

# 2009 Oregon Innovation Index

## Why Innovation?

Innovation matters.

It matters to businesses because innovation gives them a competitive advantage—those that can recognize market opportunities and address them quickly and effectively are more likely to grow and succeed, especially in an ever-more global 21st Century economy.

It matters to governments because those cities and states that can attract and cultivate the innovative firms and top-notch talent able to innovate not just once, but over and over again, will be more successful in the new economy.

It matters to communities because innovation brings good jobs, better public infrastructure and the diverse social, commercial and cultural resources that make life better.

It matters to Oregon's future.

## The Innovation Index

The *Oregon Innovation Index* was created to measure the state's innovation economy and identify opportunities for enhancing competitiveness. It is a key yardstick used by the Oregon Business Development Department ("Business Oregon") to track the state's success in building an innovation-based economy.

Business Oregon and the Oregon Innovation Council (Oregon InC), a public-private partnership charged with creating an innovation-based economic strategy, identified key factors necessary for a healthy innovation economy, including: public-private partnerships for research and development; ready access to capital; statewide entrepreneurial networks, and targeted investments in emerging industries where Oregon has a global competitive advantage.

The first *Innovation Index*, published in 2004, evaluated nine indicators to track Oregon's progress. It was updated and expanded in 2007 to include 20 indicators to ensure that each stage of the innovation process, the expected outcomes and the environment that leads to innovation were being measured. The *2009 Index* continues the framework established two years ago and provides the most recent data for each of the indicators.

The composite score is composed of a weighted sum of the 1-year, 5-year and national ranking performance for each indicator. The methodology for the composite score weighs 5-year trends highest (50%), followed by national ranking (33%) and 1-year trend (17%). Greater detail on the methodology is available in the *2009 Innovation Index Appendix*, available at [www.oregon4biz.com](http://www.oregon4biz.com).  
<http://www.businessoregon.net/assets/docs/07InnoScoreMethods.pdf>.

All the indicators included in the *Innovation Index* track trend data as well as comparisons with competitor states (Washington, California, Minnesota, Colorado, Idaho, Utah, Arizona, New York) and national averages. The competitor states are representative of those with which Oregon typically competes for technology-based economic development.

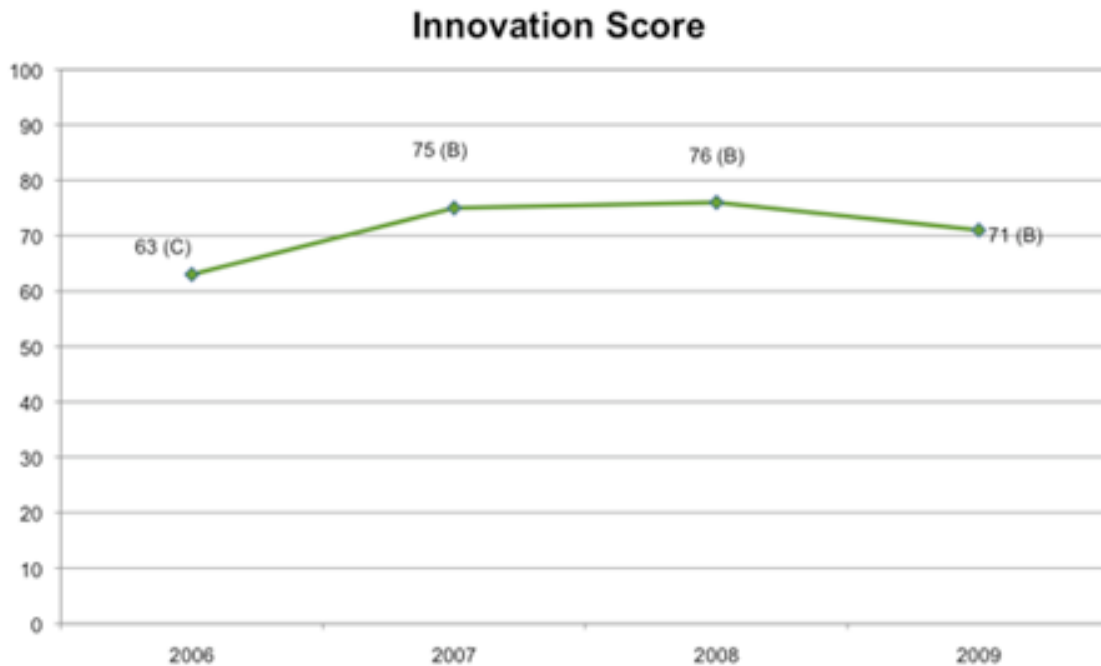
## Oregon's 2009 Innovation Scorecard

Indicator	1-yr Trend	5-yr Trend	Relative to Competitor States or U.S. Average (latest yr)	Latest National Ranking
<b>Invention</b>				
Invention Disclosures	↑	↑	↓	23rd (2007)
Patents	↓	↑	↑	6th (2008)
Patent Citations	↓	↑	↑	12th (2008)
<b>Translation</b>				
R&D Investments	↑	↑	↑	9th (2008)
SBIR/STTR Awards	↓	↓	↓	17th (2008)
University Licenses/Options	↑	↑	↑	16th (2008)
University Licensing Income	↑	↑	↔	24th (2008)
<b>Commercialization</b>				
Venture Capital Investments	↓	↓	↑	18th (2008)
Kauffman Index of Entrepreneurship	↑	↑	↔	13th (2008)
New Company Creation	↓	↔	↓	14th (2008)
University Startups	↑	↑	↑	6th (2007)
<b>Economic Prosperity</b>				
Average Wage	↔	↔	↓	27th (2008)
Technology Sector Employment	↓	↑	↔	12th (2008)
Foreign Exports	↑	↑	↔	7th (2008)
<b>Innovative Environment</b>				
Educational Attainment	↑	↑	↔	19th (2007)
Science & Engineers in Workforce	↑	↑	↔	19th (2007)
High Speed Internet Lines	↑	↑	↓	21st (2008)
Renewable Energy Usage	↓	↓	↔	2nd (2007)
Greenhouse Gas Emissions	↑	↑	↔	7th (2008)
Energy Intensity	↑	↑	↓	21st (2008)
<b>2009 Innovation Score (out of 100)</b>				<b>71</b>
<b>2009 Innovation Grade*</b>				<b>B</b>

\*The Innovation Grade is based on a quintile scale rather than a traditional academic scale. The quintile scale is as follows: 0-20 (F), 21-40 (D), 41-60 (C), 61-80 (B), 81-100 (A).

## The Innovation Score

Oregon's 2009 Innovation Score is 71, which is down five points from 2008. While the score decreased, the state still maintained a "B" grade, indicating that the state continues to perform above average in many aspects of the innovation economy. However, the decline of the innovation score highlights the competitive nature of innovation policy.



Oregon's innovation score declined primarily due to weakness in several market driven variables. The state saw strong performance in University Startups, Kauffman Index of Entrepreneurship, Patents, Foreign Exports, reducing Greenhouse Gas Emissions and R&D Investments. This strong performance was offset with poor performance in SBIR/STTR Awards, Venture Capital Investments, New Company Creation, Average Wage and Technology Sector Employment.

Overall, Oregon has a strong and improving innovation economy with positive one and five-year trends across the majority of indicators.

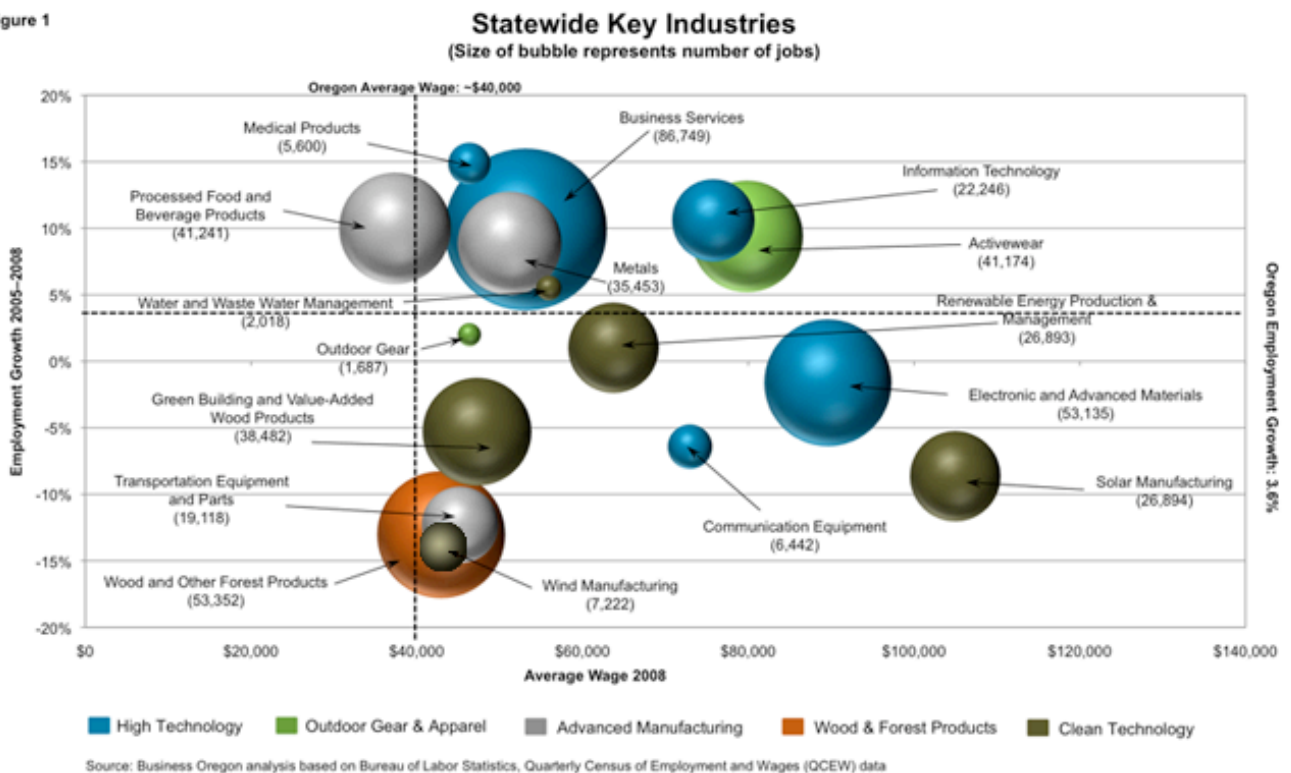
Since Oregon is an emerging player in innovation, the financial crisis (starting in 2007) and the economic recession (starting in 2008) presented unique challenges for innovation activity in the state. In an expanding economy (pre 2007), capital flows from innovation hubs into outlying areas in search of high returns, benefiting Oregon. When the economy contracts, capital flows reverse and return to key innovation hubs in a "flight to safety." The ebb and flow of capital has a direct impact on Oregon's market driven variables, areas of state that are particularly susceptible to economic activity around the nation and world.

