



Estimating the State-Level Impact of Federal Wind Energy Subsidies

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Executive Summary

This paper examines the distributional impacts of federal subsidies¹ for wind energy across all U.S. states, building on our December 2013 report on the same topic. The obvious difficulty with examining federal subsidies for wind is that, at different points in time, developers of wind facilities have had more than one type of subsidy available to them. For example, over the past 10 years of the wind Production Tax Credit (PTC), some eligible wind facilities elected to take the Investment Tax Credit (ITC) or the Section 1603 grant program instead of the PTC.

As we explain below, this does not change the distributional nature of federal wind subsidies, but merely the timing—when wind developers elected to collect the subsidy.² Also, our methodology likely *underestimates* the total amount of subsidies paid to wind developers over the ten-year period because the fact that many wind developers elected to take Section 1603 grants implies that the grants were more valuable than the PTC.

To estimate the distributional impacts of federal wind subsidies, we assume the owners of all eligible U.S. wind facilities in operation over the last 10 years elected to take the PTC rather than other subsidies available to them. Essentially, we construct a new measure of wind subsidies based on the amount of the PTC (post-tax, per KWh) and the level of wind production in each state, and we call this the “federal wind subsidy burden” to differentiate this metric from actual PTC allocations (some of which were crowded out by other subsidy options).

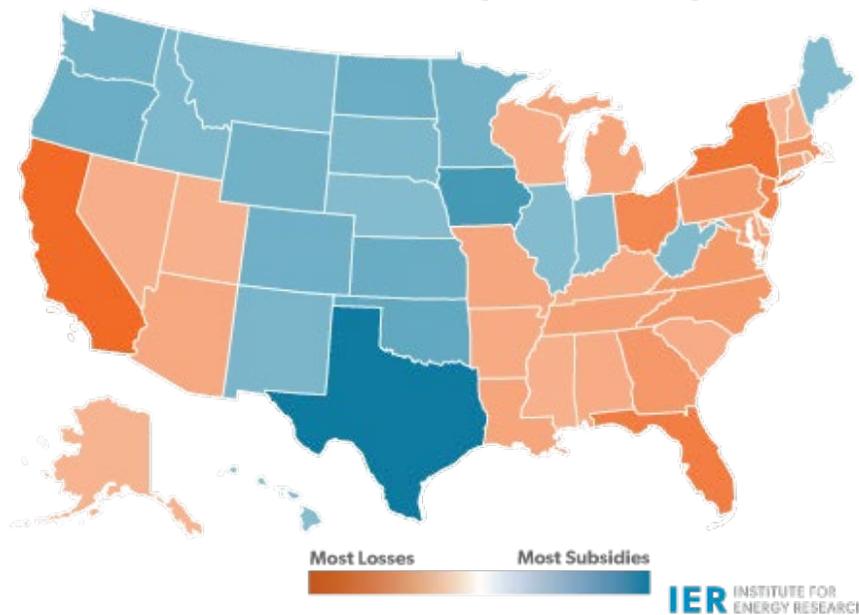
In this report, **we estimate that the cumulative magnitude of federal subsidy allocations from PTC, ITC, and Section 1603 to the wind industry over the past 10 years is at least \$18.6 billion.** Our estimate is based on generation data for the most recent 10 calendar years available (2005 through 2014).

Crucially, our paper also examines the distributional impact of *net transfers*, which are tax credit allocations from the wind PTC minus the state’s federal tax burden related to funding the program.

In other words, we assess if taxpayers in a state spend more money on federal wind subsidies than wind developers in a state receive in federal subsidies. To calculate the net impact of federal wind subsidies on each state (and determine whether each state is a “net taker” or “net payer” of federal wind subsidies), we compare each state’s estimated subsidy allocations based on wind production data with its share of the tax burden related to federal wind subsidies.

According to our calculations, **taxpayers in 30 states and the District of Columbia paid more in taxes to the federal government over the past 10 years to support wind subsidies than wind producers who own wind facilities in those states received in subsidy allocations.** Of those 30 net-paying states, 11 states³ and the District of Columbia had no wind production and received zero subsidies but still paid their share of the tax burden related to federal wind subsidies.

