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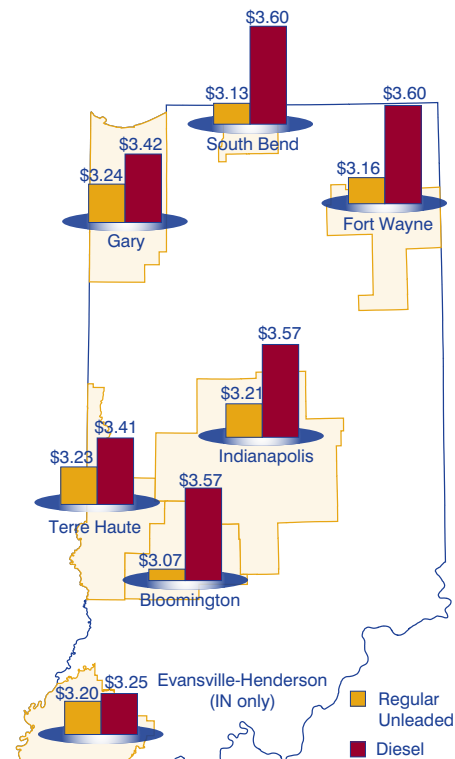
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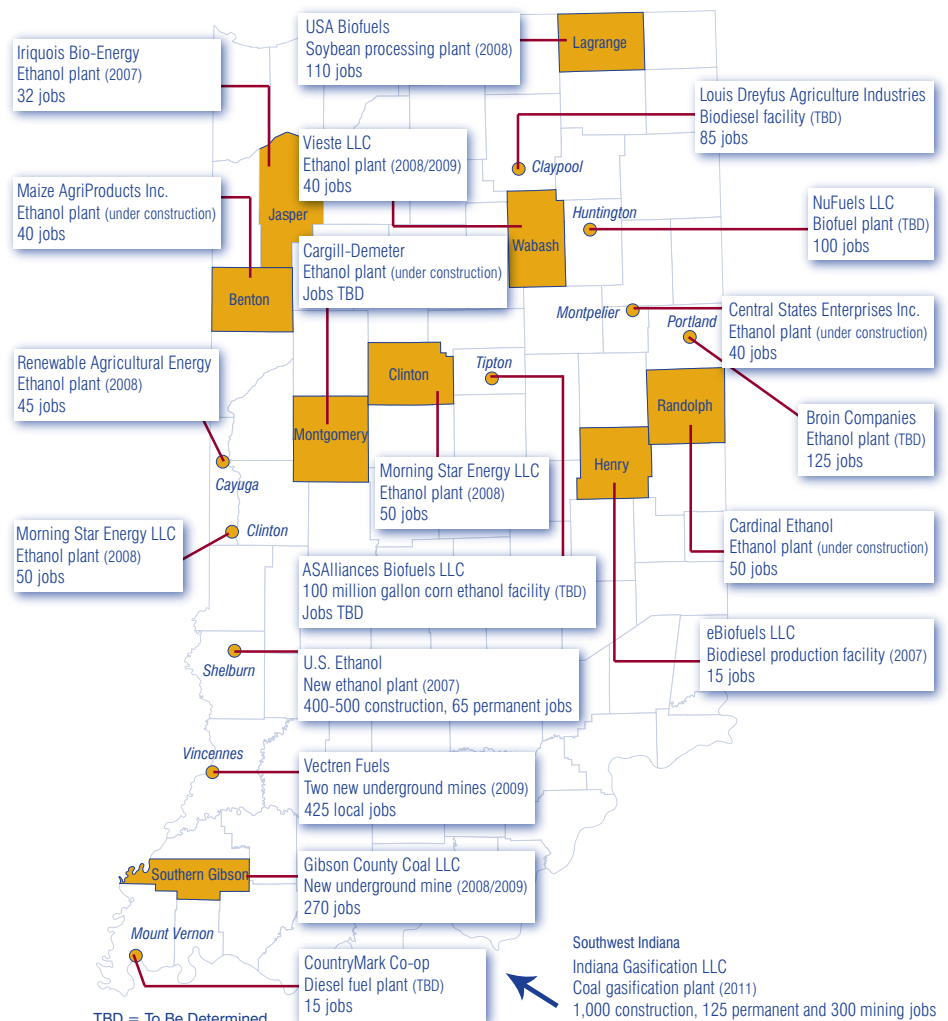
Note: Current data as of February 6, 2007
Source: IBRC using AAA data

Is Indiana Ready to Be an Emerging Leader in the Biofuels Industry?

