TOWARDS A SUSTAINABLE OREGON

Barriers and Policy Recommendations

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State and local governments in Oregon can play a key role in helping Oregon firms and communities achieve the multiple economic, social and environmental benefits of sustainability identified in the economic reports. While this is not an inclusive list, the following actions can help achieve this end:

1. *Set Clear Sustainability Goals and Targets, and Gather the Right Data*

One of the key barriers identified in the economic research was lack of awareness about what the adoption of sustainability practices means in practical terms. Companies often asked what they were supposed to be aiming for and how they would know when they have achieved success. The following steps may help resolve these issues:

- *Adopt proper indicators and data gathering systems.* There is an old saying, "any path will get you there if you don't know where you are going." The Oregon State of the Environment Report (SOER) science panel concluded that state agencies were not currently using the best indicators, nor gathering the proper data, to answer questions about ecological and economic sustainability. Without good data, agencies and the public cannot know current conditions, nor will they be able to know if their sustainability activities are headed in the right direction. State agencies must be directed to formally adopt the environmental indicators recommended by the science panel of the Oregon State of the Environment Report (SOER). The state needs to make a formal commitment to gathering the right data in the right way. This will help consistently answer the question "How sustainable are we today?"
- *Adopt Measurable Goals and Targets*. In addition to adopting the proper indicators, state agencies should be directed to establish a comprehensive set of sustainability goals and measurable targets, in all resources and ecoregions, to monitor progress towards achieving the goals. Most businesses operate with clear revenue, quality and other targets in mind. Hence, they can meet targets if they know what is expected and where they stand. This will answer the answer "where do we want to be in the future?"

2. *Establish State Sustainability Center*

Some entity is needed to support, coordinate and broker sustainability efforts within and between state government, the private sector, local governments and non-profits. One option would be to establish a new state sustainability center. The center could be created administratively, though at some point, for appropriations reasons and if a formal state commission were needed, legislation would be required. The center would serve as a networking agent and broker within and between state, private and community sustainability initiatives. In specific it could:

- Help public agencies, local governments and the private sector clarify their visions, goals and targets for sustainability and link them with the Progress Boards goals and benchmarks;
- Identify/coordinate/administer funding sources (e.g. described in #3-8 below);
- Provide information and training to public agencies, the private sector and local governments (training workshops, best practice guidelines, decision support tools);
- Provide technical assistance on: voluntary programs (those set up by agencies which invite participation from firms, sectors, communities or landowners), negotiated agreements (between government and others), unilateral commitments (by private or public sector); and private agreement programs (e.g. certification programs such as salmon safe, ISO 14000);
- Institute a networking and reference system to facilitate communication, link volunteers with programs in need, suggest consultants for specific tasks etc.
- Keep tabs of all of the above and identifying overlaps and gaps in efforts to ensure that the state has an effective overall program to meet the goal of "achieving sustainability within one generation."

3. Promote New Sustainable Technologies and Industry

To achieve sustainable development in Oregon, technological advancement is needed which creates new products, processes and services to meet our basic food, mobility and housing needs with little or no environmental impact.

Barriers And Changes Required:

- Technological advancement is needed to get substantial cuts in environmental impacts;
- Firms and government still think too much in terms of individual products rather than in terms of the functions in society that need to be filled;
- There is great uncertainty about the future, leading individual firms to hesitate on much needed and beneficial new investments;
- Key economic sectors must understand that thinking about the role of technology must have consequences for the education and in-service training of employees.

Potential Actions: The state could invite industry to join with it in thinking about the relevant themes for the future, and could facilitate the process of choosing sustainable products and processes to meet basic needs. It could arrange, for example, long-term studies and targeted conferences to reach a consensus about promising themes and the role of technology in these themes. Subjects which might come up include zero emissions and waste, industrial estates, fully integrated public transport, Total Resource Productivity economic development strategies, and more.

State government - serving as catalyst - industry and academia are the key actors that must design the relevant principles of sustainable technology development. Academic research institutes could play important role in an inter-linked research program.

4. Foster Increased Product-Service Combinations

Consumer can be satisfied in many ways. It is not always necessary for a consumer to actually purchase the product. Consumers can use a product without actually owning it. The company which best (in terms of quality, price, convenience, etc.) meets the consumer's need has an economic advantage. The supplier does not have to actually sell the product, but sell its use. On this basis, fewer products would need to be produced, with a consequent reduction in pollution, waste and raw material usage.

Changes Required To Promote Product-Service Combinations

Product suppliers (producers, importers, retailers, etc.) will need to think in terms of fulfilling *functions* desired by consumers. Producers will need to develop completely new products, and design them so that they require associated services. The retail trade and other service-providers will need to devise ways they can add value to products. This will provide increasing opportunities for the provision of new types of services between companies and between companies and consumers.

This is consistent with the general trend in industry to make the desires and expectations of the customer paramount, and to adapt supply accordingly, often with the help of Total Quality Management.

