# GREENER PATHWAYS

Jobs and Workforce Development in the Clean Energy Economy

EXECUTIVE SUMMARY

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Center on Wisconsin Strategy • The Workforce Alliance • The Apollo Alliance

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# OVERVIEW

## *The Need*

Across the country—in the media; in boardrooms, think tanks, and community organizations; in local and state government; in Congress and on the campaign trail—people are talking about the economic promise of clean energy. ***Greener Pathways*** puts **jobs** at the heart of this animated national conversation. This report provides information on the kind and quality of jobs in the clean energy economy; the skills needed to fill these jobs; and how existing plants and their workers—especially those in the beleaguered industrial heartland—can move to the center of the clean energy economy. These nuts and bolts issues bring labor, business, community, and education together as partners in the new industrial revolution.

## *The Context*

Building a competitive and equitable green economy means investing in the backbone of America's labor force: workers with more than high school, but less than a four-year degree. Beyond the modest clusters of highly skilled engineers and innovators who catalyze change, and a limited number of green-collar workers in just-invented jobs, the new energy economy will be built and sustained by middle-skill workers in traditional occupations. Indeed, many **skills of the greener future are closely related to the skills of today**. And most of the jobs in the industries examined in this report—e.g., electricians retrofitting buildings for energy efficiency, lab technicians ensuring quality control in ethanol plants, machinists crafting wind turbine components and technicians maintaining them—do not require advanced degrees. Thus the greener pathways of this report lead to **middle-skill jobs in the clean energy future**.

## *The Report*

A key insight of this report is that broadly defined "green jobs" are not a salient category for policy innovation or workforce training. To make real progress on economic and workforce development in the new energy economy, we must **focus more carefully on key clean energy sectors**. *Greener Pathways* does just that, by detailing current economic and workforce development opportunities in three leading industries: energy efficiency, wind, and biofuels. The report also examines federal resources that can support state green jobs initiatives, including programs in the Departments of Energy and Labor, and the Green Jobs Act included in the 2007 Energy Independence and Security Act. We conclude by outlining a plan of action for state policymakers, highlighting policy, program and system reform opportunities to embrace the greener and more equitable promise of the new energy economy.

# HIGHLIGHTS

## *Greener Job Prospects In Three Industries*

A greener American economy can and will create jobs. Just how many depends on the scale and terms of future investment, and on how states define "green jobs," an evocative but ambiguous term. For the purposes of this report, **green jobs are family-supporting, middle-skill jobs in the primary sectors of a clean energy economy—efficiency, renewables, and alternative transportation and fuels**.

We offer a snapshot of such jobs for three key green industries in the "at-a-glance" charts folded into this summary (with further details in the report):

**Energy efficiency** may be the fastest, cheapest way for states to address global warming, reduce energy costs for their poorest citizens, and create and sustain good jobs. We look primarily at residential retrofits, one sector in a broader field that includes commercial and industrial retrofits, green building, and green manufacturing.

We examine the **wind sector** because of its rapid and high profile growth in the U.S. and abroad, its potential as an economic driver in both urban and rural areas, and its capacity for job creation in manufacturing as well as installation and operations. Component part manufacturing for wind turbines holds particular promise.

Evidence mounts that **biofuels**, at least in their current state, are not particularly good for either the environment or the job market. Yet the industry has taken root, is growing rapidly, and generates increasing policy interest and investment, particularly, but not exclusively, in the Midwest. We look at jobs in ethanol and biodiesel production.

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The Center on Wisconsin Strategy (COWS) is a national "think and do" tank focused on high-road economic development—a competitive market economy of shared prosperity, environmental sustainability, and capable democratic government.

For the full report, including more information on partners, links to related resources, and bibliography, go to www.cows.org. The co-authors can be reached at swhite@cows.org; jason@greenforall.org.

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# POLICY PRINCIPLES FOR GREEN JOBS INITIATIVES

*Greener Pathways* provides information to help states craft clean energy agendas that simultaneously meet emerging industry demand, train and support workers, and create good, family-supporting jobs. A series of key principles helps focus and animate green jobs policy:

## *Get smarter about green jobs*

The energy, enthusiasm, and investment in "green opportunity" sometimes runs ahead of careful thinking. Careful thinking, however, is the foundation of successful policies and projects. Of key importance here is focusing the approach, and then building on a solid foundation of labor market data and analysis.

