

POLICY PLAYBOOK

INITIATIVE AND CLUSTER GUIDE



KEEPING FOCUS IN TOUGH TIMES



7TH ANNUAL LEADERSHIP SUMMIT
DECEMBER 11, 2008

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PART I: INITIATIVE GUIDE

INTRODUCTION: COPING WITH THE DOWNTURN, KEEPING OUR STRATEGIC FOCUS

As the Oregon Business Plan holds its seventh Leadership Summit we face the two-part challenge of dealing with a deepening recession while staying focused on our strategy to build cutting-edge, globally competitive industry clusters for long-term prosperity.

Amid this challenge, there is also great opportunity. The incoming Obama administration is already crafting a massive stimulus package to enact early in the coming year and it is expected to favor both infrastructure and green technology and energy initiatives. Oregon's priorities and the Oregon Business Plan's commitment to infrastructure renewal and global leadership in sustainability are well matched to the anticipated federal action. We support a state-level stimulus package that complements the federal approach and positions Oregon well when the recovery begins.

The Oregon Business Plan proposes that Oregon act early in 2009 to implement a "Jumpstart Oregon" stimulus agenda that blunts the impact of the recession while it connects with our long-term goals of making Oregon a leader in clean-technology, sustainable transportation, and education. This same package should also fit our ongoing work on policy and industry initiatives that improve the business climate and strengthen our key traded-sector firms for the long-term.

Since the last recession, which gave rise to the Oregon Business Plan process, there is evidence that we've been on the right path. Our economy has been strong over the past several years. We have doubled our exports, taken a national leadership role in green buildings and renewable energy, and gained in business startups, patent creation, and attraction of talent. Our public services have improved and our public finances are in much better shape than they were seven years ago. These are all signs of long-term strength, and they validate the strategy we have been pursuing.

And yet all this momentum cannot overcome the global business cycle. We must prepare for tough times in the period immediately ahead.

This Year's Policy Playbook

This year we've split the Policy Playbook into two parts, Part I the Initiative Guide, and Part II, the Cluster Guide. Following this introduction, Part I immediately summarizes a stimulus agenda to jumpstart Oregon's flagging economy. Putting this item first underscores the seriousness of the downturn. This is followed by an assessment of the economy, what we are up against in this recession, and how well we are prepared for it compared to the last recession. The book next turns to the ongoing Oregon Business Plan Framework that has evolved over the past six years and a summary of this year's core policy initiatives, which are explored in more detail in papers provided with this Playbook. This includes a background explanation of the Business Plan's focus on sustainability as an overriding theme. Part I then

***The policies that we propose here
address the current downturn, support
Oregon's long-term strategy of building
globally competitive industry clusters,
and position us well as a state to
consolidate our policy and business lead
in sustainability.***

presents current key indicators in Oregon Benchmarks, which are now approaching 20 years in tracking Oregon's economic, social, and environmental progress. The Playbook concludes with the Part II Cluster Guide, which reports progress by various traded sector clusters, including cluster-specific policy recommendations.

The Playbook is intended as a working tool for the Summit. We bring these recommendations as proposals for review, expecting that participants will help us improve them and then help in their implementation. We will collect comments and ideas and provide an enhanced version of the plan early in the coming year as the Legislature convenes to take up many of the issues discussed here.

Now more than ever we need to join together to act in the common interest of Oregonians. The Oregon Business Plan Steering Committee greatly appreciates the willingness of our elected and community leaders to join this process. The business community is committed to being a good partner as Oregon struggles with what will surely be some very tough times.

JUMPSTART OREGON STIMULUS PROPOSAL

The Jumpstart Oregon agenda summarized in the table below proposes actions that can boost Oregon’s economy immediately *and* make it more productive, innovative, and resilient for the long-term. Through close collaboration among federal, state, and local governments, and the private sector, Oregon should be able to move quickly in each of these areas. It is clear that the Obama Administration will act on a stimulus package right away. Already the President-elect has warned states that if they aren’t ready, funds will not flow to them. Oregon must be poised to move at once.

Beyond the specific recommendations below, we will be inviting additional suggestions to jumpstart the economy.

Given the potential scale of the downturn, the federal government has a critical role to play in stimulating economic demand and creating jobs. State and local governments can’t do that because they must balance their budgets. In fact, balanced-budget requirements often force state and local governments, as tax revenues drop, to cut public services and lay off public employees, which has the perverse effect of cutting local purchasing power and making the recession worse. Temporary federal support to states could help stabilize the economy and provide for those most vulnerable. An extension of unemployment insurance benefits and support for health and social services programs could make an important difference to the economy overall.

Tax policy also can also be employed to fight the recession. Selected tax cuts to increase spending and to spur investment may be warranted. However, any increase in taxes must be done with great care or risk exacerbating what already appears to be a dire economic outlook.

Judicious use of reserves provides one important tool for stimulating the economy. As explained in the Public Finance White Paper available in the Leadership Summit packet, Oregon has built up reserves. We will almost certainly need to apply them in the course of this recession.

Jumpstart Oregon: Actions to Support Immediate Job Creation and Long-Term Prosperity

Education			
Education is at the heart of Oregon’s strategy for economic prosperity. Roller coaster funding undermines progress towards higher standards and toward expanded access to higher education. Funding cuts disrupt and demoralize schools, displace staff, and add to unemployment. In sharp contrast to the last recession, through disciplined withdrawals from the reserve funds, we may be able to hold school funding roughly at current levels through the recession. By diverting future kickers, we help ensure long-term stability.			
Action	State Role	Federal Role	Benefits
Provide funding to ensure full school year at current program level and access to all who wish to attend higher education.	Establish a disciplined policy to tap the Education Stability Fund. Modify kicker policy to direct portions of future kickers (personal and corporate) to help refill Education Stability Funds.	Provide one-time general revenue sharing to states as part of federal stimulus package to offset some of the steep state and local revenue losses created by the financial crisis.	Assures employers that critical education services will be maintained. Enables continued work on meeting specific needs for high-demand, high-skill opportunities and raising standards across the system.

Keeping Focus in Tough Times

			Establishes Oregon's as a place committed to expanding high quality education
Increase maintenance and new construction on schools and other public facilities to make them safer, more durable, and more energy efficient.	Prepare project list for maintenance and new construction of schools and other public facilities Issue bonds to help pay for improvements.	Provide resources for school buildings as part of stimulus package, either for direct support or low interest bonds, or both.	Immediate job creation. Critical upgrades and replacement of aging buildings reduce operating costs, cut emissions, improve learning and enhance safety.

Transportation

Oregon's roads and highways are in disrepair. The Governor has proposed additional revenues and Congress appears poised to stimulate the economy through road and transit projects. Congress has the opportunity to provide additional support. Job creation, especially on maintenance projects, can begin as soon as dollars are available. Every \$10 million translates into 140 jobs.

Action	State Role	Federal Role	Benefits
Expand road maintenance and launch shovel ready, high priority road and transit projects.	Identify and expedite projects that can be done quickly. Issue bonds for constructions as part of transportation package.	Increase transportation outlays immediately as part of stimulus package	Immediate job creation. Increase long-term productivity of economy.

Forest Health

Oregon remains the leading location on the planet for forest products industries. Over 50 percent of Oregon's forests are federally owned, and good stewardship of federal forest is critical for communities throughout the state. Currently nearly 13 million acres of federal forests face the threat of catastrophic fire unless they are thinned. An aggressive forest health program would bring enormous benefits to many rural communities.

Action	State Role	Federal Role	Benefits
Accelerate thinning on national forests, providing resources for mills and energy production	Coordinate state agencies to ensure quality plans are ready for federal forest management. Support regulatory policy to encourage development of biomass energy.	BLM and forest service rapidly complete plans for thinning. Federal funding to facilitate large scale forest thinning	Jobs in the woods and in mills; 2,500 jobs in rural communities for every 250,000 acres treated. Wood products supply and biomass electric energy Reduced catastrophic fire risk, improved ecological health. Savings in millions of dollars in fire emergency costs.

Energy

Oregon is well positioned in renewable energy (especially wind and solar), green buildings, energy efficiency materials (e.g. doors and windows) and energy efficiency services. The state has already taken supportive steps to encourage energy efficiency within Oregon. Oregon's opportunity here is two-fold: 1) to attract federal dollars to step up retrofits in Oregon (creating jobs in the home and commercial improvement sector); and 2) to attract and grow our burgeoning clusters by taking a growing share of the *national* and *international* market for energy efficient buildings and renewable energy as the federal government encourages capacity building in these sectors.

Action	State Role	Federal Role	Benefits
Step up efforts to upgrade building codes and retrofit homes and buildings to increase energy efficiency.	Review current processes to accelerate retrofits. Mobilize utilities, energy services contractors, the Energy Trust, and others to develop concerted plan for local retrofits.	Provide targeted funding and tax credits to encourage accelerated home and commercial energy efficiency nationwide.	Immediate job creation Long-term savings in energy Reduced carbon emissions A stronger Oregon energy efficiency cluster, including building products suppliers
Launch national campaign to promote green building practices for all new buildings.	Mobilize local companies with green building and energy efficiency expertise to market green-building practices and services outside of Oregon.	Provide tax incentives for energy efficient buildings. Require new federal buildings to meet green standards.	Creation of immediate opportunities for Oregon's green building cluster.
Upgrade electricity and natural gas transmission systems, including LNG.	Create incentives for utility and other private investment	BPA partners with electric utilities to provide infrastructure. Expedite siting of LNG terminal	Immediate job creation Infrastructure critical for implementing renewable energy path and providing affordable natural gas
Expand Oregon's employment in renewable energy and clean technology	Continue Business Energy Tax Credits. Fund aggressive recruiting of companies here. Fund Oregon Inc. Globally market Oregon through public-private partnerships.	Extend tax credits for renewable energy sources. Include clean-technology as part of stimulus package.	Immediate job creation as Oregon takes position as a leader in design and manufacturing renewable energy Creation of new cluster, adding diversity to economy long-term

TAKING STOCK OF WHAT WE FACE

As we gather for the seventh annual Leadership Summit, the U.S. economy is in a recession – and Oregon with it. Unemployment is up, public revenues are down, and uncertainty reigns as we face the worst upheaval on both Wall Street and Main Street since the Great Depression.

What do we face in Oregon, and how well are we prepared to face it?

The Immediate Challenge

The challenge at hand is bigger, more complex, and more deeply rooted than any faced by this generation of business and public leaders. The housing bubble has collapsed, creating a crisis in toxic mortgage-backed paper, frozen credit markets, a precipitous drop in housing values and prices, delinquencies and foreclosures in the millions, severe erosion of stock portfolios and retirement accounts, and badly shaken consumer confidence and purchasing. Unemployment is soaring, underscored by half a million new job losses in November alone. The usual economic models are of little use in forecasting the path the national economy is likely to take. We must assume that we face the toughest of times

The forecast by the Oregon Office of Economic Analysis (OEA) is sobering. Employment in Oregon is anticipated to drop an additional 3.2 percent in the final quarter of 2008, with further drops anticipated in 2009. OEA does not anticipate recovery until the middle of 2010. State revenue is forecasted to grow 6.8 percent for the 2009-11 biennium, well below the level necessary to provide current services, given anticipated increases in population and inflation. The OEA stresses that its forecast is its most likely scenario in a very uncertain climate.

Still, Some Good News

Although this national recession appears to be much worse than the last one, Oregon is better prepared to weather it and to take advantage of the recovery, due in part to policies advanced by business and elected leaders through the Oregon Business Plan.

In the last recession, the state lost about 65,000 jobs over 30 painful months. Fortunately, since the bottom of that recession in 2003, Oregon has gained 175,000 jobs, more than making up those lost and reaching a new peak level of employment of 1,745,000 wage and salary workers.

The economy that emerged over the past five years is not simply a larger version of the economy we had in 2000. It evolved in much the way we imagined it would when the Oregon Business plan was introduced.

The Business Plan envisioned that Oregon would grow with traded-sector companies producing high value goods. Oregon now exports nearly \$20 billion worth of products annually, up from just \$10 billion a decade ago. The state ranks in the top ten in exports per capita. And perhaps more importantly the composition of Oregon exports has changed dramatically. Whereas the state has historically exported mostly lightly processed raw materials such as logs, lumber and wheat, today the overwhelming majority of our exports are “value added” products such as electronics, machinery, and transportation equipment.

We envisioned that this growth would come through the creation of new ideas. Oregon has nearly doubled its share of the national output of patents in the past decade, and has risen

from 24th to 8th place nationally in patents per capita, having recorded the fastest growth in this measure of any state since 1998.

We understood that entrepreneurship and innovation are essential to growth. In the past six years, Oregon's economy has added 19,000 new businesses with a payroll, a rate of increase about 40 percent faster than in the nation as a whole.

The Business Plan understood the importance of focusing on traded sector clusters, groups of firms that draw on a common talent, cultures and ideas to gain competitive advantage. In nearly all of Oregon's principal traded industry clusters – such as high technology, metals, machinery, and transportation equipment – employment growth over the past four years has been stronger in Oregon than in the same industry nationally.

In recent years, the Business Plan conceived that our reputation for sustainable development would give us an advantage in a whole new set of clusters that have become known as clean-technology. We are seeing great success in emerging clusters such as solar, wind, green-building and green-professional services

We entered the last recession earlier than the rest of the nation. This time, we are riding the same downdraft as the rest of the country. For each of the last four years, Oregon has actually outperformed the national economy in job growth, a kind of momentum we didn't have in 2001.

Our public finances are in better shape, as well. And unlike seven years ago, Oregon has set aside budget reserves, in the form of more than \$600 million in the Education Stabilization Fund and Rainy Day Fund, that can be used to buffer us from extreme revenue shortfalls. Strengthening the reserve fund has been a key public finance priority for the Oregon Business Plan from the beginning. Agreement by business groups in 2007 to forgo the corporate kicker represented a big commitment to the goal.

In addition, our public retirement system is in much better shape than it would have been had the state not adopted major reforms in 2003. While the current stock market downturn undoubtedly stresses the system, it is almost unimaginable what the condition of state finance would be at this moment had we not adopted the reforms.

As we come together for the seventh annual Leadership Summit, we have significant strengths to build upon.

Moving Forward

Fortunately federal and state policy makers are focused on the seriousness of this challenge and appear ready to take steps to avert or mitigate a severe recession. If Oregon can coordinate its response with the anticipated federal stimulus, we may be able to create significant numbers of jobs in the short and long run.

This is an opportune time to advance our sustainability strategy. Oregon has more companies involved in renewable energy production, energy efficiency services, and green building and design than almost any other state. If Oregon business and elected leaders can help shape federal and state stimulus packages as green initiatives, the opportunities for Oregon companies could be enormous and enduring. A green infrastructure stimulus package could create jobs and revenue in the short term while expanding the market reach of our products and services for the long term.

OREGON BUSINESS PLAN FRAMEWORK

The Oregon Business Plan strives to achieve quality jobs and a livable Oregon by nurturing leading-edge traded sector industry clusters globally recognized for sustainable practices. Nurturing cluster success requires a business environment enhanced by what we call Four Ps for Prosperity.

- **Pioneering Innovation** – a culture of research, innovation, entrepreneurship
- **People** – well-educated, capable people and education systems to sustain their skills
- **Place** – quality of life, good public services, attractive communities and environment to retain and attract talented people
- **Productivity** – good physical infrastructure and resources, reasonable business costs.

To achieve the Four Ps, the Business Plan promotes a range of policy initiatives designed to mitigate weaknesses or improve our advantages in innovation, human talent, quality of place, and in public infrastructure and business costs that impact productivity. The framework's focus on sustainable practices as a competitive advantage was added in 2007.

