



Industries of the Future – West Virginia

Technology Partnerships for West Virginia's Traditional Industries

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West Virginia is a(n) _____ State!

WV Industry Comparisons (2000 data)*

Industry Sectors	GSP (\$M)	Employment	GSP/Emp
Primary Metals	918	10,707	\$85,738
Fabricated Metals	369	6,192	\$59,593
Stone, Clay, & Glass	337	6,604	\$51,030
Chemicals & Polymers	2,899	14,254	\$203,382
Rubber & Plastics	173	3,727	\$46,418
Lumber & Wood Products	591	13,018	\$45,399
Paper & Allied Products	73	1,233	\$59,205
Total for IOF-WV Sectors	5,360	55,735	\$96,169
Total for WV Manufacturing	6,760	84,557	\$79,946
IOF-WV % of Manufacturing	79%	66%	
Coal Mining	2,126	16,140	\$131,722
State Totals	42,271	889,370	\$47,529

*Source: U.S. Department of Commerce, Bureau of Labor Statistics, www.bea.doc.gov

The DOE's Industrial Technologies Program

- Created in 1994 as Industries of the Future
- Managed by the Office of Industrial Technologies (OIT) in the U.S. DOE Office of Energy Efficiency and Renewable Energy (EERE)
- What will energy-intensive industries look like in five years, in ten years, in twenty years? (Vision)
 - Aluminum, steel, glass, chemicals/polymers, wood/forest products, metal casting, mining
- How do they evolve in an energy and resource efficient, economically viable manner? (Technology Roadmaps)
- OIT website: www.oit.doe.gov

IOF-WV Program

- West Virginia was the first state to launch a state IOF program in 1997 in partnership with the WV Development Office
- The IOF-WV goals:
 - Provide forums for interdisciplinary collaboration
 - Engage new technologies for the benefit of traditional industries
 - Develop teams and obtain co-funding for high priority R&D projects
- For further information visit our website:
<http://iofwv.nrcce.wvu.edu>

Industry Working Groups are the Heart of the Program

- University researchers with strong industry ties – Larry Banta, John Loth, Bob Creese, Rakesh Gupta, Ed Sneckenberger, Joe McNeel, Syd Peng, Bonnie Morris, B. Gopalakrishnan, and G. Hota
- Enthusiastic industry contacts – Ric Love, Howard Snyder, Pat Minehardt, Scottie Workman, Marshall Moore, Earl Melby, Beri Fox, Tom Fenton, Brent Blalock, Lanny Williamson, Jan Berkow, Bill Motsinger, John Morris

Examples of IOF-WV Projects

- Targeted energy savings at Century Aluminum of \$15 million per year with new diagnostic and control system
- Energy savings of \$20 million at Weirton Steel since 1998, equivalent to \$8 per ton cost reductions
- Permitting productive reuses of spent foundry sand has saved HK Casting \$650,000 to date

- \$1.48 million in energy saving opportunities at Bayer Chemical with a payback of 12 months
- Center for Extrusion Compounding of Additives for Superior Plastics Performance. One of six Research Challenge Grants funded by the WV Higher Education Policy Commission
- Laser glass cutting machine that could reduce waste by 25%
- Energy assessments at eight wood products companies show that West Virginia's wood/forest products industry could save more than 1.2 trillion BTUs per year equivalent to \$8.6 million and approximately 525 million pounds of CO₂ annually

Business and Industry Leaders for Energy Efficiency

- Industry commitments to energy efficiency and sustainable development
 - Dupont : source 10% of global energy needs from renewable sources by 2010
 - Home Depot commitment to sustainable forestry
 - Alcoa: reduce greenhouse gas emissions by 25% by 2010
- The DOE's Industrial Technologies Program puts energy and resource efficiency values on the front burner

R&D Challenges for the Future

- Project development sessions in December 2002 identified 147 key project topics
 - 64 for metals (aluminum, steel, metal casting)
 - 19 for chemicals/polymers
 - 9 for glass/refractory products
 - 17 for wood/forest products
 - 22 for mining
 - 7 for CHP/distributed and renewable energy
 - 9 crosscut technologies

Six Representative Project Areas

- Design and Development of Materials for Molten Metal Handling and Processing
- Conversion of Biomass to Fuels and Chemicals- Alternate Feedstocks for Commodity and Specialty Chemicals & Polymers
- Improved Critical Melter Refractory Products

- Efficient use of Excess Heat and Waste Gas from Industrial Processes
- Recovery and Utilization of Coal Fines and Waste Coal
- Intelligent manufacturing sensors & controls, including a structured methodology for energy analysis, diagnostics, and continuous assessment

Other IOF-WV Activities

- Annual IOF-WV Symposia
- Annual IOF-WV Day at the State Capitol
- Talks, exhibits, and consulting on the IOF-WV “journey”
- Newspaper and magazine articles
- Radio and television interviews
- IOF-WV Video

Concerns for Manufacturing in the U.S.

- Asian manufacturers have discovered America!
- Manufacturing morphing into service sector
- Manufacturing jobs are way down, but productivity is generally high – the factory of the future – one man and one dog!
- We can help create (energy) advantages for West Virginia manufacturing companies

What's Next?

- Think about West Virginia's industrial future
- Tap into some of West Virginia's "accumulated" manufacturing knowledge
- You, your company, and your contacts can help define the next generation of industrial technologies and manufacturing in West Virginia