SURVEY RESULTS

CLEAN JOBS ILLINOIS™

An In-Depth Look at Clean Energy Employment in Illinois

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THE EARTH'S BEST DEFENSE

BASED ON SURVEY RESEARCH BY

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Clean Energy Trust (CET) fuels clean energy innovation in the Midwest. A Chicago-based non-profit, CET helps launch, fund and grow Midwest clean energy companies to ensure a more prosperous, sustainable future for generations to come. It does this through direct investment, commercialization assistance, mentorship, access to its broad partner network and the promotion of a supportive clean energy community and business climate.

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ENVIRONMENTAL LAW AND POLICY CENTER
The Environmental Law & Policy Center (ELPC) is among the nation's leading public interest environmental law advocacy organizations, with a focus on the Midwest. ELPC develops and leads advocacy campaigns to improve environmental quality and protect natural resources.

NATURAL RESOURCES DEFENSE COUNCIL
The Natural Resources Defense Council (NRDC) is an environmental action organization that uses law, science and the support of 1.4 million members to protect the planet's wildlife and wild places and to ensure a safe and healthy environment for all living things.

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SPONSORS

Founded in 1991, the **Energy Foundation** promotes the transition to a new energy future by advancing energy efficiency and renewable energy in the transportation, buildings, power, and climate sectors. We work in the U.S. and China – the largest and fastest growing energy markets in the world. Our primary role is as a grantmaker, providing resources to the institutions that most effectively leverage change. When there is an unmet need, the Energy Foundation also takes direct initiatives, commissions papers, or convenes meetings. **ef.org**

The Joyce Foundation

The Joyce Foundation supports the development of policies that both improve the quality of life for people in the Great Lakes region and serve as models for the rest of the country. We invest in and focus on today's most pressing problems while also informing the public policy decisions critical to creating opportunity and achieving long-term solutions. The work is based on sound research and is focused on where we can add the most value. We partner with others and encourage innovative and collaborative approaches with a regional focus and the potential for a national reach. **joycefdn.org**

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[bw] RESEARCH PARTNERSHIP

BW Research Partnership offers the highest quality research products and consulting services to corporations, government agencies, educational institutions and non-profit agencies, and is the market leader in producing clean energy labor market analyses. **bwresearch.com**

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PHOTOGRAPHY

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A number of other organizations contributed to the project by providing advice, sharing data for the survey, encouraging survey participation among their networks, identifying employees for profiles or providing research data analysis. **They include:**

- AllCell Technologies
- Arkansas Advanced Energy Association
- ASHRAE
- Chicago Community Trust
- Commonwealth Edison
- Elevate Energy
- Energy Policy Institute at Chicago
- Illinois Chamber of Commerce Energy Council
- Illinois Department of Commerce and Economic Opportunity
- Illinois State University
- International Brotherhood of Electrical Workers
- InSPIRE
- Invenergy
- LanzaTech
- Midwest Energy Efficiency Alliance
- North Carolina Sustainable Energy Association
- Scranton Heating and Cooling
- UIC Energy Resources Center
- Wind on the Wires

Finally, we thank BW Research Partnership and Loudmouth Design for their efforts conducting, analyzing and bringing to life the Clean Jobs Illinois research and report.

INTRODUCTION

In 2013, Clean Energy Trust commissioned BW Research Partnership, a national leader in workforce and economic development research, to conduct a survey of Illinois clean energy firms to better understand employment in the sector. Clean Jobs Illinois™ is based on survey research data collected by BW Research Partnership and was developed in partnership with Environmental Entrepreneurs, The Environmental Law & Policy Center and the Natural Resources Defense Council, which contributed financial and staff resources to support the research and report.

Clean energy refers to a wide variety of technologies that create or conserve energy and help us meet our 21st century resource challenges. Energy innovation lessens our dependence on fossil fuels and foreign oil and helps keep our air and water clean. In Illinois, clean energy is creating jobs for workers and lowering utility bills for families and businesses. It is increasingly recognizable in our daily lives, from wind turbines and solar panels that harness clean, safe energy sources that won't run out; to electric vehicles that eliminate the need to stop and pay for gas; to thermostats that learn our behavior and respond to lower our electric bills.

Illinois has an important role to play in accelerating the development and adoption of clean energy. Located at the connecting point between two of the country's major electric grids, Illinois is the third largest producer of electricity in the U.S.[1] It is home to world-class research institutions and universities, leading corporations and businesses and a thriving entrepreneurial and startup community. The state's economic and geographic diversity sustain a full range of clean energy technologies – from farm fuels to advanced batteries.