Federal Wind Subsidy Burden by State



In any study of the distributional impact of government policies, there are different “levels” of analysis that one might consider, ranging from the country as a whole down to individual households. However, in this study we choose the intermediate level of state-based analysis for two reasons: First, it makes the analysis tractable with available data, and second, it helps aid the understanding of the political process behind the various tax code provisions. To understand the details of federally imposed rules, it is often instructive to see how those rules will impact the constituents of the officials involved in crafting the broad outline of the rules.

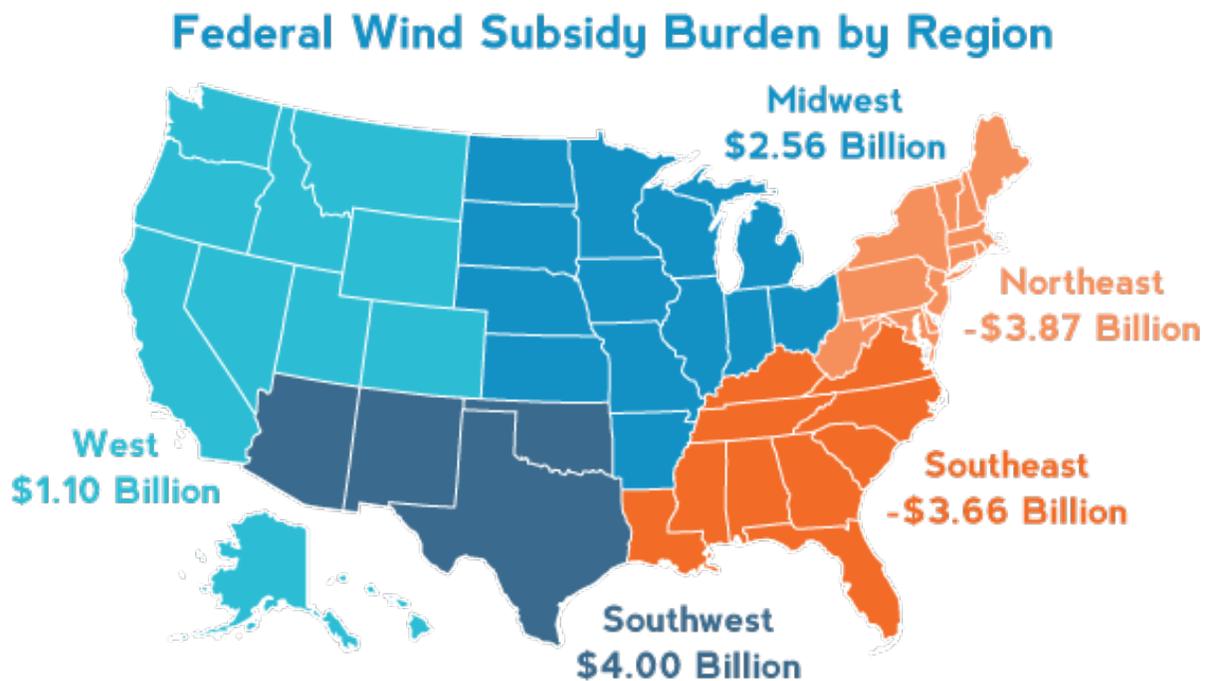
Over the last decade, we estimate that the top-five states whose taxpayers suffered the largest net losses have paid upwards of \$4.81 billion more to support federal wind subsidies than wind producers in those states have received in subsidy payments. That list includes California, New York, Florida, New Jersey, and Ohio. We also estimate that the wind producers in three states are “net takers” of at least \$800 million: Texas, Iowa, and Oklahoma. Wind producers in those states have received much more in federal wind subsidies than taxpayers in those states allocated to support the subsidies.

Net Payers	Net Impact
California	-\$1,259,744,645
New York	-\$1,079,108,565
Florida	-\$920,144,109
New Jersey	-\$825,780,657
Ohio	-\$731,994,540
Net Takers	
North Dakota	\$666,174,896
Kansas	\$698,596,910
Oklahoma	\$894,220,330
Iowa	\$1,609,850,187
Texas	\$2,998,073,428

Over the last ten years, the highest net losses and net subsidies go to California and Texas, respectively. California’s share of the federal wind subsidy burden over the last 10 years was \$2.172 billion, while wind producers in the state

received \$913 million in federal wind subsidies, leaving net losses of \$1.259 billion—the largest net loss for a state we estimated. Texas, on the other hand, had the most net subsidy receipts—wind producers received an estimated \$4.57 billion in federal wind subsidies over the past 10 years, while taxpayers in Texas contributed \$1.57 billion toward the related tax burden, for net subsidies of \$2.998 billion.