Examples: Examples can be found in inter-company relationships (car fleet leasing, photocopiers, integrated paint assemblies) and on the consumer market (repair services, car-washing, car share, energy services, tool rental, etc.). These examples involve product-service combinations, with the use of a product being linked to the provision of services such as repair, maintenance, upgrading, expertise, etc.

Potential Actions

- State government could provide targeted financial and other incentives to promote product-service combinations.
- Government and academia could organize research into the critical determinants of success and failure (environmental, economic and commercial), based on existing examples. The results could be used to assess market acceptance for the development and introduction of service-product combinations, thus generating new economic activities. This would also indicate the environmental effects and the market potential.
- Based on the research results, 5 to 8 companies willing to participate in a pilot project could be identified. These could be launched to assist companies to develop a number of pilot product-service combinations.
- Based on the results, a systematic approach could be developed for creating product-service combinations. The pilot studies would provide indications as to whether and how the product-service approach could be adopted by or integrated into existing initiatives, so that the results could be used in practice.

5. Encourage Sustainability Within Financial Services

Sustainable development is not the exclusive concern of government or those directly impacting the environment. Many other business partners and intermediates, such as the financial services sector, must play key roles.

The financial sector must acknowledge the consequences of, and economic opportunities offered by, environmental policy. Finance and financiers must play a larger role in integrating the environment into the economy and into company and landowner operations. Capital flows give new momentum to environmental policy but these will only be useful if those providing capital can take advantage of new, environmentally relevant developments in the financial services sector. The financial sector will then need to have mechanisms, which channel capital in the desired direction.

Examples: Examples from the financial services sector include existing 'green' financing systems such as the green investment and green mortgage schemes which are emerging in Chicago and elsewhere. Another example is Brownfield clean-up insurance that requires that insurance companies clean up a contaminated site rather than paying a benefit. Environmental risks such as contaminated land can have a severe impact on companies. In some cases the resources available for clean-up are insufficient and government has to pick up the tab. The introduction of environmental clean-up insurance can prevent many problems. The risk to government, creditors and the public is thereby reduced.

Barriers And Changes Required: Early evaluation of the potential of new environmental technologies allows a better ranking of projects by the banking sector. Banks can strengthen their position by providing more support for investment in environmental and energy technology. By extending successful green financing schemes (e.g. green mortgages), available capital can be diverted in a more sustainable direction.

Increasingly stringent environmental policy can also create problems (such as in the obligation to clean up contaminated land) for the creditworthiness, and therefore the continuity of companies. The financial services sector can create mechanisms (e.g. insurance) to mitigate this effect. It is important that the financial services sector seizes environmental market opportunities.

Potential Actions

- The state could review the tax system to assess the potential for extending the green investment financing idea to:
    - Technology development. An analysis can be made of how bank financing of technology development could be improved;
    - The introduction of clean technology and investment in water, effluent, emissions reduction and energy technology;
    - Expand the export of Oregon environmental and energy technologies;
- The introduction of environmental clean-up insurance can be explored. Discussions in this regard could be held with the banking and insurance sector. Problems could be

identified and resolved and the possible role of environmental rehabilitation insurance in relation to permitting or financial guarantees could be assessed.

- The role of the banking sector as a possible participant with service-providing organizations could be analyzed and promoted. Possibilities include:
    - Governor's task forces to promote sustainable technological development;
    - Participation in services to promote energy, water and resource conservation;
    - Participation in a fund for the clean-up of contaminated land.
- Various options can be researched and discussions with the banking sector can be started so that an action plan can be drawn up and developed.

6. Foster The Adoption of Private Sector Sustainability Practices

To achieve sustainable development in Oregon, a strategic approach is needed in which a company or economic sector develops "Sustainability Management Systems" (SMSs) which are linked with their core business strategy and financial policy. Less than 1% of Oregon firms currently have some type of SMS. SMSs lead to a stronger relationship between a company's products, processes and services and its use of raw materials and energy, emissions, discharges and waste. This approach would involve moving from the common situation today in which environmental policy is considered in isolation to other company or sectoral objectives to one in which the whole product chain is considered.

Changes Required: For many companies, the environment is still largely an overhead cost, not part of their core business strategy. Companies will take a more strategic view if sustainability management saves money, improves their market position, increases revenue, and/or reduces regulatory burdens. New concepts, methods and instruments are needed to achieve this.

Illustration: A number of leading Oregon companies are already developing Sustainability Management Systems (e.g. Collins Company). However, many Oregon firms still see little connection to their business strategy and environmental policy at present, so progress is slow.