On a number of fronts, Illinois is leading on clean energy. It ranked eighth in the 2013 U.S. Clean Tech Leadership Index of states with the strongest policies for reducing environmental footprints.[2] Strong building codes and the combination of a Department of Energy national laboratory, a top-ranked green MBA program and a clean energy incubator were cited among differentiating factors. Illinois also cracked the top ten for energy efficiency leadership for the first time in 2013, thanks in large part to utility efficiency standards that went into effect in 2008.[3] Additionally, the City of Chicago, a major economic driver in the state, has made efficiency in buildings a top priority through passage of energy efficiency ordinances and initiatives like Retrofit Chicago's Commercial Building Initiative.[4]

On other fronts, clean energy faces challenges. Illinois' renewable energy standard

1 EIA State Rankings: Total Net Electricity Generation, Dec. 2013: http://1.usa.gov/1nciacq
2 Clean Edge 2013 U.S. Clean Tech Leadership Index: http://bit.ly/1q64P7W
3 ACEEE 2013 State Energy Efficiency Scorecard: http://bit.ly/1lyHbjJ
4 Retrofit Chicago's Commercial Buildings Initiative: http://bit.ly/1idfhXN


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INTRODUCTION CONT.

– the Renewable Portfolio Standard (RPS) – requires that by 2025 at least 25 percent of the electricity supply comes from clean sources, which is positive. However, the RPS has faced implementation challenges because of changes in the structure of the Illinois energy market. Additionally, on-again off-again tax incentives at the federal level – including the expiration of the Wind Production Tax Credit – have made renewable energy investors wary. The effects of these challenges are evident in the survey results. Respondents noted maintaining a strong RPS as the top area of importance in terms of growing their clean energy businesses in Illinois. Policy uncertainty led to employment declines in renewable energy and supporting services, which dragged down the otherwise impressive clean energy industry growth rate.

Meanwhile, other states are moving ahead in clean energy leadership with innovative policy measures, like the new formula Minnesota regulators are using to assess the value of solar; higher energy efficiency targets for utilities in states like Massachusetts, California, New York, Oregon and Vermont; energy storage goals in California; and a Green Bank for funding clean energy projects in New York that is capitalized in part by revenues from the Regional Greenhouse Gas Initiative.

Clean Jobs Illinois offers an in-depth look at clean energy employment in Illinois – where it is today and where it is headed. It employed a rigorous, survey-based methodology in which 1,599 firms provided information on their clean energy activities and 415 firms completed the full survey. Surveys were fielded from a universe of known employers and a representative sample of unknown employers throughout October and November 2013. The total effort included placing more than 27,000 phone calls and sending more than 9,000 emails.

The survey methodology is closely aligned to how employment estimates are generated by the Bureau of Labor Statistics. It is similar in design to several other highly regarded studies, including the National Solar Jobs Census series and the Massachusetts Clean Energy Center Industry Reports. Unlike other reports, it does not rely on revenue estimates or economic models and assumptions.

For purposes of the study, clean energy was defined as energy efficiency, renewable energy, clean or alternative transportation and greenhouse gas management. The survey counted only those workers who have clean energy related jobs at organizations that are directly connected to the clean energy industry. While this narrow definition likely undercounts the total number of workers who have work responsibilities connected to clean energy, the definitions are critical to prevent over counting jobs that are only marginally connected to the industry. Even with a conservative approach, Clean Jobs Illinois affirms that the state's clean energy industry is a significant source of jobs and an economic engine with tremendous potential for continued growth.


SCRANTON
HEATING & COOLING
THE COMFORTMAN
NORTH AMERICAN
TECHNICIAN EXCELLENCE
NATE
CERTIFIED
AIR CONDITIONING
EXCELLENCE

KEY FINDINGS

Clean energy is a significant part of the Illinois economy.
There are 96,875 Illinois workers who spend some portion of their day supporting clean energy activities – that's enough to fill Soldier Field one and a half times over. In fact, the clean energy industry is larger than the real estate and accounting industries combined.[5]

96,875

CLEAN ENERGY JOBS IN ILLINOIS.

These are good jobs making Illinois' economy more productive and competitive and delivering energy that is secure, clean and affordable.

Clean energy provides good jobs for Illinois workers.
More than a third, 35 percent, of clean energy jobs are in engineering, research, manufacturing and assembly – many in STEM careers (science, technology, mathematics, and engineering). These are good jobs with good benefits, and they make Illinois' economy more productive and competitive. Nearly another third, 30 percent, of clean energy workers are in the installation and maintenance sector. These are local jobs done here in Illinois that will stay here in Illinois.

5 IDES CES Data, Dec. 2013: http://1.usa.gov/1kxYYHu

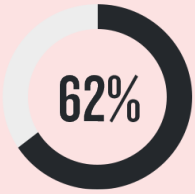
KEY FINDINGS

Clean energy is as much about how we use energy as it is about how we produce it.