On the regional level, the Northeast and Southeast shouldered the largest burden, subsidizing wind producers in other regions with net losses of \$3.87 billion and \$3.66 billion, respectively. Notably, every state in the Southeast region shouldered net losses. The states with the largest net subsidy receipts on the regional level were the Southwest and Midwest, pulling in \$4.00 billion and \$2.56 billion, respectively. The West took in about \$1.10 billion in net subsidies.



Although we discuss *states and regions* in terms of net losses and net subsidies to show the geographical distribution of federal wind subsidies, we note that the ultimate recipients are actually the *owners of wind facilities*,⁴ while losses ultimately accrue to all Americans who pay federal taxes. Subsidies to wind producers come at the expense of all taxpayers everywhere. In other words, federal wind subsidies do not necessarily make citizens of a “net subsidy” state better off.

To highlight some of the concentrated recipients of federal wind subsidies, we also profile individual wind power facilities in each region and provide background information on the facility’s parent company. As we show, many U.S. wind facilities are either foreign-owned or owned by a multinational parent company, or both. In the end, while the “benefits” of federal wind subsidies are concentrated among a small group of large corporations, the costs are spread among American taxpayers across the country.

Introduction

The federal Production Tax Credit (PTC) for renewable electricity is one of the federal government's primary policy tools for subsidizing renewable energy development. The PTC gives electricity producers a tax credit for each kilowatt-hour of electricity generated from qualifying renewable energy sources—currently 2.3 cents per kilowatt-hour (kWh) or \$23 per megawatt-hour (MWh)—for the first ten years of operation, regardless of actual price of electricity on the wholesale market. This ignores market price signals such as negative prices that indicate the electricity is unwanted.

Relative to the wholesale price of electricity, which hovered around \$50 per MWh for most markets in 2014, the PTC represents an expensive direct subsidy of around 50 percent of the wholesale price of electricity.⁵ In terms of pre-tax value, the PTC is worth approximately \$35 per MWh,⁶ often making the federal subsidy equally as valuable to the owner of wind facilities as the market price of electricity. Furthermore, since the PTC is not tied to the wholesale price of electricity, owners of wind facilities can afford to pay the electrical grid up to \$35 per MWh to take their power and still make money.

Federal subsidies for wind power have a long history. The PTC was enacted as part of the Energy Policy Act of 1992⁷ and “provided an inflation-adjusted tax credit of 1.5 cents per kilowatt-hour for generation sold from qualifying facilities during the first 10 years of operation,” according to the Energy Information Administration (EIA).⁸

PTC Adjustment Schedule

2005	\$0.018/kWh
2006	\$0.019/kWh
2007	\$0.019/kWh
2008	\$0.020/kWh
2009	\$0.021/kWh
2010	\$0.022/kWh
2011	\$0.022/kWh
2012	\$0.022/kWh
2013	\$0.023/kWh
2014	\$0.023/kWh

In 2009, the American Recovery and Reinvestment Act (ARRA) gave project owners the option of receiving a 30 percent ITC rather than the PTC. The ITC allows wind producers to deduct 30 percent of their investment costs from their taxes. ARRA also created the section 1603 program, which allowed developers to receive cash grants in lieu of tax credits for 30 percent of the investment cost, but only if construction had begun before the end of 2011.⁹

The PTC has expired and been renewed several times over its history. Most recently, the PTC expired at the end of 2013 but was renewed retroactively in January 2014, before expiring again at the end of 2014.

In 2014, wind installations generated 4.5 percent of the U.S. electricity supply despite receiving billions of dollars in subsidies. This year, the Senate Finance Committee estimated a two-year extension of the PTC would cost more than \$10 billion over ten years.¹⁰

History of Wind Power in the U.S.

