Implications of the Production Tax Credit on the Tax Liability for Companies in the Wind Energy Sector of the Energy Industry: An Exploratory Study

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Since 1998, an interest in wind power has emerged. The United States' strategic energy plan is to reduce dependence on fossil fuels and supplement and/or replace them with renewable sources of power. To promote wind power, generous economic subsidies such as the production tax credit are offered by the federal government to companies willing to make the required capital expenditures. Several subsidies are in the form of tax credits which reduce the income tax liability of the owners/operators of the wind farms. This research study explores the impact of the production tax credit (PTC) on companies' tax liabilities.

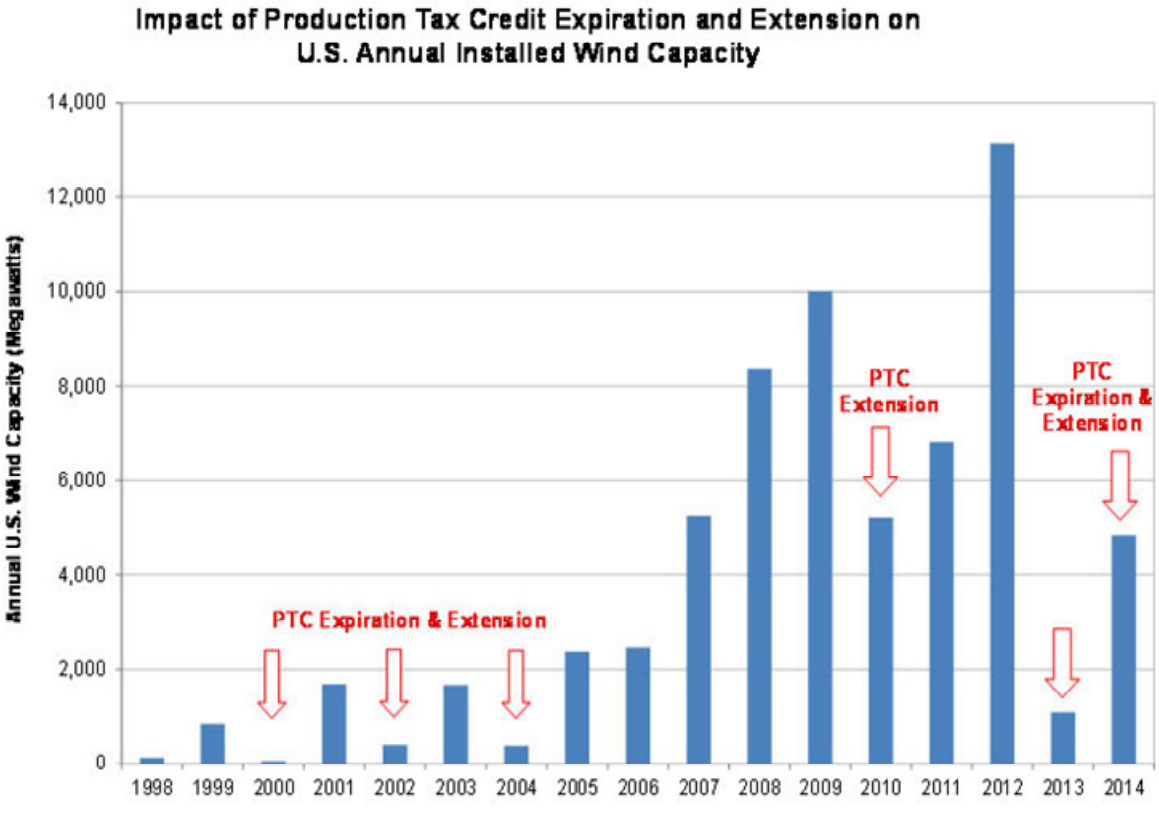
Keywords: wind energy, tax credits, tax liability