A majority of firms in the clean energy sector, 62 percent, operate primarily in the energy efficiency industry. Renewable energy is the second leading industry, with 21 percent of clean energy companies. Alternative transportation makes up 5 percent of the sector with 1 percent of firms focusing on managing greenhouse gas emissions. Another 12 percent are categorized as other, many of which are professional service firms or other service providers that work mainly with clean energy firms.

+9% GROWTH

Clean energy industry employment is expected to grow by 9% and will add its 100,000th worker in 2014.



62% of businesses in the clean energy industry focus on energy efficiency.

Clean energy companies are growing and are optimistic about 2014.

Illinois' clean energy industry is projected to grow by 9 percent and top 100,000 workers in 2014. Certain clean energy sectors experienced rapid growth in 2013, including alternative transportation (21 percent), greenhouse gas management (5 percent) and energy efficiency (3 percent). In 2014, 40 percent of firms in the clean energy sector expect to add workers.

Policy challenges are weighing down growth among renewable energy companies.

Between 2008-2012, Illinois was a top-five state for renewable energy development. Due in significant part to policy headwinds, renewable energy industry employment contracted in 2013 by 0.2 percent. While most clean energy sectors were moving forward, renewable energy lost jobs and weighed down overall clean energy industry growth in Illinois. Maintaining a strong Renewable Portfolio Standard law was cited by clean energy firms as the top area of importance for growing their business.

Illinois is ready to lead in clean energy.

Quality of life, proximity to customers and access to educated and skilled workers were top reasons clean energy businesses chose to locate in Illinois. World-class universities and research institutions and strong professional networks were also cited as advantages to locating in Illinois. Thanks to its rich clean energy ecosystem, Illinois ranked eighth among states for clean tech leadership in 2013.[6] And Illinois can again be a leader in renewable energy, as it was when it ranked in the top five among states for wind energy development between 2008-2012.[7]

6 Clean Edge 2013 U.S. Clean Tech Leadership Index: http://bit.ly/1q64P7W
7 AWEA U.S. Wind Industry Annual Market Reports 2008-2012

RESEARCH FINDINGS:

INDUSTRY SECTORS

Clean energy encompasses a wide variety of technologies that create or conserve energy and help us meet our 21st century resource challenges. This section provides a look at the overall breakdown of industry sectors that make up Illinois' clean energy industry, as well as a closer look at each individual sector. Table 1 provides the sector breakout of clean energy businesses in the state, and Table 2 shows which technologies were included in the survey definitions of each sector. It should be noted that when more than one response was allowed, there was significant overlap between renewable energy and energy efficiency firms, suggesting that many firms are engaged in both focus areas.

TABLE 1

SECTOR	2013 Employment	Share of Industry
Energy Efficiency	60,433	62%
Renewable Energy	20,123	21%
Alternative Transportation	4,423	5%
Greenhouse Gas Management	637	1%
Other (Usually professional services)	11,259	12%

TABLE 2

Energy Efficiency

- HVAC and building controls
- Lighting
- Energy efficient building materials
- Weatherization services
- Energy efficient processes and machinery
- Smart grid (smart computing/software)
- Energy efficient appliances
- Energy storage
- Water and wastewater technologies related to conserving energy
- Demand response services

Renewable Energy

- Solar (photovoltaic, thermal or concentrated)
- Wind power
- Bioenergy
- Geothermal
- Renewable combined heat and power
- Thermal to energy conversion
- Hydropower or hydrokinetic (river, wave, tidal, etc.)

Alternative Transportation

- Electric vehicles and systems
- Electric rail

Greenhouse Gas Management

- Coal gasification
- Carbon capture and storage
- Secondary carbon market

ENERGY EFFICIENCY

Energy efficiency technologies include low-energy lighting, heating and cooling controls and energy automation systems, which deliver cost savings and comfort. They also include next-generation technologies like advanced batteries and smart grid systems and controls. Energy efficiency is the primary focus for 62 percent of clean energy firms. The significance of this sector shows that clean energy is as much about how we use energy as it is about how we produce it.

