

WIND POWER AND ECONOMIC DEVELOPMENT: REAL EXAMPLES FROM THE PACIFIC NORTHWEST

Jesse Jenkins
Troy Gagliano
Renewable Northwest Project
917 Southwest Oak Street, Suite 303
Portland, OR 97205
jesse@rnp.org
troy@rnp.org

ABSTRACT

Wind power development in the Pacific Northwest is bringing significant economic development benefits to communities across the region. Between October 2005 and October 2006, seven new utility-scale wind farms were completed in the Northwest (Oregon, Washington, Idaho and Montana), providing 954 megawatts (MW) of new wind power capacity – enough clean, renewable energy to power roughly 238,500 average Northwestern homes.

In addition to bringing nearly 1,000 MW of clean energy to the Northwest grid, these projects are bringing billions of dollars of capital investment and new economic activity to the region. This paper examines the real economic development impacts of these seven recent wind projects on the Pacific Northwest. Drawing on information gathered in surveys of wind power developers, supplemented by other documents as needed, this paper presents the impacts of 954 MW of Northwest wind power development on county property tax revenues, landowner income, job creation, community spending and other economic benefits.

This paper then extrapolates an estimate of the potential economic development benefits of state renewable energy standards in Washington and Oregon. Washington voters recently enacted a renewable energy standard in November 2006, and the Oregon Legislature is currently considering a renewable energy standard proposal as this paper is written.

1. THE PROJECTS

Between October 2005 and October 2006, seven new utility-scale wind power projects were completed in the Pacific Northwest states – Oregon, Washington, Idaho and

Montana. These seven projects are now generating 954 MW of clean, renewable energy, bringing the total installed wind power capacity in the Northwest to 1,477 MW. Table 1 describes the seven new wind farms.

TABLE 1: RECENT NORTHWEST WIND POWER PROJECTS (OCTOBER 2005 TO OCTOBER 2006)

Project	Location	Capacity
Klondike Phase II	Sherman County, OR	75 MW
Hopkins Ridge	Garfield County, WA	150 MW
Judith Gap	Wheatland County, MT	135 MW
Wolverine Creek	Bonneville and Bingham Counties, ID	64.5 MW
Leaning Juniper	Gilliam County, OR	100.5 MW
Wild Horse	Kittitas County, OR	229 MW
Big Horn	Klickitat County, WA	199.5 MW
<i>Total:</i>		<i>953.5 MW</i>

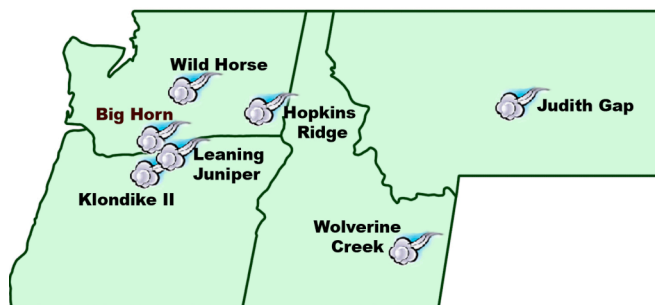


Fig. 1: Northwest Wind Power Projects Completed Between October 2005 and October 2006

2. METHODOLOGY AND STUDY LIMITATIONS

We collected information on the economic impacts of these seven wind power projects by surveying the project developers. The survey asked the developers for the following information: property tax revenue the project will generate; number of landowners involved in the project; landowner royalties; businesses and contractors involved in the project; and number and type of operation and maintenance jobs created.

We also asked the developers to distribute another survey to the main contractors involved in construction of the project. This survey asked the contractors for the following information: general information about the company; the number and type of jobs created by the project; and the other businesses involved in the contractor's operations.

After discussions with the project developers, we determined that surveying only the civil engineering and electrical engineering contractors for the projects would provide us with the most useful information on job creation and spending during the construction period of the projects. The civil and electrical engineering contractors make up the bulk of construction jobs on the projects. Therefore, the total job creation figures for each project are likely underestimated, as they do not take into account the full range of contractors involved in the project.

To protect potentially sensitive information, some questions asked the developer or contractor to provide a range of figures, rather than an exact value. We also agreed to only publish aggregated values for all seven projects, rather than values for specific projects, unless we obtained permission or the information had previously been made publicly available.

Additionally, as with any survey, some responses were incomplete. We therefore supplemented any incomplete survey responses with additional conversations with project developers or by drawing on information in other publications, including developer press releases, news articles and other reports.

It should be further noted that property tax revenue generated by wind power projects is highly dependent on the county and state the project is located in. Care should be taken when using the property tax values presented in this paper to extrapolate the potential impacts of other projects elsewhere in the country, as property tax revenue can vary considerably across jurisdictions.

