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JOBS CREATION IN THE ENVIRONMENTAL INDUSTRY IN THE U.S. and FOUR MANUFACTURING –BASED STATES: OHIO, MICHIGAN, WISCONSIN AND MINNESOTA

SYNTHESIS OF FINDINGS AND POLICY RECOMMENDATIONS

by Paula DiPerna, Founder, Jobs and Environment Initiative *

Highlights from four state reports on JOBS CREATION and THE ENVIRONMENTAL INDUSTRIES of OHIO, MICHIGAN, MINNESOTA AND WISCONSIN, and the U.S. by Management Information Services, Inc. (MISI) for the Building Diagnostic Research Institute (BDRI), May-October, 2004. These reports present new and detailed information about the jobs creation impact and potential of the environmental industry in four core manufacturing states and the nation as a whole.

KEY FINDINGS

MILLIONS OF GOOD JOBS OF ALL KINDS EXIST TODAY IN THE U.S. and CORE MANUFACTURING STATES, THANKS TO ENVIRONMENTAL PROTECTION --BUT THIS CONNECTION IS LARGELY OVERLOOKED IN ECONOMIC DEVELOPMENT and EMPLOYMENT POLICY

Millions of good stable jobs, including manufacturing jobs, have been created by environmental protection throughout the U.S., for people in all walks of life--blue-collar, white-collar and high-tech, carpenters, cashiers, electricians, etc.—and continue to be created. Also, in the four manufacturing-intensive states studied thus far--Ohio, Michigan, Wisconsin and Minnesota—data shows that investments in the environment will provide a greater than proportionate assist to the manufacturing sector. Each state is home to diverse environmental companies, many global leaders in their field, BUT their strong role in employment generation, however, is largely overlooked in economic development initiatives and policy.

Meanwhile, each day, people in virtually every line of work earn their livelihood thanks to environmental management and investment. But, very few workers realize that their jobs are directly and indirectly tied to, and even dependent on, the environmental industry. Similarly, the significant and positive employment role of the environmental industry is not salient for many policy makers at national, state and local levels.

Each state offers a different set of economic circumstances, though intensive manufacturing emphasis is common among all four. The jobs creation benefits of environmental investments are diverse in types of jobs created among the states, but

consistently positive across all four states. The jobs benefits, therefore, could be maximized and focused in each state, across the range of local priorities, strengths and concerns: For example:

--Minnesota, currently emphasizing manufacturing exports and home to Minneapolis-St. Paul, rated as the world's most "knowledge competitive region"

--Ohio, the nation's 6th largest exporter, but also struggling with jobs creation in Cleveland, Akron and Toledo, recently cited as America's poorest cities

--Wisconsin, the 2nd most manufacturing intensive state in the nation, and home to America's top ranked public universities for research and development spending

--Michigan, home to the nation's automotive industry, with the 4th largest high-tech employment ranking in the U.S

The reports find that each state could reap strong jobs creation benefits from further environmental investments and from better linking of environmental and economic development policies, including new skills training and anti-poverty efforts. .

In sum, contrary to public perception and policy presumption. environmental investment is good for jobs, workers, and long-term economic vitality, and environmental investment and jobs creation are not in conflict. On the contrary, the environmental industry has been long overlooked as a major source of current and future employment in the U.S. "Environmental jobs" cross the spectrum of work activities, and are directly and indirectly created, and could help offset jobs lost in manufacturing in manufacturing-dependent states.

IN THE U.S., IN 2003, THE ENVIRONMENTAL INDUSTRY WAS GENERATING NEARLY 5 MILLION JOBS ACROSS THE NATION: .

For perspective, compared to employment generated by other industries, this is :

- More than ten times the U.S. pharmaceuticals industry
- Nearly six times more than the apparel industry
- Almost three times more than the chemical industry
- Fifty percent more than religious organizations
- Nearly half the employment in hospitals
- Almost one-third the size of the entire construction industry

NATIONAL ENVIRONMENTAL INDUSTRY IS LARGER THAN REALIZED

Over the past four decades, protection of the environment has grown rapidly to become a major sales-generating, profit-making, job-creating U.S. industry.

In fact, in 1997, the environmental industry in the U.S. was on a trajectory to surpass defense spending in importance to the U.S. economy. At the time, environmental spending was projected to reach \$245 billion by 2005, while defense spending was projected to reach \$225-230 billion

Environmental spending has surpassed the 2005 projections already, but so has defense spending. However, absent world events, such as the war in Iraq and increased domestic security expenditures post September 11, 2001, the environmental industry might today indeed surpass defense spending in importance.

