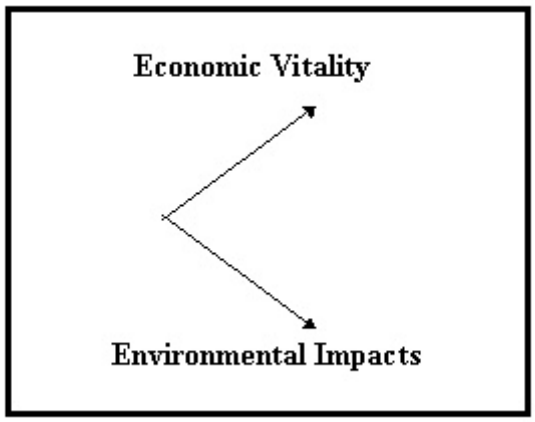
CRISIS OR OPPORTUNITY?

OREGON'S ENVIRONMENTAL PROGRAMS AT THE CROSSROADS:



A FRAMEWORK TO DECOUPLE ECONOMIC GROWTH FROM ENVIRONMENTAL IMPACTS TO ACHIEVE SUSTAINABLE DEVELOPMENT

October, 1999

Prepared By:

The Center for Watershed and Community Health

Hatfield School of Government

Portland State University

ACKNOWLEDGMENTS

This document was developed by Bob Doppelt and Dr. Craig Shinn from Portland State University with assistance from staff of the PSU Center for Watershed and Community Health (CWCH), graduate students in the School of Government at PSU, and others. Few of the ideas presented are original. They were generated from the nearly two and one half years of work by the informal stakeholder group called the Oregon Environmental Stewardship Plan Committee; from hands-on projects as well as the research done by the CWCH; the numerous sustainability initiatives underway within the private sector, communities, non-profits and government in Oregon and throughout the U.S.; and the

sustainable development programs underway in the Netherlands, Sweden, Denmark, The European Union, New Zealand, Australia and elsewhere.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

It is clear to many that Oregon's approach to environmental management is at a crossroads. The state can continue to manage the environment one crisis at a time or, it can establish an framework which leads to agreement over what is needed to manage the environment sustainably and mobilizes, guides and integrates efforts to achieve those ends. This would help resolve today's problems and respond to new ones before they become crisis. It would also position Oregon as a center of excellence in environmentally efficient business and community development.

This document outlines the potential components of a framework to achieve the later. This can be called *a framework to place Oregon on a path towards Sustainable Development.*

The proposed framework has three overall components:

- The state would declare that achieving sustainable development is a top priority and establish clear goals and a mechanisms to mobilize, guide and integrate government, private sector and community efforts towards this end;
- Each state agency would adopt clear goals and outcome-based strategies to align internal rules, regulations and programs and to mobilize, guide and support constituent efforts to achieve the new state sustainability goal;
- Ongoing private sector and community sustainability efforts would be complemented by new initiatives aimed at the common state goal of achieving sustainable development.

As many Oregon firms and communities are already finding, there will be costs, but also significant economic, community and environmental benefits through the adoption of this framework.

A number of specific proposals and action items are discussed. The list is far from complete and is intended just as a starting point to stimulate further discussion. In addition, the ideas cannot be implemented all at once. A careful, phase-in approach is needed.

Some of the actions discussed are already underway within government, the private sector and communities. These must be complemented by new programs and initiatives by all parties. In order for these combined efforts to succeed in placing Oregon on a path towards sustainable development, however, the state must provide a common vision and clear goals toward which everyone can manage, just as a state framework was needed to guide the Oregon Salmon Plan. This means the state must be a prime mover. Our hope is that this document generates even better ideas and concrete action toward this end.

CRISIS OR OPPORTUNITY? OREGON'S ENVIRONMENTAL PROGRAMS AT THE CROSSROADS

A FRAMEWORK TO DECOUPLE ECONOMIC GROWTH FROM ENVIRONMENTAL IMPACTS TO ACHIEVE SUSTAINABLE DEVELOPMENT

I. INTRODUCTION

From endangered salmon and polluted streams to increasing tensions over urban congestion and toxic use, it is clear that Oregon's approach to environmental management is at a crossroads. The state can continue to set policy only when beset by crisis, an approach which will increase civic antagonism and lead to further environmental impacts as the economy and population grow. Or, it can establish an anticipatory framework which leads to agreement over what is needed to manage the environment sustainably and mobilizes, guides and integrates efforts to achieve those ends. This would help resolve today's problems and respond to new ones before they become crisis, while positioning Oregon as a center of excellence in environmentally efficient business and community development.

Throughout the globe successful frameworks are being developed to manage the environment sustainably. These initiatives avoid management by crisis, find numerous cost-effective ways to reduce environmental impacts, and have identified means to maintain and even substantially increase economic and community well-being. We believe this is possible in Oregon also. The Oregon Plan for Salmon and other state initiatives are positive steps in this direction. Just as a overarching framework was needed to guide salmon recovery, to help Oregon manage the environment sustainably the state must declare this a top priority, establish a common mission and clear goals, and create mechanisms to mobilize, guide and integrate government, private sector and community efforts towards those ends. ***This can becalled a framework to place Oregon on a path towards Sustainable Development.***

PURPOSE OF THIS BRIEFING BOOK

This briefing book outlines some potential components of such a framework. A number of specific actions are discussed. The list is far from complete and is intended just as a starting point to stimulate further discussion. In addition, the ideas can not be implemented all at once. A careful, phase-in approach is needed.

Some of the actions discussed are already underway within government, the private sector and communities. Yet, for these efforts to ultimately succeed, the state must provide a common vision and clear goals toward which everyone can manage. This means that the state must be a prime mover. Our hope is that this document generates even better ideas and concrete action toward this end.

II. WHY THE NEED FOR A STATE FRAMEWORK TO ACHIEVE SUSTAINABLE DEVELOPMENT?

The Nature of Economic-Environmental Problems Has Changed Dramatically Since the 60's, but Our Approaches Have Remained Relatively Static. Our existing regulatory system was established 30 years ago to address the single source, easy to identify problems of that era, such as pollution from smokestacks and water pipes. The traditional regulatory approach emphasizes top-down strategy, standardization, following linear plans, predictability, and keeping things on track. These techniques have provided significant improvements in the environment such as reducing point-source pollution. However, they are increasingly less effective when applied to today's rapidly changing and complex ecological and economic challenges.

Our Current Systems Make Government Responsible for Telling Us How Bad We Can Be, Rather Than Helping All Of Us Become More Sustainable. The existing regulatory system puts government in the role of setting bottom-lines to protect the environment. While government involvement is vital to conserve "the commons," this approach alone will never successfully maintain or restore the environment. The private sector and communities must become responsible for adopting sustainable paths. To accomplish this we need systems that clarify what sustainable management entails and encourage and guide innovation and action to achieve those ends.

The State Has No Effective Means to Develop Common Understanding Over Basic Economic and Environmental Questions. Two issues have torn Oregon apart recently: disagreement over the condition and needs of the environment, and disagreement over the condition and needs of the economy. Either issue is sufficient to cause great rift. When they clash - for example, when there is disagreement over the status of forests or salmon and over the degree to which the state's economy is dependent on natural resource use - the fall out can be deafening. The state has no effective mechanism to organize data and involve the public in processes to develop common agreements over the status, trends and future risks to the economy or environment. Lacking this, policy debates often degenerate into parties "talking past each other" because there is no common basis for discussion.

Progress Has Been Made, But The State Still Manages the Environment Like An Emergency Room. The state has made many improvements, and Oregon's environmental systems consist of many effective individual programs. However, due to its historic roots, Oregon's existing approach to environmental management still lacks an overarching mission, cohesiveness and clarity on the direction towards which all parties should be managing. It therefore remains crisis driven, which leads to inefficient use of public and private resources. In does not encourage long-range technical innovation. Problems may be solved in one sphere but are inadvertently pushed into another (e.g. water quality may be improved by transferring emissions into the air). It often requires the private sector or

communities to invest in activities that do not constitute the highest and most efficient use of fiscal or human resources. Strategies to maintain and enhance social and economic well-being are rarely coordinated with environmental policies.

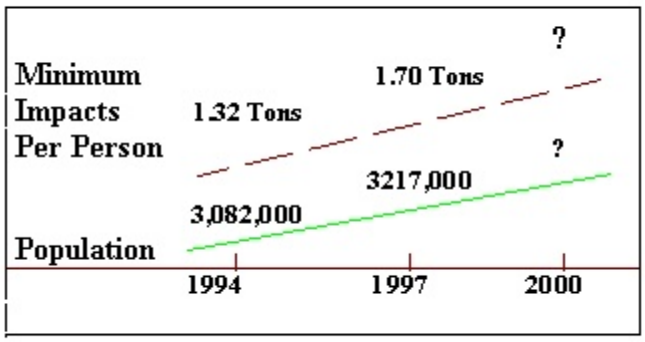
Many Initiatives Are Underway Yet They Lack Integration and A Common Mission. There are numerous growth management, livability, fish, watershed and nature restoration, and sustainability initiatives underway within government, the private sector, communities, non-profits and academia. Each is focused on specific issues or geographic areas. Because the state manages the environment through a fragmented set of agencies and programs, there is no unified framework to help integrate and guide them all toward the same common ends.

