



FACTS OREGON

A M E R I C A N S E C U R I T Y P R O J E C T

Pay Now, Pay Later: Oregon

Projected reductions in snowpack could reduce summer stream flows by up to 50% in some areas of Oregon by 2050. In Portland alone, models estimate the city will likely experience a 4.3 billion gallon shortage.¹

Oregon's lumber was worth \$1.26 billion in 2008, a 23.5% drop in production and 43% drop in value from the year prior. Perhaps linked to climate change, projected to damage this industry is expected in the years to come. Forest fire models, for example, project a 60% increase in acreage burned by the 2020s.²

Oregon is rich in renewal energy sources; roughly two-thirds of the state's energy is derived from hydroelectricity. Four years ago, the state passed legislation requiring major utilities to meet 25% by 2025.³

According to a new study, a failure to mitigate the effects of climate change could begin to cause serious gross domestic product and job losses as early as 2010 through 2050. Oregon is expected to make small gains as an adequate water supply attracts migrants from other states, translating to an increase in economic activity. Ultimately, Oregon could gain \$19.4 billion in GDP and nearly 153,000 jobs.*

**Possibly eclipsing the positive projections, the study's calculations do not include snowfall and icepack melt, which Oregon depends on for much of the water supply. GDP numbers are based on a 0% discount rate. Job losses are measured in labor years, or entire years of fulltime employment. Backus, George et al., "Assessing the Near-Term Risk of Climate Uncertainty: Interdependencies among the U.S. States," Sandia Report (Sandia National Laboratories, May 2010), 21, 137, 141. https://cfwebprod.sandia.gov/cfdocs/CCIM/docs/Climate_Risk_Assessment.pdf (accessed March 23, 2011).*

Admittedly, the effects of climate change, a complex and intricate phenomenon, are difficult to predict with precision. Informed scientific and economic projections, as we have used in our research, however, allow us to see that Oregon faces significant losses in industries crucial to its economy if no action is taken.

Moreover, data shows Oregon is poised to benefit from the research, development, and distribution of renewable energy technologies. The state can meet—and surpass—all of its energy needs using a combination of non-hydro renewable sources such as wind, solar, and geothermal.⁴ Should we fail

to take action against climate change, Oregon has much to lose.

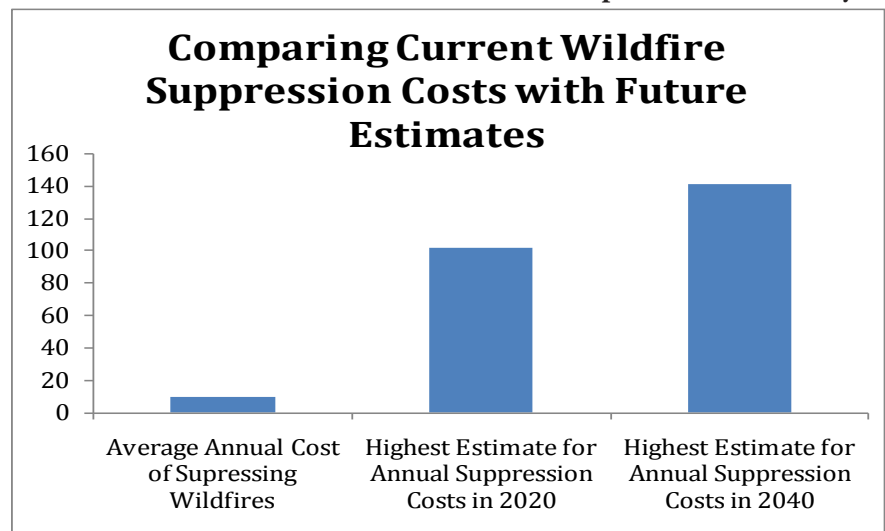
Pay Later: The Cost of Inaction

Temperatures in Oregon are expected to increase 2°F by 2020 and 3°F by 2040 compared to average temperatures from 1970-1999.⁵ These changes will affect the state's energy, tourism, agricultural, and forestry sectors in particular—which together comprise approximately one-fourth of the state's economy.⁶ Climate change will also exacerbate the state's public health problems.

