

Sustainable Practices, Sustainable Jobs in the Pacific Northwest

An Overview

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SUSTAINABILITY & JOBS: SUMMARY

This paper provides an overview of how the implementation of sustainable practices by businesses and governments can protect existing jobs and create new jobs in the Pacific Northwest. These positive impacts on employment will occur even as some jobs associated with unsustainable practices are lost. “Sustainable practices” reduce waste in the use of energy, water, toxins, and raw materials, and curtail harmful impacts on the environment. Having a better understanding of the relationship between sustainable practices and jobs is especially important now for these major reasons:

Businesses and Governments are Accelerating their Adoption of Sustainable Practices.

Sustainable practices can save substantial amounts of money, increasing business profits and reducing governmental costs.

To compete effectively in regional, national, and global markets, businesses in the Pacific Northwest increasingly must satisfy strict sustainability standards.

Global demand for goods and services associated with sustainable practices is growing, and businesses in the Pacific Northwest are striving to become market leaders.

Federal, state, and local laws, plus treaty obligations, require reduced environmental impacts.

The Adoption of Sustainable Practices Can Reduce the Region’s Vulnerability to Economic Disruptions.

The adoption of sustainable practices can help the region weather the current economic recession, by helping businesses and governments become more efficient.

More efficient use of energy and greater reliance on wind, solar and other renewable resources to generate electricity reduces the region’s vulnerability to instability in electricity prices, such as those that accompanied California’s recent electricity crisis, 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 supporting and expanding local and regional sources of uncontaminated food, avoiding contamination to soils and water bodies, and reducing the threats of air and water borne disease.

Sustainable Practices Can Protect and Create Jobs Via Five Major Pathways

1. Sustainable practices create jobs, e.g., in the construction of renewable-energy energy generators or the installation of energy-efficiency technologies.
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.

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SUSTAINABLE PRACTICES: BACKGROUND

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.

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

The concept of sustainability becomes more concrete 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. 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 essential 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 the costs of fixing damage to the environment 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.

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.

The adoption of sustainable practices entails solving problems before they are created, in contrast with past practices, where businesses and governmental agencies created toxins, pollution, habitat impacts and waste products, and then tried to clean them up. The sustainable approach entails redesigning products and production processes so that, from

the beginning, they require fewer inputs and produce less pollution and waste. With this approach, adoption of sustainable practices evolves in response to recognition that environmental problems are indicators of inefficiencies and design flaws, which waste resources, energy, and, ultimately, money. As this awareness increases, the managers of firms see pollution and waste-reduction programs as a mechanism for increasing profits, and the managers of governmental agencies see them as a mechanism for reducing costs and increasing the output of public services.

SUSTAINABLE PRACTICES PROTECT AND CREATE JOBS 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.

Although there exists no economy-wide compilation of the jobs associated with sustainable practices, they must number in the tens of thousands, in these and many other industries:

- 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
- 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
- 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
- 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
- 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.

Case studies of firms and agencies that have implemented sustainable practices indicate that the jobs associated with these 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 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.

A 1998 study of two of these industries in Washington found that they employed at least 4,000 workers. Table 1 summarizes the findings. The renewable-energy sectors has grown markedly since the study was completed, and the recent, often dramatic increases in energy costs in the region have stimulated additional activity in the energy-efficiency sector.

Table 1: Washington's Energy-Efficiency and Renewable-Energy Sectors, 1997

	# Firms	# Jobs	Wages (\$1,000)
The energy-efficiency industry ^a (Designs, manufactures, installs, and maintains facilities, equipment and processes that reduce the energy consumed per unit of output or consumption.)	134	2,895	127,877
The renewable-energy industry ^b (Derives electricity (sometimes heat) from a source that nature maintains in a constant supply over time: wind, solar, geothermal, biomass, and small hydropower.)	140	907	32,703

Source: 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.

^a Estimation assumptions were conservative; actual size of the sector is perhaps much larger. ^b Does not include recent projects, such as the Stateline Wind Farm in eastern Washington and Oregon.

