SUMMARY OF RESEARCH AND FINAL RECOMMENDATIONS FOR GROWING THE SUSTAINABILITY SECTOR(S) IN LANE COUNTY

A Report For The Lane County Sustainable Business and Jobs Project

Final Report
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Background and Acknowledgments

As we enter the new millennium, the residents of Lane County face a number of important economic, social, and environmental challenges. The economy is struggling, unemployment is high, government revenues are falling, and water quality, fisheries, and other environmental resources are at risk. Decision makers seek appropriate steps to resolve these problems in a manner that will simultaneously enhance the economy, workers, and the environment, but often are unclear about how to achieve these multiple goals.

In the winter of 2003, the Program for Watershed and Community Health (PWCH), a research and technical assistance program affiliated with the Institute for a Sustainable Environment at the University of Oregon, initiated a project to help decision makers throughout the southern Willamette Valley understand sustainable business and job development and identify strategies to secure and expand the local sustainability sector. The PWCH seeks to provide accurate, objective, and easy-to-understand information about the size and scope of the existing sustainability sector and to assess the potential costs and benefits associated with expanding the sector(s) and assisting others to adopt sustainable practices. A team of seven graduate students from the University of Oregon served as the research staff for the project. An informal group of local government and economic development specialists served as the project oversight committee. This report synthesizes and summarizes the body of work produced by this effort and offers a set of general recommendations for growing the sustainability sector(s).

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I. INTRODUCTION

This document summarizes the findings of eight months of research into the business and job opportunities potentially available through the application of sustainable development practices in Lane County, Oregon. The report closes with a set of recommendations for growing the sustainability sector(s) in Lane County. Four reports are summarized here. They cover: Green Building, Natural Foods, Eco-Industrial Development, and the results of a questionnaire mailed to private companies and public agencies throughout Lane County.

The project was initiated because there appeared to be a high level of interest in the field of sustainable development throughout Lane County. However, for a variety of reasons, it seemed difficult for local governments and economic development agencies to get traction on the issue. UO Program for Watershed and Community Health director Bob Doppelt decided to launch the project to provide Lane County decision makers and residents with data that could help build understanding and serve as a foundation for the adoption and expansion of sustainability efforts.

Sustainable development has economic, social, and environmental dimensions. The Lane County Sustainable Business and Jobs Project focuses *solely* on the business and job creation aspects of the field. In specific, the project had three goals:

1. To apprise local government and economic development officials about the principles, practices, and socio-economic benefits of sustainable business and job development.
2. To identify policies and programs to retain and expand existing sustainable businesses and to incubate or recruit new businesses applicable to rural and urban areas of Lane County.
3. To provide UO graduate students with applied research and technical assistance experience.

II. CLARIFYING SUSTAINABLE DEVELOPMENT

Sustainability–the goal–and *sustainable development*–the activities needed to achieve that goal–have emerged as the most common terms used worldwide to describe efforts to protect the environment in a manner that generates equal or greater economic and social benefits. The terminology has been used at the national and international levels for well over a decade. First described by the U.N. World Commission on Environment and Development (often called the Bruntland Commission) in its 1987 book *Our Common Future*, sustainable development was defined as *"development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs."*

Although helpful in describing the overall goal, many people find that the Bruntland Commission's definition provides little clarity on what sustainable development means for their business, agency, or household. To make the concept more concrete, sustainable development can be thought of as policies, programs, and practices that support the transition from a "linear" economic paradigm to one that is more "circular" (or closed loop) in nature.

Our current economic system is fundamentally linear in nature. Emerging out of the industrial revolution over 200 years ago, it focuses on producing products and services and delivering them to the customer in the fastest and cheapest way possible. Society extracts resources (such as wood, fish, minerals and fossil fuels) from the Earth's surface, turns them into goods, and then discharges the waste the system generates, which is substantial and often filled with toxic materials, back into nature as either air, water, and soil pollution or as solid, industrial, and hazardous waste. After two centuries of experience with what experts call a "take-make-waste" production model (also called a cradle-to-grave system), it has become firmly embedded as the dominant economic system in developed nations. Most public and private organizations today employ the linear take-make-waste production model.

The linear approach has created unprecedented economic benefits, especially in Western nations. Indeed, it has provided the basis for the production of goods and services at a level never before seen on earth. However, it turns out that the take-make waste production model also produces some unintended side effects, many of which are just now becoming apparent. These impacts include, for example, enhanced global warming due to greenhouse gas emissions, loss of native species that are the seed sources of future biodiversity, toxic contamination that is increasingly appearing in plants, animal, and human cells, and growing poverty here and abroad.

Sustainable development can be understood as a next step in the evolution of our economic thinking and progress. At its core, it closes the loop of the linear approach by transforming it into one that is *circular* in nature. The circular (or closed-loop) approach uses energy and raw materials that are extracted from nature without harm and with reduced or no toxicity, turns them into goods through processes that generate little to no pollution or toxicity, and continually recirculates the technical by-products the systems produces, which are now thought of as worthless waste, back into the industrial system to serve as feedstocks for new business activity while safely recirculating biological materials back to nature where they become nutrients for renewed growth. Thus, the new paradigm can be considered a 'borrow-use-return' system.[1]

While ample data now shows that the linear economic system often depletes the environment and generates socio-economic risks due to exposure to toxics and other factors, a growing stream of research shows that the circular model can achieve the so-called "triple bottom line" of sustainable development: concurrent economic, social, and environmental benefits. Figure 1 describes the unsustainable linear take-make-waste production model and Figure 2 describes the sustainable circular borrow-use-return approach to economic and community development.[2]

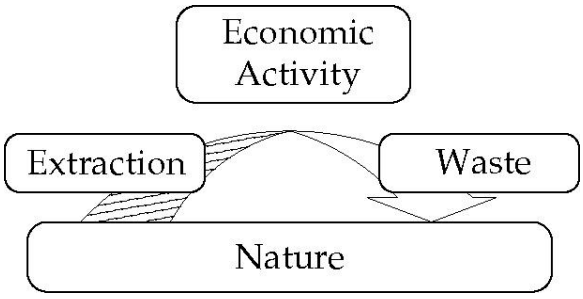
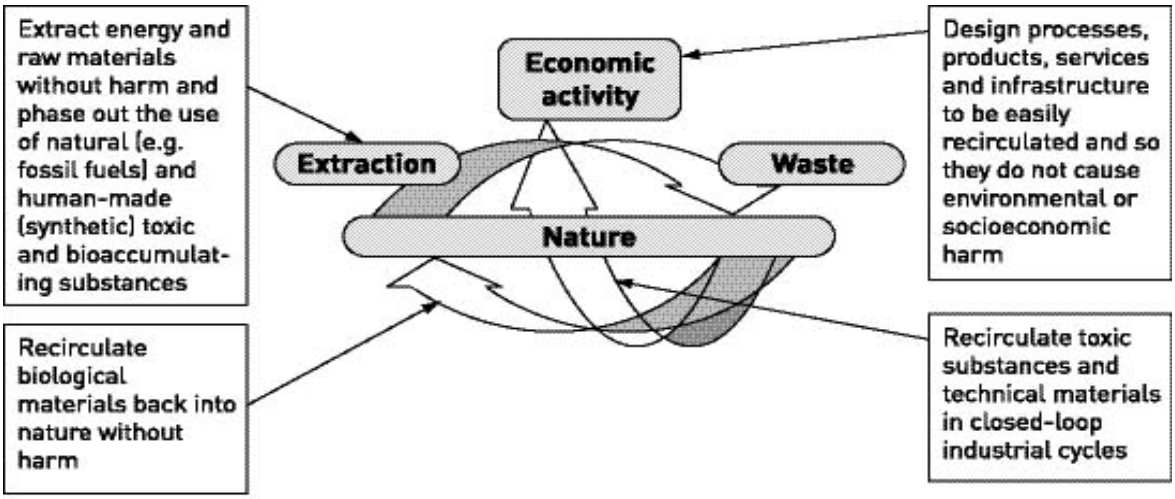