**Target specific sectors** within the "green jobs" universe
**Use good data** on labor market opportunities and skill gaps to drive green jobs initiatives
**Measure and evaluate** green jobs programs and make them better

## *Sustain good jobs through green partnerships*

The green jobs promise is realized when smart economic development links with thoughtful workforce training. That happens when green jobs partnerships are founded, supported, and sustained to ensure the linkage.

**Employ** energy standards as green job creation tools
**Promote** green industry clusters
**Design** green jobs initiatives to both save existing jobs and create new ones
**Link** green economic and workforce development
**Construct** green industry partnerships
**Integrate** green jobs initiatives into existing workforce systems

## *Make sure green jobs pay off for workers and communities*

The greatest promise of green jobs will be realized only if we are smart about generating good jobs that are accessible to the people who need those jobs. To realize this potential requires focused attention on job quality, strong access for all, and upward mobility in the green economy.

**Maximize community benefits** by requiring them
**Build greener career pathways**
**Extend green ladders** to build real pathways out of poverty

# EQUITY AND A GREENER FUTURE

Massive green investment and policy innovation need to be joined with an **opportunity agenda that extends the greener pathways to all**. The new energy economy will not simply emerge and generate good jobs; strategic state policy initiatives must hasten and direct the growth. States that build green-collar job training partnerships will be at the forefront of the new energy economy, and in a prime position to reap the benefits of the new Green Jobs Act. And as states construct greener pathways, workers will build a more green and prosperous future for their families and communities.

## *Training: Greener Pathways Across the Country*

The dual promise of environmental health and community prosperity can only be answered by green jobs and green job training **at scale**. But we should not start from scratch. The most efficient and effective way to prepare a green-collar workforce is to **build on the existing foundation** of state and local workforce development systems. More time should be spent embedding green skills training within current curricula; less energy spent inventing new programs. Retrofitting American cities, for example, requires not 'green construction workers,' but rather workers with traditional construction skills who also have up-to-date training on energy-efficient construction. And even those employers who focus more narrowly on a particular green technology, say solar installation and maintenance, require certified electricians who are thoroughly grounded in electrical theory and practice. The new energy economy will create some brand new industries and many brand new jobs. But even more of it will involve transforming the industries and jobs we already have.

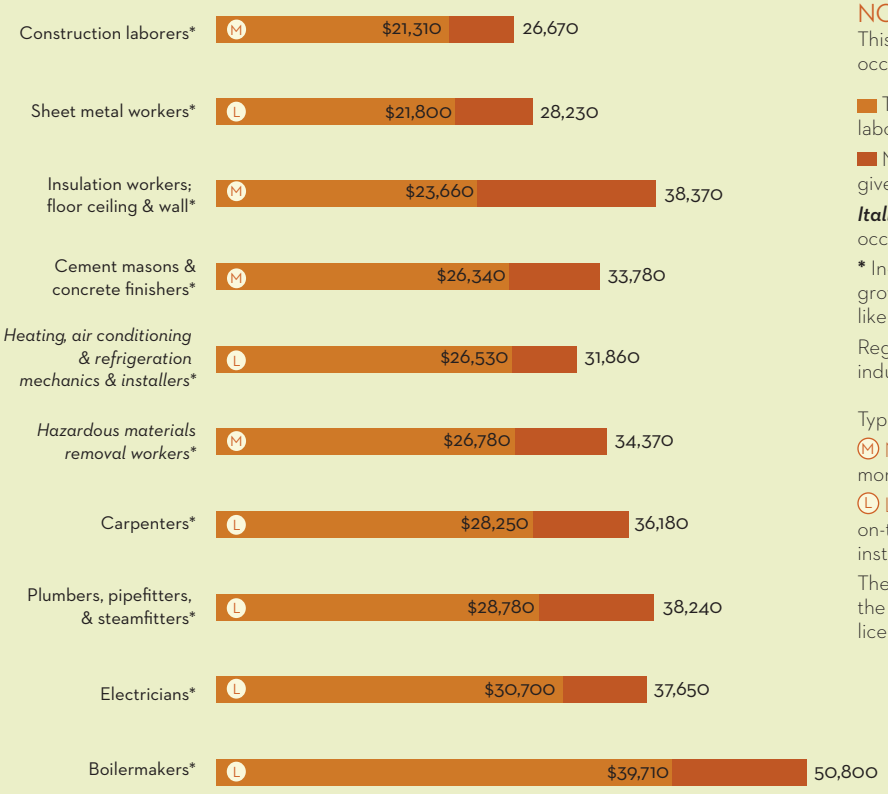
Beyond skills training, green jobs initiatives must address access and **upward mobility**. To help workers advance from unemployment, disconnection, or dead-end poverty-wage work into family-sustaining green jobs, states need to build and support career pathways. These pathways are not new ones, necessarily, but greener ones—developed in collaboration with employers, workforce agencies, community organizations, labor unions, and community and technical colleges.