INTRODUCTION

Wind energy is a $81.1 billion global industry comprised of wind facilities, turbine manufacturers, and financiers (Wang, 2019). To support the growth of the wind industry, the federal, state, and local governments have provided generous subsidies such as the production tax credit (PTC), loans, grants, investment tax credits, property tax abatements and numerous others. The PTC is a federal subsidy specifically targeted for the industrial production of wind. As a tax credit, it reduces the amount of tax liability for the company; in other words, it is a dollar-for-dollar reduction in the tax liability. The PTC is a subsidy that benefits a few energy corporations. Only 15 parent companies account for approximately three-fourths of all PTC eligibility in the United States—more than $19 billion in 10 years, 2007-2016 (Erickson, 2018).

The growth in the installed capacity of wind turbines and the subsequent output (capacity factor) of these wind turbines is highly correlated (.9153, n=11) with the production tax credit. Figure 1 shows the relationship between the growth in capacity and the PTC for the years 1998-2014.

FIGURE 1
GROWTH IN WIND CAPACITY AS A RESULT OF THE PRODUCTION TAX CREDIT—1998-2014



As Figure 1 shows, the installed capacity of wind farms varies year-to-year by the production tax credit expirations and subsequent extensions legislated by Congress. Much of the literature on the PTC develops aggregate data across years. Although the Energy Information Administration data base lists plant-specific data for the net-generation of megawatt hours, parent company ownership is often obscured via affiliates or U.S. names which are different than the parent company names. The lack of transparency across all wind farms forces researchers to estimate the PTC impact. As a result, the purpose of this research study is to explore the impact of the Production Tax Credit (PTC) on the tax liability of selected public companies by parent company name, affiliates, and U.S. company names for each of the U.S. based parent companies for the years 2008-2017. The results are expected to show a significant decrease in the actual tax liability of these companies compared to the statutory rate.

LITERATURE REVIEW

The federal government introduced subsidies for renewable energy in 1992 (Good Jobs First, HR 776 Energy Policy Act, 2018). Special interest groups such as the American Wind Energy Association (AWEA) successfully lobbied Congress to provide the PTC to wind production and allow the wind farm owners to apply the PTC to their tax liability. Table 1 identifies the PTC per kilowatt hour for the years 2007-2017.

TABLE 1
PRODUCTION TAX CREDIT PER KILOWATT HOUR FOR THE YEARS 2007-2018

Year	PTC per kwh
2007	$0.019
2008	$0.020
2009	$0.021
2010	$0.022
2011	$0.022
2012	$0.022
2013	$0.023
2014	$0.023
2015	$0.023
2016	$0.023
2017	$0.024
2018	$0.024

Source: Energy Information Administration, 2018

As Table 1 shows, the production tax credit cents/kwh has increased from 2007-2018 and supports the significant development of wind farms shown in Figure 1. In the United States wind energy industry represents 12% of the consumption in the global market (Wang, 2019). The industry operates within an intricate system of government incentives—from subsidies, to loan guarantees, and various other federal, state, and local government incentives. For example, between 2007 and 2016 the PTC was worth $5.7 billion for NextEra Energy Resources. Currently, NextEra Energy Resources is the biggest wind energy producer with more than 430 windfarms in the United States and four Canadian provinces (The Wind Watch, 2019). NextEra Energy Resources received $7.8 billion in federal tax breaks in an 8-year period (2008-2015) making it one of the most subsidized Fortune 500 companies in the United States (Gardner, 2018).

The data from the Department of Energy Information Administration shows the estimated value of eligible production tax credits for all commercial wind turbines. Fifteen large energy companies account for more than 75% of the eligible tax credits (EIA, 2018a). The results show that the PTC primarily benefits just a few large corporate entities. The PTC is scheduled to phase out over five years (2019-2024). However, over the next 11 years, it is estimated that the federal government will transfer at least an additional $48 billion in PTC subsidies to owners or financiers of commercial wind farms before it phases out completely in 2029 (Peacock, 2012). There is a 10-year subsidy window for projects installed after 2019. Despite the enormous amount taxpayer subsidies paid for wind energy, it represents only a tiny fraction of total energy generated—6.6 percent in 2018 (EIA, 2018). The PTC accounts for a majority of the subsidies received by wind energy producers.