The Result Is That While Oregon Has Many Effective Individual Programs, They Do Not Add Up to a System Which Can Prevent the Continued Increase in Environmental Impacts as Oregon's Economy and Population Grows. DEQ data demonstrates this. In 1994, when Oregon's population was 3,082,000, Oregonians generated a minimum of 1.32 tons of pollution per person. By 1997, when our population grew to 3,217,000, we generated a minimum of 1.70 tons of pollution per person. The same pattern holds for economic growth. In 1994, Oregon's Gross State Product (GSP) was $74.7 billion and we created a minimum of one tenth of a pound of pollution for every dollar generated in the state. By 1997, our GSP had grown to $93 billion and we created .12 pounds of pollution for every dollar generated. ***This is the equivalent of generating a 1 lb. coffee can of pollution for every $10 produced statewide.***

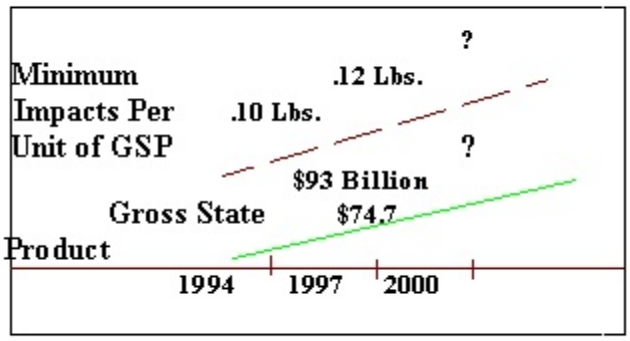
It is important to note that these are bare minimums impacts: Mobile air data is ten years old and effects on fragile habitats and other impacts are not included. Hence, Oregon's total impacts ***are undoubtedly much larger*** than this data shows, and still growing. And, ***these impacts are growing despite our existing laws and programs***.

The data also demonstrates that while some contribute more than others,***every Oregon business, citizen and institution*** contributes to the growing environmental problems.

ENVIRONMENTAL IMPACTS PER PERSON IN OREGON*



ENVIRONMENTAL IMPACTS PER UNIT OF GROSS STATE RODUCT*



- Based on DEQ data for municipal and industrial non-recovered waste, air and water emissions.

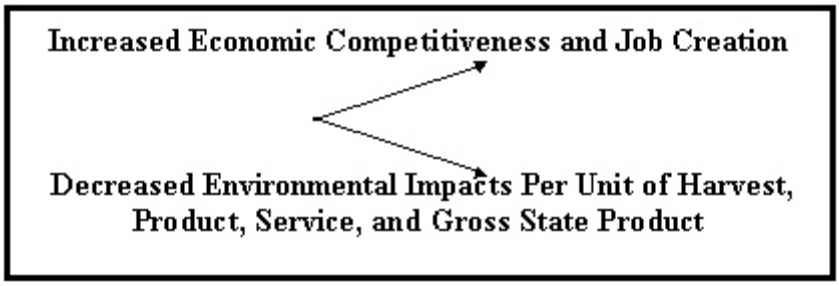
A State Framework Is Needed to Provide Clarity of Purpose and to Help Mobilize, Guide and Integrate Activities Towards the Common Goal of Placing Oregon on a Path Towards Sustainable Development.

III. WHAT IS SUSTAINABLE DEVELOPMENT?

Broadly, Sustainable Development Means "Decoupling" Economic Development and Population Growth from Environmental Impacts. The term "sustainable development" was defined by the 1987 U.N. World Commission on Environment and Development as: "meeting the needs of the present generation without compromising the ability of future generations to meet their own needs." Key objectives included: "reviving economic growth, but in a new form (less material and energy intensive…); meeting essential needs for jobs, food, water, energy and sanitation; conserving and enhancing the natural resource base; and merging ecological and economic considerations in decision making."

Many believe that the term is too fuzzy to help guide policy debates. One way to make the idea more concrete is to think of it **as *fostering increased economic competitiveness and job creation*** for ***all*** Oregonians ***while simultaneously reducing environmental impacts*** to levels needed to maintain healthy ecosystems and resources. Economic well-being rises while environmental impacts decline: they are ***decoupled.***

OREGON'S NEXT GREAT CHALLENGE:
Decoupling Economic Growth from Environmental Impacts



The Choice is Not Between Economic Growth or Contraction. It often seems that Oregonians must choose between two contrasting views: contracting the economy to resolve environmental problems, or solving environmental problems through economic growth. Both of these models provide an invalid picture for the future. A shrinking economy holds little hope for the poor or unemployed, businesses and consumers. It is also impractical as Oregon's economy today is inextricably linked with global markets. Yet, economic growth as it has been typically achieved will lead to increased consumption of natural resources, pollution and waste. Therefore, neither approach is realistic.

To Decouple, The Only Viable Choice Is To Create a More Environmentally Efficient Economy. The only possible approach - and one experience shows is achievable - is to institute the policies, programs, practices and technologies needed to dramatically improve the efficiency by which we extract natural resources from the earth's surface, turn them into products and services, and then emit them as waste and pollution. Only by creating a more "environmentally efficient economy" (i.e. squeezing more from nature using dramatically fewer resources and less impact) can we decouple economic development and population growth from environmental impacts. This is the next great Oregon challenge.

From A Technical Perspective, This Requires The Adoption of Factor Ten Increases in Efficiency Throughout the Economy. The last century witnessed huge increases in labor productivity. As market pressures and environmental concerns increase, the new millennium is more likely to be characterized by substantial increases in environmental productivity and efficiency. This means we will increase economic growth and

competitiveness through dramatic reductions in energy and raw material consumption, pollution, habitat impacts and waste generated per unit of product or service produced. Many believe that to achieve true sustainability, environmental efficiency must increase by a *factor of ten* in the future. As with labor productivity, the growth in environmental productivity will be largely based on technical and management advances which reshape the way business, government and communities function.

Is Decoupling Possible? Yes! The Netherlands is the first nation on earth to have successfully decoupled economic development from environmental impacts. Sweden and Denmark and others in the European Union have adopted similar goals. If the Dutch can do it, so can the citizens of Oregon. For over 30 years the Dutch used a command-and-control environmental regulatory approach similar to ours. However, in the late 80's they realized that, despite their system, they had become one of the most polluted nations on earth. This shocking news led to the creation of a new, more efficient and effective "goal and outcome-based" approach which stimulated innovation within the private sector and communities. While the Dutch still have many problems, they have successfully begun the process of decoupling. The need for a new approach also holds true here in Oregon.

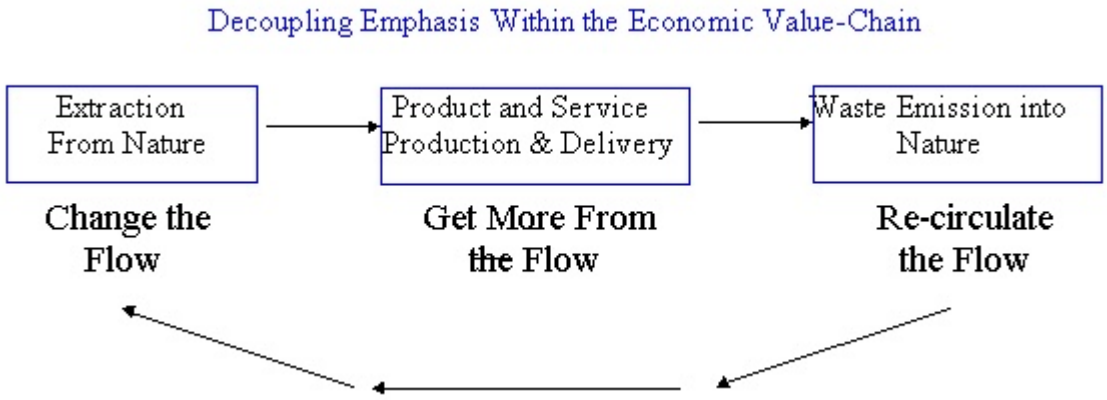
The State Must Be A Prime Mover: Only Government Can Provide the Unified Mission and Overarching Framework Needed to Mobilize, Guide and Integrate Public, Private and Community Efforts To Decouple Growth from Impacts and Place Oregon On a Path Toward Sustainable Development. There is an old saying: "if you don't know where you are going, any path will get you there." If we don't have a unified vision of what we are tying to achieve, it is very hard to know if all the steps taken by agencies, companies, landowners or communities will add up to success. While the Oregon Salmon Plan, the Community Solutions Team and other efforts are significant steps forward, they are each focused on specific issues or geographic areas. To mobilize and guide efforts to achieve sustainable development, the state must provide a unified mission and overarching framework which brings these and many other public, private and efforts together to aim toward common integrated goals.

IV. WHAT DOES DECOUPLING TO ACHIEVE SUSTAINABLE DEVELOPMENT REQUIRE?

Decoupling Requires Action Within Every Aspect of the "Economic Value-Chain."

The economic value-chain is a term used to describe the entire process by which our economy "adds value" to natural resources once they are extracted from the surface of the earth, turned into products and services, then emitted back into nature as pollution and waste. To decouple economic growth from environmental impacts, actions are needed within every component of the value chain: In the "upstream" resource extraction side examples may include environmentally compatible forestry, agriculture, fishing; In the "midstream" production and service delivery side examples may include improved energy and manufacturing efficiency, and shifts to the use of non-toxic materials in product and service design, manufacturing and delivery; In the "downstream" waste emissions side, examples include improved reuse, remanufacturing and recycling and

bioremediation.



Linked actions are needed within the entire economic value-chain if we are to successfully address today's pressing problems, such as endangered salmon, and prevent future ones.

There are Numerous Tools, Processes and Instruments Available to Help Guide Decoupling Efforts. For example, many new technologies are available to help the private sector and communities reduce environmental impacts while increasing efficiency and productivity. Local watershed programs, ISO 14000 and other Environmental Management Systems, The Natural Step, community livability and Smart Growth programs, sustainable forestry and agriculture, proposals for Green taxes and many other programs, tools and policy instruments may provide some of the basic building blocks for the initiative.

Decoupling Requires Integration and Collaboration. Sustainable development demands greatly improved coordination and integration across traditionally isolated environmental, economic and social programs. Crossing boundaries is necessary even if is difficult at first. In order to solve problems for the whole environment - and for a whole business or

community - it is often necessary to find solutions for all parts of the economic value-chain simultaneously, not just for one part. In almost every arena, single focus solutions often unintentionally impact other parts. Crisis management is but one result.

V. AIMING TOWARD SUSTAINABLE DEVELOPMENT CAN POSITION OREGON AS A CENTER OF EXCELLENCE IN ENVIRONMENTALLY EFFICIENT BUSINESS AND COMMUNITY DEVELOPMENT.