Potential Actions

- State agencies could promote the concept of Sustainability Management Systems using the tools of resource productivity/efficiency including ISO 14000, The Natural Step and other. This will have limited success if it is an isolated single agency pilot project.
- In a first phase the concept could be explored further (for example by studying the economic and market benefits of strategic environmental management, identifying the barriers and by considering the possibilities for environmental benchmarking and cost-spreading.)
- The second phase could focus on eliminating regulatory barriers, organizing agreements within economic sectors and value-chains, organizing new forms of co-operation between sectors to implement eco-efficiency, developing the concept of eco-industrial estates and the development of instruments to stimulate these developments (see below).

7. Promote Sustainability Benchmarking

For sustainable development to be achieved in Oregon, the economic sectors and communities that are major contributors to Oregon's environmental problems must assume increasing responsibility for implementing steps to reduce their impacts. Sustainability benchmarking is a means to assist this process. Oregon could focus its first sustainability benchmarking programs on issues such as water effluent reductions, waste, toxic releases, non-point runoff or CO2 reductions. The possibility of extending it to other environmental issues could be examined later.

Changes Required: In order to make benchmarking work, it will have to be incorporated into state (and eventually national) regulatory frameworks. It will call for major changes in the way the various levels of government (state and local regulatory agencies) and industry deal with one another. It is important that a protocol be established which can gain the confidence of the participants, since it will establish how they relate to one another on their performance.

Example: Water Effluent And Co2 Benchmarking: Oregon could adopt a policy that it will rank amongst the national leaders in water efficiency, effluent reductions and energy efficiency. This would be good for the environment and is also consistent with a desire to cut costs and improve competitiveness. The idea of benchmarking is to boost the water and energy conservation and effluent reduction efforts by allowing Oregon companies and communities to compare their performance with companies and communities in other states and nations

A number of economic sectors are developing benchmarking protocols in consultation with government (e.g. ISO 14000, EMAS). However, to make benchmarking effective, an agency would probably need to regularly analyzing how much water, effluent and energy Oregon companies use or generate per unit of product or service. The performance of companies and communities in a number of other states and nations could also analyzed. If Oregon companies and communities are not among the leaders, additional measures could be taken to ensure that they attain and maintain the top position within a reasonable time frame.

Potential Actions

- State agencies could develop agreements with industry and communities that if they demonstrate that that are implementing actions to attain and maintain the top slot nationally (this requires continual improvement), government would not to impose any further state or national water efficiency, effluent reduction or energy conservation regulations for a set time period (providing predictability for investment purposes). Policy agreements and a framework on benchmarking would need to be established. The framework would facilitate groupings of companies and community sectors producing similar products (e.g. agriculture, pulp and paper). The mean energy efficiency of a group of companies would be compared with a group of similar size in another state or nation. A key feature of this approach would be that poor performers in the group would commit to making additional improvements.

8. Improve Product Quality

Achieving sustainable development in Oregon will require ongoing product improvement so that the environmental impact of products are reduced and where possible eliminated. The goal would be to help companies to continuously place sustainable products on the market. Sustainable products would be those that are produced with naturally occurring, non-toxic materials, which require less material and energy intensity, and which can be easily reused, remanufactured, recycled or which naturally decompose at the end of product life. To develop these types of products requires a product chain approach. Environmental effects must be evaluated using tools such as The Natural Step and Life Cycle Analysis (LCA) and Industrial Ecology. Environmental effects would be taken into account right from the design phase.

Changes Required: In view of the need to secure both economic and environmental gain, a goal and outcome-based approach along with some market-oriented approaches are needed. Government must establish an enabling policy and facilitate the process of continuously improving products with the help of various instruments.

Examples: There are various instruments already available or being developed to promote the continuous improvement of products (ISO 14000, Life Cycle Analysis, Industrial Ecology, Natural Step, EMAS). In order to approach issues systematically, it is essential that the concept of product stewardship be promoted by state government.

Potential Actions

- The state could adopt a position that Oregon will be a national leader in the production of sustainable products. The state and industry could then seek an agreement that clarifies that the production of sustainable products is the primary responsibility of industry but that government will establish a framework to support continuous and systematic product improvement.
- For example, government could encourage and facilitate the development of new policy instruments: a) Extended Producer Responsibility programs and instruments for all products that currently end up in landfills and incinerators and support their inclusion in industry environmental management systems; b) product stewardship through incentives, general guidelines or incorporation in ISO 14001 certification (e.g. DEQ Green Permits); c) the transfer of information along product chains (for example, by developing and promoting environmental indicators in the construction industry); d) ecolabelling (e.g. Salmon Safe, Food Alliance Sustainable Farm label, Sustainable Forestry, Oregon Tilth);
- State agencies could draw up environmental profiles for the main product groups and help them develop complete value-chain programs to improve products.

9. Facilitate The Introduction Of Sustainable Products And Services Into The Marketplace

Connected to the above, to foster the production of sustainable products, the state may consider establishing a framework and incentives to facilitate the introduction of new

products into the market. Polls and the explosion of the organic food industry show that customers are increasingly willing to purchase sustainable products. This is a critical step since further market penetration occurs more rapidly when customers are ready. Yet, the risks associated with being first to market are high, and these risks are currently not spread to all stakeholders.

