

## Wind Power Can Benefit Farmers and Rural Communities

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Wind power does not currently contribute significantly to total farm income in the 10 states with the highest installed wind power capacity, although some individual farmers and rural communities have benefited considerably from this energy source. However, wind projects located on farmland have increased some individual farmers' income significantly, according to our site visits and analysis. In addition, large wind power projects established in some of the poorest rural counties in the United States have generally benefited these counties through the tax revenues they produce and the employment opportunities they provide.

## Wind Power Is a Boom for Farmers

In the 10 states we examined, total net farm income exceeded \$14 billion in 2002, but total direct income to all U.S. farmers from wind power ranged from only \$10 million to \$45 million, representing only a fraction of 1 percent of net farm income in these states. Nevertheless, wind projects located on privately owned farmland—the majority of U.S. wind power projects, according to AWEA [American Wind Energy Association]—have increased individual farmers' income by as much as tens of thousand of dollars annually, according to our analysis and site visits. In most cases, the farmers do not have an ownership interest in the projects. Rather, they receive lease payments from energy development companies for the use of the land and the associated "wind rights." According to AWEA and other sources, the compensation a farmer receives for leasing land for wind power turbines effectively amounts to between \$2,000 and \$5,000 per year per MW [megawatts of electricity] of installed capacity. However, actual compensation received varies widely, depending on the following factors:

- *The number of turbines.* One California project includes turbines with a total generating capacity of approximately 60 MW. Based on data developed from our site visit to this project, we estimate that one of the landowners has enough turbines on his land to have generated over \$200,000 in annual lease payments from the project owner. In another case, an Iowa project consisting of about 260 turbines has a total generating capacity of approximately 190 MW. However, the turbines are spread out over separate properties owned by 65 farmers. According to the project owner and one of these farmers, the average annual lease payment is about \$2,000 per turbine, with each farmer's total payments depending on the number of turbines located on that farmer's land.
- *The value of electric power generated by the project.* Land lease income is often linked to wind power project revenues. For example, land lease income may be a percentage of the gross revenues from the sale of the project's wind power. Thus, the higher the sale price of power, the higher the lease income to the landowner. The price paid by utilities for the electricity produced from wind power projects has varied by location and over time. Nationwide, these prices currently range from \$20 to \$35 per MW hours (MWh).

However, power purchase contracts signed in California in the early 1990s tended to be well above this range. For example, the price currently received for electricity from one California wind power project is about \$70 per MWh.

- *The terms of the lease payments.* The lease payments may include a single lump sum payment, fixed annual fees per turbine or per unit of power generation capacity, or a percentage of the project's gross revenues. The farmer may receive additional lease payments for other structures or considerations related to the wind project, such as substations, operations and maintenance buildings, and rights-of-way, including roads leading to and from the project and transmission poles and lines to connect the project to the local power grid. In cases in which the farmer has an ownership interest in the project, the potential financial benefits may be even greater per turbine. However, farmer-owned wind projects tend to be smaller, because farmers generally do not have the financial resources of an energy development company to establish larger projects with more turbines.

## **Wind Stabilizes Farm Income**

Whatever the lease arrangements, the income farmers receive from wind projects located on their land is relatively stable compared with the income they derive from crop and livestock production, according to some farmers and other sources. Although the income from wind projects may be modest, these individuals said, it serves as an important hedge against possible fluctuations in income from crop and livestock production. Furthermore, income from wind turbines located on a farmer's land generally does not fluctuate significantly, although higher or lower average wind speeds from one year to another can affect the amount of royalty payments a farmer receives. Royalty payment rates—for example, 4 percent of gross revenues for electric power generated—are generally negotiated for a period of years. In addition, contracts between a landowner and a wind project owner often have a provision for minimum payment per turbine per year to protect a landowner's income in cases of unusual low-wind periods or if a turbine is out of operation because of weather-related damage or maintenance. In some cases, a farmer said the additional income from the wind project helps keep the farm solvent and the farmer's family on the farm.

