Renewable and Sustainable Energy Reviews 34 (2014) 136–144

Contents lists available at ScienceDirect

Renewable and Sustainable Energy Reviews

journal homepage: www.elsevier.com/locate/rser

Fiscal and economic impacts of state incentives for wind energy development in the Western United States

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ARTICLE INFO

Article history:
Received 17 October 2013
Accepted 2 March 2014
Available online 22 March 2014

Keywords:
Wind energy
Renewable energy tax incentives
Economic impacts

ABSTRACT

Wind energy production in the United States has seen significant growth over recent years due, in large part, to the state and federal policies designed to encourage wind energy development. This research focuses on measures undertaken at the state level in the western region of the United States. Several of these states have implemented legislation in the form of financial incentives and renewable portfolio standards to support wind development. It is shown that state tax incentives and physical drivers have a significant positive impact on wind energy growth. There has been concern, however, about the fiscal impacts of financial incentives on state tax revenues. As a result, some states have removed tax incentives. A recent example is the removal of sales and use tax rebates for wind producers in Idaho. However, the removal of such incentives results in a net loss of tax revenues as well as negative economic impacts by hindering the development of wind energy projects. It is shown that attendant economic benefits from wind development results in significant positive fiscal impacts by increasing tax revenues for state and local governments. The increased tax revenues begin with the pre-construction and construction phases of such projects and continue to accrue throughout the life of project operations until eventual decommissioning. The removal of this incentive in Idaho results in a net reduction in tax revenues as well as the loss of significant economic benefits in terms of employment, incomes, and total output for the State.

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http://dx.doi.org/10.1016/j.rser.2014.03.015
1364-0321/

1. Introduction

Wind energy development has increased substantially in the United States (US) over recent years. From 2000 to 2012, total wind energy installations increased from 2453 MW to 51,644 MW, an average growth rate of approximately thirty percent (30%) per year [1,2]. A central question for potential developers of wind energy is where to locate such projects. Recognizing the benefits of wind energy, states have sought to attract wind power investment by enacting policies in the form of tax exemptions, deductions, and credits, as well as various subsidies (grants, low-interest loans, and production incentives) and renewable portfolio standards (RPS). The existing literature on the role of federal and state policies on wind power development in the United States demonstrates that these policies can have significant impacts on new wind energy capacity additions.

Financial incentives at both the federal and state levels have been shown to be important determinants of wind energy development. At the federal level, one of the most important incentives is the renewable energy production tax credit (PTC), initially authorized by the Energy Policy Act of 1992. The PTC has a volatile history, having been allowed to expire twice and being renewed for only short periods during the past decade. Hitaj [3] shows that the variability in the presence and amount of this federal incentive is an important determinant of the number of new wind power facilities in the US. In addition to federal incentives, several studies to date have concluded that state-level incentives for wind energy producers are important drivers behind wind energy development. Several of these focus on the use of renewable portfolio standards (RPS) on the part of states (see [4–6]) while others look more broadly at the variability of state level financial incentives and their effects on wind power development ([3,7–9]).

This study reviews the financial incentives for wind energy production in the western United States and the impact that these and other policies have had on wind development. The states examined are Idaho, Montana, Oregon, Utah, Washington, and Wyoming. While states can influence locational decisions by a variety of tax and other incentives, questions arise as to the impacts of such measures on state and local government revenues. For states offering exemptions or rebates, these policies are often viewed as expenditures on the part of the state and, as a result, such incentives have come under mounting scrutiny. A recent example where such concerns have resulted in the removal of tax incentives for alternative energy production is Idaho which, in 2011, failed to renew the state's tax incentive program offering sales and use tax rebates for to wind energy producers.

In order to determine the effect of tax incentives for wind energy projects, this study compares the stream of tax revenues stemming from wind energy development with the tax revenue forgone due to sales and use tax exemptions or rebates. Detailed data on capital and operating expenditures are obtained from several wind developments in Idaho. Tax rates are applied against this spending to estimate the stream of foregone revenue. Other tax revenues are estimated directly from capital and operations expenditures that are not subject to rebates or exemptions. These include personal and corporate income taxes, motor fuels, and consumption taxes. These revenues, as well as economic impacts on employment and incomes, are estimated using Input–Output analysis.

The issue for policymakers is whether the incentives offered by the tax rebate are significant enough to encourage alternative energy projects in a given state as opposed to surrounding states. With regard to the tax incentives in Idaho, it is important to note that the states surrounding Idaho have similar physical characteristics with regards to renewable energy resources, but the fiscal conditions vary. All of the states surrounding Idaho either have no sales and use tax or offer tax exemptions for purchases related to renewable energy development. In addition, all surrounding states offer additional tax incentives for alternative energy projects. Even with a continuation of the sales and use tax rebate program, Idaho would rank last in terms of fiscal incentives for alternative energy producers. This study finds that, in the case of sales and use tax incentives in Idaho, the provision of this incentive to producers generates a net increase in tax revenues. To the extent that wind developers decide to locate in other states due to more favorable economic and fiscal factors, the discontinuance of such fiscal incentives leads not only to decreased production of renewable energy but also to the loss of economic benefits from increased employment, incomes and economic activity and the associated tax revenues.

This study's analysis does not extend to electric grid management and operational issues in regard to intermittent renewables integration and Idaho's total net summer capacity of 3990 MW electric [10] nor to the question of the optimal amount of wind energy is appropriate from an energy and political standpoint. The study focuses on the opportunity costs and tax implications for Idaho in comparison to other states with similar real incentives for wind development and, as a result, it is beyond its scope to examine alternative scenarios in which tax incentives are provided to other industries or funds are spent on government programs or state-owned infrastructure.

2. State level incentives for wind energy development in the Western United States

The location of wind energy facilities is subject to geographic as well as economic factors, and all of the western states have suitable locations for wind energy production. Consequently, states in the region compete with each other during the process of producers deciding to locate production facilities in one state versus another. The economic climate influencing such decisions depends in part on the tax regimes of the states under consideration as these provide important incentives for the development of new wind energy production which, in turn, provides significant economic and tax revenue benefits. Given that the focus of the present study is the tax incentives offered by Idaho, it is important to note that other western states have fiscal incentive programs that, for the most part, are more generous to producers than those provided by Idaho. This section reviews these incentive programs in Idaho and other western states.

2.1. Idaho

Idaho's wind energy capacity was 75.22 MW in 2005 and grew following the passage of state-level incentives, reaching 675 MW in 2012, as shown in Table 1. The passage of the Idaho sales and use tax rebate for alternative energies, enacted in 2006, spurred the rapid increase in wind energy capacity. The sales and use tax rebate for alternative energy production was authorized under Idaho Statute 63-3622QQ. To receive the rebate, the developer of a new alternative energy facility, including wind energy, would pay any sales and use tax on the machinery and equipment and then a public, cooperative, or municipal utility or the Idaho Public Utilities Commission would certify that the project will generate at least 25 kW of electricity. After certification, the producer would file a refund request with the Idaho State Tax Commission by the end of the third calendar year after the taxes to be refunded were paid. Machinery and equipment that qualified for a rebate on sales and use taxes paid were required to be industrial fixtures, or devices that supported facilities that were integral and necessary to the generation of electricity from the specified alternative energy sources. The rebate would not apply to machinery and equipment such as hand-powered tools, repair or replacement parts, hand tools, buildings or building fixtures not integral to generating electricity.

One advantage of such an incentive is that the state does not need to provide additional physical infrastructure, such as industrial