Barriers And Changes Required

- The more rapid commercialization of sustainable products and processes will lead, in the long run, to a reduction in air emissions, effluent and waste by a factor of 2 to 5;
- There are considerable financial risks associated with the commercialization of a new product or the introduction of a new process;
- Today, individual suppliers or customers cannot bear these risks on their own;
- Customers tend to be conservative; they prefer proven products;
- There are regulatory barriers, which hamper the introduction of new products and processes onto the market.

Potential Actions

- The state could adopt a 'first mover" policy for investments that foster the development of sustainable products. The state could establish a revolving loan fund for this purpose.
- Regulatory barriers should be identified and ways of overcoming them examined.
- The state could take a prominent role as first mover in the purchase of environmental technology and sustainable products for all agencies.
- A task force composed of industry and research institutes and representatives of key consumer group could be established to identify needed investments in sustainable products.
- A "competition" could be established whereby the state and private sector agree to jointly issue RFP's for the best sustainable product or service designs with a guarantee that the fund will underwrite the development of the products for the winner. Purchasers could even be lined up ahead of time to assure a ready market once the product or service is ready for market.

10. Develop Zero Emissions and Waste Programs and Policies

Achieving sustainable development in Oregon will require the generation of less waste. *Zero Emissions and Waste* (emissions are just the gaseous molecular form of waste) should be the goal. For Oregon to achieve this, it must move from an existing focus on waste management to a new focus on preventing waste as it is currently defined, redesigning the waste management infrastructure, and on incubating new businesses and jobs by adding value and "upscaling" used materials into new products and services. These steps will be good for the economy and environment.

Achieving Zero Emissions and Waste will require greatly increased "closed-loop" economic cycling. The process industries, construction industry and other energy-intensive industries in particular have large material flows that have a major environmental impact as waste.

Oregon could establish an explicit state goal to be in the national forefront of meeting Zero Emissions and Waste goals and establishing closed-loop material cycles within companies and between companies and organizations. The expertise Oregon companies acquire in developing these systems will have good export potential. Closed-loop systems would be those in which virtually no waste would be generated because products, waste, raw materials and other consumables will be reused, remanufactured or recycled for use by other industries (one persons waste becomes another's food). High-grade reuse and recycling would be just one outcome.

Examples: The metal recycling industry operates at the interface between economics and the environment. High-grade metal recycling not only provides for the optimum recycling of waste metals but also can be an economically attractive activity in its own right. It saves energy and raw materials and helps to close material cycles. Research indicates that the refining, pre-separation and cleaning of aluminum scrap, high-grade processing of lead batteries, the de-zinking of galvanized steel and large-scale industrial dismantling of end-of-life cars are economically and environmentally promising areas.

Barriers And Changes Required: Today, reuse and recycled materials often cannot compete in terms of quality and price with virgin materials (subsidies for the production of virgin materials plays a major role in this). Technological breakthroughs are needed in the fields of plastics and metal recycling (including separation and refining technologies), materials (renewable raw materials), design for disassembly and recycling (so that materials are not commingled in production) industrial energy conservation, biotechnology and process technology, among others.

- In order to achieve technological advancements, the state should make or support substantial investment in R&D. There are a number of potential new technologies that can diminish environmental loading by a factor 2 to 5 when brought to market.
- Companies often never look beyond their boundary fence, and more cross-fertilization between companies and academic institutions is needed.

Strategy: An interconnected four-part strategy is needed: 1) develop Extended Producer Responsibility goals and policies which require that manufacturers develop take-back strategies for all products that currently end up in landfills or incinerators. These policies are intended to force the emphasis "upstream" to stimulate new product designs and material selections which facilitate the reuse and recycling of products; 2) improve the "downstream" reuse and recycling of end-of-product-life materials through improved waste management infrastructure, waste exchange programs, recycled material market development and other steps; 3) initiate research and development programs to find new uses of "waste" by "upscaling" used materials into new products and services; and 4) foster and support "Total Resource Productivity" (waste-based) businesses as economic development and jobs creation opportunities, especially in low income rural communities or urban neighborhoods.

Potential Actions

- The state could begin discussions with key industries, non-profits and others about developing Product Take-back Policies (Extended Producer Responsibility) for all

major products currently ending up in landfills or incinerators. (The Northwest product Stewardship Council located in Seattle has already begun a dialogue about these issues).

- A consortium composed of industry and academia, non-profits and others could be organized to prioritize the intensification, broadening and possible addition of programs aimed at ecodesign, waste reduction, renewable raw materials and renewable energy production and use, and the development of local and regional waste exchanges.
- State agencies could work local counties and municipalities to significantly improve their waste management infrastructure to establish Reuse and Recycling Estates.
- State agencies could foster and support waste-based enterprise development (reuse, remanufacturing and recycling businesses) as an economic development and jobs opportunity in Oregon.
- An Innovative Research Program could be established focused on establishing closed-loop systems. This would need to include a multidisciplinary field of science and technology.