In addition to new commercial turbines, companies can "repower" old turbines to recapture the benefit. Repowering can include anything from updating 80 percent of the components to erecting an entirely new turbine. "Many corporations are opting to double down on the PTC benefits by repowering before the subsidy expires" (Fago, 2016; Eller, 2017; Wachman, 2017).

Unfortunately, neither the IRS nor the companies who collected the PTC are required to report the corporate use of the PTC to the public. The lack of transparency means it is unclear who is benefitting from the PTC. As Table 2 illustrates, the combined top 15 wind energy producers globally were eligible for more than $19 billion in 10 years 2007-2016 (Erickson, 2018). Most of these corporations are represented by AWEA, a wind energy advocate at the federal, state, and local level. NextEra Energy and several other companies serve on the board of directors (AWEA, 2018). NextEra Energy is an example of one energy company benefitting significantly from the PTC. During an 8-year period (2008- 2015)

NextEra Energy Resources had profits of $21.5 billion and received total tax breaks worth $7.8 billion. Duke Energy is another example. It received $7.3 billion in tax breaks to its $19.8 billion in profits during that time. Both corporations received enough taxpayer money to completely offset the companies' total income tax liability and receive rebates (Gardner et al. 2017). Table 2 identifies the production tax credit eligibility for the top 15 parent companies worldwide.

TABLE 2
PRODUCTION TAX CREDIT ELIGIBILITY FOR THE TOP 15 PARENT COMPANIES WORLDWIDE FOR THE YEARS 2007, 2010, AND 2013

NextEra Energy Resources, Inc. (USA)	$778; $5,702; $9,287
Iberdrola/Avangrid Renewables (Spain)	$301; $2,65; $13,497
EDP-Energias de Portugal (Portugal)	$217; $1,671; $2,487
Invenergy, LLC (USA)	$227; $1,290; $2,181
NRG Energy, Inc. (USA)	$178; $1,143; $1,553
E.ON (Germany)	$171; $1,134; $1,987
Duke Energy (USA)	$158; $938; $1,636
BP plc (England)	$148; $913; $1,179
Brookfield Asset Management Inc. (Canada)	$189; $770; $1,525
Dominion Energy, Inc. (USA)	$107; $727; $762
EDF-Electricite de France (France)	$174; $622; $1,783
Exelon Corp. (USA)	$95; $528; $839
Pattern Energy (USA)	$131; $500; $870
Enel (Italy)	$144; $462; $1,320
AES Corporation (USA_)	$36; $330; $1,191

Source: Data are in millions of dollars from the U.S. Energy Information Administration (2018b; 2018c)

These top 15 companies listed in Table 2 represent 75% of the total production tax credits.

METHODOLOGY

There is no single source of data for wind farms, so we collected data from a variety of sources. Of the companies listed in Table 3, financial statement data is available for only U.S. based public companies. The following parent companies are included in the study--NextEra Energy Resources, Inc., NRG Energy, Inc., Duke Energy, Exelon Corporation, Pattern Energy, Dominion Energy, Inc. and AES Corporation. Although a U.S. based company, Invenergy is a privately-owned company.

The Energy Information Agency (EIA), Department of Energy database includes the names of specific windfarms in the United States. We used Wikipedia as well as the websites of specific companies to determine ownership of specific windfarms. The EIA database provides the number of MWh generated per year for a specific windfarm. The data for the net-generation of electricity by year is converted from megawatt hours (MWh) to kilowatt hours (kwh) in order to apply the production tax credit rate

(cents/kwh) for each wind farm (refer to Table 1). We combined these to determine production tax credits for each year for the sample of companies.

