

Sustainable Practices, Jobs, and Distressed Communities in the Pacific Northwest

An Overview

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BACKGROUND AND ACKNOWLEDGMENTS

As we inch towards the end of 2001, the citizens of Washington and Oregon face an increasing number of important challenges. An economic downturn has placed the economy, communities and workers at risk. The events of September 11 dramatically increased concerns about personal safety and the security of our transportation systems, water resources, energy systems, food supplies and other issues that were previously taken for granted. These issues have emerged at a time when our environment continues to be a concern. The Oregon State of the Environment Report, released in September 2000 by the Oregon Progress Board, identified a number of environmental areas where Oregonians can expect continued problems under current policies and programs including: poor water quality, especially in urban and agricultural areas, inadequate water supplies, loss of wetlands, degraded riparian areas, depleted fish stocks, invasion of exotic species, diminished biodiversity, and waste and toxic releases. Similar problems exist in Washington State.

How can we maintain and enhance our economic security and protect workers and communities while also conserving the environment? The way the region answers this question may turn out to be one of the most important challenges facing this region for the next number of years.

In the spring of 1999, The Center for Watershed and Community Health (CWCH), an education and research institute affiliated with the Mark O. Hatfield School of Government at Portland State University, initiated a project to help decision makers throughout the region better understand the economic issues and facts associated with developing a more environmentally sustainable economy. The PSU CWCH's aim is to provide accurate, objective, and easy-to-understand information about the potential costs and benefits associated with adopting policies and practices that can resolve pressing economic, social and environmental problems and lead to a more environmentally efficient and sustainable economy. The PSU CWCH has developed collaborative research partnerships with a number of academic institutions in Washington and Oregon, provides grants to a number of leading economists, and completes its own research, to accomplish this goal. This document is one in a series of reports to be produced as a result of this effort. The project is an integral part of PSU CWCH's focus on developing new, more effective and efficient approaches to environmental governance and sustainable development.

AUTHORSHIP

This report was prepared by Ernie Niemi of ECONorthwest for Center for Watershed and Community Health, Mark O. Hatfield School of Government Portland State University. Bob Doppelt, Director of the CWCH, offered some of the information included in the report and provided editorial advice.

ACKNOWLEDGMENTS

The CWCH gratefully acknowledges the financial support of the Ford Foundation, Brainerd Foundation, Lazar Foundation, New Land Foundation, Harder Foundation, Bullitt Foundation, and Flintridge Foundation for this project. The authors are solely responsible for the content.

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SUSTAINABILITY, JOBS, AND DISTRESSED COMMUNITIES: SUMMARY

This paper provides an overview of how the adoption of sustainable practices by businesses, communities and governments can affect employment and economic opportunities for distressed communities in the Pacific Northwest. “Sustainable practices” reduce waste in the use of energy, water and other raw materials (especially toxins), and curtail harmful environmental impacts. “Distressed communities” include places, such as low-income urban neighborhoods and rural towns, as well as groups, such as low-skill workers, that exhibit high levels of unemployment or poverty.

Understanding the relationships among sustainable practices, jobs, and distressed communities is especially important because businesses, communities, and governmental agencies are accelerating their adoption of sustainable practices to lower costs for energy, materials, and waste clean-up, and to comply with legal obligations that require reduced environmental impacts. Furthermore, to compete effectively in many regional, national, and global markets, businesses increasingly must satisfy sustainability standards. In some industrial sectors, global demand for goods and services associated with sustainable practices is growing, and businesses in the Pacific Northwest are striving to become market leaders.

In sum, the adoption of sustainable practices is growing and many forces exist that suggest that the trend will continue and grow. Workers and distressed communities need to know what to expect so they can prepare themselves to take advantage of new, sustainable jobs and be prepared when jobs associated with unsustainable practices are lost.

SUMMARY OF FINDINGS

The adoption of sustainable practices by businesses, governmental agencies, and communities can produce substantial economic and social benefits for distressed towns and workers in several ways. This report focuses on two of these: the protection and creation of jobs for members of distressed communities, and reduction in vulnerability to economic disruptions. Sustainable practices can have other, equally important impacts by reducing the use of toxins, thereby improving the health of workers who otherwise would be exposed on the job and of residents who would be exposed to purposeful and accidental emissions.

Sustainable Economic and Community Development Practices Can Protect and Create Jobs for Members of Distressed Communities.

Sustainable practices may cause the loss of some jobs associated with the unsustainable practices they replace, but these can be offset if the implementation of sustainable practices forestalls the loss of even more jobs, creates new jobs, or both. The overall impacts on protecting and creating jobs manifest themselves through these five mechanisms:

- 1. Sustainable practices, themselves, create jobs directly. Already they are supporting thousands of jobs in the Pacific Northwest and can create thousands more.*
- 2. The cost savings from adopting sustainable practices can be used to protect jobs that otherwise would be lost or to create new jobs.*
- 3. When sustainable practices, such as reduced use of toxic materials in a production process, create better working conditions, workers can remain healthier, become more productive, and incur fewer health-related absences from work.*
- 4. Existing jobs can become more secure and new jobs can be created as firms implement sustainable practices to retain and increase their competitiveness in regional, national, and global markets that are tightening sustainability standards.*
- 5. Adoption of sustainable practices can enhance economic security by reducing the region's vulnerability to disruptions from market instability and terrorism.*

Sustainable Practices Can Reduce the Vulnerability of Distressed Communities to Economic Disruptions.

Besides direct economic benefits for workers in distressed communities, sustainable practices also can reinforce these communities' overall economic strength by making them less vulnerable to disruptions from recessionary downturns and economic shocks. More efficient use of energy, together with greater reliance on wind and other renewable energy resources, for example, can reduce a community's vulnerability to volatile electricity prices and to disruptions by potential terrorist attacks on fossil-fuel supplies. The adoption of sustainable practices can help protect food supplies, drinking water, and public health by avoiding contamination to soils and water bodies. Altering federal wildfire-management policies so they focus less on fighting fires in the wilderness and more on protecting those least able to protect themselves, can markedly reduce the threat to lives, property, and economic prosperity in distressed communities.