The Oregon Business Plan Framework

Goal: Quality Jobs +		
<ul style="list-style-type: none"> • Healthy Environment • Safe, Caring Communities 		
Vision for the Economy: Leading-Edge, Globally Competitive Traded Sector Clusters		
<ul style="list-style-type: none"> • Forestry, agriculture and other resource clusters globally recognized for environmentally sustainable practices • High technology, sports apparel, transportation equipment, manufacturing and other clusters global leaders and known for sustainable products, practices, or both to improve bottom line while enhancing environment and community • New “clean-technology” clusters in renewable energy, conservation services, and green design are at the forefront of solving our planet’s environmental challenges. 		
Strategy – Four Ps for Prosperity		
<ul style="list-style-type: none"> • <i>Pioneering Innovation.</i> Strong connections among universities, venture capital and existing and emerging industry clusters to support product and process innovation, with special emphasis on sustainable products and practices. • <i>People</i> First rate education provides talent to support innovation-fueled economy. Workforce tied to key occupations and industry clusters. • <i>Place.</i> Quality of life attracts and retains talented people. Smart community design, innovative environmental protection strategies enhance reputation and quality. • <i>Productivity.</i> Infrastructure and regulatory systems efficiently support business while protecting the environment and livability. 		
Initiatives – Specific Actions to Support Vision and Strategy		
<ul style="list-style-type: none"> • Public Finance • Education and Workforce • Transportation 	<p style="text-align: center;">Public Policy Initiatives</p> <ul style="list-style-type: none"> • Health Care • Economic Innovation • Land-Use 	<ul style="list-style-type: none"> • Energy • Water
<p><i>Natural Resources</i></p> <ul style="list-style-type: none"> • Forestry • Food Processing • Agricultural Products • Seafood • Tourism <p><i>Metals and Transportation Equipment</i></p> <ul style="list-style-type: none"> • Metals – primary and fabricated • Machinery • Transportation Equipment 	<p style="text-align: center;">Cluster Initiatives</p> <p><i>High Technology</i></p> <ul style="list-style-type: none"> • Semiconductor • Printers • Display • Software • Biotechnology <p><i>Creative</i></p> <ul style="list-style-type: none"> • Sports Apparel and equipment design 	<p><i>Clean-Technology</i></p> <ul style="list-style-type: none"> • Green Development • Energy Efficiency Services • Wind, Solar, Wave and Geothermal Energy Production

This framework, now modified for competitive sustainability, has proved to be durable and reliable. It has helped Oregon to focus economic development policy on support for industry clusters, and to emerge as a national leader in renewable energy and clean technology business growth. And it has also enabled Oregon business and public officials to work together more readily on a broad array of policy initiatives to strengthen the Four Ps.

Building a Sustainable Advantage

The Oregon Business Plan supports three major goals articulated in *Oregon Shines*, the state's strategic plan: quality jobs, healthy natural surroundings, and safe, caring communities. Originally, the Business Plan focused on the jobs goal, while acknowledging the importance of the other two. Three years ago, we recognized that Oregon's lead in sustainable economic development could become a major competitive advantage. By focusing on all three elements of sustainability, we realized we could *accelerate* our progress in creating quality jobs.

There are five reasons for this.

Sustainability gives rise to new products and services. Oregon is taking leadership in many areas associated with sustainable development, including solar, wind and wave energy, green building and development, green professional services, smart-grid technologies, bicycles, and electric cars. A recent report published by Clean Edge and Climate Solutions points to tens of thousands of jobs over the next two decades if Oregon aggressively pursues clean technology business development.



Individual firms and industries with passion for sustainable practices gain market reputation and customer loyalty. Firms like Nike, Intel, Oregon Country Beef, Harry and David, Sokel-Blosser Winery, and many others have made significant commitments to sustainable practices and find it pays off in product differentiation and market appeal.

Sustainable practices often save business cost by reducing waste. Sustainability spurs a rethinking of processes, often to the benefit of the bottom-line. One good example of this is the emergence of lean, green manufacturing processes in Oregon. Rejuvenation Hardware, for example, recognized an opportunity to confine antiquing wastewater, a hazardous material, by changing the antiquing process. Confining that waste stream reduced the overall discharge, which allowed the creation of a closed-loop zero waste system that reduced water use and sewage charges.

Sustainability attracts talent. A growing number of knowledge workers have a strong sense of environmental and social responsibility. Businesses and communities with a pronounced environmental and social ethic have an advantage in recruiting such talent.

Business commitment to sustainability builds trust with the larger community, making it possible to develop policies that accelerate business, environmental and social improvement. For example, a proposal to create systems to trade ecological services, introduced at last year's Summit, creates the opportunity for businesses to forgo costly water treatment investments in favor of more valuable riparian restoration projects, thus

lowering costs and improving environmental outcomes. In cooperation with environmental groups and regulators, this plan is moving forward.

Sustainability can work as a strategy for an individual company. It becomes even more powerful when adopted by an entire community. The benefits of brand recognition, cost savings, and talent recruitment strengthen when we build a collective reputation. Oregon Innovation Council Chair Dave Chen has illustrated (right) how linking separate elements of sustainability mutually reinforces each of them to the benefit of the entire community.

By many metrics, Oregon is a leader in sustainability. No other state has as long and as deep a commitment as our state. And yet, many states have begun to tout sustainability as a competitive strategy and are moving ahead aggressively. With the Obama Administration expected to focus on renewable energy, green-buildings and energy efficiency as central to job creation, CO2 reduction, and energy independence, Oregon could easily be left behind by larger states such as Washington and California, which are ready to step up to the opportunity. As much as possible, we have tried to align our policy recommendations and cluster work around this strategic imperative. For example, just to cite a few opportunities:



- **Green buildings and energy efficiency.** Oregon should launch immediately a major initiative to retrofit homes and buildings to improve energy efficiency with an aim to export our expertise and products nationally as a national program emerges.
- **Expansion of Oregon’s employment in renewable energy and clean technology.** Oregon has become a national center in wind and solar over the past five years. We should maintain this momentum through aggressive business recruitment and ensure that we are maintaining a competitive environment for these companies, including investments in workforce and research programs and tax policy.
- **Alternative Fuel Vehicles.** Oregon is well on its way to becoming the US center for testing electric vehicles. Toyota has highlighted Portland as a model for future of transportation, and Nissan has selected Portland as its launch site for its electric vehicle. As part of our larger effort to transform our transportation system to meet the opportunities of the 21st century, we should lead here aggressively.
- **Forest Health and Woody Biomass.** Oregon’s forests badly need thinning to avoid catastrophic fires and ecological disaster. The wood can be used for wood products and produce energy through cogeneration, revitalizing many parts rural Oregon. We need to act on the opportunity quickly.

- ***Accelerating Sustainable Practices.*** Through organizations such as the Natural Step, the Northwest Energy Efficiency Alliance, and regional High Performance Enterprise Consortia, companies outside of the “clean tech” space can gain advantage by adopting strategies to reduce their environmental footprint and incorporating this commitment in their branding and marketing efforts.

We must also work to maintain leadership and take the next steps in policy areas where we have long held an advantage. Land use planning, innovative transportation policies, and recycling are a few examples.

As we do this work, it will be important for Oregon to brand itself aggressively. Brand Oregon and OECD will need resources for this work. Public/Private partnerships will be critical as well. Last year, we discussed an initiative to attract professionals and top graduate students from around the world to Oregon in order to learn about sustainable development. This effort, sponsored by the Oregon Business Council and the Oregon University System, with help from Gerding/Edlen Development, launched last summer when 30 participants from around the globe spent five days learning about and experiencing sustainability in the urban built environment. The program will reconvene this summer with an additional track in sustainable agriculture and food systems. The recently established Portland + Oregon Sustainability Institute could provide a central place for many of these public-private efforts to brand and market Oregon as an international leader.

SUMMARY OF INITIATIVE RECOMMENDATIONS

The summary recommendations below are drawn from public policy initiatives developed by business and public leaders to address critical needs identified by the business community in interviews and focus groups. Like the detailed initiative papers themselves, these recommendations are subject to further discussion. The full policy initiatives and the summary recommendations presented here address some of the most difficult, protracted challenges facing our community. Initiative committees work at them continuously, update progress each year, and identify the work ahead. The Oregon Business Plan recognizes that many of the recommendations here calling for public investment may be tempered by current economic and budget realities.

Public Finance Recommendations

While economic times are hard, Oregon is much better positioned to weather this downturn than most other states. The Governor and Legislature should leverage this advantage to put the state in the strongest competitive position possible when national economic growth returns. With that goal in mind, the Oregon Business Plan calls on the Governor and Legislature to:

1. Overhaul the counterproductive personal and corporate kickers. Enact long-term budgeting and the other recommendations of the Revenue Restructuring Taskforce.
2. Maintain stability of PreK-20 education services by establishing policy for disciplined withdrawals from an expanded Education Stability Fund.
3. Leverage federal revenue to support critical social services in times of growing need.
4. Develop a complete and transparent account of the impact of market declines on the state's pension system.
5. Launch the debate on the replacement of federal timber payments.

— Public Finance Initiative Leader: Malia Wasson, US Bank - Oregon

Transportation Recommendations

1. Increase gasoline taxes and vehicle registration fees. Target the additional funding for maintenance and support of critical road improvements that will reduce congestion and improve freight movement.
2. Accelerate the transition to a transportation system that 1) relies far-less on gasoline and hydrocarbon powered vehicles, 2) uses pricing and sophisticated navigation systems to improve utilization of road capacity, and 3) affords a much wider set of choices for individual travelers.
 - Sunset the gasoline tax in 2019, and give drivers the option of using mileage fees or congestion fees as a transition tool.
 - Improve the utilization of the current road system by promoting ride-sharing, expanding public transit, improving emergency response services, and coordinating traffic signals across jurisdictions.
 - Rethink urban land-use to provide greater individual choices among transportation options and to facilitate rapid freight delivery within and between regions.
 - Become an international leader in the development of electric vehicles by creating an electric infrastructure of plug-in facilities to recharge vehicles and by offering tax credits for electric vehicle purchases.
3. Create a Transportation Utility Commission to determine the revenue needs of road authorities and to design new pricing models to pay for state and local transportation services.
4. Reach a timely decision on the design of the Columbia River Crossing and secure funding to move forward on the project.

— Transportation Initiative Leaders: Steven Clark, Community Newspapers; Patrick Reiten, Pacific Power

Education and Workforce Recommendations

For Oregon to succeed in the 21st century, all Oregonians in all their diversity must be educated at higher levels than ever before. Oregon should embrace the ambitious education benchmarks proposed by the Governor and adopted by the Legislature:

40 percent of Oregon adults should have a bachelor's degree or higher (compared with 28 percent now), another 40 percent should have at least an associate's degree or other technical credential, and the remaining 20 percent should have a high school diploma that represents a high level of academic and work readiness skills.

To meet these appropriately aggressive goals, business leaders call for both broad *systemic changes* to the PreK-20 education system, as well as a number of *targeted interventions*.

Oregon has set ambitious goals for education attainment and workforce development. To support these goals, in 2009-11 Oregon should fund and implement these initiatives to the extent that current fiscal constraints allow:

1. **Early childhood.** For high return on investment, expand Head Start for at-risk children and support student mentoring.
2. **The new high school diploma.** To earn a diploma, students entering high school in fall 2008 must earn credits in at least three math and three science classes and demonstrate proficiency in reading, writing, mathematics and speaking. To assist in implementation and to provide all students the opportunity to receive additional help to meet these standards, the Legislature should appropriate target dollars for this purpose in the state school fund and the state Department of Education budget.
3. **Post-secondary education for all.** Over the past two legislative sessions, funding has been increased for the Oregon Opportunity Grant to provide scholarships to enable Oregonians to pay for college. The legislature should expand the Opportunity Grant as much as possible and provide additional dollars to the community college and university system to meet increasing access goals.
4. **Four targeted initiatives** to support industry and job creation, including a strong focus on professional-technical education and training opportunities:
 - Manufacturing • Engineering • Clean Technology • Health Care
5. **The Career Readiness Certificate.** Support widespread adoptions of this value-added credential to aid employers, employees, and potential employees.

Along with those specific initiatives, Oregon should continue the systemic changes currently in progress that support and accelerate student learning, including:

1. **Curriculum alignment** across K-12, community college and higher education
2. **A new data system** that measures system performance
3. **An integrated state budget system** that ties funding to student learning outcomes
4. **A fresh look at service delivery and governance** across the education continuum
5. **Strengthen and focus professional development programs** that support teachers.

— Education Initiative Leaders: Sam Brooks, S. Brooks & Associates, Inc.; Eileen Drake, PCC Structurals, Inc.; Kirby Dyess, Austin Capital Management LLC

Health Care Recommendations

In order to lower health care costs, improve quality, and expand access to care, the Oregon Business Plan recommends that business take a leadership role in the following:

1. Use value-based purchasing strategies by employers and public sector purchasers to improve quality and lower costs.
2. Support increased transparency of health information and investment in health information infrastructure .
3. Evaluate and support reform plans that address the high cost of health care, improve quality, and provide coverage for all Oregonians.

— Health Care Initiative Leaders: Peggy Fowler, Portland General Electric; Mark Ganz, The Regence Group

Economic Innovation Recommendations

In order to facilitate the commercialization of innovative research, create new businesses, help retain existing jobs, ensure opportunities for both rural and urban communities, and plant the seeds that grow into the next generation of family wage jobs for our state, Oregon should:

1. *Invest in established and emerging industries.*

- Further Oregon's national leadership in developing clean energy from ocean waves through the Oregon Wave Energy Trust
- Create millions in annual savings for food processors by streamlining production and reducing costs

2. *Invest in three Signature Research Centers that increase researchers' access to vital funding, help spin off new companies and build critical research infrastructure statewide.*

- ONAMI - expanding "green" nanoscience and renewable energy opportunities
- OTRADI - commercializing new methods to fight infectious diseases
- BEST - growing sustainable and bio-based businesses and recruiting clean tech firms to Oregon

3. *Enhance Oregon's ability to innovate.*

- Streamline statewide university-commercial tech transfer
- Leverage capital to increase business formation
- Support the University Venture Development Fund

— Economic Innovation Initiative Leader: David Chen, Equilibrium Capital Group LLC

Water Recommendations

1. *Endorse a long term vision of Oregon water viewed and managed as a valuable and critical asset by all Oregonians for all Oregonians, providing safe and sustainable water supplies and services for all beneficial uses.*

2. *Accelerate the transition to a water management system that supports this vision.*

- Water is managed as finite resource based on hydrologic reality,
- Water planning is integrated with energy, transportation, habitat and land use planning,
- Water management aims to achieve multiple benefits, and
- Water allocation occurs through an efficient market.

3. *Prepare for key decision points in 2014 critical to realizing this vision.*

- Increase public awareness and education around water, and assess water priorities and values.
- Establish systems for data collection that will support water management based on supply and demand realities, and inform integrated and adaptive management decisions.
- Encourage multiple benefit, multiple partner projects that exemplify integrated management solutions.
- Stimulate development of water technologies and best practices that enable Oregon's integrated water management, while advancing new technologies into the global marketplace.

— Water Initiative Leader: Michelle Girts, CH2M Hill

Energy Recommendations

To create and implement a comprehensive state energy policy, Oregon should:

1. Create the Oregon Energy Council, as suggested by the Governor, to make recommendations on energy policy for the state.
2. Accelerate energy efficiency initiatives for both commercial and residential retrofits, as well as identify opportunities to make energy generation, transmission, and delivery more efficient. This provides the lowest cost way to reduce greenhouse gas emissions.
3. Diversify Oregon's natural gas supply sources by encouraging access to additional supplies through the development of additional pipeline capacity and LNG importation facilities.
4. Expand the region's electric transmission system to integrate increasing amounts of wind power and other renewable energy (solar, geothermal and biomass) and maintain system reliability.
5. Maintain and enhance Oregon's existing hydropower resources so that they can be used to meet electric demand and assist with integrating intermittent wind resources into the power grid.
6. Accelerate adoption of electric cars and natural gas vehicles through demonstration projects and tax credits.
7. Craft state and federal carbon reduction policies to insure traded-sector industry health.

OUR PROGRESS ON OREGON BENCHMARKS

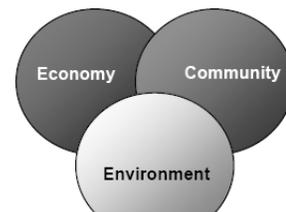
For nearly 20 years the Oregon Progress Board has tracked Oregon's progress on the three goals that represent a sustainable future – jobs and the economy, healthy natural surroundings, and safe caring communities. The vision, strategy and initiatives of the Oregon Business Plan are all guided by the Oregon Benchmarks. The Progress Board's biennial report will be available in early 2009. The tables below summarize key indicators for the economy, education, community social well being, and environmental quality.

Is Oregon making progress toward the Oregon Shines goals?