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. For example: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. Five 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 \$76 million.
- **Xerox Corp.** in 1993 initiated a Waste-Free Factory Program with the goals of decreasing municipal, hazardous, and chemical waste by 90 percent and decreasing water discharges by 90%. The company has saved over \$90 million as a result.

Table 2 offers another example, showing the potential new jobs that could be generated through practices that would reduce energy consumption in governmental office buildings,

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.

hospitals, and schools in Oregon and Washington. 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. In general, hospitals are the largest user of energy per square foot and per 1,000 employees. Space heating, cooling, and ventilation is the most energy intensive component of consumption. Lighting and water heating are the second largest components of total energy use. National studies indicate that energy consumption in existing buildings can be reduced by 22 percent, or more, through the installation of energy-efficient technologies and the adoption of energy-efficient behavior.²

If appropriate steps were taken to reduce energy consumption in the types of buildings listed in Table 2, 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 be 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 some important tradeoffs. American businesses and governments face increasing pressure to become more efficient. The more they can cut energy costs, the less the pressure to eliminate jobs and 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. 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. The data in Table 2 suggest that additional savings are possible.³

Job Mechanism #3: Sustainable practices can improve workers' health, productivity, and job security.

Good health can help workers be more productive, and workers that are more productive generally have greater 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.

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

² Energy consumption in new buildings could be reduced even more, up to 50 percent.

³ Oregon Department of Administrative Services. 2001. "State of Oregon Releases Energy Savings Report." September 5.

people see better, which reduces mistakes, increases work quality, and boosts production. Optimal heating and cooling system can increase worker comfort and output.

Table 2: 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	22
Universities/Colleges	13,381 ^e	\$12.40	\$2.73	50
Local Government ^d	51,122 ^e	\$29.35	\$6.46	86
Elem./Sec. Schools	71,010 ^e	\$65.82	\$14.48	285
Hospitals	40,365 ^e	\$98.10	\$21.58	266
Oregon Total	199,983	\$219.50	\$48.29	709
Washington				
State Government ^d	43,234 ^f	\$25.29	\$5.56	37
Universities/Colleges	33,990 ^f	\$32.11	\$7.06	132
Local Government ^d	78,904 ^f	\$46.16	\$10.16	124
Elem./Sec. Schools	139,275 ^f	\$131.57	\$28.95	655
Hospitals	55,384 ^f	\$137.20	\$30.18	353
Washington Total	350,787	\$372.33	\$81.91	1301
Total	550,770	\$591.84	\$130.20	2011

^a Numbers based on these assumptions: (a) electricity prices = \$.052 per kWh (Oregon,) and \$.053 per kWh (Washington) (Source: EIA, "Estimated U.S. Electric Average Revenue per Kilowatthour to Ultimate Consumers by Sector"); 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, "1995 Commercial Buildings Energy Consumption Survey").

^b Assumes 22 percent savings, using estimates by High-Performance Commercial Building Systems Program, Lawrence Berkeley National Laboratory.

^c Assumes labor's share of savings equals 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.

Totals may not equal sum of components because of 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.

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

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 firms that do not adopt sustainable practices. All else equal, firms that are more competitive are more likely to exhibit increases sales and growth in employment, and less likely to contract during an economic downturn.

One recent study catalogued 160 firms in the Pacific Northwest that have reduced their costs by more than \$55 million annually by reducing their impact on natural ecosystems, diminishing their use of raw materials, and eliminating practices that waste energy and resources. 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

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.

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 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.

WHAT ARE THE POTENTIAL RISKS FOR WORKERS?

The adoption of sustainable practices can pose risks for some workers, 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.

In some situations, 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. Conversely, for almost one-quarter of the displaced workers with replacement 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 implementation of sustainable practices by businesses 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. Local steps toward sustainability are being reinforced by national and international regulatory 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. ECONorthwest and the Center for Watershed and Community Health are taking a broader view, examining how sustainable practices affect workers and communities. As part of this effort, this report provides a brief overview of the potential impacts on jobs and workers.

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.

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.