Instituting a framework to decouple economic development from environmental impacts will have costs - but will also reap large benefits in increasing business, community and state ***financial performance and productivity.***

It Pays to Reduce Pollution and Waste. The growing amount of pollution and waste generated in Oregon today indicates inefficiencies in product design, materials selection and manufacturing and service delivery systems. The inefficiencies equate to lost capital and revenue at the company, community and state levels. A tremendous investment of money and resources was required to extract raw materials, process them, turn them into manufactured products and then deliver them to the end user. These investments often are lost, in very short order, as the imbedded energy and product materials are used and then buried or incinerated. Extending the productive life of these materials (and the embedded energy required to make them) as far as possible, generates a much greater return on investment. Implementing the process and operational improvements needed to eliminate pollution and waste creates greater efficiency which in turn increases productivity. These steps also lead to more sophisticated business and community management capabilities.

Decoupling Efforts Lead to Greater Efficiency and Productivity. In his recent book *Cool Companies,* Joseph Romm describes the productivity benefits of reducing pollution and waste: "A stunning example of increasing productivity by decreasing waste comes from the authors of the book *Dynamic Manufacturing*. They found that 'reducing materials waste often improves productivity far beyond what one might expect from the material saving alone.' Their study looked at Total Factor Productivity (TFP), which is not merely the output per unit of labor but also a calculation of the product output as a function of all labor, capital, energy, and materials consumed in its production. TFP examines the overall efficiency of a process, as opposed to the efficiency with which it uses any single factor, such as labor. The 'waste rate' is the ratio of wasted material (scrap and rejects) to total cost. The table summarizes their finding in one plant:

Plant	*Average Waste Rate (Percentage)*	*Effect on TFP of a 10 Reduction in Waste*
C-1	11.2	+1.2
C-2	12.4	+1.8

C-3	12.7	+2.0
C-4	9.3	+3.1
C-5	8.2	+0.8

The authors note that ‘reducing waste…by 10 percent from its mean value (which by itself would reduce total manufacturing costs by only half of 1 percent) appears to have been accompanied by a 3 percent improvement in total factor productivity.’ This reveals the ‘powerful impact that reducing wasted has on overall productivity.’"

Many Major Companies are Committing to Becoming Waste-Free and Dramatically Reducing their Full Range of Environmental Impacts. For example, Interface Inc., a leading global manufacturer of carpet and floor coverings, has decided to be a "zero waste company." This includes eliminating scrap (one type of waste) and misdirected shipments, incorrect invoices, and defective products. From 1994 through 1998 Interface cut its waste by 54 percent by weight and in doing so cut costs by $76 million. They used an integrated design approach with the goal of simultaneously minimizing costs and environmental impact. The company is "redesigning its processes and products into cyclical material flows where 'waste equals food.' " (J. Romm, 1999).

Xerox Corp. is another firm that has committed itself to produce "Waste-Free Products from Waste-Free Factories." In 1993 they initiated their Waste-Free Factory Program with the goals of decreasing municipal, hazardous, and chemical waste by 90 percent and decreasing water discharges by 90%. Each Xerox factory performs annual self-assessments against nine specific target areas to provide an overall Waste-Free Factory Score. Plants are designated "Waste-Free" when they have achieved an overall score of 450 out of a possible 500. Xerox seeks to meet its zero waste goals through source reduction, the use of post-consumer materials in at least 60 percent of material purchases, reuse, recycling, remanufacturing and energy efficiency initiatives (J. Romm).

If major companies like Interface and Xerox can become waste-free, so can Oregon firms. Indeed, Oregon companies such as Norm Thomspon, Collins Pine, Neil Kelly Co., Oki Semiconductor (before it left), Intel and many others are already taking significant steps to demonstrate that good environment management is good for business. Over 60 Oregon companies are listed on the DEQ Commercial Waste Reduction Clearinghouse data base list. Together they have found well over $1 million in savings from waste reduction alone.

Preventing Environmental Impacts Reduces Company and Shareholder Risk. From an individual firm's point of view, pollution and waste are a financial liability, incurring storage, processing, mitigation, transportation, liability and disposal costs. If pollution and waste can be significantly reduced or eliminated, the economic benefits as well as the reduced risk to shareholder value can be significant.

Decoupling Efforts will Reduce Environmental Clean-Up Costs. Aiming towards sustainable development will stimulate the design and production of more environmentally sustainable products and services. They will use naturally occurring (non toxic) materials and consequently, will be more easily disassembled, reused or recycled and naturally break down and be re-assimilated into nature when all useful value is lost. This will reduce the management and clean-up costs of waste facilities, landfills and incinerators, which are borne by taxpayers. The Short Mountain Landfill in Lane County exemplifies these issues. Not only does the county manage this site just south of Eugene, it (i.e. taxpayers) must continue to pay for to clean-up the leachtate that is seeping into the nearby Willamette River. Reducing pollution and waste will reduce these types of costs.

Creating a Move Environmentally Efficient Economy Will Stimulate New Businesses and Jobs. Whole new industries will be created by placing a major emphasis on achieving sustainable development. Entrepreneurs will find many new, creative business opportunities generating products from naturally occurring materials, providing services rather than products to consumers, and using reused and recycled materials for new ends. New, previously unheard of industries and new jobs will be some of the outcomes. The PSU Center for Watershed and Community Health's (CWCH) waste-based economic development project underscores this point. The CWCH identified more than 40 for-profit reuse and recycling businesses which could be created based on the waste material being collected in the Columbia Gorge, Illinois Valley and Southern Willamette Valley regions of Oregon. The CWCH also helped non-profit CDCs begin development of six waste-based businesses in Oregon and Northern California. These initiatives just scratched the surface. Many more opportunities exist for entrepreneurs to exploit.

Decoupling will Conserve Resources and Protect Essential Ecological Services. The process of continually extracting virgin materials and toxic minerals and metals to serve as feedstock for new products often damages fragile ecosystems and habitats. Air, water and soil pollution contaminates key resources. Landfilling - even when done to the highest standards - often causes toxic leaching into ground and surface water as well as soil contamination. Incineration generates harmful toxic emissions. All of these impacts can be reduced by efforts to achieve sustainable development.

Aiming Towards Sustainable Development Will Increase Social Equity. Efforts to achieve sustainable development must fully engage the poor and disenfranchised. This is a moral obligation. It is also important because the poor must do whatever is necessary to care for their families, which may include activities which harm the environment. With sufficient education and proper training, many of the job and business opportunities that may emerge as we grow an environmentally efficient economy can be captured by poor communities and neighborhoods. For example, businesses reusing and recycling material formerly headed for the waste stream can be established in economically distressed rural communities and urban neighborhoods. This will provide an economic benefit to these communities.

In Sum, Setting a Course Toward Sustainable Development Can Position Oregon as a Center of Excellence in Sustainable Resource Management and Business Development. This can be used as a promotional tool for Oregon goods and services nationally and across the globe. It can also help Oregon firms capture and expand market share. Finally, it will help ensure that Oregon's environment and quality-of-life are maintained.

VI. BRIEF HISTORY OF ONE EFFORT: THE ENVIRONMENTAL STEWARDSHIP PLAN PROJECT

The Environmental Stewardship Plan Committee was an informal multi-stakeholder policy dialogue group that met between February 1997 and December 1998 to develop more efficient and effective approaches to environmental management and regulation. Staff from the Hatfield School of Government at Portland State University facilitated the process. The work of this group may provide some of the basis for a state framework to achieve sustainable development.

The Stewardship Plan Committee's Vision and Principles: Through the work of two subcommittees in the summer of 1997, a vision and a set of common principles emerged to help guide new approaches to environmental management and regulation in Oregon:

There Was General Consensus For the Following Vision Statement: "The citizens of the State of Oregon are committed to being good stewards of the environment. This means we commit ourselves to ensuring that the next generation of Oregonians are advantaged and not encumbered by our actions today."

Values:

- We believe that good business practices should be fully compatible with a healthy environment and a strong economy to the benefit all Oregonians.
- We believe that every Oregonian has a right to a healthy environment and healthy economy and therefore has a right and responsibility to participate in decisions which affect both the environment and the economy.
- We believe that every Oregonian is therefore accountable to all other Oregonians for actions that may impact the environment.

Principles

The subcommittees identified a set of common principles which an expanded or new approach to environmental management and regulation needs to provide:

- Regulatory stability
- Strive to exceed standards
- Continuous improvement
- Use the most cost effective means possible
- Flexibility
- Adaptability to new science, technology and economics.
- Use EMSs that are cost effective
- Regulatory sufficiency
- Based on an understanding the dynamic

- Central gov't set standards through cor with stakeholders, citizens
- Nature of ecosystems.
- Means or ends can be modified but onl governments.
- On site-specific basis with proof that a approach is better than old standard or
- Synchronize intergovernmental actions
- Share the responsibility for environmer protection, action and solutions.
- Focus on outcomes rather than the proc counting.

(Note: Each subcommittee also identified principles that were not identified by the other subcommittee. This did not mean the other committee did not support those principles).

***The State of the Environment Report*:** In the fall of 1997 the group felt that a goal and outcome-based system focused on sustainable development was needed in Oregon. To accomplish this, the group felt the state needed to establish environmental goals. For this reason the group proposed to the Oregon Progress Board the development of a State of the Environment Report. The purpose was to begin to organize and integrate environmental data to allow the state to set goals. The Progress Board agreed and the project officially started in early spring, 1998. Dr. Paul Risser, President of Oregon State University agreed to chair the science panel. The project is operated as a "civic science" process and The Progress Board nominated a group of stakeholders to work with the science panel through the process. A first draft of the report should be completed in late fall, 1999, or early winter 2000, and the final report should be published in early 2000.

***HB 3135, The Stewardship Plan Legislative Proposal*:** Again, based on the vision and principles, in the fall of 1998 some members of the committee decided to seek legislation that would establish an interim committee to flesh out a state plan to achieve sustainable development. Staff from the PSU Hatfield School of Government also felt that the informal dialogue process had served its purpose and should be sunseted. The committee had discussed alternative models of environmental management, worked through the above set of principles and reviewed the ideas with a broader set of individuals representing a variety of interests in the state: agency directors, local government officials and other stakeholders. The Stewardship Plan now needed to address the real-time political implications of plan implementation. To do so the process needed formal state authorization.