Selected Oregon Benchmarks

Benchmark # and Title	ECONOMY GOAL: Quality jobs for all Oregonians										ECONOMY BENCHMARKS			
	3 New Employers	4 Net Job Ggrowth Overall	4a Net Job Growth (Urban)	4b Net Job Growth (Rural)	11 Per Cap Income Overall	11a Per Cap Income Metro	11b Per Cap Income NonMetro	12 Pay per Worker Overall	12a Pay per Worker Urban	12b Pay per Worker Rural	13a Top 5 th Income to Bottom 5 th	13b Top 5 th Income to Bottom 5 th	15a Unemployment rate	15b Unemployment % of U.S.
Expression	nat. rank	1,000s	1,000s	1,000s	% of U.S.	% of U.S.	% of U.S.	2007 \$\$	2007 \$\$	2007 \$\$	ratio	rank	rate	% of U.S.
	↑ = best											1987-89: 13 th 1		
1996	7 th													
1997	7 th				96.6%	87.4%	102.4%							
1998	14 th	28.09	24.44	3.65	95.0%	95.8%	101.3%	\$36,200	\$37,650	\$28,370			5.7	127%
1999	11 th	27.52	22.53	4.99	94.8%	95.6%	101.2%	\$37,200	\$38,680	\$28,870			5.5	131%
2000	10 th	30.25	27.39	2.86	94.1%	95.1%	100.4%	\$38,490	\$40,220	\$28,980			5.1	130%
2001		-10.97	-6.65	-4.32	93.3%	94.0%	99.7%	\$38,240	\$39,810	\$29,230			6.4	136%
2002	11 th	-23.86	-22.7	-1.16	93.9%	94.2%	102.5%	\$38,250	\$39,760	\$29,880		2000-03: 24 th 1	7.6	131%
2003	10 th	-10.76	-11.67	0.91	93.8%	94.2%	101.8%	\$38,390	\$39,910	\$30,010			8.1	135%
2004	12 th	32.15	27.08	5.07	92.4%	92.9%	99.9%	\$38,700	\$40,250	\$30,190			7.3	133%
2005	10 th	57.76	49.19	8.57	90.9%	91.5%	98.0%	\$38,660	\$40,210	\$29,920			6.1	120%
2006		48.36	43.19	5.17	90.7%	91.1%	98.5%	\$39,040	\$40,550	\$30,050	12.7	20 th	5.4	117%
2007		27.43	25.93	1.5	90.1%			\$39,570	\$41,100	\$30,270	12.6	19 th	5.2	113%
2010 Target	5 th -10 th	23	18.86	4.14	100.0%	100.0%	105.0%	\$39,900	\$41,460	\$31,270	tbd	tbd	5.0	100%
Last updated	4/13/07	4/19/08	9/19/08	9/19/08	11/25/08	10/3/08	10/3/08	10/3/08	10/3/08	10/3/08	12/1/08	12/1/08	9/26/08	9/26/08

Benchmark # and Title	ECONOMY GOAL: Quality jobs for all Oregonians						EDUCATION BENCHMARKS				
	19a ² Fourth Grade Reading	19b ² Fourth Grade Math	20a ² Eighth Grade Reading	20b ² Eighth Grade Math	22 H.S. Dropout Rate	23 H.S. Completion	24 Some College Education	25 Post-secondary Cred.'s	26a College - Bachelor's Degree	26b College - Advanced Degree	
Expression	% basic	% basic	% basic	% basic	% of grades 9-12	% adults	% adults	% adults	% adults	% adults	
1996		65%		67%							
1997											
1998	58%		78%		6.9%			29.7%			
1999					6.6%						
2000		64%		71%	6.3%	85.1%	49.8%	24.4%	25.1%	8.7%	
2001					5.2%						
2002	65%		80%		4.9%	86.7%	50.1%	30.0%	25.9%	9.5%	
2003	67%	79%	74%	70%	4.4%	87.7%	52.0%		26.4%	9.2%	
2004					4.6%	87.2%	52.7%	32.4%	27.7%	10.0%	
2005	63%	80%	74%	72%	4.2%	87.5%	53.0%		27.7%	10.0%	
2006					4.1%	87.6%	52.7%	29.8%	27.5%	10.0%	
2007	62%	79%	77%	73%	4.2%	88.0%	53.1%		28.3%	10.3%	
2010 Target					4.0%	100% ³	tbd	40% ³	40% ³	tbd	
Last updated	11/21/08	11/21/08	11/21/08	11/21/08	9/26/08	11/25/08	11/25/08	4/13/07	11/25/08	11/25/08	



Look for the 2009 Benchmark Progress Report in January

¹ 13b: Three-year averages from "Pulling Apart - a State-by-State Analysis of Income Trends" (April 2008) provide historical context only and are not strictly comparable to 2006 and 2007 data points.

² 19 & 20: National Assessment of Educational Progress (NAEP) data replace Oregon Benchmarks 19 and 20 here due to a recent break in the benchmark data trend for third and eighth grade reading and math.

³ 23, 25 & 26: Joint Board of Education targets for 2025. The Progress Board is developing interim targets for 2010 and 2015.

Keeping Focus in Tough Times

Benchmark # and Title	COMMUNITY GOAL: Engaged, caring and safe communities							SOCIAL SUPPORT BENCHMARKS					
	47	48	54	54a	54b	54c	55	56	58a	58b	73	74a	74b
Expression	Affordable Child Care Lower Income Households	Available Child Care	Poverty Overall	Poverty Age 0-17	Poverty Age 18-64	Poverty Age 65+	Health Insurance	Homelessness	Food Insecure 3-yr avg.	Food Insecure + Hunger 3-yr avg.	Home Ownership	Affordable Housing Lower Income Renters	Affordable Housing Lower Income Owners
	% of	slots /100	%	%	%	%	% w/out	count	nat. rank	nat. rank	ratio	% spending >30% of	income on housing
1996		under 13					11.0%		1 st =best	1 st =best			
1997			12.8%						45 th				
1998			12.8%				11.0%						
1999			11.6%	14.0%	11.0%	7.6%							
2000	36.6%	18	11.6%	16.0%	10.5%	7.1%	12.0%				64.3%		
2001		18	10.8%	13.9%	10.6%	6.2%		7,199	44 th	49 th			
2002	35.2%	17	11.7%	16.3%	11.0%	6.4%	14.0%	5,942	41 st	43 rd	63.7%		
2003		17	11.7%	16.5%	11.1%	5.8%		6,293	32 nd	32 nd	63.2%		
2004	44.1%	17	12.1%	17.7%	11.3%	5.5%	17.0%	6,862	29 th	26 th	63.0%	67.9%	52.3%
2005		17	11.9%	16.7%	11.3%	5.8%		8,432	28 th	33 rd	63.8%	68.9%	53.9%
2006	49.2%	17	12.2%	16.5%	11.4%	8.3%	15.6%	9,692	36 th	48 th	64.8%	65.9%	53.8%
2007								11,292			64.6%	64.6%	55.2%
2010 Target	tbd	25	10.0%	no targ	no targ	no targ	8.0%	tbd	10 th	11 th	tbd	tbd	tbd
Last updated	4/13/07	8/30/07	9/26/08	9/26/08	9/26/08	9/26/08	4/13/07	12/1/08	12/1/08	12/1/08	12/1/08	12/1/08	12/1/08

Benchmark # and Title	ENVIRONMENT GOAL: Healthy, sustainable surroundings							ENVIRONMENT BENCHMARKS					
	68a	68b	71	77	78a	78b	79a	79b	79c	80a	80b	82	84
Expression	Traffic Congest'n Portland	Traffic Congest'n Other	Vehicle Miles Traveled	CO2 Emissions	Wetlands Fresh Water	Wetlands Estuarine	Stream Water Quality Increase	Stream Water Quality Decrease	Stream Water Quality Good-Exc	Stream Water Quality 9+ mos/yr	Stream Water Quality 12 mos/yr	Forest Land	Municipal Solid Waste
	hours of delay		miles/cap	% of 1990	acres gained		% of streams with ...			% of streams	meeting flow rights	% of 1974 forest land	lbs./capita
1996	18.5	4.1	7,080	120%			32%	2%	35%			1984=98.0%	
1997	19.3	4.5	6,950	120%			52%	0%	32%	88%	76%	1994=98.5%	1,596
1998	19.7	4.9	7,090	119%			70%	1%	37%	94%	76%		1,609
1999	20.8	5.4	7,130	126%			64%	1%	41%	94%	65%		1,644
2000	22.9	6.7	7,060	126%			70%	1%	42%	82%	59%	98%	1,617
2001	19.1	6.1	7,020	122%	129	-2	51%	5%	46%	82%	24%		1,531
2002	19.4	6.7	7,040	120%	91	1	37%	4%	46%	88%	35%		1,568
2003	20	6.4	7,040	117%	35	-2	32%	6%	48%	65%	35%		1,588
2004			6,940	121%	75	13	24%	10%	49%	94%	47%		1,636
2005			6,930	126%	21	0	14%	14%	51%	82%	53%	98%	1,673
2006		More recent data not available at time of printing	6,960		21	10	8%	21%	50%	94%	41%		1,765
2007			6,810		102	20	6%	24%	49%	76%	29%		1,756
2010 Target	28	9.1	6,977	106%	0	250	75%	0%	45%	65%	40%	97%	1,533
Last updated	4/13/07	4/13/07	12/1/08	12/1/08	12/1/08	12/1/08	12/1/08	12/1/08	12/1/08	12/1/08	12/1/08	3/31/08	12/1/08

Get detailed reports on 91 benchmarks plus county data at www.oregon.gov/DAS/OPB.

Oregon Progress Board

PART II: CLUSTER GUIDE

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INDUSTRY CLUSTERS: THE STRUCTURE OF THE OREGON ECONOMY

Oregon's economy is driven by traded sector industry clusters. These clusters – consisting of companies, competitors, and suppliers that specialize in particular products, services, and markets – generate payrolls that sustain families and, in turn, local businesses and government services. Oregon has five groups of traded sector clusters. These are the state's traditional natural resource industries; high technology; metals, machinery and other manufacturing; creative and design services; and clean tech industries.

Strategic Implications

All clusters contribute to the state's economic performance and well-being. Our strategy isn't about picking winners or choosing who's most important, but looking to improve the competitive success of every industry.

Clusters are a vehicle for organizing public-private collaboration and action to identify and advance the state economy. Clusters continue to be a central part of the Oregon Business Plan, and economic development efforts statewide.

Clusters aren't a panacea for development. Oregon's clusters face national and global competition, and are subject to the same forces that affect businesses everywhere, including the buffeting downdraft of a national recession.

Clusters represent our best opportunity to build sustainable competitive advantage and create high wage jobs for Oregonians and communities around the state.

Innovation is key to the success of every industry cluster, whether it traces its origins to the state's traditional resource base, or whether it is a newer high tech or clean tech industry cluster.

While our strategic focus is on the traded sector of the Oregon economy, all businesses help add to Oregon's economic well being. Local businesses – those that sell their products and services exclusively or primarily to local customers, and who face little direct competition from out of state – add to the local quality of life, provide entrepreneurial opportunities for citizens, and can be the springboard to help launch traded sector clusters.

Recent Progress

With leadership coming from the Governor's office, OECDD, the Oregon Innovation Council, and a number of other economic development and business organizations, Oregon's cluster-based economic development strategy is gaining ever-greater traction. Last year Oregon was one of only seven states selected to participate in the National Governor's Association Policy Academy on Innovative Clusters and Regional Economic Strategies. Oregon was represented at the national level by a core team of public and private economic development leaders, setting an example of successful cluster development practices for other states. Also in 2007, Oregon beat out other North American locations to host the Competitiveness Institute's annual international cluster conference, drawing more than 500 participants from over 40 countries, including representatives from regions as diverse as Ethiopia, Turkey, Pakistan, and Argentina.

Perhaps most significantly, the Governor, OECDD, and the Legislature have shaped many of their economic development efforts around clusters. The Oregon Innovation Plan is a prime example. The investments made in 2007 are proving to be successful and the 2009 plan that was included in the Governor's budget calls for continued support for accelerating innovation in targeted existing and emerging industry clusters.

Another great example is the recent success with Solar/PV Manufacturing. Due in large part to efforts by the Governor, OECDD and the Legislature, Oregon has become the North American center for this emerging industry cluster. This growth is the result of aggressive, targeted recruitment, a commitment to understanding the needs of the cluster, and creating a policy environment that allows it to flourish here.

Over the past several years, OECDD and the Oregon Business Plan have sponsored the Cluster Leadership Network, bringing together representatives from a variety of clusters to learn from each other about how to best organize their work and others in the community that can support them, including education and university research. As part of this effort, we have conducted focus groups and invited clusters to submit action plans to help others identify ways they can support them.

OECDD's reorganization plans call for continuing this focus on clusters as a key strategy for economic growth. Oregon Business Plan leaders look forward to working closely with the Department on these efforts.

The plans presented on the following pages describe some of our clusters, how they are organized, their strengths and challenges, their vision for the future, and the actions they recommend to achieve their vision. Because these descriptions flow in from a wide array of cluster organizations, their content and format varies. Not all clusters are represented in this guide. It is intended as a resource for those interested in supporting Oregon's burgeoning cluster movement.

Sources

Unless otherwise noted, employment data are from Evans & Anderson (2007); international trade figures are from Oregon's Office of Economic Analysis (2008).

Allen, Jennifer and Tom Potiowsky. "Portland's Green Building Cluster: Economic Trends and Impacts," *Economic Development Quarterly*, Vol. 22, No. 4, (Special Issue on Clusters - November 2008).

Evans, Brian and Michael Anderson (2007). *Oregon's Statewide Traded Clusters: Major Industries and Trends*, Oregon Economic and Community Development Department.

Oregon Economic and Revenue Forecast, Volume 28, No. 3. Office of Economic Analysis (September 2008).

NATURAL RESOURCE CLUSTERS

Oregon's traditional natural resource base is the platform for industry clusters in forest products, food processing, and nursery products. Tourism is also bolstered by our great scenic endowment and outdoor recreation.

The state's resource based industries are important contributors to Oregon's export portfolio. The state exports about \$3 billion in food products and about \$500 million in forest products annually. (Because of import restrictions elsewhere, nursery products are sold primarily inside the United States.)

Businesses in each of these clusters capitalize on Oregon's strong reputation for quality and environmental integrity. In forest products and agriculture, some of the strongest growth markets are those that demand rigorous sustainability criteria. Oregon's wine industry competes on quality at the high end of the world marketplace.

Retrenchment in the housing market and the dim outlook for construction over the next two years is a major challenge for the state's forest products and nursery products clusters. Demand for both sectors is strongly driven by new housing starts, which are expected to remain depressed through 2010. In the longer term, as U.S. housing markets recover, Oregon's resource base, and reputation for quality and sustainability are likely to be major assets in growing these clusters.

Forest products. The forest products industry remains a mainstay of the state's economy, especially in rural communities around the state. Oregon is a leading producer of lumber, panel products, and millwork, including wood doors, windows, and moldings. More than 60,000 people work in wood products manufacturing and forest management.

More than 38,000 Oregon farms produce a diverse array of high quality food products, including fruits and vegetables. Oregon is one of the nation's leading producers of a wide range of berries, including blackberries, blueberries, and raspberries.

Food products. Oregon's food products sector is likely to be less affected by the current recession. Food consumption is less variable than durable goods consumption, and Oregon producers have enjoyed expanded export markets as a result of the decline in the dollar and continued growth in key Asian markets.

Nursery products. Nursery products are the state's leading agricultural commodity, with annual sales exceeding \$1 billion. Oregon firms provide a wide range of trees and shrubs for commercial and residential landscaping throughout the United States. Oregon is also the nation's largest producer of Christmas trees, a \$100 million annual crop.

Tourism. Oregon's scenic wonders and outdoor recreation opportunities – as well as its cultural assets – play a key role in tourism. While most visitors to attractions in Oregon are Oregonians, many visitors are from out of state, and their spending on hotels, restaurant meals, and recreational activities helps stimulate the Oregon economy. The tourism cluster is particularly important on the Oregon Coast and in Central Oregon.

Forest and Wood Products

The cluster includes over 2,500 firms concentrated along the I-5 corridor, but is found statewide. Key cluster components include primary & secondary wood products: manufacturing of lumber, panel products, molding & millwork, doors & windows, pulp, paper; forestry services: firefighters, consultants and loggers. Notable Oregon companies include Hampton, Jeld-Wen, Forest Capital Partners, Weyerhaeuser, Campbell Group, Roseburg Forest Products.

See Oregon Forest Industry Directory website (<http://www.orforestdirectory.com/>) for a more complete list of companies.

Cluster Organization

Industry associations serving the cluster include Oregon Forest Industries Council (OFIC), Oregon Small Woodlands Association (OSWA), Associated Oregon Loggers (AOL) and Portland Wholesale Lumber Association (PWLA). State agencies serving the cluster include Oregon Department of Forestry (ODF), Oregon Economic and Community Development Department (OECDD), Oregon Forest Resources Institute (OFRI) and Oregon State University - College of Forestry (OSU).

Cluster Strengths

- A cluster job concentration exceeding three times the U.S. average
- The largest softwood lumber producer in the country
- Major producer of hardwood and softwood plywood
- High quality solid wood products and innovative engineered products
- High environmental standards
- Modern harvesting practices and innovative manufacturing
- Best forestry school in the world (OSU)
- Large supply of wood with forest growth exceeding removals plus mortality by nearly 2:1 among all owners statewide and nearly 4:1 on federal lands
- Stable land base

Cluster Challenges

- Untapped capacity on federal lands
- Loss of processing infrastructure in Central and Eastern Oregon
- Increased value of Oregon's forestland for non-forest uses
- Rising transportation costs & declining infrastructure--especially short-line rail
- Regulatory instability and high costs

This cluster is composed of interrelated wholesale, manufacturing and management services industries. Wood product & paper manufacturing account for about 70% of the employment in this cluster.