## Oregon's Key Industries at a Glance

Oregon traded-sector, key industries are important drivers of our economy. Small and large companies that export their goods and services outside the state bring in new dollars and serve as customers to local suppliers of manufactured goods, professional services and retail businesses. Oregon's statewide key industries represent a diverse array of products and markets for both emerging and traditional industries.

While Oregon is home to diverse industries, the state recognizes five key industries in which it holds global competitive advantages. These industries include Advanced Manufacturing, Clean Technology, Forestry & Wood Products, High Technology and Outdoor Gear & Apparel. **Figure 1** represents statewide key industries, and their sub industries, with a comparative national advantage in terms of concentration of employment and/or wages that pay at or above the average state wage. In addition to the statewide industries, there are a number of smaller regionally oriented clusters that capitalize on groupings of companies and workers with specialized expertise around the state.

Figure 1



# INVENTION

## Patents, Citations, & Invention Disclosures

### Key message

New ideas are generated in Oregon at an increasing rate. In order to maximize value to the state, Oregon needs to focus on developing these ideas into new products and services for new and existing businesses.

### Why is it significant?

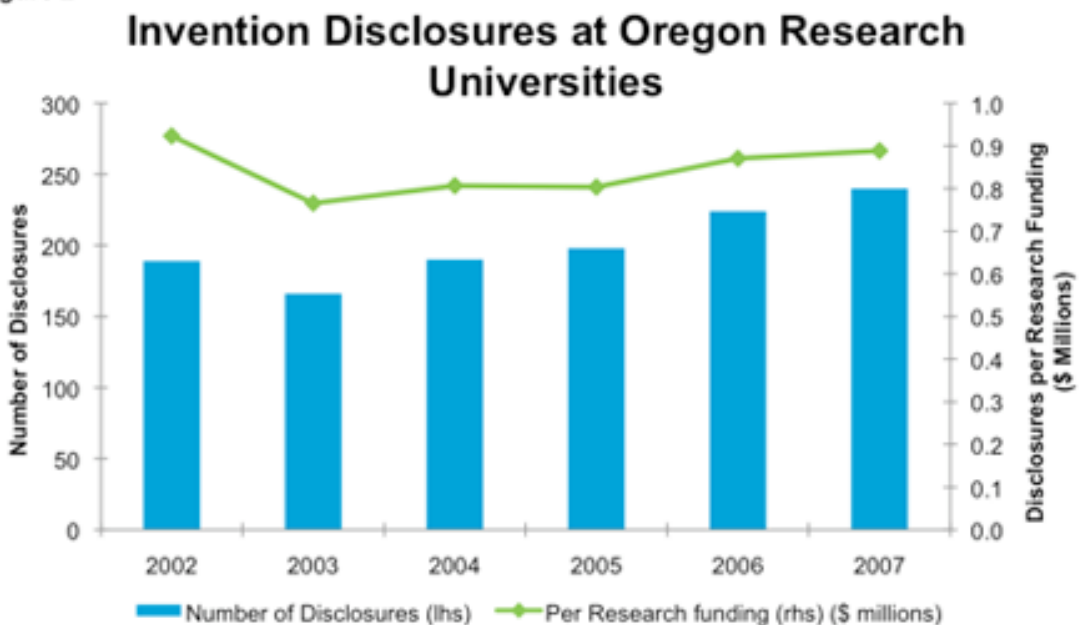
The number of *invention disclosures*—the first step in determining if an invention should be patented—and *patents* measure the extent to which intellectual property is created in the state. *Patent citations*—when an inventor cites a previous patent in a patent application—are a measure of the technical relevance of a patent to later inventions. Commercially feasible research and development (R&D) reflects the innovative abilities of the various public and private research institutions to catalyze new products, jobs and companies.

### How does Oregon perform?

Oregon ranked 23rd nationally in the number of invention disclosures coming out of the university system in 2007. The number of invention disclosures filed by the state's research institutions has grown steadily since 2003 and disclosures per million dollars of research funding are approaching highs experienced in 2002. Oregon research institutions improved in this measure relative to pre-recession levels. See **Figure 2**.

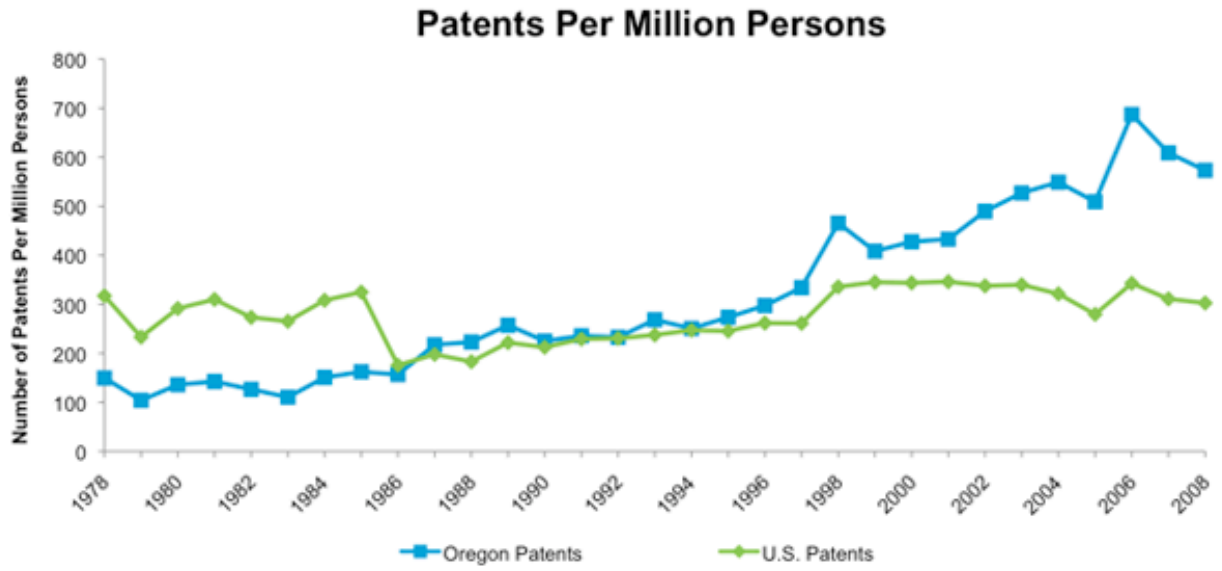
Oregon ranked 6th in the nation in patents per million persons and 12th in patent citations per million persons in 2008. Although both indicators decreased, along with both state rankings, Oregon still exceeds the national average. Recent performance indicates that the state has room for improvement and highlights the need to remain focused on developing new ideas into marketable products. See **Figure 3 & 4**.

Figure 2



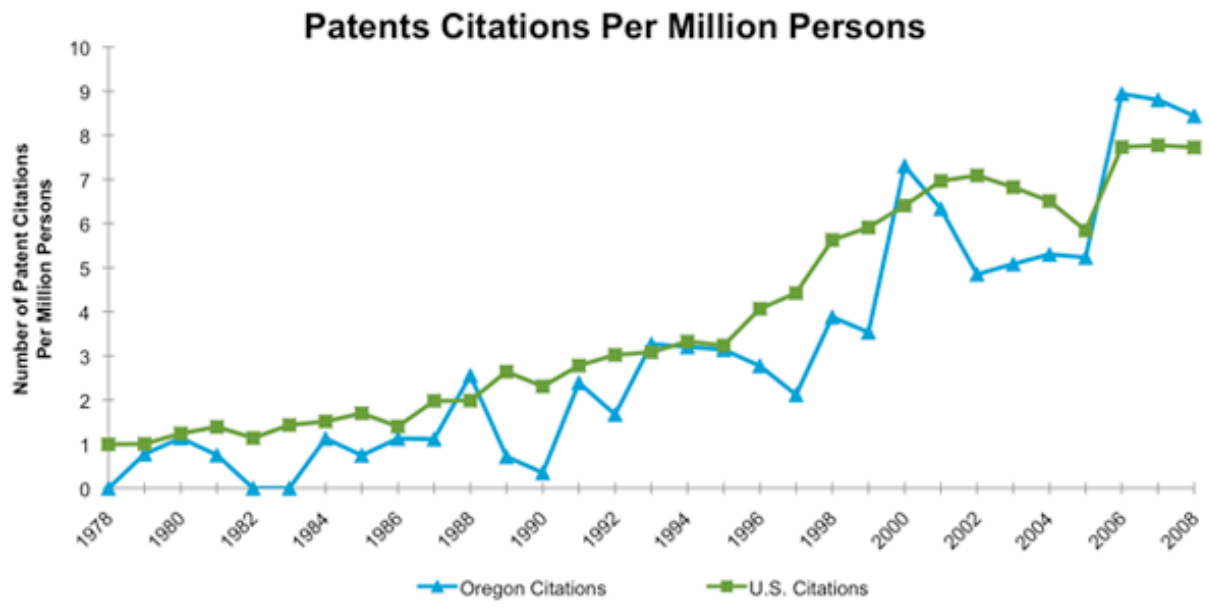
Source: AUTM. Includes Oregon Health & Science University, Oregon State University, Portland State University and University of Oregon