Because of these limitations, the values presented in this paper should not be considered exact. They do however provide a very good indication of the real economic

development impacts of modern utility-scale power projects.

3. RESULTS

3.1 Capital Investment

Wind power projects are capital intensive and represent major new capital investment in local and regional economies. Table 2 describes the total capital investment represented by the seven projects.

TABLE 2. COMBINED CAPITAL INVESTMENT FROM SEVEN NORTHWEST WIND POWER PROJECTS

Total Capital Investment	\$1.38 billion
Average Capital Investment per MW	\$1.45 million per MW (installed capacity)

3.2 Property Tax Revenue

Wind power projects provide significant new sources of tax revenue to support crucial county services. Because wind energy projects are frequently located in rural counties with small existing tax bases, these projects represent a major boon for county coffers. Additionally, wind power projects are helping to diversify and strengthen funding sources for many counties that have historically relied on just one or two economic engines – i.e., wheat or timber revenue.

For example, the 75 MW Klondike Phase II Wind Farm in Sherman County, Oregon, is expected to single-handedly increase the county's general fund by approximately 20%, or \$750,000 annually. This comes on top of tax revenues already flowing into county coffers from the previous 24 MW Phase I project, completed in 2001. The relatively small Phase I project boosted Sherman County's tax base by 10% and generated \$321,205 in property tax revenue for Sherman County in its first year of operation.¹ Figure 2 illustrates how these funds are distributed to support a wide variety of county services.

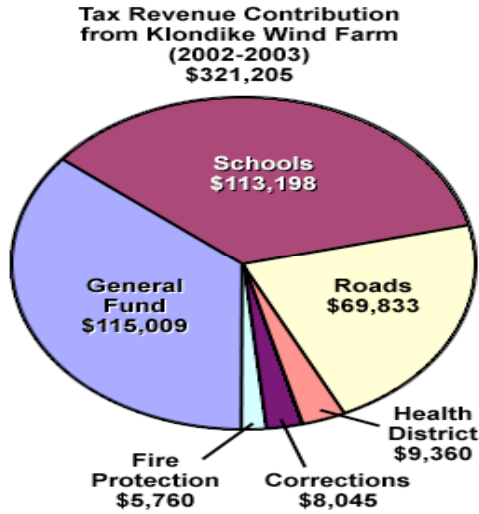


Fig. 2: Distribution of Property Tax Revenue from Klondike Wind Farm Phase I, 2002-2003

Before the construction of the Klondike wind power projects, Sherman County was a “one-crop” county, relying on dryland wheat farming for most of its economic activity and tax revenue. The county ranked last out of 36 counties in Oregon in per capita income when the Klondike Phase I Wind Farm came online in 2001. Now the county is enjoying a robust and reliable new source of revenue to support crucial county services and county officials are looking forward to continued wind power development in Sherman County. A 221 MW Phase III expansion of the Klondike project began construction in November 2006 and more wind projects are planned for the county.

Other wind power projects are having similarly large impacts on county tax revenues. Puget Sound Energy owns the 229 MW Wild Horse Wind Farm near Ellensburg, Washington. The utility is now Kittitas County’s largest single taxpayer, paying approximately \$1.3 million in property taxes annually. This new tax revenue includes \$480,000 for the Kittitas School District, \$402,000 for the state school fund, and \$162,500 for the county general fund.²

Table 3 describes the combined property tax revenues that the seven wind projects will generate.

TABLE 3. COMBINED PROPERTY TAX IMPACTS OF SEVEN NORTHWEST WIND POWER PROJECTS

Total Property Tax Revenue Generated	\$5.79 million to \$6.75 million annually
Average Property Tax Revenue Generated per MW	\$6,083 to \$7,079 per MW (installed capacity)

3.2 Landowner Payments

For many rural Northwest landowners, wind power development has become an attractive new crop that they can harvest, diversifying their income sources and providing a crucial new revenue stream. Wind power projects pay landowners royalties, or land lease payments, for wind turbines sited on their property. Our survey found that Northwest landowners receive annual royalty payments ranging from \$2,000 to \$7,000 per turbine. For comparison, each turbine sits on roughly a half-acre of land; that same half-acre would earn less than \$100 per year if used to cultivate winter wheat.

Landowners are finding wind turbines easily compatible with existing farming and ranching operations. According to John Hilderbrand, a wheat and wind farmer in Sherman County, Oregon, the turbines are a great fit with his wheat farming operations. “Put them up, we can farm around them easily,” declares Hilderbrand. “The turbines use very little land and the new roads give us better access to our fields. Plus the turbines make money in the winter when I can’t work my land.”

Table 4 describes the combined landowner royalty payments that the seven wind projects are generating.

