Industries of the Future in West Virginia:
The Benefits of Public-Private Partnership with Higher Education
Prepared remarks of
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Introduction of WVU President David C. Hardesty, Jr.
by Denise F. Swink, Deputy Assistant Secretary for Industrial Technologies
The IOF approach to facilitating R&D is a continually evolving process. It started several years ago when we asked industry groups to take a lead in setting long-term goals and research priorities for whole industry sectors. That approach is working extremely well, as you can see from the vibrant activity at this EXPO.
Over the past two years, a new dimension to implementing IOF programs has been evolving and it is being led by the state of West Virginia. State-level IOF programs have turned out to be an excellent way to reach industry at the grass roots level. The first IOF-WV industry working group meeting was in June 1997 for the WV glass industry. At that time, there were no other state-level organizations anywhere in the country seeking to involve entire industry sectors in IOF programs. Now there are 32 states in various stages of implementing state-level IOF programs.
As one of less than 50 Research I, Doctoral I, comprehensive land-grant universities, West Virginia University has been extensively involved in the IOF-WV effort. This has turned out to be a very appropriate role for the state's flagship institution, as you will hear from our next speaker – WVU President David Hardesty.
President Hardesty is a graduate of WVU and was the 16th of WVU's 25 Rhodes scholars. He was awarded an M.A. degree from Oxford and a J.D. degree from Harvard Law School. He practiced law for 20 years at the firm of Bowles Rice McDavid Graff and Love. Mr. Hardesty's legal career was wide ranging and included considerable experience in banking, taxation, general corporate and economic development law. He has served on numerous state boards, including an appointment as the first chair of the University System Board of Trustees. From 1977 to 1980 he was the Tax Commissioner of West Virginia by appointment of then Governor Jay Rockefeller and led aggressive state tax reforms during that time.
President Hardesty is a hands-on, involved, activist academic leader. His initiatives to transform WVU as a student-centered university have earned national recognition on Good Morning America, in the New York Times and USA Today. Notable among these many initiatives are outstanding freshman-year orientation programs, resident faculty in the student residence halls, a Parents club, and a recently launched Career Success Academy designed to offer world class job opportunities to WVU graduates. He is confronting the difficult issues of higher education today, creating and overseeing programs, partnerships, and creative structures that are having a profoundly positive effect in West Virginia and are influencing higher education nation-wide. His leadership and active involvement in IOF-WV are isHis examples, along with initiatives to develop research areas of excellence and a WVU Science and Technology Park.

Please join me in giving WVU President David Hardesty a warm welcome to the EXPO luncheon.

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David C. Hardesty, Jr.,
President, West Virginia University

Introduction

Good afternoon. And thank you for inviting me to speak to you today. I consider it a distinct honor to share information with you about the state-level Industries of the Future process now underway in West Virginia.

Before I do that, please allow me to thank Denise Swink and her team in the Office of Industrial Technologies for help in getting Industries of the Future-West Virginia off the ground. Denise and her staff have encouraged us from the beginning, and we are most grateful. I also would like to thank Carl Irwin of West Virginia University's National Research Center for Coal and Energy for his leadership in this program. And, we want to especially thank Dan Reicher, the Assistant Secretary for Energy Efficiency and Renewable Energy, for his interest and support of our efforts in West Virginia.

The West Virginia Development Office is a key partner in developing IOF-WV, primarily through its Energy Efficiency Program. This program, run by Jeff Herholdt, coordinates West Virginia's participation in the DOE's State Energy Program.

As you may have heard, I came to my current position by a roundabout route. I have spent most of my working life as a lawyer with primary interests in business law and economic development. I have also been a state cabinet official, in which capacity I sat on our state Economic Development Authority during Jay Rockefeller's first term as Governor of West Virginia in the late 1970s. This background gives me, as a university president, a special, sincere interest in the Industries of the Future process in West Virginia.