Energy efficiency is helping families and businesses reduce their carbon footprints, save money and improve their bottom lines. Thanks to energy efficiency technologies, household electricity use in the U.S. has fallen to the lowest levels since 2001.[8] And between now and 2016, electricity demand in the Midwest is projected to decline annually by almost 1 percent.[9]

Illinois' robust energy efficiency sector is due in part to the state's energy efficiency standards. Illinois efficiency standards say that utilities must reduce electricity demand by 2 percent each year but spend less than 2.015 percent of rates paid by customers on efficiency projects.[10] The Illinois Commerce Commission recently reaffirmed these goals, informed by input from survey partners Environmental Law & Policy Center and Natural Resources Defense Council.[11] Energy efficiency is the primary focus for 62 percent of clean energy firms. The strength of this sector has helped make Illinois the number one state in the U.S. for green buildings and shows that clean energy is as much about how we use energy as it is about how we produce it.[12]

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8 AP, Dec. 30, 2013: "Home electricity use falling to 2001 levels": http://bit.ly/1luIyf5
9 Midwest Energy News, "Efficiency gets credit for milestone drop in Midwest energy demand": http://bit.ly/1jSzpk5
10 Midwest Energy News, "Illinois raises the bar on energy efficiency": http://bit.ly/1ghKSWs
11 Ibid.
12 Fast Company, March 6, 2014: "The Top 10 States for Green Buildings": http://bit.ly/NFhwYx

WORKER PROFILE

SCOTT EDWARDS

Title:
SERVICE TECHNICIAN

Company:
SCRANTON HEATING AND COOLING

Industry:
ENERGY EFFICIENCY / GEOTHERMAL

A service technician trained in energy efficiency upgrades and geothermal installations, Scott's work puts him at the heart of growing demand for energy efficiency.

Scott Edwards gets in to the shop at Scranton Heating and Cooling around 8 a.m. each morning before heading out for service calls until 5 p.m. In the wintertime, energy efficiency upgrades keep him busy. According to Scott, "Probably ninety percent of our heating and cooling work is energy efficiency upgrades. Customers are definitely looking for improved efficiency." During the summer, Scott installs residential geothermal systems, which are popular thanks to electric bill savings and a 30 percent tax credit. In fact, only one of the last fifty new construction projects that Scranton Heating and Cooling worked on did not install a geothermal system.

"I didn't know much about geothermal before I started, so that's the most interesting part of the job for me," says Scott. Before joining Scranton, Scott graduated from the Midwest Technical Institute's heating, ventilation and air conditioning training program. Scott says the program equipped him well "My training program definitely paid off. It made it a lot easier coming into the job having some of the basic theory behind the work and the technical skillset to handle the installs."

ENERGY EFFICIENCY IN FOCUS:

ENERGY STORAGE

One of the most important technology areas for advancing clean energy is energy storage. This includes any technology that can store energy for use at a later time – the most recognizable of which are batteries and fuel cells. Energy storage enables other clean energy technologies. For example, a high-capacity battery linked to a solar energy system can store energy while the sun shines and deliver it after dark. Likewise, energy storage helps resolve the intermittency of wind power and enables electric vehicles that can go farther on a single charge. While energy storage technology is a growing part of all sectors of the clean energy industry, most businesses working on energy storage identified themselves as energy efficiency firms.

Illinois is at the forefront of energy storage technology as home to the Joint Center for Energy Storage Research (JCESR) – a U.S. Department of Energy-supported $120 million public-private partnership based out of Argonne National Laboratory in Lemont, Illinois that is working to develop next-generation batteries. Clean Energy Trust is a key commercialization partner of JCESR, which has a 5x5x5 goal: creating batteries with five times the energy density of today's batteries at one fifth the cost in five years. Energy storage is an important sub-sector of Illinois' clean energy economy, and the economy as a whole, as it combines a number of advanced industries – materials science, chemistry, manufacturing and engineering.

WORKER PROFILE

ROSE McGEE

Title:
PRODUCTION LEADER

Company:
ALLCELL TECHNOLOGIES

Industry:
ADVANCED BATTERIES

Rose manages a team of fifteen operators at AllCell Technologies who manufacture custom lithium-ion battery packs and who are helping build America's clean energy future.

America's clean energy future is being built in advanced battery workshops like the one in Chicago that Rose McGee manages. Better batteries enable other clean energy technologies, like plug-in vehicles that can go farther on a single charge and solar systems that can store energy for use after the sun goes down. Rose manages a team of fifteen operators at AllCell Technologies who manufacture custom lithium-ion battery packs. The company's technology is helping improve battery safety – a key industry concern. Rose says her co-workers are the best part of her job and also enjoys working in an industry that's taking off "It's a new product, which makes it exciting."

Rose has a bachelor's degree and is pursuing a master's degree in electrical engineering. This background made her an ideal fit for AllCell Technologies, which she joined in 2011. Although she has a supervisory role, Rose often gets on the line and can complete every step in the battery production process. It is work she takes pride in: "Building something from the ground up – from nothing – gives me responsibility over making sure it's a quality product."

RENEWABLE ENERGY

Renewable energy was reported as the primary technology area by 21 percent of businesses. It is perhaps the most widely recognized clean energy sector, from wind farms and biofuels refineries that dot Illinois' countryside to increasingly common rooftop solar arrays. Other renewable technologies include geothermal energy, bioenergy, combined heat and power and hydropower.