Figure 1: The unsustainable linear take-make-waste economic model

Figure 2



The sustainable circular 'borrow–use–return' economic model

The Lane County project sought to identify the types of local business and job opportunities that currently existed and/or could be expanded, incubated, or established in the many elements involved with the transition to the circular borrow-use-return production model.

III. RESEARCH METHODOLOGY

A. Company and Organizational Types

The research team used work done for the Portland Development Commission on sustainable economic development as the basis for investigating five types of sustainability sectors or activities in Lane County.[3]

- Businesses that apply sustainability practices to current operations.
- Public entities that apply sustainability practices to current operations.
- Companies that produce sustainable goods.
- Organizations and processes that support the development of sustainable products, services, and practices.
- Organizations and processes that provide jobs and benefits specially tailored to low-income individuals (this category is a subset of the other four categories).

B. Research and Evaluation Criteria

When investigating the economic and jobs potential of the sustainability sectors and practices described above, we addressed the following issues as best we could:

1. Description of the sector.
2. Identification of existing firms and organizations.
3. Analysis of existing business clusters.
4. Opportunities and obstacles for the sector.
5. Potential applications for Lane County.
6. Policies and programs that could encourage local growth of the sector.

C. Criteria of Sustainable Practices

The research team used a combination of criteria used by two prominent programs, ShoreBank Pacific (a Northwest bank that lends only to sustainable businesses) and Oakland's Green Map program (a local government program that provides incentives and awards for sustainable companies) to determine if a company or practice would fall within the category of "sustainable." Four criteria were chosen and organizations were considered to be applying sustainable development practices if they met at least one of these criteria. The four criteria are:

- *Businesses that formally adopt sustainability policies, principles, and strategies, as demonstrated by:*
  - Formal adoption of a written policy and goal of sustainable development.
  - Adoption of a detailed written strategy for moving toward their definition of sustainability.
  - Utilize one the following systems or set of principles for understanding and implementing their sustainable development strategy: CERES Principles, Natural Step Principles, Eco-Efficiency, ZERI Principles, and others.

- *Businesses that achieve third-party certification:* Organizations that are certified by independent third parties as using sustainable materials or practices (e.g. ISO 14000 for a certified environmental management system, Oregon Tilth for organic foods, Forest Stewardship Council for sustainable forestry certification).

- *Businesses that apply comprehensive green chemistry/engineering practices:* Organizations that in their operations, products, or services apply *comprehensive* strategies – as verified by outside sources – focused on reducing the use and emission of toxic bioaccumulating chemicals and substances.

- *Businesses that implement comprehensive resource efficiency technologies or practices:* Organizations that in their operations, products, or services incorporate *comprehensive* waste elimination practices at the source, reuse, remanufacturing, recycling, efficient and environmentally benign extraction methods, and use of clean renewable energy and energy efficiency and conservation practices. The practices must be verified by local waste management authorities (Lane County), utilities (EWEB, SUB), or other sources.

IV. SUMMARY OF RESEARCH FINDINGS

The research was completed through four separate but interrelated projects. The outcomes were published in four reports, which are summarized below. For more detailed information on each project, please see the individual full reports.

1. *Surveys of Local Private and Public Sustainability Sectors*

A questionnaire was mailed to 157 businesses and non-profit organizations in Lane County that were determined to have potentially applied sustainability practices or policies in their operations. The goal of the survey was to determine the extent to which sustainability practices are being applied, the types of practices adopted, their costs and benefits, the potential for future growth, and what may be needed to help expand the practices and grow the businesses. The survey was completed and returned by 54 organizations, representing better than a 33% return rate. A second questionnaire was mailed to 113 public agencies in rural and urban communities from throughout Lane County. This survey sought to determine the extent to which the agencies have applied sustainability practices, the financial, social, and environmental outcomes of those applications, and their interest in doing more. A total of 19 completed surveys were received from the mailing. This equates to an 18% response rate, which is a decent response for a survey of this type. The results of these surveys were summarized in the document entitled *Status And Trends Of Sustainability Practices In Lane County: An Analysis Of Survey Data* (UO PWCH, October 2003)

Seven core findings were deduced from the surveys of local private and public sustainability activities:

a. *The Sustainability Sector in Lane County is Diverse***:** Survey respondents were grouped into seven business categories, with the largest category being the natural foods growers, producers, and retailers (27% of total respondents). Other categories were recycling businesses, consulting firms, green building companies, industrial manufacturing operations, service-oriented business, alternative energy companies, and investment firms. This indicates that sustainability practices are being applied by a wide variety of local businesses and that, in reality, there is no single "sustainability sector"--many industries or sectors are involved. The variety of sectors applying the practices also suggests that because sustainability measures are not limited to a few industries, with proper education, training, and support, many if not all local industries and organizations may be able to apply the measures.

b. *The Local Sustainability Sector is Stable*: Most of the private sector firms have been in business for 11 or more years (and 45% for 20 plus years). The vast majority of firms were founded by people who already lived in the area (71%). Most expect to stay in the same location or expand locally. This information suggests that the sector has deep roots, is therefore not likely to leave when conditions get tough, and may not require extensive external recruitment efforts to help expand and grow.

c. *The Local Sustainability Sector Makes an Important Economic Contribution*: Data from 43 of the firms that responded to the private sector survey found that the sector employs at

least 1024 and probably 2195 or more people, and the 43 businesses have a combined net payroll of $57,035,192. Because we have data from just one third of the companies that were sent surveys (and because many firms other than those to which we sent surveys may be using the practices), it is likely that the sustainability sector employs at least 3,000 and generates well over $60 million annually (possibly closer to $75 million or more) to the local economy. This information suggests that the sustainability sector(s) already makes an important contribution to the economy of Lane County.

d. *Most Firms Do Not Comprehensively Apply Sustainability Practices, Yet a Large Majority of Businesses Found Significant Advantages, Suggesting Major Room for Expansion*: Few of private companies that responded to the survey have adopted the majority of the practices listed in it. Most have adopted just one or two practices (for example, energy efficiency and/or recycling). Yet, most of the firms said they had found cost savings and other benefits from those practices they had applied. This suggests that a significant opportunity may exist to help local firms reduce costs and achieve competitive advantage by expanding the awareness of the benefits of sustainability practices within the business community and assisting companies to adopt more comprehensive measures.