The West Virginia IOF project is an industry-led, visioning process intended to design and implement cost-shared R&D projects, the successful completion of which will move an entire industry toward improved productivity, through better energy efficiency, waste reduction and utilization, and use of new technologies.

In order to help you understand why we have strongly embraced the IOF program in West Virginia, let me share some insights with you about our state and its flagship university, West Virginia University.

Our State's Economy

West Virginia's economy has been dominated for many, many years by traditional industries: coal, oil, gas, timber, glass, steel, aluminum, and other metals. The combined might of these industries is still 75% of our manufacturing and more than 20% of the overall GSP in West Virginia.

In recent decades, however, the globalization of trade and state policy have led to diversification, with service industries, light manufacturing, government, transportation, and tourism increasing their economic importance to West Virginia. We have also seen real changes in traditional industries. For example, thousands of tons of steel are sold each month through MetalSite — an Internet-based marketplace for steel products.

Nevertheless, our historic reliance on traditional industries explains a lot about West Virginia's government and politics, our educational system, and our economic development policies.

Our State's Government

Governor, now Senator, Jay Rockefeller's administration began looking at our economic development policies in a serious way in 1977. His innovations included the

concept of a professional economic development staff, international trade offices, comprehensive tax reform, and economic diversification. Subsequent governors have continued this momentum.

During Governor Gaston Caperton's administration, 1989 to 1997, the economic development office became a public-private partnership, with business executives joining government executives on our state's development policy council. The effort has been bipartisan, and our current governor, Cecil Underwood, has maintained the prior reforms and continued pro-development initiatives.

We have been fortunate also to have a very experienced, strong, and visionary Congressional delegation led by Senator Robert C. Byrd. In fact, yesterday, Senator Byrd was honored during the Steel Industry Breakout Session for his steadfast support of the U.S. steel industry and for successfully enabling government and industry collaborative programs.

Senator Rockefeller was also recognized during this Symposium at the Congressional Reception last evening. He was honored for his enduring efforts to ensure a fair and competitive steel industry and for his personal commitment to our Industries of the Future-West Virginia program.

We greatly value and appreciate their service to our state and their dedication to continual improvement of America's core industries. Indeed, our entire West Virginia delegation is very interested in the IOF industries and makes our success possible in the state-level initiative.

Our State's Flagship University

West Virginia University is our state's flagship, land-grant university. In fact, WVU is one of under 50 universities in the nation sharing the profile of a comprehensive, Research I, Four-Year I, land-grant university with a comprehensive health sciences center. For 132 years we have served and partnered with industries that are important to West Virginia. Our assets include industrial extension, our national center devoted to energy and coal, comprehensive engineering programs, and statewide offices.

We have, naturally, developed new programs to meet emerging needs—for example, programs in advanced materials, computer science and engineering, geographic information systems, and environmental sciences. WVU faculty, staff, and leaders are experts at incorporating the best of older perspectives and practices with the most recent, and at discovering new ones. There is much creative collaboration potential between WVU and IOF in West Virginia.

Industries of the Future: The West Virginia Experience

Initially, WVU became integrated with IOF because of our longstanding research program directed at coal-based feedstocks (called "precursors") for carbon products. Our work with companies such as UCAR Carbon, KOPPERS Industries, Conoco, Century Aluminum, and Touchstone Research Labs—all having operations in West Virginia—as well as with ALCOA, Amoco Polymers, Applied Sciences Inc., and other companies, led to the creation in 1992 of the Carbon Products Consortium, or CPC. Thus, when the Office of Industrial Technology accepted carbon products as a crosscutting industry for the national IOF program, WVU's participation became almost certain.

In 1996, the OIT sponsored the Carbon Products Industry Vision Workshop at WVU. The following year, in February 1997, Denise Swink and Charlie Sorrell visited with the West Virginia carbon products industry and WVU research groups. Discussions with Denise and Charlie during that visit led to the idea of a state-level IOF program. The conditions in West Virginia were right:

- WVU was already involved in an industry-led program—carbon products—that involved most of the core IOF industry sectors.