Figure 3



Sources: U.S. Patent and Trademark Office, Patents by Country/State and Year, December 2006; US Census Bureau and PSU Population Research Center

Figure 4



Sources: US Patent and Trademark Office, US Census Bureau and PSU Population Research Center

# TRANSLATION

## Research & Development

### Key message

Oregon's competency in forging research and development (R&D) partnerships among universities and private industry gives the state a competitive advantage. Because these R&D expenditures typically leverage federal and private foundation support and bring new dollars into the state, it is important for the state to continue to enhance this key source of innovation in our economy.

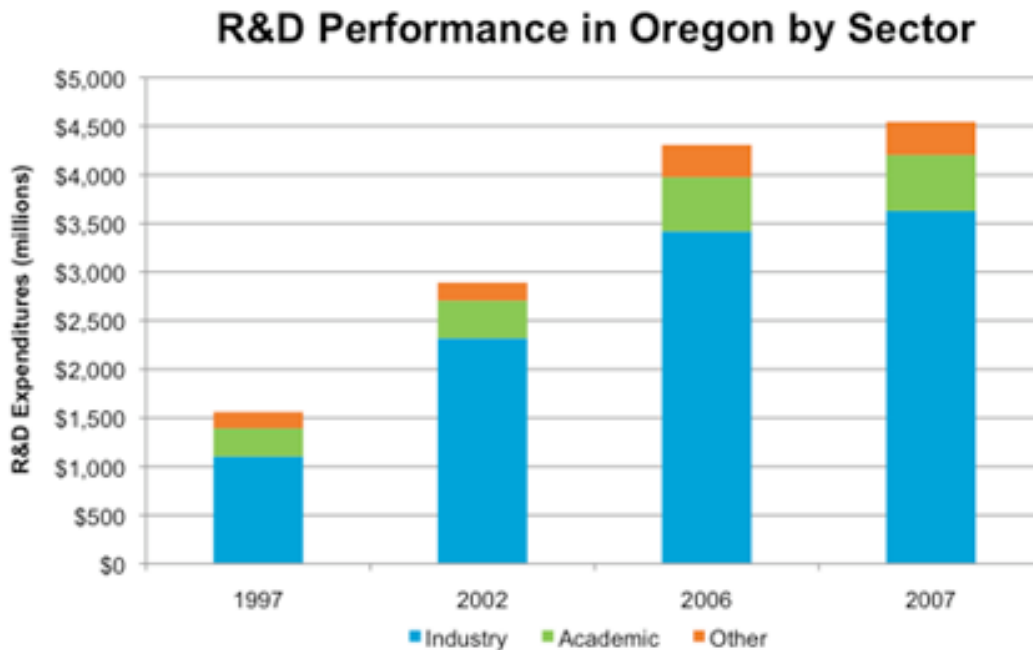
### Why is it significant?

Research and development expands the knowledge base of industry and produces new products, which are key to sustained economic growth. New ideas, processes and products fuel innovation and attract investment in Oregon companies.

### How does Oregon perform?

Oregon's R&D spending is driven by private industry, which accounted for more than 75 percent of total R&D expenditures in 2007. Total R&D spending in Oregon tripled between 1997 and 2007. See **Figure 5**. Oregon ranked 9th nationally in industry R&D as a percentage of private sector Gross Domestic Product by State (GDP by State—the value of all goods and services produced in the state). This is due, in part, to the fact that in Oregon, private industry R&D more than tripled between 1997 and 2007. See **Figure 6 & 7**.

Figure 5



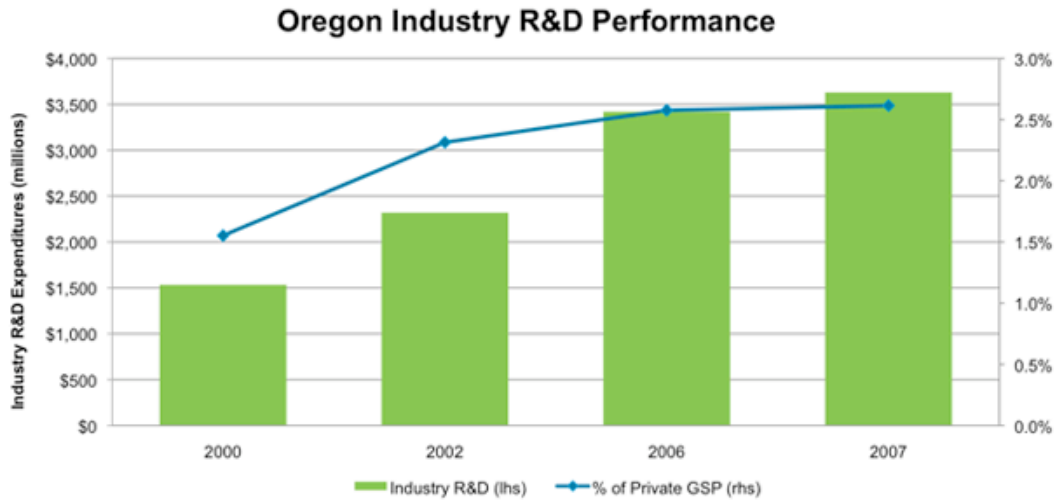
Source: National Science Foundation; State Science & Technology Institute

Figure 6. Industry R&D (\$ millions)

State	Rank	Industry R & D	% of Private GSP	Industry R & D	% of Private GSP	Industry R & D	% of Private GSP
		2002		2006		2007	
Arizona	18	\$3,201	2.1%	\$3,590	1.7%	\$3,846	1.8%
California	6	\$39,664	3.3%	\$58,424	3.8%	\$64,187	4.0%
Colorado	11	\$2,823	1.8%	\$4,657	2.3%	\$5,223	2.0%
Idaho	22	\$992	3.2%	\$625	1.5%	\$726	1.6%
Minnesota	8	\$4,460	2.5%	\$6,296	2.9%	\$6,636	2.9%
New York	29	\$9,234	1.3%	\$9,518	1.0%	\$10,916	1.1%
Oregon	9	\$2,320	2.3%	\$3,419	2.6%	\$3,629	2.6%
Utah	17	\$1,116	1.8%	\$1,274	1.5%	\$1,764	1.9%
Washington	3	\$8,579	4.3%	\$11,320	4.6%	\$12,687	4.8%
United States		\$190,809	2.1%	\$247,669	2.1%	\$269,267	2.2%

Source: National Science Foundation

Figure 7



Source: National Science Foundation

# TRANSLATION

## SBIR/STTR

### Key message

The SBIR and STTR (Small Business Innovation Research/Small Business Technology Transfer) federal R&D grant programs drive innovation in Oregon's small businesses. Oregon should continue to focus on increasing its share of these federal grants by enhancing the tools available to small business owners to successfully learn about and apply for SBIR/STTR funding.

### Why is it significant?

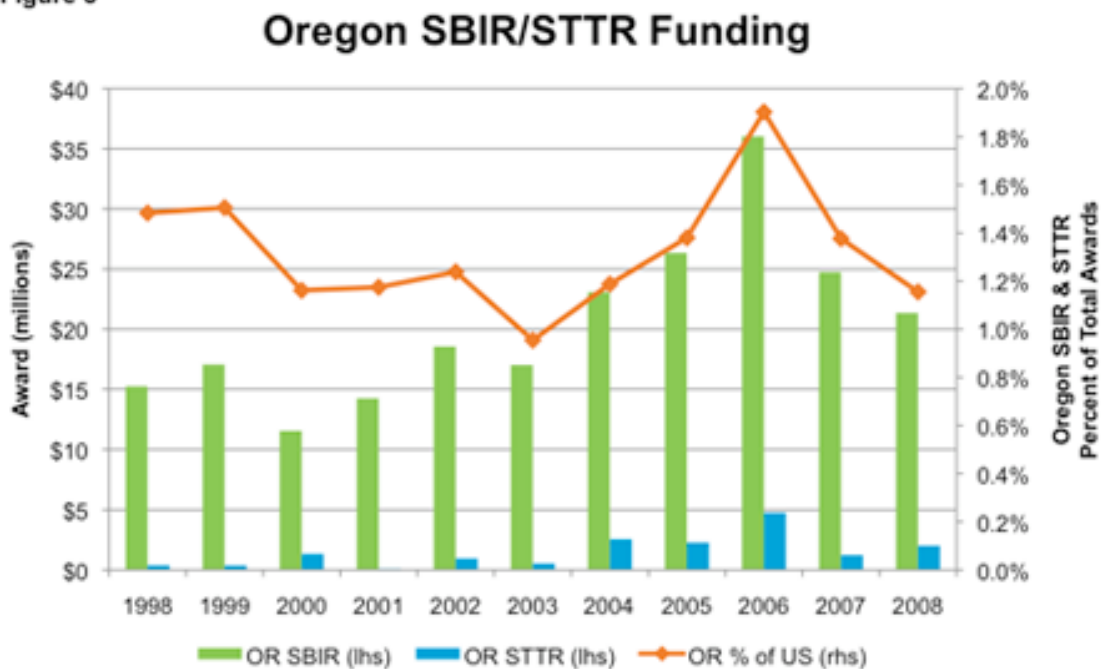
SBIR and STTR grants from federal agencies allow entrepreneurs to conduct research and develop new technologies. These programs often provide initial funding to help small companies turn ideas into commercially viable products.