SUSTAINABLE ECONOMIC AND COMMUNITY DEVELOPMENT PRACTICES: BACKGROUND

At its core, sustainability is about eliminating design flaws and inefficiencies to reduce toxins, waste, habitat impacts and unneeded costs.

The 1987 U.N. Commission on Environment and Development defined the term, sustainable development, as “meeting the needs of the present generation without compromising the ability of future generations to meet their own needs.” In other words, sustainability means passing along to future generations ample, healthy stocks of "natural capital" such as clean water, air, and oceans; productive estuaries, forests and topsoil; predictable climate; intact ozone layers; and a diversity of fish, wildlife, and plant species.

The concept of sustainability becomes more concrete, however, when seen in terms of disconnecting the linkages between economic growth and environmental degradation. In the past, as profits, incomes, and employment have moved to new levels, so too has the amount of raw material extracted from the earth and the amount of (often toxic) waste and pollution dumped onto the land and into the rivers and the air. Recent data show that waste in Oregon and Washington has grown faster than population and economic output (gross state product). Moving toward sustainable development means adopting business and governmental practices that increase the standard of living while steadily diminishing the impacts on the environment. Five types of sustainable practices can move the economy toward this end:

- **Redesign** production and resource extraction processes, products, transportation systems and buildings to use less energy, toxic materials and fewer raw materials and thus generate less waste, pollution and habitat impacts.
- **Replace** natural toxic (e.g. fossil fuels) and synthetic toxic (bio-accumulating) substances with non-toxic, environmentally sound alternatives to eliminate damage to workers, neighbors, the environment, and future generations.
- **Reduce** the use of raw materials, water and energy used by firms, organizations and households by eliminating excess inputs in products, processes and services.
- **Refine** existing processes to get more output per unit of input by instituting measures to increase efficiencies in production and service delivery processes.
- **Reclaim** all waste materials by finding ways to use the waste as a raw-material input in other production processes and in other products.

The key point is that habitat impacts, excessive resource use, toxins and wastes *are costly*. For example, the unnecessary use of toxic materials causes damage to workers and others, and contaminates the environment, and the costs of repairing the damage generally is greater than the costs of preventing it in the first place. Using energy and natural materials wastefully is the same as throwing away money and forgoing higher profits, incomes, and jobs. Sustainable practices entail the adoption by businesses and governmental agencies of product designs, technologies, and behaviors that reduce or eliminate this waste and generate cost savings while maintaining—or even increasing—their production of goods and services.

Increasingly, consumers, investors, and governments are requiring the adoption of sustainable practices due to their economic and job benefits. This is especially true for firms trading with the European Union and Japan.

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The adoption of sustainable practices entails solving problems before they are created, in contrast with traditional practices, where businesses and governmental agencies created toxins, pollution, habitat impacts and waste, and then try to control them or clean them up. The sustainable approach entails redesigning products, production processes and service delivery systems so that, from the beginning, they require fewer raw-material inputs and produce less pollution and waste. This approach is driven by the recognition that environmental problems are indicators of inefficiencies and design flaws, which waste resources, energy, and, ultimately, money. As this awareness increases, business leaders see pollution and waste-elimination programs as a mechanism for increasing profits, and governmental agencies see them as a mechanism for reducing costs and increasing the output of public services.

To date, most of the analytical effort aimed at sustainable practices has come from businesses, governmental managers, and groups interested in their impacts on costs and the environment. Advocates for workers, poverty alleviation, and community development have been less engaged. There can be no doubt, however, that, if current trends of accelerating adoption of sustainable practices continue, there will be widespread impacts on distressed communities and families of all types. The impacts may manifest themselves in many ways: through economic and social changes; restructuring of the public and private sectors; and realignment of the interaction between economic activity and the natural environment.

To gain insights into the potential implications for distressed communities, we focus on how the adoption of sustainable practices can affect jobs.

SUSTAINABLE PRACTICES PROTECT AND CREATE JOBS FOR DISTRESSED COMMUNITIES IN THE PACIFIC NORTHWEST

The implementation of sustainable practices by businesses and governments can protect existing jobs and create new jobs through the five major mechanisms described below. Our understanding of these mechanisms comes from the experiences of businesses and governmental agencies—in this region and elsewhere—that have realized a tangible and substantial payoff from initiatives that replace toxic with non-toxic materials, avoid wasteful use of energy and raw materials, and get more value per unit of these inputs.

JOB MECHANISM #1: SUSTAINABLE PRACTICES CREATE JOBS.

Sustainable practices can create jobs in a wide array of industries, occupations, and locations. We first discuss the job-creation opportunities from a broad perspective, then narrow the focus to sustainable practices especially suited for distressed communities.

Sustainable practices and job-creation--an overview

Although there exists no economy-wide compilation of the jobs in the Pacific Northwest associated with sustainable practices, they must already number in the tens of thousands. Table 1 lists some of the sustainable practices that already have generated jobs in this region.