While some claim today's subsidies like the PTC, ITC, and section 1603 program support an "infant" industry, using wind power to generate electricity is nothing new—the practice actually dates back to the late 1800s. In 1887, James Blyth, a professor at Anderson's College in Glasgow, Scotland, constructed the first known device that generated electricity from the wind.

A few months later, Charles Brush built a custom 12 KW wind turbine to provide electricity to his home in Cleveland, Ohio.¹¹ Brush used the intermittent (off and on) energy from his wind turbine to charge a large bank of batteries in his basement, which in turn provided reliable power to his home.¹² At that time, pairing intermittent power from the wind with battery storage made economic sense because power from the electric grid was still not an option in many U.S. cities.

From the late 1800s through the 1920s, the use of wind power expanded in rural areas, as wind-powered turbine generators were increasingly used on farms for charging batteries that powered lights, pumps, and radios.¹³

In 1941, the first megawatt wind turbine was connected to the power grid in Vermont,¹⁴ but the blades broke in 1945, and the turbine was never restarted.¹⁵ (By comparison, some coal-fired power plants commissioned in the 1940s are operational today). In the 1970s, the federal government began a coordinated push to make commercial, on-grid wind turbines competitive with other sources.

On the policy front, the Public Utility Regulatory Policies Act of 1978 (PURPA) mandated that utilities take wind power as it was produced, which forced utilities and grid operators to give wind facilities preference above other, more reliable sources of electricity.¹⁶

This is similar to the subsidy scheme of many European countries, including Spain and Germany, whose electricity rates are three times higher than the United States.

Today's wind PTC is just the latest version of decades-old federal support for the wind industry, dating back to the 1970s. Furthermore, the U.S. Government Accountability Office has tallied over 80 federal programs across nine agencies that support wind power.¹⁷ In short, there is nothing about wind power or the subsidies for it that can be considered an "infant."

Findings and Methodology

In this report we examine which states suffer the most losses and which states receive the most federal wind subsidies. At the outset, we should note that the states themselves are not shouldering these losses or receiving these subsidies, and the subsidy “benefits” are much more concentrated than a color-coded map could indicate.

The recipients of these subsidies are the companies that own the wind facilities in the state—not the state as a whole—while the cost of the subsidies is spread among all Americans who pay federal taxes.

There are a few challenges to estimating the state-by-state breakdown of recipients of wind subsidies. First, the federal government does not provide a state-by-state breakdown. Second, some wind producers elected to receive subsidies other than the PTC that preclude them from also receiving PTC subsidies.

The ARRA, for example, allowed wind producers to receive an investment tax credit (ITC) or a Section 1603 cash grant from the U.S. Treasury in lieu of the PTC if they began construction on a facility before the end of 2011.¹⁸

While these alternative tax incentives reduce actual PTC subsidies, they do not reduce the total subsidy transfer to wind producers. The fact that many wind producers elected to take the ITC or Section 1603 grants instead of the PTC provides *prima facie* evidence that the ITC and Section 1603 grants were more “valuable” than the PTC at that time for those specific wind developers.¹⁹

As a result, we likely underestimate cumulative federal wind subsidies. In this analysis, we estimate the subsidy allocations that would have occurred if all of the wind companies had taken the PTC instead of the other options.

To calculate the subsidies to wind producers generating electricity between 2005 and 2014 (if they had all taken the PTC in lieu of the other subsidies), we start with the actual wind generation data from the EIA for each calendar year, which is broken down by state.

From that we subtract wind electricity generated from ten years prior for each state (e.g., for 2005, we subtract 1995 data) because the PTC only provides subsidies to wind developers for a given wind facility’s first 10 years of operation.