### How does Oregon perform?

In 2008, Oregon received \$23 million in SBIR and STTR awards, a return to 2003 award levels. This total accounted for 1.2 percent of total awards nationally. Oregon received 58 SBIR awards and seven STTR awards in 2008. See Figure 8.

Oregon ranked 17th among all states in SBIR and STTR awards per \$1 million of GSP. Oregon's performance in this measure deteriorated over the last two years with Oregon's share of SBIR and STTR funding declining in the run-up to the 2008 recession. Performance in this category will improve once the recession ends. See Figure 9.

Figure 8



Source: Small Business Association

**Figure 9. Total SBIR/STTR Award Amount per Million Dollars Gross Domestic Product by State**

State	2008 Rank	2004	2005	2006	2007	2008
Colorado	3	\$479	\$413	\$446	\$395	\$370
California	10	\$294	\$257	\$244	\$190	\$212
Utah	11	\$144	\$230	\$177	\$160	\$171
Washington	15	\$235	\$180	\$179	\$184	\$147
Oregon	17	\$193	\$207	\$270	\$164	\$145
Minnesota	20	\$107	\$123	\$114	\$95	\$126
Arizona	22	\$169	\$195	\$177	\$131	\$116
New York	29	\$101	\$110	\$84	\$81	\$82
Idaho	40	\$106	\$134	\$59	\$107	\$41
United States		\$186	\$168	\$164	\$138	\$143

Source: Small Business Administration

# TRANSLATION

## University Licensing Income & Options

### Key message

Oregon universities have had increasing success in generating income from the licensing of new technologies to businesses. Continued focus on this measure will increase linkages between higher education and private businesses that will help commercialize new technologies.

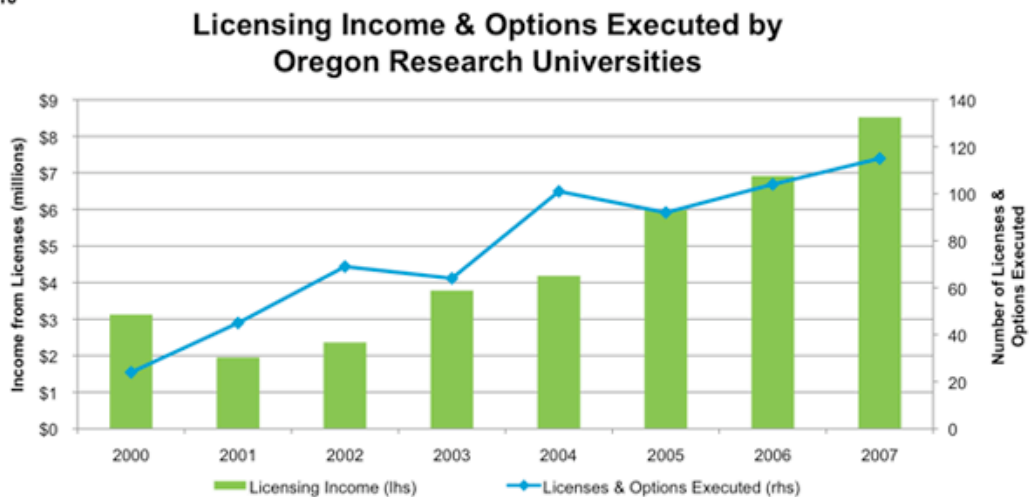
### Why is it significant?

*University licensing income*—the amount firms pay universities to use their technology—and *options*—the agreement firms make with universities to use their technology—are indications of the commercial viability of university inventions. The number of licenses and options executed in a given year tells how many university inventions appear to have commercial potential. The amount of income universities receive is an indication of the value companies assign to the intellectual property developed at research institutions.

### How does Oregon perform?

Oregon ranked 16th in the nation in the number of licensing options executed, and 24th in the nation in licensing income in 2007. University licensing income has quadrupled since 2001. This increase indicates that Oregon research universities are able to generate more income from private sector use of their intellectual property. The number of licenses and options executed at Oregon universities more than doubled since 2001. This indicates that companies are increasingly integrating university research into their products and services. See Figure 10.

Figure 10



Source: Association of University Managers (AUTM); includes data from Oregon Health & Science University, Oregon State University, University of Oregon and Portland State University

# COMMERCIALIZATION

## Venture Capital

### Key message

Attracting venture capital into the state is vital for innovative Oregon businesses to thrive. Venture capital investments in Oregon have grown over the last year after several years of stagnation. Continuing this trend will be vital to growing Oregon's innovation economy.

### Why is it significant?

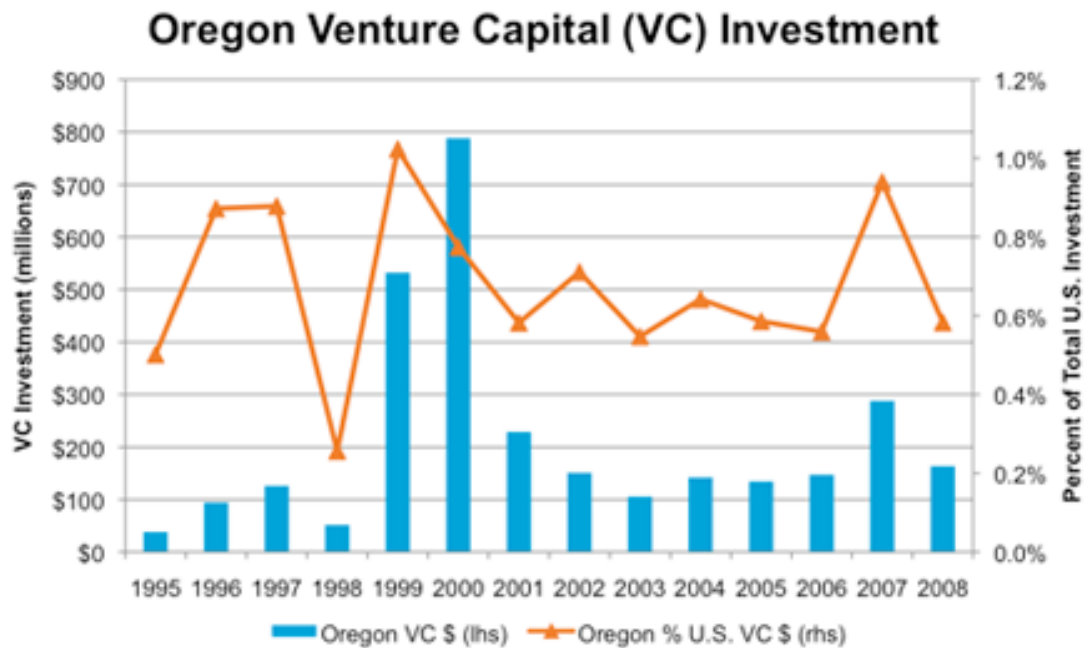
Access to capital plays a crucial role in new firm formation and stimulating economic growth. Angel investors and venture funds provide the risk capital many companies need to begin or expand their operations.

### How does Oregon perform?

Oregon venture capital investment returned to 2002 levels after a large and temporary increase in 2007. With the exception of 2007, Oregon venture capital investment has remained relatively stable since 2002. See Figure 11.

Oregon ranked 18th in the nation in venture capital investment per \$1,000 of GSP in 2008. Among competitor states Oregon attracts relatively little venture capital and has been below the national average in this measure for the last ten years. See Figure 12.

Figure 11



Source: PricewaterhouseCoopers/National Venture Capital Association MoneyTree(tm)  
Report based on data from Thomson Reuters

**Figure 12. Venture Capital per \$1,000 of State Gross Domestic Product**

<b>State</b>	<b>2008 Rank</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
California	2	\$6.15	\$6.28	\$7.40	\$8.16	\$7.60
Colorado	3	\$2.25	\$2.88	\$2.94	\$2.56	\$3.40
Washington	5	\$3.43	\$2.70	\$3.57	\$4.38	\$2.90
Minnesota	6	\$1.57	\$0.98	\$1.33	\$1.92	\$1.88
Utah	8	\$2.33	\$2.79	\$1.91	\$1.78	\$1.71
New York	12	\$0.80	\$1.09	\$1.26	\$1.02	\$1.20
Oregon	18	\$1.17	\$1.00	\$1.01	\$1.82	\$1.01
Arizona	19	\$0.54	\$0.69	\$1.11	\$0.83	\$0.84
Idaho	28	\$0.06	\$0.17	\$0.03	\$0.36	\$0.45
United States		\$1.80	\$1.76	\$2.03	\$2.26	\$1.98

Source: PricewaterhouseCoopers/National Venture Capital Association MoneyTree(TM)  
Report based on data from Thomson Reuters; Bureau of Economic Analysis

## COMMERCIALIZATION

### Entrepreneurial Activity

#### Key message

States that are able to generate and support entrepreneurship will be well placed to develop new products and services. Startup firms have the potential to grow rapidly and provide leadership in developing new markets that benefit both emerging and existing businesses around the state.