The survey found that wind businesses in Illinois are 41 percent larger than the average solar firm. Today, wind farms in Illinois generate enough electricity to power 750,000 homes with energy that is secure, clean and affordable.[13] In contrast, Illinois' solar sector is less mature in its development but, surprisingly, Illinois has better solar intensity than the world's leading solar markets, Germany and Japan.[14] Illinois' Renewable Portfolio Standard has incentives for both utility scale and smaller scale, or distributed, solar energy, which if fully implemented will result in consistent demand for solar energy through 2025 and beyond.

13 Wind on the Wires: http://bit.ly/NzkXjz
14 ELPC: http://bit.ly/1jU9rdu

WORKER PROFILE

MAGGIE PAKULA

Title:
MANAGER OF PERFORMANCE ANALYTICS

Company:
INVENERGY

Industry:
WIND ENERGY

Maggie Pakula is helping the wind industry master big data to improve performance and operational practices. Keeping existing wind farms productive helps encourage future development, and ultimately that means more wind power.

The soaring wind turbines that dot the Illinois countryside are equipped with sensors that constantly transmit data back to wind companies. "Our wind fleet generates massive amounts of data. My role is to get as much useful information out of that data as possible to keep our turbines running optimally," explains Maggie Pakula. Most days, Maggie works at a desk, but a couple times each year, she scales Invenergy's wind towers to see new technology or complete safety training.

In 2010, Maggie left a Ph.D. program at Stanford University for her job at Invenergy, North America's largest independent wind power generation company. "Being involved in the evolution of how the wind industry uses data has been fulfilling," Maggie says. Today, companies are placing as much emphasis on the efficient operation of wind farms as on the construction of new ones. Keeping wind farms productive not only maximizes operating wind projects, but helps encourage future development. That ultimately translates into more wind power, and makes the job rewarding.

ALTERNATIVE TRANSPORTATION

Alternative transportation is the primary technology focus of 5 percent of clean energy businesses. This sector includes electric vehicles, electric rail and supporting infrastructure such as charging stations. Electric vehicles are an exciting, fast-growing segment of the industry, with Tesla leading the way as the first successful new U.S. automaker in half a century. Advances in the mileage range that plug-in electric cars can drive on a single charge, as well as up to $1,200 in annual fuel cost savings, are driving growth in this segment of the clean energy industry.[15] Electric vehicle owners aren't the only ones who benefit from alternative transportation. Electric vehicles can help make our electricity system more reliable. The large battery systems that power electric vehicles are usually charged during the nighttime – when electricity is cheap and in low demand – and can deliver electricity back to the grid during peak hours when demand for electricity is highest, like summer afternoons. This means a lower risk of blackouts and brownouts and fewer old, inefficient coal plants being used to help meet electricity demand.

GREENHOUSE GAS MANAGEMENT

Greenhouse gas management – the management of carbon emissions – was reported as the primary technology area by 1 percent of firms. This sector includes coal gasification, carbon capture and storage and the secondary carbon market. Greenhouse gas management is helping other industries recycle waste and generate new revenue streams.

OTHER

Twelve percent of clean energy businesses reported "other" as their primary business focus. Most typically, these firms provide consulting, finance, legal and other support services to clean energy businesses.

15 Union of Concerned Scientists, State of Charge, Jul 2012: http://bit.ly/1hnjLZV

WORKER PROFILE

JEREMY OWEN

Title:
ENGINEERING MANAGER

Company:
LANZA TECH

Industry:
GREENHOUSE GAS MANAGEMENT / ADVANCED BIOFUELS

Jeremy helps LanzaTech produce low-carbon fuels and chemicals from carbon-rich gases, turning waste gases into clean energy and helping the energy industry move beyond the "food versus fuel" debate.

Jeremy Owen spends his days studying how waste can be turned into products-- and profits. The company he works for, LanzaTech, captures carbon-rich waste gases from large industrial operations like steel plants and uses microbes to recycle the waste gas. "We like to say that we give carbon a second life," says Jeremy. The products created through LanzaTech's process – which can include ethanol or chemicals – can be blended into gasoline for cars, converted to jet fuel for airplanes or used to make common products like tire rubber and sporting goods.

Jeremy has worked on alternative fuels in the clean energy sector for ten years. When he entered the industry, he worked mostly on grain- and corn-based ethanol. Today, LanzaTech's technology doesn't rely on food crops to produce low-carbon fuels, helping the energy industry move beyond concerns about "food versus fuel". To Jeremy, evolution in the industry is welcome: "Clean energy is a really rewarding area to work. It's a space where there is a lot of change – to me that makes it very exciting."