Green **partnerships** provide the leadership to build greener workforce development pathways. The report profiles some of the best examples in the nation where such work is underway, including:

**Building Greener Construction Careers in California • Iowa's Bio-Fuels Job-Training Bonds • Training Turbine Techs in Oregon • Pennsylvania's Green Reindustrialization**

# Jobs At-A-Glance

## ENERGY EFFICIENCY




*Source: U.S. Bureau of Labor Statistics*

### NOTES

This chart depicts national wage data for selected middle-skill occupations in the residential building construction industry.

The 25th percentile describes wages at the lower end of the labor market.

Median wage marks the center of the wage distribution in a given occupation.

***Italics*** indicate that BLS projects faster than average growth for this occupation across all industries over the next decade.

***** In-Demand occupation per DOL, regardless of overall occupational growth levels, because the work is central to a high-growth industry, like energy or construction.

Regional wage ranges and more precise occupational projections by industry can be run on a state-by-state basis.

Typical education and training path:

Ⓜ Moderate-term on-the-job training: Requires from one to twelve months of training, which typically occurs at the workplace.

Ⓛ Long-term on-the-job training: Requires more than one year of on-the-job training, or combined work experience and classroom instruction, and may include apprenticeships of up to five years.

These are general indicators; there may be other pathways into the occupation, as well as additional educational, training or licensing requirements.

## *Key Points*

- Jobs in energy efficiency retrofitting look a lot like traditional construction jobs.
- While only two of these occupations show faster than average projected growth, the Department of Labor (DOL) identifies all 10 as "in-demand" because they are critical to high-growth industries.
- Every $1 Million invested in efficiency retrofits generates eight to eleven on-site jobs. Job numbers rise if we include indirect economic effects.
- State and municipal retrofitting programs will need to be tied to regional training programs, as the construction and building trades face imminent shortages of skilled workers.
- A good place to start greening career pathways in the building trades is through union apprenticeship and related programs, some of which are currently constructing workable pathways out of poverty.
- Some construction jobs have high wages, but offer only seasonal employment.