This led to the development of HB 3135, which was introduced by House Agriculture and Forestry Committee chair Larry Wells (R-Jefferson). However, the bill was not referred to Rep. Wells committee. Instead, Rep. Wells had to "borrow" the bill from the House Government Affairs Committee. Nevertheless, a hearing was held in the House

Agriculture and Forestry Committee and more than 20 businesses, organizations, individuals and state agencies sent letters or stated support. No visible opposition was stated. HB 3135 was supported by a majority of the Environmental Stewardship Committee participants. However, as with most other environmental legislation, the bill did not move out of committee.

Given the growing list of supporters for the, the proposed Environmental Stewardship Plan could serve as a beginning point for the development of a state framework to achieve sustainable development.

VII. COMPONENTS OF A STATE FRAMEWORK TO MOBILIZE, GUIDE AND INTEGRATE EFFORTS TO ACHIEVE SUSTAINABLE DEVELOPMENT

Just as the Oregon Plan for Salmon provides a comprehensive framework to guide salmon recovery, the state must develop a framework to mobilize, guide and integrate efforts by government, the private sector and communities to achieve sustainable development. The framework should place state government in a first mover, "steering" role - serving as a catalyst and providing support and guidance. Most of the "rowing" functions - specific actions to achieve the goal - must be done by the private sector and communities.

Based on the work of the Oregon Environmental Stewardship Plan Committee, reviews of successful programs in the U.S. and across the globe, as well as local initiatives, there appear to be at least three components of a framework which can successfully mobilize, guide and integrate efforts to place Oregon on a path toward sustainable development.

- The state would declare that achieving sustainable development is a top priority and establish clear goals and a mechanisms to mobilize, guide and integrate government, private sector and community efforts towards this end;
- Each state agency would adopt clear goals and outcome-based strategies to align internal rules, regulations and programs and to mobilize, guide and support constituent efforts to achieve the new state sustainability goal;
- Ongoing private sector and community sustainability efforts would be complemented by new initiatives aimed at the common state goal of decoupling economic development and growth to achieve sustainable development.

A. <u>State Goal and Framework To Achieve Sustainable Development</u>

1. ***The State Must be A Prime Mover and Declare Sustainable Development a Top Priority:*** To place Oregon on the path toward sustainable development, state leaders must declare this a top priority. Few things mobilize government and the public more than government leaders declaring an issue a top priority. A public declaration is vital to mobilizing agency action and to provide a compelling reason for the private sector and communities to focus on the issue.

The Governor is perhaps the best person to initially lead the effort. His office could go so far as to declare, as many nations have done, that Oregon shall achieve sustainable development within one generation, or 20 years. Some state agencies (e.g. State Forestry, Economic and Community Development) and many programs initiated by the Governor (e.g. Salmon Plan, Community Solutions team) have already adopted similar goals or compatible ends. State agency commissions could follow the governor's lead. Eventually the legislature would need to adopt the goal of sustainable development.

2. The State Would Develop a Means to Mobilize, Guide and Integrate Sustainable Development Efforts. Some components could include:

a. Comprehensive Assessments of the Status, Trends and Risks to the Environment to Generate Agreements On Existing Conditions and Anticipate Future Problems. A fundamental building block of any sustainable development program must be credible information to determine what is needed to sustain the environment over the long run. This requires an assessment of current conditions, trends and future risks. Key stakeholders must be engaged in the process to generate common understanding of the way the environment functions and agreements on existing problems and future risks that should be addressed now. Comprehensive scientific baseline information is vital to provide a platform for anticipatory policy development. Only the state can establish systems needed to provide this type of information. Without it, advocacy science will be the norm.

About twenty states, a few federal agencies and numerous nations have developed some type of a "State of the Environment" or "Environmental Indicator" reports to provide this type of information. The most successful assessments are updated every 2-4 years using environmental data strategies adopted by all agencies. Information in these assessments is used to set sustainability goals and targets, and to assess current policies and programs against to determine is they can achieve the goals. If research shows existing policies can't achieve the goals, policy adjustments are made. The process has proven so important in some nations that a representative of the Danish government, when informed that neither Oregon nor many other U.S. states have this type of data, asked "how can you set environmental policy without this type of information?" The State of Oregon must institute this process.

An Oregon State of the Environment Report is now being completed under the auspices of the Oregon Progress Board. This report is the first attempt to provide some the scientific information needed to establish environmental goals and targets. It is being developed on a shoestring with volunteer scientists and taff and consequently there will be omissions and holes. With sufficient resources, the process will be refined and improved over time. The SOER process should be institutionalized and funded by

the state to help improve it, guide long term sustainability policy development, and to keep the public informed about the condition of their environment.

b. Means to Link Data on Economic Drivers with the Environmental Data to Provide Common Understanding and Generate Socio-Economic Goals and Targets. Another key piece of information needed to establish an anticipatory management system is credible data describing today's real economy and it's linkages to environmental problems, and an analysis of the costs and benefits of alternative strategies to decouple economic development from environmental impacts. This information can lead to the development of integrated sustainable development goals and targets.

There is no mechanism in the state to provide this type of information. As a result, advocacy economics prevails. Discussions have been held by those involved with the Progress Board's State of the Environment Report to institute this process immediately, or soon after the report is completed. The state may want to support and fund this process, or initiate other mechanisms to generate this vital data.

b. Coordination Within the Executive Branch. The Governor's office has a number of programs which touch on or directly relate to sustainable development (Community Solutions Team, Governor's Natural Resources Office). A common set of sustainable development goals and principles may prove useful to help coordinate and integrate these programs around the common goal of sustainable development. In addition, the Governor's office is the logical place within which to establish a mechanism to coordinate and integrate all of the sustainability programs and policy development underway within state agencies. Some type of coordinating process should be considered.

c. Guidance to State Agencies. State agencies need direction and authority from either the Governor and/or their commissions and the legislature to make sustainable development a priority. While many agencies have initiated pilot projects or discussions on their own or due to legislation (e.g DEQ Green Permits) they will be greatly enhanced by clear direction from state leadership to proceed forward. Guidance can take the form of an open invitation to any agency, requirements that all agencies participate, or the selection of pilot projects involving a few agencies. As sustainable development requires action within every aspect of the economic value-chain, the pilot project approach risks the transference of problems from one media to another (water effluent into air emissions or increased waste).

d. Statewide Coordinating Council. The state may also want to consider establishing some type of multi-stakeholder process to provide direct communication and coordination between the Governor, legislature, agencies, privatesector and community sustainable development programs. While each agency will communicate with its constituents, it may also prove helpful to have a mechanism for ongoing direct communication between state leaders and the public.

B. State Agency Goal Setting and Action Plan Development

1. ***Each Agency Would Assess its Operations, Identify Needed Changes and Develop an Action Plan to Adopt a Path Toward Sustainable Development.*** While state agencies know some of the steps they must take to adopt paths towards sustainable development, a comprehensive assessment of each agency's operations is certain to prove very helpful.

The State of Minnesota Environmental Quality Board and the Minnesota Planning Department recently sent a survey on sustainable development to most state agencies. The results were published in the April 1998 document Taking Root. The responses provided an initial assessment of how agencies perceived their mission's and activities in light of sustainability. Minnesota agencies recognized the following shortcomings:

- A common understanding of what sustainable development means and how it might change the way agencies and programs function;
- An awareness of the need to consider the net environmental, economic and community impacts of each decision;
- A coherent, well-defined policy framework to guide state agencies in contributing their respective strengths to the state's overall sustainable development goals;
- Criteria for evaluating the degree to which a given policy or program promotes sustainable development.

These shortcomings reduced the ability of Minnesota state agencies to adequately assess their own actions for sustainable outcomes. This is certain to be true in Oregon as well. For this reason, an agency wide assessment would prove useful to identify specific actions and develop a long term action plan to achieve sustainable development.

This past summer, graduate students working with the Portland State University, Center for Watershed and Community Health completed preliminary assessments of three Oregon agencies: The Department of Economic and Community Development, Department of Environmental Quality, and Department of Fish and Wildlife. In crafting this assessment, the students incorporated questions to deal with the concerns found in

the Minnesota survey. In addition, following HB 3135, they added three addition criteria which recognize that agencies would need to:

- Establish clear, long term measurable goals for environmental and natural resource stewardship along with measurable objectives and interim benchmarks to monitor progress towards the goals;
- Examine a performance based system in which long term measurable goals can be attained by carefully monitored and self-generated, incentive based strategies that improve the efficiency and effectiveness of environmental management and regulation for businesses, communities and government; and
- Integrate environmental and natural resource goals with economic and societal goals.

The results of these preliminary assessments reaffirmed that Oregon agencies need education and training, as well as clear guidance from the Governor and other state leaders to adopt effective sustainable development policies and programs. This underscores the need for a thorough assessment of agency operations.

Following the assessment, an action plan can be created which identifies immediate steps each agency can take such as changes in rules, regulations, procurement policies, and program operations. The plan should also identify legislative changes needed to place the agency on a more sustainable path. *A key component of each plan should be clear criteria for deciding what is and is not sustainable*.

2. Each Agency Would Adopt Clear Goals and Objectives for Achieving Sustainable Development. A key part of each agency's action plan should be the adoption of clear long-term goals, specific measurable 2-5 year objectives and interim benchmarks (progress indicators) for managing the environment. These should be linked with socio-economic goals as discussed previously. The information for goal setting should be obtained from processes such as the State of the Environment Reports.

a. Goal Setting Means Moving from Counting "Outputs" to Measuring "Outcomes": Traditionally, regulatory agencies focus on counting "outputs" (number of inspections, enforcement actions) and case-disposition statistics (convictions, financial penalties) to demonstrate enforcement. Enforcement is assumed to lead, through deterrence, to compliance. Compliance is assumed to lead, in turn, to achievement of regulatory goals (public health, safety, environmental quality etc.). This traditional "bean counting" approach is now being challenged on many fronts - including by many Oregon agencies - because focusing on "outputs" has not necessarily translate into ***"outcomes" (i.e. results).***

b. Lack of Clear Goals and Measurable Objectives Leads to Crisis Management: Without clear goals, society may unknowingly overshoot, government reacts with strong controls, and crisis management continues.