For more information see *Establishing Environmentally Sustainable and Economically Efficient Economies: From Waste Management Towards Zero Waste. Report for Oregon and the Pacific Northwest.* PSU Center for Watershed and Community Health and The Institute for Local Self-Reliance Inc. July 1999.

11. Assist Small And Mid-Sized Firms To Adopt Sustainability Practices

Many small and medium-sized enterprises (SMEs) have limited resources and time to adopt sustainability practices. They are therefore not fully aware of profitable opportunities from sustainability practices. Efforts must be made to assist SMEs so that they understand and gain the resources needed to benefit from the business opportunity that sustainability can provide to reduce costs and improve their market position.

To accomplish this:

- Information must be made simpler and tailored to smaller businesses;
- There must be more co-operation with intermediary organizations such as trade associations;
- SME is a growth sector and the backbone of Oregon's economy. The state should establish an explicit goal to improve the environmental performance of SMEs hand-in-hand with improving their economic viability.

Examples: The City of Portland Pollution Prevention Program is an excellent example of a program working to help small businesses improve their environmental management. However, this is a small program with a minimum geographic reach. Programs need to be initiated in all urban and rural communities statewide.

Barriers And Changes Required: There are a number of programs that encourage companies to incorporate environmental care into their everyday operations. These include environmental management systems, ecodesign, waste prevention, environmental

technology, energy conservation. However, research shows that these programs typically have much less impact on SMEs than on large companies. The SMEs do not relate to the issues raised and find the messages which come from then lacking coherency and lacking specifics.

The state should work with local communities and intermediary organizations to institute a clear strategy specifically for the needs of SME which provides a co-coordinated package of effective communications, incentives and technical support.

Potential Actions:

- The state could facilitate a process whereby an explicit policy and a framework is established to target and support sustainability practices by SMEs.
- The state could work with trade associations and other intermediary organizations (e.g. Chamber of Commerce) to develop a common communications strategy and information program, which might include:
    - The co-ordination of informational activities and materials form different sources;
    - Less 'policy' and more concrete information which SMEs can identify with;
    - Financial support to trade associations and Chambers of Commerce for specific initiatives in this area;
    - The development of a subsidy program for sustainability practices targeted to SMEs.

12. Expand Green Building and Construction

The construction sector is a key to achieving sustainable development in Oregon. As our research has found, environmental and economic interests can be merged in the construction sector through the sound and creative use of raw materials, fuels, labor, engineering, technology and land. Market demand can also drive the development of new building concepts.

Changes Required: The Oregon construction industry must be able to offer affordable total solutions to the housing and building markets, which caters to the needs of the customer and the environment and optimize the price/quality ration. The construction industry will need to make use of techniques from other sectors such as market research (into requirements of users and society), client-oriented and turnkey concepts (including design, production, assembly, management, maintenance, guarantee), variety of supply, prefabrication of independent modules (requiring agreements about interfaces and measurements), logistics ("just in time" production), flexible, automated production methods, naturally occurring non-toxic materials (Natural Step) etc. These total solutions require early, non-project-related co-operation between the parties in the construction sector (client, architect, contractor, installation engineers, suppliers) and other sectors. They will also utilize existing and/or develop further expertise and technology

Potential Actions

- The state could establish an explicit policy and goal for Oregon to rank as the nation's leader in Green Building.
- State and local governments could establish programs to monitor progress towards the goal above (e.g. materials and energy saved, demolition waste reduced).
- The state and private sectors can promote and market these attributes of Oregon's construction industry locally, regionally and nationally.
- The state, academia and the private sector could establish or support a research program on the market potential for sustainable construction.
- A "competition" could be established whereby the state and private sector agree to jointly issue RFP's for the best sustainable construction design and guarantee that the winning design will be provided funds to develop the design. Purchasers could even be lined up ahead of time to assure a ready market once the design is ready for market.
- The state and communities could investigate the desirability and feasibility of an innovation fund for Green Construction: a revolving fund financed by government and industry to support the development and application of innovative sustainable construction.
- The state and communities could help organize Green Construction demonstration building projects to stimulate the supply (construction industry) and demand (user) side.
- The state could negotiate the development of location-specific declarations of intent between housing authorities, financiers, investors, construction firms, academic institutions, public agencies and communities aimed at co-operating in the development of sustainable construction in a specific area.
- Homebuyers may not be aware of the savings associated with green building and may perceive initial investments as simply an uncompensated cost. Many states have promoted Home Energy Rating Systems (HERS) to provide information on energy costs and specific systems. To draw attention to energy-saving features, one homebuilder has even offered a money-back guarantee. Bigelow Homes of Chicago guarantees that seasonal heating bills will be less than $200 or the homebuilder will pay the difference (RMI, 1998). The builder has had to make good on the guarantee only twice.
- Energy savings must be worked into financial vehicles. In this credit-card culture with households willing to pay up to 18 percent interest on their current purchases, we have ample evidence that some people simply won't value energy savings unless they are immediate. Energy-efficient mortgages are one solution to this dilemma. The notion is simple. The less you're expected to pay for electricity, gas, or water over time; the more you have left to spend on the physical house. These lending vehicles allow you to capture those long-run energy savings in the initial mortgage effectively raising the price ceiling for a home purchase.
- Get green comparables into the marketplace**.** Most builders and developers are not aware of the latent demand for green buildings, and the extent to which their green product could be a big moneymaker. Promoting the cost savings and financial benefits of green building will generate even further demand.