Table 1: Some Sustainable Practices That Generate Jobs in the Pacific Northwest

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| <ul style="list-style-type: none"> • Retrofitting buildings with energy-efficiency technologies • Replacing undersized and poorly designed culverts blocking fish passage in watersheds • Producing biofuels such as ethanol from agricultural waste • Recycling raw materials, paper, plastics, and other solid-waste materials | <ul style="list-style-type: none"> • Removing and rehabilitating forest roads causing runoff problems for salmon • Designing, building, and operating wind-powered electricity generators • Designing and installing transmission lines that carry electricity more efficiently |
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Table 1, cont.: Some Sustainable Practices That Generate Jobs in the Pacific Northwest

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| <ul style="list-style-type: none"> • Redesigning existing manufacturing technologies and designing and constructing more efficient processes • Collecting seeds from native plants, and operating native-plant nurseries • Redesigning urban neighborhoods to absorb and treat stormwater locally • Producing non-toxic aqueous cleaning processes to replace toxic solvents • Installing "Eco-Roofs" that naturally absorb stormwater runoff while providing increased insulation • Cleaning up polluted, "brownfield" sites so they can be redeveloped for commercial & other uses • Offering services to support products rather than just selling products, such as car-sharing businesses, floor covering and copy equipment leasing • Production of environmentally-certified food resources. • Paving roads and driveways with new pervious road materials. | <ul style="list-style-type: none"> • Producing construction materials, polymers (for plastics) and other key raw materials from plant materials (shifting to a carbohydrate economy) • Implementing pest-control systems that use multiple approaches rather than relying solely on artificial pesticides • Manufacturing products from reclaimed by-products and waste from other processes and products • Removing dams and other structures that have outlived their economic usefulness • Deconstruction of buildings to recover and reuse materials • Designing and constructing "Green" buildings. • Manufacturing of photovoltaic devices. • Designing, installing, and maintaining water-conservation systems for farms and urban landscapes • Remanufacturing of worn products, such as toner cartridges for copiers and appliance remanufacturing |
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Skill requirements and wage levels of jobs generated by sustainable practices can be suitable for distressed communities

Case studies of firms, non-profit institutions, and governmental agencies that have implemented sustainable practices indicate that many of the jobs associated with these practices are suitable for residents of distressed communities. In some sectors, the jobs associated with sustainable practices are similar in skill requirements and wage levels to those associated with unsustainable practices. Construction of a building consistent with Green Building principles, for example, requires architects, carpenters, plumbers, and electricians. But, instead of constructing the building to be wasteful, they do so to reduce the consumption of energy, water, and other raw materials; avoid using toxins; and eliminate waste.

In some instances, the jobs associated with sustainable practices are new, as when used equipment components are remanufactured rather than discarded in a landfill. Or, when new factory jobs are created to manufacture materials for photovoltaic generation of electricity.

In some cases, all or nearly all of the jobs match the skills and availability of residents in a distressed community. In others, the job requirements are more diverse, but evidence available to date indicates that rarely, if ever, does the implementation of sustainable practices not create jobs opportunities for residents of distressed communities.

Table 3 provides some examples of private, non-profit, and governmental enterprises that generate jobs for members of distressed communities by applying sustainable practices. Most of the examples are from the Pacific Northwest, but others are included to illustrate that these opportunities are not limited solely to this region. Indeed, the national scope of these opportunities reinforces the conclusion that more opportunities will unfold in this region in the future, at a faster pace.

The examples in Table 3 have widely varying characteristics, reflecting the many ways in which sustainable practices can protect existing jobs, generate new ones, and reinforce the economic strength of distressed communities. Some of the examples are large corporations; others small craft shops. Some implement practices aimed at preventing the use of toxins and the wasteful use of energy, water, and other raw materials; others aim to make productive use of waste generated by others. Some operate within the constraints of generating private-sector profits; others within the constraints of non-profit institutions and governmental programs.

Combined, the examples in Table 3 make it clear that workers and communities, including those facing greater economic distress, can realize significant benefits directly from the adoption of sustainable practices in the private and public sectors. The discussion following Table 3 examines ways in which the adoption of sustainable practices can indirectly enhance job opportunities and economic conditions in communities.

Table 3: Examples of Sustainable Practices Generating Jobs for Members of Distressed Communities

Example #1: The ecosystem management industry.

This industry maintains, restores, and manages natural ecological systems on public and private lands. The industry has become especially significant in the Pacific Northwest during the past decade in response to recognition that historical management of wildlands, especially forests and streamside (riparian) zones significantly degraded natural ecosystems, contributed to the decline of salmon, the northern spotted owl, and other species, generated degraded water quality in streams and other outcomes that created economic problems for the region.

An initial survey of the ecosystem management industry in Oregon found it provides than 16,000 jobs, with wages ranging from \$340 to \$1,600 per month.^a . Many of these jobs are available to one of the most notable distressed communities in the Pacific Northwest: workers in rural areas, where job opportunities disappeared over the past decade along with declines in the timber and agricultural industries, and incomes are significantly below those in urban areas.

Example #2: Integrated Recycling and Remanufacturing.

St. Vincent De Paul of Lane County recycles, reuses, and remanufactures materials drawn from throughout much of the U.S. Out of recycled feedstock it produces, or soon will produce:

Glass products – Beds – Chlorinated fluorocarbons (CFCs) – Propane – Appliances – Wood furniture – Metal objects – Mattress pads – Cotton batting for furniture and/or mattress fill from non-sellable clothing

The organization currently employs 255 workers, with an annual payroll of \$5 million. New employees often are drawn from the community of chronically unemployed persons in Lane County, given training, and other assistance, such as housing assistance, so they can work productively. Net proceeds from the operation are used to augment social services in the area.

Example #3: Building Deconstruction.

The ReBuilding Center of Our United Villages, a non-profit organization in Portland, uses hand-dismantling techniques to demolish buildings, recycles and resells construction and demolition materials, and reduces market pressures to convert trees and other natural resources into new building materials. The ReBuilding Center owns and operates a Used Building Material Retail Operation in the Boise neighborhood of northeast Portland.

The ReBuilding Center employees 40-50 people with a starting wage: of \$10 per hr. plus full benefits (sick, vacation, medical, dental). The average wage is \$14 per hr. and the monthly payroll is \$65,000-70,000. Retail sales (10 month period) are approximately \$350,000; deconstruction revenues total #650,000.

The ReBuilding Center diverts approximately 100,000 tons per year of construction and demolition materials headed to landfills. To date the ReBuilding Center has dismantled 100 buildings by hand and salvaged over 100 additional buildings. It plans to hire 5-10 additional employees this year when a major expansion project at its site is completed.