Average Wage 2007: \$43,685

Cluster Employment 2007: 63,549

Wage Growth 2003-2006: 8.8%

Cluster Employment Growth 2003-2006: 0.2%

Competitive Share Growth: 0.3%

Competitive share growth is the portion of Oregon employment growth attributed to factors unique to Oregon that have contributed to employment within a cluster.

Notes:

- This cluster is among the largest in the state based on employment.
- The average wage is above the state's private sector average
- Customers include home builders and lumber distributors nationwide with a concentration in the far western and southwestern U.S.
- Key competitors are southeastern U.S., Canada, Asia, southern hemisphere plantations & non-renewable wood product substitutes

- Aging workforce, lack of reliable workers interested in cluster
- Higher energy costs
- Wildfire risks to forest cluster investments

Vision for the Cluster in Oregon

ODF, OECD, OFRI and OSU are working together with private sector partners to craft an Oregon Forest Cluster Economic Development Strategy with the goal of: Creating and maintaining a favorable investment climate for environmentally sensitive, socially responsible, and globally competitive forest-based businesses throughout Oregon. As a result, these businesses will generate high quality, value-added products; family wage, highly skilled employment; increased revenues to private landowners for providing public benefits, and increased forest products exports.

Key Actions for the Future

To achieve this vision and to help implement the Governor's broader Economic Vision for Oregon, the proposed Oregon Forest Cluster Economic Development Strategy includes:

1. Federal Forest Restoration

Actions Needed:

- Widely communicate Oregon forest health and forest cluster and rural community economic vitality as priorities of the Governor and the State of Oregon.
- Encourage and support local collaboration efforts, such as community wildfire protection plans and fully using Healthy Forest Restoration Act authority, to accomplish federal forest restoration work and provide wood fiber to local mills.
- Explore a role for the State of Oregon to directly participate in addressing federal forest/private forest interface issues with respect to fires, insects, and diseases.

2. Forest Cluster Vitality

Actions Needed:

- Promote development of market opportunities and removal of market barriers for wood products, non-timber forest products and ecosystems services.
- Promote increased funding for integrated research programs that directly benefit the forest cluster through improved management systems, technologies, and higher value wood products.
- Promote state and federal laws and policies which provide economic incentives for biomass energy research and industry development.
- Promote ways to improve Oregon's forest sector innovation system to increase competitiveness and synergies among the forest sector, higher education and other Oregon business sectors.
- Strengthen relationship between Oregon's forest cluster and green building cluster.
- Ensure the Governor's *Investing in Infrastructure and Communities* Initiative meets the transportation and energy needs of the forest cluster.

The Oregon Innovation Council is supporting an OSU proposal for: (1) enhanced forest transportation research and development to reduce costs, (2) developing comprehensive silviculture technologies through the Center for Intensive Planted Forest Silviculture, and (3) strengthening the commercialization support capabilities of the Oregon Wood Innovation Center.

3. Forestry Workforce:

Actions Needed

- Establish employer-led training consortia by county or workforce region.
- Expand forest cluster employers outreach programs to teachers, school counselors, students and parents that promote career opportunities in the cluster and develop appropriate forestry education programs and specific skill training for students who want to pursue university/community college education or enter the workforce directly from high school.
- Establish a *Career Pathways in Wood Products* programs to link high school students and adults with careers in the cluster based on the Oregon Forest Resources Institute's *Careers in Forestry Program* model.

This cluster summary was produced with the help of the Oregon Forest Resources Institute.

Agriculture

Cluster Description

Agriculture is a natural resource based industry includes the production of food, fiber, fuel & foliage (nursery and forestry). The industry encompasses a diversity of products from commodities crops to specialty foods to cattle ranching to the production of feed for livestock. Oregon's specialty crops strengths include Hazelnuts, Grass Seed, Cranberries, Christmas Trees, pears, and cherries.

Roughly 28% of Oregon's land mass (17.3 million acres) is devoted to agriculture production. Oregon has 220 different commercially grown agricultural crops. The farm gate value of Oregon's agricultural bounty is nearly \$5 billion with 72% coming from crops and the rest from livestock. As much as 85%

of the agricultural products produced in Oregon are sold out-of-state and 40% of those are exported to foreign countries. There are nearly 40,000 farms in Oregon.

Oregon leads the nation in the production of a variety of products, including Christmas trees, hazelnuts, grass seeds, blackberries, Dungeness crab and mint just to name a few. Nursery crops represent the leading sector in terms of value at nearly \$1 billion. There are 14 commodity categories that represent more than \$100 million in sales each year.

Moreover, Oregon's 200 food processors account for about \$3 billion in value-added sales revenue. Nearly 17,000 workers are employed in Oregon's food processing sector generating a payroll of more than \$500 million annually. Processors produce everything from dairy products, to a variety of fruit and vegetable products, wine, and seafood items.

Taken together, Oregon's vast agricultural sector makes up roughly 10% of the state's gross domestic product. Fully 1 in 10 Oregon jobs are tied to agriculture.

Cluster Organization

There are a variety of public and private organizations that help organize and promote the agriculture industry in Oregon. Many sub-sectors of the industry have their own trade associations or industry groups and there are commissions representing Oregon's 14 commodity categories.

Strengths and Challenges

Strengths

- People (Oregonians are pioneers, leaders, innovators)
- Multiple climates make it possible to produce a diversity of crops
- History/Heritage/Culture
- Geography—access to export markets

Challenges

- Environmental Concerns:

Average Wage 2006: \$22,069

Cluster Employment 2006: 36,237

Average Wage Growth 2003-2006: 9.46%

Cluster Employment Growth 2003-2006: 6.91%

NOTES

Source: BLS, QCEW data based on cluster definition from 2006 OECD "Statewide Traded Industry Clusters" report

- Resource Utilization: Fair and Equitable Water Allocation, Distribution, & Availability
- Air Quality
- Transportation Infrastructure (rivers, roads, railways)— costs, congestion, trucker shortages, and railroad policies (Union Pacific hauls in corn for ethanol and hauls back empty to MidWest because it is quicker)
- Perception of industry and resistance to learning about agriculture industry: people think that growers aren't stewards of the land, Farming doesn't lead to a living wage
- Agricultural Variety makes it difficult to do collective marketing and hard for individual segments of the industry to gain visibility & show their impact on the economy
- Land Use—Both measures 37 and 49 are imperfect, defunding the Big Look Task Force was a mistake
- Getting credit for carbon sequestration
- Tax Policy
- Immigration Policy—Hiring a legal workforce

Recent Accomplishments

Over the past year more than 20 different agriculture organizations partnered to develop a public opinion survey focusing on important issues to the industry such as labor, water quality/quantity, pesticide application, food safety and the urban/rural divide. The groups have now started a fundraising effort to begin developing an awareness campaign to engage urban Oregonians in some of the critical conversations and issues facing the industry.

Key Actions for the Future

- ***Water.*** Bring together business & government in a way that separates politics from sound policy-making. The Oregon Business Plan effort is a good start. All impacted groups (agriculture industry, tribes, etc.) should be at the table in this effort and also represented in the Governor's group on water policy. Funding must be secured to address this issue.
- ***Leverage.*** Oregon's dual strengths in sustainability and agriculture.
 - Take advantage of increase in worldwide recognition of food certifications and labels (Organic, Food Alliance, etc.)
 - Get Carbon Sequestration Credits for being caretakers of the land and maintaining open space
 - Invest in sustainable agriculture research
- ***Brand Oregon Agriculture inside and outside Oregon.*** Secure funding for Brand Oregon & recognize the diversity of the Agriculture cluster.
- ***Education.*** Let people know the value of Oregon Agriculture. Make agriculture classes required in the curriculum from grade school to high school.
- ***Address rural policy issues*** by funding the Governor's Office of Rural Policy and use the research that has already been collected in rural areas statewide

- ***Encourage more regional cooperation*** with Washington and British Columbia on access to water and transportation issues.

For More Information

Oregon Department of Agriculture: www.oregon.gov/ODA/

Agri-Business Council of Oregon: www.aglink.org

This cluster summary was produced with the help of the Agri-Business Council of Oregon and the Oregon Department of Agriculture.

Food Processing

Cluster Description

The Northwest (OR, WA and ID) Food Processing cluster represents a diverse group. The extended cluster is a mix of commodity producers, specialized, niche producers, processors, distributors and packagers.

In 2003 Northwest Food Processors Association (NWFPA) responded to unprecedented regional threats in the global marketplace by initiating the nation's first comprehensive, multi-state initiative and competitive assessment of a food manufacturing cluster. Support for this program came from three governors, state and regional government, members of Congress, the U.S. Economic Development Administration, industry, education, and others. NWFPA's "big hairy audacious goal" is to reposition the three-state food processing industry to compete globally through dramatically increased productivity and innovation. The model is simple: Innovation leads to productivity gains, which lead to global competitiveness, which leads to increased profitability.

The Oregon cluster includes 197 companies in the food processing sectors represented by NWFPA membership which meet the size requirements of at least 20 employees or estimated annual sales of \$1.0 million or more, but does not include final food preparation at retail supermarkets or other food-related businesses downstream from the initial food processors. The extended cluster includes hundreds of firms that provide supplies and services to the food manufacturing firms in the state.

Food manufacturing (processing) companies—Bakery, Dairy, Fruits and Vegetables, Meat and Poultry, Seafood, Snacks, and Specialty—with processes including: Canned, Dehydrated, Freeze Dried, Fresh Cut, Frozen, Juice, Organic, Powder, and Puree. In addition to food processing, the expanded food cluster also includes farm production, packaging and machinery, transportation and warehousing.

The regional industry contributes over \$10 billion in value added food processing, employs over 56,000 individuals, and plays a vital role in maintaining the stability of the regional economy. From cherries to peas to onions to canning and freezing, food processing is the third largest manufacturing sector in Oregon (Source Globalwise, Inc. July 15, 2008). The average food processing wage for 2006 was \$36,793 (Source Northwest Food Processing Cluster Assessment & Roadmap October 2006 by Applied Development Economics).

According to the 2008 Oregon Business Manufacturers Directory, "the biggest (employment) gains were made in the food products sector, which saw a 6.6% increase in employment. Dave Zepponi, president of the Northwest Food Processors Association, says some of that growth can be attributed to a clustering strategy the industry has been developing in Oregon over the past five years in an effort to address increased international competition. One such cluster is located in southwest Oregon, where manufacturing employment rose 1.5%, adding 783 jobs, according to the study."

Cluster Organization

The cluster is represented by the Northwest Food Processors Association. Local clusters of food processors and the infrastructure bundled into a regional cluster with a Knowledge Center, based in Portland that serves the Northwest region. In Oregon the major food

processing cluster areas include: Boardman/Eastern Oregon, Greater Portland, Greater Salem/Willamette Valley, Medford/Southern Oregon, and Astoria/Tillamook and the Coast.

Strengths and Challenges

Strengths:

- Access through seaports to the Pacific Rim
- Farmland – 17.5 million acres
- Healthy lifestyles, healthy foods, and consistent market demand (everyone eats)
- Northwest pioneering spirit and appetite for risk-taking
- Hydro-electric infrastructure
- Industry association and leadership (NWFPA and its subsidiary Northwest Food Processors Education Research Institute (ERI) and operating unit Innovation Productivity Center (IPC)
- Energy management including partnership with Northwest Energy Efficiency Alliance
- Industry-driven talent pipeline programs

Challenges:

- Energy supply and prices, including transportation expenses, inflate the cost of delivered goods
- Fresh water supply
- Increased regulatory environment
- Shortage of qualified workers - replacements needed for retiring baby boomers (including engineers, electricians, and mechanical technicians)
- The need for increased innovation in managing all challenges of the industry

Vision for the Cluster in Oregon

Reposition the food manufacturing industry in Oregon (and the region) to compete globally through increased innovation and productivity.

Industry Role in the Decade Ahead

- Provide cluster leadership training for local clusters.
- Create a culture of innovation throughout the industry.
- Implement the 25 percent energy intensity reduction plan over 10 years and implement other elements of the innovative food processor "blue print" for the future.
- Transfer and commercialize new technology by adapting previous R & D projects from national laboratories and universities in areas such as energy efficiency, food safety, waste management and water recycling.
- Share the Mechatronics "MECOP-Lite" high school and community college internship pilot project model throughout the state and region.
- Address key transportation challenges with solutions in terms of innovative freight management software to reduce the carbon footprint of deliveries by increased

consolidation of less than full truckload shipments and increased percentage of backhaul loads.

New Products and Services

Established the Northwest Food Processors Education Research Institute (ERI) and Innovation Productivity Center (IPC) in 2007 as a global center of excellence funded, in part, by a \$3.4 million grant by the Oregon Legislature through the Oregon Innovation plan

- Supported a model of common development which integrates leadership, innovation and productivity to the benefit of the state and regional economy and enhances the global competitiveness of the community
- Developed an innovative plan in 2008, funded by U.S.DOE and Northwest Energy Efficiency Alliance (NEEA) for the food processing cluster to be the first industry-sector in the nation to adopt the goal of reducing energy intensity by 25% in 10 years
- Instituted Green Energy Management System (GEMS) in Oregon and Washington manufacturing plants to assist with energy efficiency and greenhouse gas management
- Improved energy efficiency and food safety by exploring and adapting R & D findings from universities and national laboratories (PNNL, INL and GTI) through an Oregon industry-driven taskforce, to the Oregon food industry
- Encouraged students to develop their education and career planning towards the innovative new occupations in the food industry

Key Actions for the Future

- Implement 25 percent energy intensity reduction in 10 years
- Increase the capacity of the Northwest's innovation infrastructure
- Increase industry's operation productivity
- Develop a robust workforce pipeline
- Develop an industry-wide sustainability process
- Build an economic distress strategy
- Collaborate on transportation strategies
- Explore international markets for Oregon food products

This cluster summary was produced with the help of the Oregon Food Processors Association.

Nursery Products

Cluster Description

Businesses in Oregon’s nursery products cluster sell greenhouse and ornamental landscape plants, including sub-elements such as shade trees (Oregon is #1 in nation), potted florist azaleas, root stock (for fruit & nuts), flowering shrubs, evergreens (grafted conifers & broadleaf evergreens), and perennials. Companies are located across the state but primarily in the Willamette Valley.

Oregon, the second largest nursery grower behind California, exports 81% of its output.

Average Wage (full time and part time) 2007: \$16,430

Cluster Employment 2007: 21,000

Average Wage Growth 2005-2007: 23%

Cluster Employment Growth 2005-2007:

-5%

NOTES

Source: USDA national Agricultural Statistics Service

Cluster Organization

The Oregon Association of Nurseries (OAN) is a non-profit trade association that represents more than 1,400 individual nursery stock producers, retailers, landscapers and related companies serving the nursery and greenhouse industry. The OAN is the main voice for Oregon's nursery and greenhouse producers, re-sellers, transporters, retailers and suppliers. It is governed by a volunteer Board of Directors with oversight by a seven-member Executive Committee.

Strengths and Challenges

Strengths

- Climate, rain, temperature—18-hour growing days, 9-month growing season
- Quality of the soil
- Limited size of the valley means nurseries are close to each other
- OAN’s culture of collaboration (growers share truckloads, technologies, best practices, etc.)
- The Oregon mystique: Commercial buyers on the East Coast and Midwest perceive something special about Oregon plant material

Challenges

- **Labor Costs & Shortages:**
High minimum wages drive up costs, without attracting new workers. Oregon’s plant prices are becoming less competitive with other states that have lower labor costs.

Seasonal nature of industry – everything is very time dependant and lost time can not be made up.

Immigration policy – tighter borders make it harder to find workers. Nursery is competing with other industries that rely on the same type of labor force.

Aging workforce and limited training in Oregon for young people.
- **Transportation:**
Seasonal nature of industry—growers are all competing for trucks to export products at the same time, driving up prices.

Nursery products are less desirable items for truckers to ship because plants dirty the trucks, plants are perishable and need to be shipped in refrigerated trucks with the right temperatures and unloaded promptly, and it takes a long time to load trucks (between 2 to 6 hours) due to the variable sizes of plants.

- **Public Research capabilities:**
Research facilities at OSU are eroding due to lack of funding and ability to retain talented individuals.

Research has been privatized (industry now relies on consultants, company research).

OSU Extension Service has lost integrity- Provides outdated information, Losing staff in the horticulture department, decreased budget for research.

- **Increased competition:**
East Coast growers have started to figure out how to grow quality plants, so Oregon's quality is no longer enough to offset higher prices due to labor and transportation costs.
- **Hard to predict future demand** because of the long time horizon for plant growth (3-6 years).

