with closely related skills listed above in the occupation overview of: computer, automated teller, and office machine repairers,

avionics technicians, electrical and electronics repairers, commercial and industrial equipment, electrical and electronic equipment assemblers, and model makers, metal and plastic. Again, these occupations are not all of the related occupations that O*Net lists for electricians. Rather, these related occupations have SOC codes that are not at a decimal level. We label the group of related occupations at a whole number level the "narrow" category. To include related occupations at the most detailed level, those with SOC codes with a decimal place value, we develop a "wide" group of related occupations. This category of indirect employment encompasses all related occupations defined by O*Net, both at the whole number SOC level and a decimal place level. In the wide category of related occupations for electricians above, 3,282 workers with those occupations were employed in Nebraska in 2009. In conclusion, roughly 3,000 workers could potentially easily switch from their current occupation to fulfill demand in electrician occupations.

Narrowly defined, at the economic region level related occupations in the Omaha consortium employed 1,284 workers that year, in the Lincoln MSA 556, in the Southeast region 265, in the Central region 275, in the Mid Plains 219, in the Panhandle 146, and in the Northeast 431 were employed. More widely defined, at the economic region level related occupations in the Omaha consortium employed 1,507 workers that year, in the Lincoln MSA 712, in the Southeast region 288, in the Central region 324, in the Mid Plains 257, in the Panhandle 161, and in the Northeast 506 were employed.

Job Growth

It is estimated that 147 green jobs for electricians will be created over the next two years and that no green jobs in the occupation will be eliminated. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Lincoln MSA.

Conclusions

Of all the occupations we analyzed, only four employed more people than electricians. Work as an electrician requires a great deal of education and specialized training. This might be why the number of workers in related employment is actually less that the number of workers employed as electricians. We do not see this as a problem though. Given the modest increase in demand, and the large numbers of current electricians, we believe that current labor supply and ongoing education and training programs will be able to adequately supply trained electricians for the future.

Electrician (47-2111)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	5,325	3,282	2,745	147
Regions				
Omaha Consortium	2,680	1,507	1,284	74
Lincoln MSA	926	712	556	26
Southeast Region	219	288	265	6
Central Region	389	324	275	11
Mid Plains Region	208	257	219	6
Panhandle Region	171	161	146	5
Northeast Region	649	506	431	18

Specific SOC Code: Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)

Occupation Overview

The heating, air conditioning, and refrigeration mechanics and installers occupation is made up of two sub-categories: (1) heating and air conditioning mechanics and installers and (2) refrigeration mechanics and installers. Heating and air conditioning mechanics and installers are classified as a Green Enhanced Skill occupation by O*Net and refrigeration mechanics and installers are defined as a Green Increased Demand occupation. The major category, heating, air conditioning, and refrigeration mechanics and installers is determined as a green job by NDOL. According to NDOL-LMI estimates, 87.2% of these workers were involved in green activities. Further, this large occupation is ranked first in Nebraska in terms of the absolute number of green workers. Most workers in the occupation have some college experience but no educational degree and O*Net's Job Zone categorizes the occupation as "medium preparation needed" (level three) in regards to obtaining employment in this occupation.

When we look at specific occupation characteristics to Nebraska, the average age of workers in the in the Omaha region is 35 years old. Within the occupation, 33% of individuals had less than a high school diploma or GED, 28% had a high school diploma or GED, and 24% had an associate's degree. For the Lincoln region, heating, air conditioning, and refrigeration mechanics and installers had an average age of 30 years old. All of the individuals had some college education, but no degree. In the non-metro region, heating, air conditioning, and refrigeration mechanics and installers had an average age of 35 years old. The majority of individuals in the area, 60%, had an associate's degree, while 17% of individuals had a high school diploma or GED and 14% had some college but no degree.

Skills involved for both sub-categories of the occupation are: installation, troubleshooting, repairing, equipment maintenance, operation monitoring, quality control analysis, and critical thinking, operation and control. The additional skills involved in being in first sub-occupation, heating and air conditioning mechanics and installers, are active listening and judgment and decision making. The additional skills involved in being in second sub-occupation, refrigeration mechanics and installers, are equipment selection and complex problem solving.

Nine of the ten skills of motorboat mechanics are the same as heating and air conditioning mechanics and installers, thus the two occupations are very closely related. Other occupations with much similarity in skills involved are outdoor power equipment and other small engine mechanics, refrigeration mechanics and installers, and home appliance repairers. Skills in these three occupations contain 80% of the same skills involved in the heating and air conditioning mechanics and installers occupation. Electric motor, power tool, and related repairers and motorcycle mechanics have a 70% skills overlap, while control and valve installers

and repairers and locksmiths and safe repairers have a 60% match in skills. Workers in these occupations versus other occupations are likely to be able to transition easier into the heating and air conditioning mechanics and installers occupation.

Four occupations: electric motor, power tool, and related repairers, motorboat mechanics, outdoor power equipment and other small engine mechanics, and heating and air conditioning mechanics and installers consist of skills that have a 80% overlap of the ten skills listed as being involved in the second sub-category, refrigeration mechanics and installers. Other occupations with much similarity in skills involved are motorcycle mechanics and home appliance repairers. Skills in these two occupations contain 70% of the same skills involved in the refrigeration mechanics and installers occupation. Half of the skills of locksmiths and safe repairers overlap with the refrigeration mechanics and installers occupation, too. Workers in these occupations versus other occupations are likely to be able to transition easier into the heating and air conditioning mechanics and installers occupation.

Current Employment

Statewide, 2,197 workers were employed in the heating, air conditioning, and refrigeration mechanics and installers occupation in 2009 according to NDOL's Short-Term Occupation projections. To see how these workers in Nebraska are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 941 heating, air conditioning, and refrigeration mechanics and installers were employed that year, in the Lincoln MSA there were 241 workers in the occupation, in the Southeast region 44, in the Central region 417, in the Mid Plains 159, in the Panhandle 131, and in the Northeast 273 heating, air conditioning, and refrigeration mechanics and installers were employed.

Job Growth

Based on survey results, it is estimated that 245 green jobs for heating, air conditioning, and refrigeration mechanics and installers will be created over the next two years and that seven green jobs in the occupation will be eliminated. Therefore, net green job growth in the occupation is estimated at 239 jobs. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Central Region.

Heating and Air Conditioning Mechanics and Installers (49-9021.01)

Indirect Employment

Statewide, 1,982 workers are employed in occupations with closely related skills listed above in the occupation overview of: electric motor, power tool, and related repairers, motorboat mechanics, motorcycle mechanics, outdoor power equipment and other small engine mechanics, control and valve installers and repairers, home appliance repairers, and locksmith and safe repairers. These occupations are not all of the related occupations that O*Net lists for heating

and air conditioning mechanics and installers because these related occupations have SOC codes that are not at a decimal level – the "narrow" category. To include SOC codes with a decimal place value in addition to the "narrow" group, in the "wide" group of related occupations 4,179 workers with those occupations were employed in Nebraska in 2009. In conclusion, these workers could potentially easily switch from their current occupation to fulfill demand in the heating and air conditioning mechanics and installers occupation.

Narrowly defined, at the economic region level related occupations in the Omaha consortium employed 1,004 workers that year, in the Lincoln MSA 445, in the Southeast region 55, in the Central region 196, in the Mid Plains 102, in the Panhandle 76, and in the Northeast 206 were employed. Widely defined, at the economic region level, related occupations in the Omaha consortium employed 1,945 workers that year, in the Lincoln MSA 686, in the Southeast region 99, in the Central region 613, in the Mid Plains 261, in the Panhandle 207, and in the Northeast 479 were employed.

Refrigeration Mechanics and Installers (49-9021.02)

Indirect Employment

Narrowly defined, statewide 1,698 workers are employed in occupations with closely related skills listed above in the occupation overview of: electric motor, power tool, and related repairers, motorboat mechanics, motorcycle mechanics, outdoor power equipment and other small engine mechanics, home appliance repairers, and locksmith and safe repairers. More widely defined to include related occupations at the most detailed level (those with SOC codes with a decimal place value), which include the addition of the heating and air conditioning mechanics and installers (the other sub-category of the major occupation group that refrigeration mechanics and installers is in), 3,895 workers with those occupations were employed in Nebraska in 2009. In conclusion, these workers could potentially easily switch from their current occupation to fulfill demand in the heating and air conditioning mechanics and installers occupation.

Narrowly defined, at the economic region level related occupations in the Omaha consortium employed 870 workers that year, in the Lincoln MSA 161, in the Southeast region 36, in the Central region 175, in the Mid Plains 77, in the Panhandle 53, and in the Northeast 190 were employed. Widely defined, at the economic region level, related occupations in the Omaha consortium employed 1,811 workers that year, in the Lincoln MSA 402, in the Southeast region 80, in the Central region 592, in the Mid Plains 236, in the Panhandle 184, and in the Northeast 463 were employed.

Conclusions

The occupation of heating, air conditioning, and refrigeration mechanics and installers has the potential to be an important green occupation in the future. NDOL projects demand to grow by nearly 10% of current employment in the next two years. Further, an associate's degree or a training program is an important component of the education requirements for this occupation. However, as is evident in figures for Indirect Employment, there are a large number of workers in related occupations. For this reason, we do not anticipate difficulties filling jobs in these occupations.

Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)

	Current Employment	**Indirect Employment**		**Green Job Growth**
		Wide	***Narrow***	
Nebraska Statewide	2,197	8,074	3,680	239
Regions				
Omaha Consortium	941	3,756	1,874	102
Lincoln MSA	241	1,088	606	26
Southeast Region	44	179	91	5
Central Region	417	1,205	371	45
Mid Plains Region	159	497	179	17
Panhandle Region	131	391	129	14
Northeast Region	273	942	396	30

Specific SOC Code: Refuse and Recyclable Material Collectors (53-7081)

Occupation Overview

Refuse and recyclable material collectors is classified as a Green Enhanced occupation by O*Net, in large part due to workers involved in recycling. NDOL has also designated the occupation as a green job. According to NDOL-LMI estimates, 27.3% of these workers were involved in green activities. Most workers in the occupation have a high school diploma or equivalent and O*Net's Job Zone categorizes the occupation as "some preparation needed" (level two) in regards to obtaining employment in this occupation. Turning to characteristics for Nebraska, in the Omaha region, refuse and recyclable material collectors had an average age of 29 years old. A large majority of individuals in the region, 80%, had a high school diploma or GED and 13% had some college but no degree. For the Lincoln region, refuse and recyclable material collectors had an average age of 29 years old. All individuals had some college experience, but no degree. In the rest of the state, refuse and recyclable material collectors had an average age of 43 years old in the non-metro region and 57% had a high school diploma or GED, 24% of had less than a high school diploma or GED, and 15% had a bachelor's degree.

The skills involved in being a refuse and recyclable material collector are: Operation and control, operation monitoring, critical thinking, coordination, active listening, speaking, monitoring, social perceptiveness, judgment and decision making, and complex problem solving. Other occupations with much similarity in skills involved are tire repairers and changers, and wellhead pumpers. Skills in these two occupations contain 80% of the same skills involved in the refuse and recyclable material collector occupation. Parking enforcement workers and parking lot attendants have a 70% skills overlap, while gas compressor and gas pumping station operators have a 50% match in skills. Workers in these occupations versus other occupations are likely to be able to transition more easily into the refuse and recyclable material collector occupation.

Current Employment

Statewide, 1,295 refuse and recyclable material collectors were employed in 2009 according to NDOL's Short-Term Occupation projections. To see how Nebraska's refuse and recyclable material collectors are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 449 refuse and recyclable material collectors were employed that year, in the Lincoln MSA there were 184 refuse and recyclable material collectors, in the Southeast region 52, in the Central region 171, in the Mid Plains 87, in the Panhandle 30 and in the Northeast 188 refuse and recyclable material collectors were employed.

Indirect Employment

Statewide, 1,445 workers are employed in the occupations mentioned above with closely related skills listed above. These occupations are: Parking enforcement workers, tire repairers and changers, parking lot attendants, gas compressor and gas pumping station operators, and wellhead pumpers. These occupations are not all of the related occupations that O*Net lists for refuse and recyclable material collectors. Rather, these related occupations have SOC codes that are not at a decimal level. We label the group of related occupations at a whole number level the "narrow" category. There were no related occupations that had SOC codes with a decimal place value. Therefore, the wide category of related occupations for refuse and recyclable material collectors is also 1,445 workers employed in Nebraska in 2009. In conclusion, nearly 1,500 workers could potentially easily switch from their current occupation to fulfill demand in refuse and recyclable material collector occupations in the state.

At the economic region level for both narrow and wide definitions, related occupations in the Omaha consortium employed 875 workers that year, in the Lincoln MSA 323, in the Southeast region 83, in the Central region 296, in the Mid Plains 121, in the Panhandle 113 and in the Northeast 290 were employed.

Job Growth

It is estimated that 82 green jobs for refuse and recyclable material collectors will be created over the next two years and that no green jobs in the occupation will be eliminated. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Lincoln MSA and Northeast regions.

Conclusions

Workers as refuse and recyclable material collectors provide an important service. The occupation does not employ a large number of workers in the state. Projected future job growth is also modest. This occupation has modest educational requires and there is a relatively large number of workers in related occupations. We do not anticipate a need to provide additional training program to prepare workers for this occupation.

Refuse and Recyclable Material Collectors (53-7081)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	1,295	1,445	1,445	82
Regions				
Omaha Consortium	449	875	875	28
Lincoln MSA	184	323	323	12
Southeast Region	52	83	83	3
Central Region	171	296	296	11
Mid Plains Region	87	121	121	6
Panhandle Region	30	113	113	2
Northeast Region	188	290	290	12

Specific SOC Code: Plumbers, Pipefitters, and Steamfitters (47-2152)

Occupation Overview

The plumbers, pipefitters, and steamfitters occupation is made up of two sub-categories: (1) Pipefitters and steamfitters (2) plumbers. Pipefitters and steamfitters are classified as a Green Enhanced Skill occupation by O*Net and plumbers are defined as a Green Enhanced Skill occupation as well. The major category, plumbers, pipefitters, and steamfitters is determined as a green job by NDOL. According to NDOL-LMI estimates, 19.0% of these workers were involved in green activities. However, this large occupation is ranked twelfth in Nebraska in terms of the absolute number of green workers. Most workers in the pipefitters and steamfitters sub-category have some college experience but no educational degree, while most workers in the plumbers sub-category have obtained a high school diploma or equivalent. O*Net's Job Zone categorizes the plumbers, pipefitters, and steamfitters occupation as "medium preparation needed" (level three) in regards to obtaining employment in this occupation.

When analyzing occupation characteristic for the state with the PUMS data, we had to refer to a more aggregated SOC code: pipelayers, plumbers, pipefitters, and steamfitters. These individuals had an average age of 44 years old in the Omaha region. In this region, 51% of individuals had a high school diploma or GED and 40% had some college but no degree. In the Lincoln region, pipelayers, plumbers, pipefitters, and steamfitters had an average age of 41 years old. Most individuals, 65%, had less than a high school diploma or GED, with the remaining 35% having some college but no degree. For the non-metro region, pipelayers, plumbers, pipefitters, and steamfitters had an average age of 33 years old and 81% of individuals had a high school diploma or GED, with the remaining 19% having some college but no degree.

Skills involved for both sub-categories of the occupation are: Critical thinking, operation monitoring, active listening, speaking, monitoring, judgment and decision making, reading comprehension, and complex problem solving. The additional skills involved in being in first sub-occupation, pipefitters and steamfitters, are coordination and time management. The additional skills involved in being in second sub-occupation, plumbers, are quality control analysis and operation and control.

Nine of the ten skills for three related occupations of the pipefitters and steamfitters sub-category are the same. Thus these occupations, rough carpenters, reinforcing iron and rebar workers, and laborers and freight, stock, and material movers (hand) are very closely related to pipefitters and steamfitters. Other occupations with much similarity in skills involved are aircraft structure, surfaces, rigging, and systems assemblers; welders, cutters, and welder fitters; and the other sub-category, plumbers. Skills these three occupations contain 80% of the same skills involved in the pipefitters and steamfitters occupation. Construction carpenters have a 70% skills overlap, while recreational vehicle service technicians and refractory materials repairers, except

brickmasons have a 60% match in skills. Workers in these occupations versus other occupations are likely to be able to transition easier into the pipefitters and steamfitters occupation.

With respect to the plumber's sub-category, the occupational category welders, cutters, and welder fitters has a 90% skill overlap. Two occupations: aircraft structure, surfaces, rigging, and systems assemblers, and the other sub-category, pipefitters and steamfitters, consist of skills that have a 80% overlap of the ten skills listed as being involved in the second sub-category, plumbers. Other occupations with much similarity in skills involved are boilermakers and rail car repairers, with a 70% skills overlap with that of plumbers, and construction carpenters with a 60% skills overlap. Half of the skills of refractory materials repairers, except brickmasons overlap with the plumber occupation, as well. Finally, helpers--pipelayers, plumbers, pipefitters, and steamfitters share 30% of skills with plumbers. Workers in these occupations versus other occupations are likely to be able to transition easier into the plumber occupation.

Current Employment

Statewide, 4,668 workers were employed in the plumbers, pipefitters, and steamfitters occupation in 2009 according to NDOL's Short-Term Occupation projections. To see how these workers in Nebraska are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 2,711 plumbers, pipefitters, and steamfitters were employed that year, in the Lincoln MSA there were 420 workers in the occupation, in the Southeast region 259, in the Central region 555, in the Mid Plains 189, in the Panhandle 149, and in the Northeast 366 plumbers, pipefitters, and steamfitters were employed.