TABLE 4. COMBINED LANDOWNER ROYALTY PAYMENTS FROM SEVEN NORTHWEST WIND POWER PROJECTS

Total Landowner Royalty Payments	\$1.98 million to \$3.28 million annually
Average Landowner Royalty Payment per MW	\$2,073 to \$3,283 per MW (installed capacity)
Average Landowner Royalty Payment per Turbine	\$3,328 to \$5,269 per turbine

3.3 Development and Construction Jobs and Community Spending

Wind power projects are capital and labor intensive, each employing hundreds of workers and infusing millions of dollars into the local and regional economy. A variety of supporting businesses also experience positive economic development impacts from wind power development. Job creation from wind power development begins before the first shovel even breaks ground. The pre-construction phase of wind power projects involves the following businesses:

- Legal consulting firms;
- Design and engineering firms; and
- Environmental and other consulting firms.

Most of the jobs that wind power development creates are tied to the construction phase. Our survey shows that the construction phase of wind power projects typically involves dozens of different contractors and businesses including:

- Longshoreman and port workers who unload turbines from ships;
- Truck drivers who transport turbines, blades and towers to project sites;
- Civil and electrical engineering firms;
- Gravel, concrete, rebar, fuel and other materials suppliers;
- Heavy equipment rental companies; and
- Road construction, concrete laying, surveying, excavating and numerous other construction contractors.

Often, many of the contractors and businesses involved in the construction phase are based in the local community or surrounding rural communities. For example, construction of the Wild Horse Wind Farm employed 250 construction workers, most from within Oregon and Washington and approximately one-third from within rural central Washington counties. Furthermore, during the construction of the wind farm, Horizon Wind Energy and its contractors spent over \$8.4 million in the local community during the twelve-month period on equipment rental, salaries for local hires and other local purchases.

The new income and investment wind power development directly creates also has a larger ‘ripple effect’ as this new income is spent and re-spent throughout the local and regional economy. For example, in addition to those businesses directly involved in the construction of wind power projects, other local businesses including restaurants, grocers, gas stations, hotels, and hardware and supply stores receive added income by providing services and supplies to workers and businesses involved in wind farm construction. Additionally, the income earned by local hires involved in project development tends to be spent within the local economy, bolstering the community’s economic activity.

This paper does not attempt to quantify the ‘ripple effect’ or ‘economic multiplier’ of the jobs and spending directly created by wind power development. However, it should be noted that the total economic impacts of wind power development extend far beyond the direct job creation considered in our survey. For example, The International Longshore and Warehouse Union (ILWU), Local 4, which unloads wind turbines at the Port of Vancouver, Washington, reports that the increased volume of wind turbines arriving through the port has directly generated more than 25,000 labor hours in the past two years and created about 30 new positions. However, the ILWU

estimates that the ‘ripple effect’ from this new port activity has created nearly 2,000 new jobs in the area.⁴

Table 5 describes the combined construction jobs created by the seven wind projects.

TABLE 5. COMBINED CONSTRUCTION JOBS CREATED BY SEVEN NORTHWEST WIND POWER PROJECTS

Total Construction Jobs Created ⁱ	1,172 to 1,323 jobs
Average Construction Jobs Created per MW	1.23 to 1.39 jobs per MW (installed capacity)

3.4 Operations and Maintenance Jobs

In addition to the hundreds of workers employed during the construction of wind power projects, these projects also create permanent operations and maintenance positions.

For example, nine employees operate and maintain wind turbines at the Klondike Phase I and II Wind Farms. Nine employees may not sound like much, but considering that the population of Sherman County, Oregon is only about 1,900, nine jobs is not insignificant. In fact, nine new jobs in Sherman County is proportionate to nearly 3,100 new jobs in populous Multnomah County, Oregon where Portland is located.

These operations and maintenance positions tend to be local hires and those hired from outside the area almost always relocate to the local community surrounding the wind power project, keeping their income and spending in the community.

Table 6 describes the combined operations and maintenance jobs created by the seven wind projects.

TABLE 6. COMBINED OPERATIONS AND MAINTENANCE JOBS CREATED BY SEVEN NORTHWEST WIND POWER PROJECTS

Total Operations and Maintenance Jobs Created	66 to 72 jobs
Average Operations and Maintenance Jobs Created per MW	0.07 to 0.08 jobs per MW (installed capacity)

i. As discussed in Section 2 above, the construction job creation figures presented by this paper only include jobs employed by civil and electrical engineering firms and are an underestimate of total jobs involved in development and construction of wind power projects. These figures should therefore be considered conservative representations of job creation associated with wind power development.

3.5 Results Summary

Tables 7 and 8 below summarize the results of our survey. Table 7 presents combined economic development totals for the seven wind projects while Table 8 presents average economic development impacts for the seven projects per megawatt of installed wind power capacity.