RESEARCH FINDINGS:

INDUSTRY GROWTH

The clean energy industry is projected to grow by 9 percent in 2014, significantly above Illinois' overall projected growth rate of .98 percent for the year ahead.[16] Forty percent of firms expect to add clean energy workers over the coming 12 months, and the industry is projected to add its 100,000th worker in 2014.

In 2013, a number of industry sectors experienced strong growth, including alternative transportation, greenhouse gas management and energy efficiency. Other sectors were beset by the impacts of policy uncertainty and market forces, including companies in the renewable energy sector and the businesses that support them (usually categorized under "other"). Nevertheless, even the sectors hit hardest in 2013 are optimistic about 2014 and are projected to grow at rates greater than 5 percent.

Note that because the research findings are based on survey responses, the employment growth projections represent employers' best estimates of how many jobs they will add over the coming year. Actual growth may vary.

SECTOR	2012 EMPLOYMENT	2013 EMPLOYMENT	2013 GROWTH RATE	2014 EMPLOYMENT *(Projected)*	2014 GROWTH *(Projected)*
Renewable Energy	**20,163**	**20,123**	**- 0.2%**	**21,874**	**8.7%**
Energy Efficiency	**58,692**	**60,433**	**2.9%**	**66,415**	**9.9%**
Alternative Transportation	**3,486**	**4,423**	**21.2%**	**4,888**	**10.5%**
Greenhouse Gas Management	**605**	**637**	**5.0%**	**637**	**0.0%**
Other	**13,634**	**11,259**	**- 17.4%**	**11,889**	**5.6%**
Totals	**96,580**	**96,875**	**0.31%**	**105,703**	**9.11%**

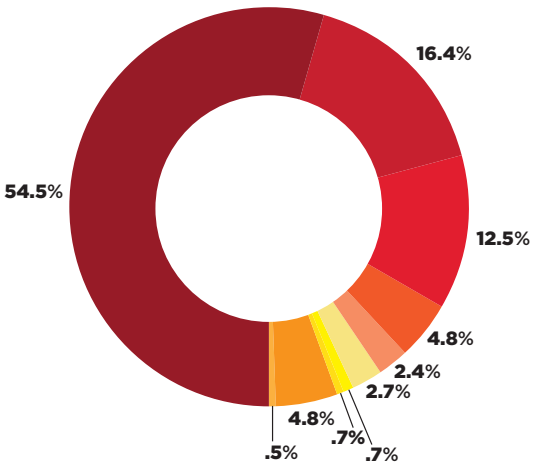
16 Pew Research / Moody's Analytics, Top States for Job Growth in 2014: http://bit.ly/1adco68

RESEARCH FINDINGS:

FIRM CHARACTERISTICS

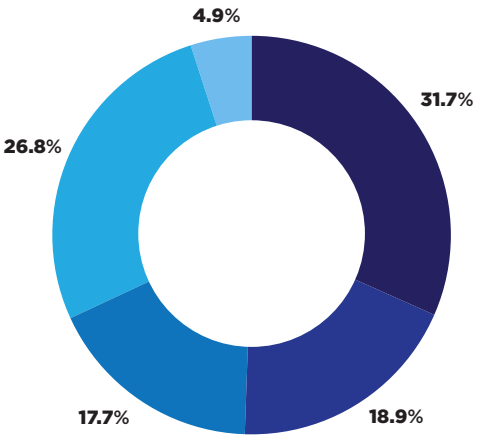
Clean energy is a growth-stage industry. Clean energy businesses are mostly small, with more than three quarters (77 percent) having fewer than 25 workers. The median firm size is six employees. About 85 percent of clean energy firms have only one location in Illinois and about half of all firms receive a majority of their revenue from clean energy goods and services. Some 17 percent of clean energy businesses reported being a woman or minority owned business enterprise.

NUMBER OF CLEAN ENERGY SUPPORT WORKERS AT BUSINESS LOCATION



1 to 5 WORKERS
6 to 10 WORKERS
11 to 24 WORKERS
25 to 49 WORKERS
50 to 99 WORKERS
100 to 249 WORKERS
250 to 499 WORKERS
500 or more WORKERS
DK/NA
NO WORKERS

BUSINESSES BY PORTION OF REVENUE DERIVED FROM CLEAN ENERGY ACTIVITIES



ALL OF IT (100%)
HALF TO MOST OF IT (50% - 99%)
A QUARTER TO ALMOST HALF OF IT (25% - 49%)
LESS THAN A QUARTER (1% - 24%)
DK/NA

RESEARCH FINDINGS:

WORKFORCE

The **Clean Jobs Illinois** survey shows that clean energy jobs are in demand. More than half of employers, 51 percent, found it difficult or very difficult to fill new clean energy positions over the last 12 months. This is higher than is typical, compared to other industries. Occupations that employers found most difficult to fill were engineers (software developers, electrical engineers, mechanical engineers, etc.), welders and installers. These are competitive, good-paying occupations.

