

Occupational Implications from Indiana's Green Economy

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LinkedIn: Join “**Green Tech Manufacturing**” group

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Indy Partnership

EDO for the Indianapolis Region

Focused on marketing the Region's strengths in:

- Life Sciences
- Clean-Tech Energy
- Advanced Manufacturing
- Transportation, Distribution, Logistics
- Information Technology
- Motorsports



A top-ten economic development organization for 2008.
(*Site Selection Magazine*)



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The “greening” of occupations refers to the extent to which green economy activities and technologies:

Increase the demand for existing occupations,
“*Green Increased Demand*” occupations

Shape the work and worker requirements needed for occupational performance, or
“*Green Enhanced Skills*” occupations

Generate unique work and worker requirements
“*New and Emerging*” (N&E) occupations

Source: National Center for O*Net Development, 2009

www.onetcenter.org/reports/Green.html



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Green Economy Activities and Technologies

Renewable Energy
Generation
Transportation
Energy Efficiency
Green Construction
Energy Trading
Energy and Carbon
Capture and Storage
Research, Design, and
Consulting Services

Environment Protection
Agriculture and Forestry
Manufacturing
Recycling and Waste
Reduction
Governmental and
Regulatory
Administration

Source: National Center for O*Net
Development, 2009



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Indiana Existing Relative Strength

Renewable Energy
Generation

Transportation

Energy Efficiency

Green Construction

Energy Trading

Energy and Carbon
Capture and Storage

Research, Design, and
Consulting Services

Environment Protection

Agriculture and Forestry

Manufacturing

Recycling and Waste
Reduction

Governmental and
Regulatory
Administration

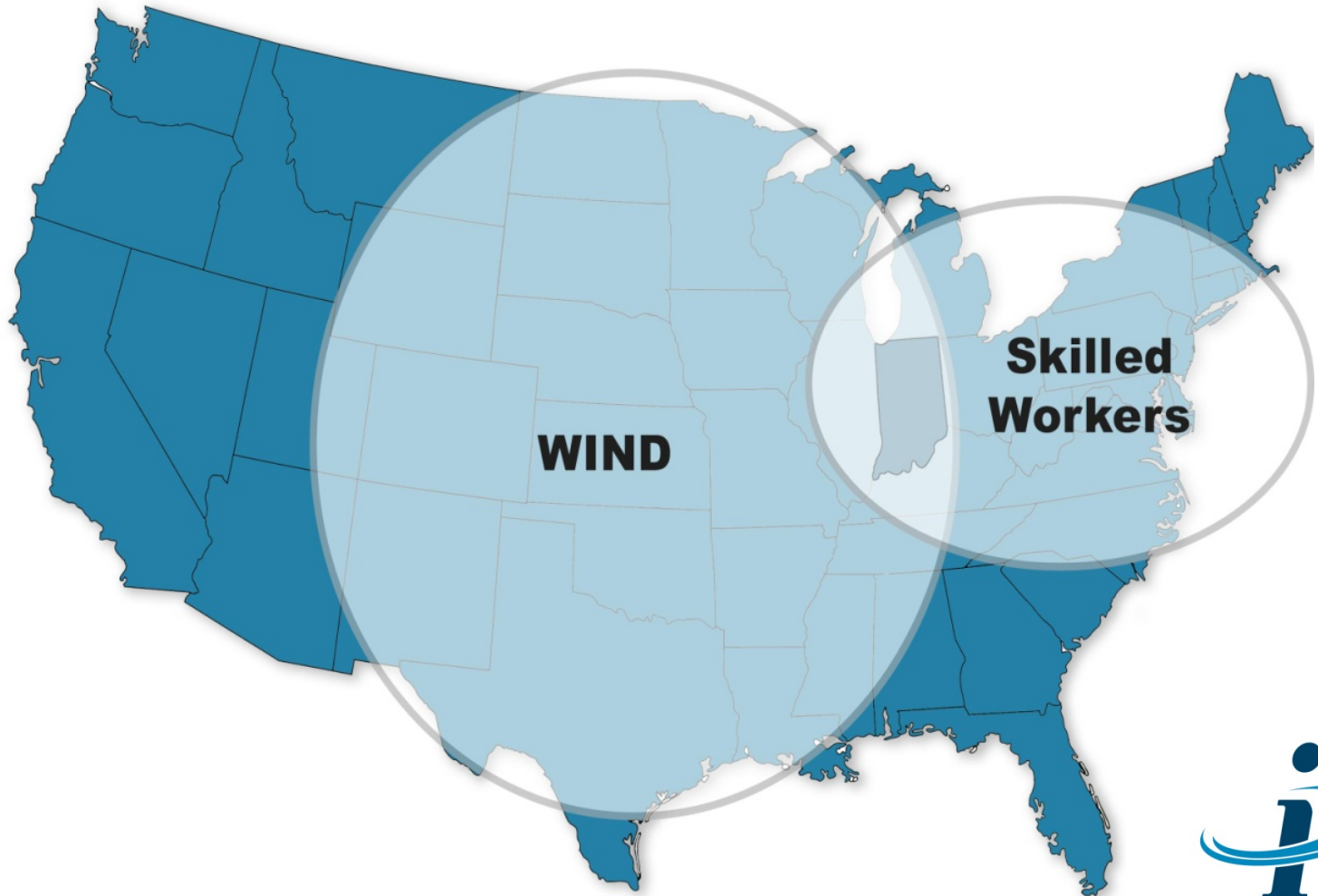
Sources: Bureau of Labor Statistics,
Census Bureau, 2009.