- Many of the designated IOF industries had a major presence in West Virginia, and they were interested in increasing their international competitiveness.
- WVU faculty members had established working relations with the IOF industry sectors.
- And, by this time, our state's public-private partnership for economic development was very comfortable with collaboration among business, education, and government.
- Finally, our state is small, and the leaders of all sectors know each other well. This means that if the right people are brought together, good things can happen—and they can happen rather quickly.

Beginning in June 1997, working group meetings were convened for West Virginia's glass, chemicals/polymers, wood/forest products, aluminum, and steel industries. Metal casting and mining have since been added.

For each of these industry sectors, the working groups consist of key industry leaders, State Development Office personnel, national lab representatives, OIT vision team leaders, and WVU research groups.

These early meetings served two main purposes: (1) to inform state industry groups about the visions and technical roadmaps developed for the national-level IOF program; and (2) of equal importance, to encourage industry leaders in our state to discuss their particular concerns for the future with each other, and to offer their views on what R&D topics should be pursued. The West Virginia industry groups have been highly responsive to these discussions.

Our goal is for each working group to become self-sustaining: to arrange its own meetings, interact with OIT team leaders, visit plants, develop research agendas, and pursue all possible leads for obtaining resources.

In December 1997, WVU convened the first ever state-level IOF Symposium in Charleston, our state capital, keynoted by our Governor. At that meeting, industry participants brainstormed to create lists of more than 100 fertile R&D topics.

And, in December 1998, WVU hosted the second annual IOF-WV Symposium on our campus, with both Senator Rockefeller and Governor Underwood taking part.

The focus at the second symposium shifted from brainstorming to implementing projects. Partnerships were developed between core industries and teams of faculty and private sector suppliers for the development of proposals to the OIT. At least one proposal to each industry sector and several OIT program proposals resulted from the second symposium.

The IOF-WV Program Potential

In West Virginia, the aluminum, steel, glass, chemical/polymer, wood products, and metal casting industries represent at least 50,000 direct jobs—over half of our manufacturing employment. Consequently, there is a real sense of urgency in West Virginia about retaining these companies over the coming decades. We look to the IOF-WV program as a contributor to an advantageous business climate which enables existing companies to thrive, and which attracts new manufacturing companies.

Already, IOF-WV is benefiting our industries. The symposia and working group meetings bring together groups of people who might otherwise never meet. They exchange ideas, compare problems, and create solutions from their common pool of knowledge. Let me share some examples:

At the first symposium in 1997, a retired engineer from Union Carbide heard Beri Fox, chief operating officer of Marble King Inc., describe a problem with declining refractory life in her lehrs, or ovens. During the next break the retired engineer suggested a solution to Beri that has doubled refractory life—and made a profound, positive impact on her business.

At the same meeting, people from the forest products industry heard Brian Joseph, president of Touchstone Labs, describe the properties of a new metal matrix composite material developed for electric power lines. The forest products people are now working on using that material to design thinner blades for sawmills. The thinner blades will use 25% less power and create less sawdust than standard blades.

The meetings have also provided opportunities for industry leaders to meet directly with leaders in both state and federal government; for small, technology-related businesses to develop contacts with large industries; and for WVU students and faculty to be exposed to some of the real-world problems faced by American industry.

Some Results, Outcomes, and Examples of Work in Progress

We are pleased that each industry sector in the West Virginia IOF initiative is already reporting progress:

Aluminum

Century Aluminum in Ravenswood makes the aluminum alloy radiator stock used in over 60% of domestically produced automobile radiators. Century is a participant in a $2.2 million award through the national-level IOF program. The project will develop and evaluate new material additives for pot liners that could yield significant electricity savings in the aluminum smelting process. Century credits involvement with IOF-WV and IOF for helping secure the subcontract for this major project.