^a Beltram, J., E. Evans, M. Hibbard, and J. Luzzi. 2001. *The Scope and Future Prospects—Oregon's Ecosystem Management Industry*. Organization for Economic Initiatives, Inc. and Ecosystem Workforce Program, University of Oregon. EWP Working Paper No. 1. Fall.

Table 3, cont.: Examples of Sustainable Practices Generating Jobs for Members of Distressed Communities

Example #4: Water Conservation in Low-Income Neighborhoods.^b

The Water Services Dept. of Phoenix, Arizona, in partnership with neighborhood groups, provides low-income, inner-city homeowners with free plumbing services to repair leaks that waste water and install water-saving devices, such as low-flow showers and toilets. After an experienced plumber inspects a home and describes the necessary work, the work order is filled by students in a training program at Metro Tech Vocational Institute. The training program was developed by the Water Services Dept. and an educational arm of the plumbing and pipe-fitting industry.

After three years, the program had completed repairs and upgrades for 560 homes, at an average cost of \$679; trained more than 176 students; and resulted in saving 66,800 gallons of water per day. In addition, the water savings lowered homeowners' bills for water, wastewater treatment, and water heating.

Funding for the program is provided the city, Metro Tech, The Arizona Dept. of Water Resources, and the Bureau of Reclamation.

Example #5: The Remanufacturing Industry.

Many products discarded because consumers find they have unacceptable appearance or performance can have their useful lives extended by remanufacturing. Typically, the remanufacturing process entails a factory environment, where products are disassembled and component parts are cleaned, inspected, and refurbished or replaced.

A 1996 national study of the industry found 73,000 firms employing 480,000 workers.^c If their share of this industry is the same as its share of total U.S. employment, then Oregon has 6,100 jobs in the remanufacturing industry, and Washington has 10,400. A more detailed study of Ohio's recycling, reuse, and remanufacturing industry found the average payroll was \$39,000.^d For the smaller establishments, averaging 7 employees, the average payroll was \$17,000.

Example #6: Artistic and Craft Products.

Trillium Artisans is a women-run, non-profit program of the Neighborhood Pride Team, which supports home based businesses that make and market arts and crafts from reclaimed and recycled materials. The program works with low-income women in southeast Portland to help them make and sell their art/gift products. After 2.5 years, on average, it employs 3 and helps 15 artisans and entrepreneurs. It expects to hire another employee this year. Participants produce children's toys, pet toys, garden products, home decor, furniture, living room accessories, and natural living products from fabric, wood, and wire. It diverts 2 tons of material from the landfill each year.

^b Community Information Exchange. 1998. *Case Studies on Communities Creating Jobs and Protecting the Environment*. Washington, D.C. pp. 51-54.

^c Lund, R.T. 1996. *The Remanufacturing Industry: Hidden Giant*. Boston University.

^d R.W. Beck. 2001. *Ohio Recycling Economic Information Study*. Prepared for the Ohio Department of Natural Resources.

Table 3, cont.: Examples of Sustainable Practices Generating Jobs for Members of Distressed Communities

Example #7: Agricultural Plastics.^e

The Agri-Plas company collect, cleans and processes plastic materials that otherwise would be discarded as waste by the agricultural industry in the Willamette Valley. For example, the company converts used plastic baling twine, nursery film and containers into pots and other items and sells these to nurseries. The firm capitalizes on the rapid growth in the nursery-stock sector of the agricultural industry.

Headquartered near Salem, Agri-Plas currently employs about 40 workers and plans to hire an additional 30-50 over the next two years. Although wages are near the regulatory minimum, the firm helps distressed communities of farmworkers by creating jobs in the agricultural industry, where jobs are declining rapidly. It currently diverts almost 3,000 tons of material that otherwise would go to landfills.

Example #8: Wood/Plastic Building Products.^e

Marathon Recovery, a unit of Boise Cascade Co., procures waste plastic materials and remanufactures them into building products. The company has been engaged in research and development for seven years but now has plans to open a \$70 million facility in Elma, Washington, 25 miles west of Olympia in spring, 2002. The plant will produce a wood/plastic composite to be used as siding for buildings and, eventually as other construction products.

The plant site is located in a distressed area that once had one of the region's highest concentrations of timber-industry workers. It plans to hire 200 workers, with production workers paid \$9-17 per hour, plus benefits.

The new plant, when fully operational, is expected to use 8-9 million lbs. of post-consumer plastics per month.

Example #9: Tire-Rubber Remanufacturing.^e

Scientific Developments, Inc., in Eugene, manufactures molded rubber products from used tires. Products include traffic control devices, such as delineator bases, speed bumps, and wheel chocks.

The firm currently employs 16 workers, with an annual payroll of \$600,000, and gross receipts of \$2 million. It plans to expand in the future, hiring at least two more workers over the next two years.

Table 3, cont.: Examples of Sustainable Practices Generating Jobs for Members of Distressed Communities

Example #10: Polystyrene Remanufacturing.^e

Marko Foam, of Wilsonville, Oregon, recycles and remanufactures products from white polystyrene packaging. The firm produces (1) molding pellets containing 70 percent used foam for use by a California firm to make rigid plastic molding for doorways, windows etc.; and (2) foam packaging containing 10 percent used foam for printers, computers etc. The firm also recycles polystyrene foam packaging, supplying silicon-chip manufacturer, Wacher Electronics, in Portland. The end-user ships the packaging back to Marko at no charge and the product is reused again for Wacher products.

Marko Foam currently employs 44 people, mostly in production. Hourly payroll ranges from \$7.50 to \$20. Benefits include pay for vacation, sickness, and holidays, plus insurance coverage for medical, dental, and vision. After 1 year, employees get a matching 10 percent contribution to a 401(K) plan.