#### Why is it significant?

*Entrepreneurship*—the creation of new companies—is often used as a measure of the extent to which new ideas are introduced into the market. These new ideas are one measure of innovation in an economy. The Kauffman Foundation’s Index of Entrepreneurial Activity calculates the percent of individuals ages 20 to 64 who start a new business.

#### How does Oregon perform?

In 2008 Oregon ranked 13th in the nation in entrepreneurial activity. In each of the last five years Oregon has exceeded the US average and among competitor states Oregon performs relatively well. See **Figure 13**.

**Figure 13. Kauffman Index of Entrepreneurial Activity**

State	2008 Rank	2005	2006	2007	2008
New Mexico	2	0.45%	0.35%	0.25%	0.58%
Arizona	4	0.32%	0.30%	0.46%	0.49%
California	5	0.32%	0.35%	0.40%	0.44%
Colorado	7	0.53%	0.28%	0.34%	0.43%
New York	8	0.28%	0.33%	0.35%	0.40%
Utah	8	0.38%	0.29%	0.34%	0.40%
Idaho	13	0.47%	0.37%	0.46%	0.37%
Oregon	13	0.33%	0.38%	0.35%	0.37%
Washington	29	0.23%	0.27%	0.22%	0.27%
Minnesota	42	0.31%	0.29%	0.31%	0.21%
United States		0.29%	0.29%	0.30%	0.32%

Source: Kauffman Index of Entrepreneurial Activity by State

# COMMERCIALIZATION

## New Business Creation and Company Closings

### Key message

Startup firms have the potential to grow rapidly and provide leadership in developing new markets that benefit both emerging and existing businesses around the state. Oregon's high rates of both business creation and company closings highlight the need to continue to encourage entrepreneurship and support small business owners, especially during the critical first years in business.

### Why is it significant?

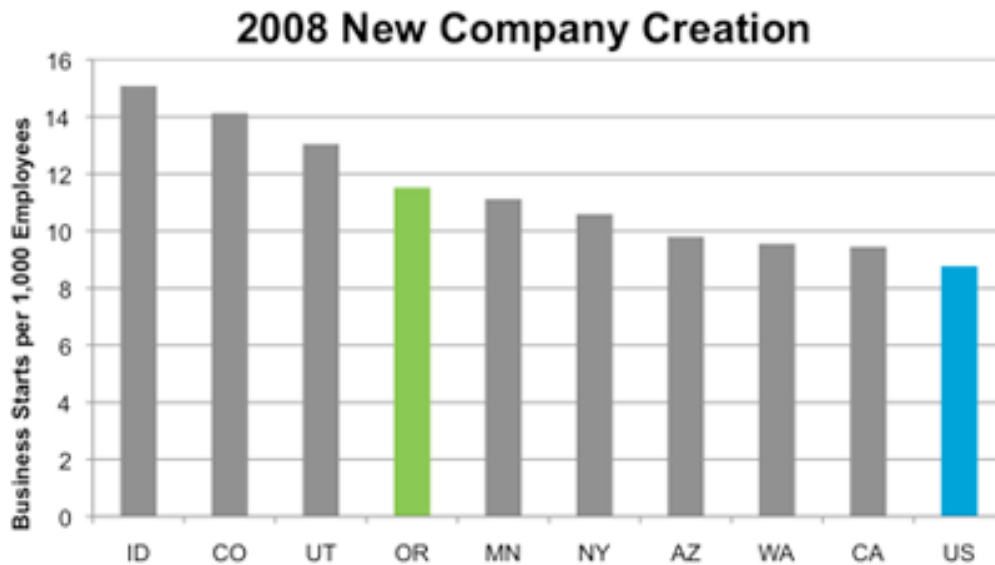
New companies create new jobs, which expand and strengthen economies. The rate of new company formation is an indication of an innovative and dynamic economy. Company closings threaten the vitality of an economy but they also provide an opportunity for talented people to introduce new ideas and ventures into the market.

### How does Oregon perform?

In 2008, Oregon ranked 14th in the nation in the number of new businesses started per 1,000 persons in the workforce. This strong performance exceeded the US average but trailed a number of competitor states. See **Figure 14 & 16**.

Oregon ranked 15th in the nation in the percentage of business closings between 2007 and 2008. Like many competitor states, Oregon appears to have a very dynamic economy, characterized by high rates for both business starts and business closings. See **Figure 15 & 17**.

Figure 14



Source: Bureau of Labor Statistics

Figure 15



Figure 16. New Company Creation per 1,000 Workers

State	2008 Rank	2003	2007	2008
Idaho	2	13.4	15.9	15.1
Colorado	4	12.9	14.0	14.1
Utah	9	12.7	13.9	13.1
Oregon	14	11.5	11.9	11.5
Minnesota	16	9.2	7.3	11.1
New York	18	11.1	10.9	10.6
Arizona	27	8.4	10.4	9.8
Washington	29	11.6	9.7	9.6
California	30	9.3	9.7	9.5
United States		9.5	9.0	8.8

Source: Bureau of Labor Statistics; U.S. Census Bureau

Figure 17. Percent of Company Closings

State	2008 Rank	2003	2007	2008
Idaho	3	16.5%	18.8%	21.8%
Colorado	5	19.3%	19.5%	21.2%
Utah	6	19.9%	18.1%	20.7%
Arizona	8	18.4%	18.9%	20.4%
Oregon	15	17.4%	16.6%	18.0%
New York	18	18.4%	17.2%	17.6%
Minnesota	19	15.4%	19.1%	17.3%
Washington	33	13.9%	14.3%	14.9%
California	49	13.7%	13.7%	13.2%
United States		15.8%	15.0%	14.9%

Source: Bureau of Labor Statistics

# COMMERCIALIZATION

## University Startups

### Key message

The rising number of university startups is a good indication that Oregon's focus on commercializing university research is beginning to pay off. Streamlining the process which transfers university research to new business ventures will increase Oregon's ability to attract new investment and encourage collaborative partnerships between researchers and entrepreneurs.

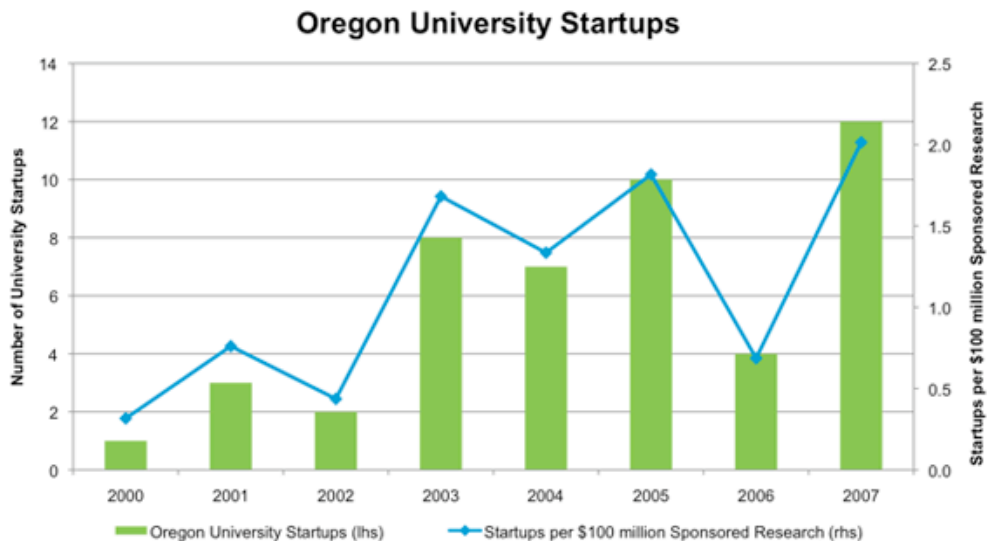
### Why is it significant?

*University startups*—companies formed from university research—measure the number of new businesses that are created as a direct result of university intellectual property. This measure demonstrates the strength of Oregon's university system in commercializing research and fostering entrepreneurship.

### How does Oregon perform?

Oregon ranked 6th nationally in university startups in 2007. University startups in the state rebounded in 2007 after decreasing in 2006. This change demonstrates the ability to commercialize technology. However, to reduce pipeline volatility, the state should continue to focus on commercializing research and utilizing research funding for market ready products at Oregon universities. See Figure 18.

Figure 18



Source: Association of University Technology Managers; includes Oregon Health & Science University, Oregon State University, University of Oregon and Portland State University

# ECONOMIC PROSPERITY

## Average Wage

### Key message

Oregon must continue to focus on raising the wages of workers statewide. One of the key drivers of wage growth is human capital development. A skilled and educated workforce creates value for Oregon companies, thereby contributing to average wage growth.