ENVIRONMENT INDUSTRY IS LARGER THAN THE TOP FORTUNE 500

The size and scope of the U.S. environmental industry is not fully clear to the public-at-large, decision-makers, or the media. The size and scope of the environmental industry in Minnesota is likewise not fully appreciated.

Nationally, the environmental “industry” ranks well above the top of the Fortune 500, and this report estimates that in 2003 protecting the environment generated:

- \$301 billion in total industry sales
- \$45 billion in Federal, state, and local government tax revenues
- \$20 billion in corporate profits

Indeed, the sales and spending of the U.S. environmental industry is larger than that of Wal-Mart, America’s largest corporation.

ENVIRONMENTAL INDUSTRY LIKELY TO GROW and HAS BEEN RECESSION PROOF

The environmental industry will continue to grow rapidly for the foreseeable future, and MISI forecasts that in the U.S. real expenditures (2003 dollars) will increase from \$301 billion in 2003 to:

- \$357 billion in 2010
- \$398 billion in 2015
- \$442 billion in 2020

AND,

- In the late 1970s, when the U.S. economy was reeling from inflationary shocks, record interest rates, energy crises, and anemic economic growth, between 1975 and 1980 EP expenditures grew nearly 60 percent, from \$77 billion to \$121 billion.
- In the early 1980s, when the U.S. experienced the most severe economic recession in half a century, with many industries experiencing depression-level problems, between 1980 and 1985 EP expenditures increased by \$37 billion -- 31 percent.
- During the early 1990s, when the U.S. experienced a relatively mild recession, with GDP declining one percent and unemployment increasing to 7.5 percent, between 1990 and 1995 EP expenditures increased from \$204 billion to \$235 billion -- 15 percent.
- Between 2000 and 2003, while U.S. economic and job growth was generally anemic, the EP industry expanded continuously, growing to \$301 billion.

IN 4 MANUFACTURING STATES, ENVIRONMENTAL INDUSTRY IS MAJOR EMPLOYER AND ECONOMIC FORCE.

MISI estimates that in 2003:

In Minnesota:

- Sales of Minnesota's environmental industries totaled \$5.1 billion.
- The number of environment-related jobs totaled more than 92,000.
- The environmental industry in Minnesota comprised 2.6 percent of gross state product.
- Minnesota environmental industries accounted for 1.7 percent of the sales of the U.S. environmental industry.
- Environment-related jobs comprised 3.5 percent of Minnesota employment.
- Environment-related jobs in Minnesota comprised 1.8 percent of the total number of environment-related jobs in the U.S.

In Wisconsin:

- Sales of the environmental industries in Wisconsin totaled \$5.4 billion.
- The number of environment-related jobs totaled more than 97,000.
- The environmental industry in Wisconsin comprised 2.9 percent of gross state product.
- Wisconsin environmental industries accounted for 1.8 percent of the sales of the U.S. environmental industry.
- Environment-related jobs comprised 3.5 percent of Wisconsin employment.
- Environment-related jobs in Wisconsin comprised two percent of the total number of environment-related jobs in the U.S.

In Ohio:

- Sales of the environmental industries in Ohio totaled \$12.2 billion
- The number of environment-related jobs totaled more than 176,000
- The environmental industry in Ohio comprised 3.2 percent of gross state product
- Environment-related jobs comprised 3.3 percent of Ohio employment
- Ohio environmental industries accounted for 4.1 percent of the sales of the U.S. environmental industry
- Environment-related jobs in Ohio comprised 3.5 percent of the total number of environment-related jobs in the U.S.

In Michigan:

- Sales of the environmental industries in Michigan totaled \$12.9 billion.
- The number of environment-related jobs totaled nearly 217,000.
- The environmental industry in Michigan comprised 3.9 percent of gross state product.
- Environment-related jobs comprised 4.9 percent of Michigan employment.
- Michigan environmental industries accounted for 4.3 percent of the sales of the U.S. environmental industry.
- Environment-related jobs in Michigan comprised 4.4 percent of the total number of environment-related jobs in the U.S.

IN ALL FOUR STATES, ENVIRONMENT-RELATED EMPLOYMENT IN HAS BEEN INCREASING IN RECENT YEARS BETWEEN ONE AND TWO PERCENT ANNUALLY.