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Skilled Workforce vs. Wind Resource Locations



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Manufacturing Sector

Indiana ranks #1 in advanced manufacturing technology. Ewing Marion Kauffman Foundation, 2007 New Economy)

Most productive manufacturing workers in Midwestern U.S.
(Census of Manufacturers, 2006)

Manufacturing employment = 13% of Indianapolis Region's workforce.

More than 2x U.S. average
(Bureau of Labor Statistics, May 2008 OES)

The Indianapolis Region hosts >100,000 jobs in manufacturing.
(Bureau of Labor Statistics, May 2008 OES)

The Indianapolis Region has over 375 manufacturing facilities with ≥ 50 employees. (Dun & Bradstreet, 2009)

Indianapolis Region

Occupation	Current Employment	Current Applicants
Machinists	25,130	882
Engineers*	8,120	2,430
Engineering Technicians*	2,040	801
Drafters	2,620	453

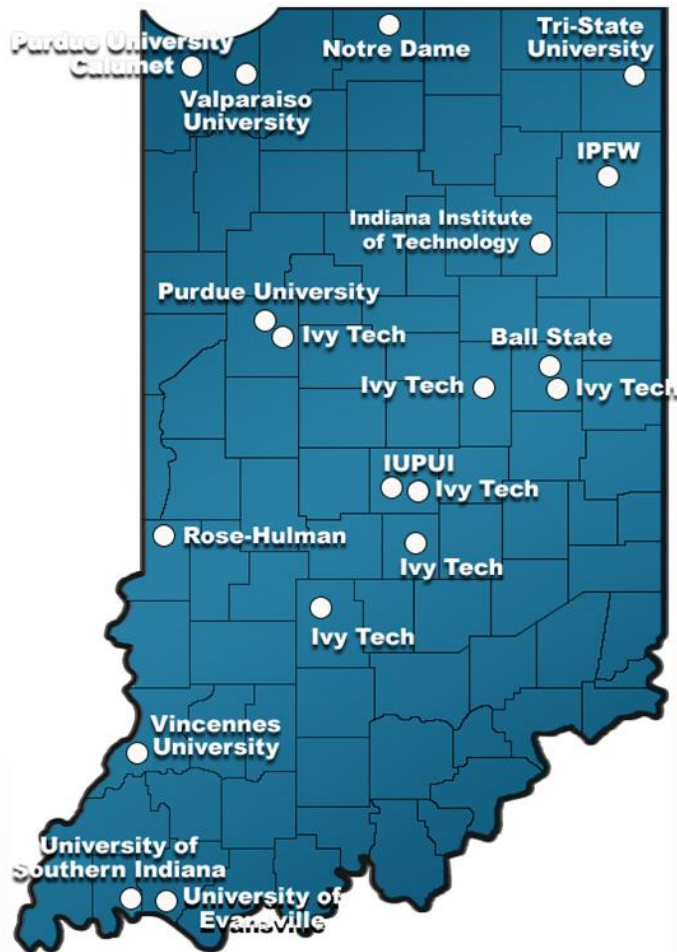
* Does not include civil or health. Employment for some sub-occupations were not reported.