Vision for the Cluster in Oregon

- **Greater utilization of plants for ecoservice benefits in public transportation/infrastructure projects and urban landscapes:**
 - City trees for reducing heat island effect
 - Constructed wetlands for wastewater treatment
 - Green roofs and rain gardens for stormwater management
 - Riparian buffers for water quality protection and erosion control
 - Urban trees for greenhouse gas reduction, air cooling and quality protection
 - Grasses, trees, and shrubs for soil remediation
 - Ecological landscaping for habitat restoration
- **Advancing the dialogue and driving innovation in multi-modal transportation, water conservation and management, and energy efficiencies.**
- **Driving national improvements in management and eradication of invasive pests and diseases.**

Key Actions for the Future

- **Do more with less** (more innovation with less public research; More mechanization and technology with less labor; more pest control with less chemicals)
- **Turn interest in sustainability into a competitive advantage for the Oregon nursery industry.**
 - Respond to the demand for sustainable products: Create a commonly accepted definition for the nursery industry and collaborate with other stakeholders and industries to learn from them.
 - Educate the public about how plants can save the planet. (i.e., tree canopies can be used to shield houses and streets from the sun and decrease energy use, green buildings have plants inside, green roofs, dwarf varieties can accommodate the smaller yards and smaller living spaces required by high-density living, plants on highways capture carbon and manage water)

- Use sustainability as a marketing strategy. Be able to sell to vendors that look at suppliers' sustainability practices and dispel the notion that the industry is polluting.
- Improve water and energy efficiency:
 - Invest in water conservation and reuse innovation (i.e., drip irrigation systems) where applicable.
 - Educate growers about electricity savings using variable water pumps
- Take a holistic look at water conservation and storage. Work with legislators and Governor to address competing claims for a limited supply of water.
- Educate growers about new forms of marketing. Use the Internet and new technologies to develop innovative business management tools.

This cluster summary was produced with the help of the Oregon Association of Nurseries.

Tourism and Hospitality

Cluster Description

The cluster includes entertainment, recreation, accommodations, culinary, meeting facilities & venues, cultural & heritage, retail, transportation and marketing and public relations. Notable cluster members include McCormick and Schmick, OMSI, Bandon Dunes, Oregon Zoo, Widmer Brewing, Oregon Coast Aquarium, Timberline Lodge, McMinnamin's, Wildlife Safari, Sunriver Resort, Ponzi Vineyards, Oregon Convention Center, Shakespeare Festival, The Bite of Oregon.

Customers include Oregon and U.S. residents as well as international visitors.

Jobs and revenue, 2007: 91,100 jobs with industry revenue of \$2 billion.

Recent trends in growth:

- Direct Visitor Spending: 2003 v. 2007 – up 28 percent
- Direct Employment: 2003 v. 2007 – up 6 percent
- Industry Earnings: 2003 v. 2007 – up 18 percent
- Tax Receipts (local/state): 2003 v. 2007 – up 30 percent

Key Competitors: Regional & Global

Cluster Organization

Associations representing the cluster: The tourism and hospitality cluster is a diverse set of industries that include retail establishments, lodging providers, restaurants, transportation services, arts and entertainment venues and others (as seen above in “products and services” section).

Cluster Strengths and Challenges

Strengths:

- Strong economic contributor to all areas of Oregon – traded sector industry that is made up of a diverse set of interrelated businesses. Ninety-five percent of Oregonians believe that tourism is important to Oregon's economy.
- Largest traded sector employer in the state – provides great careers, flexible work schedules as well as entry level positions that teach transferable job and customer service skills.
- Visitors help build our state's reputation for environmental stewardship and natural recreation. Seventy-seven percent of Oregonians see tourism as an environmentally friendly and 82 percent believe tourism improves the state's quality of life.
- Tourism is a business recruitment and retention tool. Often times new business starts in Oregon occur because the owner came as a tourist first. In the 1990s, according to a study, 70 percent of new business starts in Central Oregon resulted from the owners first visiting the region on vacation. Intel says that recruiting employees to Oregon is easy; getting them to relocate away from Oregon is difficult.

Challenges:

- Education of policy makers and other industries about the importance of tourism to the socio-economic fabric of Oregon.
- Understanding the total tourism resource locally and statewide; creating increased public/private successes, helping local governments to maximize return on investment of revenues raised through lodging taxes and used for tourism purposes.
- Availability of well-trained workforce: a) Oregon no longer has a four-year college tourism and hospitality program, b) State needs improved connection between higher education & tourism industry.
- Getting vast and diverse industry largely made up of small, fiercely independent entrepreneurs to see themselves as part of the cluster as a whole.
- Conveying the positive aspects of the industry employment/flexibility, upward opportunity. Tourism jobs are often the first entry into the workforce where foundational skills are established.

Vision for the Custer in Oregon

What role will the industry play in the decade ahead?

Tourism and Hospitality will play an even more important role in Oregon's future as it is recognized for its continued contribution to the socio-economic success of the state and will help determine the success of the state's sustainability reputation and experience.

Recent Accomplishments

- Governor's continued commitment to and recognition of the relationship between transportation, tourism and hospitality by the ongoing support of the work of the Transportation and Tourism Task Force.
- Siskiyou Welcome Center at southern entrance to Oregon completing county planning phase.
- Continued successful public/private partnership in statewide marketing efforts that have resulted in enhanced visitor spending.
- Tourism and Hospitality Consortium work to tell the story of the industry. Recent publication of "*Impact Oregon*" through partnership with Oregon Business Magazine. Wally Van Valkenburg facilitates the tourism and business discussion. Similar Town Hall meetings throughout Oregon are planned for November and December 2008.
- Implementation of a free online customer service program – Q CARE - that is designed to train front line tourism employees and connect them with local tourism information. The behavioral program is transferable across industry lines so it is a tool that nearly any business sector could use.

Key Actions for the Future

Educate people outside the industry (business & thought leaders, legislators, economic development organizations) about the socio-economic impact of the tourism/hospitality industry. Secure recognition of tourism as a core traded-sector cluster with major impacts on the Oregon economy.

- Pursue a major transportation funding package (roads, rail, rest stations, etc.)
- Create synergies among diverse marketing entities. Use destination marketing organizations (DMOs) to get word out and centralize the branding effort.

- Create career pathways from high schools to higher education to industry. Connect industry with post high school programs on hospitality & tourism.
- Support federal legislation, adoption of a travel and promotion act in the next congress, a bill to communicate United States travel policies and improve marketing and other activities designed to increase travel in the United States from abroad.
- Participate in future decisions related to statewide land use law. Understand and communicate future issues resulting from changing land-use environment.
- Move the Siskiyou Welcome Center plan through the Jackson County Commission.
- Protect Oregon's tourism investment structure in the 2009 legislature. This program assures the continued success the industry has enjoyed since 2004 by leveraging local private investment, local public investment, and statewide public investment.

This cluster summary was produced with the help of Travel Oregon.

HIGH TECHNOLOGY CLUSTERS

Oregon is an important center of high technology businesses, whose products include computers, semiconductors, electronic instruments, and software. The industry is anchored by Intel's operations in Washington County. The metropolitan area is home to hundreds of other high tech firms, many started as spinoffs from Intel, Tektronix, and Electro Scientific Industries.

Oregon accounts for about ten percent of the nation's output of semiconductors, and is a major center for related research and development. Intel, for example, secures more patents for the research it performs in Oregon than from all of its other worldwide operations combined.

Oregon's high technology industries employ more than 80,000 workers according to estimates by the Oregon Economic and Community Development Department. Computers and electronic products lead Oregon exports, accounting for about \$8 billion in annual export sales, about 40 percent of the state's total.

Although the past several years have been challenging for the high technology industry in the United States, Oregon's high tech firms have generally outperformed their peers in other states. Nationally, high tech employment declined 7.5 percent from 2003 to 2008; in Oregon, the decline was half as much, about 3.7 percent. Still, Oregon has not been immune to the effects of global competition and restructuring in this industry. South Korea's Hynix announced the closure of its Eugene semiconductor fabrication plant in 2008, which will lead to the loss of more than 1,000 jobs.

The recession is likely to be even more challenging for high technology over the next two years. Business and consumer spending on information technology, a key driver of the high tech industry, is likely to slow as a result of the global recession.

In the longer term, Oregon is well positioned to continue to grow its high tech sector. The state has a strong base of industry-specific talent, and ranks well above the national average in patenting per capita, a key indicator of future high tech growth. The state also performs above average on measures of new firm formation and venture capital.

High Technology

Cluster Description

Oregon's high-tech industry represents a broad cluster of companies in the information technology sector, including electronics hardware and medical device manufacturers, software producers, and internet-telecommunications firms. The largest single segment is semiconductor manufacturers (32%). Other important sectors include software publishers, display technology, printing and imaging, electronic design, and test and measurement. High tech is Oregon's leading industrial sector, responsible for more than 83,000 workers. End users of technology products are not included in the definition because technology is widely used by almost every industry. Notable companies include Intel, Hewlett Packard, Tektronix, Xerox, ESI, RadiSys, FLIR, FEI, and TriQuint.

Average Wage 2006: \$75,600
Cluster Employment 2006: 86,000
Average Wage Growth 2004-2006: 0%
Cluster Employment Growth 2004-2006: 5%
Value of exports 2007: \$6.5 billion
Percentage of state exports: 39%
Note:
Data from AeA's CyberStates 2008 & Trade in the Cyberstates 2008

Cluster Organization

Many organizations serve the needs of Oregon's high tech industry and its various sub-sectors. The largest organization that represents many of these sectors collectively is the American Electronics Association, Oregon Council. AeA is a national trade association founded more than 60 years ago in the Bay Area by David Packard. AeA has been active in Oregon for 40 years. The organization sponsors industry education workshops, hosts networking events, and engages in public advocacy. Its tagline is "Advancing the Business of Technology." Other key organizations include the Software Association of Oregon and various groups that represent the interests of manufacturers.

Cluster Strengths and Challenges

Strengths

- Lifestyle and quality of life are positive elements in recruiting talented people.
- Land availability and regulatory infrastructure.
- Because high-tech companies are diverse in Oregon (few head-to-head competitors) there is little inter-company disagreement on public policy issues.
- Existence of professional services expertise in such areas as law and accounting.
- Business tax structure, including the existence of targeted tax incentives.

Challenges

- "Doing business in a global economy" (outsourcing software development, competing with people who want to work hard in China and India, foreign students increasingly are getting educated here and returning to their own countries to set up businesses).
- Dispersed higher education funding and location (of eight public universities, none of them are world-class).
- Declining K-12 education system nationally and lower quality of science education.
- Transportation infrastructure—growing traffic congestion detracts from quality of life.
- Recruiting top talent and companies is hampered by a short supply of math and science educators at the K-12 level and lack of a world class engineering school in higher ed.

- Lack of political will and courage to make radical changes to the university system structure.
- Lack of diversity in Oregon means people from other countries don't have nearby communities and support networks as they do in other parts of the country.
- National skilled immigration policies are not supporting business growth to recruit top talent from around the globe.
- Venture capital is hard to attract because major venture capital firms are located in the Bay Area and there are some negative perceptions in that region about Oregon.
- A need for stronger mentoring connections between successful management and newcomers.
- Lack of critical mass may convince potential employers that they may be looking at a double-relocation if the job in Oregon doesn't work out.

Vision for the Cluster in Oregon

Once thought of as the “new kid on the block” in Oregon’s economy, high technology is now a mature industry and the state’s largest industrial sector. Because of its integration in the global economy, many tech companies today find a large part of their growth coming from operations and sales located outside of Oregon and the U.S. The large double-digit employment growth rates for this sector that occurred in the 1990s in Oregon may be behind us.

Oregon remains a key center in the world for semiconductor research and production, driven primarily by the huge presence in the state of Intel’s largest worldwide site. The software part of the industry is diverse and robust.

Recent Accomplishments

A major recent development in Oregon is the siting and growth of solar energy product (photovoltaic) companies. Many of the processes used in this industry (and the required workforce skills) are quite similar to the more established semiconductor part of the sector

Key Actions for the Future

- Continue public-private partnership to invest in STEM education (Science, Technology, Engineering and Mathematics) at the K-12 level and in building public university engineering and computer science programs through the existing Engineering and Technology Industry Council (ETIC). Major investments have been made over the past 10 years in ETIC. Oregon needs to continue this momentum to ensure it can meet the needs of employers in the future.
- Foster an environment that is conducive to start-ups: Improve Oregon’s access to capital, including venture capital and stage two funding, by demonstrating that the intellectual capital for success exists in Oregon.
- Continue to educate policymakers about the importance of the technology sector to Oregon’s economy. Support efforts to encourage business attraction by articulating Oregon’s high-tech strengths.
- Continue to educate policymakers about the important of global trade to the health of Oregon’s export-based economy. Avoid state-level policies that work against a healthy trade environment.

- Invest in and market Oregon’s “lifestyle” advantage. Recognize the importance of low commute times (lower at least than in other major tech markets), quality schools, and environmental stewardship to Oregon’s quality of life.

This cluster summary was produced with the help of the American Electronics Association, Oregon Council.

Software

Cluster Description

The software industry in Oregon had its roots early in the region's semiconductor era. Formally organized into an industry association in 1989 as The Software Association of Oregon, the industry has become a leading advocated for tax reform and educational funding for the area's knowledge workers and entrepreneurs.

Software is everywhere today and represents a significant (\$9 billion and growing!) financial impact to the state. Skilled software workers in Oregon produce the code that makes medical equipment, websites, automotives, computer chips and a host of other products viable in today's market.

Currently the software industry is composed of those that publish and sell software, those who have web-based companies ("Web 2.0"), those that embed software in their products and Information Technology (IT) professionals that support a businesses' technological infrastructure, which is inclusive of both high-tech and traditional businesses.

Firms are located in Hillsboro, Portland, Beaverton, Wilsonville, Corvallis, Eugene-Springfield, Central Oregon and The Gorge.

Cluster Organization

The Software Association of Oregon is the leading organizational body for Oregon software companies. There are many associations that represent sub-sectors of the industry.

Cluster Strengths and Challenges

Strengths

- Networking opportunities – Oregon has an active network of people that organize social events critical to progress in development.
- Significant Research and Development – HP, Intel and other major high-tech companies do their research and development in Oregon due to our human capital and tax credits.
- Open Source – two of the greatest minds in Open Source reside in Oregon: Ward Cunningham (father of the Wiki) and Linus Torvalds (father of Linux), as well the Open Source Lab at Oregon State University and many open-source start-up companies
- Sub-clusters in collaboration, financial, education, construction, medical, automated flight, gaming, sustainability, G.I.S., insurance and talent management software development
- Progressive mentality – Software professionals value creativity, freedom, originality, education, artistic endeavors and appreciate nature/sustainability.

Average Wage 2006: \$72,900

Cluster Employment 2006: 52,000

Average Wage Growth 2003-2006: 13.4% total payroll growth.

Cluster Employment Growth 2003-2006: 11.2%

Competitive Share Growth:

7.4% greater than the national average.

NOTES:

- Every 10 software related jobs in Oregon supports an additional 13 jobs in other sectors of the economy.
- Software Industry produced over \$833 million in state and local tax revenue in 2005.
- \$9.2 billion in aggregate economic impact from the software industry in 2005
- 2005 Aggregate Wages = \$3.2 billion
- Between 2004-2014 employment in the software publishing industry is forecast to rise by 22.7% and employment in computer systems design and related services will increase 30.1%.

Challenges

- Financial Capital
 - Less local capital available to entrepreneurs on a per-capita basis than neighboring states Result: companies move out of the state in order to obtain necessary funding.
 - Oregon's nation-leading capital gains tax causes tax advisers who exercise fiscal prudence to encourage high tech entrepreneurs to leave the state before selling their business.
 - The Oregon Investment Fund, with over \$150 million in capital, invests a small percentage into Oregon-based start-ups, in spite of a legislative mandate to do so.
- Human Capital
 - Qualified workers – Local companies must import qualified workers.
 - Few students pursuing degrees – the demand for computer science degrees lags far behind the demand for these skilled workers. Many students and parents are still under the (incorrect) impression that outsourcing will make these jobs nonexistent.
 - Math, Science, Technology and Engineering education in K-12 lacks strong emphasis and funding. Lower rate of women and minorities in these classes.

Key Trends

- Utilization of “Web 2.0” platforms to create businesses with very little up-front capital required.
- Large data centers (like Google's in The Dalles) are the future of IT. Oregon's inexpensive hydroelectric power and access to significant data grids makes it a top location for these centers.
- Retirees with technical expertise, investment capital and time on their hands are moving to Oregon in droves, looking to put their resources to work in an active retirement.
- Major opportunities for software applications to aid solutions to carbon, water and other resource management and sustainability challenges. Some Oregon companies are already taking a lead.