IN ALL FOUR STATES, MANUFACTURING JOBS BENEFIT FROM ENVIRONMENTAL ACTIVITIES:

In Minnesota, more than one fifth of private sector environmental jobs are in manufacturing, compared to 15 percent for all other private sector employment

In Ohio, nearly one-third of private sector environmental jobs are in manufacturing, compared to less than 20 percent of all private sector employment.

In Wisconsin, 31 percent of private sector environmental jobs are in manufacturing, compared to 21 percent for all other private sector employment.

In Michigan, 29 percent of private sector environmental jobs are in manufacturing, compared to 17 percent for all other private sector employment.

ENVIRONMENTAL PROTECTION GENERATES MILLIONS OF JOBS THROUGHOUT ALL SECTORS OF THE ECONOMY AND WITHIN MANY DIVERSE OCCUPATIONS.

MISI forecasts that U.S. employment created directly and indirectly by environmental protection will increase from 4.97 million jobs in 2003 to:

- 5.39 million jobs in 2010
- 5.76 million jobs in 2015
- 6.38 million jobs in 2020

Firms working in the environmental and related areas employ a wide range of workers at all educational and skills levels and at widely differing earnings levels. Even in environmental companies, most of the employees are not classified as “environmental specialists.” Rather, most of the workers are in occupations such as laborers, clerks, bookkeepers, accountants, maintenance workers, cost estimators, engine assemblers, machinists, assemblers, machine tool operators, mechanical and industrial engineers, welders, tool and die makers, mechanics, managers, purchasing agents, etc.—all jobs that lie outside the easily identified classically “green” sector.

HIGH-TECH EMPLOYMENT IN ALL FOUR STATES BENEFITS FROM ENVIRONMENTAL ACTIVITIES :

In Minnesota, eleven percent of the jobs in the professional, scientific, and technical services are environmental jobs and environmental investments generate, proportionately, more than five times as many jobs in professional, scientific and technical services as the state average.

In Ohio, more than 11 percent of Ohio jobs in the professional, scientific, and technical services are environmental jobs, and environmental investments generate, proportionately, more than five times as many jobs in professional, scientific and technical services as the state average.

In Wisconsin, more than ten percent of jobs in the professional, scientific, and technical services are environmental jobs and environmental investments generate, proportionately, more than four times as many jobs in professional, scientific and technical services as the state average.

In Michigan, more than 20 percent of the jobs in the professional, scientific and technical services are environmental jobs and environmental investments generate, proportionately, more than six times as many jobs in professional, scientific and technical services as the state average.

BUT JOBS OF SURPRISING VARIETY ARE CREATED IN ALL FOUR STATES, FOR ALL SKILL LEVELS:

FOR EXAMPLE, in 2003, environmental protection generated:

In Minnesota:

- More jobs for machinists (265) than geoscientists (127)
- More jobs for executive secretaries (771) than for biological technicians (293)
- More jobs for truck drivers (1,452) than for environmental scientists and specialists (1,324)
- More jobs for electricians (303) than occupational health and safety specialists (112)

In Ohio:

- More jobs for welders (385) than for biochemists (43)
- More jobs for office clerks (5,301) than for environmental engineers (1,470)
- More jobs for plumbers (353) than for health and safety engineers (140)
- More jobs for customer service representatives (2,716) than for environmental scientists and specialists (2,490)

In Wisconsin:

- More jobs for truck drivers (2,328) than hazardous material removal workers (510)
- More jobs for receptionists (777) than medical scientists (479)
- More jobs for security guards (354) than chemists (287)
- More jobs for machinists (441) than forest and conservation technicians (262)

In Michigan,

- More jobs for machinists (966) than for forest and conservation technicians (190)
- More jobs for executive secretaries (2,522) than for environmental scientists (1,523)
- More jobs for truck drivers (2,176) than for hazardous material removal workers (1,210)
- More jobs for human resource managers (297) than for medical scientists (225)

IN ALL FOUR STATES, ENVIRONMENTAL COMPANIES ARE:

- Located in urban centers, suburbs, towns, and rural areas.
- Diverse in size and activities, from 10 employees to thousands

IN ALL FOUR STATES, THERE ARE MANY ENVIRONMENTAL COMPANIES, AND THEY ARE AMONG THE STATE'S MOST SOPHISTICATED, HIGH-TECH FIRMS, SUCH AS:

Ecolab, in St. Paul, Minnesota, a \$3 billion company and leading global developer and marketer of premium cleaning, sanitizing, pest elimination, maintenance, and repair products and services for the world's hospitality, institutional, and industrial markets.

First Solar, LLC, in Perrysberg, Ohio, a leading U.S. manufacturer of solar photovoltaic modules.