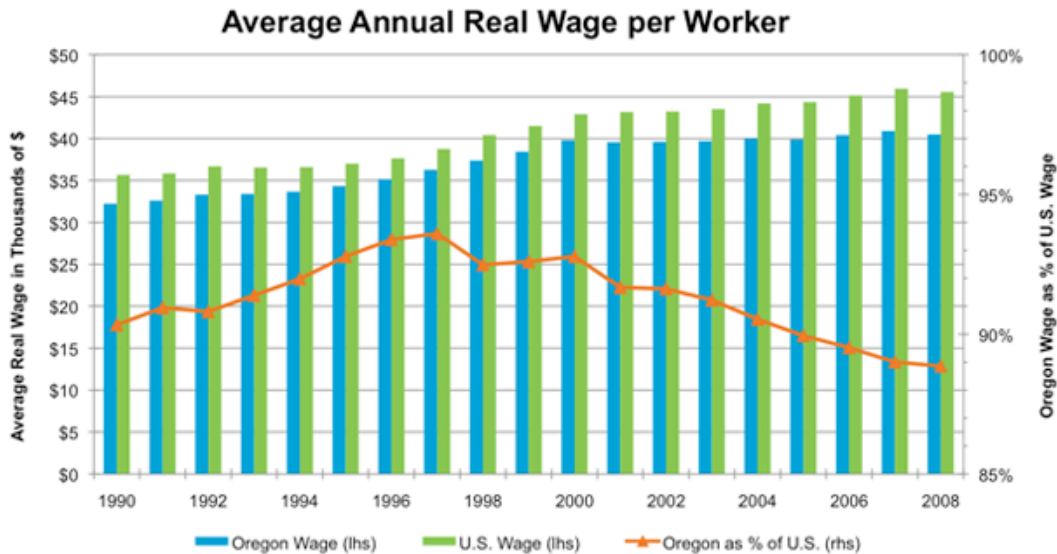
### Why is it significant?

Average wage measures trends in the average annual income of workers in Oregon. This measure is limited to workers covered by unemployment insurance, which excludes self-employed workers. Wages have been adjusted for inflation.

### How does Oregon perform?

Real average wages in Oregon showed steady increases between 1990 and 2000. Unfortunately, real wages in Oregon have stagnated since the economic recession in 2001. Oregon wages have failed to keep pace as the real US average wage rose following the recession. See Figure 19.

Figure 19



Source: US Bureau of Labor Statistics & US Bureau of Economic Analysis. Wages are adjusted for inflation.

# ECONOMIC PROSPERITY

## Technology Sector Employment & Wages

### Key message

Oregon has a well-established technology sector, which commercializes new ideas and generates high wage jobs. It is becoming evident that all companies are dependent on technological innovation to compete in the global economy. Thus, it is important to maintain the state's leadership in technology generating industries.

### Why is it significant?

Technology sector industries—as defined by the *2008 New Economy Index*—are an important part of an economy because they account for a significant share of new invention applications in a broad set of industries. States with a critical mass of jobs in technology generating industries tend to attract other businesses and workers with a high degree of inventiveness, and help to increase the competitiveness of all traded sector industries.

### How does Oregon perform?

Oregon's technology sector is comprised of approximately 92,000 manufacturing and service jobs that account for about 6.4 percent of Oregon's private sector employment. Oregon's technology sector employment is volatile. Sector employment was hard hit by the economic recession in 2001, outpaced the nation during the subsequent expansion from 2004 to 2006, and fell faster than the national average during the economic recession of 2008. See **Figure 20**.

Oregon's technology sector is larger than the nation's when measured as a percentage of private employment. Among competitor states, Oregon ranks in the middle of the pack and behind many of our neighboring states. See **Figure 21**.

Average wages in the technology sector pay twice as much as the average private sector job. In 2008, technology sector wages were approximately \$80,000 per year compared to an average private sector wage of about \$40,000. See **Figure 22**.

Figure 20



Source: Bureau of Labor Statistics, QCEW 2008; Technology sector defined by 2008 State New Economy Index

Figure 21. 2008 Technology Sector Employment

State	Rank	Technology Sector Employment	Private Sector Employment	% Private Sector Employment
Colorado	3	175,671	1,943,280	9.0%
California	5	1,087,738	13,042,134	8.3%
Washington	8	195,085	2,429,884	8.0%
Utah	10	72,218	1,021,933	7.1%
Oregon	12	92,255	1,437,750	6.4%
Minnesota	13	147,062	2,303,642	6.4%
Idaho	14	33,987	539,626	6.3%
Arizona	17	124,801	2,174,709	5.7%
New York	25	359,362	7,162,962	5.0%
United States		6,865,021	113,192,473	6.1%

Source: Bureau of Labor Statistics, QCEW; Technology sector defined by 2008 New State Economy Index

# ECONOMIC PROSPERITY

## Foreign Exports

### Key message

Oregon's relatively high ranking in foreign exports and proximity to China and other emerging markets demonstrates the state's competitive advantage in developing global markets.

### Why is it significant?

Export-oriented companies have a multiplier effect on the local economy. As these companies work to meet the demand for their products, they rely on local firms to supply goods and services, which benefit the state's economy.

### How does Oregon perform?

In 2008, Oregon exported over \$19 billion worth of goods and services to 197 countries. Overall, Oregon ranked 7th in the nation in value of exports as a share of gross domestic product by state. Among competitor states, Oregon trailed only Washington in this measure and exceeded the national average. See **Figure 23**.

Figure 23



# INNOVATIVE ENVIRONMENT

## Educational Attainment

### Key message

Educational attainment is an important indicator of the human capital that is available in Oregon. The role of education in creating a successful innovation environment cannot be overstated. Investments in Oregon’s educational system—kindergarten through graduate school—will benefit the state in the form of a highly skilled workforce.

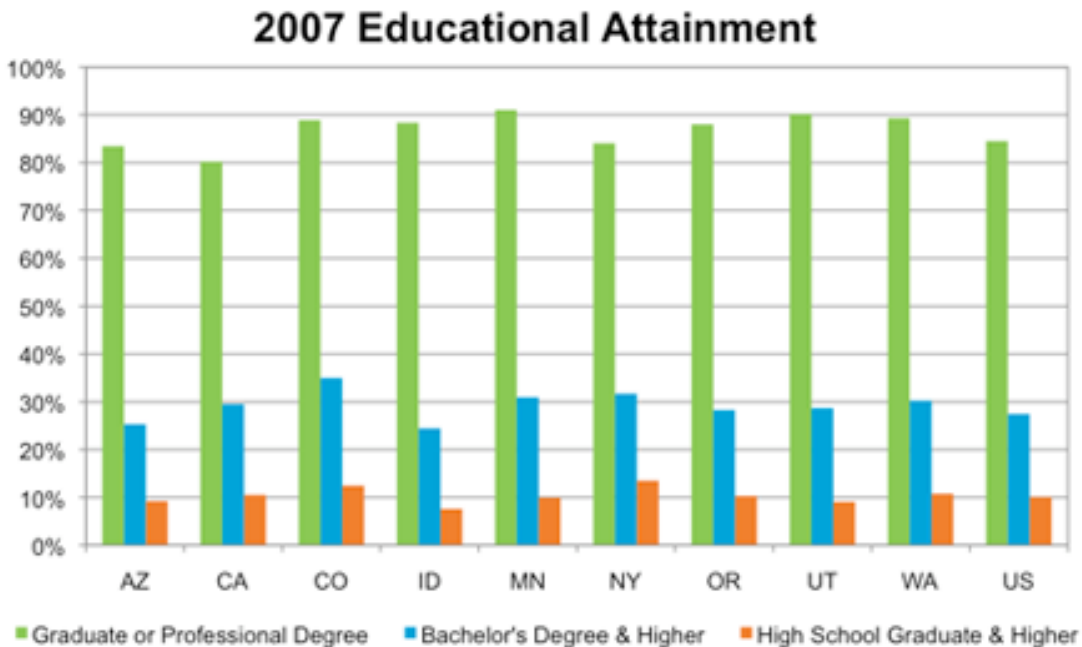
### Why is it significant?

Educational attainment is a key driver of the innovation economy. Innovation cannot occur if educated people are not plentiful in Oregon companies, universities and other innovation incubators.

### How does Oregon perform?

Educational attainment is rising in Oregon and meets or exceeds the national average at all levels. In 2007, Oregon ranked 19th nationally in the percentage of residents with a college degree or higher. Oregon still trails some competitor states, particularly in the percentage of adults with Bachelor’s degrees or higher. See Figure 24 & 25.

Figure 24



Source: U.S. Census Bureau

**Figure 25. Educational Attainment**

	High School Graduate and Higher			Bachelor's Degree and Higher			Graduate or Professional Degree		
	2002	2006	2007	2002	2006	2007	2002	2006	2007
Arizona	82%	84%	83%	23%	25%	25%	8%	9%	9%
California	79%	80%	80%	29%	29%	30%	10%	10%	11%
Colorado	87%	88%	89%	33%	34%	35%	12%	12%	12%
Idaho	85%	87%	88%	23%	23%	24%	7%	7%	8%
Minnesota	90%	91%	91%	30%	30%	31%	9%	10%	10%
New York	82%	83%	84%	29%	31%	32%	13%	13%	14%
Oregon	87%	88%	88%	26%	28%	28%	10%	10%	10%
Utah	90%	90%	90%	27%	29%	29%	8%	9%	9%
Washington	89%	89%	89%	30%	30%	30%	10%	11%	11%
United States	83%	84%	84%	26%	27%	27%	9%	10%	10%

Source: U.S. Census Bureau

# INNOVATIVE ENVIRONMENT

## Scientists & Engineers in Workforce

### Key message

Scientists and engineers are often the professionals that spearhead innovative new products, business models and markets. It is important to increase the number of advanced science and engineering degrees in the state to keep pace with the ever-increasing demand for these professions by Oregon companies.