If the state establishes clear goals and measurable objectives, it can focus more on outcomes than on the means to achieve them.

c. Clear Goals and Objectives Leads to Greater Equity. In lieu of clear goals, government often focuses on the businesses for which more information exists or which are easiest to regulate. Clear goals and objectives can lead to the involvement of those that have not shared the burden, thus easing the burden of those that have done their part for many years. All Oregonians should contribute.

d. Goal Setting Has Already Begun In Some Areas: The Governor signed an Executive Order requiring goals and objectives to be established in the salmon program. Oregon DEQ (Strategic Plan) and the Department of Forestry (Sustainability Indicators), among others, are also developing goals. These need to be integrated across all agencies and resources (e.g. waste management is not coordinated with watershed rehabilitation).

e**. How Are Goals and Performance Measures Set?** Private businesses have many qualitative and quantitative tools to determine whether programs and policies are leading to desired goals. In contrast, government has not often developed goals or performance measures. To do this means that we would first have to decide what is needed to sustain the environment. In other words, what results do we expect our environmental programs to achieve? This is the type of information a State of the Environment Report should provide. Agencies then need to establish ways to track how well and how timely their efforts are in progressing towards these goals. This will not be an easy task. It will require up front investments of time and energy. Stakeholders must be thoroughly involved and it is certain to test the patience of the public and government alike. Yet, if the agencies and stakeholders are willing to slog through the process, the improvement that results from actually knowing what is to be achieved and how we are doing will more than pay for itself in the long term, thereby reducing overall costs.

3. ***Each Agency Would Develop Outcome-Based Regulatory and Management Programs.*** Developing a unified state mission, framework and clear goals will not, alone, lead to a more sustainable paths. The *means* to achieve the goals must also improve. A key component of each agency's action plan should include the creation of outcome-based programs whereby companies, landowners and communities would be held accountable for achieving specific goals and objectives but be free to choose ***how*** to accomplish desired ends. Focusing on ***results*** places the responsibility for the environment where it rightfully belongs: on the private sector and communities. This will stimulate tremendous innovation to solve problems in the most cost effective and efficient way.

a. Outcome-Based Programs Are Fundamentally Different Than the Traditional Regulatory Approach*:* Most businesses do not mind

investing in capital or management improvements to help the environment. They do dislike being required to invest in data gathering or activities that provide marginal benefits, especially when they know how to achieve greater benefits for the same or less cost. Rather than micromanaging entities on how compliance is achieved, government's primary role in outcome-based programs is to set clear goals, objectives and interim benchmarks. Government then provides technical assistance and incentives to help entities develop their own customized, least-cost path to achieve the objectives. An entity decides on its own how to allocate resources to achieve the needed outcomes. Once a customized plan is developed, government reviews and approves it through a variety of legally binding agreements. Government then monitors progress to verify that interim objectives and benchmarks are met to assures compliance.

b. Outcome-Based Approaches Often Provide Some Type of "No Surprises" Assurance and Allow Business to Make Changes Within Normal Business Investment Cycles. Change is not foreign to businesses. The nature of today's economy forces every firm to rapidly adjust processes, products or services to meet changing market demands. Yet, to ensure business viability, except where serious health, safety or environment risks exist, outcome-based programs often allow entities to phased-in major capital improvements within their normal business investment cycle. "No surprise" assurance is also provided for some set period so that customized plans have sufficient time to be implemented without changing the goals or requirements.

Examples of Legally Binding Agreements Providing "No Surprises" Assurances:

- Custom Waivers: Special permits for innovative approaches which substitute for existing legal requirements (DEQ Green Permits).
- Permits for Voluntary Environmental Management Systems: Waivers or binding agreements which declare that adoption of management systems such as ISO 14000, International Sustainable Forestry Criteria and others are sufficient to meet legal standards.
- Incidental Take Permits: Administrative sufficiency provided against prosecution for a suite of steps taken to protect endangered species or their habitat.
- Memorandums of Agreement: Almost every agency has authority to write cooperative agreements which specify what an agency will commit to in return for specific commitments by an entity. For example, an agency may agree to place entities low on the priority list for potential

fines or prosecution of violations if it agrees to implement and abide by a self-generated Stewardship Plan.

- Performance Contracts: These are adaptive, vary in scope, and could apply to facilities, firms, supply chains, business sectors, products, substances and communities and even to larger issues such as climate change, land use, Brownfields redevelopment etc. They are similar to Cooperative Environmental Agreement laws.
- Covenants: Legally enforceable civil contracts between whole economic sectors, individual firms or communities and government specifying the commitments each will make to achieve specific goals and objectives (used extensively by the Dutch Government).

c. Outcome-Based Approaches Use Incentives to Create Flexibility and Encourage Innovation: In outcome-based systems, entities can use their best ideas, imagination and innovation to adjust inputs and processes as needed. In return, agency managers can be confident that participants are working toward the agreed goals. Feedback systems - based on consistent measurement and the achievement of benchmarks - help ensure that participants are working in the right direction and allow managers to dispense with constant micromanagement and oversight. Government provides public recognition, financial assistance, and other incentives to foster and support implementation.

Performance incentives can include:

- Public recognition;
- Streamlined facility or site permitting;
- Reduced reporting requirements;
- Flexibility in permit adjustments for modest changes;
- Priority for technical assistance;
- Priority for grants, low interest loans and other financial tools:
- Priority for government contracts; other.

d. This Would be An Alternative Path, Not a New Layer of Government: Outcome-based programs would provide an alternative path for entities that want to commit to the sustainable development goals. Those that choose not to participate can remain under the existing regulatory system. It is possible that as we learn more over time the traditional regulatory system will become less important. However, some form of regulation will probably always be needed, if for no other reason than to address "free riders."

e. The Existing Regulatory System is Maintained But Used Differently. Rather than using regulation as the sole or dominant tool, it

would be used primarily as a back-up to set baseline conditions, regulate "free-riders" (those that choose to do little), to assure a level playing field for all, and to monitor and provide feedback. Thus, the *existing regulatory system is maintained* but used differently. Government therefore encourages innovation while providing assurance that "the commons" (air, water, biodiversity) are protected for all.

f. Voluntary, Bottom-Up Approaches Are Key Components of Outcome-Based Programs: This approach builds upon the Oregon Salmon Plan and other bottom-up voluntary programs. The development of specific goals and measurable objectives will allow participants to know if all their efforts add up to success.

g. A growing number of states and nations believe goal and outcome-based systems provide a better "Return on Governance" (ROG). Scarce resources and management attention require that returns on governance be maximized. This means that routine activities and continuous improvement must be able to occur without constant management oversight and resources must be conserved to focus on the most critical issues and opportunities. Many believe that goal and outcome-based systems promise to deliver ROG better than most other approaches to environmental governance.

4. This Approach is Consistent with Many State Programs. This approach is consistent with and builds upon exemplary programs such as:

- **The Oregon Progress Board Benchmark Program** and SB 1130, Section 8, ORS 291.200 (2) (Budget Development Policy). This requires state agencies to accomplish set goals when developing their budgets. However, there is little clarity on how agencies should accomplish this in the environmental arenas, and there is no umbrella state policy which can integrate all state agency goals. While the Progress Board has developed environmental benchmarks, this area lags behind the other benchmarks.
- **The Oregon Plan for Salmon and Watersheds**, **the SB 1010 plans** and other state programs focused on salmon and water quality. A state framework on sustainable development would add clarity and direction for integrated goal setting for these programs, thus supporting local citizen and landowner efforts. It could be viewed as a logical next step of expanding a goal and outcome-based approach to all environmental and natural resource issues, not just salmon.
- **The Governor's Community Solutions Teams**, which are in the process of establishing Quality Development Objectives for growth management issues and integrated agency responses to resolve problems.
- **The DEQ Green Permits Program**, which seeks to provide recognition and incentives for going beyond minimum compliance.
- **Department of State Forestry's First Approximation Report** which is using sustainable forestry indicators as part of their forests assessments work and

Stewardship Agreement Program which authorized the Board of Forestry to develop rules to provide increased flexibility for going beyond minimum compliance.

- **The Enlibra Principles Adopted by the Western Governors' Association**. The Stewardship Plan proposes to establish a formal state framework (governance structure) to guide, monitor and assure performance of state programs which use these types of principles.
- **Executive Order No 99-13** on the Elimination of Persistent, Bioaccumulative, and Toxic Pollutants.

5. Can This Approach Address Federal Mandates? Reform has to start somewhere. Oregon needs to get its act together before the issues can be taken to the federal level. Once the state develops a refined strategy, it can petition the federal government for waivers, much as the Oregon Option created waivers for medical and welfare reform. It should be noted that many experts believe that in the coming years, environmental and sustainable development innovation will emerge primarily at the state level and the federal government will learn how to respond to and support the states. If true, as with welfare and health care reform, Oregon may once again lead the way.

C. Action Plans By the Private Sector, Communities and Non-Profits

The first mover position and framework developed by the state should be taken as an invitation and challenge to the private sector, communities, special government units and non-profits to develop action strategies to achieve sustainable development.

1. ***Individual Firms, Landowners, Communities and Non-Profits Should Develop Customized Action Strategies Within Every Component of the Economic Value-Chain***. As the diagrams on the following pages show, our economy is a system in which materials (minerals, metals, biological) are extracted from nature, converted into products and services, and then discharged as waste (physical materials and dispersed pollutants) back to the same landscapes that provide our resources and key ecological services. Understanding the way in which the economic value-chain impacts the environment demonstrates that actions are needed within every component to place Oregon on more sustainable paths. Each company, landowner, community, special government district and non-profit should develop customized, least-cost strategies to achieve the sustainable development goals and objectives established through a State of the Environment Report process and/or agency goal setting.