e. *A Number Of Sustainable Businesses Could Provide Jobs For Less Educated and Skilled Members Of Our Community*: The information gathered by the private sector survey suggests a number of job opportunities may exist in the sustainability sectors for less educated or skilled individuals. Although only roughly 6% of the businesses reported that the majority of their employees required a low skill level, over 50% said that just a moderate skill level was needed. The major job opportunities appear to be in reuse, recycling, and Natural Foods.

f. *The Public Agency Survey Suggests that Most Agencies Have Done Little But See the Need and Potential and Want Help To Adopt Sustainability Practices*: The vast majority of public agencies that responded to our survey have not implemented many sustainability practices However, the level of waste generated and energy used by these agencies suggests that with effective leadership and skillful implementation, a major opportunity may exist to help the public sector cut costs by reducing the energy use and waste generation. (Note that because our pool of respondents was small—19 in total—it could be that it is impossible to draw any useful conclusions from the data and that many more agencies have adopted one or more practices).

g. *In Sum, The Stability and Potential of The Sustainability Sector, Combined with the Benefits and Lack of Major Constraints Most Firms See in Lane County, Suggests That It Could Be A Prime Source of Future Business and Job Growth*: Even in the difficult economic conditions of the past two years, the vast majority (over 90%) of the private businesses that responded to the survey remained stable or grew. For example, during 2003, a year when the economy continued to struggle, about three quarters of the businesses expected equal or increased growth. In addition, an overwhelming majority of the respondents to the private sector survey (over 90%) think that Lane County is a good place to operate a sustainable business. This contrasts sharply to other assessments that have found that businesses felt the area (Eugene in particular) was not business friendly. Well over half of the respondents who believe Lane County is a good place to do businesses said that a primary reason was that the community is informed and places value on health and sustainability. Most respondents also stated few structural barriers

to their continued growth. This suggests that a knowledgeable customer base exists that helps to support and drive the sustainability sector to continually produce top quality goods and services. The ability to withstand, thrive, and even grow in difficult economic times, combined with the assets that many businesses believe currently exist in Lane County and the lack of outstanding major barriers suggests that with skillful assistance, the sustainability sector could be a major source of future local business and job growth.

2. *Green Building*

In a separate but related research project, the research team analyzed the costs, benefits, and potential opportunities for expanding the "Green Building" Industry in Lane County. Information and data for this research were obtained through a review of the literature and websites, informal telephone interviews, meetings with local trade associations, and discussions with local government representatives.

The building industry is the nation's largest manufacturing activity, representing 13% of Gross Domestic Product, and provides nearly 10 million professional and trade jobs. More than 50% of the nation's reproducible wealth is invested in constructed facilities.[4] The building industry in Lane County includes 438 companies[5] that employ 9,030 workers.[6] The average annual local wages are $36,889 and annual gross revenues are $90,904,200.

In addition to economic impacts, buildings have a large environmental impact. The National Science and Technology Council says that buildings consume a large portion of all resources within the United States including: 36% of total energy used, 65% of electricity generated, 25% of the timber harvested, 16% of fresh water consumed, and 30% of all raw materials used.[7] Also, buildings generate huge amounts of secondary outputs such as: 30% of the total waste output in the U.S., which accounts for 136 million tons annually, 40% of municipal solid waste destined for local landfills, 35% of the world's CO2 emissions, and 50% of ozone-depleting CFCs still in use.

This information suggests that the widespread adoption of Green Building practices in the construction industry in Lane County may generate substantial economic, social, and environmental benefits.

Green Building has been defined as "*innovative building and site design techniques that improve the quality and performance of buildings while simultaneously reducing stress on the environment.*" Green Building encompasses a broad range of activities including: highly efficient management and conservation of energy and water resources, use of renewable energy; use of low or non-toxic substances and materials; careful management of material resources and waste; protection of healthy indoor environmental quality; landscaping that minimizes stormwater runoff and maximizes the use of native vegetation, and integrated design approaches. Our research found that the main benefits of green building include: some construction costs can be reduced (while others, at least in the near term, may be higher); reduced long term operation costs; increased return on investment and asset values; improved labor productivity and human health for those working or living in Green Buildings; enhanced local economic vitality; and an improved environment.

Our research found a number of obstacles to expanding green building in Lane County including:

- Lack of monetary incentives to finance upfront costs
- The economic benefits are often accrued by future homeowners or renters, not those who make the initial investments
- Absence of information and education that creates fear about new products and the unknown
- Lack of communication and integration among and between builders, material suppliers, and consumers
- Lack of a clear standards and criteria for Green Building among local governments and the sector as a whole

Recommendations: Although our research found that the Green Building industry in Lane County faces many obstacles, by examining the experiences and strategies employed by other municipalities we identified potential solutions. The following recommendations are offered for overcoming the barriers and expanding Green Building in Lane County:

- Government agencies should partner with building trade associations and others to offer educational programs for builders, building product suppliers, public employees, and consumers.
- Local, state, and federal government agencies should lead by example by explicitly applying green building practices to new construction and renovations of public buildings
- Local governments should establish clear green building standards for non-public buildings within their community so that local contractors can understand the criteria and know what to focus on.
- Local governments and economic development agencies should partner with the construction industry to identify ways to overcome regulatory and cost barriers.
- A county-wide steering committee should be established composed of public, private, non-profit, and academic leaders to identify the best ways to assist small communities to achieve the goals above and to develop linkages and networks that can help to expand the Green Building industry county-wide.

More detailed information and recommendations can be found in the complete report entitled *Growing the Green Building Industry In Lane County* (UO PWCH, October 2003) posted on the PWCH website: http://cwch.uoregon.edu

3. *Natural Foods*

The research team analyzed the size, scope, and interrelationships of the Natural foods industry in Lane County. The Natural Foods sector includes organic and sustainable farms, food processing and distribution companies, and food retailers. Research was pursued to determine if an industry "cluster" existed or could be developed composed of suppliers, producers, shippers, wholesalers, retailers, and other parties. "Gaps" were identified in the local supply chain: products or services that are heavily used but are not produced by local suppliers, suggesting potential business opportunities.

Our research found that the local Natural Foods Industry comprises more than 30 businesses and 30 organic farms. The 15 natural food companies that responded to our survey reported at least 334 local employees and annual local payrolls of at least $8.39 million. The lowest level of annual sales reported was $76,000; the highest was $16 million. This information suggests that the natural foods industry makes an important contribution to the local economy.

Our research found that many local food producers, café's, distributors and organic farms know each other and maintain business relationships. However, our research did not identify a well-defined business cluster. This suggests that with an effective approach, a major opportunity may exist to help stabilize and grow the natural foods industry as a major business cluster in Lane County. In addition, in assessing sustainable business practices within the sector, we found gaps in the supply chain that suggest a few potential business opportunities.

In sum, our research found that the Natural Foods sector is already a vibrant part of the local economy and has the potential to grow into a major cluster that could provide increased benefits for the firms, workers, and the local economy and environment.