Job Growth

It is estimated that 121 green jobs for plumbers, pipefitters, and steamfitters will be created over the next two years and that 23 green jobs in the occupation will be eliminated. This leaves net green job growth of 98 jobs in the occupation. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Central Region.

Pipefitters and Steamfitters (47-2152.01)

Indirect Employment

Narrowly defined at the statewide level, 25,313 workers are employed in occupations with closely related skills listed above in the occupation overview. They are: construction carpenters; rough carpenters; plumbers; reinforcing iron and rebar workers; recreational vehicle service technicians; refractory materials repairers, except brickmasons; aircraft structure, surfaces, rigging, and systems assemblers; welders, cutters, and welder fitters; and laborers and freight, stock, and material movers, hand. These occupations are not all of the related occupations that O*Net lists for pipefitters and steamfitters because, as before this category only includes occupations at the whole digit level. When we broaden our scope to

include occupations at the decimal level we find that 34,645 workers in related occupations were employed in Nebraska in 2009. In conclusion, these workers could potentially easily switch from their current occupation to fulfill demand in the pipefitters and steamfitters occupation.

Narrowly defined, at the economic region level related occupations in the Omaha consortium employed 11,344 workers that year, in the Lincoln MSA 4,212, in the Southeast region 1,016, in the Central region 3,260, in the Mid Plains 1,311, in the Panhandle 1,635, and in the Northeast 2,425 were employed as pipefitters and steamfitters. Broadly defined, at the economic region level, related occupations in the Omaha consortium employed 14,899 workers that year, in the Lincoln MSA 5,093, in the Southeast region 1,674, in the Central region 4,757, in the Mid Plains 1,844, in the Panhandle 1,958, and in the Northeast 3,863 were employed.

Plumbers (47-2152.02)

Indirect Employment

Narrowly defined, statewide 2,111 workers are employed in occupations with closely related skills listed above in the occupation overview of: Boilermakers; construction carpenters; pipefitters and steamfitters ; helpers--pipelayers, plumbers, pipefitters, and steamfitters; rail car repairers; refractory materials repairers, except brickmasons; aircraft structure, surfaces, rigging, and systems assemblers; and welders, cutters, and welder fitters. More widely defined to include related occupations at the most detailed level (those with SOC codes with a decimal place value), which include the addition of pipefitters and steamfitters (the other sub-category of the major occupation group that plumbers is in), 20,474 workers with those occupations were employed in Nebraska in 2009. In conclusion, these workers could potentially easily switch from their current occupation to fulfill demand in the plumber occupation.

Narrowly defined, at the economic region level related occupations in the Omaha consortium employed 245 workers that year, in the Lincoln MSA 287, in the Southeast region 65, in the Central region 79, in the Mid Plains 251, in the Panhandle 403, and in the Northeast 118 were employed as plumbers. Widely defined, at the economic region level, related occupations in the Omaha consortium employed 8,015 workers that year, in the Lincoln MSA 3,068, in the Southeast region 1,245, in the Central region 2,540, in the Mid Plains 1,289, in the Panhandle 1,163, and in the Northeast 2,411 were employed.

Conclusions

The plumbers, pipefitters, and steamfitters occupation is not expected to grow very quickly in the next two years. Further, net job growth is quite small relative to Current Employment in this occupation. Nebraska also has a large number of workers in related occupations. Given these facts, we do not see any difficulties in staffing future green job openings in this occupation.

Plumbers, Pipefitters, and Steamfitters (47-2152)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	4,668	55,119	27,424	93
Regions				
Omaha Consortium	2,711	22,914	11,589	54
Lincoln MSA	420	8,161	4,499	8
Southeast Region	259	2,919	1,081	5
Central Region	555	7,297	3,339	11
Mid Plains Region	189	3,133	1,562	4
Panhandle Region	149	3,121	2,038	3
Northeast Region	366	6,274	2,543	7

Specific SOC Code: Water and Liquid Waste Treatment Plant and System Operators (51-8031)

Occupation Overview

The occupation of water and liquid waste treatment plant and system operators is not classified as a "green" occupation according to O*Net. However, NDOL has designated it as a green job. According to NDOL-LMI estimates, 43.9% of these workers were involved in green activities. Most workers in the occupation have a high school diploma or equivalent and O*Net's Job Zone categorizes the occupation as "medium preparation needed" (level three) in regards to obtaining employment in this occupation. For the Omaha region, data for water and liquid waste treatment plant and system operators was unavailable. In the Lincoln region, the average age of water and liquid waste treatment plant and system operators is of 42 years old and all individuals had less than a high school diploma or GED. For the non-metro region, water and liquid waste treatment plant and system operators had an average age of 46 years old. Most individuals in the area, 74%, had a high school diploma or GED, 15% had a bachelor's degree, and 11% had some college but no degree.

The skills involved in being a water and liquid waste treatment plant and system operator are: operation monitoring, operation and control, monitoring, quality control analysis, reading comprehension, active listening, equipment maintenance, troubleshooting, critical thinking, and repairing. Another occupation with much similarity in skills involved is maintenance workers, machinery because it contains 80% of the same skills involved in the water and liquid waste treatment plant and system operators occupation. Chemical plant and system operators, petroleum pump system operators, refinery operators, and gaugers, photographic processing machine operators, and pump operators, except wellhead pumpers have a 70% skills overlap. Also, four related occupations have a 60% match in skills. These occupations include: Plating and coating machine setters, operators, and tenders, metal and plastic; textile bleaching and dyeing machine operators and tenders; gas plant operators; and chemical equipment operators and tenders. Workers in these occupations versus other occupations are likely to be able to transition easier into the water and liquid waste treatment plant and system operator occupation.

Current Employment

Before beginning our discussion of current employment in this occupation we must make the reader aware that there are data problems for this occupation. Specifically, the NDOL 2009 Short-Term Occupation Projections included an extraordinary large Current Employment estimate for the Southeast region. Therefore, we do not report a Current Employment value for that region. To date, NDOL-LMI has not been able to provide corrected data for this region.

Statewide, 1,066 water and liquid waste treatment plant and system operators were employed in 2009 according to NDOL's Short-Term Occupation projections. We find this to be

an especially interesting occupational category. For most occupations in this report we find the highest degree of worker concentration in the Omaha and Lincoln regions. Water and liquid waste treatment plant and system operators are an outlier in this respect. In this case the Southeast region of Nebraska more than five times as many water and liquid waste treatment plant and system operators as the Omaha consortium and nearly ten times as many as the Lincoln MSA. In the Omaha consortium 257 water and liquid waste treatment plant and system operators were employed in 2009, in the Lincoln MSA there were 140, in the Southeast region 1,358, in the Central region 221, in the Mid Plains 58, in the Panhandle 27 and in the Northeast 187 water and liquid waste treatment plant and system operators were employed.

Indirect Employment

Our analysis shows that there are 2,424 people currently employed in related occupations as we narrowly define it. These workers are found in occupations such as: Maintenance workers, machinery; plating and coating machine setters, operators, and tenders, metal and plastic; textile bleaching and dyeing machine operators and tenders; chemical plant and system operators; gas plant operators; petroleum pump system operators, refinery operators, and gaugers; chemical equipment operators and tenders; photographic processing machine operators; and pump operators, except wellhead pumpers.

Once more we find that there are no additional related occupations at the decimal level. Therefore our wide and narrow estimates of indirect employment coincide at the statewide and regional. Related occupations in the Omaha consortium employed 839 workers that year, in the Lincoln MSA 334, in the Southeast region 281, in the Central region 464, in the Mid Plains 147, in the Panhandle 47 and in the Northeast 652 were employed.

We must point out that unlike in many of our previous findings there is potential here for tight labor markets. In every region besides the Southeast the indirect employment exceeds the current employment. This leads us to believe that should demand for water and liquid waste treatment plans and system operators increase there would an ample supply of potential labor. Conversely, in the Southeast economic region the current employment outstrips the indirect by almost five times.

Job Growth

It is estimated that 9 green jobs for water and liquid waste treatment plant and system operators will be created over the next two years and that no green jobs in the occupation will be eliminated. The highest concentration of these new job additions will likely be in the Southeast Region. However, current occupation in this region yields inaccurate results at the moment. Therefore, it is difficult to see how these jobs will be distributed throughout the state.

Conclusions

NDOL-LMI projections call for very limited net growth in jobs in the water and liquid waste treatment plant and system operators occupation. We do not think there will be any problems meeting the modest demand for these workers in the future.

Water and Liquid Waste Treatment Plant and System Operators (51-8031)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	1,066	2,424	2,424	9
Regions				
Omaha Consortium	257	839	839	2
Lincoln MSA	140	334	334	1
Southeast Region	N/A*	281	281	1
Central Region	221	464	464	2
Mid Plains Region	58	147	147	0
Panhandle Region	27	47	47	0
Northeast Region	187	652	652	2

Note: The NDOL 2009 Short-Term Occupation Projections included an extraordinary large Current Employment estimate for the Southeast region. Therefore, we do not report a Current Employment value for that region.

Specific SOC Code: Forest and Conservation Technicians (19-4093)

Occupation Overview

The occupation of forest and conservation technicians is classified as a Green Increased Demand occupation by O*Net and NDOL has designated the occupation as green as well. As is evident from the occupation title, nearly all workers in this occupation would be involved in green activities. Most workers in the occupation have a high school diploma or equivalent and O*Net's Job Zone categorizes the occupation as "medium preparation needed" (level three) in regards to obtaining employment in this occupation. Nebraska-level occupation characteristics were unavailable for the occupation because of PUMS data limitations.

The skills involved in being a forest and conservation technician are: Critical thinking, active listening, reading comprehension, speaking, judgment and decision making, monitoring, social perceptiveness, coordination, instructing, and systems analysis. At this time, O*Net has not listed any related occupations for forest and conservation technicians. Therefore we are unable to determine the likelihood that workers in similar occupations will be able to transition easily into the forest and conservation technician occupation. Nebraska-level occupation characteristics were unavailable for the occupation because of PUMS data limitations.

Current Employment

Statewide, 299 forest and conservation technicians were employed in 2009 according to NDOL's Short-Term Occupation projections. To see how Nebraska's forest and conservation technicians are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 97 forest and conservation technicians were employed that year, in the Lincoln MSA there were 54 forest and conservation technicians, in the Southeast region 11, in the Central region 23, in the Mid Plains 55, in the Panhandle 50 and in the Northeast 17 forest and conservation technicians were employed.

Indirect Employment

Due to the unavailability of "related occupations" data for forest and conservation technicians on O*Net, we are unable to perform analysis on this occupation's indirect employment estimates on a statewide or economic region level.

Job Growth

It is estimated that 19 green jobs for forest and conservation technicians will be created over the next two years and that no green jobs in the occupation will be eliminated. The highest concentration of these new job additions will likely be in the Omaha Consortium.

Conclusions

Forest and conservation technicians are not extremely prevalent in Nebraska. The occupation only employs approximately 300 people statewide, and NDOL-LMI projects only 19 new positions will be created over the next two years. Given this limited growth, requirements for additional workers could better be met through on-the-job training rather than new training initiatives.

Forest and Conservation Technicians (19-4093)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	299	(Unavailable)		19
Regions				
Omaha Consortium	97	(Unavailable)		6
Lincoln MSA	54	(Unavailable)		3
Southeast Region	11	(Unavailable)		1
Central Region	23	(Unavailable)		1
Mid Plains Region	55	(Unavailable)		3
Panhandle Region	50	(Unavailable)		3
Northeast Region	17	(Unavailable)		1

Specific SOC Code: General and Operations Managers (11-1021)

Occupation Overview

General and operations managers is classified as a Green Enhanced Skill occupation by O*Net. NDOL has also named this a green occupation. This large occupation is ranked seventeenth in Nebraska in terms of the absolute number of green workers. Most workers in the occupation have an associate's degree and O*Net's Job Zone categorizes the occupation as "medium preparation needed" (level three) in regards to obtaining employment in this occupation. When we turn to Nebraska-specific characteristics, the average age of individuals in the occupation in the Omaha region is 42 years old. Most individuals, 52%, had a bachelor's degree, 14% had a high school diploma, and 13% of individuals had less than a high school diploma or GED. For the Lincoln region, general and operations managers had an average age of 44 years old and 70% of individuals had some college but no degree, and 21% had an associate's degree. In all other areas of the state, the non-metro region, general and operations managers had an average age of 45 years old, 31% of individuals had a high school diploma or GED, 26% had some college but no degree, and 27% had a bachelor's degree.

The skills involved in being a general and operations manager are: Time management, writing, persuasion, management of personnel resources, operations analysis, instructing, service orientation, systems analysis, systems evaluation, and management of material resources. At this time, O*Net has not listed any related occupations for general and operations managers. Therefore we are unable to determine the likelihood that workers in similar occupations will be able to transition easily into the general and operations manager occupation.

Current Employment

Statewide, 7,840 general and operations managers were employed in 2009 according to NDOL's Short-Term Occupation projections. To see how Nebraska's general and operations managers are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 3,912 general and operations managers were employed that year, in the Lincoln MSA there were 1,352 general and operations managers, in the Southeast region 301, in the Central region 768, in the Mid Plains 360, in the Panhandle 331, and in the Northeast 788 general and operations managers were employed.

Indirect Employment

Due to the unavailability of "related occupations" data for general and operations managers on O*Net, we are unable to perform analysis on this occupation's indirect employment estimates on a statewide or economic region level.

Job Growth

It is estimated that 115 green jobs for general and operations managers will be created over the next two years and that no green jobs in the occupation will be eliminated. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Lincoln MSA.

Conclusions

General and operations managers is another occupation for which we could not establish indirect employment. Projected green job growth is very modest compared even to Current Employment in this occupation. Specifically, future demand is only 1.5% of the current number of employed workers. Therefore we do not anticipate problems filling the new green positions in this occupation in the future.

General and Operations Managers (11-1021)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	7,840	(Unavailable)		115
Regions				
Omaha Consortium	3,912	(Unavailable)		57
Lincoln MSA	1,352	(Unavailable)		20
Southeast Region	301	(Unavailable)		4
Central Region	768	(Unavailable)		11
Mid Plains Region	360	(Unavailable)		5
Panhandle Region	331	(Unavailable)		5
Northeast Region	788	(Unavailable)		12

Specific SOC Code: Environmental Engineers (17-2081)

Occupation Overview

The occupation of environmental engineers is classified as a Green-Enhanced occupation by O*Net and determined to be a green job by NDOL. According to NDOL-LMI estimates, 47.4% of these workers were involved in green activities. Most workers in the occupation have a bachelor's degree and O*Net's Job Zone categorizes the occupation as "considerable preparation needed" (level four) in regards to obtaining employment in this occupation. Nebraska-level occupation characteristics were unavailable for the occupation because of PUMS data limitations.

The skills involved in being an environmental engineer are: Reading comprehension, critical thinking, active listening, speaking, complex problem solving, judgment and decision making, writing, systems analysis, science, and operations analysis. At this time, O*Net has not listed any related occupations for environmental engineers. Therefore we are unable to determine the likelihood that workers in similar occupations will be able to transition easily into the environmental engineer occupation.

Current Employment

Statewide, 278 environmental engineers were employed in 2009 according to NDOL's Short-Term Occupation projections. To see how Nebraska's environmental engineers are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 126 environmental engineers were employed that year, in the Lincoln MSA there were 121 environmental engineers, in the Southeast region 8, in the Central region 20, in the Mid Plains 6, in the Panhandle 4, and in the Northeast 21 environmental engineers were employed.

Indirect Employment

Due to the unavailability of "related occupations" data for environmental engineers on O*Net, we are unable to perform analysis on this occupation's indirect employment estimates on a statewide or economic region level.

Job Growth

It is estimated that 46 green jobs for environmental engineers will be created over the next two years and that no green jobs in the occupation will be eliminated. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Lincoln MSA.

Conclusions

There is reason for concern that the supply of environmental engineers may fall short of future growth in demand for this occupation. Specifically, projected net green job growth over a two year period is nearly 17% of Current Employment. There are also high education and experience requirements for environmental engineers. However, we do not believe the Nebraska labor market will have problems supplying the necessary workers in the future. In the short-run, there may be potential to attract environmental engineers to high paying opportunities in Nebraska. In the long-run, more students may choose this career option during their undergraduate studies.

Environmental Engineers (17-2081)

	Current Employment	**Indirect Employment**		**Green Job Growth**
		Wide	***Narrow***	
Nebraska Statewide	278	(Unavailable)		46
Regions				
Omaha Consortium	126	(Unavailable)		21
Lincoln MSA	121	(Unavailable)		20
Southeast Region	8	(Unavailable)		1
Central Region	20	(Unavailable)		3
Mid Plains Region	6	(Unavailable)		1
Panhandle Region	4	(Unavailable)		1
Northeast Region	21	(Unavailable)		3

Specific SOC Code: Architects, Except Landscape and Naval (17-1011)

Occupation Overview

Architects, except landscape and naval is classified as a Green Enhanced Skill occupation by O*Net and determined to be a green job by NDOL. According to NDOL-LMI estimates, 56.1% of these workers were involved in green activities. Further, this large occupation is ranked sixth in Nebraska in terms of the absolute number of green workers. Most workers in the occupation have a master's degree and O*Net's Job Zone categorizes the occupation as "extensive preparation needed" (level five) in regards to obtaining employment in this occupation. Architects, except landscape and naval, in the Omaha region had an average age of 48 years old. Of those with experience in the occupation, 56% of individuals had a bachelor's degree and 44% had a master's degree. In the Lincoln region, the average age of individuals is 51 years old and all had a bachelor's degree. For the non-metro region, non-metro area individuals in the occupation had an average age of 28 years old and, similar to the Lincoln region, all had a master's degree.