ANGI International, Inc., in Wisconsin, one of the world's leaders in manufacturing and distributing Compressed Natural Gas (CNG) refueling equipment for natural gas vehicles and other applications in the CNG Industry.

American Energy Exchange, Inc., in Kalamazoo, Michigan, a manufacturer of energy recovery equipment built around its patented frost free heat exchanger, and the second largest manufacturer of this type of energy recovery equipment in the U.S.

....and many others described in the full state reports.

POLICY OPPORTUNITIES: JOBS CREATION AND THE NEXT TIER OF ENVIRONMENTAL MANAGEMENT AND ECONOMIC DEVELOPMENT

The nexus between jobs creation and environmental protection can constitute the “next tier” of environmental and economic development policy in the U.S., i.e., take environmental protection activities to a level more integrated with economic policies to maximize the socio-economic benefits of environmental investments. Strategic policy options exist for the nation as a whole and all states, even counties.

No state has yet to fully realize this potential. Yet, all four reports make clear that investments in environmental spending will pay significant dividends in jobs creation and workforce development in all sectors, including in anti-poverty efforts. Each state has some level of environmental protection programs or philosophy, or both. However, the scope, diversity and scale of environmental employment today has shown that, rather than viewing environmental spending or compliance costs as economically negative, states should aggressively move to maximize the benefits, short and long-term of environmental spending.

There is no inherent institutional impediment in manufacturing-intensive states. On the contrary, existing environmental policies can better maximize environmental jobs creation in each state. However, what is still needed is more “cross-over” so that the environmental industry in its broadest sense becomes integral to the state’s ambitious economic development plans. With such cross-over, the value of environmental management can be brought to bear on traditional economic development and unemployment policies. Most state governments do not achieve this crossover.

Each State Should Create a Jobs and Environment Task Force

An immediate recommendation would be for all 50 states to create a Task Force on “Jobs Creation and Environment Investment,” with the goal of connecting environmental investment and spending with other governmental agencies and initiatives linked to economic development and workforce training, especially to align tax incentives and other policy tools with pro-active environmental jobs creation. Each state could also create an Environmental Jobs Association, to highlight and strengthen the jobs creation benefits of the environmental industry.

In 4 core manufacturing states, each has special policy opportunities at hand to maximize jobs creation benefits, such as

In Minnesota,

- Centralize a jobs creation focus in the Minnesota Sustainable Development Initiative
- Integrate environmental jobs creation in “Governor’s Forums: Citizens Speak Out” public interactive discussions sponsored by the Minnesota Pollution Control Agency
- Establish staff focus on environmental jobs creation within the Governor’s Council on Workforce Development

In Ohio,

- An “Environmental Jobs and Manufacturing” Summit, convened by the state of Ohio, with an ongoing jobs focus on the jobs-environment nexus in any annual state-policy session on manufacturing and outsourcing.
- Integrating an aggressive environmental jobs component in the following: Third Frontier Project; Research and Development Investment Loan Fund; Clean Ohio Fund; Edison Technology Centers; Innovation Ohio Loan Fund; Technology Investment Tax Credit Program; Energy Efficiency Skills for Professionals, etc.

In Wisconsin,

- Expand the innovative Green Tier program, to better highlight the jobs-environment benefits for participating agencies and companies
- Re-establish the Wisconsin Conservation Corps, terminated in June, 2003.
- Integrate the jobs creation component in key programs, such as Grow Wisconsin, Technology Zone, Community Financial Assistance, Cooperative Environmental Focus, and the Brownfield Development Program

In Michigan,

- Integrating an aggressive environmental jobs component in all of the following: Michigan Strategic Plan; Clean Michigan Initiative; Clean Michigan Fund; State Environmental Sciences Board; Michigan Retired Engineer Technical Assistance Fund; Michigan Energy Office; Department of Environmental Quality; Department of Labor and Economic Growth; Michigan Biomass Energy Program; Michigan Economic Growth Authority: Smart Zone planning; Michigan NextEnergy Program
- Initiative focused on jobs creation in the automotive sector, based on research, development and marketing of more energy efficient automobiles, cars and trucks.

Maximizing benefits by integrating environmental management with economic development, workforce training and employment policy

Finally, these studies have shown that a ripe breakthrough opportunity exists for states to recognize and realize the economic and jobs benefits that could flow from specifically facilitating the growth of environment and environment-related industries. This would be a fresh new arena for economic development initiatives, including the creation of new strong export markets.