Recommendations: Based on our research we offer the following suggestions to help secure and expand the local Natural Foods industry:

- Members of the natural foods industry should consider forming a local business coalition or trade association to provide a vehicle for joint problem solving, marketing, bulk purchasing, enhanced business relationships, and other ventures.
- Local economic development agencies should consider helping to establish a natural foods task force with membership from the private, public and non-profit sectors with the goal of identifying the key factors required for establishing a strong natural foods industry cluster. This could include developing strategies to share information about and provide access to capital, technical assistance, worker training, infrastructure development, and other needed assistance to local businesses.
- The natural foods industry business coalition/trade association and public-private task force should work closely with the Lane County Food Coalition to establish the Lane County Food Policy Council. Ensure that efforts to provide food security for local residents and efforts at economic development are mutually reinforcing.
- As part of the strategy to secure and grow the industry, a "Buy Local, Buy Organic (or Sustainable)" consumer education and marketing program should be considered.
- National grocery chains with local outlets should be encouraged to buy local foods.
- Funding should be found to conduct market studies for a proposed new site for the Lane County Farmers' Market, and for a weekly Farmers' Market in downtown Springfield.
- A recommendation was made to explore an incubator facility for the local Natural Foods Industry. However, a feasibility study on the issue suggested it may not be cost effective.
- Local economic development agencies should consider ways to help the industry establish wider markets for local greenhouse products such as plant starts.
- Low-interest loans could be provided to small business officers and farm operators who maintain enrollment in the LCC Small Business and Farm Management programs.
- A recognition program could be established to publicly acknowledge local natural foods businesses that implement sustainability practices. Example: use a ranked award system

that consists of symbolic awards such as one-star awards for beginning efforts and a scale up to five-star awards for advanced efforts that address their entire production processes.
- Federal and state agencies could be encouraged to create tax incentives for farms and businesses to install photovoltaic and other renewable energy generating equipment.
- Conduct market research to determine if the "branding" of local natural foods would improve sales (e.g. "Produced in Lane County, Northwest leader of natural foods").
- Develop capacity at the University of Oregon and/or Lane Community College to conduct sustainability through-put analyses for company production processes.
- Research the cost-effectiveness and business opportunities related to manufacturing recyclable packaging, greenhouse materials and tractor parts farm supply, and manufacturing of high-quality hand tools for gardening and farming.

More information can be found in the full report entitled *Growing the Natural Foods Industry In Lane County* (UO PWCH, October 2003) posted on the PWCH website: http://cwch.uoregon.edu

4. *Eco-Industrial Development Opportunities*

The research team investigated the potential business and job opportunities in the diverse field of *Eco-Industrial Development.* In specific, the research assessed the potential to expand, incubate, or recruit businesses related to the development of eco-industrial parks, bio-refineries and bio-based industrial systems, renewable energy systems including biomass, biofuels, hydrogen fuel cells and solar, and zero waste (waste free) programs. Through case studies, information gathered from leading local and national experts, and extensive web research, we found significant potential for Lane County to become a center of excellence in Eco-industrial development

A. *The Potential for Eco-industrial Parks in Lane County*

Sustainable small businesses and new technology startups provide an important way to grow economies. Industrial zones or specific business incubation and development facilities (Eco-industrial Parks) can provide the critical support structures needed to link these organizations to the capital, markets, energy and raw material flows, innovative ideas, and research needed for their growth. Eco-industrial parks have also been found to produce a multiplier effect that helps both existing and new small business grow within and outside of the park. According to a document prepared for the U.S. Economic Development Administration, the benefits of eco-industrial parks can include economic efficiency and profitability, job retention and growth, community development, and environmental stewardship.

Recommendations:

- To establish Eco-industrial Parks in Lane County, one key step is for local governments (or private landowners) to establish a clear declaration of intent. An explicit goal must be declared of establishing a site with the specific purpose of incubating, growing, and recruiting organizations that agree to apply principles of eco-industrial development and exchange energy resources and waste materials.

- Once the goal has been established, potential sites can be examined. In addition, potential incentives to lure or retain businesses can be identified. Marketing and promotional strategies can also be developed.
- The level of planning, information gathering and coordination involved with the development of an Eco-industrial Park may be extensive. Rather than develop an entire knowledge base from scratch, Lane County communities might seek outside expertise. One possible approach is to request that the Governor's Community Solutions Team provide the expertise, write up a plan, and provide (or identify) start-up funding. Other potential partners include local Chambers of Commerce's', the Lane Economic Committee, Oregon Department of Community and Economic Development, and Lane Metro Partnership.
- Partners that could provide expertise, research and, possibly, research assistance at an internship level, include the University of Oregon Charles H. Lundquist College of Business, the UO Program on Watershed and Community Health, Lane Community College, and other programs and institutions.
- Maintaining eco-industrial development efforts will require all levels of government and the private sector.

B. *Bio-Based Products and Bio-Based Industrial Systems*

Lane County has the opportunity to establish bio-refineries and an industrial system that produces bio-based industrial products. Bio-based fuels (grain or biomass ethanol, oilseed biodiesel, biomass methanol, commercial cooking oil biodiesel), lubricants (motor oils, total loss lubricants, hydraulic fuels), nutraceuticals, chemicals, composites, building materials, textiles, corn-based plastics, and paper are just some of the bio-based products that could be produced in Lane County. Grains, oilseeds, and biomass such as wheat straw and grass seed, as well as local crops such as canola and mustard could provide the feedstocks for the bio-products.

This economic opportunity is based on a few key points:
- The market for using bio-based industrial lubricants is expected to substantially grow over the next 5-10 years with the primary drivers being public sector and environmentally oriented end users.
- Production of oilseed feedstock in the region is low at present, but can expand to meet the needs for an appropriate scale crushing and refining operation.
- Area farmers can consider several approaches to cooperating to pursue this opportunity, in order to capture the value-added benefits.

Bio-based lubricants, made primarily from canola oil, but which can also be produced from soybean, sunflower and safflower oils, can be used in several applications such as hydraulic fluids (used in turf mowers, tractors, forklifts, and front-end loaders); total loss lubricants (two-stroke engine oil used in lawnmowers, snow blowers, and boats, chainsaw bar and chain oil, railroad flange oil and grease, drip oil, wire rope lubricant and dust suppressants); and automotive lubricants (used in engine crankcases).

Examples of potential near term markets include the Port of Siuslaw, Port of Portland, and other ports, Lane County Parks, Eugene Parks, Willamalane Parks, Oregon State Parks, and other park systems, Oregon Department of Forestry (chain saw lubricant) and other chain saw users. Lane

Transit District, Tri Met in Portland Metro area, and other local public transportation systems, and golf courses

Recommendations. To incubate and grow the bio-based product sector we suggest:

- Form an exploratory committee composed of interested entrepreneur, individuals, businesses, farmers, academic, and government leaders interested in the business concept with the goal of identifying the key factors needed to help grow a bio-based product industrial cluster.
- The first priority should be to become educated about the potential of developing a bio-refinery and producing bio-based products. The committee could then: refine market data and analysis related to specific products to be considered; secure commitments from regional customers to establish initial markets; and take other steps to help the industry get off the ground.
- Focus initially on packaging, marketing and distribution of selected products. Specific product market analysis is needed and a business enterprise needs to be created to undertake the necessary business planning. Careful attention to satisfying questions of potential end users will be needed at the beginning.
- Analyze adding crushing and blending capacity needs, and identify an initial scale of production that strikes a balance between end user demand and ability to secure feedstock.