The skills involved in being an architect (except landscape and naval) are: Active listening, critical thinking, speaking, complex problem solving, reading comprehension, judgment and decision making, coordination, active learning, monitoring, and operations analysis. Other occupations with much similarity in skills involved are landscape architects, marine architects, and set and exhibit designers. Skills in these three occupations contain 80% of the same skills involved in the architect (except landscape and naval) occupation. There are five occupations that have a 70% overlap in skills with architects (except landscape and naval). These occupations include: civil engineers, industrial safety and health engineers, mechanical engineers, mining and geological engineers, including mining safety engineers, and civil engineering technicians. Finally, electrical drafters have a 60% match in the skills required of an architect (except landscape and naval). Workers in these occupations versus other occupations are likely to be able to transition easier into the architect (except landscape and naval) occupation.

Current Employment

Statewide, 937 architects (except landscape and naval) were employed in 2009 according to NDOL's Short-Term Occupation projections. To see how Nebraska's architects (except landscape and naval) are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 647 architects (except landscape and naval) were employed that year, in the Lincoln MSA there were 180 workers, in the Southeast region 9, in the Central region 42, in the Mid Plains 11, in the Panhandle 6, and in the Northeast 41 architects (except landscape and naval) were employed.

Indirect Employment

Narrowly defined at a statewide level, 3,981workers are employed in occupations with closely related skills listed above in the occupation overview of: Landscape architects, civil engineers, industrial safety and health engineers, marine architects, mechanical engineers, mining and geological engineers, including mining safety engineers, electrical drafters, civil engineering technicians, and set and exhibit designers. These occupations are not all of the related occupations that O*Net lists for architects (except landscape and naval). Rather, these related occupations have SOC codes that are not at a decimal level. We label the group of related occupations at a whole number level the "narrow" category. To include related occupations at the most detailed level, those with SOC codes with a decimal place value, we develop a "wide" group of related occupations. This category of indirect employment encompasses all related occupations defined by O*Net, both at the whole number SOC level and a decimal place level. In the wide category of related occupations for architects (except landscape and naval), 4,222 workers were employed in Nebraska in 2009. In conclusion, nearly 4,000 workers could potentially easily switch from their current occupation to fulfill demand in architect (except landscape and naval) occupations in the state.

Narrowly defined, at the economic region level related occupations in the Omaha consortium employed 2,488 workers that year, in the Lincoln MSA 1,208, in the Southeast region 91, in the Central region 289, in the Mid Plains 116, in the Panhandle 92, and in the Northeast 186 were employed. More widely defined, at the economic region level related occupations in the Omaha consortium employed 2,566 workers that year, in the Lincoln MSA 1,245, in the Southeast region 100, in the Central region 311, in the Mid Plains 120, in the Panhandle 96, and in the Northeast 210 were employed.

Job Growth

It is estimated that 50 green jobs for architects, except landscape and naval, will be created over the next two years and that no green jobs in the occupation will be eliminated. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Lincoln MSA.

Conclusions

Architects, except landscape and naval is another occupation that should not experience staffing difficulties. Limited job growth is projected. Further, there are a large number of people currently working in this field, as well as an even larger number of workers in related occupations. Therefore, even though this occupation has high education and experience requirements, we do not anticipate staffing problems in the future.

Architects, Except Landscape and Naval (17-1011)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	937	4,222	3,981	50
Regions				
Omaha Consortium	647	2,566	2,488	35
Lincoln MSA	180	1,245	1,208	10
Southeast Region	9	100	91	0
Central Region	42	311	289	2
Mid Plains Region	11	120	116	1
Panhandle Region	6	96	92	0
Northeast Region	41	210	186	2

Specific SOC Code: Laborers and Freight, Stock, and Material Movers, Hand (53-7062)

Occupation Overview

The occupation of laborers and freight, stock, and material movers, hand is classified as a Green Increased Demand occupation by O*Net and determined to be a green job by NDOL. This large occupation is ranked eighth in Nebraska in terms of the absolute number of green workers. Most workers in the occupation have obtained a high school diploma or equivalent and O*Net's Job Zone categorizes the occupation as "some preparation needed" (level two) in regards to obtaining employment in this occupation. For the Omaha region, laborers and freight, stock, and material movers, hand had an average age of 39 years old. Most individuals in the region, 42%, had a high school diploma or GED, 29% had some college but no degree, and 18% of individuals had less than a high school diploma or GED. For those with experience in the occupation, the average age of individuals in the Lincoln region is of 37 years old. Education levels vary in the area; 24% of individuals had a high school diploma or GED, 33% had some college but no degree, and 19% had a bachelor's degree. In the non-metro region, laborers and freight, stock, and material movers, hand had an average age of 37 years old, 40% had a high school diploma or GED, 25% of individuals had less than a high school diploma or GED and 24% had some college but no degree.

The skills involved in being a laborer and freight, stock, and material mover (hand) are: Active listening, critical thinking, operation monitoring, reading comprehension, speaking, monitoring, coordination, social perceptiveness, judgment and decision making, time management. Other occupations with much similarity in skills involved are landscaping and groundskeeping workers, helpers—brickmasons, blockmasons, stonemasons, and tile and marble setters, and packers and packagers, hand. Skills in these three occupations contain 80% of the same skills involved in the laborer and freight, stock, and material mover (hand) occupation. Both cleaners of vehicles and equipment and wellhead pumpers have a 60% skills overlap with those of laborers and freight, stock, and material movers (hand). Workers in these occupations versus other occupations are likely to be able to transition easier into the laborer and freight, stock, and material mover (hand) occupation.

Current Employment

Statewide, 15,612 laborers and freight, stock, and material mover (hand) were employed in 2009 according to NDOL's Short-Term Occupation projections. To see how Nebraska's laborers and freight, stock, and material mover (hand) are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 6,891 laborers and freight, stock, and material mover (hand) were employed that year, in the Lincoln MSA there were 2,247 workers, in the Southeast region 493, in the Central region 2283, in the

Mid Plains 799, in the Panhandle 1,198 and in the Northeast 1,556 laborers and freight, stock, and material mover (hand) were employed.

Indirect Employment

Statewide and narrowly defined, 16,979 workers are employed in occupations with closely related skills listed above in the occupation overview of: Landscaping and groundskeeping workers; helpers--brickmasons, blockmasons, stonemasons, and tile and marble setters; cleaners of vehicles and equipment; packers and packagers, hand; and wellhead pumpers. These occupations are not all of the related occupations that O*Net lists for laborers and freight, stock, and material mover (hand). Rather, these related occupations have SOC codes that are not at a decimal level. We label the group of related occupations at a whole number level the "narrow" category. To include related occupations at the most detailed level, those with SOC codes with a decimal place value, we develop a "wide" group of related occupations. This category of indirect employment encompasses all related occupations defined by O*Net, both at the whole number SOC level and a decimal place level. Because there were no related occupations that had SOC codes with a decimal place value, the wide category of related occupations for laborers and freight, stock, and material movers (hand) is also 16,979 workers employed in Nebraska in 2009. In conclusion, nearly 17,000 workers could potentially switch from their current occupation to fulfill demand in laborer and freight, stock, and material mover (hand) occupations in the state.

At the economic region level for both narrow and wide definitions, related occupations in the Omaha consortium employed 6,899 workers that year, in the Lincoln MSA 2,448, in the Southeast region 861, in the Central region 1,965, in the Mid Plains 1,383, in the Panhandle 855, and in the Northeast 2,607 were employed.

Job Growth

It is estimated that 103 green jobs for laborers and freight, stock, and material movers, hand will be created over the next two years and 46 green jobs in the occupation will be eliminated. Net job growth in the state according to survey results, therefore, is 57 jobs. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Lincoln MSA and Central Region.

Conclusions

Work as laborers and freight, stock, and material movers, hand is common in Nebraska. This was the third largest occupation we looked at, based on absolute employment numbers. Further, NDOL-LMI projects only modest green job growth over the next two years, especially relative to the large level of Current and Indirect Employment. We do not foresee future staffing problems for green jobs in this occupation.

Laborers and Freight, Stock, and Material Movers, Hand (53-7062)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	15,612	16,979	16,979	57
Regions				
Omaha Consortium	6,891	6,899	6,899	25
Lincoln MSA	2,247	2,448	2,448	8
Southeast Region	493	861	861	2
Central Region	2,283	1,965	1,965	8
Mid Plains Region	799	1,383	1,383	3
Panhandle Region	1,198	855	855	4
Northeast Region	1,556	2,607	2,607	6

Specific SOC Code: Farmworkers and Laborers, Crop, Nursery, and Greenhouse (45-2092)

Occupation Overview

The farmworkers and laborers, crop, nursery, and greenhouse occupation is made up of two sub-categories: (1) nursery workers and (2) farmworkers and laborers, crop. Neither nursery workers nor farmworkers and laborers (crop) are classified as a "green" occupation according to O*Net. However, their combined occupation of farmworkers and laborers, crop, nursery, and greenhouse has been determined to be a green job according to NDOL. According to NDOL-LMI estimates, 49.6% of these workers were involved in green activities. Most people in the nursery workers sub-category have a high school diploma or equivalent, while most workers in the farmworkers and laborers (crop) sub-category have an education level that is less than a high school diploma. O*Net's Job Zone categorizes the farmworkers and laborers, crop, nursery, and greenhouse occupation as "little or no preparation needed" (level one) in regards to obtaining employment in this occupation. Nebraska-level occupation characteristics were unavailable for the occupation because of PUMS data limitations.

Skills involved for both sub-categories of the occupation are: operation monitoring, operation and control, active listening, speaking, critical thinking, coordination, and monitoring. The additional skills involved in being in first sub-occupation, nursery workers, are social perceptiveness, service orientation, and reading comprehension. The additional skills involved in being in second sub-occupation, farmworkers and laborers (crop), are equipment maintenance, management of personnel resources, and repairing.

Eight of the ten skills of farmworkers, farm and ranch animals are the same as the first sub-category, nursery workers, thus the two occupations are very closely related. Other occupations with much similarity in skills involved are hunters and trappers, with 70% of an overlap compared to nursery workers' skills, and packers and packagers, hand with a 60% overlap. Finally, landscaping and groundskeeping workers have skills that match half of those that nursery workers have. Workers in these occupations versus other occupations are likely to be able to transition easier into the nursery workers occupation.

One occupation, fishers and related fishing workers, utilizes skills that have an 80% overlap of the ten skills listed as being involved in the second sub-category, farmworkers and laborers (crop). Other occupations with much similarity in skills involved are first-line supervisors/managers of agricultural crop and horticultural workers, agricultural equipment operators, and farmworkers, farm and ranch animals. Skills in these three occupations contain 70% of the same skills involved in the farmworkers and laborers (crop) occupation. Three occupations share a 60% overlap with skills of farmworkers and laborers (crop): farmers and ranchers, first-line supervisors/managers of agricultural workers, and first-line supervisors/managers of animal husbandry and animal care workers. Finally, agricultural inspectors share 40% of skills with farmworkers and laborers (crop). Workers in these

occupations versus other occupations are likely to easily transition into the farmworkers and laborers (crop) occupation.

Current Employment

Statewide, 28,677 workers were employed in the farmworkers and laborers (crop, nursery, and greenhouse) occupation in 2009 according to NDOL's Short-Term Occupation projections. To see how these workers in Nebraska are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 1,442 farmworkers and laborers, crop, nursery, and greenhouse were employed that year, in the Lincoln MSA there were 1,231 workers in the occupation, in the Southeast region 3,873, in the Central region 6,391, in the Mid Plains 3,125, in the Panhandle 2,908, and in the Northeast 6,914 farmworkers and laborers (crop, nursery, and greenhouse) were employed.

Job Growth

The farmworkers and laborers (crop) occupation has negative net jobs growth forecasted over the next two year. It is estimated that 15 green jobs will be created over the next two years but that 28 green jobs in the occupation will be eliminated. This results in an overall loss of 13 jobs over the time period. The highest concentration of net job losses will likely be in the Central and Northeast regions.

Nursery Workers (45-2092.01)

Indirect Employment

Statewide, 18,099 workers are employed in occupations with closely related skills listed above in the occupation overview of: Landscaping and groundskeeping workers; farmworkers, farm and ranch animals; hunters and trappers; and packers and packagers, hand. These occupations are not all of the related occupations that O*Net lists for nursery workers because these related occupations have SOC codes that are not at a decimal level – the "narrow" category. Because there were no related occupations that had SOC codes with a decimal place value, the wide category of related occupations for laborers and freight, stock, and material movers (hand) is also 18,099 workers employed in Nebraska in 2009. In conclusion, these workers could potentially easily switch from their current occupation to fulfill demand in nursery worker occupations in the state.

At the economic region level for both narrow and wide definitions, related occupations in the Omaha consortium employed 5,567 workers that year, in the Lincoln MSA 2,096, in the Southeast region 1,249, in the Central region 2,821, in the Mid Plains 1,598, in the Panhandle 1,085, and in the Northeast 3,484 were employed.

Farmworkers and Laborers, Crop (45-2092.02)

Indirect Employment

Narrowly defined, statewide 8,496 workers are employed in occupations with closely related skills listed above in the occupation overview of: Farmers and ranchers; first-line supervisors/managers of aquacultural workers; first-line supervisors/managers of agricultural crop and horticultural workers; first-line supervisors/managers of animal husbandry and animal care workers; agricultural inspectors; agricultural equipment operators; farmworkers, farm and ranch animals; and fishers and related fishing workers. More widely defined to include related occupations at the most detailed level (those with SOC codes with a decimal place value), 10,319 workers with those occupations were employed in Nebraska in 2009. In conclusion, these workers could potentially easily switch from their current occupation to fulfill demand in the farmworkers and laborers (crop) occupation.

Narrowly defined, at the economic region level related occupations in the Omaha consortium employed 442 workers that year, in the Lincoln MSA 298, in the Southeast region 1,257, in the Central region 2,028, in the Mid Plains 1,030, in the Panhandle 692, and in the Northeast 2,702 were employed. Widely defined, at the economic region level, related occupations in the Omaha consortium employed 567 workers that year, in the Lincoln MSA 387, in the Southeast region 1,518, in the Central region 2,402, in the Mid Plains 1,289, in the Panhandle 886, and in the Northeast 3,300 were employed.

Conclusions

The only occupation projected to shrink in Nebraska is farmworkers and laborers, crop, nursery, and greenhouse. If employment does shrink over the next two years we expect only minor losses. However, should employment grow we do not expect labor market frictions due to the large number of workers in related occupations.

Farmworkers and Laborers, Crop, Nursery, and Greenhouse (45-2092)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	28,677	28,418	26,595	-13
Regions				
Omaha Consortium	1,442	6,134	6,009	-1
Lincoln MSA	1,231	2,483	2,394	-1
Southeast Region	3,873	2,767	2,506	-2
Central Region	6,391	5,223	4,849	-3
Mid Plains Region	3,125	2,887	2,628	-1
Panhandle Region	2,908	1,971	1,777	-1
Northeast Region	6,914	6,784	6,186	-3

Specific SOC Code: First-Line Supervisors/Managers of Production and Operating Workers (51-1011)

Occupation Overview

First-line supervisors/managers of production and operating workers is classified as a Green Increased Demand occupation by O*Net and determined to be a green job by NDOL. According to NDOL-LMI estimates, 23.9% of these workers were involved in green activities. However, this large occupation is ranked fourth in Nebraska in terms of the absolute number of green workers. Most workers in the occupation have some college education, but have not obtained a degree. O*Net's Job Zone categorizes the occupation as "medium preparation needed" (level three) in regards to obtaining employment in this occupation. Regarding occupation characteristics specific to the state, in the Omaha region first-line supervisors/managers of production and operating had an average age of 50 years old. Most individuals, 40%, had some college but no degree, 22% had a high school diploma or GED, 18% had a bachelor's degree, and 11% of individuals had less than a high school diploma or GED. For the Lincoln region, the average age of individuals with experience in the occupation is 40 years old, 49% of individuals had a high school diploma or GED, and 29% had some college but no degree. First-line supervisors/managers of production and operating individuals in the non-metro area had an average age of 47 years old, 37% had some college but no degree, 33% of individuals had a high school diploma or GED, 13% had a bachelor's degree, and 11% had an associate's degree.

The skills involved in being a first-line supervisor/manager of production and operating workers are: critical thinking, time management, active listening, speaking, reading comprehension, coordination, management of personnel resources, monitoring, social perceptiveness, and judgment and decision making. Another occupation with much similarity in skills involved are first-line supervisors/managers of helpers, laborers, and material movers, hand, which contains 90% of the same skills involved in the first-line supervisors/managers of production and operating workers occupation. Similarly, industrial production managers and purchasing managers have an 80% overlap, while purchasing agents and buyers, farm products and first-line supervisors/managers of logging workers have a 70% overlap. Finally, natural sciences managers and industrial engineering technicians have a 60% match in skills with those of a first-line supervisor/manager of production and operating workers. Workers in these occupations versus other occupations are likely to be able to transition easier into the first-line supervisor/manager of production and operating workers occupation.

