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# The Employment Impacts of Wind Power Development in Maine 2003-2010

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For

First Wind, Inc  
TransCanada Maine Wind Development Inc.

February 2011

## SUMMARY:

- Analysis of 257 megawatts of wind power capacity in three projects in western, eastern, and northern Maine over 7 years
- Over 7 years an average 240 direct and indirect jobs were created
- During peak years of construction, 600 jobs were created each year
- Construction of these wind power projects required inputs from more than 300 Maine firms

The development of wind power in Maine has emerged as a significant economic opportunity in the past several years, providing one of the few growing sectors in the latter half of the last decade. The employment impact of this development has been discussed in regulatory filings before, but has not been examined in detail using post-construction data on actual wind power projects. This report examines the employment impacts of three major wind power projects: Mars Hill in Aroostook County, Stetson Mountain in Washington County, and Kibby Mountain in Franklin County. (Stetson and Kibby were undertaken in two phases.) These projects together provide 257 megawatts of installed generating capacity.

The first two projects were developed by First Wind and the third project by TransCanada Maine Wind Development Inc. Mars Hill was the first utility-scale wind project in Maine and construction was completed in 2006. The Stetson Mountain projects were constructed during 2008-2010, while the Kibby Project was built in 2009-2010. However, planning for these projects stretched back to 2003. Together the projects required development expenditures of over \$642 million for the purchase of generation and transmission equipment and for the construction of the wind turbines and associated transmission lines.

In sum, over the eight years of planning and construction for these three major wind power projects, an average of 240 jobs per year were created or supported in the Maine economy. During the peak years of construction activity in 2008 and 2009, both years of severe distress in the Maine economy brought on by the national recession, wind power construction created or supported an average of over 600 jobs. Employment impacts during the peak construction years averaged 2 direct and indirect jobs per installed megawatts of generating capacity for all projects

To ascertain the employment impacts of these projects, data was obtained from the two development companies plus Reed & Reed Inc., the construction company for all three projects. This data was then analyzed with economic models of the Maine economy developed by Regional Economic Models Inc. (REMI) of Amherst, MA and maintained by the Maine Center for Business and Economic Research (MCBER) at the University of Southern Maine. REMI models are widely used to analyze economic impacts by comparing economic performance with and without a specific change such as wind power construction.

For purposes of analysis, three major industries are considered to be directly affected by the projects:

- Construction
- Project planning and permitting services provided by the professional and technical services industry
- Food and accommodation for construction workers who require accommodation while constructing the project

Table 1 shows the expenditures in each of these areas in Maine for the three projects over the period of development and construction. These represent expenditures in Maine for Maine-supplied goods and services related to the projects, which Reed & Reed reports come from 300 different Maine companies. These figures do not include expenditures for turbines, blades, towers, and transformers, which are sourced outside of Maine.

	Total 2003-2010
Construction	\$197.82
Food & Lodging	\$1.31
Professional & Technical Services	\$23.67
Total	\$222.79

Table 1 Wind Power Development and Construction Expenditures in Maine (\$ Millions, excludes equipment manufactured outside Maine)

The figures in Table 1 represent that portion of the total costs of the projects that was spent on Maine-provided goods and services. The total cost of the projects was \$642 million. The difference between this total and the total in Figure 1 represents the turbines, towers, and transmission equipment that are manufactured outside of Maine.

Table 2 shows the employment and output impacts from the three projects in the Maine economy. The table shows direct, indirect and total employment effects estimated by the REMI model.

	Maine							
Direct Employment	2003	2004	2005	2006	2007	2008	2009	2010 <sup>1</sup>
Construction				220	5	470	520	114

<sup>1</sup> Through July 2010. This figure excludes the Rollins Project under development by First Wind.

Food & Lodging						15	20	5
Prof & Tech Services	3	5	10	30	30	45	25	10
Total Direct	3	5	10	250	35	530	565	130
Indirect Employment	2	10	5	75	15	160	145	25
Total Employment	5	15	15	325	50	690	710	155

Table 2 Estimated Job and Output Impacts of Wind Power Projects

The employment estimated includes both “new” and “supported” employment. “New” employment includes jobs that would not exist “but for” the wind power projects. Many of these jobs will have been taken by those living in the vicinity of the projects, though the exact distribution is not available. These are primarily the jobs directly engaged in the construction activity. Other jobs in the service industries and industries such as retail trade (part of indirect employment) are not created by the projects, but a portion of the incomes earned in these jobs is derived from the spending associated with the projects.

A major portion of the employment benefit is the wages paid within Maine, which are estimated at \$46.8 million, or \$182,000 per megawatt installed. The average hourly pay, including benefits, for the construction activities is estimated by Reed & Reed at \$29.00 per hour.

Once constructed, the Mars Hill, Stetson, and Kibby projects will require about 30 people for operations, including conducting routine maintenance and assuring safe operations of the turbines. These operational period jobs will support an annual average 15 additional “indirect” jobs. It should also be noted that over the lifetime of these projects there will be periodic repair, maintenance and overhaul projects during which higher employment levels may be experienced. The timing and magnitude of such projects cannot be accurately predicted at this time because the projects are all relatively new. But total employment impacts over a 20-30 year project operational period will be higher than indicated by these regular annual figures.

The wind power projects examined here primarily affected four regions: Aroostook County (Mars Hill), Eastern Maine (Stetson I and II), Western Maine (Kibby Mountain), and Cumberland County, where much of the professional and technical service support is provided. Reed & Reed and Cianbro, with headquarters in Sagadahoc and Somerset counties respectively, provided much of the major construction services, but smaller firms located in virtually all other Maine counties supplied parts or services to the construction projects.

The relatively remote sites for the Stetson and Kibby projects brought workers into these areas who lived throughout Maine and their spending in the economically distressed communities near the projects such as Mars Hill, Eustis, Farmington, Lincoln and Houlton while working on the project was a boost to these communities. Economic impacts also occurred in

the home communities of the workforce and in the retail centers such as Bangor, Presque Isle, and Lewiston-Auburn.

## Notes

1. The installed capacity for the four projects is:

	Megawatts Installed Capacity
Kibby	132
Mars Hill	42
Stetson I	57
Stetson II	26
Total	257

2. Four regions of the seven regions in the REMI models for Maine are directly affected by the wind power projects:

- Aroostook County
- Eastern Maine (Penobscot, Piscataquis, Hancock, and Washington counties)
- Western Maine (Androscoggin, Franklin, and Oxford counties)
- Cumberland county

3. Employment in this analysis is the Bureau of Economic Analysis “total employment” concept, which includes self employment as well as wage & salary employment. It includes both full and part time jobs without distinction.

4. For purposes of analyzing the “professional and technical services” industry, expenditures for such purposes as meteorological monitoring and soils testing were assigned to the region where the project was constructed. Other professional and technical service expenditures were assigned to Cumberland County, where most of the professional services are located. Some of the expenditures in this category may have been made in other regions of Maine, but records do not indicate where specific expenditures were made. Employment in professional and technical services is reported in the statewide totals.