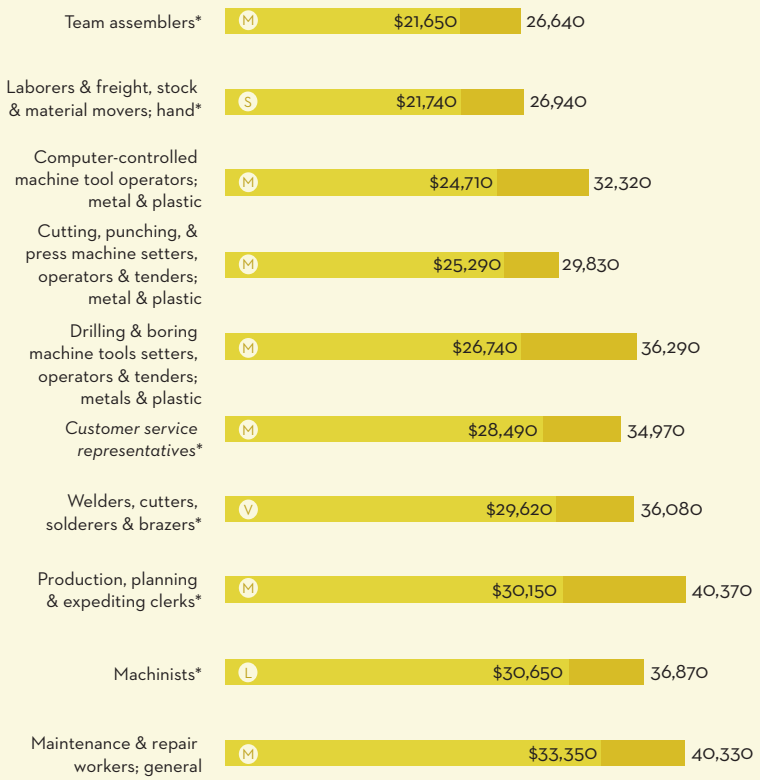
## *Jobs to Watch*

Some high-demand energy-efficiency jobs are relatively new; we do not have good wage and employment data because they are not yet tracked by the U.S. Bureau of Labor Statistics (BLS). Local research is the most fruitful source of information about these sorts of jobs.

The New York State Energy Research and Development Authority, for example, is in the process of standardizing job titles and skill requirements for energy auditors. And the Regional Economic Development Institute at Los Angeles Trade-Technical College identifies several emerging middle-skill occupations among green construction jobs with highest employment potential:

Energy and indoor air quality auditor
Deconstruction worker
HVAC operations and maintenance technician
Systems technician
Solar installer and technician

# WIND




*Source: U.S. Bureau of Labor Statistics*

## NOTES

This chart depicts national wage data for selected middle-skill occupations in turbine and power transmission equipment industry, which includes producers of critical component parts for wind turbines, such as generators and gearboxes.

The 25th percentile describes wages at the lower end of the labor market.

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Ⓛ Long-term on-the-job training: Requires more than one year of on-the-job training, or combined work experience and classroom instruction, and may include apprenticeships of up to five years.

Ⓥ Postsecondary vocational award: Requires credentials earned in training programs lasting from a few weeks to more than a year, typically offered at vocational or technical schools.

These are general indicators; there may be other pathways into the occupation, as well as additional educational, training, or licensing requirements.

## *Key Points*

- Jobs in wind turbine production look a lot like traditional manufacturing jobs.
- While only customer service shows faster than average projected growth, the Department of Labor (DOL) identifies six of these jobs as "in-demand" because they are critical to high-growth industries.
- Total employment in U.S. manufacturing is declining. Public and private investment in renewables can help connect the industrial base to a more sustainable future, thereby preserving domestic manufacturing jobs.
- To stabilize carbon emission levels, the U.S. needs to add 185,000 MW of renewable energy in ten years. The Renewable Energy Policy Project calculates wind power's share to be roughly 125,000 MW, which would support close to 400,000 domestic manufacturing jobs.
- The American wind industry is growing at an astonishing 45% per year. State and federal policy should encourage its continued expansion, and ensure that its benefits are shared with the communities and workers that manufacture, install, and operate its wind turbines.

## *Jobs to Watch*

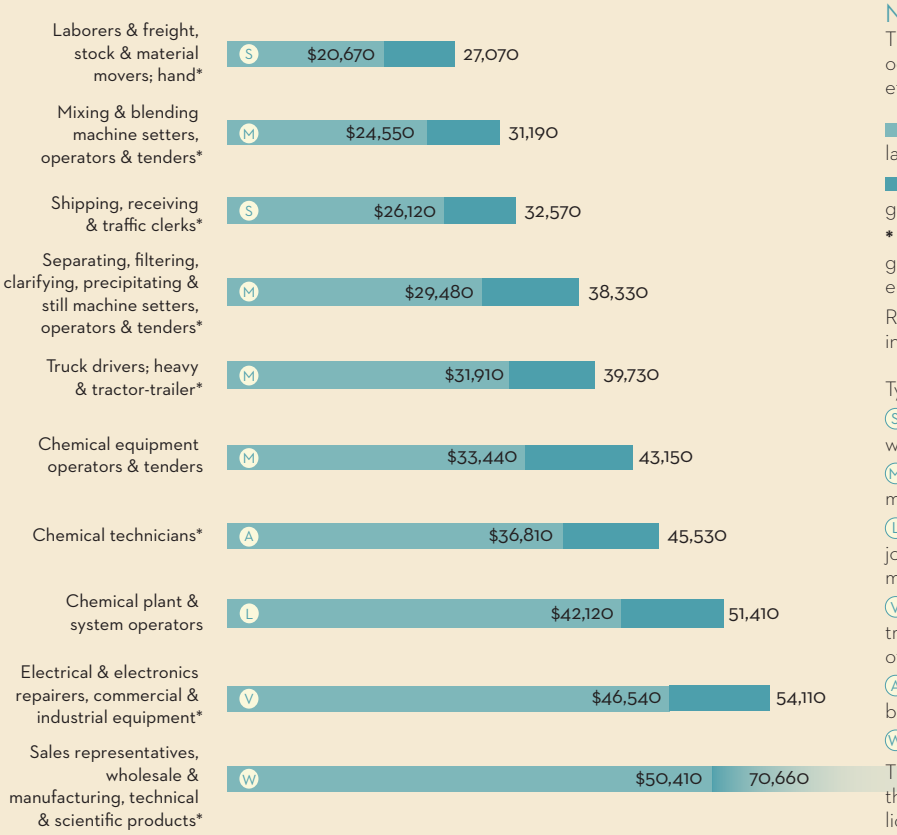
While the majority of well-paid wind industry jobs requiring less than a bachelor's degree will likely stem from component manufacturing, there will also be good jobs in installation and operations. Some of these, like Wind Technicians, are relatively new; we do not have good wage and employment data for such occupations because they are not yet tracked by the U.S. Bureau of Labor Statistics (BLS).