Current Employment

Statewide, 4,803 first-line supervisors/managers of production and operating workers were employed in 2009 according to NDOL's Short-Term Occupation projections. To see how Nebraska's first-line supervisors/managers of production and operating workers are concentrated

geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 1,516 first-line supervisors/managers of production and operating workers were employed that year, in the Lincoln MSA there were 648 workers, in the Southeast region 366, in the Central region 709, in the Mid Plains 306, in the Panhandle 198 and in the Northeast 1,016 first-line supervisors/managers of production and operating workers were employed.

Indirect Employment

Statewide and narrowly defined, 3,785 workers are employed in occupations with closely related skills listed above in the occupation overview of: industrial production managers, purchasing managers, natural sciences managers, purchasing agents and buyers, farm products, industrial engineering technicians, first-line supervisors/managers of logging workers, and first-line supervisors/managers of helpers, laborers, and material movers, hand.. These occupations are not all of the related occupations that O*Net lists for first-line supervisors/managers of production and operating workers. Rather, these related occupations have SOC codes that are not at a decimal level. We label the group of related occupations at a whole number level the "narrow" category. To include related occupations at the most detailed level, those with SOC codes with a decimal place value, we develop a "wide" group of related occupations. This category of indirect employment encompasses all related occupations defined by O*Net, both at the whole number SOC level and a decimal place level. In the wide category of related occupations for first-line supervisors/managers of production and operating workers, 5,608 workers were employed in Nebraska in 2009. In conclusion, these workers could potentially easily switch from their current occupation to fulfill demand in first-line supervisor/manager of production and operating workers in the state.

Narrowly defined, at the economic region level related occupations in the Omaha consortium employed 1,750 workers that year, in the Lincoln MSA 664, in the Southeast region 166, in the Central region 371, in the Mid Plains 205, in the Panhandle 148, and in the Northeast 605 were employed. More widely defined, at the economic region level related occupations in the Omaha consortium employed 1,875 workers that year, in the Lincoln MSA 753, in the Southeast region 427, in the Central region 745, in the Mid Plains 464, in the Panhandle 342, and in the Northeast 1203 were employed.

Job Growth

It is estimated that 209 green jobs for first-line supervisor/manager of production and operating workers will be created over the next two years and that no green jobs in the occupation will be eliminated. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Northeast Region.

Conclusions

First-line supervisors/managers of production and operating is one of the few management occupations analyzed in this report. Demand for this occupation is expected to grow modestly over the next two years. Moreover, expected growth is small relative to Current Employment, and there are also high levels of Indirect Employment. In the future, we do not expect that businesses will have trouble finding qualified people.

First-Line Supervisors/Managers of Production and Operating Workers (51-1011)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	4,803	5,608	3,785	209
Regions				
Omaha Consortium	1,516	1,875	1,750	66
Lincoln MSA	648	753	664	28
Southeast Region	366	427	166	16
Central Region	709	745	371	31
Mid Plains Region	306	464	205	13
Panhandle Region	198	342	148	9
Northeast Region	1,016	1,203	605	44

Specific SOC Code: Truck Drivers, Heavy and Tractor-Trailer (53-3032)

Occupation Overview

Truck drivers, heavy and tractor-trailer is classified as a Green-Enhanced occupation by both O*Net and NDOL. This large occupation is ranked third in Nebraska in terms of the absolute number of green workers. Most workers in the occupation have a high school diploma or equivalent. O*Net's Job Zone categorizes the occupation as "some preparation needed" (level two) in regards to obtaining employment in this occupation. For the Omaha region, truck drivers, heavy and tractor-trailer had an average age of 46 years old and a majority of individuals, 52%, had a high school diploma or GED, 25% had some college but no degree, and 15% of individuals had less than a high school diploma or GED. In the Lincoln region, truck drivers, heavy and tractor-trailer had an average age of 43 years old, 42%, had a high school diploma or GED, 33% had some college but no degree, and 20% had a bachelor's degree. For the non-metro region, truck drivers, heavy and tractor-trailer had an average age of 49 years old. Similar to Omaha area, 59% had a high school diploma or GED, 20% had some college but no degree, and 13% had less than a high school diploma or GED.

The skills involved in being a truck driver (heavy and tractor-trailer) are: operation and control, operation monitoring, monitoring, active listening, critical thinking, quality control analysis, reading comprehension, speaking, social perceptiveness, and equipment maintenance. Other occupations with much similarity in skills involved are: bus drivers, school; truck drivers, light or delivery services; rail yard engineers, dinkey operators, and hostlers; motorboat operators; and industrial truck and tractor operators. Skills in these five occupations contain 80% of the same skills involved in the truck driver (heavy and tractor-trailer) occupation. Finally, bus drivers, transit and intercity, locomotive engineers, railroad brake, signal, and switch operators, and bridge and lock tenders have a 70% skills overlap. Workers in these occupations versus other occupations are more likely to easily transition into the truck driver (heavy and tractor-trailer) occupation.

Current Employment

Statewide, 29,221 truck drivers (heavy and tractor-trailer) were employed in 2009 according to NDOL's Short-Term Occupation projections. To see how Nebraska's truck drivers (heavy and tractor-trailer) are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 13,737 truck drivers (heavy and tractor-trailer) were employed that year, in the Lincoln MSA there were 6,830 workers, in the Southeast region 896, in the Central region 2,646, in the Mid Plains 1,059, in the Panhandle 578 and in the Northeast 3,440 truck drivers (heavy and tractor-trailer) were employed.

Indirect Employment

Statewide, 13,231 workers are employed in occupations with closely related skills listed above in the occupation overview of: bus drivers, school; truck drivers, light or delivery services; rail yard engineers, dinkey operators, and hostlers; motorboat operators; industrial truck and tractor operators; bus drivers, transit and intercity; locomotive engineers; railroad brake, signal, and switch operators; and bridge and lock tenders. These occupations are not all of the related occupations that O*Net lists for truck drivers (heavy and tractor-trailer). Rather, these related occupations have SOC codes that are not at a decimal level. We label the group of related occupations at a whole number level the "narrow" category. To include related occupations at the most detailed level, those with SOC codes with a decimal place value, we develop a "wide" group of related occupations. This category of indirect employment encompasses all related occupations defined by O*Net, both at the whole number SOC level and a decimal place level. Because there were no related occupations that had SOC codes with a decimal place value, the wide category of related occupations for truck drivers (heavy and tractor-trailer) is also 13,231 workers employed in Nebraska in 2009. In conclusion, over 13,000 workers could potentially easily switch from their current occupation to fulfill demand in truck driver (heavy and tractor-trailer) occupations in the state.

At the economic region level for both narrow and wide definitions, related occupations in the Omaha consortium employed 6,575 workers that year, in the Lincoln MSA 2,533, in the Southeast region 778, in the Central region 1,869, in the Mid Plains 1,375, in the Panhandle 986, and in the Northeast 1,711 were employed.

Job Growth

It is estimated that 437 green jobs for truck drivers, heavy and tractor-trailer will be created over the next two years and that 7 green jobs in the occupation will be eliminated. Thus, 430 net green jobs are expected to be added within the occupation. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Lincoln MSA.

Conclusions

Truck drivers, heavy and tractor-trailer is the green occupation that currently employs the most workers statewide. It is also expected to have the highest net green job growth of all of 16 green occupations analyzed in the present study. At the same time, this occupation currently employs over 29,000 individuals, and NDOL-LMI projects 430 new drivers will be needed in the near future with almost two thirds of that in the Omaha Consortium and the Lincoln MSA. However, given the large amount of Current and Indirect Employment and modest training requirements we do not think there will be any supply problems for this industry.

Truck Drivers, Heavy and Tractor-Trailer (53-3032)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	29,221	13,231	13,231	430
Regions				
Omaha Consortium	13,737	6,575	6,575	202
Lincoln MSA	6,830	2,533	2,533	101
Southeast Region	896	778	778	13
Central Region	2,646	1,869	1,869	39
Mid Plains Region	1,059	1,375	1,375	16
Panhandle Region	578	986	986	9
Northeast Region	3,440	1,711	1,711	51

Specific SOC Code: Carpenters
(47-2031)

Occupation Overview

The carpenter occupation is made up of two sub-categories: (1) construction carpenters and (2) rough carpenters. Both sub-categories, construction carpenters and rough carpenters, are classified as Green Increased Demand occupations by O*Net NDOL also identifies the major occupation category a green job. Carpenters play a critical role in the construction of green commercial structures and in home improvements to add insulation and otherwise improve energy efficiency. Most workers in the occupation have a high school diploma or equivalent and O*Net's Job Zone categorizes the occupation as "some preparation needed" (level two) in regards to obtaining employment in this occupation. Specific to the state, carpenters in the Omaha Region had a weighted average age of 41 years old, 36% of individuals had a high school diploma or GED, 28% had some college but no degree, 18% had an associate's degree, and 18% had a bachelor's degree. Carpenters in the Lincoln area had an average age of 40 years old. Most individuals, 49%, had a high school diploma or GED and 29% had some college but no degree. For the non-metro region, carpenters had an average age of 47 years old, 39% had a high school diploma or GED, 27% had some college but no degree, 15% of individuals had less than a high school diploma or GED, and 12% had an associate's degree.

Skills involved for both sub-categories of the occupation are: critical thinking, operation monitoring, active listening, monitoring, coordination, judgment and decision making, and time management The additional skills involved in being in first sub-occupation, construction carpenters, are equipment selection, mathematics, and quality control analysis. The additional skills involved in being in second sub-occupation, rough carpenters, are reading comprehension, speaking, and active learning.

Eight of the ten skills of brickmasons and blockmasons and tile and marble setters are the same as the first sub-category, construction carpenters, thus the two pairs of occupations are very closely related. Other occupations with much similarity in skills involved are rough carpenters, reinforcing iron and rebar workers, helpers—carpenters, and helpers—pipelayers, plumbers, pipefitters, and steamfitters. Skills in these four occupations contain 70% of the same skills involved in the construction carpenters occupation. Stonemasons, drywall and ceiling tile installers, and plumbers each have a 60% skills overlap, while cabinetmakers and bench carpenters have a 50% match in skills. Workers in these occupations versus other occupations are likely to be able to transition easier into the construction carpenters occupation.

Nine of the ten skills of tile and marble setters are the same as the second sub-category, rough carpenters, thus the two occupations are very closely related. Four occupations: stonemasons, drywall and ceiling tile installers, reinforcing iron and rebar workers, and helpers—brickmasons, blockmasons, stonemasons, and tile and marble setters consist of skills

that have a 80% overlap of the ten skills listed as being involved in the second sub-category, rough carpenters. Other occupations with much similarity in skills involved are brickmasons and blockmasons, as well as the other sub-category of construction carpenters. Skills in these two occupations contain 70% of the same skills involved in the rough carpenter occupation. Workers in these occupations versus other occupations are likely to be able to transition easier into the rough carpenter occupation.

Current Employment

Statewide, 9,031 workers were employed in the carpenter occupation in 2009 according to NDOL's Short-Term Occupation projections. To see how these workers in Nebraska are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 4,215 carpenters were employed that year, in the Lincoln MSA there were 1,900 workers in the occupation, in the Southeast region 522, in the Central region 964, in the Mid Plains 505, in the Panhandle 437, and in the Northeast 855 carpenters were employed.

Job Growth

It is estimated that 35 green jobs for carpenters will be created over the next two years and that no green jobs in the occupation will be eliminated. The highest concentration of these new job additions will likely be in the Omaha Consortium, followed by the Lincoln MSA.

Construction Carpenters (47-2031.01)

Indirect Employment

Statewide and narrowly defined, 3,985 workers are employed in occupations with closely related skills listed above in the occupation overview of: Brickmasons and blockmasons, stonemasons, rough carpenters, tile and marble setters, drywall and ceiling tile installers, plumbers, reinforcing iron and rebar workers, helpers—carpenters, helpers--pipelayers, plumbers, pipefitters, and steamfitters, and cabinetmakers and bench carpenters. These occupations are not all of the related occupations that O*Net lists for construction carpenters because these related occupations have SOC codes that are not at a decimal level – the "narrow" category. To include SOC codes with a decimal place value in addition to the "narrow" group, in the "wide" group of related occupations 17,684 workers with those occupations were employed in Nebraska in 2009. In conclusion, these workers might easily switch from their current occupation to fulfill demand in the construction carpenters occupation.

Narrowly defined, related occupations in the Omaha consortium employed 1,694 workers that year, in the Lincoln MSA 600, in the Southeast region 234, in the Central region 539, in the Mid Plains 246, in the Panhandle 118, and in the Northeast 365 were employed. Widely defined, at the economic region level, related occupations in the Omaha consortium employed 8,620

workers that year, in the Lincoln MSA 2,920, in the Southeast region 1,015, in the Central region 2,058, in the Mid Plains 940, in the Panhandle 704, and in the Northeast 1,586 were employed.

Rough Carpenters (47-2031.02)

Indirect Employment

Narrowly defined, statewide 2,796 workers are employed in occupations with closely related skills listed above in the occupation overview of: Brickmasons and blockmasons, stonemasons, construction carpenters, tile and marble setters, drywall and ceiling tile installers, reinforcing iron and rebar workers, helpers--brickmasons, blockmasons, stonemasons, and tile and marble setters. More widely defined to include related occupations at the most detailed level (those with SOC codes with a decimal place value), 11,827 workers with those occupations were employed in Nebraska in 2009. In conclusion, these workers could potentially easily switch from their current occupation to fulfill demand in the rough carpenter occupation.

Narrowly defined, at the economic region level related occupations in the Omaha consortium employed 1,284 workers that year, in the Lincoln MSA 400, in the Southeast region 106, in the Central region 406, in the Mid Plains 146, in the Panhandle 61, and in the Northeast 365 were employed. Widely defined, at the economic region level, related occupations in the Omaha consortium employed 5,499 workers that year, in the Lincoln MSA 2,300, in the Southeast region 628, in the Central region 1,370, in the Mid Plains 651, in the Panhandle 498, and in the Northeast 1,586 were employed.

Conclusions

Based on absolute employment numbers, carpenters is the fourth largest occupation included in our analysis. Demand expectations over the next two years predict limited job growth for carpenters, and a significant level of Current and Indirect Employment. As a result, we do not foresee future staffing problems for green jobs in this occupation.

Carpenters (47-2031)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	9,031	29,511	6,781	35
Regions				
Omaha Consortium	4,215	14,119	2,978	16
Lincoln MSA	1,900	5,220	1,000	7
Southeast Region	522	1,643	340	2
Central Region	964	3,428	945	4
Mid Plains Region	505	1,591	392	2
Panhandle Region	437	1,202	179	2
Northeast Region	855	2,716	640	3

Specific SOC Code: Environmental Science and Protection Technicians, Including Health (19-4091)

Occupation Overview

Environmental science and protection technicians, including health is classified as a Green Enhanced Skill occupation by O*Net. NDOL also classifies this occupation as a green job. As the occupation title suggests, nearly all of these workers are involved in green activities. Most workers in the occupation have a bachelor's degree and O*Net's Job Zone categorizes the occupation as "considerable preparation needed" (level four) in regards to obtaining employment in this occupation. Nebraska-level occupation characteristics were unavailable for the occupation because of PUMS data limitations.

The skills involved in being an environmental science and protection technician (including health) are: reading comprehension, active listening, writing, speaking, critical thinking, science, monitoring, judgment and decision making, time management, and complex problem solving. Nine of the ten skills of chemical technicians are the same as the skills for environmental science and protection technicians (including health), thus the two occupations are very closely related. Other occupations with much similarity in skills involved are: soil and plant scientists; chemists; food science technicians; forensic science technicians; and chemical equipment operators and tenders. Skills in these five occupations contain 80% of the same skills involved in the environmental science and protection technician (including health) occupation. Finally, environmental compliance inspectors and occupational health and safety specialists have a 70% skills overlap. Workers in these occupations versus other occupations are more likely to have an easy transition into the environmental science and protection technician (including health) occupation.

Current Employment

Statewide, 133 environmental science and protection technicians (including health) were employed in 2009 according to NDOL's Short-Term Occupation projections. To see how Nebraska's environmental science and protection technicians (including health) are concentrated geographically, we then turn to employment levels in the state's economic regions. In the Omaha consortium 95 environmental science and protection technicians (including health) were employed that year, in the Lincoln MSA there were 26 workers, in the Southeast region 10, in the Central region 30, in the Mid Plains 2, in the Panhandle 9, and in the Northeast 17 environmental science and protection technicians (including health) were employed.

Indirect Employment

Statewide and narrowly defined, 1,807 workers are employed in occupations with closely related skills listed above in the occupation overview of: Environmental compliance inspectors, soil and plant scientists, chemists, food science technicians, chemical technicians, forensic

science technicians, occupational health and safety specialists, and chemical equipment operators and tenders. These occupations are not all of the related occupations that O*Net lists for environmental science and protection technicians (including health). Rather, these related occupations have SOC codes that are not at a decimal level. We label the group of related occupations at a whole number level the "narrow" category. To include related occupations at the most detailed level, those with SOC codes with a decimal place value, we develop a "wide" group of related occupations. This category of indirect employment encompasses all related occupations defined by O*Net, both at the whole number SOC level and a decimal place level. In the wide category of related occupations for environmental science and protection technicians (including health), 4,805 workers were employed in Nebraska in 2009. In conclusion, these workers could potentially easily switch from their current occupation to fulfill demand in environmental science and protection technician (including health) occupations in the state.