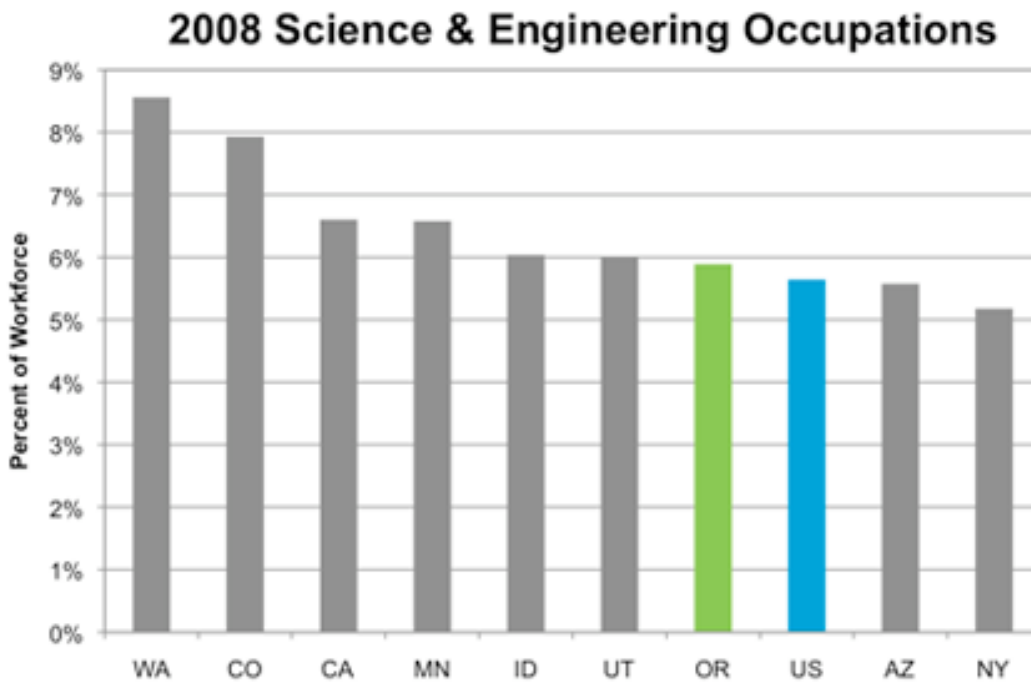
### Why is it significant?

Knowledge workers are at the center of an innovation economy. The presence of scientists and engineers in the workforce has a direct correlation to a state's research and development capacity as well as being key assets to innovative businesses. In addition to the existing workforce, a state's ability to educate and train new scientists and engineers indicates future workforce potential and is key to attracting and growing Oregon businesses.

### How does Oregon perform?

Oregon is slightly above the US average in this measure but trails Washington, California and Idaho. Since 2001, Oregon has improved in this measure and it consistently ranks as one of the top 20 US states in the percentage share of science and engineering occupations in the workforce. See Figure 26 & 27.

Figure 26



Source: Bureau of Labor Statistics

**Figure 27. Science and Engineering Occupations as Percentage of Workforce**

State	2008 Rank	2003	2004	2005	2006	2007	2008
Washington	3	7.8%	7.8%	7.9%	8.0%	8.4%	8.6%
Colorado	6	7.8%	7.8%	7.7%	7.7%	7.8%	7.9%
California	8	6.4%	6.3%	6.3%	6.3%	6.4%	6.6%
Minnesota	9	6.0%	6.4%	6.3%	6.3%	6.4%	6.6%
Idaho	15	6.1%	6.2%	6.2%	6.1%	6.0%	6.0%
Utah	17	5.9%	5.9%	5.9%	6.1%	6.0%	6.0%
Oregon	19	5.8%	5.8%	5.6%	5.6%	5.7%	5.9%
Arizona	20	5.5%	5.6%	5.4%	5.3%	5.5%	5.6%
New York	22	4.7%	4.6%	4.8%	4.9%	5.1%	5.2%
United States		5.3%	5.4%	5.4%	5.4%	5.5%	5.6%

Source: Bureau of Labor Statistics

# INNOVATION ENVIRONMENT

## High Speed Internet Connections

### Key message

Oregon's ability to develop and maintain high speed internet access is vital in a business environment that emphasizes global markets and internet-dominated communication. States that are able to increase the speed and reliability of internet connections will be leaders in the innovation economy.

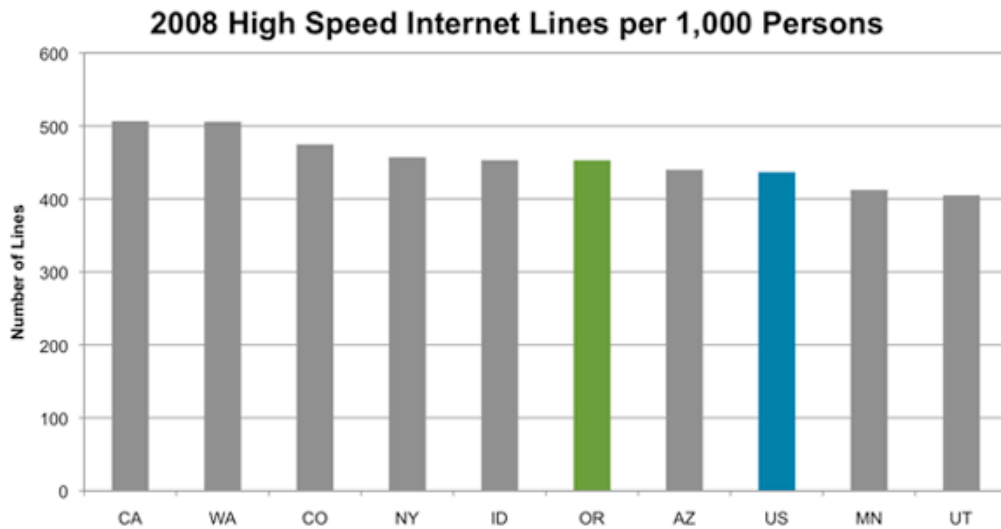
### Why is it significant?

High speed internet connections—more than 200 kbps in at least one direction—allow for faster transmission of data, which is critical for companies that rely on the internet to communicate with customers, suppliers and colleagues. High-speed connections also facilitate knowledge dissemination and collaboration by reducing the costs associated with telecommunications and business transactions.

### How does Oregon perform?

Oregon ranks 21st in the nation in the number of high-speed internet lines per 1,000 persons. Among competitor states, Oregon ranks in the middle and exceeds the national average. See Figure 28.

Figure 28



Source: Federal Communications Commission; U.S. Census Bureau

# INNOVATION ENVIRONMENT

## Renewable Energy Usage

### Key message

Oregon is a leader in renewable energy usage. As the world becomes increasingly focused on fossil fuel consumption states that are able to diversify sources of energy consumption will benefit from early adoption of innovative fuel sources and reduced reliance on fossil fuels.

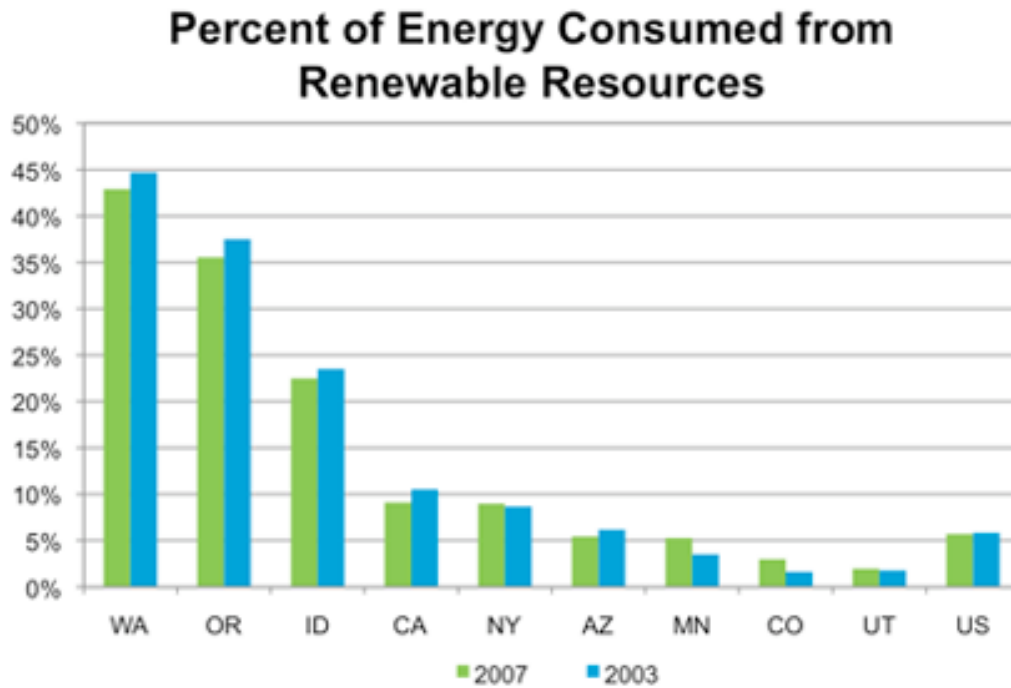
### Why is it significant?

*Renewable energy*—including hydropower, wind, solar, geothermal and biomass—usage is one measure of a state’s ability to adapt to new challenges and reduce its dependence on fossil fuels. States that are able to utilize emerging technologies often become leaders in new industries and markets.

### How does Oregon perform?

Oregon is the second largest user of renewable energy as a percentage of total energy consumption in the US. Oregon’s performance in this measure is more than six times higher than the US average mostly due to the high level of hydroelectric power in the Pacific Northwest. See **Figure 29 & 30**.