The firm concentrates on hiring from within the area's low-income, non-English-speaking community. Critical material is written in Spanish.

It currently recycles 20,000-30,000 pounds of polystyrene per week.

Example #11: Mattress and Appliance Remanufacturing.^e

St. Vincent de Paul, in Eureka, California, collects and remanufactures mattresses and appliances. Last year, it diverted from the waste stream 700 tons of metal and appliances and 43 tons of mattresses.

The operation employs 71 workers, with wages ranging from \$6.25 to \$8.50 per hour, plus medical/dental benefits. Higher skilled employees also receive a commission on each piece sold, creating private-sector incentives to increase production and satisfy customers.

The operation provides jobs in a chronically depressed area of northern California. It also provides job training for approximately six people with mental and/or physical disabilities.

Example #12: Computer Recycling.^e

Computer Drive Connections, in Cornelius, Oregon, a suburb of Portland, recycles used computers, printers and related electronic components for reuse. It gives usable machines and parts to qualifying non-profit organizations, free of charge. Non-usable parts and materials are diverted to other operations for recycling of components.

Computer Drive Connections does not engage in remanufacturing and, hence, does not require highly-skilled employees. It currently employs about 8 employees, with wages ranging from \$8 to \$10 per hour. The operation diverts 150 tons of computers and related materials from going to landfills per month.

Table 3, cont.: Examples of Sustainable Practices Generating Jobs for Members of Distressed Communities

Example #13: The Collins Companies.^f

The Collins Companies manage timberlands and manufacture wood products in southern Oregon's Klamath and Lake Counties and elsewhere. In 1993 The Collins Companies became the first privately-owned forest-products company in North America to receive the Forest Stewardship Council's certification that its operations satisfied the council's sustainability criteria. The corporation has a philosophy to "sustain and protect the integrity of our total forest ecosystem." In 2001 the firm announced its TruWood® Siding had become the first engineered siding in the world to be certified by the Forest Stewardship Council.

The Collins Companies employ about 700 employees in Oregon, mostly in small communities where employment opportunities are limited and educational levels are below statewide averages.

Example #14: Washington's Energy-Efficiency Industry.^g

This industry designs, manufactures, installs, and maintains facilities, equipment and processes that reduce the energy consumed per unit of output or consumption.

A 1998 survey, conducted for the Department of Community, Trade, and Economic Development, found that the industry contained 134 firms that employed 2,895 workers and paid an annual payroll of \$128 million. The estimation was conservative, focusing on firms that concentrated on work in this industry. Additional firms, workers, and payroll were associated with firms that occasionally worked in this industry but concentrated elsewhere.

Example #15: Washington's Renewable-Energy Industry.^g

This industry designs, manufactures, installs, and maintains systems that derive electricity (sometimes heat) from a source that nature maintains in a constant supply over time: wind, solar, geothermal, biomass, and small hydropower.

A 1998 survey, conducted for the Department of Community, Trade, and Economic Development, found that the industry contained 140 firms that employed 907 workers and paid an annual payroll of \$33 million. The estimation was conservative, focusing on firms that concentrated on work in this industry. Additional firms, workers, and payroll were associated with firms that occasionally worked in this industry but concentrated elsewhere. The estimate also does not include recent projects, such as the Stateline Wind Farm in eastern Washington and Oregon.

^g Information provided by the Waste-to-Work Partnership, a program of the Center for Watershed and Community Health.

^f Information provided by The Collins Companies and the Certified Forest Products Council.

^g ECONorthwest. 1998. *The Next Generation of Energy: The Energy Efficiency and Renewable Energy Industries in Washington State*. Washington Department of Community, Trade, and Economic Development.

JOB MECHANISM #2: COST SAVINGS FROM SUSTAINABLE PRACTICES CAN BE USED TO PROTECT AND CREATE JOBS.

When businesses save money through the adoption of sustainable practices, job security for existing workers can increase if the savings increase the firm's financial stability. New jobs can be created if the savings are reinvested in the firm. Similar mechanisms can protect and create jobs when governmental agencies realize costs savings from the adoption of sustainable practices.

A number of leading firms have shown the types of cost savings possible from the adoption of sustainable practices:¹

- **Hewlett Packard** in Roseville, California reduced its waste by 95% and saved \$870,564 in 1998.
- **Epson Computers** in Portland, Oregon reduced its waste to landfills to zero and has saved \$300,000 in the process. Ten percent of its waste is still incinerated.
- **Interface Inc.**, a leading global manufacturer of carpet and floor coverings, decided to be a "zero waste company." From 1994 through 1998 Interface cut its waste by 54 percent by weight and in doing so cut costs by \$167 million.
- **BFGoodrich Aerospace**, with a \$200,000 initial cost to redesign its ventilation and heating system, reduced annual energy costs at an aircraft-maintenance facility in Everett, Washington, by \$448,000.
- **Xerox Corp.** in 1993 initiated a Waste-Free Factory Program to decrease water discharges and municipal, hazardous, and chemical waste by 90 percent. Savings exceed \$90 million.

Table 4 offers another example, showing the new jobs that could be generated by reducing energy consumption in governmental office buildings, hospitals, and schools. Buildings consume energy in four major ways: (1) provide lighting; (2) heat/cool/ventilate air; (3) heat water; and (4) operate office equipment and appliances. National studies indicate that energy consumption in existing buildings can be reduced by 22 percent, or more, (up to 50 percent in new buildings) through the installation of energy-efficient technologies and the adoption of energy-efficient behavior.

¹ Romm, J.J. 1999. *Cool Companies: How the Best Businesses Boost Profits and Productivity by Cutting Greenhouse Gas Emissions*. Washington, D.C.: Island Press, and Conweb <http://www.newsdata.com/enernet/conweb/conweb.html#cw-70-2>.