Narrowly defined, at the economic region level related occupations in the Omaha consortium employed 539 workers that year, in the Lincoln MSA 384, in the Southeast region 163, in the Central region 463, in the Mid Plains 135, in the Panhandle 73, and in the Northeast 318 were employed. More widely defined, at the economic region level related occupations in the Omaha consortium employed 1,876 workers that year, in the Lincoln MSA 1,336, in the Southeast region 231, in the Central region 581, in the Mid Plains 193, in the Panhandle 143, and in the Northeast 481 were employed.

Job Growth

It is estimated that 2 green jobs for environmental science and protection technicians, including health will be created over the next two years and that no green jobs in the occupation will be eliminated.

Conclusions

The environmental science and protection technicians, including health occupation does not employ a large number of workers in the state and is a skilled occupation where most workers in the field have a bachelor's degree. Projected future green job growth is also limited, at less than two percent of Current Employment. Further, there are a relatively large number of workers in related occupations, signifying that modest job growth in the occupation can be readily met with supply since most of the related occupations have similar educational requirements. We do not anticipate a need to provide additional training program to prepare workers for this occupation.

Environmental Science and Protection Technicians, Including Health (19-4091)

	Current Employment	Indirect Employment		Green Job Growth
		Wide	***Narrow***	
Nebraska Statewide	133	4,805	1,807	2
Regions				
Omaha Consortium	95	1,876	539	1
Lincoln MSA	26	1,336	384	0
Southeast Region	10	231	163	0
Central Region	30	581	463	0
Mid Plains Region	2	193	135	0
Panhandle Region	9	143	73	0
Northeast Region	17	481	318	0

IV. Conclusions

This study has looked at the issue of green employment in Nebraska as it is defined by the Nebraska Department of Labor. We have developed an employment profile for 16 selected green occupations by using NDOL employment data, O*Net occupation profiles and American Community Survey data. This has allowed us to build worker profiles for individuals that currently work in these occupations. Finally, we used results from the recent NDOL LMI business survey to forecast the future demand for green workers in these selected occupations. The preceding analysis has yielded much valuable information, which is summarized at the statewide level in Table 2. Appendix 1 also provides a detailed profile of Nebraska green jobs based on the O*Net classifications system.

The ultimate value of this research lies in the detailed pictures we have developed of these individual occupations. For example, the green occupation that currently employs the most workers, and is projected to have the greatest demand growth for green workers, is truck drivers. This occupation currently employs over 29,000 individuals, and NDOL-LMI projects 430 new jobs for green workers will be needed in the near future with almost two-thirds of the demand in the Omaha Consortium and the Lincoln MSA. However, given the large amount of Current Employment and modest training requirements, we do not anticipate future supply problems for this occupation.

The story could be different though if we look at heating, air conditioning, and refrigeration mechanics and installers or at civil engineers. These occupations are projected to have solid demand growth relative to Current Employment within the next two years. These occupations also have a much higher percentage of workers involved in green activities.

With respect to heating, air conditioning, and refrigeration mechanics and installers, we note that there are a large number of workers who are in related occupations (i.e. Indirect Employment). These workers can transition into the occupation in order to meet future growth in demand.

For civil engineers, there are fewer workers in related occupations. As a result, the market for civil engineer could be tight in the near term. However, the civil engineers occupation does not present a training opportunity given that workers in this occupation typically possess a bachelor's degree or higher. Further, we anticipate that market forces may resolve any future labor shortages. In the short-run, there may be potential to attract out-of-state civil engineers to high paying opportunities in Nebraska. In the long-run, more students may choose this career option during their undergraduate studies.

Fortunately, most of the 16 occupations we have analyzed should face labor markets like that for truck drivers and heating, air conditioning, and refrigeration mechanics and installers. Anticipated growth in demand is small relative to Current Employment, or relative to Indirect

Employment, respectively. Therefore, we expect that supply can meet future growth in demand for these occupations. The notable exceptions are civil and environmental engineers.

Green occupations could require existing workers to retool and reapply their skills in new ways. In this way the markets for green workers will not look drastically different than they do today. Businesses will still be able to provide necessary training for their workers either on the job or in coordination with the community college system. We also suspect that much of the retooling of workers' skills will be provided by companies marketing new green tools and methods.

In summation, we find that Nebraskans are well positioned to take advantage of a new green economy. The state currently supports a large labor force of workers whose skills and talents are well matched with the future demand for workers in green occupations. Training in specific skills may be required but the state already has the necessary occupational make-up. It must be said that this situation is the result of substantial, ongoing efforts by educators, Nebraska workers, and their employers. These ongoing efforts should be recognized and will need to continue.

Table 2: Summary of Results

SOC Code	Current Employment	Indirect Employment		Green Job Growth
		Wide	*Narrow*	
Civil Engineers (17-2051)	1,805	2,489	2,248	156
Electrician (47-2111)	5,325	3,282	2,745	147
Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)	2,197	8,074	3,680	239
Refuse and Recyclable Material Collectors (53-7081)	1,295	1,445	1,445	82
Plumbers, Pipefitters, and Steamfitters (47-2152)	4,668	55,119	27,424	93
Water and Liquid Waste Treatment Plant and System Operators (51-8031)	1,066*	2,424	2,424	9
Forest and Conservation Technicians (19-4093)	299	(Unavailable)		19
General and Operations Managers (11-1021)	7,840	(Unavailable)		115
Environmental Engineers (17-2081)	278	(Unavailable)		46
Architects, Except Landscape and Naval (17-1011)	937	4,222	3,981	50
Laborers and Freight, Stock, and Material Movers, Hand (53-7062)	15,612	16,979	16,979	57
Farmworkers and Laborers, Crop, Nursery, and Greenhouse (45-2092)	28,677	28,418	26,595	-13
First-Line Supervisors/Managers of Production and Operating Workers (51-1011)	4,803	5,608	3,785	209
Truck Drivers, Heavy and Tractor-Trailer (53-3032)	29,221	13,231	13,231	430
Carpenters (47-2031)	9,031	29,511	6,781	35
Environmental Science and Protection Technicians, Including Health (19-4091)	133	4,805	1,807	2
TOTALS	113,187	175,607	113,125	1,676

IV. Appendices

Appendix 1: O*NET Green Jobs Classification

Introduction

In the body of this report we have used the NDOL definition of a green occupation in order to motive our research. The national classification system used by O*Net differs from that developed by NDOL, however. The O*Net system separates green occupations into three categories: Green Increased Demand, Green Enhanced, and Green New and Emerging. In addition to our main analysis we have also prepared this extensive appendix that describes green employment in Nebraska using the O*Net classification system.

Below, we provide the full O*Net descriptions of the three green occupation categories. We then include a Methodology section that describes how we went about this analysis. We provide state wide and economic region results.

Green Increased Demand - The increase in green economic activity and use of green technology will result in an increase in employment demand for existing occupations. However, this increase in employment demand does not entail significant changes in either occupational or worker activities. The work context may change, but the tasks themselves do not.

Green Enhanced Skills - The increase in green economic activity and use of green technology will result in a significant change in the types of labor firms require. These changes in labor demand will happen with in specific O*NET-SOC occupation categories that currently exist. In other words, the essential purposes of the occupation remain the same, but tasks, skills, knowledge, and external elements, such as credentials, have been altered. These changes may not result in an increase in employment demand for the occupation.

Green New and Emerging - The increase in green economic activity and use of green technology is sufficient to create the need for unique work and worker requirements, which results in the generation of a new occupation relative to the O*NET taxonomy. This new occupation could be entirely novel or "born" from an existing occupation.

To repeat these are not the classifications or criteria used by NDOL-LMI. O*Net provides a national and standardized classification system that could be used in comparing green employment in Nebraska with other states. For this reason we included the following analysis.

Methodology

We began this analysis by consulting O*Net and the supplied lists of occupations that fall into each of its three categories of green occupations. We then compared these lists to the 2009 NDOL Short Term Occupation Projections. This allowed us to compile a database of green occupations in Nebraska, as well as employment levels in the same occupations. Finally we summed the employment numbers within the three categories of green occupations and compared these subtotals to total employment figures – both at the statewide and economic region level. Table 1 below displays the statewide results while Tables 2 through 7 display results for each economic region.

For each green job identified via the O*Net classification system we then gathered information on the education level required for that occupation as well as its related occupations. O*Net describes their related occupations as a list of occupations related based on similar characteristics. Conversations with O*Net personnel revealed that the related occupations file was developed as a resource for workers who are re-entering the workforce and to guide them in identifying occupations where the requirements for knowledge, skills, abilities, and work activities are similar to their previous job. O*Net's related occupations were identified through an algorithm applied to analyst ratings on five O*NET domains combined into three dimensions: I-skills, abilities, general work activities, II-work context, and III-knowledge.

Next we created tables that ranked the top twenty green occupations, as identified by O*Net, that were projected to have the most growth from 2009 to 2011. The NDOL Short-Term Occupation Projections data set for O*Net's green occupations was sorted by highest absolute change from 2009 to 2011 for each economic region in Nebraska. Within each region, a ranking was created for each of the three O*Net green jobs classifications.

Statewide Results

Table 1
Green employment as a share of total statewide employment

*O*NET Classification*	**2009 estimated employment**	**2011 projected employment**
Green Increased Demand Occupations	10.3%	10.2%
Green Enhanced Skills Occupations	9.4%	9.4%
Green New and Emerging Occupations	3.6%	3.6%

Table 1: Nebraska wide percent of workers in occupations and projected employment of same.
Source O*NET: The Green Economy-- http://www.onetcenter.org/green.html?p=2

In Table 1 above we present an aggregate view of the Nebraska economy with respect to our three categories of green occupations using Short Term Occupation Projections produced by the Nebraska Department of Labor, Labor Market Information (NDOL-LMI). The table shows that in 2009 approximately 10.3% of all workers in Nebraska could be classified as working in an occupation classified as Green Increased Demand. Furthermore, 9.4% of workers could be classified as working within Green Enhanced Skills Occupations, and 3.6% within Green New and Emerging occupations.

Table 1 also presents aggregate projections for the state's green economy in the year 2011. This is, however, too broad of a prediction and we need to focus more on specific occupations in order to get a more accurate picture of what might happen to the State's economy over the coming years. In appendices 1.1a, 1.1b, and 1.1c we present our occupation specific projections for all three categories of green jobs, and also list the level of required education, as given by O*Net, for these green occupations.

Statewide Green Jobs Growth

Green Increased Demand

At this point we would like to discuss our finding with respect to statewide green occupation growth. In 2009 110,322 people were employed in occupations classified as Green Increased Demand according to NDOL. In 2011 total employment is projected to be 111,285. Appendix 1.1a provides an overview of this projected employment growth in percentage as well as absolute terms for the top twenty occupations in this category.

With respect to the table of Green Increased Demand occupations in Appendix 1.1a, we see that on-the-job training is the most common educational requirement. It is true that many of these occupations require medium to long term on-the-job training, but many workers could have

comparable skill sets in other occupations not classified as Green Increased Demand. This could facilitate rapid staffing of open positions.

Green Enhanced Skills

In 2009, 100,633 people were employed in occupations classified as Green Enhanced Skills according to NDOL. In 2011 total employment is projected to be 101,907. Appendix 1.1b presents the Green Enhanced Skills Occupations projections, and we see a somewhat different situation. The average level of education required for the top twenty Green Enhanced Skills Occupations is greater than that for the previous category. Twelve out of the twenty-nine unique occupations require at least a bachelor's degree, and eighteen of the twenty-nine total Green Enhanced Skills Occupations require some form of post-secondary education

Green New and Emerging

According to NDOL, in 2009 38,485 people were employed in occupations classified as Green Increased Demand. In 2011 total employment is projected to be 39,066. We identify a total number of 31 Green New and Emerging Occupations in this report. Twenty of those occupations are shown in Appendix 1.1c. The other 11 occupations categorized as Green New and Emerging are either projected to have zero or negative growth through 2011. Again we see that the level of educational attainment is rising compared with our previous green occupation categories. Thirteen of the twenty occupations presented require some form of secondary education, and eleven of the twenty require at least a Bachelor's degree. This hints that labor supply might be slow to grow.

Nebraska Economic Region Results

Omaha Consortium

In Table 2 below we present an aggregate view of the current and projected percentage of workers in green occupations in the Omaha Consortium economic region, as well as total employment figures. The data is presented with respect to our three categories of green occupations using Short Term Occupation Projections produced by NDOL-LMI.

Table 2

*O*NET Classification*	**2009 (estimated employment)**	**2011 (projected employment)**
Green Increased Demand Occupations	8.7% (39,734)	8.7% (40,502)
Green Enhanced Skills Occupations	9.8% (44,598)	9.7% (44,994)
Green New and Emerging Occupations	4.1% (18,679)	4.1% (19,035)

Table 2: Omaha Consortium percent of workers in occupations and projected employment of same.
Source O*NET: The Green Economy-- http://www.onetcenter.org/green.html?p=2

Table 2 shows that in 2009 approximately 8.7% of workers in the Omaha Consortium economic region could be classified as working in an occupation identified as Green Increased Demand. Additionally, 9.8% of workers could be classified as working within Green Enhanced Skills Occupations, and 4.1% within Green New and Emerging Occupations. Table 2 also presents the projected shares of total employment for the three categories of Green Jobs in 2011. In addition, the table also displays the absolute employment figures for all three categories of Green Jobs in the Omaha Consortium. This provides a better view of employment changes. For example, we see that Green Enhanced Skills occupations, as a share of total jobs in the Omaha Consortium, are projected to decline through 2011

Appendices 1.2a, 1.2b, and 1.2c list the SOC title for the selected occupations and the estimated employment in the occupation for the year 2009 and the projected employment in 2011 within the Omaha Consortium economic region. We then show the absolute change in the level of employment in the occupational category that is projected to take place through the year 2011.

Lincoln Metropolitan Statistical Area (MSA)

In Table 3 below we present employment numbers on the current and projected percentage of workers in green occupations in the Lincoln MSA economic region, as well as, numbers of absolute employment. The data is presented with respect to our three categories of green occupations using Short Term Occupation Projections produced by NDOL-LMI.

Table 3

*O*NET Classification*	**2009 (estimated employment)**	**2011 (projected employment)**
Green Increased Demand Occupations	7.2% (13,482)	7.2% (13,698)
Green Enhanced Skills Occupations	9.6% (18,008)	9.6% (18,339)
Green New and Emerging Occupations	3.9% (7,255)	3.9% (7,384)

Table 3: Lincoln MSA percent of workers in occupations and projected employment of same. Source O*NET: The Green Economy-- http://www.onetcenter.org/green.html?p=2

Table 3 shows that in 2009 approximately 7.2% of workers in the Lincoln MSA economic region could be classified as working in a Green Increased Demand occupation. Additionally, 9.6% of workers could be classified as working within Green Enhanced Skills occupations, and 3.9% within Green New and Emerging Occupations. Table 3 also displays the projected shares of total employment for the three categories of Green Jobs in 2011.

In addition, Table 3 also shows the absolute employment figures for all three categories of Green Jobs in the Omaha Consortium. We see that Green Increased Demand and Green New & Emerging occupations are projected to decline in relative employment shares through 2011. However, we project over 300 new jobs will come from these two areas (the table does not reflect this due to rounding). In total we expect green employment to expand by almost 700 in the Lincoln MSA.

In Appendices1.3a, 1.3b, and 1.3c we present our occupation-specific projections for all three categories of green jobs in the Lincoln MSA.

Southeast Region

In Table 4 below we present an overview of the current and projected percentage of workers in green occupations in the Southeast Nebraska economic region, as well as, numbers of absolute employment. The data is presented with respect to our three categories of green occupations using Short Term Occupation Projections produced by NDOL-LMI.

Table 4

O*NET Classification	**2009 (estimated employment)**	**2011 (projected employment)**
Green Increased Demand Occupations	7.3% (4,268)	7.3% (4,238)
Green Enhanced Skills Occupations	6.1% (3,560)	6.2% (3,621)
Green New and Emerging Occupations	1.2% (697)	1.2% (707)

Table 4: Southeast region percent of workers in occupations and projected employment of same. Source O*NET: The Green Economy-- http://www.onetcenter.org/green.html?p=2

Table 4 shows that in 2009 approximately 7.3% of workers in the Southeast Nebraska economic region could be classified as working in an occupation identified as Green Increased Demand. Additionally, Green Enhanced Skills Occupations employ 6.1% of workers while Green New and Emerging Occupations employ 1.2% of workers in the Southeast region. Table 4 also displays the projected shares of total employment for the three categories of Green Jobs in 2011. In addition, Table 4 presents the absolute employment figures for all three categories of Green Jobs in the Southeast Region.

We see for the first time that employment in Green Increased Demand occupations will decline in absolute terms through 2011. The other two categories are projected to grow, if only slightly.

In Appendices 1.4a, 1.4b, and 1.4c we present our occupation-specific projections for all three categories of green jobs in the Southeast Region.

Central Region

In Table 5 below we present data on the current and projected percentage of workers in green occupations in the Central Nebraska economic region, as well as, numbers of absolute employment. The data is presented with respect to our three categories of green occupations using Short Term Occupation Projections produced by NDOL-LMI.