SECTOR	SOFTWARE DEVELOPER	INDUSTRIAL ENGINEER	MECHANICAL ENGINEER	WELDER	INSTALLER
2012 Median Pay	$93,350.00 *per year* $44.88 *per hour*	$78,860.00 *per year* $37.92 *per hour*	$80,580.00 *per year* $38.74 *per hour*	$36,300.00 *per year* $17.45 *per hour*	$43,640.00 *per year* $20.98 *per hour*
Entry-Level Education	Bachelor's degree	Bachelor's degree	Bachelor's degree	High school diploma or equivalent	Postsecondary non-degree award
10-year projected employment growth	22%	5%	5%	6%	21%

Bureau of Labor Statistics Occupational Outlook Handbook: http://www.bls.gov/ooh/

Of the 96,875 workers who spend some portion of their time in clean energy, 71 percent spend a majority and 60 percent spend all of their time supporting clean energy.

Installation and maintenance businesses accounted for 30 percent of clean energy jobs. This work most commonly includes products and services related to energy efficiency upgrades, like heating ventilation and air conditioning (HVAC) controls, LED lighting, insulation, storm windows and weatherization.

Engineering and research was the second most common focus area, with 21 percent of jobs in the industry. Given the diverse range of technologies in the industry, these roles can vary from shop floor workers to high-tech lab scientists. Engineering roles include software engineers developing online energy management platforms, manufacturing engineers designing solar modules or electrical engineers developing advanced batteries. Research roles include chemists growing solar crystals, physicists testing wind blade design or researchers studying electric vehicle capabilities.

Manufacturing and assembly occupations accounted for 14 percent of the clean energy industry. There is a wide range of physical products that clean energy businesses produce, including biofuels, smart meters, advanced batteries, LED lighting, wind turbines and electric vehicles and charging stations. Together with engineering and research jobs, manufacturing and assembly jobs are among occupations in the STEM fields that grow Illinois' economy and keep it competitive.

Finally, fast-growing businesses like those in the clean energy industry require sales and distribution operations to find new customers and deliver products. Sales and distribution were equal to manufacturing and assembly with 14 percent of jobs in the industry. An additional 21 percent of businesses in the sector classified their work as "other" and are generally occupations that support other businesses – like lawyers, accountants and consultants.

WORKER PROFILE

ADAM REICH

Title:
INSTALLER

Company:
SCRANTON HEATING AND COOLING

Industry:
GEOTHERMAL / ENERGY EFFICIENCY

An Army veteran, Adam began working in the clean energy industry last year and is using his vocational training to help Scranton Heating and Cooling's customers save energy and money.

After serving six years in the Army, Adam Reich enrolled in Midwest Technical Institute's heating, ventilation and air conditioning program. A job shadow opportunity at Scranton Heating and Cooling in Mt. Sterling, Illinois led to a full time job when he graduated in 2013. "Even though I'm the newest guy on the team, we do service calls together so I'm learning a lot," says Adam of the on-the-job experience he gets installing and servicing residential geothermal energy systems and energy efficient appliances.

The geothermal systems Adam installs consist of a loop system buried in the earth that is connected to a heat pump in the home. This captures the moderate temperatures in the ground to provide warm air in winter and cool air in summer. Scranton Heating and Cooling estimates that geothermal systems offer 40 percent to 50 percent electric bill savings versus conventional systems. "Usually people are pretty well versed on the benefits of geothermal since they know about the savings," says Adam.

WORKER PROFILE

PAUL GARCIA

Title:
AMI INSTALLER

Company:
COM ED

Industry:
SMART GRID

Paul is equipping Illinois' electric grid for the future. He works on Chicago's South Side upgrading electric meters and answering customer questions like, "So, what exactly is a smart meter?"

Illinois' electric system is catching up to the digital age, thanks to workers like Paul Garcia. Paul replaces old analog electric meters with new digital smart meters at homes on Chicago's South Side. Part of his job is educating residents about their new meters. Smart meters communicate energy usage data in real-time, making customers more aware of how they use electricity and enabling utilities to better respond to outages. "Everyone wants to leave as small a carbon footprint as possible," Paul says. "Once you are aware of how this technology helps save energy, you can take the next step."

Paul joined ComEd in 2006 after graduating from Southern Illinois University in Carbondale. After company training and three months on the job, he earned membership in the International Brotherhood of Electrical Workers. Today, he upgrades between 100 and 125 meters each week. "It seems routine, but the equipment we're replacing is 50 to 100 years old – we see everything from birds nests to homemade wiring attempts inside old meters," says Paul about the variety that keeps the job interesting.