Recent Accomplishments

- The Engineering Technology Industrial Council worked hard to receive an increase in funding for engineering programs at our state universities from the Oregon Legislature in 2007.
- With the growth of social networks (FaceBook, LinkedIn, MySpace, etc.), local companies with expertise in these applications have enjoyed large rounds of investment.
- In 2007 the Software Association of Oregon created a social networking site to help members find and create value networks.

Actions for the Future

- Invest in Science, Math, Engineering & Technology education in pre-K through post-graduate educational system. Make policy leaders, foundations, universities, teacher training programs, educators, career counselors and parents/guardians aware of and committed to encouraging the pursuit of the education required to obtain these great jobs.
- Secure Workforce Development dollars to improve the skills of existing knowledge workers.
- Provide a range of economic development tools to keep companies in the region, give incentives for companies to relocate here, and decrease taxes that cause investment capital to flee.

For More Information

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This cluster summary was produced with the help of the Software Association of Oregon.

Education Technology and Services

Cluster Description

All organizations and companies are located in the northwest with additional supporting firms located outside the region. Most of the organizations are located in the greater Portland metropolitan area. A few are from Eugene, Salem and Southwest Washington

Organizations and companies that are in the NW Education Cluster generally offer education technology products and services that are mostly software based but some are hardware based as well. These include assessment products, educational content, back-end school support software, online charter school management, early childhood education and workforce training.

Cluster customers are schools, school districts, and other education companies located throughout the US. One study found that the majority of member companies derive more than 80 percent of their revenue from outside of Oregon. Around 80 percent of the organizations work in the K-12 education space.

The largest member company in the cluster is Knowledge Learning Corp., a childcare and learning provider headquartered in Portland, with over 41,000 employees and revenue in excess of \$1.6 billion. There has not been a study as to the number of jobs that NW Education Cluster member's contribute to the region but besides Knowledge Learning there are more than five organizations that have over 40 employees in the area (Learning.com, Inspiration Software, Vernier, ViaTraining, and Clarity Innovations) and two have more than 200 employees (NWEA and Insight Schools). The NW Education Cluster is researching the potential to do an impact study but currently funds for such a study are lacking

Cluster Organization

There are over 40 companies and organizations that are members of the NW Education Cluster. Membership is open to any NW area company that provides education products and services. The organization structure is informal and there are no member fees. There are quarterly meetings. The cluster is affiliated with the Software Association of Oregon. The cluster has received no direct financial government support – though some state education-related agencies participate. It is a good example of a decentralized, spontaneous, networked initiative for knowledge-based industry and economic development. The website (www.nwedcluster.com) contains additional information about the cluster.

Strengths and Challenges

There are many keys that make Oregon a successful place for the NW Education Cluster. Oregon is attractive to educated people who are passionate about education. They are obvious employment targets for education companies, and obvious candidates to become education-related entrepreneurs. They don't want to leave Oregon, so the companies have to come here or stay here.

One challenge for many of the small companies in the cluster is access to startup funding. In the past there has not been a great deal of access to venture capital in Oregon. This has not changed much even with the state attempting to invest in startup companies lately.

Vision for the Cluster

The cluster is looking at building a larger presence in the local school district systems. With the current financial situation, cluster organizations are looking for ways to creatively work with schools and the public-sector agencies. There is the potential to better formalize the structure of the cluster.

Growth Rates

The cluster hopes to maintain its current rate of growth – the next few years will be a challenge. There are still other potential organizations serving the K-20 market that are located in the NW that have not joined the cluster.

Key Actions for the Future

- Carry out a potential impact study
- Get national speakers to talk at upcoming meetings
- Spark investment in the cluster
- Explore opportunities for articulating shared needs, addressing common challenges within the industry
- Explore opportunities for effective interface with public, non-profit, and private-sector agencies, groups, and associations.

This cluster summary was developed with the help of the NW Education Cluster.

Digital 3D

Cluster Description

The Oregon Digital 3D Initiative is a collection of companies, universities, and other organizations who participate in Oregon's digital 3D industry. This includes suppliers of hardware, software, services, and education. The digital 3D industry in Oregon is surprisingly broad and diverse. OD3I was created to look for the unexpected collaborations that will lead to the most significant innovations.

OD3I is fairly new, and consists of 31 members. It is growing quickly. Most of the members are in the Eugene-Corvallis-Salem-Portland part of the Willamette Valley, with one company in Medford and one in Bend. All of the OD3I companies are traded-sector companies, with significant portions of their business outside of Oregon.

This is a sampling of what our member companies provide: 3D displays, 3D printing, 3D scanning, animation tools, chemistry visualization, console games, display systems, flight trainers, game engines, handheld game software, input devices, medical graphics, systems, motion capture, movie and commercial production, multicore processors for graphics, optical trackers, PC games, photorealistic rendering, projection systems, serious games, traffic simulation and visualization.



The
Oregon Digital 3D Initiative
"Collaborate, Innovate, Inspire"

In addition, our university members contribute research in areas such as:

Animation, architecture, augmented reality, digital art, geometric, modeling, GPU programming, motion capture, physical prototyping, real time realistic rendering, scientific visualization, stereo displays.

Strengths and Challenges

Our biggest strength in this area is our breadth and diversity. The most significant innovations are going to come about because groups with diverse experience and expertise combine their knowledge in ways not thought of before.

Our biggest challenge is to find and fund these collaborations. Many of our members are small businesses, and thus cannot afford to dedicate an employee to speculative collaboration. We are looking for state and federal funding to fuel these collaborations, as well as joint trade missions, joint participation at trade shows, targeted university research, creating an Oregon Digital 3D conference, creating regional workshops, etc.

Recent Accomplishments

We held our first all-hands meeting in September with nearly all members participating. Several collaborative efforts have grown out of that meeting, and we expect more in the months to come.

Vision for the Cluster

Digital 3D is the future. It does not matter what industry you are in – digital 3D will touch you in some way. And, when it does, we want Oregon industries to be there!

OD3I will act as a catalyst to escalate and accelerate collaborative innovation among the many companies and organizations in Oregon’s Digital 3D ecosystem. It will act as a “watering hole”, collaboration center, promoter, and business recruiter. It will allow us to target opportunities that none of us can go after by ourselves. The OD3I will also give us an avenue to inspire a future generation of high-tech Oregonians through 6-12 outreach. Our goal is to use this collaboration to radically change the dynamics of Oregon’s Digital 3D industry, for years to come.

This cluster summary was developed with the help of the Oregon Digital 3D Initiative.

Bioscience

Key Cluster Components: In Oregon, the bioscience cluster includes medical devices and components, diagnostics, research products (reagents, services and instruments/equipment), therapeutics, biomanufacturing, bio-ag and bio-fuels. Geographic locations include greater Portland, Albany, Corvallis, Eugene, and Bend.

Notable companies include Genentech, A-Dec, Biotronik, Tyco Medical, Welch Allyn, Invitrogen, Acumed, Bend Research, Suterra, Synthetech, Oregon Freeze Dry, Thortex, Sandvik Medical, Precision Wire Components, Tec Labs, HemCon, Neurocom, Electrical Geodesics, Inovise, iSense, Micro Power Systems, Mitosciences and many more. There are over 300 traded sector companies generating over \$2.5B in sales, employing over 7,000 employees with an average annual wage of over \$50,000.

Another key component of the Bioscience Industry Cluster is sponsored life science research, which totaled \$450 million in 2007. While Oregon Health & Science University (OHSU) conducts 66 percent of this research, other prominent institutions in Life Science Research include Oregon State University, University of Oregon, Portland State University, Oregon Institute of Technology, Kaiser Center for Health Research, Legacy Research, and Providence Research.

The Oregon bioscience cluster is built on the four cornered foundation of Research, Workforce, Funding, and Infrastructure. These elements exist in Oregon, they're growing, and, in fact, generate over \$2.5 billion in traded sector sales or sponsored research.

Average Wage 2008: >\$50,000

Cluster Employment 2008: >10,000

Average Wage Growth 2002-2008: >20%

Cluster Employment Growth 2002-2008: >30%

Source: Oregon Bioscience Association

Cluster Organization

The Oregon Bioscience Association is the principal organization for the cluster: The OBA mission is to optimize growth, economic health, workforce and technology development. It has a current membership of over 170.

Cluster Contact: Bob Lanier, Executive Director, OBA <http://www.oregonbio.org/bob@oregonbio.org>

Trends

- Universities are more engaged in technology-based economic development.
- OTRADI is the first of what will likely be more bio-based SRCs.
- Six major bioscience companies have a presence in the state.
- We continue to spawn startup bioscience companies in all four sub clusters.

Cluster Challenges

- A state-wide need for access to funding for seed, early and advanced stage companies.
- Universities must increase their impact on bioscience industry development.
- Fill the gaps in the Oregon bioscience industry infrastructure.
- Address the gaps in managerial talent and top scientific talent.

Cluster Action Ideas

Need for local funding for seed, early and later stage company development

- Support a sustainable pipeline of financing sources, including angel, seed and venture funding as well as university and Signature Research Center funding.
- Enhance Angel funding through
 - Personal state tax credits (i.e. similar to the situation for university foundation investments)
 - State matching of angel investments.
 - Reduce/eliminate the capital gains tax on such investments.
- Fund an Oregon BioSeed Fund targeted at early stage companies.
- Expand and stabilize support for SBIR/STTR grant applications and provide matching and gap funds to leverage this significant funding source.
- Re-examine and modify the PERS investment strategy to encourage more venture funds specializing in the Biosciences to make investments in Oregon.

Need for universities to increase their impact on bioscience industry development

- Recruit research staff to fill key bioscience competence gaps in the university system.
- Encourage commercialization of university based intellectual property.

Bioscience industry infrastructure

- Create a system of accelerators/incubators which contain wet lab and clean room space.
- Create incentives for private developers to build wet lab and clean room space.
- Help universities to more user friendly to early stage bioscience companies.

Need to address the gaps of managerial talent, and top scientific talent

- Build a pipeline of leadership talent.
- Through state/private fellowships increase the number of quality graduates.
- Ensure that there is a Biotech Management option in MBA programs at OUS.
- Expand the Health Science Professional Management certificates available from OUS.
- Create an executive level “Bioscience Mentoring Program.”

Other Opportunities

- Provide incentives for organizations to purchase Oregon-made technologies and products.
- Work with OECD to develop a package for the 2009 legislative session.

This cluster summary was produced with the help of the Oregon Bioscience Association.

METALS, MACHINERY AND MANUFACTURING CLUSTERS

Despite concerns about the decline of manufacturing nationally, Oregon remains a place that makes things. Oregon's clusters in metals, machinery, and transportation equipment include firms making primary metals such as steel and titanium, producers of fabricated metal products ranging from knives to steel structures, and makers of a wide range of industrial machinery, barges, trucks, and recreation vehicles.

More than 50,000 Oregonians work at jobs related to metals, machinery, and transportation equipment, according to estimates by the Oregon Economic and Community Development Department. Oregon exports about \$4 billion dollars worth of machinery, transportation equipment, and metal products annually.

Although most of the state's metals, machinery and transportation firms are concentrated in the Portland metropolitan area, these clusters are represented in communities around the state.

Over the past five years, Oregon manufacturing clusters have significantly outperformed their counterparts elsewhere in the country. Employment in primary metals and transportation equipment grew more than 10 percent in Oregon from 2003 to 2008, while those industries were in decline nationally. Employment in fabricated metals grew at more than triple the national rate during this period, and Oregon machinery employment increased twice as fast as in the rest of the nation.

The current recession will pose major challenges for many of Oregon's manufacturers. Markets for capital investment goods – like the steel or equipment that goes into new factories – are among the most sensitive to economic cycles. Similarly, consumer spending on big ticket durable goods like recreation vehicles is also affected by the recession. In the longer term, growth prospects for these industries seem to be favorable.

Manufacturing

Description

Manufacturing is an activity that many different industry clusters engage in, including metals, machinery, transportation equipment, computer and electronic products, wood and paper products, food processing, apparel and sporting goods, solar, bioscience, and many others. Firms that engage in manufacturing are located across Oregon, with the strongest presence in the Portland Metro Area. Oregon manufactured products serve customers around the globe.

Organization

Many of the clusters that engage in manufacturing are highlighted in other sections of this guide. Several have their own organizational entities and a unique set of priority initiatives. However, manufacturers across a variety of industry clusters face common challenges operating in a fiercely competitive global market.

Two groups in particular have been working actively across industry lines to pursue a “manufacturing agenda” for Oregon.

The Oregon Manufacturing Workforce Steering Committee represents a cross section of key industries, association and regions committed to expanding the reach of high-performance manufacturing, raising awareness of the importance of manufacturing and attracting workers to high wage, high-demand occupations. The Steering Committee is charged with implementing the Governor’s four-year, industry-developed strategic plan to build competitive companies, fill the skilled worker shortage and provide high-wage jobs for Oregonians.

Created in 2004, the Manufacturing 21 Coalition (MFG 21) is a private-public partnership, including members from business, labor, education and training institutions, and local workforce development boards. Manufacturing 21 advocates for interests of the manufacturing industry in Oregon and SW Washington. Its goals are to tackle two big 21st century challenges – sustaining a highly skilled workforce and expanding the region’s capacity to support innovation through applied research and development.

Strengths and Challenges

Strengths:

- Quality of life: low traffic congestion, lower cost of living, accessible outdoor recreation activities improve the ability to recruit and retain professional talent (operations, engineering, finance, sales/marketing, managerial, etc.)
- Historically lower-cost power, wages, and workers compensation costs than California
- Proximity to coast: raw materials imports and final product exports
- Niche companies with high quality products

Manufacturing is made up of 21 distinct sectors ranging from metals and transportation equipment to wood products to computer and electronic equipment.

Average Wage 2007: \$51,723

Employment 2007: 204, 300

Number of Companies 2007: 6,038

Average Wage Growth 2004-07: 10.69%

Employment Growth 2004-07: 2.25%

Top Sectors by Employment

Metals, Machinery and Transportation Equipment: 55, 681

Computer and Electronic Products: 40, 690

Wood and Paper Products: 35,887

Source: Oregon Employment Department Oregon Labor Market Information System (OLMS). CES and OCEW data (NAICS 31-33)

Challenges:

- Access to mid-skill level, drug-free workforce
- Demographics: a) competition for same employees, b) aging workforce with significant turnover in near future, c) cultural and language barriers within a diverse workforce
- Connection between educational institutions/ workforce training providers & industry: a) while improving, a lack of coordination among community colleges and universities still impedes progress, b) regionalization of education and workforce makes it difficult for employers to find out who does what, c) workers needs more flexible education programs that evolve with the industry
- Transportation: a) Air travel: not enough direct flights from Portland to/from East Coast, Europe, & China b) Rail c) Mass transit accessibility, d) Port prices
- Image of manufacturing industry in general, made worse by the string of recent downsizings and closures in Oregon manufacturing plants
- Lack of awareness and financial commitment to support a long-term high-performance agenda, which is critical to maintaining competitive advantage.

Key Actions for the Future

Workforce:

- Aggressively expand manufacturing-related Career Technical Education programs and promote Career Pathways as a systems-building strategy to link high school, community college and university programs of study.
- Adopt a statewide Career Readiness Certificate that would signal “readiness for work” based on specific, standardized criteria and aligned with 21st century workplace foundation skills.
- Adopt a statewide “Core/Foundations Certificate” in Manufacturing/Green Tech offered by the community colleges and targeted towards “middle skill” production and technician occupations that emphasizes critical foundation academic, employability and cross-cutting technical skills.
- Expand and prioritize training programs in clean/green technologies that have a documented, immediate need, such as wind turbine and solar that will support the state’s sustainability agenda.
- Aggressively address the need for more qualified instructors to teach technical courses in high-demand occupational areas at all levels; train retired or semi-retired skilled workers.
- Expand programs to strengthen science, technology, engineering and mathematics at the middle, secondary and community colleges, which offer project-based, problem solving curriculum along with experiential learning and extracurricular activities.

Workplace:

- Increase innovation & improve productivity by replicating & expanding high performance consortia throughout state (HPEC) and high performance/lean manufacturing training offered through the Oregon Manufacturing Extension Partnership (OMEP).
- Strengthen the technology transfer partnerships between firms and university applied research.
- Expand efforts to promote drugfree workforces through the training and education programs of Workdrugfree Oregon.

Both the Workforce and Workplace initiatives must incorporate the means to educate, recruit, train, promote and retain employees who reflect the increasingly diverse Oregon population.

More information

The Voice of Oregon Manufacturing. www.oregonmanufacturing.org (a website of the Governor's Manufacturing Workforce Strategy).

Manufacturing 21 Coalition. www.manufacturing21.com/

This cluster summary was produced with the help of the Governor's Manufacturing Workforce Steering Committee.