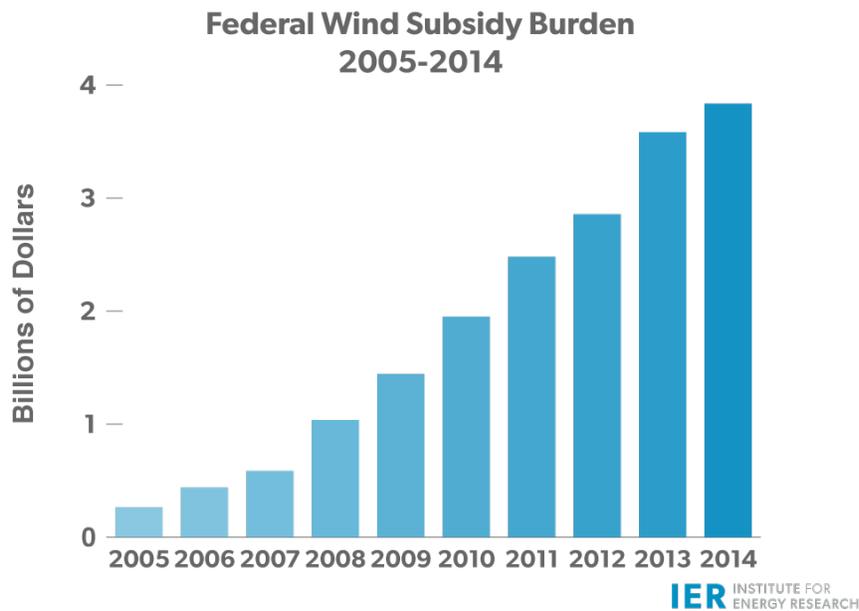
Since some portion of wind generation in each year (2005–2014) was in operation for more than 10 years, the owners of those older generators are no longer eligible to receive the PTC and hence we “net out” that older generation.

After netting out ineligible generation, we estimate the total amount of subsidies that went to wind producers in each state from 2005 to 2014 by multiplying each eligible kilowatt-hour produced by the then-current PTC rate (the PTC was 1.8 cents per kilowatt-hour for 2005, 1.9 cents for 2006–2007, 2 cents for 2008, 2.1 cents for 2009, 2.2 cents for 2010–2012, and 2.3

cents for 2013–2014). We use this simplified calculation because accurate and comprehensive data on the exact amount of PTC allocations by state are not available, as noted above.

To estimate each state’s share of the PTC cost, we use data²⁰ from the IRS that show the share of the total federal tax burden borne by each state. From there, we multiply each state’s share of the total federal tax burden by our estimate of the sum total of all federal wind subsidies to arrive at that state’s share of the cost of federal wind subsidies.

For the purposes of this study, we assume the administrative costs of implementing subsidies are negligible (i.e., payments in equal payments out). **Our estimate of the total federal wind subsidy burden over the last ten years is at least \$18.58 billion.**



To estimate the *net impact* of the federal wind subsidy burden on each state, we subtract each state’s share of the federal wind tax burden from the subsidies given to wind producers in each state.

For example, we estimate that Ohio’s share of the federal wind tax burden is \$812.6 million, while wind producers in the state received an estimated \$80.6 million in subsidies, indicating a net loss to the state taxpayers of about \$732 million that went to support wind producers in other states.

As the following table shows, **taxpayers in 30 states and the District of Columbia paid more in taxes to the federal government over the past 10 years to support wind subsidies than wind producers in those states received in subsidy allocations.**