Table 5

O*NET Classification	**2009 (estimated employment)**	**2011 (projected employment)**
Green Increased Demand Occupations	10.1% (12,881)	10.1% (13,034)
Green Enhanced Skills Occupations	7.9% (10,115)	7.9% (10,281)
Green New and Emerging Occupations	1.9% (2,390)	1.9% (2,436)

Table 5: Central region percent of workers in occupations and projected employment of same. Source O*NET: The Green Economy-- http://www.onetcenter.org/green.html?p=2

Table 5 indicates that in 2009 approximately 10.1% of workers in the Central Nebraska economic region could be classified as working in an occupation identified as Green Increased Demand. Additionally, 7.9% of workers could be classified as working within Green Enhanced Skills Occupations, and 1.9% within Green New and Emerging Occupations. Table 5 also presents the projected shares of total employment for the three categories of Green Jobs in 2011. In addition,

We see that employment in all three occupational categories should expand through 2011. Overall the NDOL projects employment to expand by almost 350 jobs. With perhaps 150 additional jobs in the Green Increased Demand category and another 150 coming from Green Enhanced Skills occupations, the Central region can expect robust job growth through 2011.

In Appendices 1.5a, 1. 5b, and 1.5c we present our occupation-specific projections for all three categories of green jobs in the Central Region.

Mid Plains Region

In Table 6 below we present employment figures on the current and projected percentage of workers in green occupations in the Mid Plains Nebraska economic region. We also provide numbers on absolute employment figures. The data is presented with respect to our three categories of green occupations using Short Term Occupation Projections produced by NDOL-LMI.

Table 6

O*NET Classification	**2009 (estimated employment)**	**2011 (projected employment)**
Green Increased Demand Occupations	7.8% (4,665)	7.6% (4,539)
Green Enhanced Skills Occupations	6.3% (3,774)	6.2% (3,731)
Green New and Emerging Occupations	1.9% (1,186)	1.9% (1,173)

Table 6: Mid Plains region percent of workers in occupations and projected employment of same. Source O*NET: The Green Economy-- http://www.onetcenter.org/green.html?p=2

Table 6 shows that in 2009 approximately 7.8% of workers in the Mid Plains economic region could be classified as working in an occupation identified as Green Increased Demand. Additionally, 6.3% of workers could be classified as working within Green Enhanced Skills Occupations, and 1.9% within Green New and Emerging Occupations. Table 6 also presents the projected shares of total employment for the three categories of Green Jobs in 2011. In addition, Table 6 shows the absolute employment figures for all three categories of Green Jobs in the Mid Plains Region.

We see that employment in all three occupational categories is expected to fall through 2011. Of note is the fact that all three categories are projected to decline in relative importance in the local labor markets, while at the same time shedding workers in absolute terms.

Appendices 1.6a, 1.6b, and 1.6c contain the occupation specific projections for all three categories in the Mid Plains region.

Panhandle Region

In Table 7 below we present figures on the total absolute employment in addition to the current and projected percentage of workers in green occupations in the Panhandle economic region. The data is presented with respect to our three categories of green occupations using Short Term Occupation Projections produced by NDOL-LMI.

Table 7

*O*NET Classification*	**2009 (estimated employment)**	**2011 (projected employment)**
Green Increased Demand Occupations	9.6% (4,500)	9.4% (4,500)
Green Enhanced Skills Occupations	5.1% (2,443)	5.1% (2,453)
Green New and Emerging Occupations	1.8% (842)	1.8% (847)

Table 7: Panhandle region percent of workers in occupations and projected employment of same. Source O*NET: The Green Economy-- http://www.onetcenter.org/green.html?p=2

Table 7 shows that in 2009 approximately 9.6% of workers in the Panhandle economic region could be classified as working in an occupation identified as Green Increased Demand. Additionally, 5.1% of workers could be classified as working within Green Enhanced Skills Occupations, and 1.8% within Green New and Emerging Occupations. Table 7 also presents the projected shares of total employment for the three categories of Green Jobs in 2011. In addition, Table 7 shows the absolute employment figures for all three categories of Green Jobs in the Panhandle Region.

According to the NDOL occupation projections, total employment in our three Green Jobs categories could change by as little as 15 jobs from 2009 to 2011. Ten of those new jobs should come from Green Enhanced Skills occupations and five from Green New & Emerging occupations. All three categories are projected to fall in terms of relative employment shares in the Panhandle region.

Appendices 1.7a, 1.7b, and 1.7c contain the occupation specific projections for all three categories in the Panhandle region.

Northeast Region

Table 8 below contains NDOL estimates for the current and projected percentage of workers in green occupations in the Northeast Nebraska economic region. The table also presents the actual employment numbers for the region. The data is presented with respect to our three categories of green occupations using Short Term Occupation Projections produced by NDOL-LMI.

Table 8

*O*NET Classification*	**2009 (estimated employment)**	**2011 (projected employment)**
Green Increased Demand Occupations	10.1% (13,955)	10.1% (14,051)
Green Enhanced Skills Occupations	7.7% (10,655)	7.7% (10,789)
Green New and Emerging Occupations	1.9% (2,703)	1.9% (2,732)

Table 8: Northeast region percent of workers in occupations and projected employment of same. Source O*NET: The Green Economy-- http://www.onetcenter.org/green.html?p=2

Table 8 shows that in 2009 approximately 10.13% of workers in the Northeast Nebraska economic region could be classified as working in an occupation identified as Green Increased Demand. Additionally, 7.73% of workers could be classified as working within Green Enhanced Skills Occupations, and 1.96% within Green New and Emerging Occupations. Table 8 also presents the projected shares of total employment for the three categories of Green Jobs in 2011. In addition, the table shows the absolute employment figures for all three categories of Green Jobs in the Northeast Region.

Table 8 demonstrates the stability of the Northeast region. According to the NDOL occupation projections, total employment in our three Green Jobs categories could change by as little as 15 jobs from 2009 to 2011. Ten of those new jobs should come from Green Enhanced Skills occupations and five from Green New & Emerging occupations. All three categories are projected to fall in terms of relative employment shares in the Northeast region.

Appendices 1.8a, 1.8b, and 1.8c contain the occupation specific projections for all three categories in the Northeast region.

Explanation for Appendices 1.1 through 1.8

As discussed in the introduction to this appendix, O*Net provides the only standardized national method for identifying green occupations. O*Net uses a three category classification system which classifies green occupations as: Green Increased Demand, Green Enhanced Skills, or Green New and Emerging. These categories were not used by NDOL when surveying employers in Nebraska.

Nevertheless, we wanted to provide an overview of employment in Nebraska using the O*Net green jobs classification system. In appendices 1.1 through 1.8, we present tables that list employment levels for selected occupations for the year 2009, as well as, the projected employment in 2011.This data comes from the 2009 NDOL short term occupations projections. We also show the absolute and percentage change in the level of employment in the occupational category that is projected to take place through 2011, also derived from the NDOL short term occupations projections data set. Finally we provide the education level required for that occupations according to O*Net.

Appendix 1.1 presents aggregate state employment numbers. Appendices 1.2 through 1.8 present the same information for each economic region. Each appendix (1.1 through 1.8) is divided into three parts (e.g. 1.1a, 1.1b, and 1.1c). Appendix 1.Xa presents figures on green jobs classified as Green Increased Demand. Appendix 1.Xb shows information on Green Enhanced Skills occupations, and Appendix 1.Xc presents data on Green New and Emerging occupations.

In each green job classification we try to present the occupations with the highest projected growth, based on growth in the level of employment. In Appendix 1.1 when presenting the aggregate state figures we focus on the top twenty growth occupations. These are the occupations expected to have the largest employment increases in absolute terms. In Appendices 1.2 through 1.8 when presenting the regional figures we try to do the same. However, in some regions NDOL does not project any growth. In other cases data were withheld for confidentiality. In these cases we present as much as possible. We do not show figures that relate to occupations that NDOL projected shrinking employment.

Appendix 1.1a

Green Increased Demand employment at the state level. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
43-4051	Customer Service Representatives	18,171	18,731	560	3.08%	Moderate-term on-the-job training
47-2031	Carpenters	9,031	9,251	220	2.44%	Long-term on-the-job training
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	2,197	2,337	140	6.37%	Postsecondary vocational training
47-2111	Electricians	5,325	5,465	140	2.63%	Postsecondary vocational training
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	1,805	1,908	103	5.71%	Moderate-term on-the-job training
15-1032	Computer Software Engineers, Systems Software	2,723	2,825	102	3.75%	Bachelor's degree
47-2073	Operating Engineers and Other Construction Equipment Operators	3,064	3,154	90	2.94%	Moderate-term on-the-job training
47-2051	Cement Masons and Concrete Finishers	2,755	2,834	79	2.87%	Moderate-term on-the-job training
49-9051	Electrical Power-Line Installers and Repairers	1,376	1,434	58	4.22%	Associate degree
49-9041	Industrial Machinery Mechanics	1,753	1,796	43	2.45%	Long-term on-the-job training
47-2221	Structural Iron and Steel Workers	739	763	24	3.25%	Long-term on-the-job training
47-3012	Helpers--Carpenters	457	478	21	4.60%	Short-term on-the-job training
45-1011	First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers	1,823	1,844	21	1.15%	Work experience in a related occupation
47-2131	Insulation Workers, Floor, Ceiling, and Wall	639	658	19	2.97%	Moderate-term on-the-job training
43-5061	Production, Planning, and Expediting Clerks	1,915	1,930	15	0.78%	Moderate-term on-the-job training
53-3021	Bus Drivers, Transit and Intercity	852	865	13	1.53%	Moderate-term on-the-job training
19-2041	Environmental Scientists and Specialists, Including Health	472	484	12	2.54%	Master's degree
49-9044	Millwrights	350	360	10	2.86%	Long-term on-the-job training
45-2011	Agricultural Inspectors	428	438	10	2.34%	Work experience in a related occupation
17-2112	Industrial Engineers	1,066	1,076	10	0.94%	Bachelor's degree
51-8021	Stationary Engineers and Boiler Operators	377	384	7	1.86%	Long-term on-the-job training

Appendix 1.1b

Green Enhanced Skills employment at the state level. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
49-9042	Maintenance and Repair Workers, General	8,946	9,111	165	1.84%	Moderate-term on-the-job training
53-3032	Truck Drivers, Heavy and Tractor-Trailer	29,221	29,386	165	0.56%	Postsecondary vocational training
47-2061	Construction Laborers	4,633	4,794	161	3.48%	Moderate-term on-the-job training
11-9021	Construction Managers	4,585	4,735	150	3.27%	Bachelor's degree
47-2152	Plumbers, Pipefitters, and Steamfitters	4,668	4,814	146	3.13%	Long-term on-the-job training
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	2,197	2,337	140	6.37%	Postsecondary vocational training
27-3031	Public Relations Specialists	3,463	3,600	137	3.96%	Bachelor's degree
13-1073	Training and Development Specialists	1,925	2,000	75	3.90%	Bachelor's degree
13-2052	Personal Financial Advisors	1,085	1,156	71	6.54%	Bachelor's degree
13-2051	Financial Analysts	1,515	1,571	56	3.70%	Bachelor's degree
17-2051	Civil Engineers	1,805	1,855	50	2.77%	Bachelor's degree
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	706	739	33	4.67%	Moderate-term on-the-job training
53-7081	Refuse and Recyclable Material Collectors	1,295	1,321	26	2.01%	Short-term on-the-job training
11-2021	Marketing Managers	819	839	20	2.44%	Bachelor's or higher degree, plus work experience
47-2211	Sheet Metal Workers	1,016	1,034	18	1.77%	Long-term on-the-job training
17-1011	Architects, Except Landscape and Naval	937	951	14	1.49%	Bachelor's degree
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	2,249	2,262	13	0.58%	Work experience in a related occupation
49-3023	Automotive Service Technicians and Mechanics	4,818	4,831	13	0.27%	Postsecondary vocational training
47-2181	Roofers	1,056	1,068	12	1.14%	Moderate-term on-the-job training
47-4011	Construction and Building Inspectors	494	505	11	2.23%	Postsecondary vocational training
17-2081	Environmental Engineers	278	288	10	3.60%	Bachelor's degree

Appendix 1.1c

Green New and Emerging employment at the state level. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
13-1041	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	2,783	2,939	156	5.61%	Bachelor's degree
47-1011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	4,780	4,915	135	2.82%	Work experience in a related occupation
13-1199	Business Operations Specialists, All Other	6,183	6,279	96	1.55%	Bachelor's degree
41-3099	Sales Representatives, Services, All Other	4,095	4,171	76	1.86%	Work experience in a related occupation
41-3031	Securities, Commodities, and Financial Services Sales Agents	1,617	1,672	55	3.40%	Bachelor's degree
17-2051	Civil Engineers	1,805	1,855	50	2.77%	Bachelor's degree
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	2,249	2,262	13	0.58%	Work experience in a related occupation
19-2041	Environmental Scientists and Specialists, Including Health	472	484	12	2.54%	Master's degree
13-1081	Logisticians	384	395	11	2.86%	Bachelor's degree
15-1099	Computer Specialists, All Other	906	915	9	0.99%	Bachelor's degree
11-9199	Managers, All Other	3,505	3,513	8	0.23%	Work experience in a related occupation
19-4099	Life, Physical, and Social Science Technicians, All Other	380	387	7	1.84%	Associate degree
17-2199	Engineers, All Other	209	215	6	2.87%	Bachelor's degree
11-9121	Natural Sciences Managers	223	228	5	2.24%	Bachelor's or higher degree, plus work experience
13-2099	Financial Specialists, All Other	282	287	5	1.77%	Bachelor's degree
53-1021	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand	1,484	1,489	5	0.34%	Work experience in a related occupation
47-4099	Construction and Related Workers, All Other	192	195	3	1.56%	Moderate-term on-the-job training
17-3029	Engineering Technicians, Except Drafters, All Other	226	227	1	0.44%	Associate degree
51-8099	Plant and System Operators, All Other	26	27	1	3.85%	Long-term on-the-job training

Appendix 1.2a

Green Increased Demand employment in the Omaha Consortium. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
43-4051	Customer Service Representatives	12,247	12,588	341	2.78%	Moderate-term on-the-job training
47-2031	Carpenters	4,215	4,334	119	2.82%	Long-term on-the-job training
47-2111	Electricians	2,680	2,799	119	4.44%	Postsecondary vocational training
15-1032	Computer Software Engineers, Systems Software	2,211	2,296	85	3.84%	Bachelor's degree
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	941	1,006	65	6.91%	Postsecondary vocational training
47-2051	Cement Masons and Concrete Finishers	1,251	1,304	53	4.24%	Moderate-term on-the-job training
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	461	485	24	5.21%	Moderate-term on-the-job training
47-2131	Insulation Workers, Floor, Ceiling, and Wall	583	606	23	3.95%	Moderate-term on-the-job training
53-4011	Locomotive Engineers	771	786	15	1.95%	Moderate-term on-the-job training
47-2221	Structural Iron and Steel Workers	345	356	11	3.19%	Long-term on-the-job training
53-4031	Railroad Conductors and Yardmasters	778	788	10	1.29%	Moderate-term on-the-job training
43-5061	Production, Planning, and Expediting Clerks	1,056	1,065	9	0.85%	Moderate-term on-the-job training
47-3012	Helpers--Carpenters	195	204	9	4.62%	Short-term on-the-job training
17-3011	Architectural and Civil Drafters	293	297	4	1.37%	Associate degree
29-9011	Occupational Health and Safety Specialists	181	184	3	1.66%	Bachelor's degree
19-2031	Chemists	126	128	2	1.59%	Bachelor's degree
51-8021	Stationary Engineers and Boiler Operators	134	136	2	1.49%	Long-term on-the-job training
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	22	23	1	4.55%	Bachelor's degree
19-4031	Chemical Technicians	43	44	1	2.33%	Associate degree
45-2011	Agricultural Inspectors	53	54	1	1.89%	Work experience in a related occupation

Appendix 1.2b

Green Enhanced Skills employment in the Omaha Consortium. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
47-2152	Plumbers, Pipefitters, and Steamfitters	2,711	2,836	125	4.61%	Long-term on-the-job training
11-9021	Construction Managers	2,798	2,889	91	3.25%	Bachelor's degree
47-2061	Construction Laborers	2,009	2,089	80	3.98%	Moderate-term on-the-job training
49-9042	Maintenance and Repair Workers, General	3,447	3,526	79	2.29%	Moderate-term on-the-job training
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	941	1,006	65	6.91%	Postsecondary vocational training
27-3031	Public Relations Specialists	1,628	1,688	60	3.69%	Bachelor's degree
13-2052	Personal Financial Advisors	669	714	45	6.73%	Bachelor's degree
13-2051	Financial Analysts	1,085	1,129	44	4.06%	Bachelor's degree
17-2051	Civil Engineers	1,069	1,108	39	3.65%	Bachelor's degree
47-2211	Sheet Metal Workers	503	521	18	3.58%	Long-term on-the-job training
11-2021	Marketing Managers	552	566	14	2.54%	Bachelor's or higher degree, plus work experience
17-1011	Architects, Except Landscape and Naval	647	661	14	2.16%	Bachelor's degree
47-2181	Roofers	471	483	12	2.55%	Moderate-term on-the-job training
17-2081	Environmental Engineers	126	134	8	6.35%	Bachelor's degree
11-9041	Engineering Managers	215	219	4	1.86%	Bachelor's or higher degree, plus work experience
19-3051	Urban and Regional Planners	90	93	3	3.33%	Master's degree
17-1012	Landscape Architects	88	90	2	2.27%	Bachelor's degree
17-2011	Aerospace Engineers	25	27	2	8.00%	Bachelor's degree
17-2071	Electrical Engineers	441	443	2	0.45%	Bachelor's degree
17-3025	Environmental Engineering Technicians	32	33	1	3.13%	Associate degree