- State and local governments can work with the building industry to study and quantify savings for the newest techniques. Ideas that are still in their infancy—like building commissioning—lack solid statistical data on the costs and benefits. Rigorous studies that follow a consistent format should be conducted to demonstrate the energy and non-energy benefits of the measures.
- State and local governments can work with the industry to standardize green building measures**.** The U.S. Green Building Council has designed a "Leadership in Energy and Environmental Design" or "LEED" system for rating green buildings, and it is proving to be an industry benchmark for green building, particularly for commercial buildings. The LEED Green Building Rating System evaluates environmental performance from a "whole building" perspective, providing a definitive standard for what constitutes a green building. The feature-oriented system rates new and existing commercial, institutional, and high-rise residential buildings. The City of Seattle recently adopted the LEED system as a benchmark for its new municipal buildings. The LEED system is also referenced in Oregon Governor Kitzhaber's recent Executive Order as a benchmark for state buildings.
- Enact enhanced appliance standards through Congress and the US Department of Energy**.** For certain techniques—particularly appliances like refrigerators, freezers, water heaters, clothes washers—the most effective way to spur widespread use of the technique would be through the legislative and regulatory processes. Public interest groups, utilities, manufacturers, and state energy offices will need to supply policymakers with information from relevant pilot projects like Super Efficient Refrigerator Project.

13. Spur The Construction Of Sustainable Industrial Estates

An innovative initiative unfolding globally is the establishment of sustainable industrial estates. These are locations where companies cooperate on a voluntary basis to share feedstocks and used materials to create sustainable products and processes at the lowest possible costs. They share facilities and seek to close material cycles by reusing or recycling residues or by-products between firms. Research has found that the dedication of specific locations for these programs can make individual companies more competitive by reducing costs or even generating additional receipts. These are business incubators which may provide a more attractive business climate for many new or emerging industries.

Changes Required: When old industrial areas are being revitalized, or new ones developed, the state and local communities could encourage sustainability by, for example, encouraging companies to improve the physical configuration and ensure a more efficient use of space. The parties involved could be encouraged to work together with close attention to coordinating their business processes and activities. Examples are companies that act as supplier of their own residual or by-products or participated in a joint business venture. Efforts must be made to achieve an optimum 'clustering and segmentation' so that groupings of companies form which complement each other in economic and ecological terms. These may sometimes lead to shared facilities for transportation, the storage of goods, waste processing, transportation etc.

Barriers

- Some fear that co-operation produces dependency. Confidence between the parties concerned is crucial. Often a long period of mutual familiarization, co-operation and communication is needed before companies are willing to be open about their own operations and make themselves interdependent;
- The regulatory and permitting processes are geared towards individual companies. Permitting will have to be modified and made applicable to co-operating companies;
- Communities and the state will have to refuse to allow companies to locate on a site when they do not conform to the intended profile for that site. This may present legal and financial problems, and political support will be needed for such a measure.

Potential Actions

- State and local economic development, natural resource, environmental, transportation and energy management agencies could all work together to support and foster the development of sustainable industrial estates by:
  * establishing an explicit state goal of establishing sustainable industrial estates in a specific number of counties or communities within 5 years.
  * organizing a symposium on sustainable industrial estates in each targeted community in which possibilities can be presented and discussed;
  * identifying the most promising projects for sustainable industrial estates (e.g. brown or green field);
  * identifying and implementing means to eliminate barriers to new projects (organizational, institutional, technological, financial);
- Apprise local authorities, trade associations and others with the possibilities for sustainable industrial estates through information dissemination;

14. Develop "Economic Value-Chain" Programs

Sustainable development will require increased cooperation within entire economic value chains to improve efficiency (e.g. in relation to raw materials, energy and transportation) and reduce waste and pollution. Experience in other nations shows that economic value-chain programs can benefit the sectors involved and the environment. Some environmental problems which are difficult to solve within a particular link can be solved within the chain as a whole.