**Figure 29**



Source: U.S. Department of Energy, Energy Information Administration

**Figure 30. Percent of Energy Consumed from Renewable Resources**

<b>State</b>	<b>2007 Rank</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Washington	1	44.7%	42.6%	41.1%	45.7%	42.9%
Oregon	2	37.5%	25.9%	33.7%	39.2%	35.5%
Idaho	5	23.5%	22.4%	22.8%	27.3%	22.5%
California	11	10.5%	10.1%	10.6%	11.5%	9.1%
New York	12	8.7%	8.5%	8.8%	9.7%	9.0%
Arizona	19	6.2%	5.7%	5.7%	5.6%	5.4%
Minnesota	21	3.5%	3.8%	4.4%	4.5%	5.3%
Colorado	34	1.6%	1.6%	2.5%	2.7%	3.0%
Utah	41	1.8%	1.7%	2.5%	2.3%	1.9%
United States		5.8%	5.7%	5.8%	6.1%	5.7%

Source: U.S. Department of Energy, Energy Information Administration

# INNOVATION ENVIRONMENT

## Carbon Dioxide Emissions

### Key message

Global attention to carbon emissions means that states that are able to reduce their emissions will be well placed to compete in an increasingly carbon focused world.

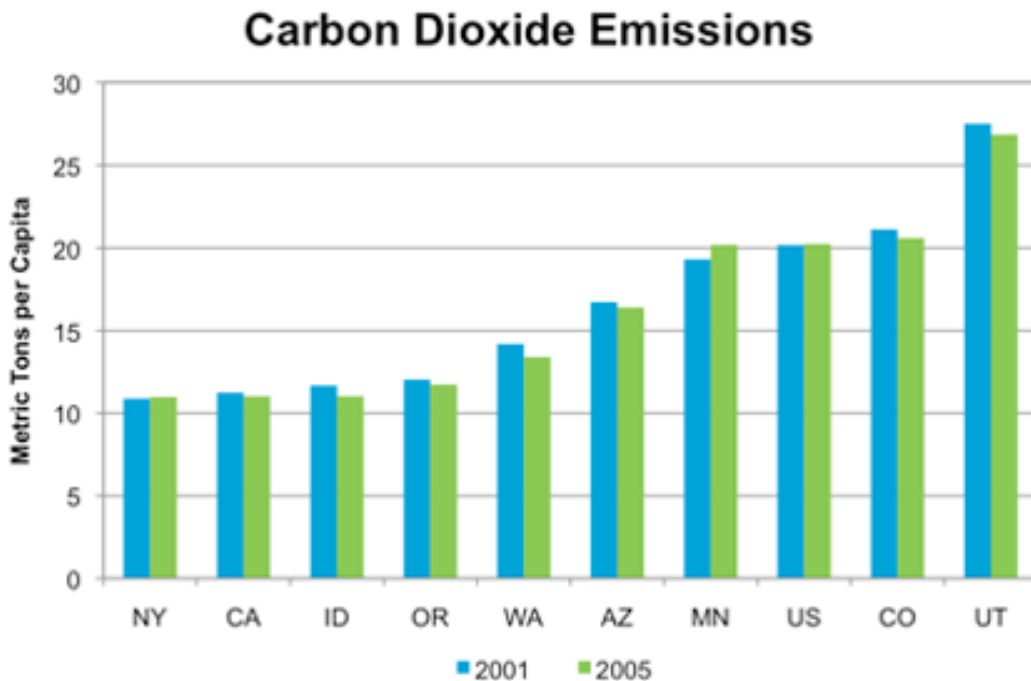
### Why is it significant?

Carbon dioxide emissions are a major source of greenhouse gases, which affect human health and contribute to climate change. It is increasingly evident that states that are able to develop innovative technologies and policies to reduce emissions will have an advantage if and when national carbon regulation comes into effect.

### How does Oregon perform?

Oregon has the 7th lowest carbon dioxide emissions per million people in the country. Oregon's carbon emissions decreased slightly between 2001 and 2005, which was consistent with many competitor states. All competitor states west of the Rockies decreased per capita carbon emissions during the same time period. See Figure 31 & 32.

Figure 31



Source: U.S. Department of Energy, Energy Information Administration; U.S. Census Bureau

**Figure 32. Carbon Dioxide Emissions (metric tons per capita)**

State	2005 Rank	2001	2002	2003	2004	2005
New York	3	10.9	10.4	11.0	11.2	11.0
California	5	11.2	11.0	11.2	11.2	11.0
Idaho	6	11.7	11.0	10.4	11.1	11.0
Oregon	7	12.0	11.4	11.4	11.8	11.7
Washington	10	14.2	12.9	13.0	13.4	13.4
Arizona	14	16.7	16.1	16.0	16.8	16.4
Minnesota	23	19.3	19.7	20.4	20.1	20.2
Colorado	27	21.1	20.3	19.9	20.3	20.6
Utah	38	27.5	26.7	26.4	26.8	26.9
United States		20.2	20.2	20.2	20.3	20.2

Source: U.S. Department of Energy, Energy Information Administration; U.S. Census Bureau

# INNOVATION ENVIRONMENT

## Energy Intensity

### Key message

Energy efficiency is becoming a key aspect of the success of businesses worldwide. States that are able to enhance productivity by generating wealth for residents while reducing the amount of energy required to create that wealth will be well placed to compete in an increasingly energy focused world.

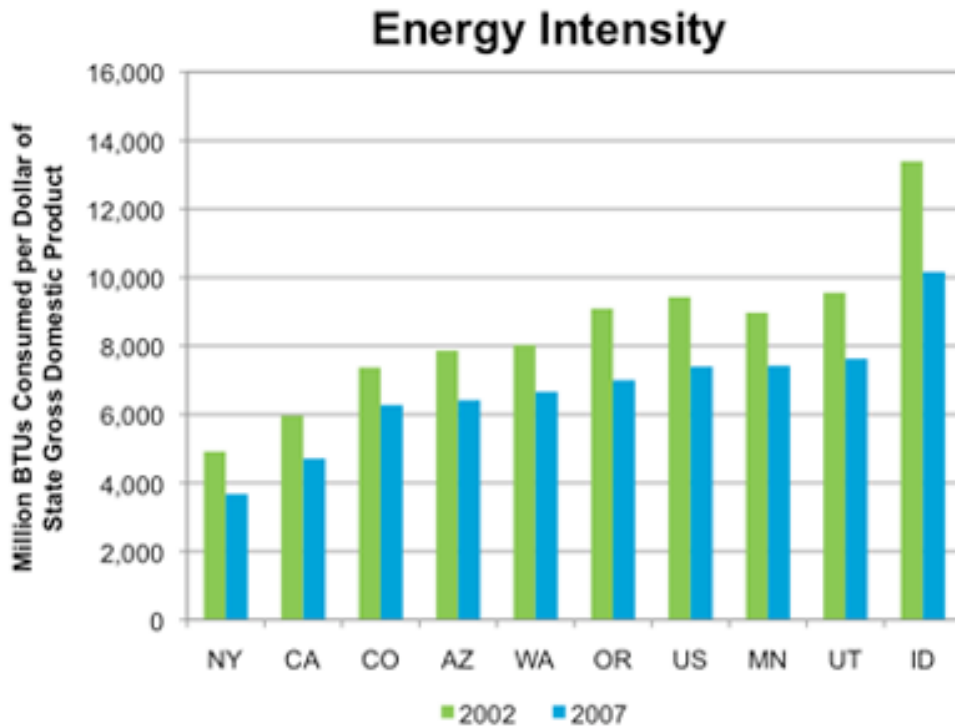
### Why is it significant?

*Energy intensity*—calculated as the amount of energy used to generate one dollar state output (GDP)—measures the energy efficiency of a state economy. States with high energy intensities pay relatively more to convert energy into benefits for the state whereas low energy intensity indicates greater productivity by lowering the cost to convert energy into output. Increasingly, states are taking a closer look at their energy consumption to identify areas where greater efficiencies can be gained.

### How does Oregon perform?

Among competitor states, Oregon's energy intensity is about average, meaning it takes more energy to generate a dollar of output in Oregon than in some other states. Nevertheless, Oregon has made steady improvement in this measure in recent years by decreasing its energy intensity below the national average and remaining in the top half of states. See Figure 33 & 34.

Figure 33



Source: U.S. Department of Energy, Energy Information Administration; Bureau of Economic Analysis

**Figure 34. Energy Intensity (million BTUs per \$ of state gross domestic product)**

State	2007 Rank	2002	2003	2004	2005	2006	2007
Arizona	15	7,868	7,513	7,400	6,904	6,502	6,415
California	6	5,965	5,845	5,490	5,116	4,879	4,713
Colorado	14	7,370	7,176	6,983	6,719	6,378	6,272
Idaho	37	13,388	12,200	11,697	10,838	10,627	10,163
Minnesota	22	8,970	8,607	8,158	7,964	7,569	7,425
New York	2	4,916	4,895	4,739	4,353	3,794	3,678
Oregon	21	9,087	8,515	8,082	7,786	7,288	7,002
Utah	24	9,553	9,329	9,137	8,514	8,015	7,630
Washington	18	8,032	7,784	7,578	7,221	7,047	6,662
United States		9,428	9,042	8,634	8,142	7,627	7,398

Source: U.S. Department of Energy, Energy Information Administration; Bureau of Economic Analysis

**Acknowledgements**

The *Innovation Index* was developed by Business Oregon in partnership with the Oregon InC Metrics committee. The *Index* is prepared and produced by Business Oregon: Michael Anderson, Business Oregon Economist; John Doussard, Innovation Strategist; Nathan Buehler, Branding and Marketing Manager; Carmen Spuhler, Web Administrator.

**For more information, contact:**

Business Oregon  
121 SW Salmon Street, Suite 205  
Portland, OR 97204  
E-mail: [biz.info@state.or.us](mailto:biz.info@state.or.us)  
Web: [www.oregon4biz.com](http://www.oregon4biz.com)