Appendix 1.2c

Green New and Emerging employment in the Omaha Consortium. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
47-1011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	2,295	2,380	85	3.70%	Work experience in a related occupation
13-1041	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	1,280	1,346	66	5.16%	Bachelor's degree
13-1199	Business Operations Specialists, All Other	3,182	3,235	53	1.67%	Bachelor's degree
41-3099	Sales Representatives, Services, All Other	2,731	2,778	47	1.72%	Work experience in a related occupation
41-3031	Securities, Commodities, and Financial Services Sales Agents	1,037	1,080	43	4.15%	Bachelor's degree
17-2051	Civil Engineers	1,069	1,108	39	3.65%	Bachelor's degree
11-9199	Managers, All Other	1,977	1,989	12	0.61%	Work experience in a related occupation
19-4099	Life, Physical, and Social Science Technicians, All Other	169	174	5	2.96%	Associate degree
11-9041	Engineering Managers	215	219	4	1.86%	Bachelor's or higher degree, plus work experience
13-2099	Financial Specialists, All Other	158	162	4	2.53%	Bachelor's degree
17-3029	Engineering Technicians, Except Drafters, All Other	111	115	4	3.60%	Associate degree
15-1099	Computer Specialists, All Other	442	444	2	0.45%	Bachelor's degree
17-2199	Engineers, All Other	139	141	2	1.44%	Bachelor's degree
49-9099	Installation, Maintenance, and Repair Workers, All Other	257	259	2	0.78%	Moderate-term on-the-job training

Appendix 1.3a

Green Increased Demand employment in the Lincoln MSA. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
43-4051	Customer Service Representatives	3,337	3,442	105	3.15%	Moderate-term on-the-job training
47-2031	Carpenters	1,900	1,977	77	4.05%	Long-term on-the-job training
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	383	403	20	5.22%	Moderate-term on-the-job training
15-1032	Computer Software Engineers, Systems Software	386	399	13	3.37%	Bachelor's degree
47-2111	Electricians	926	939	13	1.40%	Postsecondary vocational training
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	241	254	13	5.39%	Postsecondary vocational training
51-2041	Structural Metal Fabricators and Fitters	286	297	11	3.85%	Moderate-term on-the-job training
47-2051	Cement Masons and Concrete Finishers	518	528	10	1.93%	Moderate-term on-the-job training
49-9051	Electrical Power-Line Installers and Repairers	137	146	9	6.57%	Associate degree
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	135	138	3	2.22%	Associate degree
49-2094	Electrical and Electronics Repairers, Commercial and Industrial Equipment	93	95	2	2.15%	Postsecondary vocational training
49-9098	Helpers--Installation, Maintenance, and Repair Workers	62	64	2	3.23%	Short-term on-the-job training
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	17	18	1	5.88%	Bachelor's degree
29-9011	Occupational Health and Safety Specialists	100	101	1	1.00%	Bachelor's degree
47-3012	Helpers--Carpenters	11	12	1	9.09%	Short-term on-the-job training

Appendix 1.3b

Green Enhanced Skills employment in the Lincoln MSA. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
53-3032	Truck Drivers, Heavy and Tractor-Trailer	6,830	6,997	167	2.45%	Postsecondary vocational training
27-3031	Public Relations Specialists	1,047	1,088	41	3.92%	Bachelor's degree
11-9021	Construction Managers	704	739	35	4.97%	Bachelor's degree
47-2061	Construction Laborers	705	738	33	4.68%	Moderate-term on-the-job training
49-9042	Maintenance and Repair Workers, General	1,379	1,404	25	1.81%	Moderate-term on-the-job training
13-2052	Personal Financial Advisors	231	244	13	5.63%	Bachelor's degree
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	241	254	13	5.39%	Postsecondary vocational training
49-3023	Automotive Service Technicians and Mechanics	544	556	12	2.21%	Postsecondary vocational training
17-2051	Civil Engineers	520	530	10	1.92%	Bachelor's degree
47-2152	Plumbers, Pipefitters, and Steamfitters	420	430	10	2.38%	Long-term on-the-job training
13-2051	Financial Analysts	182	186	4	2.20%	Bachelor's degree
11-2021	Marketing Managers	144	147	3	2.08%	Bachelor's or higher degree, plus work experience
51-4041	Machinists	402	405	3	0.75%	Long-term on-the-job training
11-1021	General and Operations Managers	1,352	1,354	2	0.15%	Bachelor's or higher degree, plus work experience
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	47	49	2	4.26%	Moderate-term on-the-job training
17-2081	Environmental Engineers	121	122	1	0.83%	Bachelor's degree
17-3025	Environmental Engineering Technicians	34	35	1	2.94%	Associate degree
19-1031	Conservation Scientists	30	31	1	3.33%	Bachelor's degree
19-3051	Urban and Regional Planners	29	30	1	3.45%	Master's degree
17-1011	Architects, Except Landscape and Naval	180	180	0	0.00%	Bachelor's degree

Appendix 1.3c

Green New and Emerging employment in the Lincoln MSA. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
13-1041	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	920	976	56	6.09%	Bachelor's degree
13-1199	Business Operations Specialists, All Other	1,526	1,554	28	1.83%	Bachelor's degree
47-1011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	644	670	26	4.04%	Work experience in a related occupation
17-2051	Civil Engineers	520	530	10	1.92%	Bachelor's degree
41-3099	Sales Representatives, Services, All Other	824	833	9	1.09%	Work experience in a related occupation
15-1099	Computer Specialists, All Other	325	328	3	0.92%	Bachelor's degree
11-1011	Chief Executives	381	383	2	0.52%	Bachelor's or higher degree, plus work experience
19-4099	Life, Physical, and Social Science Technicians, All Other	103	105	2	1.94%	Associate degree
11-9199	Managers, All Other	671	672	1	0.15%	Work experience in a related occupation
13-2099	Financial Specialists, All Other	69	70	1	1.45%	Bachelor's degree
11-2011	Advertising and Promotions Managers	90	90	0	0.00%	Bachelor's or higher degree, plus work experience
17-3024	Electro-Mechanical Technicians	28	28	0	0.00%	Associate degree
17-3029	Engineering Technicians, Except Drafters, All Other	37	37	0	0.00%	Associate degree
51-9199	Production Workers, All Other	46	46	0	0.00%	Moderate-term on-the-job training

Appendix 1.4a

Green Increased Demand employment in the Southeast region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
49-9051	Electrical Power-Line Installers and Repairers	138	147	9	6.52%	Associate degree
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	99	108	9	9.09%	Moderate-term on-the-job training
47-2051	Cement Masons and Concrete Finishers	207	214	7	3.38%	Moderate-term on-the-job training
47-2111	Electricians	219	225	6	2.74%	Postsecondary vocational training
47-2073	Operating Engineers and Other Construction Equipment Operators	168	171	3	1.79%	Moderate-term on-the-job training
53-7051	Industrial Truck and Tractor Operators	221	224	3	1.36%	Short-term on-the-job training
43-4051	Customer Service Representatives	198	200	2	1.01%	Moderate-term on-the-job training
43-5032	Dispatchers, Except Police, Fire, and Ambulance	88	90	2	2.27%	Moderate-term on-the-job training
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	44	46	2	4.55%	Postsecondary vocational training
29-9011	Occupational Health and Safety Specialists	19	20	1	5.26%	Bachelor's degree
49-1011	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	145	146	1	0.69%	Work experience in a related occupation
49-9044	Millwrights	53	54	1	1.89%	Long-term on-the-job training
11-9121	Natural Sciences Managers	1	1	0	0.00%	Bachelor's or higher degree, plus work experience
17-3023	Electrical and Electronic Engineering Technicians	18	18	0	0.00%	Associate degree
19-2031	Chemists	1	1	0	0.00%	Bachelor's degree
19-2032	Materials Scientists	0	0	0	0.00%	Bachelor's degree
19-2043	Hydrologists	0	0	0	0.00%	Master's degree
19-4031	Chemical Technicians	3	3	0	0.00%	Associate degree
47-2011	Boilermakers	0	0	0	0.00%	Long-term on-the-job training
47-2131	Insulation Workers, Floor, Ceiling, and Wall	0	0	0	0.00%	Moderate-term on-the-job training

Appendix 1.4b

Green Enhanced Skills employment in the Southeast region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
53-3032	Truck Drivers, Heavy and Tractor-Trailer	896	925	29	3.24%	Postsecondary vocational training
47-2061	Construction Laborers	301	313	12	3.99%	Moderate-term on-the-job training
47-2152	Plumbers, Pipefitters, and Steamfitters	259	271	12	4.63%	Long-term on-the-job training
49-9042	Maintenance and Repair Workers, General	493	503	10	2.03%	Moderate-term on-the-job training
49-3023	Automotive Service Technicians and Mechanics	272	277	5	1.84%	Postsecondary vocational training
13-1073	Training and Development Specialists	73	76	3	4.11%	Bachelor's degree
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	130	133	3	2.31%	Moderate-term on-the-job training
27-3031	Public Relations Specialists	60	62	2	3.33%	Bachelor's degree
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	70	72	2	2.86%	Work experience in a related occupation
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	44	46	2	4.55%	Postsecondary vocational training
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	21	23	2	9.52%	Moderate-term on-the-job training
11-3071	Transportation, Storage, and Distribution Managers	24	25	1	4.17%	Work experience in a related occupation
47-2181	Roofers	28	29	1	3.57%	Moderate-term on-the-job training
51-8013	Power Plant Operators	102	103	1	0.98%	Long-term on-the-job training
11-9041	Engineering Managers	39	39	0	0.00%	Bachelor's or higher degree, plus work experience

Appendix 1.4c

Green New and Emerging employment in the Southeast region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
47-1011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	220	226	6	2.73%	Work experience in a related occupation
13-1041	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	62	64	2	3.23%	Bachelor's degree
41-3099	Sales Representatives, Services, All Other	49	51	2	4.08%	Work experience in a related occupation
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	70	72	2	2.86%	Work experience in a related occupation
19-3099	Social Scientists and Related Workers, All Other	1	2	1	100.00%	Master's degree
11-9041	Engineering Managers	39	39	0	0.00%	Bachelor's or higher degree, plus work experience
11-9121	Natural Sciences Managers	1	1	0	0.00%	Bachelor's or higher degree, plus work experience
13-2099	Financial Specialists, All Other	5	5	0	0.00%	Bachelor's degree
47-4099	Construction and Related Workers, All Other	1	1	0	0.00%	Moderate-term on-the-job training
53-1021	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand	86	86	0	0.00%	Work experience in a related occupation

Appendix 1.5a

Green Increased Demand employment in the Central region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
47-2031	Carpenters	964	1,002	38	3.94%	Long-term on-the-job training
43-4051	Customer Service Representatives	887	916	29	3.27%	Moderate-term on-the-job training
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	417	441	24	5.76%	Postsecondary vocational training
49-9051	Electrical Power-Line Installers and Repairers	231	242	11	4.76%	Associate degree
47-2073	Operating Engineers and Other Construction Equipment Operators	518	527	9	1.74%	Moderate-term on-the-job training
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	150	159	9	6.00%	Moderate-term on-the-job training
47-2221	Structural Iron and Steel Workers	155	162	7	4.52%	Long-term on-the-job training
47-3012	Helpers--Carpenters	91	97	6	6.59%	Short-term on-the-job training
49-9041	Industrial Machinery Mechanics	284	290	6	2.11%	Long-term on-the-job training
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	2,283	2,289	6	0.26%	Short-term on-the-job training
47-2051	Cement Masons and Concrete Finishers	296	301	5	1.69%	Moderate-term on-the-job training
47-2111	Electricians	389	394	5	1.29%	Postsecondary vocational training
45-1011	First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers	374	378	4	1.07%	Work experience in a related occupation
45-2011	Agricultural Inspectors	108	112	4	3.70%	Work experience in a related occupation
53-7051	Industrial Truck and Tractor Operators	358	362	4	1.12%	Short-term on-the-job training
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	142	145	3	2.11%	Associate degree
51-9011	Chemical Equipment Operators and Tenders	113	116	3	2.65%	Moderate-term on-the-job training
19-2041	Environmental Scientists and Specialists, Including Health	23	25	2	8.70%	Master's degree
29-9011	Occupational Health and Safety Specialists	48	50	2	4.17%	Bachelor's degree
49-1011	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	388	390	2	0.52%	Work experience in a related occupation

Appendix 1.5b

Green Enhanced Skills employment in the Central region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
53-3032	Truck Drivers, Heavy and Tractor-Trailer	2,646	2,703	57	2.15%	Postsecondary vocational training
47-2061	Construction Laborers	697	723	26	3.73%	Moderate-term on-the-job training
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	417	441	24	5.76%	Postsecondary vocational training
47-2152	Plumbers, Pipefitters, and Steamfitters	555	571	16	2.88%	Long-term on-the-job training
11-9021	Construction Managers	349	364	15	4.30%	Bachelor's degree
49-9042	Maintenance and Repair Workers, General	1,080	1,095	15	1.39%	Moderate-term on-the-job training
13-2052	Personal Financial Advisors	76	82	6	7.89%	Bachelor's degree
17-2051	Civil Engineers	79	85	6	7.59%	Bachelor's degree
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	68	74	6	8.82%	Moderate-term on-the-job training
27-3031	Public Relations Specialists	185	190	5	2.70%	Bachelor's degree
17-3025	Environmental Engineering Technicians	48	51	3	6.25%	Associate degree
11-9041	Engineering Managers	41	43	2	4.88%	Bachelor's or higher degree, plus work experience
19-1031	Conservation Scientists	50	52	2	4.00%	Bachelor's degree
47-2211	Sheet Metal Workers	211	213	2	0.95%	Long-term on-the-job training
53-7081	Refuse and Recyclable Material Collectors	171	173	2	1.17%	Short-term on-the-job training
13-1022	Wholesale and Retail Buyers, Except Farm Products	88	89	1	1.14%	Long-term on-the-job training
19-3051	Urban and Regional Planners	13	14	1	7.69%	Master's degree
19-4091	Environmental Science and Protection Technicians, Including Health	30	31	1	3.33%	Bachelor's degree
11-2021	Marketing Managers	32	32	0	0.00%	Bachelor's or higher degree, plus work experience
13-1073	Training and Development Specialists	120	120	0	0.00%	Bachelor's degree

Appendix 1.5c

Green New and Emerging employment in the Central region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
47-1011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	592	611	19	3.21%	Work experience in a related occupation
13-1199	Business Operations Specialists, All Other	467	477	10	2.14%	Bachelor's degree
17-2051	Civil Engineers	79	85	6	7.59%	Bachelor's degree
13-1041	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	104	109	5	4.81%	Bachelor's degree
41-3031	Securities, Commodities, and Financial Services Sales Agents	96	99	3	3.13%	Bachelor's degree
41-3099	Sales Representatives, Services, All Other	126	129	3	2.38%	Work experience in a related occupation
11-9041	Engineering Managers	41	43	2	4.88%	Bachelor's or higher degree, plus work experience
19-2041	Environmental Scientists and Specialists, Including Health	23	25	2	8.70%	Master's degree
11-3051	Industrial Production Managers	94	95	1	1.06%	Bachelor's or higher degree, plus work experience
13-1081	Logisticians	21	22	1	4.76%	Bachelor's degree
15-1099	Computer Specialists, All Other	47	48	1	2.13%	Bachelor's degree
11-9121	Natural Sciences Managers	20	20	0	0.00%	Bachelor's or higher degree, plus work experience
17-2141	Mechanical Engineers	82	82	0	0.00%	Bachelor's degree
17-2199	Engineers, All Other	17	17	0	0.00%	Bachelor's degree
17-3029	Engineering Technicians, Except Drafters, All Other	18	18	0	0.00%	Associate degree

Appendix 1.6a

Green Increased Demand employment in the Mid Plains region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	156	166	10	6.41%	Moderate-term on-the-job training
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	159	166	7	4.40%	Postsecondary vocational training
43-4051	Customer Service Representatives	308	313	5	1.62%	Moderate-term on-the-job training
47-2031	Carpenters	505	510	5	0.99%	Long-term on-the-job training
45-1011	First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers	259	261	2	0.77%	Work experience in a related occupation
19-4093	Forest and Conservation Technicians	55	56	1	1.82%	Associate degree
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	1	1	0	0.00%	Bachelor's degree
17-3011	Architectural and Civil Drafters	11	11	0	0.00%	Associate degree
29-9011	Occupational Health and Safety Specialists	19	19	0	0.00%	Bachelor's degree
45-2011	Agricultural Inspectors	47	47	0	0.00%	Work experience in a related occupation
47-2073	Operating Engineers and Other Construction Equipment Operators	186	186	0	0.00%	Moderate-term on-the-job training
49-9051	Electrical Power-Line Installers and Repairers	174	174	0	0.00%	Associate degree

Appendix 1.6b

Green Enhanced Skills employment in the Mid Plains region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Growth	Percent Change	Education Title
53-3032	Truck Drivers, Heavy and Tractor-Trailer	1,059	1,089	30	2.83%	Postsecondary vocational training
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	159	166	7	4.40%	Postsecondary vocational training
49-3023	Automotive Service Technicians and Mechanics	424	429	5	1.18%	Postsecondary vocational training
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	51	54	3	5.88%	Moderate-term on-the-job training
13-1073	Training and Development Specialists	68	70	2	2.94%	Bachelor's degree
19-1031	Conservation Scientists	52	53	1	1.92%	Bachelor's degree
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	17	18	1	5.88%	Work experience in a related occupation
47-2061	Construction Laborers	225	226	1	0.44%	Moderate-term on-the-job training
47-2152	Plumbers, Pipefitters, and Steamfitters	189	190	1	0.53%	Long-term on-the-job training
11-9041	Engineering Managers	23	23	0	0.00%	Bachelor's or higher degree, plus work experience
13-2051	Financial Analysts	5	5	0	0.00%	Bachelor's degree