You cannot go long in today's world without hearing conversations, sound bites, commercials or debates about the energy crisis, our dependence on foreign oil and the looming threat of global warming. But what does this mean for the Hoosier workforce? There is a steady stream of regular

announcements concerning new ethanol, biodiesel and coal gasification plants sprouting up around the state. What do we know about these new technologies and the types of jobs that these developments will bring? Does the Indiana workforce have the skills and experience necessary to fill these positions?

FIGURE 1: ENERGY SECTOR EXPANSIONS AND JOB ANNOUNCEMENTS, 2006



Source: Research and Analysis Department, Indiana Department of Workforce Development

In 2006, there were 18 proposed ethanol, biodiesel and coal gasification projects (new and expansion sites) in Indiana (see **Figure 1**). According to the Indiana Corn Marketing Council, at least 20 ethanol plants alone have been proposed since 2005. Controversy still surrounds many of these projects. The debate continues over which new technology will yield the greatest economic benefit with the highest energy efficiency and least damaging environmental impact. Yet if these projects are approved, all of them will

be using new technology to access resources in the Hoosier Heartland, such as coal, animal waste, corn and soybeans.

As a result of these expansions, thousands of new jobs have been announced, including occupations in advanced manufacturing, construction and extraction. These new plants will also require people to fill managerial and leadership positions. Some jobs will require advanced technology skills and could pay higher wages than Indiana manufacturing jobs of

old. The projects are estimated to add more than 1,500 construction jobs (up to 500 may be permanent) throughout the state. The average wage for construction/extraction occupations is \$36,855.¹ Many of the permanent jobs will be in chemical manufacturing and mining. The average wage for employment in these related industries is slightly higher at \$41,934. Many of these occupations do not require postsecondary education; however, a moderate to long-term level of on-the-job training or previous work

TABLE 1: JOBS AND EXPERIENCE REQUIRED IN THE CHEMICAL MANUFACTURING (BIOFUELS) AND MINING INDUSTRIES

Job Title	Education Needed	Total Indiana Employment, 2004	Average Wage, 2004	Applicants (Southwest Indiana)	Skill Cluster*
Chemical engineers	Bachelor's degree	560	\$81,626	18	Information
General and operations managers	Bachelor's degree or higher, plus work experience	31,660	\$77,402	2,417	Systems
Chemists	Bachelor's degree	2,080	\$73,048	34	People
Industrial production managers	Bachelor's degree	5,180	\$67,588	335	People
First-line supervisors/managers of mechanics, installers and repairers	Work experience in a related occupation	13,800	\$49,763	212	Things
Industrial machinery mechanics	Long-term on-the-job training	7,770	\$45,637	n/a	Things
First-line supervisors/managers of production and operating workers	Work experience in a related occupation	26,820	\$44,417	2,776	Things
Separating, filtering, clarifying, precipitating, and still machine setters, operators, and tenders	Moderate-term on-the-job training	750	\$40,314	26	Things
Mine cutting and channeling machine operators	Work experience in a related occupation	130	\$39,340	130	Things
Chemical plant and system operators	Long-term on-the-job training	1,000	\$36,930	31	Systems
Truck drivers, heavy and tractor-trailer	Moderate-term on-the-job training	58,660	\$36,406	1,061	Things
Chemical technicians	Associate degree	1,470	\$35,306	81	Systems
Electrical and electronic repair workers, commercial and industrial equipment	Postsecondary vocational training	1,550	\$35,058	101	Systems
Chemical equipment operators and tenders	Moderate-term on-the-job training	3,140	\$32,355	137	Systems
Maintenance and repair workers, general	Long-term on-the-job training	36,640	\$31,894	558	Things
Executive secretaries and administrative assistants	Moderate-term on-the-job training	25,360	\$31,629	4,050	People
Mixing and blending machine setters, operators, and tenders	Moderate-term on-the-job training	3,120	\$31,189	228	Things
Continuous mining machine operators	Moderate-term on-the-job training	110	\$30,764	124	Things
Inspectors, testers, sorters, samplers and weighers	Moderate-term on-the-job training	18,590	\$29,186	3,148	Things
Packaging and filling machine operators and tenders	Short-term on-the-job training	11,570	\$25,502	n/a	Things
Shipping, receiving and traffic clerks	Short-term on-the-job training	17,490	\$25,406	1,968	People
Laborers and freight, stock, and material movers, hand	Short-term on-the-job training	60,530	\$21,797	1,265	Things

*These are the skills necessary for successful employment based on Indiana's research to develop new skill-based career clusters
 Note: This list accounts for 66 percent of total employment in the chemical manufacturing (biofuels) and mining industries. The remaining employment is divided among another 128 occupations.
 Source: Research and Analysis Department, Indiana Department of Workforce Development