Complete Table of Findings

State	Subsidy-Eligible MWhs	\$ Federal Wind Subsidies	\$ Federal Wind Tax Burden	\$ Net Effect
AK	369,894	8,421,660	35,316,493	-26,894,833
AL	0	0	156,137,683	-156,137,683
AR	0	0	188,387,172	-188,387,172
AZ	1,873,914	42,118,800	249,484,233	-207,365,433
CA	41,825,366	913,233,061	2,172,977,706	-1,259,744,645
CO	37,938,487	829,652,448	309,827,232	519,825,216
CT	0	0	353,173,605	-353,173,605
DC	0	0	140,170,275	-140,170,275
DE	20,182	453,159	149,044,959	-148,591,800
FL	0	0	920,144,109	-920,144,109
GA	0	0	480,009,995	-480,009,995
HI	2,773,916	60,591,342	48,994,311	11,597,032
IA	79,742,365	1,747,091,323	137,241,136	1,609,850,187
ID	9,738,393	217,728,254	55,147,288	162,580,966
IL	44,215,888	981,540,075	908,080,720	73,459,354
IN	18,047,343	402,137,888	337,675,774	64,462,114
KS	38,559,267	853,337,824	154,740,915	698,596,910
KY	0	0	179,875,146	-179,875,146
LA	0	0	263,349,199	-263,349,199
MA	611,695	13,872,939	586,670,506	-572,797,567
MD	1,239,111	27,905,662	368,439,288	-340,533,626
ME	4,765,159	106,117,514	45,268,049	60,849,464
MI	9,066,600	205,531,042	445,508,447	-239,977,405
MN	47,024,648	1,017,216,618	567,156,233	450,060,385
MO	6,349,092	141,071,938	355,727,975	-214,656,037
MS	0	0	75,714,372	-75,714,372
MT	9,523,214	208,428,520	32,412,223	176,016,297
NC	0	0	454,009,214	-454,009,214
ND	32,101,600	707,592,865	41,417,970	666,174,896
NE	8,378,183	186,149,856	138,393,823	47,756,033
NH	1,229,228	27,765,849	67,261,595	-39,495,746
NJ	135,725	2,836,836	828,617,493	-825,780,657
NM	16,555,012	352,013,155	59,064,294	292,948,862
NV	679,471	15,499,045	105,160,321	-89,661,276
NY	20,764,674	454,529,083	1,533,637,649	-1,079,108,565
OH	3,566,269	80,571,278	812,565,818	-731,994,540
OK	49,433,836	1,088,451,461	194,231,132	894,220,330
OR	37,333,849	817,349,935	171,370,448	645,979,488
PA	15,135,793	333,341,286	790,728,740	-457,387,453
RI	17,031	384,289	81,675,211	-81,290,922
SC	0	0	139,022,846	-139,022,846
SD	13,373,096	297,369,592	38,348,305	259,021,286
TN	437,014	9,225,505	347,642,845	-338,417,340
TX	209,816,735	4,570,020,624	1,571,947,195	2,998,073,428
UT	3,112,453	69,471,271	112,653,568	-43,182,297
VA	0	0	461,824,442	-461,824,442
VT	681,620	15,385,119	26,290,549	-10,905,430
WA	41,322,042	898,705,043	399,161,712	499,543,331
WI	8,520,833	187,395,879	303,455,719	-116,059,839
WV	7,455,119	163,353,604	46,434,385	116,919,219
WY	24,446,022	534,135,447	30,437,666	503,697,781
US (Total)	848,180,140	18,587,997,091		

Regional Analysis

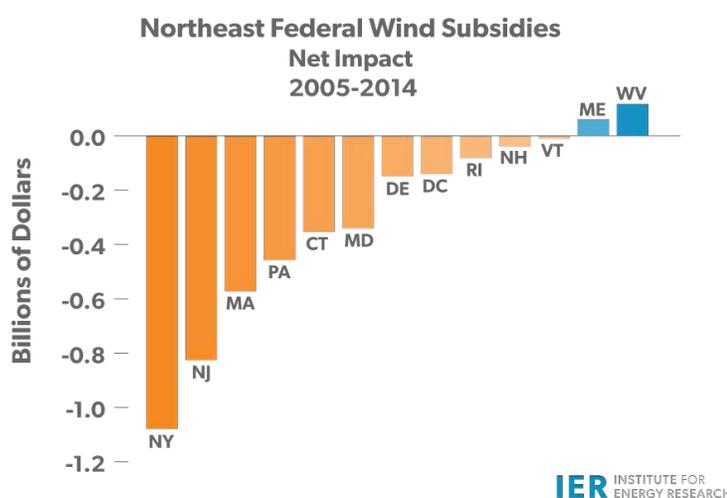
Federal wind subsidies impact every state and region in the country. As has been shown in previous articles,²¹ studies,²² and testimony before Congress,²³ subsidies such as the wind PTC are inefficient²⁴ policies that distort energy markets, threaten grid reliability,²⁵ and encourage rent-seeking²⁶ rather than spur reliable energy production. This report shows that federal wind subsidies are also terribly inequitable. A majority of U.S. states—generally states that lack the geography and wind supply to support wind power—unfairly shoulder the burden of these subsidies. IER has highlighted²⁷ the pitfalls of having a one-size-fits-all federal energy policy that takes from some states and gives to others. This study estimates the amount of this inequity.