Aviation

Cluster Description

There are about 200 firms in Oregon, providing manufacturing, first- and second-tier supply-chain services, and product distribution. While most manufacturing is centered on or near public-use airports (Portland, Scappoose, Redmond, Bend, Aurora), supply-chain and distribution firms exist in at least 15 Oregon communities, both urban and rural. They produce or provide manufacturing for avionics, airplane components and assembly, raw material for fabrication, and unique components for specialty aircraft (e.g. “Alaska Bushwheel”) in communities such as Joseph, Oregon. Their customers are individual purchasers, as well as major airframe manufacturers in other states (e.g., Cessna Aircraft in Kansas). Additionally, Oregon’s kit plane manufacturers provide over 70 percent of the kit plane sold within the U.S. each year to customers globally. The industry cluster includes those businesses providing fabrication services locally, which has created a robust maintenance and repair for all sizes of aircraft, including balloons and forest-fire fighting airframes. There are over 13,500 family-wage and professional-level jobs in Oregon, with an average annual salary of \$58,500, plus benefits. As orders for airplanes, components, and avionics/communications equipment sales are in place for all planned production, our conservative estimation is that 5 percent annual growth in this industry is continuing, despite gloomier trends in other transportation traded and non-traded sectors. Key competitors include international manufacturers in Brazil, Republic of Czech, Canada, Mexico, and providers/manufacturers in three other states.

Cluster Organization

The Aerospace Industries Coalition is re-forming into this cluster. Some businesses represented under the Heavy Lift Helicopter Cluster have indicated a willingness to also participate in the newly formed Aviation Industries Cluster, and there will also be some overlap with the Manufacturing Cluster. There will also be representation within this cluster from the Oregon Aviation Business Association, the Oregon Airport Manager’s Association, and the Oregon Pilot’s Association. Cluster contact is Daniel E. Clem, Director, Oregon Department of Aviation 503-378-2340.

Cluster Strengths and Challenges

Strengths include the singular focus on aircraft manufacturing and the strong foundation of existing inter-reliance upon each other to produce aircraft components and related products. There is current strong emphasis on use of airports and aviation industries for economic development at many of Oregon’s airports, including Port of Portland, Bend Municipal Airport, Salem’s McNary Field, Scappoose Industrial Park, Aurora State Park, and Baker City Municipal Airport. Challenges include the instability and inconsistencies of FAA funding and policy-making in aircraft manufacturing and oversight; erratic fuel pricing; inability to obtain commercial short-term lines of credit because liability concerns (real or imagined) by the banking community.

Vision for the Cluster in Oregon

This industry will likely continue to grow and its success is interdependent with economic and land-use vision of the local communities. We anticipate that the small aircraft manufacturing market will continue to employ more people as the smaller aircraft’s

efficiencies in reducing greenhouse gases, improved fuel consumption efficiencies, and lower acquisition costs will be attractive in a time when constraints on renewable energy resources in the next decade accelerate. We believe that the growth rate will continue at the current 5 percent, if not at a higher rate for the next decade. The installation of Oregon-manufactured Garmin avionics and communications devices within the FAA's Next-Gen-2025 infrastructure will synergize with Oregon's exploding competencies in producing aircraft using carbon-fiber materials throughout the airframe. These products, exclusive to Oregon manufacturers, are currently in high demand and will continue to be so for the next 3-5 years.

Recent Accomplishments

The cluster is forming from the organizations and associations mentioned previously.

Key Actions for the Future

1. Recommend strategies to retain current levels of employment in Oregon's aviation manufacturing industries.
2. Recommend an immediate-impact economic stimulus package to overcome financing barriers.
3. Recommend strategies for support by a state aviation caucus.
4. Potential declaration by state government of "financial disaster" to create access to low-interest federal disaster relief-type/loans/programs for aviation manufacturers. Period of loans could be short-term (2-5 years) or under existing SBA terms for a 30-year period, without requirements for collateral or conditions based upon other forms of credit or financial relief.
5. Support statements and policies from the FAA in the area of aircraft inspections and certification processes. These statements and policies should cause local/regional inspection and certification personnel to be more responsive to the projected roll-out date(s) of new planes or equipment.
6. Curtailment or delay of intended FAA policies and rules requiring more administrative or non-safety-related requirements.
7. Access to low-interest credit/borrowing (due to banking industry hesitation to extend any credit). Could possibly include: opportunity-based credit, wherein divestiture or mergers can more easily be financed, and "innovations" R&D funding to continue projects in development.
8. Methods to lower cost of aviation-related liability insurance, i.e. industry-based risk pooling.
9. Incentives to health insurance providers to lower costs of employer-provided health insurance to employees.
10. Training programs which support craftsman-level production. Current local training programs provide only apprentice-level welders/fabricators/CNC operators, which are not trained to unique and highly-technical level of skill required for airframe structural and high-technology manufacturing.

This cluster summary was produced with the help of the Oregon Department of Aviation.

SPORTS APPAREL AND RECREATION PRODUCT CLUSTERS

Oregon is home to the world's most recognized brands in footwear and sports apparel. Locally headquartered firms include Nike, Columbia Sportswear and the North American headquarters of Adidas. Other recreation related firms flourish in communities around the state, from aluminum boat builders in Southern Oregon, to wind sports gear manufacturers in the Columbia Gorge and bicycle manufacturers in the Willamette Valley.

According to the Oregon Economic and Community Development Department, this cluster employs more than 11,000 workers in the state.

In the past few years, a number of new businesses have been attracted to Oregon by the strength of the existing cluster of businesses, and the strong local talent base. These firms include Keen, a maker of outdoor footwear, and the headquarters of Yakima, the nation's leading supplier of car racks and accessories. In addition, there have been many local startups and spinoffs in related industries.

Competition in these industries features a combination of fashion, performance and sustainability. Oregon firms have been leaders in developing new and improved products that meet these criteria.

Although this sector of the Oregon economy continued to grow through the 2001 recession, the apparel sector may be harder hit this time around. Consumer spending is down, and many of the nation's retailers are retrenching. In the long term, the trends toward more active lifestyles, both in the U.S. and in developing countries around the world, create potential future growth opportunities for this sector of the Oregon economy.

Activewear/Outdoor Gear

Cluster Description

The Portland metropolitan area and Oregon have long been home to performance footwear and apparel companies with global brands. Some industry pioneers can trace their history back decades – Pendleton Woolen Mills was born in 1863; Columbia Sportswear in 1938; and Nike in 1972. From the foundation and success of such companies, the cluster’s growth is fueled by the immigration of talent and the emergence of new firms, many of which are spin-offs of the larger companies.

The Activewear/Outdoor Gear Industry includes companies involved with the production and sales of footwear and apparel and gear associated with bicycling, water sports, hiking, mountaineering, skiing, in-line skating, rock climbing, backpacking, camping and related activities.

The Activewear/Outdoor Gear industry in Portland can be generally grouped into two major categories with very different needs: 1) globally based firms that are headquartered in the Portland region and conduct design, development, marketing and distribution in the region but that manufacture elsewhere; and 2) small to mid-sized, and emerging businesses that perform the sales, marketing and distribution functions in Oregon. In some cases, these firms also produce the product in Oregon, but lack the production capacity or demand of the larger firms and those that are U.S. subsidiaries of foreign companies.

Industry growth in the past 10 to 20 years has been propelled by the increasing popularity of outdoor recreational activities, new fabrics and technologies, and the fusion of outdoor-inspired styles in to more general fashion circles

Cluster Organization

There is no organization through which companies can articulate key issues, challenges, and opportunities. The Outdoor Industry Association (OIA) operates at the national level and serves a very broad industry membership.

Cluster Strengths and Challenges

Strengths

- **Strong creative talent drawn by headquarters for the “big three”:** the region is one of the top 5 national net importers of talent. Nike, adidas and Columbia Sportswear and the spin-offs they generate have fueled the talent pool by attracting other firms and individual to the region.
- **Synergy between companies:** Regardless of a ferocious need to be the first to bring the best performing products to market to protect intellectual property, firms trade and share talent. People seem to have career paths that cross firms in the Portland region and nationally. These firms also fuel start-ups and encourage other firms to locate in the Portland region to access the talent pool.
- **This state is a playground:** easy access to a wide variety of recreational opportunities for product testing and recreation is very attractive to the industry.

- **Active Lifestyle:** Oregonians have a reputation for pursuit of active lifestyles and an awareness and desire to have a better live-work balance that is attractive to creative talent.
- **Sustainable reputation:** Oregonian’s deeply rooted commitment to sustainable policies, practices and lifestyles and its requirements for protecting natural resources make this state a Nirvana for companies seeking enlightenment in “green” practices and a refuge for those companies’ leaders.
- **Geographic Location:** Direct flights to Asia, Mexico, Canada, West Coast, Midwest and East Coast cities. This facilitates connections between West Coast designers and material sourcing and manufacturing a majority of which is conducted in Asia. The connectivity also promotes commerce and the exchange of ideas.
- **Increasing national popularity of outdoor recreational activities:** the development of new fabrics and technologies with a focus on performance and sustainability; the fusion of outdoor-inspired styles into mainstream fashion; and an uncertain economy.
- **Innovation:** Portland ranks 7th in number of patents issues per 1,000 population outranking Boston, Seattle, Los Angeles and New York
- **Affordability:** Residential, industrial and commercial space in Portland is cheaper than many other metro areas in the US and all on the West Coast.
- **Higher Education collaboration:** Oregon University System is responsive to industry needs and collaborates with private and public sector organizations to support industry expansion.

Challenges

- **Competitive nature of industry companies:** It has been challenging to convene industry players to identify issues considered “safe” to discuss in the form of initiatives that will contribute to the Oregon cluster’s global competitiveness.
- **Lack of a unifying group/organizational body:** there has been no organization companies can seek in which they can articulate key issues, challenges, and opportunities. The Outdoor Industry Association (OIA) operates at the national level and serves a very broad industry membership.
- **Fees and Taxes:** City of Portland Business License Fee and Business Income Tax are not competitive with other jurisdictions in the region.
- **Oregon does not have a nationally or globally recognized design program:** Many designers are recruited outside of Oregon.
- **Access to venture capital.**

Key Actions for the Future

Local industry leaders agreed the cost to recruit Material Connexion to Portland was too high. Instead, PDC is collaborating with local leaders (University of Oregon, PSU, Ziba, OECD, industry leaders) to explore development of local materials library.

OECD, Greenlight Greater Portland, and Portland Institute of Metropolitan Studies are collaborating on an Activewear Industry study.

This cluster summary was produced with the help of the Portland Development Commission.

CLEAN TECHNOLOGY INDUSTRY CLUSTERS

Oregon's commitment to alternative energy development and sustainability policies have made the state a leader in a range of emerging clean tech industries. Clean tech includes companies that develop alternative wind, solar, and tidal energy, and that design and develop more sustainable products, including green buildings and vehicles.

Over the past year, Oregon has emerged as a key location for the growing solar power industry. Tapping the state's established workforce and facilities for advanced semiconductor manufacturing, global businesses have announced more than \$1 billion in investments in new facilities to manufacture solar photovoltaic cells and related technologies. Solaicx and Solar World are investing in the heart of the Silicon Forest, while Peak Sun and Sanyo are building facilities in Millersburg and Salem.

Portland is the nation's leading market for hybrid-electric vehicles, with the highest level of per capita purchases of hybrid cars of any metropolitan area in the United States. Oregon is working closely with Toyota and Nissan-Renault to explore the development of infrastructure and policies to support the future deployment of plug-in electric vehicles in Oregon.

Portland is a key leader in the development of sustainable buildings, with the highest number of LEED accredited buildings of any city in the United States. The state's green building industry is estimated to have a total payroll between \$300 and \$900 million annually.

Customer attitudes and public policy play key roles in the development of clean tech industry clusters in Oregon. Oregon consumers are avid purchasers of a range of green products, creating a demanding local marketplace. State and local governments have also encouraged the development of these technologies through regulatory reform and through procurement and subsidy programs like the Business Energy Tax Credit (BETC). State and local governments have also played key roles in helping promote the industry and in researching new technologies, like wave energy.

While the current recession has blunted investment budgets, interest in clean tech energy sources continues to grow. The likelihood of a national strategy to reduce greenhouse gas emissions is likely to fuel demand for a wide range of clean technologies in the coming decade.

Green Building and Development

Cluster Description

Oregon's green development industry cluster includes architects, developers, engineers, planners, product developers, non-profits, government agencies, higher education, community colleges and service providers working to design and build environmentally sustainable communities here in Oregon and around the world.

Cluster Organization

A group of cluster representatives has been meeting since early 2007 to accelerate green development in Oregon and strengthen Oregon's competitiveness in the global economy. The Oregon Economic and Community Development Department, the Portland Development Commission and the City of Portland have provided organizational help.

Cluster Strengths

- Political leadership and government support at state and local levels
- Business energy tax credit (BETC)
- Collaborative culture – connections between industry, government & community organizations and connections with other industries
- Lower costs for professional services, electricity, and housing relative to competitor regions, e.g., Bay Area
- Intellectual capital – workforce with sustainability skills, understanding & attitudes
- State's sustainability ethos and appreciation of state's quality of life/livability
- Natural resources: water, wind, waves and biomass

Cluster Challenges

- Education and workforce, particularly energy analysts and modelers
- Slowdown in construction projects
- Smaller scale of venture capital compared to other regions
- Time and money required to get regulatory approval of new materials/processes

Recent Accomplishments

- PDX Lounge, a highly collaborative intersection of local government, businesses and non-profit organizations transforming Oregon's legacy of environmental stewardship into a profitable new business model, was recreated as part of West Coast Green 2008.
- The Portland + Oregon Sustainability Institute (POSI) has found an interim home at the Left Bank Center and has hired an Executive Director. POSI will serve as the

The green development cluster includes specialized wood product manufacturing industries, architects, engineers and other professional services. About two thirds of employment in this cluster is in manufacturing industries with the other third coming from professional services.

Average Wage 2007: \$45,617

Average Wage Growth 2004-2007: 10.4%

Cluster Employment 2007: 41,491

Cluster Employment Growth 2004-2007: 4.2%

Top five counties by cluster employment 2007:

Multnomah: 24.0%

Lane: 12.6%

Washington 12.1%

Marion: 9.1%

Clackamas: 7.6%

Source: BLS, QCEW data based on cluster definition from 2005 Cogan Owens Cogen report for OECDD. Exact NAICS codes used available upon request.

permanent location for PDX Lounge and will provide a variety of services to the Green Building and Sustainable Development sectors of the area's economy.

- The Department of Consumer and Business Services' Building Codes Division has taken a number of actions to facilitate the adoption of green building practices, such as dedicating specific staff to work on green building issues, approving the use of wastewater conservation systems for commercial and industrial buildings and making alternative method rulings on rainwater harvesting.
- Governor Kulongoski's Energy Efficiency Working Group (EEWG) and Renewable Energy Working Group (REWG), which both included a number of participants from the Green Development Cluster, debated several of the cluster's initiatives as recommendations for the Governor. Many of these recommendations will be debated in the 2009 legislative session.
- Portland was again ranked #1 in SustainLane's sustainable US city rankings. Portland also came out on top of the green building category within rankings. This category rated cities on the per capita number of LEED-registered buildings with additional points given for higher levels of LEED certification.

Key Actions for the Future

- Support a mechanism (policy, funding, etc.) that facilitates energy efficiency retrofits of existing buildings.
- Adopt a state policy platform, e.g., 2030 Challenge, to continue to push the envelope for green building and maintain the state's leadership position in this sector.
- Require energy performance certificates, similar to mpg ratings for vehicles, as part of the sale of homes and buildings so that prospective owners understand the relative energy performance of the properties.

This cluster summary was produced with the help of the Oregon Economic and Community Development Department.

Environmental Technologies and Services

Description

Technologies & services addressing environmental protection & cleanup, waste & recycling, energy & efficiency, water & wastewater, sustainable development, and sustainable business practices.

Company activities include the design and sale of products & technologies, engineering, consulting, science, legal services, laboratory services, contracting & field work, project development, finance, insurance, and other related services.

Oregon strengths include stormwater management, pollution clean-up (soil & water), pollution prevention technologies, engineering, legal services, renewable energy services, and carbon management services.

Organization

Northwest Environmental Business Council (NEBC), Robert Grott, Executive Director (robert@nebc.org), www.nebc.org

Established in 1996, NEBC is a trade association representing the leading environmental technology and service firms in the Northwest who are working to protect, restore, and sustain the natural and built environment. Objectives include business development, member education, information dissemination, networking, and regulatory and legislative advocacy. NEBC's structure as a cross-discipline, cross-sector organization fosters transfer of knowledge and builds synergies and business opportunities among members. NEBC's activities cover the states of Oregon, Washington, Idaho, Montana, and Alaska.