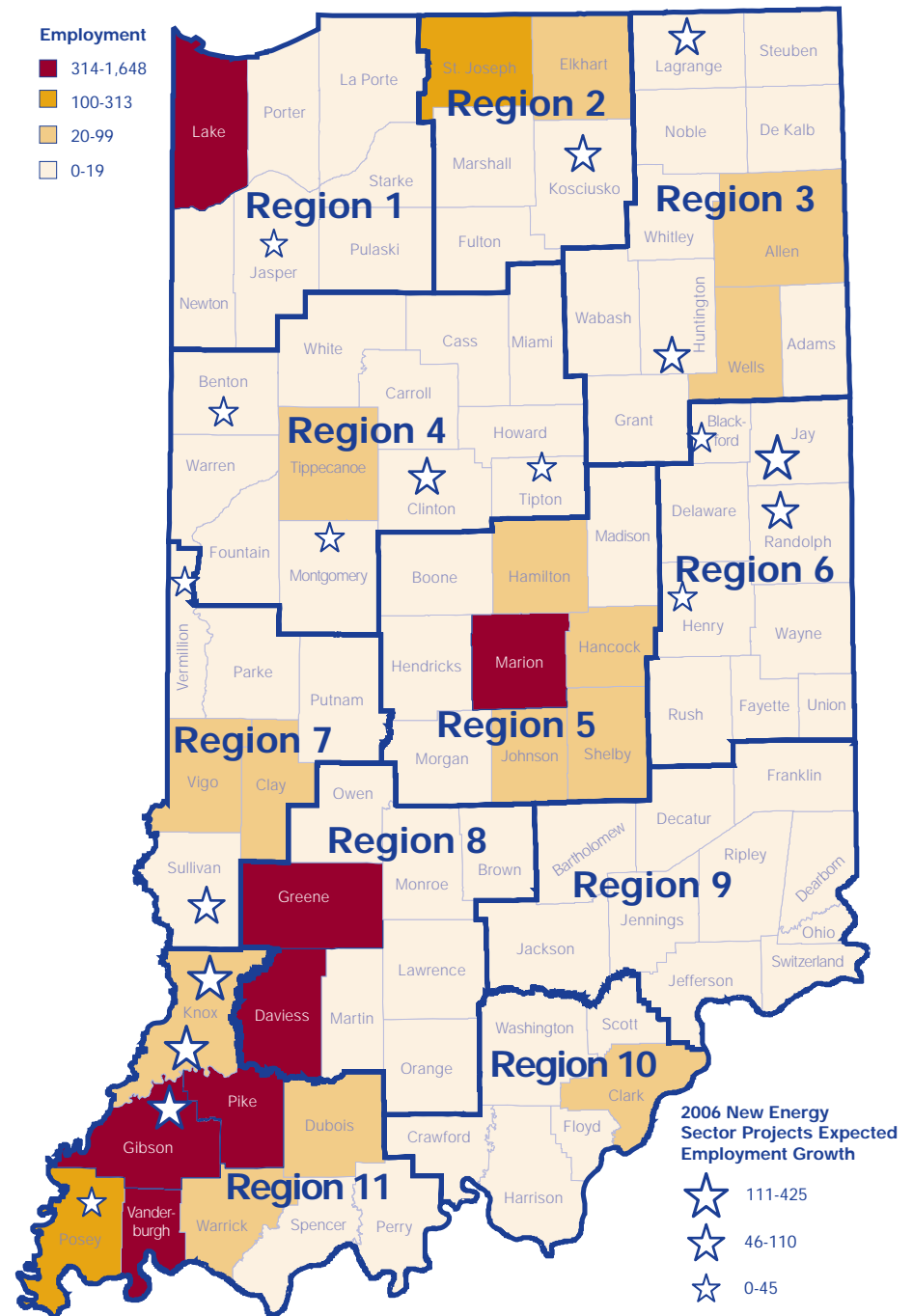
experience may be required. The typical skills required by these jobs include equipment maintenance, equipment selection, installation, operation and control, operation monitoring, repairing, and troubleshooting. **Table 1** lists the types of jobs and the required education and skills.

Where We Are

Indiana's workforce has a strong historical precedent of a vibrant manufacturing industry. In the first quarter of 2006, 550 businesses in mining and related biofuel manufacturing industries employed an average of 12,042 workers statewide. However, contractions, company reorganizations and relocations in recent years have created a large pool of dislocated workers. According to mass layoff statistics for the mining, manufacturing, utilities and construction industries,² a total of about 6,750 layoffs occurred at 48 establishments throughout the state dating back to 2001. The highest concentration of these layoffs was located in southwest Indiana, with a total of 4,304 layoffs at 36 establishments in economic growth regions (EGRs) 7, 8, and 11. Fortunately, this is where several of the new developments will occur (see **Figure 2**). Some of the announcements pledging to bring the greatest numbers of jobs are located in these southwest regions of the state.