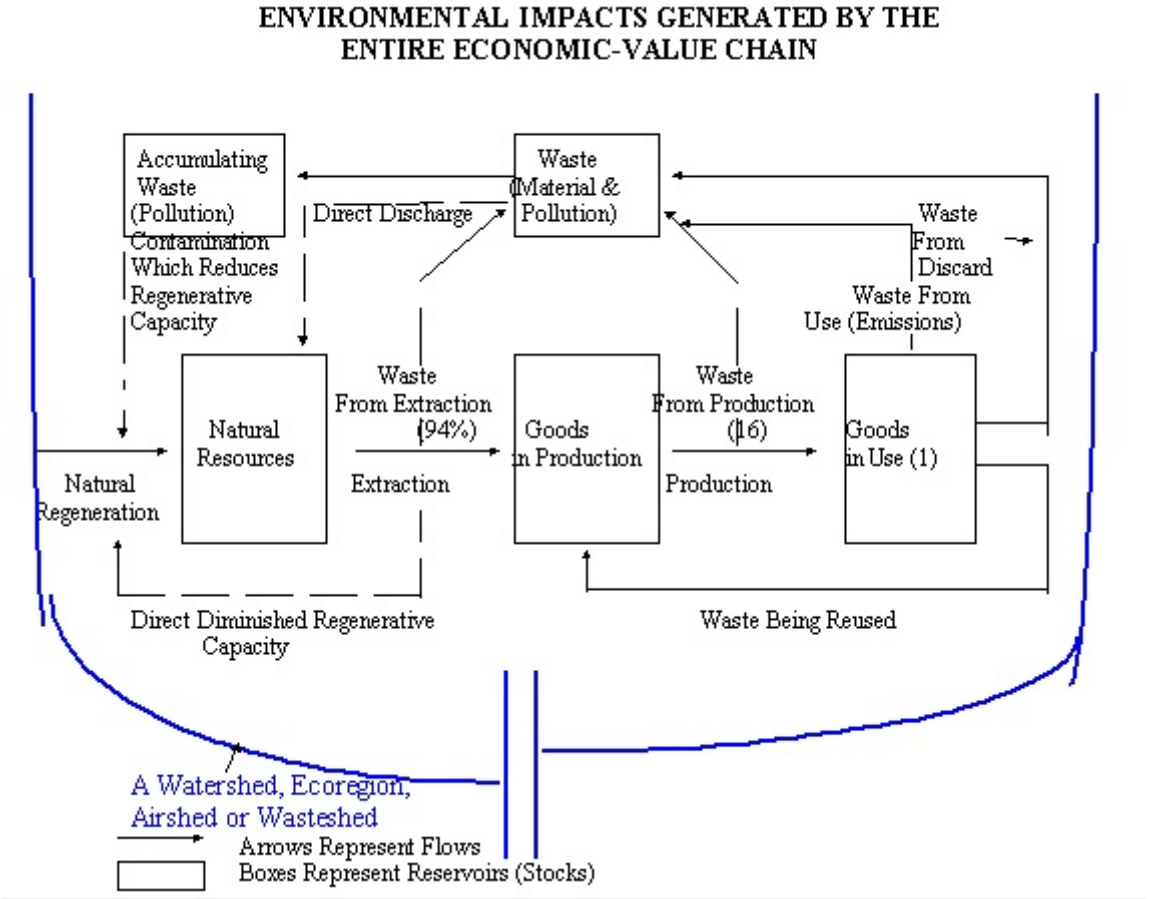
2. Work Through Whole Economic Sectors When Feasible. It is often difficult for firms, landowners or communities to significantly improve environmental performance without commensurate changes throughout the entire economic sector in which they operate. It is for this reason that sector-based management programs are emerging as a viable means to address key problems.

Many activities that effect the environment result from management decisions that are driven by real or anticipated economic forces within the sector in which an entity operates. For example, a business may hesitate to make investments to reduce effluent discharges due to cost pressures from upstream suppliers which control the type, cost or availability of key feedstocks or hesitate due to pressure from downstream distributors which demand reduced per unit costs to meet market demands. Individual firms often cannot obtain new technologies to reduce their environmental impacts until their equipment suppliers see sufficient demand in their customer base to make retooling cost-effective.

Small and mid-sized firms often do not have the expertise or resources required to implement sophisticated process improvements. They need help from larger pools of expertise. Further, many businesses will hesitate to make major investments unless their competitors are required to make similar investments (i.e. they fear the effects of free-riders and a non-level playing field). Just as firms may feel constrained by pressures within their economic sector, communities may feel constrained by the economic conditions and trends of the firms and sectors which are key economic engines within their tax base.

It is for these and other reasons that it can be helpful to initiate decoupling strategy development by working with whole economic sectors rather than by focusing just on individual firms, landowners or communities, one at a time.

Diagram A

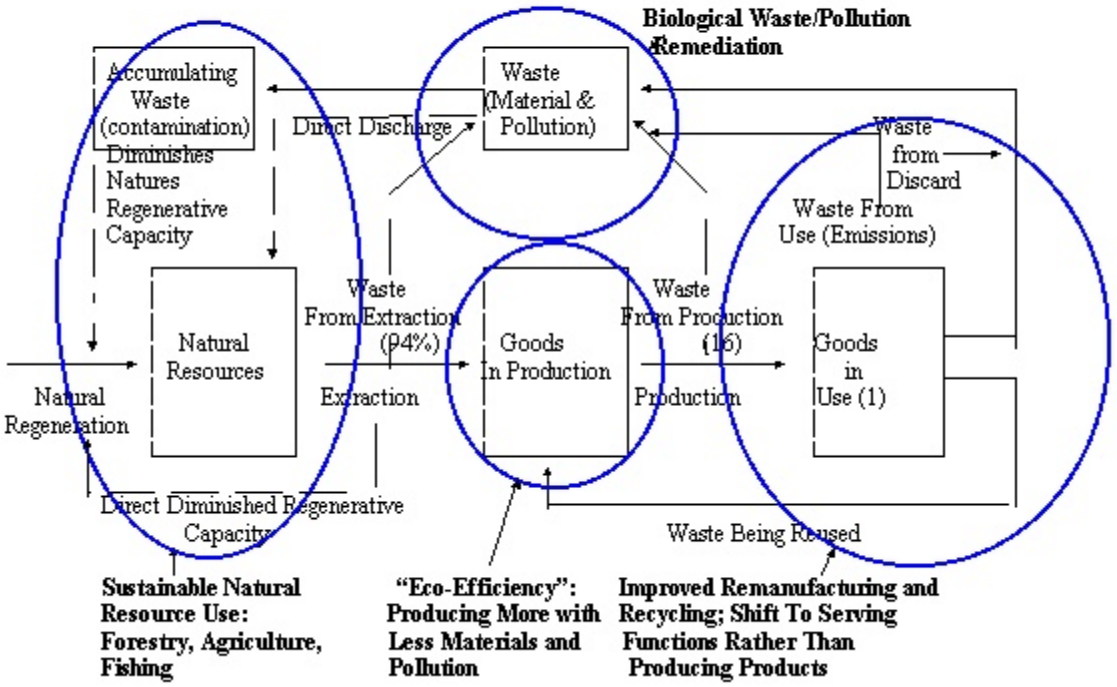


- 94% of the materials extracted from nature end up as waste and never enter production stage
- There is roughly a 16 to 1 ratio of waste from production to final products.

Diagram B

OPPORTUNITIES TO CREATE AN ENVIRONMENTALLY EFFICIENT ECONOMY

Opportunities exist in all components of the economic value-chain to establish sustainable practices and develop or grow profitable businesses which improve the environment.



Strategies within all four areas must be pursued simultaneously. Any one in isolation could, and often does, create even greater environmental risks. For example, eco-efficiency on its own may lead to reduced costs which generates increased sales and production of products and services which uses more raw materials and leads to more waste and pollution.

Sector-based solutions must be applied by each individual member of the sector through locally tailored strategies. However, if organized properly, sectors can aggregate expertise and resources, design templates for recovery, identify solutions to common technical problems, and develop policy proposals that benefit all members. These steps help ensure a level playing field for all sector members.

a. **Sample Process**

Organize Priority Sector Groups. Sectors can be organized based on their use, production or delivery of similar products, processes or services. Government or it's representatives must generally take the initial steps to contact and ask the sectors to participate and organize themselves. The sectors can organize themselves through trade associations, ad hoc groups or other strategies. It is best to work through sub-sectors rather than large sectors when possible. For example, "agriculture" is generally too large a sector to be useful from an planning perspective. Orchardists, grass seed, dairy and nursery are examples of sub- sectors that are better organizing units.

Once the sectors are organized, the following questions should be answered:

- What is the economic and social structure of each key sector group?
- What are the key economic and political forces and constraints that shape it’s activities (pressure from upstream and downstream within the economic sector)?
- What role does government and public policy play in influencing activities within the sector?
- Which are the key organizations?
- What are the more progressive businesses and institutions and who are the leaders?
- What is the best way to ask the sector to organize itself to develop strategies (through trade associations, ad hoc groups?)

Begin Option Planning. Once the context and forces affecting each sector are understood, problem solving and the development of action plans can begin. The following questions can help guide the process:

- What are the known possible measures which could be taken by each key sector to reduce or eliminate their impacts?
- Which measures are clearly necessary to achieve the environmental quality goals and targets?
- Which options can be implemented quickly with little cost ("low hanging fruit") and which may require more time to implement but which may generate significant benefits?
- What are the potential costs of each option?
- What are the economic benefits to the sector and society at large from each of the possible short and long term measures?
- What would the time frame be to introduce the measures?