Strained Energy Sources

Oregon currently obtains 80% of its energy from hydropower.⁷ While it should be applauded for using this clean energy source, climate change will jeopardize hydropower generation.

The snowpack that feeds Oregon's rivers is expected to decrease by



Sources: Oregon Climate Change Research Institute; Oregon.gov

as much as 50% in some areas.⁸ Thus, stream flows will be depressed in the summer (when demand for energy is highest) and higher in the winter (when demand is reduced). This change is estimated to cost the region around \$230 million by 2020. Furthermore, a drop in precipitation, as projected, could add to this cost.⁹

A Nightmare for the Outdoorsy

Oregon's tourism industry is primarily based on outdoor activities such as skiing, hiking, and camping. In 2006, over 2 million people spent \$1.6 billion on wildlife-related activities; at this time this sector was responsible for supporting roughly 41,000 jobs in the state.¹⁰ However, recent trends have called this industry's sustainability into question. **Oregon's snow-based recreation sector employs over 10,000 workers and contributes over \$200 million each year; however, as recently as 2005, many mountain resorts have had to close due to insufficient snow.**¹¹

Fishing, hunting, and wildlife watching are also expected to suffer. Warmer winters will increase the seasonal presence of diseases, pests, and parasites. Changes in snowpack will affect fish hatching seasons and reproductive cycles.¹²

Oregon's forests—which cover about half of its 62 million acres—are vital to the state's economy.¹³ Temperature increases will directly affect tree growth, precipitation, the spread of insects and other pestilence, and cause a dramatic increase in wild-

fires. Models suggest that the area of wildfires in the Pacific Northwest is projected to increase 60% by 2020, 120% by 2040, and 300% by 2080. **If the costs associated with suppressing these wildfires climb proportionally to the increase in surface area, Oregon will spend \$64-102 million per year by the 2020s and \$88-141 million by the 2040s.**¹⁴ The state currently spends an average of \$9.5 million suppressing wildfires each year, though 2002 set the record, reaching \$50 million.¹⁵ Such events will also disrupt the state's timber industry, which is the largest in the country.¹⁶

A Threat to Orchards

Also worrisome are the potential effects of climate change on the agriculture industry, which employs over 230,000 Oregonians and has continually been increasing in value.¹⁷ Reduced snowpack and water availability, warmer temperatures, and an altered growing season threaten the sector's output and profits.¹⁸ The impact climate change will have on Oregon's wide array of crops—pears, potatoes, and winegrapes, to name a few—remains uncertain, but some studies point to negative impacts. For example, Oregon's Pinot Noir—enjoyed globally—is particularly sensitive to changes in climate. A warming of Oregon's temperatures could require the relocating and replanting of winegrape crops, creating costs for the sector and possibly moving it out of state. Early maturity could diminish the quality and value of the state's pear and apple crops, which currently thrive in the global marketplace.¹⁹

Coastal Troubles

As a coastal state, Oregon is especially susceptible to a rise in global temperatures. **Though its rugged coastline makes it less vulnerable than most, the sea level is estimated to rise 0.5-3.5 inches per decade, significantly accelerating beach erosion.**²⁰

Large and growing waves, which also contribute to serious increases in coastal erosion and cause flooding, have increased 3 meters in height over the past 30 years.²² Severe weather events, like the winter storms of 2006-07, are also likely to more frequently occur in a warmer global climate. That winter, **winds of up to 129 mph and flooding up 21 feet caused over \$100 million in commercial and homeowner property damage.**²³ **It is estimated that the 1997 El Nino event, the worst ever on record, caused over \$1 billion in losses to the Pacific Northwest.**²⁴

The long-term consequences of the predicted rise in sea levels are damaging. **The Pacific Northwest is expected to lose up to 44% of its tidal flats, 25% of its tidal fresh marsh, and 13% of its inland fresh marsh,**²⁶ causing degradation of natural ecosystems and negatively affecting their habitats, many of which—shrimp, oysters, and clams to name a few—are important to the region's economy.²⁷