Table 4: Potential Cost Savings and New Jobs from Adoption of Energy-Efficiency Practices: Government Office Buildings, Hospitals, and Schools

	No. Employees	Annual Energy Cost (\$ millions) ^a	Potential Cost Savings (\$ millions) ^b	Potential New Jobs from Savings ^c
Oregon				
State Government ^d	24,105 ^e	\$13.84	\$3.04	20
Universities/Colleges	13,381 ^e	\$12.40	\$2.73	50
Local Government ^d	51,122 ^e	\$29.35	\$6.46	85
Elem./Sec. Schools	71,010 ^e	\$65.82	\$14.48	285
Hospitals	40,365 ^e	\$98.10	\$21.58	265
Oregon Total	199,983	\$219.50	\$48.29	710
Washington				
State Government ^d	43,234 ^f	\$25.29	\$5.56	35
Universities/Colleges	33,990 ^f	\$32.11	\$7.06	130
Local Government ^d	78,904 ^f	\$46.16	\$10.16	125
Elem./Sec. Schools	139,275 ^f	\$131.57	\$28.95	655
Hospitals	55,384 ^f	\$137.20	\$30.18	355
Washington Total	350,787	\$372.33	\$81.91	1300
Total	550,770	\$591.84	\$130.20	2010

Source: ECONorthwest. 2001. *Sustainable practices, Public Buildings, and Jobs*.

^a Numbers based on these assumptions: (a) electricity prices = \$.052 per kWh (Oregon,) and \$.053 per kWh (Washington); and (b) energy use per 1,000 employees = 11,039,000 kWh (state and local government), 46,739,000 kWh (hospitals), 17,824,000 kWh (elem./sec. schools and universities) Source: ECONorthwest with data from the EIA, "Estimated U.S. Electric Average Revenue per Kilowatthour to Ultimate Consumers by Sector", and "1995 Commercial Buildings Energy Consumption Survey".

^b Assumes 22 percent savings (High-Performance Commercial Building Systems Program, Lawrence Berkeley National Laboratory).

^c Assumes labor's share of savings approximate its estimated current share of total costs per sector (assumptions and sources available upon request). Oregon: state government 25%; universities/colleges 62%; local government 45%; elem./sec. schools 57%; hospitals 43%. Washington: state government 25%; universities/colleges 67%; local government 45%; elem./sec. schools 63%; hospitals 45%.

Assumes mean earnings per worker per sector (sources: same as no. employees). Oregon: state government \$35,823; universities/colleges \$33,900; local government \$34,764; elem./sec. schools \$29,120; hospitals \$35,202. Washington: state government \$38,633; universities/colleges \$35,882 local government \$37,909; elem./sec. schools \$27,778; hospitals \$39,019. Calculations reflect rounding.

^d Refers to the "Public Administration" sector of the state and local governments.

^e Source: "1999 Oregon Covered Employment & Payrolls," State of Oregon Employment Department.

^f Source: "1999 Employment and Payrolls in Washington State by County and Institution," Washington State Employment Security.

If appropriate steps were taken to reduce energy consumption in the types of buildings listed in Table 3, the annual savings would total more than \$48 million in Oregon and \$81 million in Washington. If these savings were used to expand output, with the current average mix of costs (land, equipment, labor, etc.), labor's share of the expansion would be roughly 2,000 new jobs. Alternatively, the savings

might passed to taxpayers and consumers, or used to keep employment at current levels in the face of budget cuts.

These are rough estimates only. But they illustrate important tradeoffs. As businesses and governments face pressure to become more efficient, the more they can cut energy costs, the less the pressure to cut labor costs. This can be seen most clearly as the public sector strives to cope with higher energy costs occasioned by California's energy crisis and lower revenues occasioned by the current recession. As governors, mayors, and administrators are forced to reduce costs, they will have to cut labor costs unless they can find savings elsewhere. Although labor cuts adversely affect anyone laid off, they can be especially harmful to workers, janitorial and other workers earning low wages and with limited prospects for finding replacement jobs.

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Some efforts to trim costs have already been implemented. The Oregon Department of Administrative Services, which oversees the state's facilities, has reported that, in response to the energy crisis, state agencies reduced energy consumption during the first six months of 2001 by ten percent and, if the reductions persist, the savings will total \$1.6 million per year.² The State of Washington reports that efforts to reduce energy use have caused usage in of electricity and gas to decline by 8.88 and 15.7 percent, respectively, comparing August of 2000 with August of 2001.³ The data in Table 4 suggest that significant, additional savings are possible.

JOB MECHANISM #3: SUSTAINABLE PRACTICES CAN IMPROVE WORKERS' HEALTH, PRODUCTIVITY, AND JOB SECURITY.

Good health can help workers be more productive, thereby increasing their job security. Sustainable practices in the workplace can improve the health and productivity of workers directly, by making the work site a healthier and better place to work, or indirectly, by making the larger community a healthier place to live.

² Oregon Department of Administrative Services. 2001. "State of Oregon Releases Energy Savings Report." September 5.

³ *Executive Agencies Energy Report for August 2001.*

The direct impacts at the work site can occur by reducing or eliminating the use of toxic materials that require costly handling procedures and can lead to illness and lost-time from work if workers are exposed to them. Often, however, increases in health and productivity can occur not through the elimination of toxic materials but simply by making work sites healthier and more pleasurable places to work. Efficient lighting, for example, can help people see better, which reduces mistakes, increases work quality, and boosts production. Optimal heating and cooling system can increase worker comfort and output.

Businesses that reduce their costs and increase worker productivity by eliminating toxins in the workplace and reducing wasteful use of energy and raw materials can produce the same output for less cost. Similarly, governments can save taxpayers money by eliminating toxins, reducing waste, and increasing worker productivity. Together, businesses and governments can improve the business climate by preventing pollution in a cost-effective manner, rather than allowing pollution and then cleaning it up.