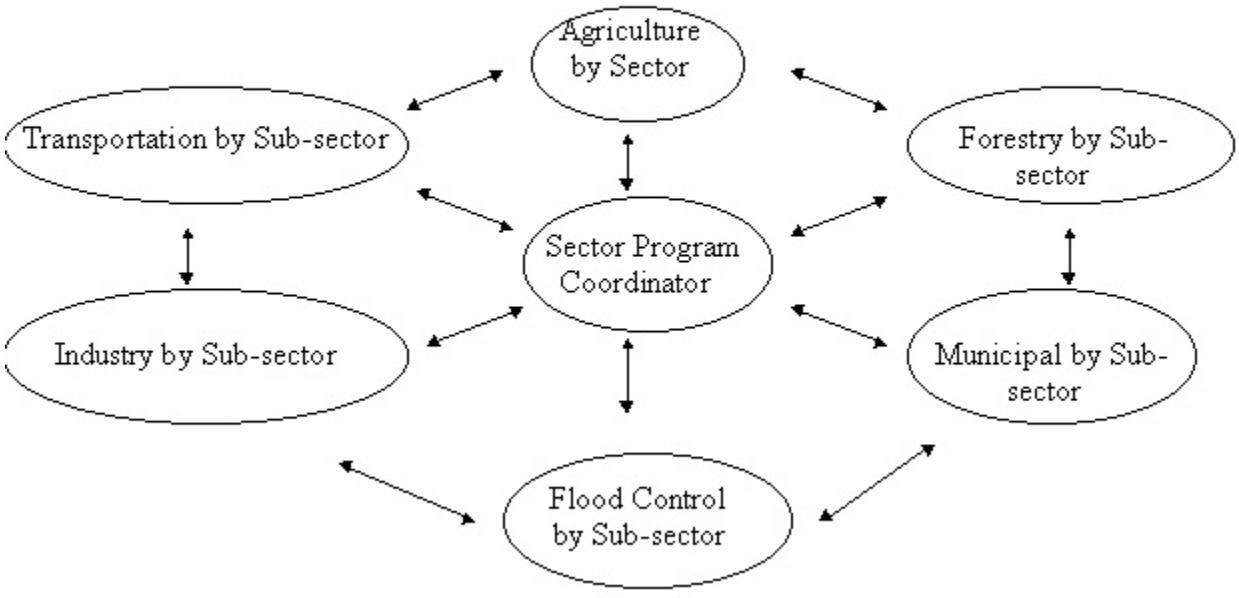
- What government actions or public policies could be most effective to help the sector implement the measures?

These questions should be discussed with the key sectors as well as with public agencies that deal with the sectors and groups that are part of the sectors' economic value-chain (upstream suppliers, downstream distributors, power suppliers, waste management authorities, etc.). This enhances the discussions and can open up new ideas and options.

The level of uncertainty is always of great importance in these processes. A good rule of thumb is that if the confidence level about cause and effect is 75% or more, the step should be taken because this level certainty far exceeds the level of certainty in almost every type of business investment.

Establish Communication And Exchange Mechanisms. Better options will emerge if all of the sectors can communicate and possibly explore the potential for trades and exchanges between sectors. To accomplish this, a communication and exchange mechanism should be established. The key is to ensure that sectoral strategies are not developed in isolation. The sum total of the actions by each economic sector must eventually "add up" to reduce environmental impacts to the desired environmental goals established through a State of the Environment Report goal and target setting process.

SCHEMATIC OF EXAMPLE SECTOR-BASED SUSTAINABLE DEVELOPMENT PROGRAM



Seek Opportunities For Trades Between Sectors. For example, effluent trading (e.g. trading of credits between point sources and point and non-

point sources) and financial trades between sectors (e.g. downstream urban areas agreeing to fund upstream improvements on farm or forest lands) can be effective means to find the most cost-effective way to reduce environmental impacts.

Develop Sectoral Action Plans. An understanding of the key decision making drivers that influence environmental performance within a sector can serve as a platform to design solutions to address environmental problems. A sector-wide strategy will often involve organizing coordinated programs upstream and downstream within the entire economic sector, and/or exchanges between sectors or key actors within different sectors Hence, suppliers and distributors may be asked to become involved, in order to develop complete value-chain solutions.

The recommendations that may result include the adoption of improved technologies and management practices, a phase in of non-toxic substances and feedstocks, new waste management procedures and other steps.

The sectors may also propose new policies, financial incentives, emissions and effluent trading programs, funding help for capitalization programs, land trades, buy outs, and other strategies that can help foster and support environmental improvements within the entire sector.

Implement The Sectoral Action Plans Through Locally Tailored Programs. The sector-based programs would then be implemented by each individual firm, landowner , community or agency within the sector through tailored strategies to fit the needs and conditions of local environments. Public agencies provide technical assistance and public recognition, when appropriate, to support these efforts. They would also seek to link each firm or landowner's improvement strategies with those of other economic interests within a management unit (watershed, ecoregion, airshed, wasteshed etc.) to develop a comprehensive and integrated program.

b. This Is Not a Totally New Approach. There are a number of examples of sector-based programs in this country and globally. Perhaps the most advanced is the comprehensive sectoral program initiated by the Dutch government as part of their National Environmental Policy Plan. All sectors that contribute to environmental problems nationally are involved with the Dutch program. The European Union has adopted the Dutch sectoral approach, which suggests that many other nations will eventually apply it. In the U.S., the Clinton Administration recently unveiled an initiative with the construction industry to reduce energy needs in response to global climate change issues. EPA has initiated a number of sector-based programs, such as the Sustainable Industries Project of the Office of

Policy, Planning and Evaluation, and the Sector Notebooks project of the Office of Compliance. These programs are developed within a regulatory context. Many states and regions have used versions of sector-based programs to address numerous issues over the years.

Diagram C provides a schematic view of how integrated horizontal-vertical sector-based sustainable development initiatives can operate. **Diagram D** provides a schematic view of how the Metal Finishing industry, as an example, can apply the approach.

Diagram C

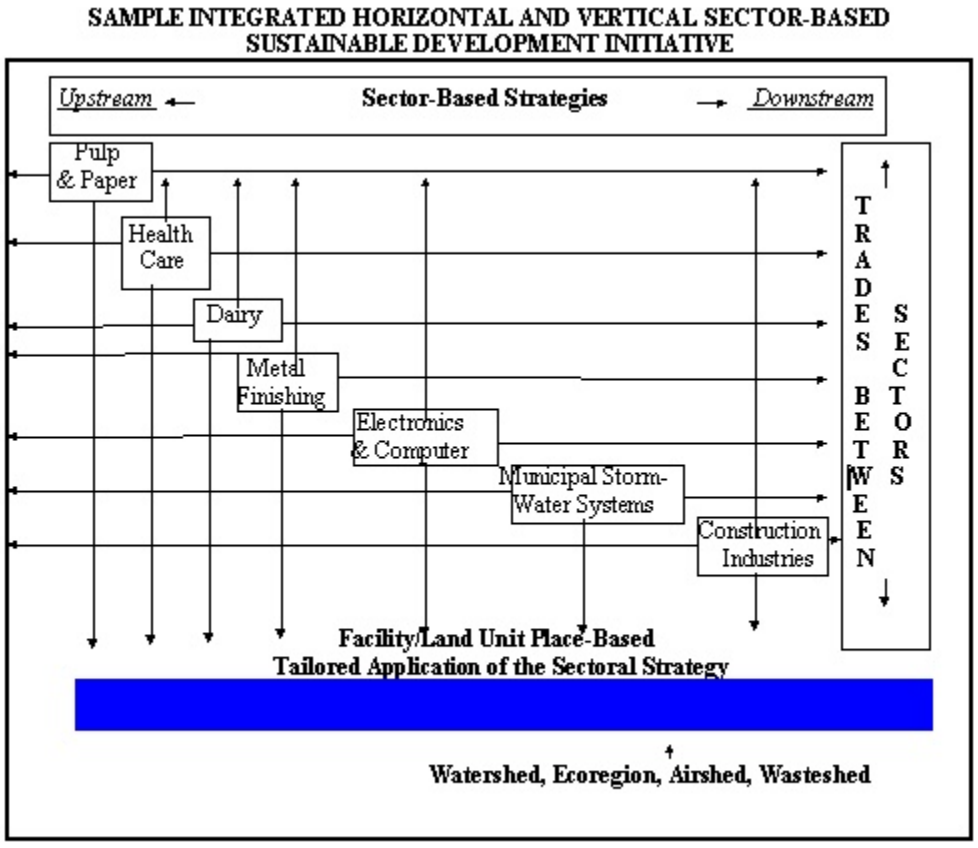
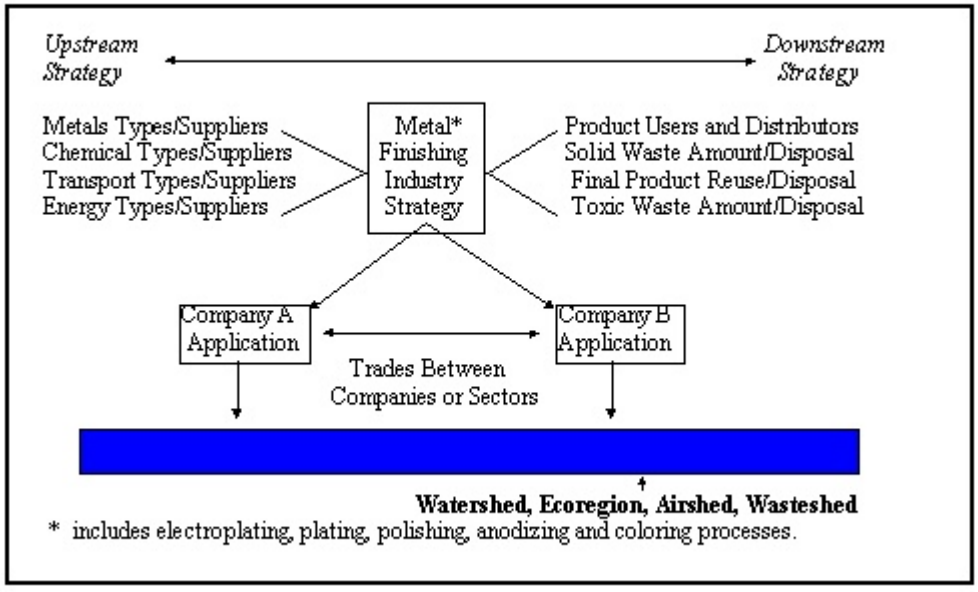


Diagram D

EXAMPLE OF INTEGRATED SECTOR-BASED, PLACE-BASED APPROACH WITHIN THE METAL FINISHING INDUSTRY



VIII. EXAMPLES OF POLICIES, PROGRAMS AND PRACTICES THAT CAN HELP DECOUPLE ECONOMIC GROWTH AND IMPACTS AND PLACE OREGON ON A PATH TOWARDS SUSTAINABLE DEVELOPMENT

The following are examples of the actions that can be generated through an integrated state framework to place Oregon on a path towards sustainability. The ideas have been gathered from numerous, programs, states and nations. The list is NOT inclusive and should be used simply to stimulate discussion and further development.