A major source of labor supply for the energy industry expansion will be supported by dislocated workers who predominantly come from construction, production and extraction occupations. These jobs typically require moderate-to long-term on-the-job training. Only a few occupations require workers to have a bachelor's degree. This pool of workers has a substantial amount

FIGURE 2: ENERGY SECTOR EMPLOYMENT AND ATTRACTION PROJECTS, 2006:1



Source: Research and Analysis Department, Indiana Department of Workforce Development

“According to mass layoff statistics for the mining, manufacturing, utilities and construction industries, a total of 6,750 layoffs occurred at 48 establishments throughout the state (dating back to 2001).”

of work experience and their skills will transfer well to these new jobs in biofuels and other energy sector initiatives.

Where We Are Headed

In the southwest region of the state (EGRs 7, 8 and 11) more than 12,000 job applicants from Indiana's Department of Workforce Development (DWD) job-matching system reported 12 months or more of related experience in mining, construction and production occupations.³ The numbers of job applicants in each of the occupations specific to the biofuels and mining industries are listed in **Table 1**. Of those with more than one year of experience, the average level of experience is a little over seven years. More than 10,000 of these applicants report having attained some college, more than 2,500 report having a bachelor's degree, over 3,000 report having an associate's degree and approximately 500 report having a postsecondary vocational degree.

However, fewer applicants possess employment experience in occupations that emphasize managerial skills, information technology skills, and interpersonal skills, such as coordination, instructing, negotiation, persuasion, service orientation, social perceptiveness and time management. Training and education that targets these skill areas are needed to fully develop the potential of this emerging workforce. Assessment of applicants using WorkKeys or other skill-assessment tools (and providing additional training or retraining as appropriate) will prove valuable in preparing the available workforce for the specific tasks required for the new, high-tech jobs being created in the biofuels industry.

Are We Ready?

This initial glance results in a fair degree of confidence in Indiana's ability to fill many of the projected new jobs with a skilled and experienced workforce; nevertheless, there is room for opportunity and growth. In the 21st century economy, employers increasingly demand workers with advanced technology and computer skills. Although these energy-related expansions are heavy with jobs for the manufacturing, mining and construction industries, many of the added jobs will require new skill proficiencies. Indiana's Strategic Skills Initiative (SSI) identified skill shortages throughout the state in the following areas: critical thinking, complex problem solving, science, mathematics, reading comprehension and active (lifelong) learning. The SSI also pointed to shortage areas including advanced manufacturing and medical technology.

Many national articles also emphasize shortage areas in science, engineering and technology, as America faces increased global competition. American (and Indiana) workers at every skill level are in direct competition with workers throughout the world. Indiana and the United States can maintain a competitive advantage with increases in education and training that will lead to innovation and creativity.⁴

Conclusion

The Indiana workforce is ready to fill many posts for the projected ethanol, biofuel and coal mining plants. Experienced workers and an emerging workforce with growing levels of educational attainment will ensure that Indiana remains a powerful hub of manufacturing (chemical and

"Experienced workers and an emerging workforce with growing levels of educational attainment will ensure that Indiana remains a powerful hub of manufacturing (chemical and otherwise), mining and construction."

otherwise), mining and construction. WorkOne Centers⁵ will direct dislocated or underemployed workers to this expanding industry and, with increased focus on the educational and skill shortages that exist, Indiana will be well able to meet the challenge of this expanding, high-tech sector.

Notes

1. Based on the staffing patterns of construction/extraction occupations in mining and biofuels related industries: www.hoosierdata.in.gov/dpage.asp?id=24&view_number=2&menu_level=smenu1&panel_number=2.
2. The Mass Layoff Statistics (MLS) program measures job losses or separations when an establishment's employees file at least 50 initial claims for unemployment insurance during a consecutive five-week period. MLS does not track smaller industry cutbacks and often misses dislocated workers who are offered packages, or are let go over a period of time.
3. DWD CS3 System as of December 2005.
4. National Center on Education and the Economy, the Commission on the Skills of the American Workforce, "America's Choice: high skills or low wages!" 1990, available at www.skillscommission.org; Richard B. Freeman, "Investing in the Best and Brightest: Increased Fellowship Support for American Scientists and Engineers," *The Hamilton Project*, December 2006, available at www.hamiltonproject.org; The National Association of Manufacturers (NAM)—2005 Skill Gap Report.
5. WorkOne Centers are designed as one-stop shops, able to assist job seekers and the unemployed with a wide range of employment and training services. For more information, call 1-888-WORK-ONE or visit www.in.gov/dwd/job_seekers/workone_centers.html.

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