In two model sites, the U.S. Green Building Council estimates that paying attention to the quality of work-site features increased worker productivity between 6 and 16 percent. Even small productivity gains can justify an investment in green techniques. For example, consider a typical, 10,000-square-foot office space renting for \$20 per square foot including energy costs of \$1.80 per square foot. If 25 workers occupy the office, and each earns an average annual salary of \$50,000, the workers cost \$125 per square foot—or 70 times more than energy. In this example, a 1-percent increase in worker productivity would pay for the company's entire energy bill for eight months.⁴

Improvements in health and productivity are especially important to workers who already have health problems or who have such low earnings that they cannot afford illness-related absences from work. Thus, they become especially important to low-income workers and their families, and to distressed communities with high concentrations of low-income workers.

⁴ Example from US EPA Office of Air and Radiation. January 1997. *Introducing Your Company's Newest Profit Center*. EPA Document Number: EPA-430-R-97-004.

JOB MECHANISM #4: SUSTAINABLE PRACTICES CAN IMPROVE FIRMS' COMPETITIVENESS

The adoption of sustainable practices can help businesses in the Pacific Northwest become national and global leaders. Businesses that reduce their costs and increase worker productivity by eliminating toxins in the workplace and reducing wasteful use of energy and raw materials can produce the same output for less cost. Similarly, governments can save taxpayers money by eliminating toxins, reducing waste, and increasing worker productivity. Together, businesses and governments can improve the business climate by preventing pollution in a cost-effective manner, rather than allowing pollution and then cleaning it up. Lower costs and higher worker productivity mean a firm can become more competitive relative to other firms. All else equal, firms that are more competitive are more likely to exhibit increased sales and growth in employment, and less likely to contract during an economic downturn.

One recent study catalogued 160 firms, institutions, and agencies in the region that cut costs by more than \$55 million annually by implementing sustainable practices. Another found that, between 1992 and 1999, 137 firms and agencies in the region saved more than \$42 million, and the researchers concluded that, if only one-quarter of the firms in nine industrial sectors were to take similar actions, the total savings (and increase in profits) for the region would exceed \$1.1 billion over five years. These findings, and others like them, have helped business leaders and elected officials recognize the importance of taking the steps needed to encourage broader adoption of actions that can improve the region's economy and environment.⁵

At present, there are insufficient data to determine the extent to which increases in competitiveness translate into job opportunities for members of distressed communities. Further research is needed in this area to identify which policies, if any, hold the promise of increasing such opportunities.

⁵ Doppelt, B. and L. Watson. 2000. *"Just Plain Good Business" The Economic and Environmental Benefits of Sustainability as Exemplified by One Hundred Sixty Case Examples*. The Center for Watershed and Community Health, Portland State University. Portland, Oregon. Goodstein, Eban, Bob Doppelt, and Karin Sable. 2000. *Saving Salmon, Saving Money: Innovative Business Leadership in the Pacific Northwest*. Center for Watershed and Community Health, Portland State University. Portland, Oregon. January.

JOB MECHANISM #5: SUSTAINABLE PRACTICES CAN ENHANCE REGIONAL ECONOMIC SECURITY

The job outlook in the Pacific Northwest has darkened over the past year as the national economy has turned downward. Things have been made worse by disruptions occasioned by an energy crisis that spread throughout the West, and the terrorist attacks and threats since September. Investments in sustainable practices can help insulate the region's economy and jobs from future downturns and disruptions.

Energy security.

Disruption of oil supplies in the 1970s sparked major economic recessions. Disruption of electricity markets have had a similar, though smaller, effect in 2001. During the oil crises, tens of thousands of workers in the region lost jobs. The full effects of the electricity crisis are not yet known, but workers at aluminum smelters and other facilities lost jobs as high electricity prices triggered plant closures.

Electricity markets in the Pacific Northwest are highly vulnerable to drought (reduces the supply of hydropower), natural-gas prices (most new electricity generators burn natural gas), and the structure of the electricity industry (deregulation, proposals in Congress to force the Bonneville Power Administration to increase its rates, etc.). In the past year all three of these factors have disrupted power supplies, causing rates to jump. The region responded to the past crisis by reducing electricity consumption by about 4,000 megawatts (enough to power four cities the size of Seattle). Workers bore much of the load: more than 60 percent of the reduction came from closing aluminum smelters.

Future disruptions seem likely, but their impacts on the regional economy can be diminished by (a) increasing the region's energy efficiency and reducing the amount of energy consumed per unit of economic output, and (b) expanding the supply of electricity generators powered by wind, solar, and other renewable sources of energy. With greater energy efficiency, future shortages and price increases will have less leverage on the economy. With greater use of renewable energy supplies, the region will be less vulnerable to future droughts and increases in natural gas prices.

Transportation security.

Similar reasoning applies to the transportation sector. The greater the fuel efficiency for cars, trucks, airplanes, and ships, the lower the region's vulnerability to potential disruptions in the nation's petroleum supplies.

Food security.

With sustainable farming practices, farmers diminish their use of petroleum-based pesticides and fertilizers, relative to conventional farming practices, and they employ cultivation techniques, such as planting seeds without first plowing fields, that entail less use of tractors and other heavy equipment. Consequently, their production is less dependent on petroleum supplies. Because they do not use crop dusters or other heavy equipment for large-scale spraying of chemicals, there is less risk that such equipment could be commandeered for terrorist acts.

Water-supply security.

When the source water for a municipal utility comes from a degraded watershed or a polluted aquifer, it must pass the water through a complicated treatment process to kill pathogens and filter out impurities. Such systems are expensive and occasional warnings to consumers or outbreaks of waterborne diseases reveal their fallibility. Protecting watersheds and aquifers so the source water from them does not become degraded offers greater assurance of reliable water supplies.

Increased economic security is especially important to members of distressed communities, for they have the least economic reserves to tide them over if disruptions should interrupt their employment or close the doors on social services.