C. *Renewable Energy Opportunities*

1. *Biomass Energy*

Biomass energy uses the embodied energy in organic materials like agricultural and forestry waste to produce energy in the form of electricity or heat. Several different processes generate energy from biomass on a larger scale: *Direct-fired consumption* processes directly burn biomass residues or "energy crops" for energy; *Cogeneration, or co-firing,* is similar to direct-fired consumption, except that the biomass is burned with traditional fuels, like coal or natural gas; *Anaerobic digestion* occurs at landfills which contain constantly decomposing organic materials that produce large quantities of methane and at facilities that produce methane gas from animal waste; *Gasification* is a relatively new technological development which converts solid biomass to gas form. All four methods are being used in the United States and worldwide. The U.S. currently holds 7,000 MW of installed biomass capacity, concentrated in the industrial sector

There is a huge economic potential for biomass: the U.S. Department of Energy estimates that by 2020, 30,000 MW of biomass-powered energy will provide over 260,000 new jobs nationwide[8]. However, pure biomass plants have higher capital and operations costs than traditional fossil fuel plants, with reduced output efficiencies.[9]

The environmental benefits and risks of biomass energy are also uncertain. Although biomass energy diverts waste from landfills or animal waste, concern exists that reliance on biomass energy from waste will hinder Zero Waste initiatives (see below) by decreasing the incentive to recycle and reuse. From a climate change perspective, biomass energy can be sustainable only if organic inputs are raised and harvested sustainably, and the biomass process replaces traditional fossil fuel generation.[10] However, biomass inputs must be replanted so that they can absorb enough carbon dioxide to balance out carbon dioxide released during energy generation. Air

quality in the southern Willamette Valley may also be a concern, especially during periods of temperature inversions. Generally, biomass generation produces less of other air pollutants, like sulfur and nitrogen oxides, than traditional energy production.[11] Despite these potential drawbacks, biomass energy could potentially be a viable, sustainable option if used with care and foresight.

Most biomass generation facilities are built as a part of existing industrial facilities or generation stations. In these cases, the biomass industry in Lane County only requires the opportunity to add to existing processes and the biomass inputs; special equipment and new businesses are unnecessary. Stand-alone and gasification systems require special equipment, as well as hefty start-up funding. These systems also require a need for additional energy supply, which is absent in Lane County. An opportunity exists in Lane County for existing organizations to save money by reducing their own energy costs through the use of biomass-based energy (in the case of agricultural waste or industrial applications) or producing excess electricity for resale (in the case of landfill gas applications).

Recommendations: Lane County could expand its biomass production capabilities by focusing on agricultural anaerobic digestion and industrial processes:

- *Agricultural Methane*: The waste from the county's 28,000 cattle and calves[12] could produce 10.8 MWh/yr[13] if its methane was harnessed for electricity production. Lane County could join with local economic development and agricultural agencies, private firms, and others to hold a series of workshops to educate local farmers about electricity production from methane and to encourage them to apply for the state's business energy tax credit (see below).

- *Industrial Co-Generation*: Lane County could explore combined heat and power opportunities with industrial facilities for biomass cogeneration. Possible fuels include wood waste from wildfire-thinning projects, or lumber processing. Care should be taken to ensure that fuels are harvested sustainably to close the carbon dioxide cycle.

2. *Biofuels*

Biofuels derive their energy from organic sources, typically agricultural "energy crops" (soybeans and oilseed crops), agricultural waste (including corn husks) or waste grease from food service. After processing, these organic inputs become fuel for uses such as transportation. Fuels can take the form of biodiesel or ethanol. Retrofitted diesel vehicles can use pure biodiesel fuel, or biodiesel can be added to traditional diesel fuel in small quantities. Ethanol can either be used as an oxygenate to help traditional gasoline burn more cleanly, or as pure fuel for retrofitted vehicles.

Biofuels create environmental benefits of reduced vehicle emissions and reduced agricultural and restaurant waste. The U.S. Environmental Protection Agency believes biodiesel can reduce particulate matter emissions by 47%, unburned hydrocarbons by 67% and carbon monoxide by 48%[14]. From an economic perspective, the biofuels industry creates job at all three levels –

manufacture, distribution and vehicle retrofit. Biofuels also offer an opportunity to bolster the agricultural industry by providing "cash crops" as inputs.

Recommendations:

- Establish an exploratory committee composed of representatives of local and state government, academia, and the private sector to identify the potential factors needed to foster and support a local bio-fuels industrial cluster.
- In order to provide an example and jump-start the local biofuels market, the cities of Eugene and Springfield and/or Lane County government could consider a biodiesel initiative for publicly owned vehicles. A consortium could be developed that also includes Lane Transit District buses, public school buses, and local government fleets throughout the county. A consortium of local governments and public agencies could purchase 100% bio-diesel and mix it with regular diesel at levels that make the mixture cost effective yet reduces toxic emissions (e.g. 90-10 or 85-15).

3. *Hydrogen and Fuel Cell Development in Lane County*

Hydrogen fuel cells offer perhaps one of the best renewable energy—and business--opportunities for the U.S. and the field is growing rapidly. Hydrogen has the highest energy content per unit weight of any known fuel. When hydrogen burns with oxygen, it produces heat and water without toxic emissions. Fuel cells are a devise that converts hydrogen into electricity. The device also permits the storage and distribution of energy in the form of fuel.

Hydrogen can be produced from renewable resources, such as reforming ethanol (natural gas) and by splitting water (electrolysis). Electrolysis emits nothing but water as a byproduct, but it is relatively expensive. Reforming ethanol emits carbon dioxide, but costs the least. As a result, reforming ethanol is the most widely used today.

The production and use of hydrogen fuel cells provides a number of benefits including:

- *Economic Benefits*: Converting to a hydrogen-based economy would create thousands of permanent scientific and industrial jobs. Building plants, manufacturing parts, selling equipment, and developing technology could be important investments that would stimulate U.S. jobs and economic growth.
- *Increased Energy Efficiency*: Hydrogen power is very energy efficient. The amount of energy produced by hydrogen per unit weight of fuel is about three times the amount of energy contained in an equal amount of gasoline and almost seven times that of coal.
- *Energy Security and Self-Sufficiency*: Hydrogen is renewable and virtually unlimited. Solving our energy supply and energy security problems through hydrogen can help ensure economic stability.
- *Environment and Public Health.* Hydrogen is clean and efficient because the mechanism of fuel cells utilizes chemical reaction rather than combustion.

There are many uses for fuel cells including: stationary uses (large-scale, on-site power generation systems such as those in airport terminal, hospitals, schools), residential applications for homes, applications in the transportation sector, portable/mobile uses *(*for micro fuel cells include pagers, video recorders, cell phones, smoke detectors etc) and landfill/wastewater treatment plant applications.

The fuel cell industry is growing rapidly. The growth trends and huge potential of the industry led the states of Ohio, Michigan, and California to make major investments to grow the fuel cell industry with a major focus on the transportation sector.