We extracted tax data from the 10K reports filed with the Securities and Exchange Commission (SEC) for the sample companies for the years 2008-2017. Financial statements include both current and deferred tax liability each year. The notes also include a reconciliation between the statutory rate (35% for the sample years) and the effective rate. We examined the disclosures and computed production tax credit on total as a percentage of tax expense.

RESULTS

Table 3 shows the computed production tax credit for each company in each year. The ten-year total ranges from approximately 250 million to 4.4 billion dollars of tax savings.

TABLE 3
PRODUCTION TAX CREDIT AS COMPUTED

	AES Corp.	Dominion Energy	Duke Energy	Exelon Corp.	NextEra Energy	NRG Energy	Pattern Energy
2008	26,036,320	109,280	12,086,088	7,851,900	199,866,403	1,383,240	5,260
2009	24,561,327	13,238,421	25,234,748	16,835,469	202,079,609	3,109,449	9,209,676
2010	40,121,598	32,995,864	41,422,502	26,437,504	272,149,535	3,337,180	23,124,156
2011	44,383,680	31,854,086	47,096,984	34,337,705	315,047,474	34,325,786	30,349,704
2012	50,277,150	31,705,086	109,379,053	46,978,414	341,022,360	32,791,242	35,658,373
2013	46,768,584	34,107,689	121,429,558	66,720,377	461,204,956	37,899,860	62,067,570
2014	53,108,012	35,226,179	132,329,902	68,244,650	513,816,059	50,750,075	76,999,262
2015	46,349,853	37,077,334	163,528,233	70,304,168	566,751,087	44,616,874	103,174,090
2016	49,730,646	34,043,013	197,789,232	73,085,274	726,077,368	54,259,415	117,436,413
2017	50,787,768	NA	92,989,560	93,106,664	826,970,241	51,753,096	127,817,232
Total	432,124,938	250,356,952	943,285,860	503,902,125	4,424,985,092	314,226,217	117,436,413

- In U.S. dollars

Table 4 shows PTC as a percentage of reported tax expense for each year the ten-year period. Negative values result from periods when companies report losses and have a tax benefit rather than expense. The Tax Cuts and Jobs act of 2017 changed the federal tax rate from 35% to 21% and eliminated bonus depreciation for regulated industries. The sampled companies adjusted tax expense for the change in rate on deferred tax assets and liabilities. This resulted in apparent tax benefits (negative tax expense). The magnitude of the tax credits in relation to the expense is far from negligible. We realize the computation of expense is imprecise since the PTC constitutes a permanent difference between tax expense and taxes paid. Tax expense includes federal, state, and foreign taxes and current taxes.

TABLE 4
PTC AS A PERCENTAGE OF TAX EXPENSE

	AES Corp.	Dominion Energy	Duke Energy	Exelon Corp.	NextEra Energy	NRG Energy	Pattern Energy
2008	3%	0%	2%	1%	44%	O%	NA
2009	4%	2%	3%	1%	62%	0%	NA
2010	7%	2%	5%	2%	51%	1%	NA
2011	7%	4%	6%	2%	50%	-4%	112%
2012	7%	22%	16%	7%	49%	-10%	-210%
2013	14%	4%	10%	6%	59%	-13%	414%
2014	13%	8%	8%	10%	44%	1692%	-208%
2015	10%	4%	13%	7%	46%	3%	-202%
2016	155%	6%	17%	10%	53%	217%	-273%
2017	5%	0%	8%	-74%	-125%	-118%	-183%

CONCLUSIONS

The production tax credit is expected to begin phasing out in 2019. Before the PTC is set to expire, it is estimated that an additional $48 billion will be added to the billions of dollars already spent by the federal government to the wind farm owners, developers and/or operators. A majority of the subsidies will go to a few energy corporations, worldwide many of whom are likely to pay little to no income tax in the next 11 years. The vast sums of money for the wind PTC subsidy cost the American taxpayers billions of dollars in lost revenue to the federal government treasury monies which could be used for social programs, deficit and debt reductions, and other purposes.

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