For example, agricultural products are used as feedstocks in a number of non-agricultural industries including construction, chemicals, textiles and pharmaceuticals. Timber grown in Oregon is used in high-value, durable applications, for example in the building industry. The environmental aspects of these products can make an important contribution to a company or sector's image. The development of competitively priced products in which the environment figures as a self-evident component of quality represents a significant opportunity. Environmentally-friendly products may generate a higher value-added/price or capture more market share as tie breakers.

Barriers And Changes Required

- Failure to spot opportunities presented by co-operation within product chains;
- Inadequately structured organization of product chains and weak communications within chains;
- Lack of knowledge of the nature and extent of environmental effects within chains;
- Inequitable distribution, between the links of the chain, of the costs and benefits of environmental measures;
- Competitiveness on domestic and foreign markets;
- Procedural constraints in closing cycles (waste as raw material).

Government policy must aim to better identify, and where possible, remove these barriers. The developments themselves are the primary responsibility of the industry, however, and depend on the co-operation of the most influential link(s) in the chain and on consumer behavior. The government will have an enabling role, and will support and encourage environmentally friendly behavior on the part of the consumer.

Examples

- The Food Alliance, Oregon Tilth organic certification, and Salmon-Safe labels are a sign of sound agricultural environmental standards and makes it clear that environmental measures have been taken along the entire production chain (grower to supermarket).

Potential Actions

- State and local government could work with key sectors to analyze obstacles to the adoption of a product chain approach to sustainability, and study how to overcome the obstacles;
- The state could expand and actively incorporate environmental considerations (certification) in export promotion policy;
- The state could provide funding to promote third party certification and eco-labeling;
- The state could promote use of sustainably harvested timber in its own construction processes and by consumers.
- The state could support and foster research into life cycle analysis (LCA) methods in the agriculture, forestry and other sectors, to serve as a model for industry;
- The state and key economic sectors could support the development of new technologies (information and communications technology, biotechnology) that support product chain programs.
- The state could continue to look at new financial instruments for a greening of the tax system which provides tax concessions for sustainably produced products.

15. Promote the Development of Bioproducts (a "Carbohydrate-based Economy")

Phasing out toxic materials in favor of non-toxic materials made from naturally occurring substances will be a key element of a sustainable economy. One option to achieve this is to use agricultural and forest biomass as feedstock for non-food industrial products. This has been called a "carbohydrate economy. The move to a carbohydrate economy can make an important contribution to providing renewable materials for industrial products

and technological renewal while improving industrial competitiveness and reducing the environment effects over the entire production cycle.

Examples

- Production of bioplastics (the original polymers were made from plant material);
- Flax membranes as a composite material for the manufacture of lighter, recyclable components such as auto interiors (Flax was once a key crop in the Willamette Valley);
- Bio-ethanol for the manufacture of high-grade petrol components (could be ideal in eastern and central Oregon);
- Derivatives of vegetable oils which can replace petrochemical solvents in paints, printing inks and resins (a growing segment of the market);
- Electricity from biomass (cultivated crops/waste).

Changes Required: Until recently the main focus of a carbohydrate economy was on research into possible industrial applications. The focus must now expand to support practical market-oriented projects:

- applications using natural materials in products with high added value (e.g. bioplastics from starch);
- application of biofuels in transport (bio-ethanol and biodiesel).

These possibilities may have wide implications than Oregon agriculture. The concept provides opportunities for a broader technological renewal and therefore for increased competitiveness of Oregon industry. A carbohydrate economy offers opportunities for new economic activity within and outside agriculture, and has implications for several important environmental issues, such as reducing effluent and CO2 emissions from production processes and transport and consumer trends towards more sustainable products.

Barriers: The use of agricultural materials has been dramatically curtailed during this century by synthetic fossil fuels. We now know that there are many obstacles to a return to natural products. For example, we have failed to support the necessary technological research, and the infrastructure to support relationships between producers of natural/agricultural materials and industrial producers does not exist. Careful attention must also be given to whether there might be an undesired impact on food production or ecosystems. The relatively high production costs in some areas of Oregon due to high land costs (e.g. Willamette Valley) is a major impediment to widespread production.

Potential Actions

- The state could promote the development of a carbohydrate economy by establishing a state goal to produce a specific percentage of products using naturally occurring materials within a set time frame.
- The state could work with the private sector to institute a process to examine and address barriers within research, co-operation within product chains, the regulatory system, product policy, technology/innovation policy and fiscal policy.

- The state and private sector could benchmark the most advanced carbohydrate programs underway in the U.S. and around the globe.
- The state could provide funding to develop the carbohydrate economy.

For more information see *Creating Closed-Loop Economies: Transitioning to a "Carbohydrate Economy" By Turning Agricultural and Forestry Waste into Industrial Products - Report for Idaho, Oregon and Oregon,* PSU Center for Watershed and Community Health and the Institute for Local Self-Reliance, January 1998).