Strengths and Challenges

Current growth in this cluster is driven by state support for renewable energy, voluntary action on climate change, green building, and a renewed emphasis on environmentally responsible practices (tied to "sustainability" as a driver of business decisions). However, Oregon's relatively small size, means that local firms export much of their services – which can lead to a shift of staff to other offices. While Oregon is a desirable location for potential workers, more needs to be done to recruit experienced technical professionals to the state.

New Trends

In addition to the strong growth in energy related work, a number of firms have added "climate management" practices, and new firms in this field are making Oregon their home – working on carbon footprinting, carbon offset trading, and offset project development. These firms are the ones who are now guiding traditional industry and government clients in

Scope

The environmental technologies and services cluster includes a broad range of company types, including product developers & vendors and service firms in the areas of engineering, science, law, consulting, insurance, laboratories, contracting, field work, construction, project development, etc.

Of the several hundred Oregon companies working in this sector, many overlap into other sectors, making it difficult to segregate employment data.

Growth

The ascendance of Renewable Energy & Climate Change as driving issues, plus the resurgence of interest in environmentally sensitive practices (tied to "sustainability") has led to rapid growth of this cluster.

Jobs

Prior to the current economic downturn, job growth had been quite strong, with many technical positions going unfilled due to a shortage of skilled applicants. The shortage is most acute for experienced, project manager level professionals.

Export

While this sector is dominated by service providers, a substantial amount of their work is performed outside of Oregon, with the revenues returning to the state.

taking voluntary action. This trend will increase sharply if carbon reduction becomes a regulatory mandate.

Key Cluster Activities

- Working with government and regulatory agencies to advance appropriate regulation, economic incentives, and receptiveness to technology and process innovation.
- Working with the insurance industry to overcome barriers facing energy projects.
- Educating businesses about climate change and the range of possible responses to it.
- Exploring market-oriented approaches to protecting ecosystems.
- Joining with other clusters to address workforce issues.

This cluster summary was produced with the help of the Northwest Environmental Business Council.

Energy Efficiency

Cluster Description

This cluster includes more than a thousand firms across Oregon and the Northwest region with a diverse set of products and services, holding in common their capacity to reduce energy use and cost in commercial, industrial, and residential buildings. Cluster components include manufacturers, distributors, and retailers of energy efficient products, architectural design and engineering services, building commissioning, and electrical and mechanical contractors. This set of sales and professional service positions support trades positions such as plumbers, pipefitters, sheet metal workers, and electricians. This cluster supports the largest network of “green jobs” in the State of Oregon. Wage rates are competitive and job growth potential in the cluster is strong.

Cluster Organization

A number of sector specific industry and trade associations represent interests in this cluster, including the American Institute of Architects, American Society of Heating, Refrigeration and Air-conditioning Engineers, Illumination Engineers Society, a number of trade groups, as well as trade unions. The Northwest Energy Efficiency Council (NEEC) is a regional trade association representing a broad array of business types that have energy efficiency as a core product and service function.

Cluster Strengths

- Twenty five year history of delivering building related energy efficiency solutions for Oregon customers
- Partnership relation with Oregon utilities and the Energy Trust of Oregon
- World class businesses known as national leaders and innovators in green and efficient building design and technologies
- A business case for products and services that offer triple bottom line advantages
- State tax credits which encourage investment by building owners in energy efficiency
- Efficiency is the “first fuel” in a new energy economy that is focused on carbon reduction
- Energy efficiency is a high yield, low risk investment for building owners

Cluster Challenges

- Energy efficiency investments often have higher first cost (but lower life cycle costs) necessitating capital availability
- End use customers remain unaware of quality investment grade opportunities in their properties
- Split incentive challenges – tenants pay energy costs, but property owners make infrastructure investment decisions
- Workforce needs of the industry are not being adequately met by education and training institutions and thereby retarding rate of growth in the cluster

Vision for the Cluster in Oregon

This cluster has enormous potential for leading and innovating a new energy economy in the United States. Serious greenhouse gas reduction strategies are all built on a foundation of maximum penetration of energy efficient technologies in the built environment. Utility economics favor energy efficiency as the lowest cost resource to meet future electrical energy needs in the state, region, and country. Developing economic capacity at a multiple of 2 to 4x from current levels is realistic and would result in the creation of tens of thousands of new jobs in the state.

Recent Accomplishments

Organizations such as the Energy Trust of Oregon and Bonneville Power Administration are exceeding targets for energy efficiency acquisition. The cost of the acquisition of this resource is a fraction of the marginal cost of new traditional generating capacity. Oregon is one of the national leaders in the design and construction of buildings earning recognition from the Leadership in Energy and Environmental Design (LEED) rating system. NEEC produced a report on energy efficiency cluster workforce needs that finds Oregon companies bullish on job growth potential. The report can be reviewed at <http://www.neec.net/>.

Key Actions for the Future

The current economic downturn may exacerbate sufficient access to capital for building owners to make prudent investments to improve the energy performance of their properties. Policies and programs that facilitate adequate capital access, especially those with attractive terms and low transaction costs, will help. Tax credits that further enhance those investments can also stimulate additional growth. Cap and trade mechanisms for greenhouse gas reduction that provide clear market signals on the advantage of improved energy performance will be necessary to fuel the development of a clean energy economy. Regulatory flexibility may be required to ensure sufficient opportunity for new approaches and successful deployment of new efficient technologies in the field. Education and training institutions must work closely with cluster employers to develop curriculum and in-field experiences for students to make them work ready for growing industry needs. The recent NEEC report

The incoming Obama administration is considering energy efficiency investments as a key stimulus component of its economic recovery plan. Northwest companies should take aggressive action now to position themselves for business growth if and when a stimulus package is enacted.

For More Information

Northwest Energy Efficiency Council, www.neec.net

This cluster summary was produced with the help of the Northwest Energy Efficiency Council.

Solar Energy

Cluster Description

This statewide industry includes a range of solar industry companies, from solar panel installation, manufacturing, and development, to solar water heating.

Oregon's existing semiconductor industry provides a natural fit for attracting solar photovoltaic manufacturers. Competition for solar manufacturers is high as many others see the advantages of starting a cluster at this early stage to take advantage of the economic opportunities and jobs and reap future rewards as the solar industry continues to mature.

Cluster Organization

This cluster is represented by the Oregon Solar Energy Industries Association (OSEIA), which is dedicated to developing a strong renewable energy industry in Oregon.

Cluster Contact: Desari Strader, Oregon Solar Energy Industry Association, l@oseia.org www.oseia.org

Trends

- Renewable Portfolio Standards
- People will pay more for renewable energy
- Far greater interest and demand for solar energy products

Oregon Advantages

- Good infrastructure and suppliers here due to Oregon's semi-conductor industry base (materials and manufacturing process are very similar)
- Solar PV is in a great position to take advantage of a previous slump in the semiconductor industry (former semiconductor manufacturing plants can be used to make solar cells)
- Existing workforce has skill sets and education needed by solar PV manufacturing because of semi-conductor industry here.
- Less traffic and travel time than in the Bay area (a competing semiconductor manufacturing hub)
- Policies & Tax Credits: BETC, RPS



Solar energy is one of the fastest growing industries worldwide. The photovoltaic manufacturing and installation sector in particular has seen steady growth over 30% annually for the past 10 years. Recent growth rates exceed 40%.

The following data includes all renewable energy production industries in Oregon.

This cluster is composed of industries that focus on utility and power construction, energy production, and professional and technical services. Half of the employment in this cluster is from energy-related manufacturing. Professional and technical services account for 30%, and construction makes up the balance with 20%.

Average Wage 2006: \$59,149

Cluster Employment 2006: 27,893

Average Wage Growth 2003-2006: 9.62%

Cluster Employment Growth 2003-2006: 8.12%

Source:

BLS, QCEW data based on cluster definition from 2005 Cogan Owens Cogen report for OECDD. NAICS codes used are available upon request.

Cluster Challenges

- Deployment factor and installation capabilities—There are not enough trained people in Oregon to meet rapidly growing installation needs.
- Restrictive labor limits on installations both drives up the cost and inhibits the growth of both solar hot water and solar PV penetration.
- Renewable energy limited licenses must be changed to be more effective (LRT—Limited Renewable Energy Technician and STL Solar Thermal License)
- Varied utility connection standards and utility resistance to statewide standards (net metering and interconnection)—Oregon has approx. 40 utilizes with 75% of Oregon population served by Investor owned utilities (IOUS) and 25% by Public utilities
- Developing a skilled workforce throughout Oregon. Solar systems have been installed throughout Oregon in over 100 cities. However, the workforce in rural areas in particular must be developed to meet large demand.
- Insuring the Business Energy Tax Credit (BETC) is sufficient to drive both solar PV and thermal projects forward.

Cluster Action Ideas

- Affect federal tax legislation collectively
- Find a tool to incentivize local purchasing- Buy Oregon, Buy Green campaign
- Address Deployment/Installation by adopting installation standards seen in other states and improving the renewable energy licenses (LRT and STL)
- Improve utility interconnection standards in public utilities(alignment of standards would benefit all the renewable energy industries)
- Increase the training opportunities for installers. Develop courses and deliver them throughout Oregon. Work with the existing Renewable Energy JATC and other training centers on course development.
- Expand Sharing & Learning Networks about lean manufacturing and Renewable energy
- Partner with universities for R&D
- Streamline Oregon's varied permit requirements for PV and hot water installations. Waive onerous fees and requirements. Work with Building Codes Division and other stakeholders to develop progressive permit policies.

This cluster summary was produced with the help of the Oregon Solar Energy Industry Association.

Wind Energy

Cluster Description

Oregon's wind energy cluster includes manufacturing (corporate headquarters, but not currently manufacturing), development, legal services, environmental consulting, operations & maintenance, transportation, market, and policymakers. Major developers include Horizon Wind Energy, PPM Energy (Iberdrola) Energy, RES, Columbia Energy Partners, EnXco, Vestas, Momentum Energy and CH2MHill. Firms in the wind energy industry are located statewide.

Cluster Organization

In 1994, a broad coalition of public-interest organizations and energy companies created the Renewable Northwest Project (RNP) to actively promote development of the region's untapped renewable resources. RNP has proven to be a forceful advocate for expanding solar, wind and geothermal energy in the Northwest.

Key Trends

- Retiring workforce
- Volatility in gas prices, climate change and fear of future carbon constraints → 1/2 of states have some kind of renewable energy policy → Increased demand for turbines
- Consolidation in the wind energy industry, especially on the developer-owner side.
- Manufacturing offshore → longer wait times and more expensive parts
- European investment into American companies.
- Exchange rate making manufacturing in the US more desirable

Strengths and Challenges

Strengths

- Logistics and Ports, especially Port of Vancouver
- Renewable Energy Policies and Tax Credits (Renewable Portfolio Standard, BETC)
- Local market and proximity to California market
- People: skills, expertise and values
- Transportation policies for trucks are better than Washington's (easier to haul turbines)
- Portland is the headquarters for three major utilities
- Presence of the steel industry
- Predictable siting regime through EFSC
- Wind resources and compatible land uses

Average Wage 2007: \$41,423.

Cluster Employment 2007: 8,850

Average Wage Growth 2004-2007: 10.0 %

Cluster Employment Growth 2004-2007: 10.1 %

Source: BLS, QCEW data based on cluster definition from "Renewable Energy Policy Project, Wind Turbine Development Technical Report 2004". Data provide a summary of the Oregon industrial base that *could* compete in the wind turbine market.

Operating wind capacity in Oregon: 817 MW

Wind capacity under construction in Oregon: 927 MW

Wind capacity to be constructed: 2,055 MW

Proposed wind capacity: 850 MW

Total capacity in Oregon if everything becomes operational: 4,649 MW

Source: ODOE, 2008.

- Portland has most of the USA's major developers and is N. American headquarters for the largest turbine manufacturer.

Challenges

- Transmission constraints on the grid are becoming a problem; need more transmission built
- Lack of certainty around the scope and timing of federal energy policy and government leadership
- Lack of skilled workforce (Need GIS and operating technicians, Electrical, energy, environmental engineers, Meteorologists, and MBAs with an understanding of renewable energy, project finance, & engineering)
- Very few university programs focused on renewable energy, except OIT & Columbia Gorge Community College
- Equipment procurement – Difficult to get the turbine component parts because many are not manufactured here. Exchange rates make them very expensive and there are long wait times.
- Physical Infrastructure Constraints - Shortage of cranes and limited number of trailers to move the heaviest turbines

Key Actions for the Future

- Develop plan to deal with transmission constraints
- Collaborate with other Oregon industries to create new business opportunities – discuss opportunities with Oregon's manufacturing and construction sectors
- Expand education & workforce training programs with a focus on renewable energy
- Policy: At the national level, pass an RPS and climate legislation. At the state level, maintain the BETC
- Address issue of cost and interconnection standards/rules with the PUC and utilities

More information

Rachel Shimshak, Executive Director, Renewable Northwest Project, rachel@rnp.org, www.rnp.org.

This cluster summary was produced with the help of the Renewable Northwest Project and the Oregon Economic and Community Development Department.

Wave Energy

Cluster Description

Number of firms: There are numerous industry players developing the wave energy cluster in Oregon ranging from technology providers, developers, metals manufacturing, maritime engineers, researchers and utility companies. Oregon is home to three of the leading technology developers in the Nation focused on developing new technologies and commercial projects. In addition, there are over 50 firms that will support the development of this emerging cluster.

Geographic location of firms within the region: Wave energy firms are geographical disbursed throughout the State with the majority located in coastal communities and the Portland Metro area.

Products and services: Products include the development and deployment of wave energy technologies and projects in Oregon, providing clean, renewable energy for Oregon consumers.

Customers and their locations: Oregon is the primary market for energy consumption, with neighboring states and the Northwest region serving as additional markets.

Jobs, average wages: This cluster is composed of industries that focus on utility and power construction, energy production, and professional and technical services. Bases on other renewable energy sectors, it is assumed half of the employment in this cluster is from energy-related manufacturing. Professional and technical services account for 30%, and construction makes up the balance with 20%.

The average wage for the Renewable Energy Production sector is \$59,149.

Recent trends in growth: The Renewable Energy Production sector's employment was 27,893 in 2006, with an average wage growth of 9.62% between 2003-2006. Cluster employment growth resulted in 8.12% growth rate for the time period of 2002-2006.

Key Competitors (other regions): Canada and Europe

Cluster Organization

Associations representing the cluster: The Oregon Wave Energy Trust (OWET) is the central entity charged with directing the responsible development of the wave energy industry in Oregon. The State of Oregon and its stakeholders have been exploring the development of wave energy for well over five years now, and Oregon State University has been focusing on wave energy technology development for over ten years. Since January 2005, a group of stakeholders have been networking to learn about each other's businesses, discover synergies, and explore the potential of developing the wave energy industry as an economic driver for the Oregon coast and State in general. This group has formalized itself into the Oregon Wave Energy Trust.

Cluster Strengths and Challenges

Strengths

- Wave energy resource
- Port capacity—can build, deploy, and maintain devices

- Transmission infrastructure—population and load centers close to resource
- Applied research capabilities
- Renewable energy portfolio standards
- Business Energy Tax Credit (BETC)
- Social change: People willing to pay more for renewable energy

Challenges

- Missing cluster components: naval architecture and mooring design
- Regulatory processes: cost of permitting, FERC and Oregon State licensing processes
- Ecological study plan development
- Long term production tax credits (PTC)
- Workforce needs: marine operations, merchant mariners, generation and transmission engineers

Vision for the Cluster

Role the industry play in the decade ahead: The wave energy industry will play a significant role in developing renewable energy for Oregon over the coming decade. Conservative estimates forecast up to 500 megawatts of installed capacity serving Oregon by 2025.

Growth rates: Oregon will see its first demonstration project consisting of 2 megawatts of capacity by 2010. Upon success of this project, industry growth will increase significantly.

New products and services: Oregon is leading the country in developing wave energy projects. In addition new services will include; development expertise, manufacturing, deployment, operation, technology development and intellectual property.

Recent Accomplishments

- \$3.5 million of direct industry development, \$25 million planned by 2010
- \$6.25 million award from US DOE to establish a National Wave Energy Center
- International Ocean Energy Conference and UK Trade Mission
- Community working groups established in key coastal areas
- Ecological studies conducted
- Regulatory coordination and industry permitting roadmap

Key Actions for the Future

- Develop comprehensive environmental monitoring program that will include studying the social, environmental, and economic impact of pilot technologies
- Advance policy and market development strategies, including price support mechanisms and marketing programs, and capital access and financing strategies for commercial scale projects
- Convene community forums and educational opportunities to inform Oregonians of the potential job opportunities that could be generated in as little as five years – with many jobs in rural parts of the state.

This cluster summary was produced with the help of the Oregon Wave Energy Trust.

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