Security from Wildfire

During the summer and autumn, wildfires can rage over hundreds of thousands—or millions—of acres of forest and range lands in Washington and Oregon. Much, if not most attention afforded wildfires concerns those that burn in open areas, well away from human development. This is especially true of large forest fires that burn for weeks in rugged, remote areas. Far more damaging economically, however, are wildfires that impinge on communities, at the so-called wildland-urban interface, extending outward from the edge of an urban area and encompassing rural homes and other developments.

Over the past century, wildfire-related programs have focused on suppressing fires, largely in an effort to keep forests from burning trees and reducing their value to the timber industry. Now, ecologists recognize that, by preventing small, frequent fires that would have burned low-lying bushes, small trees, and broken limbs, these programs have promoted a build-up of highly flammable fuels and, ironically, increased risks of large, severe fires.

Now, the Forest Service and other land management agencies seek to correct the situation by setting small, prescribed fires or by logging forests to remove fuel under controlled conditions. At current funding levels, however, these efforts will take decades to complete the job, even though current funding is vastly larger than in past decades.

Consequently, many scientists, resource managers, and community advocates have suggested alternative practices that focus first on minimizing the likelihood that wildfires will ignite homes and other structures. Fire scientists have demonstrated that the best way to keep structures from burning is to build them with non-flammable materials on the exterior, surrounded by a fire-proof zone where flammable materials have been removed. Such a shift in policy would be especially important for poor households and communities that are highly exposed to wildfires, would suffer devastating economic consequences if a fire should occur, and lack sufficient resources to reduce the risks.

WHAT ARE THE POTENTIAL RISKS FOR WORKERS AND DISTRESSED COMMUNITIES?

The adoption of sustainable practices can pose risks for some workers and communities, as they increase opportunities for others. Workers in jobs associated with unsustainable practices might lose their jobs when these practices are terminated. Or, workers in a firm that fails to adopt sustainable practices may lose jobs when the firm loses sales and contracts in the face of increased competitiveness from firms that have adopted sustainable practices. To our knowledge, nobody has quantified these impact.

Sometimes, dislocations occasioned by the adoption of sustainable practices would have happened anyway, within the foreseeable future, insofar as the jobs depend on activities that are sufficiently wasteful and expensive that management could not have sustained them for long. In others, the inevitability of the dislocations lies further in the future: the underlying activities, though fundamentally unsustainable, can be sustained for a considerable time.

Losing one's job can be emotionally devastating and economically punishing. During recent years, however, robust economic conditions have tempered the severity of unemployment. An on-going study of mass layoffs (more than 50 workers) of workers who had worked for their employer for at least three years found that, of workers laid-off in 1997-98, 80 percent had found replacement jobs by February 2000. Of these, 49 percent were reemployed in less than 5 weeks and 72 percent in less than 15 weeks. More than 60 percent found jobs with wages equal or above what they were paid before they were laid-off, and more than one-quarter had wages more than 20 percent higher. But, for almost one-quarter of the displaced workers with new jobs, wages fell at least 20 percent. The experiences of workers displaced in the current economic downturn undoubtedly will be worse, but the full extent of the deterioration in outcomes is not yet known.

Any potentially adverse impacts on workers from the future adoption of sustainable practices could be curtailed if the beneficiaries from these practices committed resources to transition programs that helped workers find replacement jobs and maintain their incomes. The programs, often called just-transition programs, might take several shapes. Employers might help dislocated workers find jobs elsewhere within the firm, if for no other reason than to avoid employee opposition and to maintain worker morale. A larger community might provide assistance for workers when the actions that caused their dislocation resulted in significant improvements in environmental quality for the entire community.

CONCLUSIONS

Many indicators point, over the foreseeable future, toward further adoption of sustainable practices by businesses, communities and governments in the Pacific Northwest. Economic and technological changes are increasing the opportunities for realizing meaningful cost savings from actions that eliminate the use of toxins and reduce the wasteful use of energy and raw materials. Business and governmental leaders in the region already have realized the necessity of and potential benefits from sustainable practices, and have set the stage for much more, through multiple actions, such as Governor Kitzhaber's issuance of an executive order directing state agencies to pursue sustainability, and Governor Locke's announcement that he is directing his staff to develop a sustainability initiative. Local steps toward sustainability are being reinforced by national and international regulatory, market and citizen pressures.

Historically, most of the attention given the trend toward sustainable practices has focused on how they affect business profits, governmental budgets, and environmental quality. The PSU Center for Watershed and Community Health and ECONorthwest are taking a broader view, examining how sustainable practices affect workers and communities, and especially those at or near the bottom of the economic ladder. As part of this effort, this report provides an initial overview of the potential impacts on jobs, workers, and distressed communities.

Unlike earlier efforts by businesses and governments to cut costs, which often focused on cutting labor costs, sustainable practices focus on cutting costs associated with the use of toxins, energy, and raw materials. These practices can result in job reductions, but they also can protect existing jobs and create new ones. They can create new jobs as they are designed and implemented. The cost savings they yield can protect existing jobs by lessening the pressures for business and governmental administrators to cut labor costs. They can contribute to the creation of new jobs by increasing firms' competitiveness, making them more likely to grow, and by improving governmental agencies' efficiency, making them more likely to expand the services they provide the public. They can protect and create jobs by reducing the vulnerability to disruptions from market instability and terrorist attacks.

Furthermore, sustainable practices can improve the livability of houses, work places, neighborhoods and communities. Eliminating the use of toxins in industrial processes and removing them from

buildings and industrial products is especially important to the members of distressed communities, insofar as they live in areas with the greatest pollution and work in places with the greatest exposure to toxic materials.

Current knowledge about the interactions among sustainable practices, jobs, and communities is limited. Further study is needed to gain clearer insights into how sustainable practices affect workers and communities, especially those near the bottom of the economic ladder. Better understanding is essential if workers and communities are to know what steps they might take to ensure that they realize more of the potential benefits of future efforts to implement sustainable practices in the Pacific Northwest.

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