16. Foster and Support Sustainable Agriculture

The adoption of sustainable agricultural practices must be a cornerstone of any sustainable development program in Oregon. Conserving on-site farm productivity (e.g. the soil base) and preventing off-site environmental impacts (e.g. sedimentation and nutrient run-off) must no longer seen as a burden, but as a central element of a farm's operations. Farm accounting systems must be amended to include an integrated management system which included not just financial results, but also environmental results. In doing so, Oregon could make its farms and agricultural businesses among the most environmentally sustainable in the nation. Our research has shown that these practices can save farmers money and increase revenue and market share.

Examples:
- The installation of combined heat and power equipment;
- Formation of associations between similar businesses or businesses which use each other's products: grain for manure initiatives, the use of by-products (formerly waste) of the food industry by animal-breeders;
- Recirculation of materials such as water and nutrients in closed systems on farms;
- Use of integrated or organic methods of cultivation, with maximum use of natural methods of pest and disease control;
- Use of the integrated environmental plans to improve operations (such as the SB 1010 plans were intended to do);
- Cover cropping and conservation tillage practices;
- The combination of agriculture with functions such as recreation and conservation;
- The sale of local products for niche markets;
- Installation of riparian buffers;
- Third party certification and eco-labeling.
- Converting growing trends such as precision farming, information and communications technology into firm environmental and financial results. The environment is one of the factors of which an entrepreneur will wish to take careful account in order to maintain and extend the market for his products.

Barriers And Changes Required
- Government (especially USDA) primarily promotes (e.g. research dollars etc.) large scale industrial farming and the extensive use of petrol-additives (pesticides and fertilizers) and places much less emphasis on sustainable farming. Equal or greater emphasis must be placed on sustainable farming.

- Awareness must be built of the inseparability of environment and economic performance in agriculture;
- Discussions of environmental issues in agriculture often generate substantial controversy. One way to change this is for environmental quality to be more recognizable in products. The State could develop a program to verify and then promote and market Oregon products as the most environmentally sound in the nation (such as New Zealand has done which helped their depressed agricultural sector recapture market share in Europe);
- Building awareness that there are other ways of producing crops and that other kinds of relationships can be made with organizations in the food product chain. Forming new alliances, (e.g. environmental co-operatives) could prove helpful;
- The development and application of science and technology. The new technologies, which allow the needs of plants and animals to be met precisely, for example, can be applied more readily in large-scale agriculture.
- Development of markets. State and local governments can demonstrate their commitment to sustainability by purchasing sustainability grown foods.

Domestic and international markets (for those Oregon farms competing in international markets such as grass seed and wheat) require that costs be strictly controlled. New developments can require a high level of expertise and investment. Farms will have to have sufficient resources to make often risky investments. The financing needs of farms will increase, which can create a barrier to new businesses or new practices. An additional barrier is that the extra efforts are not directly visible in products, and often do not command a premium.

Challenges include:

- The recognition of the variety of objectives operating within a single farm. A farmer is required to comply with a range of requirements of different government agencies. This is demotivating and can be at odds with the goal of linking environmental and economic goals.
- Finding the right incentives and new instruments to promote further integrations of en environmental and economic objectives.

Potential Actions

- The state could establish an explicit goal of making Oregon agriculture the most environmentally sound in the nation (world). It could then establish a framework to achieve this which may include:
- The state and local governments can adopt purchasing policies that favor sustainably certified food for all institutions.
- Financing support for sustainable agriculture: The extent to which existing financing instruments can be used to benefit the environment should be examined. New instruments should be established.
- Tax concessions*:* The possibility of giving tax concessions to farms with low nutrient losses and runoff and other 'sustainable' practices should be examined;
- The state could look at the possibility of establishing a means to support experiments with farmers' environmental cooperatives;

- The state, the industry and academic institutions could jointly promote the development of science and technology, for example by supporting demonstration projects. A large part of the effort would be directed towards innovation, dissemination and demonstration of technologies which improve the product or production process environmentally. Capital allowances for environmentally friendly equipment should be examined.
- The state could establish a complete performance-based system for the implementation of water quality plans. This could include an agreement to certify farms which have environmentally sound plans and to provide regulatory incentives.

17. Support Sustainable Rural Development

A healthy rural economy is critical for Oregon to achieve sustainable development. Individuals who are or believe they are disadvantaged will take whatever steps they believe are needed to maintain their economic well-being, and many of these activities could harm the environment.

Potential Actions

- Promote programs and policies aimed at "Total Resource Productivity" (TRP), which creates value-added jobs by fully utilizing all agricultural and forest materials as well as waste from all product development processes as feedstock for new businesses and products. TRP has proven to be an extremely successful approach to job and income generation in many rural areas throughout the world, yet has lagged in the U.S. Oregon could become a leader in TRP (see ZERI initiative for more information)

- The state could support (via fiscal instruments etc.) growth in the rural "carbohydrate economy", sustainable agriculture and sustainable forestry and institute major marketing programs to help these sectors gain and expand market share.