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Engineering Schools in Indiana



2007 Completions

Associates Degrees 992

Bachelors Degrees 3,128

Graduate Degrees 935

4-Year Schools

Ball State University
 Indiana Institute of Technology
 Indiana University- Purdue University, Fort Wayne
 Indiana University- Purdue University, Indianapolis
 Purdue University
 Purdue University Calumet
 Rose- Hulman Institute of Technology
 Tri-State (Trine) University
 University of Evansville
 University of Notre Dame
 University of Southern Indiana
 Valparaiso University

2-Year Schools

Vincennes University
 Ivy Tech Community College

(only the Ivy Tech locations
 in central Indiana are shown
 on the map)



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University Support

Purdue University Renewable Energy Center

Research park at Ameriplex

- Research in turbine engines, including world-recognized success in noise reduction technologies
 - Vibration
 - Nanotech
- School of Mechanical Engineering - 7th for both undergraduate and graduate programs (U.S. News)
- Operates research wind farm near Lafayette campus



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University Support

Sen. Richard G. Lugar Center for Renewable Energy –
Indiana University Purdue University - Indianapolis

Areas of Current Research

- Fuel cell technology
- Hydrogen (Solar, Reformers)
- Bio-fuels
- Advanced batteries
- Hybrid Electric Vehicles
- Plug-in Hybrid Electric Vehicles
- Policy and societal issues



www.lugarenergycenter.iupui.edu

Collegiate Energy Summit
9/18/09



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Other Indiana Opportunities

Renewable Energy
Generation
Transportation
Energy Efficiency
Green Construction
Energy Trading
Energy and Carbon
Capture and Storage
Research, Design, and
Consulting Services

Environment Protection
Agriculture and Forestry
Manufacturing
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Sources: Bureau of Labor Statistics,
Census Bureau, 2009.



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National Occupational Forecasts in Indiana's Strengths and Opportunities



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Renewable Energy Generation

Wind and solar offer more jobs per mW of power than most other energy regimes

(Source: Plunkett Research, 2009)

Developing dedicated energy crops could create more than 120,000 jobs by 2012 (Source: DOE, 2002)

Biomass currently employs roughly 66,000 people with a 200% growth capability related to developing dedicated “energy crops” used for fueling biopower generators (Source: Dierdorff et al., 2006)



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Transportation

Increased demand occupations include railroad conductors and locomotive engineers

Enhanced skills occupations include automotive specialty technicians, transportation managers, and electronics engineers

Examples of N&E occupations include fuel cell engineers & technicians, and automotive engineers & technicians

Source: National Center for O*Net Development, 2009



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Agriculture and Forestry

Increased demand occupations include agricultural workers and inspectors

Enhanced skills occupations include farmers and ranchers, landscape architects, and agricultural technicians

N&E occupations in precision agriculture and biomass farming

Source: National Center for O*Net Development, 2009



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Manufacturing

Occupational impact is most likely to be in the forms of increased demand and enhanced skills occupations.

Existing manufacturing occupations such as
drilling and boring machine tools setters, operators and tenders
separating, filtering, clarifying, precipitating and still machines setters,
operators and tenders

Enhanced skills occupations may include occupations such as
industrial engineering technicians
electrical engineering technicians
machinists
occupational health and safety technicians

N&E occupations likely in manufacturing of products designed and developed by engineers in such fields as biochemistry, microsystems engineering, and photonics.

Source: National Center for O*Net
Development, 2009



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Research, Design, and Consulting Services

Increased demand and green enhanced skills occupations through “indirect jobs” or occupations such as financial analysts, sales representatives, geoscientists, engineering managers, marketing managers, and public relations specialists

N&E possible in marketing green products or services, research and development engineers of green technology

Source: National Center for O*Net Development, 2009



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Energy Efficiency

Increased demand occupations include
electrical power line installers and
repairers,
stationary engineers and boiler operators,
boilermakers

Enhanced skills needed in heating and air conditioning
mechanics and installers, and mechanical engineers

N&E include weatherization or sealing of buildings to
improve energy efficiency

Source: National Center for O*Net
Development, 2009



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Questions?

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