## **Boosting Rural Economies**

The construction and operation of a large wind project in a rural county is likely to increase the county's general level of economic activity and wealth. Constructing a large wind power project with several dozen turbines requires the services of multiple businesses and scores of skilled and unskilled workers, as well as the purchase of equipment and material, such as turbines, towers, asphalt, cement, concrete, and electrical cables. In these activities, wind power project developers and operators have directly benefited rural communities by hiring local people and purchasing locally some of the goods and services needed to construct and operate a project. Furthermore, according to DOE [the U.S. Department of Energy], increasing the proportion of the nation's energy generation attributable to wind power to 5 percent by 2020 would add about \$60 billion in capital investment in rural America; provide an estimated \$1.2 billion in new income to farmers, Native Americans, and rural landowners; and create approximately 80,000

new jobs. (To determine the overall economic benefits of increasing wind power to farms and rural communities, any losses to the fossil fuel industry need to be counted as an offsetting factor.)

In general, a county with a larger, more diversified economic base can more likely provide these services and supplies, thereby retaining more of the project's direct economic benefits. For example, according to the developers of a large wind project—High Winds in Solano County, California—they obtained much of the services and supplies needed to construct this project within the county, which has over 400,000 residents and a diversified business community. However, if a county cannot provide some of the services and supplies needed, other nearby counties or cities that can provide these services and supplies may benefit. In Pipestone County, Minnesota, for example, wind power developers purchased some supplies locally, such as concrete, but had to contract with a firm in Fargo, North Dakota, for a crane large enough to erect the turbines and with a firm in Minneapolis to do the electrical wiring. Pipestone County, located in southwestern Minnesota, has about 9,800 residents and a small business community.

## **Indirect Benefits**

Furthermore, businesses and individuals directly employed by the wind project are likely to spend part of their income at local businesses, such as restaurants, hotels, and gas stations, and hardware, clothing, and food stores. In some cases, the benefits from these activities may exceed the level of a project's direct benefits. For example, according to the Fort Stockton Economic Development Corporation in Pecos County, Texas, the county experienced a 10 percent increase in gross sales during the construction of several wind power projects.

The property tax revenues resulting from the establishment of a wind power project in a county creates additional revenues that support schools, hospitals, fire protection, and other public services. Following are some examples:

- Lincoln County, Minnesota, with a population of about 6,200, obtained about \$470,000, or 18 percent of its property tax revenues, in 2003 from local wind power projects with a combined capacity of 156 MW.
- Pipestone County, Minnesota, obtained about \$660,000, or 8 percent of its property tax revenues, in 2001 from wind projects with a combined capacity of 113 MW.
- In Pecos County, Texas, with a population of about 16,000 the school districts received about \$5 million in 2002 from property tax revenues directly associated with wind power projects in that county. For example, the Iraan-Sheffield School District, obtained one-third of its property tax revenues from wind power projects that year. These projects also added about 30 to 35 full-time permanent jobs to operate and maintain the projects.

For some counties, tax benefits may have to be deferred to attract wind power developers. These counties have offered generous tax abatements, forgoing part or much of the tax revenues that would have otherwise been collected for the period covered by the abatement. For example, to attract wind power developers, Texas's Upton County offers a tax abatement of 10 years, waiving all property taxes during this period with the exception of taxes collected for schools.

In terms of other taxes, counties that have sales taxes or that receive a share of state sales tax revenues are likely to realize income from the sale of taxable goods and services connected with the construction and operation of a wind power project. In addition, in states that have a personal or corporate income tax, the increased employment and business opportunities associated with a wind power project are likely to increase these tax revenues, which are then shared with counties in the state or used for public projects that benefit county residents.

## **Rising County Employment and Income**

To better gauge the significance of general increases in economic activity, we asked NREL [the National Renewable Energy Laboratory] to use its Wind Impact Model to estimate these benefits, as well as direct benefits, for the counties we visited. NREL developed a number of estimates, varying the size of the wind project but otherwise keeping key model assumptions constant. In general, the results of NREL's analysis confirm our observations from our site visits. For example, NREL estimates that the operation of a 150 MW project located in Alameda County, California—a county with a large population and diversified economic base—would result in the creation of 65 new jobs in the county and increase total income in the county by \$5.4 million. However, the same size project located in Upton County, Texas, which has a much smaller population and economic base, would result in only 47 new jobs and an increase in total county income of \$2.75 million. This is because in the case of Upton County, more of the staff needed to operate the project would be hired from outside the county. Nevertheless, the impact of the local hires on employment in Upton County may be greater than in Alameda County because the population of Upton County is so much smaller.

### **Further Readings**

U.S. Government Accountability Office, “Wind Power’s Contribution to Electric Power Generation and Impact on Farms and Rural Communities,” Report GAO-04-756 Renewable Energy, September 2004, pp. 34–38.

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