There appears to be few constraints on where hydrogen fuel cell related businesses could locate. That is, there are few, if any, structural issues that constrain locational decisions. This suggests that the potential exists for Lane County to capture a piece of the growing industry. Lane County may not be able to compete with Michigan, Ohio, or California, which are the centers of the automotive industry, but there may be a number of fuel cell related products and businesses that could be incubated or attracted to Lane County. Lane County may have at least three major advantages that could be used to grow the fuel cell industry: Highly educated and skilled workers; an environmentally friendly reputation and high quality-of-life; and ample water resources (which is critical for producing hydrogen and for some of the technologies involved in fuel cells).

Recommendations for growing the local hydrogen fuel cell industry:

- Establish an exploratory committee composed of representatives of local and state government, academia, and interested entrepreneurs to identify the potential factors that could foster and support a local fuel cell industrial cluster.
- The committee should investigate the strategies and incentives utilized by other states and communities where hydrogen and fuel cell technologies are located and promoted.
- Develop pilot projects in County government and/or municipal facilities to identify regulatory barriers, economic feasibility, and job-creation potential.
- Obtain industry feedback on the government facility projects to serve as a springboard for developing a strategic plan to promote local commercialization of fuel cell power.
- Investigate potential new technologies applicable to Lane County, especially in the field of water-based hydrogen technology

4. *Solar Energy Opportunities in Lane County*

The solar energy field is a rapidly growing market: between 1988 and 1999, worldwide PV sales increased by a factor of six.[15] Solar energy manufacturer, distribution and installation provide numerous job opportunities at varying skill levels. The National Renewable Energy Laboratory projects that within 50 years, 150,000 Americans will work in the domestic photovoltaic industry and 'by the end of the 2020s, the industry expects to double this employment-with jobs at the same level currently supported by General Motors or the U.S. steel industry."[16] There are significant job opportunities at each level of the industry – manufacture, distribution, installation and maintenance. Lane County seems well positioned to capture some of these business opportunities.

The solar energy industry already exists to a certain extent locally with at least seven solar energy companies operating in Lane County. Solar energy applications in Lane County are visible, as well. But despite the presence of solar installation and distribution companies, and the large solar electric installation in Eugene, no local corporations manufacture photovoltaics or solar water heaters. The technical expertise and material inputs for these industrial processes are

quite significant. Photovoltaic production, especially, requires a technologically-savvy workforce and chemical and circuitry inputs. As the demand for solar energy increases in Lane County, the county will attract input businesses and local technological knowledge, making the production process more sustainable.

Recommendations:

- Lane County could bolster the local solar industry by forming a consortium of solar energy industry representatives, stakeholders, and public agency representatives with the goal of identifying the factors required for developing a solar industry cluster and help promote existing end-user financial incentives, since increased utilization of these resources will create increased demand for local solar products.

D. Zero Waste Opportunities in Lane County

A growing number of private firms, local municipalities, states and regions are adopting Zero Waste (also called Waste Free) programs. These initiatives seek to reduce waste to incinerators and landfills to zero. Zero waste initiatives go beyond the current recycling paradigm and close the resource use loop. Zero waste efforts often have three integrated components. Public and private organizations seek to reduce the amount of energy, raw materials, and toxic substances they purchase and consume. Steps are then taken to ensure that the resources that are consumed are used at much higher rates of efficiency. Finally, the toxic and useable industrial by-products generated by the organization or community are fully sequestered and recirculated in technical cycles for reuse by industry while non-contaminated biological materials are recirculated into nature through composting and other strategies. To achieve these goals, by-products (which we now call waste) must generally be separated into natural materials (i.e. food, wood, plant, water) and technical/toxic materials (e.g. industrial solvents, circuitry). In their most ideal form, zero waste initiatives are also zero emissions efforts.

Zero Waste initiatives also offer tremendous economic opportunities. The Institute for Local Self-Reliance of Washington D.C. estimates that one job is created for every 15,000 tons sent to landfills, while *seven jobs* are created if that waste is composted or nine jobs if the waste is recycled (discounting additional production opportunities for recycled waste).[17] According to the Materials Future Foundation (California), rural areas with increasing unemployment from timber industry layoffs may benefit from the creation of a new manufacturing industry based on recycling and reuse[18]. In Auckland, New Zealand, where many local government councils have committed to zero waste goals, employment opportunities are rapidly growing.

A growing number of public and private organizations around the globe have instituted Zero Waste programs and found significant benefits. For example, Fetzer Vineyards in California reduced waste-to-landfill by 94% from 1990-2001 while the savings from reduced tipping fees totaled over $150,000. Herman Miller, Inc., a major producer of office furniture, reduced landfill waste by 65% by 1995.[19] These actions led to $500,000 in direct savings and cost avoidances. The Xerox Corporation adopted a Waste-Free factory policy in the mid-1990s. By 2002, company products used 80% less energy, and emitted 81% less dust than in 1990[20] In 2001, non-hazardous recycling rates topped 90% while air emissions from manufacturing were reduced 89%.[21] In 1999 alone, Xerox saved $47 million through reduction, recycling and reuse.

A number of local governments, including San Francisco, Toronto, and communities in Japan and New Zealand have also adopted Zero Waste goals and policies.

Several organizations and events in Lane County have set zero waste goals. The Oregon Country Fair, one of Lane County's largest tourist events, has a zero-waste goal for the event in 2003. The University of Oregon's Comprehensive Environmental Policy includes several waste reduction and prevention activities: environmentally responsible purchasing, efficient resource use and minimized solid waste production. Eugene, Oregon's BRING recycling center provides a large reuse center for building materials, and MEECA provides art material reuse opportunities.

Recommendations:

- Lane County could build on the existing Zero Waste efforts by developing a County-wide Zero Waste initiative. Local municipalities throughout the county can establish their own zero waste programs that link with a county-wide initiative.
- Lane County could aim for "50% waste reduction to landfills by 2010" at which point the County could evaluate the effort and set a time frame for zero waste. Alternatively, the County could set a goal of "Zero Waste by 2010" and design programs to achieve it. These goals are in-line with those set by other U.S. states and communities. Not only would approach encourage local businesses to set their own goals more quickly, it will also prepare the county for potential state-wide zero waste efforts. Finally, a Zero Waste initiative fits in well with Lane County's clean and green image, and could be used to promote tourism as well.
- To achieve these goals, Lane County may want to consider the following programs and several policy changes: Tipping fee schedule adjustment to pay for increased recycling/reuse infrastructure; Landfill bans/fines for easily recycled or reused materials; Tax incentives for corporations showing significant movement towards zero waste.
- In addition to these policy changes, the following new programs could be considered: Expanded curbside composting program to includes kitchen waste; Rewards and recognition for commercial and individual zero waste heroes; Expanded recycling opportunities in public facilities; Increased community and school education, including recycling and reuse curriculum development and community workshops, and: annual County-wide free yard sale

More information and recommendations for growing Eco-industrial development in Lane County can be found in the complete report entitled *Eco-Industrial Development: Eco-Industrial Parks, Bio-Refineries, Renewable Energy, and Zero Waste Opportunities for Lane County* (UO PWCH, October 2003) posted on the PWCH website: http://cwch.uoregon.edu

V. OVERALL RECOMMENDATIONS FOR GROWING LOCAL SUSTAINABLE BUSINESS AND JOB DEVELOPMENT OPPORTUNITIES

As demonstrated by our research, private and public organizations that have adopted sustainable practices or produce sustainable goods and services already make an important contribution to the local economy. The ability to withstand and even grow in difficult economic times, combined with the assets that local businesses believe currently exist in Lane County, suggests that with the proper type of support provided over time, the sustainability sector(s) could be a major source of future local business and job development. The expansion of sustainable business practices promises to generate income for workers as well as tax revenue to support public services while enhancing public health and conserving the environment within Lane County.