1. New Technology 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 cost.

Barriers And Changes Required:

- Technological advancement is needed to get substantial cuts in environmental impacts;
- We still think too much in terms of individual products rather than in terms of the functions we need filled or overall systems or product chains;
- There is great uncertainty about the future, leading individual actors to wait;
- 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 industrial estates, fully integrated public transport, zero waste strategies etc.

State government - serving as catalyst - and industry 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 aimed at developing new technologies to increase the environmental efficiency of processes, products and services..

2. 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 and the shared use of products. 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.

3. 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 which 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 an 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 these effect. It is important that the financial services sector seizes environmental market opportunities.

Potential Actions

- The state could expand its review of 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 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.

4. Business Environmental Management

To achieve sustainable development in Oregon, a strategic approach is needed in which a company or economic sector develops environmental management systems which are linked with their financial-economic policy. A stronger relationship would be established 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 overall strategic management system. Companies will take a more strategic view if environmental management improves their market position or produces cost savings as a result of meeting environmental objectives and legal requirements more effectively. New concepts, methods and instruments are needed to achieve this.

Examples: A promising concept which can help management to implement a sustainability strategy of this kind is "eco-efficiency." This involves expressing environmental performance in various units of input, output or pollution, energy etc (e.g. energy use per unit of product or service, effluent discharges per unit of product). It is an instrument for setting new objectives within the framework of local (e.g. watershed) state and national sustainability goals and objectives. As companies think more in terms of product chains, environmental performance will increasingly become a factor in the relations between companies. In this context, use can also be made of new eco-efficiency indicators and related methodologies such as The Natural Step, Life Cycle Analysis etc..

Illustration: A number of leading Oregon companies are already developing strategic environmental policies and management systems including Wacker Siltronics, Hewlett Packard, Intel, Neil Kelly Co., Collins Pine, Norm Thompson and others. Many others are involved with some type of environmental management. However, (except for those involved with international trade) many Oregon firms see little connection to environmental or financial policy at present, so progress is slow.

Potential Actions

- The governors office could ask that OEDD and other economic development agencies work closely with DEQ and other environmental agencies to develop the concept of strategic environmental policy (or sustainable business practice) using the tools of eco-efficiency including ISO 14000, The Natural Step and other tools. Currently, DEQ is the only agency involved with this through their Green Permit program. This will have limited success if it remains 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).

5. Environmental Benchmarking

For sustainable development to be achieved in Oregon, the economic sectors and communities that are major contributors to environmental problems must assume increasing responsibility for implementing steps to reduce their impacts. Environmental benchmarking is a means to assist this process. Oregon could focus its first environmental benchmarking programs on water effluent reductions and 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 permitting 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 such that if they demonstrate that that are implementing actions to attain and maintain the top slot nationally, government would not to impose any further state or national water efficiency, effluent reduction or energy conservation regulations. 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. aluminum, pulp and paper). The mean energy efficiency of a group of companies would be compared with a group of similar size in another state. A feature of the this agreement would be that poor performers in the group would commit to making additional improvements.

6. Improved Product Development

Achieving sustainable development in Oregon will require ongoing product improvement so that the environmental impact of products are reduced and where possible prevented. 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 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). 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, LCA, 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 which 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, Sustainable Forestry);
- The state could (OEDD, DEQ, others), draw up environmental profiles for the main product groups and help them develop complete value-chain programs to improve products .

7. 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.

8. Developing Zero Waste Programs and Policies

Achieving sustainable development in Oregon will require the generation of less waste. Zero 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 generating income and jobs through waste-based economic development. These steps will be good for the economy and environment.

Achieving Zero 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 which have a major environmental impact as waste.

Oregon could establish an explicit state goal to be in the national forefront of meeting Zero Waste goals and establishing closed-loop material cycles within companies and between companies along product chains. 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 anothers food). High-grade 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 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, 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 comingled 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 three-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; and 3) foster and support 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, NGOs and others about developing Product Take-back Policies (Extended Producer Responsibility) for all major products currently ending up in landfills or incinerators.
- A consortium composed of industry and academia, NGOs 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.
- The state (DEQ) could work local counties and municipalities to significantly improve reuse and recycling programs, techniques and especially the waste management infrastructure to establish better Waste Exchanges, Reuse and Recycling Estates and other.
- The state (OEDD) 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.

9. Assisting Small And Mid-Sized Firms To Improve Environmental Management

Many small and medium-sized enterprises (SMEs) have little interest or time to focus on environmental issues. They are therefore not fully aware of profitable opportunities for environmental management. Efforts must be made to change the thinking in SMEs so that they understand that the environment can represent a business opportunity to improve 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. It has some economic focus. However, it is a very small program with a minimum reach. The Hood River Green Smart Program, operated by the Hood River Chamber of Commerce, is an other excellent example - this one in a small rural community.

Barriers And Changes Required: There are a number of programs which 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-ordinated 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 sound environmental management 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 better environment management targeted to SMEs. This could allow SMEs to identify and respond to opportunities in the field of the environment and energy.

10. Sustainable Construction

The construction sector is a key to achieving sustainable development in Oregon. 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.

Providing they are properly developed, sustainable construction can reduce building and demolition waste, optimize the use of materials and energy and extend the life of the structure as a whole (it can be modified rather than demolished) and sections of it (recycling), maximize natural light, energy, heat and coolness, minimize raw material use and maximize the use of naturally occurring, non-toxic materials. Since these concepts are innovative and involve high labor productivity (high-grade labor), they could increase the competitiveness and export potential of the Oregon construction industry.

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), flexible, automated production methods, naturally occurring 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 sustainable construction.

- The state 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, 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 sustainable 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 sustainable 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.

11. Stimulating The Construction Of Sustainable Industrial Estates

An innovative initiative unfolding in globally is the establishment of sustainable industrial estates. These are locations where companies cooperate on a voluntary basis to create sustainable products and processes a the lowest possible costs. They share facilities and seek to close material cycles by reusing or recycling residues or by-products to each other. 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 industrial estates are being revitalized, 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 activities. Examples are companies which 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

- The states 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;

12. Developing 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 Salmon-Safe label is a sign of sound agricultural environmental standards regarding water quality, and makes it clear that environmental measures have been taken along the entire production chain (grower to supermarket). "Organic" certification provides the same.

Potential Actions

- The state could work with key sectors to analyze obstacles to the adoption of a product chain approach to the environment, 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 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.

13. Development Of Bioproducts (a "Carbohydrate-based Economy")

The use of naturally occurring materials (rather than toxic synthetic derivatives), will be a key element of a sustainable economy. One option to achieve this is to use agricultural products 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 (reintroduction of flax is now being considered in the Willamette Valley, and Detroit auto makers are now considering its use in auto interiors due to European Product Take-Back policies for autos);
- 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. the 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 Washington*, PSU Center for Watershed and Community Health and the Institute for Local Self-Reliance, January 1998).

14. 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.

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 no till practices;
- the combination of agriculture with functions such as recreation and conservation;
- the sale of local products for niche markets;
- 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 petro-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.

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 created 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 (SB 1010 has stalled for lack of an effective governance system and incentives).

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:
- 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 SB 1010 water quality plans. This could include an agreement to certify farms which have environmentally sound plans and to provide regulatory incentives.
- The state could institute a marketing program to promote Oregon farm products that have been certified under SB 1010 or other programs as environmentally sound and seek to establish or expand the market share of the products locally, nationally and even globally.

15. 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

- Improved regional planning: environmental considerations - including local carrying capacity are rarely explicitly integrated into regional strategic plans.
- 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.
- The state could promote research by the agricultural, forestry and economic development departments into a methodology for introducing new businesses and farm and agricultural business activities into rural areas that do not sacrifice environmental quality.
- The state could develop a framework for the development of sustainable technologies that provide multifunctional activities.

16. Combining Agriculture And Conservation

In keeping with the areas discussed above, for Oregon to achieve sustainable development the state must find a way to optimize sites where agricultural operations and conservation can occur simultaneously. This could improve economic well-being, enhance the fabric of rural communities and creates a more attractive environment for living, working and recreation. It could also maintain and restore biodiversity and ecosystem functions.

The allocation, use, development and management of multifunctional areas must be attuned as closely as possible to the natural characteristics of the land and aquatic systems. For example, the lands natural cleansing capacity, capacity to replenish groundwater and to conserve water would all be important. Efficient and effective management should reap economic benefits. The types of multi-faceted functions will be determined by the characteristics and constraints of a particular area.

There are a number of conservation activities which can provide an economic return on agricultural lands while providing conservation benefits. Examples include nature conservation, some forms of nature-based recreation, organic or other farming which provide value-added through their environmentally friendly methods of production. Even affordable housing, provided it is adapted to rural areas, can be combined with conservation of sensitive sites (as is achieved by the State of Vermont Housing and Conservation Program). Combining functions allows the land to be used more effectively, broadens the support for the management of the area and generates additional income.

Changes Required

- In order to facilitate the combination of functions and the development of area-specific programs, the state may need to develop policies and programs to address:
- co-ordination between area specific and state (and federal) policy;
- flexibility and the tailoring of policy to specific situations, and the consequent role of local government and industry;
- the role of the state in coordinating the various parties in the areas;
- improving the planning instruments for land-use, water use and the environment;
- co-ordination in the oversight of functions between different government agencies.

NOTE: The items discussed above are examples of the types of activities a state framework on sustainable development could lead to. This is not an inclusive list. For example, Transportation, Land Use, Urban Planning And Development, Mining And Mineral Development, Sustainable Forestry, Sustainable Fishing, Energy, and many other issues should be included in any comprehensive sustainable development initiative.

The Center for Watershed and Community Health
Hatfield School of Government
P.O. Box 756
Portland State University
Portland, Oregon 97207
(503) 725-8101 or (541) 744-7072
www.upa.pdx.edu/CWCH/