In addition, from the long-term point of view of expanding and deepening the constituency in favor of environmental protection, it would seem that the positive jobs creation impact of environmental investment could create new constituents for environmentalism among all worker groups, including unionized labor in the automotive industry, thus expanding and diversifying the voice in favor of environmental protection nation-wide, much needed, especially in an era of inter-generational transition.

Jobs creation is a reconciling force between economic development and environmental protection—which have traditionally been treated as irreconcilable. The link between jobs creation and environmental protection can be maximized for strategic impact on the jobs outlook of the U.S., and long-term environmental and economic health.

In sum, the link between jobs creation and environmental management is pivotal for economic development, and presents a strategic and solutions-oriented new policy approach with practical benefits for workers in all communities and walks of life.

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ABOUT THE JOBS AND ENVIRONMENT INITIATIVE

The Jobs and Environment Initiative, founded in 2004 by Paula DiPerna, is a pilot program of research, policy analysis and public education. The objective of the Initiative is to examine and demonstrate the links between jobs creation in all sectors of economic activity, including manufacturing, and all aspects of environmental management. The Initiative seeks to describe and analyze current jobs benefits of environmental investment and stewardship; bring further public and policy attention to the strength and scope of the environmental industry; examine potential for further jobs creation; highlight policy opportunities, and improve understanding of the positive contributions of environmental management to economic growth and employment generation, at local, state, regional, national and international levels. The Initiative conducts state-based and national research, reports, and other inquiries, and is a collaboration between Management Information Services, Inc. (www.misi-net.com) and the Building Diagnostics Research Institute (www.buildingdiagnostics.org). Contact Paula DiPerna at 607-547-8356.

ABOUT MANAGEMENT INFORMATION SERVICES, INC. (www.misi-net.com)

Management Information Services, Inc. (MISI) is an economic research firm with expertise on a wide range of complex issues, including energy, electricity, and the environment. The MISI staff offers expertise in economics, information technology, engineering, and finance, and includes former senior officials from private industry, federal and state government, and academia. Over the past two decades MISI has conducted extensive proprietary research, and since 1985 has assisted hundreds of clients, including Fortune 500 companies, nonprofit organizations and foundations, academic and research institutions, and state and federal government agencies including the National Academy of Sciences, the U.S. Department of Energy, the U.S. Environmental Protection Agency, the Department of Defense, and the Energy Information Administration.

ABOUT THE BUILDING DIAGNOSTICS RESEARCH INSTITUTE (www.buildingdiagnostics.org)

The Building Diagnostics Research Institute, Inc. (BDRI) is a Section 501(c)(3) not-for-profit organization dedicated to providing the highest level of research, education and training, and public outreach on issues related to the effects of building performance on health, safety, security, and productivity. The Institute's mission is to leverage more than 25 years of building diagnostics experience in order to enhance health, safety, security, and productivity, and it is implemented by conducting basic and applied research, providing

education and training for health and building professionals, disseminating knowledge, and serving as an advocate for the general public. BDRI's basic and applied research, its education and training, and its public outreach are carried out by an interdisciplinary team of staff and external scientists and professionals representing a variety of disciplines, including chemistry, industrial hygiene, engineering, microbiology, and law and public policy.

BIOGRAPHICAL INFORMATION

Paula DiPerna, founder of the Jobs and Environment Initiative, served formerly as President of the Joyce Foundation, and Vice-President for International Affairs for the Cousteau Society and is a widely published author and public policy analyst.

Roger H. Bezdek, Ph.D., is President of Management Information Services, Inc. He has 30 years experience in consulting and management in the environmental, energy, economic forecasting, and regulatory areas, serving in private industry, academia, and the Federal government. He has served as a consultant to the White House, Federal and state government agencies, environmental organizations, and various corporations and research organizations. Dr. Bezdek, is an internationally recognized expert in economic forecasting and environmental analysis, and is the author of four books and of 200 articles in scientific and technical journals. He received his Ph.D. in Economics from the University of Illinois (Urbana).

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Dr. James Woods, Ph. D. is CEO of the Building Diagnostics Research Institute. Dr. Woods has 35 years experience in management and consulting in the environmental industry, serving in academia, industry, and as an advisor to DOE, EPA, NIST, and the National Academy of Sciences. He has extensive experience in end-use demand in the residential, commercial, and industrial sectors, environmental factors, and energy modeling, has managed 20 large-scale energy and environmental research projects, and is the founder of the Building Diagnostics Research Institute. He received a Ph.D. in Mechanical Engineering from Kansas State University.