Oregonian Health Risks

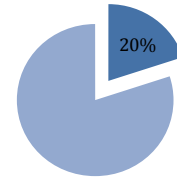
The increase in global temperatures will increase morbidity and mortality and reduce productivity. **Deaths from asthma in Oregon are predicted to increase 20% in the next 10 years due to climate change,** and temperature increases will make the state a more favorable location for pests such

as malaria-carrying mosquitos. Increased temperatures are also predicted to hospitalize countless Oregonians—especially considering the aging population; a 150% increase in morbidity is predicted in Portland.²⁸

Pay Now: The Benefits of Taking Action

Oregon is poised to develop and harness its green energy potential. From the state legislators to the boardrooms, there seems to be a consensus that the state should become a leader in the green-energy movement. Should the state realize its potential, it could also accrue substantial financial benefits.

Oregonian Labor Force Projected to be Directly Affected



Sources: State Board of Agriculture; U.S. Bureau of Economic Analysis²⁹



Oregon can satisfy—and surpass—all of its electricity needs using solar, wind, biomass, and geothermal resources.³⁰ The state has over a million acres of windy land that are capable of producing 70 million MWh of electricity per year,³¹ and it has sufficient solar resources to produce up to 5,500 watt hours per square meter. Accordingly, setting aside just 1 square mile in Oregon for solar power can satisfy the electricity needs of 1,300 households each year.³² Furthermore, **expanding solar capacity by 30% throughout the United States would create in Oregon 1,193 jobs and attract \$960 million in investments.**³³

Developing its green industry would also allow Oregon to mitigate the effects of the global financial crisis, as **it is poised to receive nearly \$1.8 billion and create 21,000 jobs due to increased investment in clean energy.**³⁴ Furthermore, there is a strong incentive for Oregon to invest in clean energy instead of fossil fuels. Compared to an equivalent amount invested in traditional energy; clean-energy investments create 2.6 times more jobs for people with at least a college degree and, for people with a high school diploma or less, 3.6 times more jobs.³⁵

Oregon's clean energy economy is already blooming, growing an estimated 51% from 1998-2007, outperforming the state's average growth rate of 7.5%. By 2007, the state's estimated 1,613 businesses had generated over 19,340 jobs, and between 2006 and 2008 venture capitalists pumped nearly \$70 million into the state's economy.³⁶ If Oregon keeps making strides in this industry, it will benefit tremendously.

Major Electric Power Plants (>=100 MW)		Renewable Energy Potential
Coal Mine, Surface	▲ Coal	■ Biomass (>= 50 tons/sq km/yr)
Coal Mine, Underground	○ Geothermal	■ Geothermal (>= 80 milliwatts/m2)
★ Natural Gas Hub	◆ Hydroelectric	■ Solar (>= 8.0 kWh/m2/day)
■ Petroleum Refinery	▼ Natural Gas	■ Wind (>= 3 Power Class)
◆ Oil Import Site	● Nuclear	■ Wind (>= 3 Power Class)
◆ Oil Seaport	○ Petroleum	■ Wind (>= 3 Power Class)
— Electricity Transmission Line (>= 345 kV)	✕ Wind	■ Wind (>= 3 Power Class)
■ Natural Gas Flow (1 mile band width = 100 million cubic feet/day)	▲ Wood	■ Wind (>= 3 Power Class)
■ Oil and Gas Active Leases	● Other Renewable	■ Wind (>= 3 Power Class)

Conclusion

Oregon must consider action on climate change not just in terms of cost, but also in terms of opportunities. If we give Oregon's population, businesses, and investors clear and consistent signals by properly offering initiatives and cultivating demand, investment and innovation in renewable technologies will follow.

Oregonians will have to pay for the effects of climate change. The only remaining question is whether they will pay now, or pay later and run the risk of paying significantly more.

(Endnotes)

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