Appendix 1.6c

Green New and Emerging employment in the Mid Plains region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
13-1041	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	53	57	4	7.55%	Bachelor's degree
13-1199	Business Operations Specialists, All Other	188	189	1	0.53%	Bachelor's degree
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	17	18	1	5.88%	Work experience in a related occupation
11-9041	Engineering Managers	23	23	0	0.00%	Bachelor's or higher degree, plus work experience
17-3027	Mechanical Engineering Technicians	1	1	0	0.00%	Associate degree
19-2099	Physical Scientists, All Other	1	1	0	0.00%	Doctoral degree
19-3099	Social Scientists and Related Workers, All Other	1	1	0	0.00%	Master's degree
41-3099	Sales Representatives, Services, All Other	54	54	0	0.00%	Work experience in a related occupation
51-8099	Plant and System Operators, All Other	0	0	0	0.00%	Long-term on-the-job training
51-9199	Production Workers, All Other	32	32	0	0.00%	Moderate-term on-the-job training

Appendix 1.7a

Green Increased Demand employment in the Panhandle region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
43-4051	Customer Service Representatives	420	445	25	5.95%	Moderate-term on-the-job training
49-9051	Electrical Power-Line Installers and Repairers	300	308	8	2.67%	Associate degree
47-2111	Electricians	171	176	5	2.92%	Postsecondary vocational training
47-2073	Operating Engineers and Other Construction Equipment Operators	116	119	3	2.59%	Moderate-term on-the-job training
49-1011	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	225	228	3	1.33%	Work experience in a related occupation
19-2041	Environmental Scientists and Specialists, Including Health	26	27	1	3.85%	Master's degree
47-2221	Structural Iron and Steel Workers	36	37	1	2.78%	Long-term on-the-job training
17-2041	Chemical Engineers	1	1	0	0.00%	Bachelor's degree
17-2112	Industrial Engineers	13	13	0	0.00%	Bachelor's degree
27-1021	Commercial and Industrial Designers	0	0	0	0.00%	Bachelor's degree
29-9011	Occupational Health and Safety Specialists	14	14	0	0.00%	Bachelor's degree
51-8091	Chemical Plant and System Operators	6	6	0	0.00%	Long-term on-the-job training
51-9011	Chemical Equipment Operators and Tenders	10	10	0	0.00%	Moderate-term on-the-job training
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	82	82	0	0.00%	Moderate-term on-the-job training

Appendix 1.7b

Green Enhanced Skills employment in the Panhandle region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
53-3032	Truck Drivers, Heavy and Tractor-Trailer	578	584	6	1.04%	Postsecondary vocational training
47-2061	Construction Laborers	172	175	3	1.74%	Moderate-term on-the-job training
13-1073	Training and Development Specialists	60	62	2	3.33%	Bachelor's degree
13-2051	Financial Analysts	35	37	2	5.71%	Bachelor's degree
27-3031	Public Relations Specialists	42	44	2	4.76%	Bachelor's degree
53-7081	Refuse and Recyclable Material Collectors	30	32	2	6.67%	Short-term on-the-job training
13-1022	Wholesale and Retail Buyers, Except Farm Products	43	44	1	2.33%	Long-term on-the-job training
47-2181	Roofers	60	61	1	1.67%	Moderate-term on-the-job training
49-3023	Automotive Service Technicians and Mechanics	244	245	1	0.41%	Postsecondary vocational training
11-2021	Marketing Managers	18	18	0	0.00%	Bachelor's or higher degree, plus work experience
11-3071	Transportation, Storage, and Distribution Managers	47	47	0	0.00%	Work experience in a related occupation
17-1011	Architects, Except Landscape and Naval	6	6	0	0.00%	Bachelor's degree
17-1012	Landscape Architects	1	1	0	0.00%	Bachelor's degree
17-2011	Aerospace Engineers	0	0	0	0.00%	Bachelor's degree
17-3024	Electro-Mechanical Technicians	0	0	0	0.00%	Associate degree
17-3025	Environmental Engineering Technicians	0	0	0	0.00%	Associate degree
19-4041	Geological and Petroleum Technicians	0	0	0	0.00%	Associate degree
19-4051	Nuclear Technicians	0	0	0	0.00%	Associate degree
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	51	51	0	0.00%	Work experience in a related occupation
43-5071	Shipping, Receiving, and Traffic Clerks	88	88	0	0.00%	Short-term on-the-job training

Appendix 1.7c

Green New and Emerging employment in the Panhandle region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
13-1041	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	65	70	5	7.69%	Bachelor's degree
41-3099	Sales Representatives, Services, All Other	77	79	2	2.60%	Work experience in a related occupation
53-1021	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand	66	68	2	3.03%	Work experience in a related occupation
13-1199	Business Operations Specialists, All Other	133	134	1	0.75%	Bachelor's degree
15-1099	Computer Specialists, All Other	20	21	1	5.00%	Bachelor's degree
19-2041	Environmental Scientists and Specialists, Including Health	26	27	1	3.85%	Master's degree
19-3011	Economists	0	0	0	0.00%	Master's degree
19-3099	Social Scientists and Related Workers, All Other	1	1	0	0.00%	Master's degree
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	51	51	0	0.00%	Work experience in a related occupation
51-8099	Plant and System Operators, All Other	0	0	0	0.00%	Long-term on-the-job training

Appendix 1.8a

Green Increased Demand employment in the Panhandle region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
51-2092	Team Assemblers	1,833	1,857	24	1.31%	Moderate-term on-the-job training
51-4121	Welders, Cutters, Solderers, and Brazers	1,072	1,095	23	2.15%	Postsecondary vocational training
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	461	483	22	4.77%	Moderate-term on-the-job training
43-4051	Customer Service Representatives	560	580	20	3.57%	Moderate-term on-the-job training
49-9051	Electrical Power-Line Installers and Repairers	253	268	15	5.93%	Associate degree
49-9041	Industrial Machinery Mechanics	434	448	14	3.23%	Long-term on-the-job training
47-2031	Carpenters	855	865	10	1.17%	Long-term on-the-job training
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	273	281	8	2.93%	Postsecondary vocational training
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	423	429	6	1.42%	Associate degree
51-8021	Stationary Engineers and Boiler Operators	319	325	6	1.88%	Long-term on-the-job training
43-5061	Production, Planning, and Expediting Clerks	164	168	4	2.44%	Moderate-term on-the-job training
47-2073	Operating Engineers and Other Construction Equipment Operators	505	509	4	0.79%	Moderate-term on-the-job training
49-1011	First-Line Supervisors/Managers of Mechanics, Installers, and Repairers	456	460	4	0.88%	Work experience in a related occupation
19-4031	Chemical Technicians	57	59	2	3.51%	Associate degree
45-2011	Agricultural Inspectors	175	177	2	1.14%	Work experience in a related occupation
47-2051	Cement Masons and Concrete Finishers	356	358	2	0.56%	Moderate-term on-the-job training
47-2221	Structural Iron and Steel Workers	128	130	2	1.56%	Long-term on-the-job training
47-3012	Helpers--Carpenters	56	58	2	3.57%	Short-term on-the-job training
49-9044	Millwrights	105	107	2	1.90%	Long-term on-the-job training
53-3021	Bus Drivers, Transit and Intercity	49	51	2	4.08%	Moderate-term on-the-job training

Appendix 1.8b

Green Enhanced Skills employment in the Panhandle region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
53-3032	Truck Drivers, Heavy and Tractor-Trailer	3,440	3,491	51	1.48%	Postsecondary vocational training
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	414	436	22	5.31%	Moderate-term on-the-job training
49-3023	Automotive Service Technicians and Mechanics	731	747	16	2.19%	Postsecondary vocational training
47-2061	Construction Laborers	555	568	13	2.34%	Moderate-term on-the-job training
49-9042	Maintenance and Repair Workers, General	1,064	1,076	12	1.13%	Moderate-term on-the-job training
13-1073	Training and Development Specialists	94	103	9	9.57%	Bachelor's degree
27-3031	Public Relations Specialists	204	213	9	4.41%	Bachelor's degree
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	273	281	8	2.93%	Postsecondary vocational training
51-4041	Machinists	341	349	8	2.35%	Long-term on-the-job training
11-9021	Construction Managers	348	355	7	2.01%	Bachelor's degree
47-2152	Plumbers, Pipefitters, and Steamfitters	366	370	4	1.09%	Long-term on-the-job training
13-2052	Personal Financial Advisors	58	59	1	1.72%	Bachelor's degree
17-2051	Civil Engineers	69	70	1	1.45%	Bachelor's degree
17-3026	Industrial Engineering Technicians	18	19	1	5.56%	Associate degree
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	119	120	1	0.84%	Work experience in a related occupation
47-4011	Construction and Building Inspectors	56	57	1	1.79%	Postsecondary vocational training
11-1021	General and Operations Managers	788	788	0	0.00%	Bachelor's or higher degree, plus work experience

Appendix 1.8c

Green New and Emerging employment in the Northeast region. Based on NDOL 2009 short term occupations projections

SOC	SOC Title	2009 Estimated Employment	2011 Projected Employment	Absolute Change	Percent Change	Education Title
13-1199	Business Operations Specialists, All Other	521	530	9	1.73%	Bachelor's degree
47-1011	First-Line Supervisors/Managers of Construction Trades and Extraction Workers	469	478	9	1.92%	Work experience in a related occupation
13-1041	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation	133	138	5	3.76%	Bachelor's degree
41-3099	Sales Representatives, Services, All Other	227	232	5	2.20%	Work experience in a related occupation
53-1021	First-Line Supervisors/Managers of Helpers, Laborers, and Material Movers, Hand	173	176	3	1.73%	Work experience in a related occupation
11-3051	Industrial Production Managers	171	172	1	0.58%	Bachelor's or higher degree, plus work experience
15-1099	Computer Specialists, All Other	50	51	1	2.00%	Bachelor's degree
17-2051	Civil Engineers	69	70	1	1.45%	Bachelor's degree
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	119	120	1	0.84%	Work experience in a related occupation
11-9199	Managers, All Other	254	254	0	0.00%	Work experience in a related occupation
13-1081	Logisticians	26	26	0	0.00%	Bachelor's degree
19-2041	Environmental Scientists and Specialists, Including Health	17	17	0	0.00%	Master's degree

Appendix 2: Nebraska Economic Regions

Our analysis is at both the statewide and economic region level for Nebraska. Here is a list of the counties included in each economic region.

The Omaha Consortium :

- Cass, Douglas, Sarpy, Saunders, and Washington counties.

The Lincoln MSA:

- Lancaster and Seward counties.

The Southeast economic region:

- Fillmore, Gage, Jefferson, Johnson, Nemaha, Otoe, Pawnee, Richardson, Saline, Thayer, and York counties.

The Central economic region:

- Adams, Blaine, Buffalo, Clay, Custer, Franklin, Garfield, Greeley, Hall, Hamilton, Harlan, Howard, Kearney, Loup, Merrick, Nance, Nuckolls, Phelps, Sherman, Valley, Webster, and Wheeler counties.

The Mid Plains economic region:

- Arthur, Chase, Cherry, Dawson, Dundy, Frontier, Furnas, Gosper, Grant, Hayes, Hitchcock, Hooker, Keith, Lincoln, Logan, McPherson, Perkins, Red Willow, and Thomas counties.

The Panhandle economic region:

- Banner, Box Butte, Cheyenne, Dawes, Deuel, Garden, Kimball, Morrill, Scotts Bluff, Sheridan, and Sioux counties.

The Northeast economic region:

- Antelope, Boone, Boyd, Brown, Burt, Butler, Cedar, Colfax, Cuming, Dakota, Dixon, Dodge, Holt, Keya Paha, Knox, Madison, Pierce, Patte, Polk, Rock, Stanton, Thurston, and Wayne counties.

Appendix 3: American Community Survey (ACS) Analysis for Potential Employment

Civil Engineers (17-2051)

For the Omaha region, 100% of civil engineers were currently employed. For the Lincoln region, 46% of civil engineers were employed and 54% were non-labor force. For the non-metro region, 100% of civil engineers were currently employed. Total statewide potential employment for civil engineers is 0 individuals.

Electrician (47-2111)

For the Omaha region, 97% of electrician's were currently employed, with the remaining 3% unemployed. For the Lincoln region, 100% of electrician's were currently employed. For the non-metro region, 88% of electrician's were currently employed, with 5% unemployed and 7% non-labor force. Total statewide potential employment is 302 individuals.

Heating, Air Conditioning, and Refrigeration Mechanics and Installers (49-9021)

For the Omaha region, 100% of heating, air conditioning, and refrigeration mechanics and installers were currently employed. For the Lincoln region, 100% of heating, air conditioning, and refrigeration mechanics and installers were currently employed. For the non-metro region, 100% of heating, air conditioning, and refrigeration mechanics and installers were currently employed. Total statewide potential employment is 0 individuals.

Refuse and Recyclable Material Collectors (53-7081)

For the Omaha region, 87% of refuse and recyclable material collectors were currently employed, with the remaining 13% non-labor force. For the Lincoln region, 100% of refuse and recyclable material collectors were currently employed. For the non-metro region, 84% of refuse and recyclable material collectors were currently employed, with the remaining 16% non-labor force. Total statewide potential employment is 168 individuals.

Plumbers, Pipefitters, and Steamfitters (47-2152)

For the Omaha region, 60% of pipelayers, plumbers, pipefitters, and steamfitters were currently employed, with the remaining 40% non-labor force. For the Lincoln region, 100% of pipelayers, plumbers, pipefitters, and steamfitters were currently employed. For the non-metro region, 57% of pipelayers, plumbers, pipefitters, and steamfitters were currently employed, with the remaining 43% unemployed. Total statewide potential employment is 2,915 individuals.

Water and Liquid Waste Treatment Plant and System Operators (51-8031)

For the Omaha region, data for water and liquid waste treatment plant and system operators was unavailable. For the Lincoln region, 100% of liquid waste treatment plant and system operators were currently employed. For the non-metro region, 89% of liquid waste

treatment plant and system operators were currently employed, with the remaining 11% non-labor force. Total statewide potential employment is 228 individuals.

Forest and Conservation Technicians (19-4093)

For the Omaha, Lincoln, and non-metro regions, data for forest and conservation technicians was unavailable.

General and Operations Managers (11-1021)

For the Omaha region, 100% of general and operations managers were currently employed. For the Lincoln region, 43% of general and operations managers were currently employed, 40% were unemployed, and 17% were non-labor force. For the non-metro region, 72% of general and operations managers were currently employed, with the remaining 28% non-labor force. Total statewide potential employment is 2,664 individuals.

Environmental Engineers (17-2081)

For the Omaha, Lincoln, and non-metro regions, data for environmental engineers was unavailable.

Architects, Except Landscape and Naval (17-1011)

For the Omaha region, 100% of architects, excluding landscape and naval, were currently employed. For the Lincoln region, 100% of architects, excluding landscape and naval, were currently employed. For the non-metro region, 100% of architects, excluding landscape and naval, were currently employed. Total statewide potential employment is 0 individuals.

Laborers and Freight, Stock, and Material Movers, Hand (53-7062)

For the Omaha region, 80% of laborers and freight, stock, and material movers, hand were currently employed, 9% were unemployed, and 11% were non-labor force. For the Lincoln region, 69% of laborers and freight, stock, and material movers, hand were employed, 13% were unemployed, and 18% were non-labor force. For the non-metro region, 76% of laborers and freight, stock, and material movers, hand were currently employed, 9% were unemployed, and 15% were non-labor force. Total statewide potential employment is 4,709 individuals.

Farmworkers and Laborers, Crop, Nursery, and Greenhouse (45-2092)

For the Omaha, Lincoln, and non-metro regions, data for farmworkers and laborers, crop, nursery, and greenhouse was unavailable.

First-Line Supervisors/Managers of Production and Operating Workers (51-1011)

For the Omaha region, 81% of first-line supervisors/managers of production and operating were currently employed, with the remaining 19% non-labor force. For the Lincoln region, 91% of first-line supervisors/managers of production and operating were currently

employed, with the remaining 9% non-labor force. For the non-metro region, 97% of first-line supervisors/managers of production and operating were currently employed, with the remaining 3% non-labor force. Total statewide potential employment is 516 individuals.

Truck Drivers, Heavy and Tractor-Trailer (53-3032)

For the Omaha region, 86% of driver/sales workers and truck drivers were currently employed, 5% were unemployed, and 9% were non-labor force. For the Lincoln region, 87% of driver/sales workers and truck drivers were currently employed, with the remaining 13% non-labor force. For the non-metro region, 83% driver/sales workers and truck drivers were currently employed, 3% were unemployed, and 14% were non-labor force. Total statewide potential employment is 4,929 individuals.

Carpenters (47-2031)

For the Omaha region, 80% of carpenters were currently employed, with the remaining 20% non-labor force. For the Lincoln region, 91% of carpenters were currently employed, with the remaining 9% non-labor force. For the non-metro region, 85% of carpenters were currently employed, with the remaining 15% non-labor force. Total statewide potential employment is 4,364 individuals.

Environmental Science and Protection Technicians, Including Health (19-4091)

For the Omaha, Lincoln, and non-metro regions, data for environmental science and protection technicians, including health was unavailable.