While federal wind energy subsidies are a losing proposition for a majority of states and their taxpayers, some states lose much more than others. On a regional level, the Northeast and Southeast shoulder the largest losses, subsidizing wind companies in other areas to the tune of \$3.9 billion and \$3.7 billion, respectively, over the last ten years. The regions that received the most net subsidies are the Southwest and Midwest, with wind producers in those states receiving \$4 billion and \$2.6 billion in net subsidies, respectively. Below we also highlight some of the largest wind power producers in each region.

The Northeast

The Northeast suffers the largest net losses, allocating \$3.9 billion more in taxes from 2005 to 2014 than wind producers in their states received in federal wind subsidies. For the purposes of this study, states in the Northeast include Connecticut, District of Columbia, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and West Virginia.

Figure 1 below highlights net subsidies or net losses for each state in the Northeast.

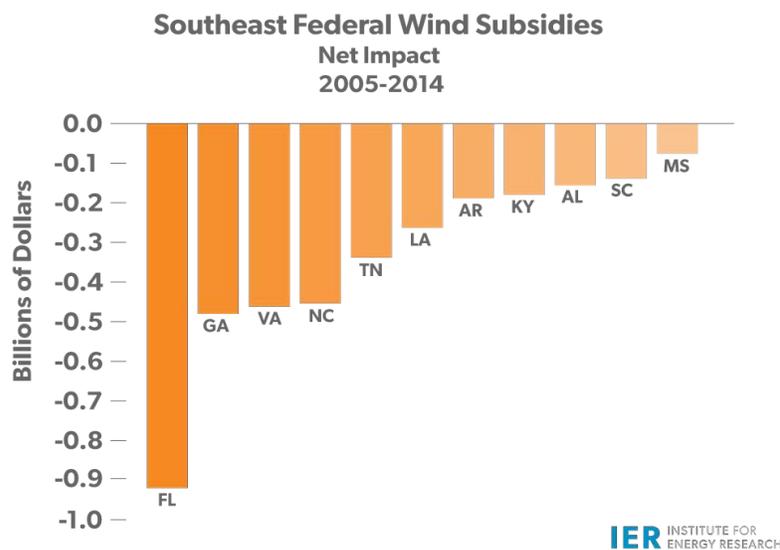


Iberdrola’s Maple Ridge wind project in Lewis, New York (a small upstate town near the Vermont border) is the largest wind facility in the Northeast, with 195 turbines and a nameplate capacity of 322 MW. In addition to federal subsidies, Iberdrola’s Maple Ridge facility also reaps a generous state production incentive and is exempt from property taxes.³¹ In fact, Iberdrola is active across the Northeast. In Pennsylvania, two hours northwest of Philadelphia, sits Iberdrola’s Locust Ridge wind facilities.³² The two facilities have a nameplate capacity of 128 MW over 64 turbines, which span 5,700 acres of land. This is a vast amount of land for a small amount of electrical capacity. For example, the Arkansas Nuclear One Station has a nameplate capacity of 1,800 MW and requires just 1,100 acres.³³

The Southeast

The Southeast region suffers the second largest net losses. Taxpayers in the Southeast allocated, in total, \$3.7 billion more in taxes from 2005 to 2014 than wind producers in their states received in federal wind subsidies. In this study, the Southeast region includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

Figure 2 below highlights net losses for each state in the Southeast.



As Figure 2 shows, every state in the Southeast region shouldered net losses. Of the 11 states in the region, the largest losses go to Florida (\$920.1 million), Georgia (\$480 million), Virginia (\$461.8 million), and North Carolina (\$454 million).

Taxpayers in the Southeast suffer net losses because their states simply do not have the wind availability of other regions. Since the Southeast does not have quality wind resources, the states in the region generally do not have Renewable Portfolio Standards (RPS), which require utilities to generate a certain percentage of their electricity from renewable sources. If lawmakers in Southeastern states were to impose renewable electricity mandates, these states

would most likely be forced to buy renewable energy credits (RECs) from states with higher wind potential, providing additional subsidies to wind producers in other states.³⁴