RESEARCH FINDINGS:

ILLINOIS BUSINESS CLIMATE

Illinois as a home to clean energy

The primary driver for firm location in Illinois is quality of life, since it is where the ownership and leadership want to live, according to 77 percent of responding businesses. Components of a strong business network are the next most important factors, including proximity to customers (30 percent), access to educated and skilled workers (13.8 percent), proximity to suppliers and vendors (13.5 percent) and proximity to world-class research universities (9.3 percent).

When prompted for other reasons why they located in Illinois, the Illinois market's size and opportunities and the state's central U.S. location were the two most common responses.

Among specific aspects about Illinois, proximity to high-quality universities and public transportation were considered strengths or major strengths by 84 percent and 69 percent of respondents, respectively. Economic development and business assistance stood out as a weakness or major weakness according to 31 percent of respondents.

Illinois employers consider the state's clean energy ecosystem a major advantage. When prompted about the biggest advantages of operating in Illinois, top responses included the state's clean energy network, proximity to customers and resources in Chicago, such as its strong workforce and networking opportunities. Top disadvantages cited were high taxes and costs, government regulation and the political climate, including dysfunction and uncertainty.

POLICY

Employers most frequently cited maintaining a strong renewable energy standard as the top policy that would have the greatest impact on accelerating clean energy. Additional priority areas included stronger incentives and rebates for clean energy investment and regulations on traditional fuel sources (CO2 generation, etc.). In terms of tax, regulatory and other barriers, 66 percent of respondents think the state regulations are the greatest obstacles, with about 30 percent citing local and 19 percent citing federal regulations and policies. When asked about specific policies that present obstacles, firms most frequently mentioned high taxes (corporate, personal, sales, etc.), minimal state support for clean energy, and poor PACE, RPS, incentive, rebate, and grant programs.

APPENDIX:

RESEARCH METHODOLOGY

In response to the Clean Jobs Illinois survey, 1,599 firms provided information on their clean energy activities and 415 firms completed the full survey. The total effort included placing more than 27,000 phone calls and sending more than 9,000 emails. Surveys were fielded to a universe of known employers and a representative sample of unknown employers by phone and web throughout October and November 2013. The representative sample included industries in the North American Industry Classification System categories identified by the Bureau of Labor Statistics and BW Research Partnership as being potentially "clean."

The 1,599 firms that provided information on their clean energy activities provides an overall margin of error for incidence rates at +/-2.38 percent at a 95 percent confidence interval. The 415 full survey completions provide a margin of error of 4.69 percent at a 95 percent confidence interval for employment related questions. This is within the typical range for similar industry studies.

For the purposes of this study, clean energy is defined as renewable energy (minus hydropower), energy efficiency (including smart grid), clean or alternative transportation, and carbon management, accounting, or sequestration. The screener question used for this definition was:

Is your company involved with an activity related to the clean energy industry? We define this as being directly involved with researching, developing, producing, manufacturing, distributing or implementing components, goods or services related to renewable energy, energy efficiency or conservation, smart grid, energy storage, carbon management, and/or electric or hybrid vehicles, including supporting services such as consulting, finance, tax, and legal services related to clean energy.

The treatment of fossil fuel technologies poses challenges when defining clean energy. A number of fossil fuel technologies, like vehi-

cles that run on compressed natural gas or natural gas-fired combined heat and power systems, have lower emissions profiles than the comparable technologies most commonly used today. However, increased adoption of these technologies sustains demand for and dependence on fossil fuels. To address this challenge, the survey distinguishes between technologies that use fossil fuel to generate power – which it excludes – and technologies that reduce the use of fossil fuels or makes them cleaner – which it includes.

The screener question allowed for a conservative approach in counting clean energy jobs. For a job to be counted, the employer must be engaged in the development, production, sale, installation, maintenance or other activity directly related to clean energy goods and services, and the employee must spend some portion of his or her time supporting that work. Only those workers who have clean energy related jobs at organizations that are directly connected to the clean energy industry are counted. Jobs at organizations that do not work directly with clean energy goods and services are excluded. For example, an automotive technician working on electric buses would be included, while the driver of that bus would not.

Also excluded are the many jobs that have clean energy components – most often focused on saving energy – but are not at firms that are directly connected to the clean energy industry. For example, an energy conservation specialist at a hospital would be excluded from the study. While these narrow definitions likely undercount the total number of workers who have responsibilities connected to clean energy, the definitions are critical to prevent over counting jobs that are only marginally connected to the industry.

In addition to the definition of clean energy worker, the research calculates employment for workers who spend any part of their time supporting clean energy (consistent with the Massachusetts Clean Energy Center Report). These totals are then refined to include the number spending a majority of their time (>50 percent) and all of their time (100 percent).