We have already offered a number of specific recommendations aimed at stabilizing and expanding each of the local sustainability sector(s). The following information and recommendations are offered to provide an overall framework for enhancing sustainable business and job development opportunities in Lane County:

Background On Strategies To Promote Sustainable Economic Development

The development of an effective strategy for growing the local sustainability sector(s) will require careful thought and analysis. A starting point for this is an understanding of how productive and vibrant economies evolve. After an exhaustive study of the world's best firms in a variety of industries, Michael Porter of the Harvard School of Business, in his landmark book *The Competitive Advantage of Nations*, concluded that firms seldom achieve world-class status in isolation and that with surprising regularity, the world's most competitive businesses are found concentrated in relatively small geographic areas. The clustering of firm's harnesses what Porter calls the 'diamond' of competitive advantage: including firm rivalry, the availability of inputs, supporting industries, and demanding customers.

Porter found that the location in the same geographic area of a number of businesses in the same or similar industries creates a rivalry that spurs continuous innovation and improvement while also facilitating cooperation among firms to resolve common problems. The presence of a critical mass of similar businesses inspires the growth of related suppliers, reducing costs and making all of the firms more dynamic. The presence of knowledgeable local customers spurs the development of clusters and pushes them to continually improve their products and services. The availability of inputs such as skilled labor tends to be greatest where entrenched clusters exist. The interactions between all of these factors combine to spur industry competitiveness and dramatically enhance the local economy. This information suggests that a number of steps should be taken to promote sustainable business and job development in Lane County.

1. Establish A Goal Of Promoting Sustainable Business and Job Development.

The first prerequisite for sound economic development policies and programs is to establish clear and appropriate goals. The goals should be aimed at stimulating dynamism and innovation. Michael Porter has said that productivity is a root cause of economic vitality and to improve productivity an economy must be continually upgrading. Porter says, "This requires relentless

improvement and innovation in existing industries and the capacity to compete successfully in *new* industries. New business formation is necessary to create jobs for new persons entering the workforce, to replace jobs freed up by productivity gains in other successful industries, and to replace jobs lost in less productive industries that become uncompetitive." [22] Porter goes on to say that, "Defining economic goals in terms other than long-term productivity growth is a fundamental error that leads to inappropriate policies."[23]

The application of sustainable development measures here and around the globe has been found to significantly improve the productivity of existing businesses while stimulating innovation and also being one of the leading sources of new products that may form the basis of new industries of the future. As resources become increasingly scarce and prices rise (such as with fossil fuels) and environmental problems increase in size and complexity over the next decade, the industries, companies, and communities that have adopted sustainability practices will be the winners. Indeed, the growth of the local Natural Foods industry in difficult economic times and the expected growth of other sectors such as renewable energy and green building strongly suggests that Lane County may soon fall behind other communities and regions if we do not adopt an explicit goal of expanding the use of sustainability measures and growing sustainable businesses. For these and other reasons, local governments and economic development agencies in Lane County should adopt the goals of helping existing private firms (and public agencies) adopt sustainable policies and practices and of making the growth of the sustainable business clusters a top priority.

2. Establish Coordinated Policies and Programs.

If the first requirement for sound economic development policy is an appropriate goal, the second is a proper strategy for achieving it. No single program or policy alone is likely to be successful. A consistent, long-term effort is needed composed of a suite of interrelated policies and programs that build the 'diamond' of competitive advantage in Lane County outlined by Michael Porter: increased firm rivalry, the availability of inputs, supporting industries, and demanding customers.

A specific focus should be placed on the factors that foster and support sustainable business and job development. These policies and programs would potentially seek to: a) expand local industry clusters where they exist or could exist (such as in the Natural Foods industry, Green Building, bio-products and the renewable energy sectors); b) expand, incubate, or recruit related suppliers for the existing clusters or potential clusters; c) assist all existing firms in Lane County not related to the sustainability clusters to understand and apply sustainability practices and technologies; d) assist all public agencies in Lane County (hospitals, schools, utilities, special government units, government agencies) to understand and apply sustainability practices; e) increase the knowledge and skills of the labor force and focus on other inputs needed for the clusters or potential clusters to grow; f) increase the understanding of local consumers and turn public agencies into knowledgeable customers (for example, by purchasing locally produced sustainable products) which will spur demand, improve local economic conditions, and increase the efficiency of government, and; g) identify and build the infrastructure needed to support the sustainability sector(s) (such as the scientific and economic information systems).

3. To Build the Sustainability Sector(s) A Major Focus Should Be To Grow Existing Clusters and Incubate and Expand Clusters That Could Be Established

In keeping with the point above, research by Michael Porter and others suggests that local policies to stimulate economic development that rely on generalized subsidies to induce unrelated companies to locate plants or other facilities in a region usually have marginal effect. Subsidies to induce dissimilar firms to locate in communities in which they do not see tangible long term reasons to exist is, to quote Michael Porter, "hardly a way to foster a solid economic base or create competitive advantage."[24] Competitive advantage grows out of the capacity of a region's firms to improve and relentlessly innovate. Porter says that, "Regional policy will be more effective if it follows the principle of building on clusters. (Building the) magnets of clusters, in the form of universities, research laboratories, specialized infrastructure, or trained labor pools, are much more effective than subsidies. The best regional policy identifies cores of industry strengths and builds on them, to encourage geographically concentrated clusters. One industry creates sophisticated demand or inputs for others. This is far superior to encouraging a diverse and random group of firms to establish feeder plants or distribution centers in a location they will never develop and upgrade further."[25]

This information suggests that the programs established to grow the sustainability sector(s) should focus initially on building industry clusters based on existing businesses. The local Natural Foods industry is an obvious place to start. However, with proper long-term effort, the Green Building, bio-based products, and renewable energy sectors could also grow into important local clusters. Recruitment of external firms should be aimed at creating competition within those industries and at filling niches in their supply and distribution chains. At the same time, local trade associations representing those industries should help their members cooperate in order to understand and resolve common problems, improve their skills, and continually increase their abilities to understand the needs of their customer base. Finally, steps should be taken to help every business and government entity in Lane County adopt sustainability practices. These practices will improve the knowledge, sophistication, and productivity of local firms and agencies, thus offering the potential of stimulating innovation that may generate new products and lead to new clusters.

4. Create and Continuously Improve the Proper Factors that Support Economic Development

One of the most important roles of government in economic development is creating and improving the key factors needed to support economic activity such as workforce skills, basic scientific knowledge, economic information, and infrastructure. These factors are continually changing and growing. For example, a high school education today no longer represents the advantage it did twenty years ago. The telephone no longer facilitate the type of economic activity that high-speed cable, fiber optics, and satellite communication technologies do today. A community's economy will be at a significant disadvantage if government does not meet these responsibilities effectively.