Local industry research is the most reliable source of specific information about emerging occupations. In Oregon's Columbia River Gorge, for example, a forward-thinking workforce partnership started training wind technicians after assessing demand in the regional labor market. Similarly, Minnesota West Community and Technical College found that employers wanted graduates of three related tracks:

Wind energy technician
Wind energy mechanic
Windsmith

*For a copy of the full report, go to: www.cows.org*

# BIOFUELS




*Source: U.S. Bureau of Labor Statistics*

## NOTES

This chart depicts national wage data for selected middle-skill occupations in the basic chemical manufacturing industry, which includes ethanol and biodiesel production.

The 25th percentile describes wages at the lower end of the labor market.

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Ⓛ Long-term on-the-job training: Requires more than one year of on-the-job training, or combined work experience and classroom instruction, and may include apprenticeships of up to five years.

Ⓥ Postsecondary vocational award: Requires credentials earned in training programs lasting from a few weeks to more than a year, typically offered at vocational or technical schools.

Ⓐ Associate degree: Requires two years of full-time academic work beyond high school.

Ⓦ Work experience in related occupation.

These are general indicators; there may be other pathways into the occupation, as well as additional educational, training, or licensing requirements.

## *Key Points*

- Jobs in biofuels often look like traditional chemical manufacturing jobs.
- While none of these occupations shows faster than average projected growth, the Department of Labor (DOL) identifies all but two as "in-demand" because they are critical to high-growth industries.
- Jobs in biodiesel and ethanol production pay decent wages, but offer few jobs: A 50 million gallon per year (MGY) plant employs on average 35 workers. A few good jobs, however, can bring significant benefits to rural communities.
- Increasing the scale of production does not significantly increase employment. An ethanol operation that grows from 40MGY to 100MGY might grow from 35 to 45 or 55 workers; a biodiesel plant expanding from 4 to 10MGY could potentially operate at the same general staffing level—12 employees.
- The job creation potential of biofuel refineries has been greatly exaggerated. Reliable studies now suggest that the jobs multiplier is a modest 3-4, depending on local markets. Local ownership demonstrably boosts indirect economic impacts.
- Metal manufacturing jobs will likely be in demand as the biofuels industry matures. While no empirical studies yet exist on the nature and scale of the requisite supply chains, we do know that the biofuel infrastructure needs capital goods—tanks, boilers, centrifuges, etc. As traditional shops step up to produce them, skilled labor will be in high demand.

## *Jobs to Watch*

As with some efficiency and wind sector jobs, biofuels jobs are relatively new. We do not have good wage and employment data because they are not yet tracked by the U.S. Bureau of Labor Statistics (BLS). In the absence of solid labor market data, local research can provide critical information to workforce development partners.

Indian Hills Community College in Iowa, for example, surveyed the regional ethanol industry and developed job guides for shift maintenance and plant operator positions, which became the basis of its Ethanol Plant Technician A.A.S. program. The college is now working to codify biodiesel occupations.

Related jobs include:

Ethanol plant technician
Ethanol plant operator
Ethanol maintenance mechanic
Biodiesel laboratory technician
Biodiesel maintenance mechanic
Biodiesel process control technician