TABLE 7. COMBINED ECONOMIC DEVELOPMENT IMPACTS OF SEVEN NORTHWEST WIND POWER PROJECTS

Total Capital Investment	\$1.38 billion
Total Property Tax Revenue Generated	\$5.79 million to \$6.75 million annually
Total Landowner Royalty Payments	\$1.98 million to \$3.28 million annually
Total Construction Jobs Created	1,172 to 1,323 jobs
Total Operations and Maintenance Jobs Created	66 to 72 jobs

TABLE 8. ECONOMIC DEVELOPMENT IMPACTS PER MEGAWATT OF INSTALLED WIND POWER CAPACITY

Average Capital Investment per MW	\$1.45 million per MW (installed capacity)
Average Property Tax Revenue Generated per MW	\$6,083 to \$7,079 per MW (installed capacity)
Average Landowner Royalty Payment per MW	\$2,073 to \$3,283 per MW (installed capacity)
Average Construction Jobs Created per MW	1.23 to 1.39 jobs per MW (installed capacity)
Average Operations and Maintenance Jobs Created per MW	0.07 to 0.08 jobs per MW (installed capacity)

4. EXTRAPOLATING ECONOMIC DEVELOPMENT IMPACTS TO STATE RENEWABLE ENERGY STANDARDS

Taking these seven Northwest wind power projects as representative of the economic development effects of wind power development in general, we can provide an indication of the economic development effects of state renewable energy standards (RES), sometimes also referred to as renewable portfolio standards. Although it is unlikely, for the sake of illustration we will assume that RES policies in Oregon and Washington are met entirely with wind power. We can use the per megawatt results from this survey (shown in Table 8 above) to extrapolate the total direct economic development benefits of these policies.

In November 2006, Washington State voters enacted Initiative 937 (I-937). I-937 enacts a state RES that requires Washington’s 17 largest utilities to get 15% of their electricity from renewable energy sources by 2020. This Initiative is expected to support the development of approximately 1,300 average megawatts (aMW) of new renewable energy development,⁵ or roughly 4,333 MW of wind power capacity if met entirely by new wind development.ⁱⁱ

The Oregon State Legislature is currently considering a 25% by 2025 RES policy. This policy is expected to result in approximately 1,900 aMW of new renewable energy generation, or roughly 6,333 MW of wind power capacity if met entirely by wind.

Together, the two state RES policies will result in the construction of approximately 3,200 aMW of new renewable energy generation. If this new generation is met entirely with wind power development, the two policies would result in the installation of roughly 10,667 MW of wind power capacity by 2025.

Table 9 presents estimates of the direct economic development impacts of these two state RES policies, if met entirely by wind power development. This is a rough analysis, but should provide some indication of the kind of economic development benefits to expect as these policies are implemented.

TABLE 9. ESTIMATED ECONOMIC DEVELOPMENT IMPACTS OF WASHINGTON AND OREGON RENEWABLE ENERGY STANDARDS

Total Installed New Wind Power Capacity	10,667 MW (installed capacity)
Total Capital Investment	\$15.4 billion
Total Property Tax Revenue	\$64.9 to \$75.5 million
Total Landowner Royalty Payments	\$22.1 to \$35.0 million
Total Construction Jobs Created	13,111 to 14,800 jobs
Total Operations and Maintenance Jobs Created	738 to 805 jobs

5. CONCLUSIONS

Wind power development in the Pacific Northwest represents a major economic windfall for the region. The seven large, recently completed Northwest wind power projects analyzed here are generating millions of dollars in new property tax revenues for counties, millions more in

ii. Assumes 30% average capacity factor for wind power projects.

annual royalty payments for landowners and creating thousands of new jobs (see Table 7 above).

State Renewable Energy Standard policies, including the 15% by 2020 standard enacted in Washington and the 25% by 2025 standard being considered in the Oregon State Legislature, can be expected to create even more significant economic development benefits for the Northwest. These policies will result in the installation of several thousand new megawatts of wind power and other renewable energy generation, bringing with it the kind of economic development described in this paper.

It is clear that harvesting the region's abundant renewable energy resources not only creates clean, homegrown renewable energy, but also creates a robust regional economy by bringing new jobs and revenue to communities across the Pacific Northwest.

8. REFERENCES

- (1) Brad Ouderkirk and Meghan Pedden. "Windfall from the Wind Farm: Sherman County, Oregon." Renewable Northwest Project, 2004 (Revised August 2005). Presented at Windpower 2005 Conference.
<http://www.rnp.org/Resources/default.html>.
- (2) "Wild Horse Wind Power Project Tax Impacts." Economic Development Group of Kittitas County, 2006.
- (4) "The Port of Vancouver Carries its Weight." *The Columbian*, October 15, 2006.
- (5) Deyette, Jeff. "The Washington Clean Energy Initiative: Effects of I-937 on Consumers, Jobs and the Economy." Union of Concerned Scientists, 2006.