However, most governments here and abroad provide these factors for their communities, which suggest that the factors provided by government are rarely in themselves a source of competitive

advantage. Michael Porter found that the most significant factors for competitive advantage involved the local firms themselves, often working with government agencies. "Mechanisms included specialized apprenticeship programs, research efforts with universities connected with the industry, trade association activities, and most important, the private investments of firms themselves."[26]

This information suggests that consortiums composed of business, government, non-profit, and academic representatives should be formed to carefully examine the key factors required for the long-term growth of sustainable industry clusters in Lane County. Government should then act to provide these factors.

5. Formally Involve a Diverse Range of Interests and Focus on the Linkages Between Urban and Rural Areas.

The field of sustainable business and job development is a new economic paradigm. It will take considered effort and time for public and private organizations to make the transition from the linear take-make-waste production model to the circular 'borrow-use-return approach. Because many industries are tied to the old model, new ideas and perspectives will be critical to help people see opportunities and make this transition.

Jane Jacobs, who helped revitalize Toronto and is the author of *The Nature of Economies* and other renowned publications, found that economic prosperity is seldom achieved in communities or nations where diversity of ideas and values are devalued or locked out of the debate. This explains why nations controlled by theocracies and dictators are usually poor. In addition, Jacobs points out that rural and urban areas are interdependent. In fact, urban areas cannot exist without the food, energy, and other inputs provided by rural areas. The implication of these findings is that the more rigorous debate and diversity of views actively involved with economic development, and the more that urban areas transfer capital to rural areas to foster development, the more likelihood our region can prosper.

Jacob's information suggests that, as difficult as this may be, diverse interests and perspectives must be formally involved in the development of policies and programs if Lane County is to successful grow the sustainability sector(s). One option may be to establish industry specific working groups focused on helping all companies within the sector understand and adopt sustainability measures. Community and/or county-wide sustainable business and job coordinating councils could also be established composed of people from all segments of the population.

In addition, a major emphasis of local economic development should be on providing access to the capital, technical assistance, worker training, infrastructure, and other factors needed to grow sustainable business and job opportunities in rural Lane County. Natural Foods, biofuels, bio-based lubricants and industrial products are just some of the rural industries that could become centers of excellence in Lane County with a proper focus. The goods generated in rural Lane County will enhance the urban centers, thus creating a more than sufficient return on the investment while improving the productivity of the entire county.

6. Form Partnerships Between the Private, Public, Non Profit Sectors and Academia

In addition to involving diverse interests and focusing on the linkages between rural and urban areas, to grow the sustainability sector(s) numerous types of partnerships will be required. One of the strongest findings of Michael Porter's investigations is that specialized research institutions focused on industry clusters or crosscutting technologies are frequently associated with the leading industries. Porter says that an example is the Hollywood film schools and universities in Los Angeles with top-notch film departments that have been critical to the success of the Hollywood film industry. These institutions provide money, scientific and economic talent, and a natural problem solving focus for the industry while stimulating vigorous company research. Strategic partnerships will be required between the private sector, local governments, non-profits, and academia in Lane County and vicinity to establish the specialized research institutions needed to support the growth of the sustainability sector(s).

7. Focus on Lane County's Unique Assets, Not Our Similarities or Deficiencies

No community can be extremely competitive or centers of excellence at everything. Competitive advantage results from a match between a regions unique environment, population base, and the sources of competitive advantage in particular industries. Community and regional differences can be extremely valuable—not liabilities—if they are used to build competitive advantage. It will be a mistake for Lane County to follow an economic development model created or used by a majority of other communities. Following a model used by many others may allow our communities to attain a base level of development, but the level will never result in the type of vibrancy that could result from turning Lane County's attributes and assets into the primary source of competitive advantage.

The factors that have helped the local sustainable industry sector(s) grow (such as a knowledgeable customer base and consumer desire for a healthy environment and foods) suggest that Lane County has a number of unique assets that could form the basis of an economic development strategy that can differentiate the region from others. For example, rather than focusing on fixing perceived local weaknesses (such as the belief that the area is not business friendly), Lane County may benefit from highlighting and building upon its strengths (such as by focusing on growing and recruiting firms that produce sustainable products and/or use sustainable practices and thus, as our research found, may find Lane County a good place to do business). This is not to suggest that real problems should be ignored. Rather, the point is to realize that one person's perceived weakness may be another's strength. Economic development strategies may prove more effective if they differentiate Lane County based on its assets.

8. The Process Of Building Sustainable Business Clusters And Clarifying Competitive Advantage Will Not Be Easy, Nor Without Tension.

Finally, it is well known that economic development is not an easy task nor can it be accomplished quickly. Growing sustainable industry cluster(s) in Lane County will require a long term sustained effort that, as Michael Porter says, "involves constant pressure and challenges, requires constant improvement, and demands sustained investment."[27] Porter warns that many companies, especially those in long established industries that may no longer be on the

cutting edge of innovation or very competitive, will undoubtedly prefer to operate in an environment in which prosperity is guaranteed rather than one in which it has to be continually re-earn. Protecting industries that no longer are sources of innovation or have a strong competitive advantage (as possibly demonstrated, for example, by the difference between the natural foods industry which is growing at 20% or more annually while conventional agriculture has seen relatively flat sales) will only serve, to quote Michael Porter again, to "postpone, change, dampen innovation, cut off firms from the benefits of clustering, and work in exactly the wrong direction form those necessary to create competitive advantage." [28]

Great care should be taken to ensure that local economic development policies and programs encourage constant upgrading, innovation, and the development of new products, processes, and businesses based on sustainability principles and practices. Failure to do so may only undermine Lane County's economic future.

[1] Excerpted from *Leading Change toward Sustainability: A Change Management Guide for Business, Government, and Civil Society*, Bob Doppelt, Greenleaf Publishing, United Kingdom, 2003. For more information on sustainable development and the transition from linear to circular production systems see: Doppelt B., *Leading Change toward Sustainability: A Change Management Guide for Business, Government, and Civil Society*, Greenleaf Publishing, UK, 2003; McDonough W., & Braungart M., *Cradle to Cradle: Remaking the Way We Make Things*, North Point Press, 2002; Pauli G., *Upsizing: The Road to Zero Emissions, More Jobs, More Income and No Pollution*, Greenleaf Publishing, 1998; Hawken P., Lovins, A, and Lovins H, *Natural Capitalism: Creating the Next Industrial Revolution*, Little, Brown and Company, 1999; Wackernagel M., and Rees W., *Our Ecological Footprint: Reducing Human Impact on Earth*, New Society Publishers, 1996.

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[15] National Renewable Energy Lab's "Solar Energy Fact Sheet", 4/00, http://www.nrel.gov/documents/solar_energy.html

[16] *NREL*, Report No. BR-520-30280: Second Quarter 2001, p. 7

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[22] Porter M., *The Competitive Advantage of Nations*, New York, Free Press, 1990, Page 617-618.

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[25] Ibid, page 657

[26] Ibid, Page 627

[27] Ibid, Page 625.

[28] Ibid. Page 625.