Steel

West Virginia has several excellent steel companies. Two, Weirton Steel and Wheeling Nisshin, are working with the Oak Ridge National Laboratory and WVU on a project to develop and test anti-corrosive materials for roller bearings in continuous galvanizing lines. WVU Professor Gopalakrishnan was recognized at our most recent IOF-WV Symposium for his tremendous efforts in assisting Weirton Steel with preparation of two NICE^3 proposals.

lass

West Virginia glass is famous throughout the world for its beauty and fine craftsmanship. An IOF project now being conducted may reduce wastage from "crack-off"—the breaking of a finished glass product when it is separated from the blow tube. The research team, which includes several glass companies, the Federal Energy Technology Center (FETC), and WVU, has recently been awarded $200,000 to develop CO2 lasers for cutting off the glass piece. Since crack-off causes up to 40% of the total scrap in the hand glass industry, the laser process could have a payback period of less than four months.

The chemical/polymer industry is very prominent in West Virginia, employing over 15,000 people and producing millions of pounds of chemicals and polymers. A WVU research team and our new Polymer Alliance Zone are teaming with D.N. American of Fairmont, West Virginia, and MBA Polymers of Richmond, California, on a $1.5 million project to develop technologies for recycling plastics from obsolete or used-up electronics, such as computer cases and keyboards.

Wood Products

Wood is West Virginia's greatest renewable resource, and the many lumber processors in the state provide over 11,500 jobs. However, primary wood processing produces a large amount of waste: sawdust, bark, small limbs, etc. On average, only about 55% of a log is directly used for production of finished lumber. Part of that waste is due to the thickness, or "kerf," of the saw blade. As I just mentioned, an IOF-WV industry/University group is now investigating heat dissipation and energy use reduction for thin-kerf saw blades. This project received seed money from the State and a funding commitment from the OIT Advanced Materials Program.

Metal Casting

The metal casting industry is the newest participant in the IOF-WV program, and during the past four months it has had four working group meetings. Some of the most complex castings in the U.S. are made in West Virginia by companies such as HK Castings. Like the glass and most of the wood products industry, the metal casting companies tend to be small and do not have in-house R&D capabilities. WVU Professor Bob Creese, who has worked with the industry for years, has now developed a coalition of over 20 metal casting and foundry shops.

Cross-Cutting Technologies

The WVU Electric Industry Research Group is an example of an interdisciplinary research team whose work applies to several IOF-WV industry sectors. This group is currently working on a project through the OIT's Combined Heat and Power program to assess potential benefits of distributed generation. Deregulation or mandated renewable energy portfolios may provide incentives for IOF-WV companies to more extensively utilize waste heat or combustible byproducts to generate power on-site. For West Virginia companies both small and large, the opportunity to work with faculty/student research teams on IOF-WV projects is proving quite beneficial. It is also an excellent chance for our students and faculty to experience real-world problems and develop solutions that can help retain our companies and our graduates in our state.

Summary and Conclusion

To repeat: The West Virginia IOF project is an industry-led, visioning process intended to design and implement cost-shared R&D projects, the successful completion of which will move an entire industry toward improved productivity, through better energy efficiency, waste reduction and utilization, and use of new technologies.

There is not a single IOF-WV company that does not intend to be viable and globally competitive in the year 2020. Truly in West Virginia, we look to IOF-WV to strengthen our traditional industries. But, we are in the midst of an emerging new economy and new ways of doing business, some of which were unimagined just a few years ago.

Through our IOF project, West Virginia's traditional manufacturing industries will envision their futures, and decide now upon courses of action to ensure success in the next century. Aluminum, steel, glass, chemicals, polymers, and wood products will definitely be produced somewhere in 2020. We say, "Why not in West Virginia!"

Thank you again for inviting me to be part of EXPO 99. I invite all of you to visit the IOF-WV display in the exhibit hall and talk with some of our people about coalitions being formed in West Virginia.