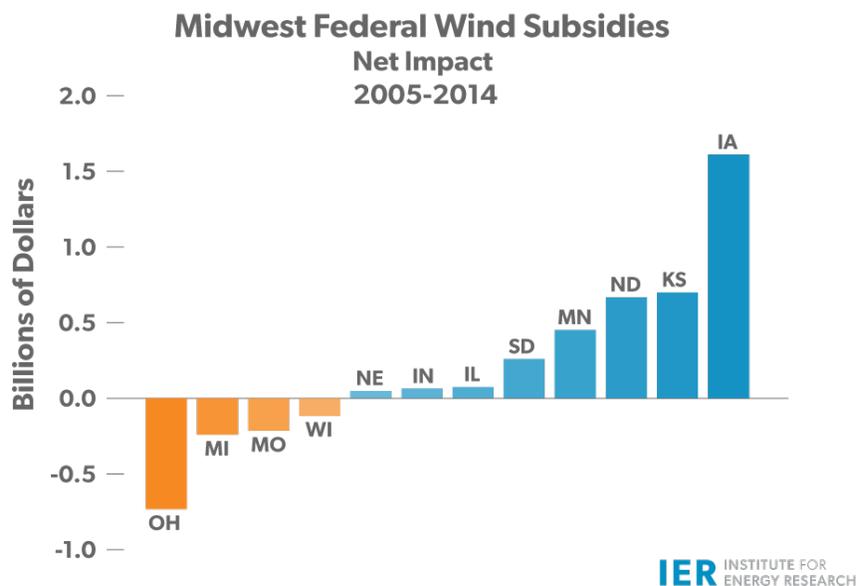
State focus: Florida suffers the third largest net losses nationwide and the biggest net loser in the Southeast. Its net losses of \$920.1 million from 2005 to 2014 represent the all-pain, no-gain prospect of federal wind subsidies in the Southeast. Because the state of Florida had zero wind generation over the last decade but a high share of the federal wind subsidy-related tax burden, federal subsidies to wind power imposed a heavy tax on Floridians without conferring “benefits” to anyone in the state.

Facility focus: The proposed Amazon Wind Farm U.S. East will be the first utility-scale wind farm in North Carolina and one of the first in the Southeastern United States.³⁵ The project is owned by Spanish-based Iberdrola.” Perhaps because North Carolina has some of the lowest potential wind capacity in the nation, Amazon Wind Farm U.S. East is currently the only planned wind facility in the state.

The Midwest

On a regional level, the Midwest is the second largest net recipient of federal wind subsidies. Wind producers in Midwest states received, in total, about \$2.6 billion more in federal wind subsidies from 2005 to 2014 than their states allocated in taxes to support those federal wind subsidies. For the purposes of this study, states in the Midwest region include Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

Figure 3 below highlights net subsidies or net losses for each state in the Midwest.



As figure 3 shows, wind producers in 8 out of 12 Midwestern states received more federal wind subsidies than taxpayers in those states contributed to their share of the wind subsidy tax burden. Wind producers in Iowa received \$1.6 billion in net subsidies, making Iowa second only

to Texas in terms of largest net subsidies. Ohio, on the other hand, fares the worst out of all states in the Midwest, suffering net losses of \$732 million.

Despite the Midwest region being a net recipient of federal wind subsidies, Michigan, Missouri, Ohio, and Wisconsin all shouldered net losses. Each of these states also has an RPS that requires electric utilities to generate a certain percentage of their electricity from renewable sources. Given that these states do not produce much wind but are still required to add renewables like wind to their generation mix, these states are most likely buying wind from states whose wind producers are net recipients of federal wind subsidies.

State focus: Ohio provides a case study for how state renewable electricity mandates can force taxpayers to bestow additional subsidies on wind producers in other states. Ohio's RPS, which in 2014 was frozen for two years, requires utilities to generate 12.5 percent of their electricity from renewable sources like wind by 2024. In annual compliance filings,³⁶ Duke Energy Ohio, a utility that provides electricity for much of the Cincinnati area, reported that they met one-half of their total non-solar renewable energy requirements for 2012 by purchasing RECs from "adjacent states."

Similarly, FirstEnergy Ohio Utilities,³⁷ which includes subsidiaries³⁸ that provide electricity to Akron, Cleveland, and Toledo, also purchased renewables from "other states deliverable into Ohio" to comply with the RPS in 2012.

In other words, Ohio taxpayers subsidize wind producers in other states not only through their federal tax dollars but also through the state RPS—which utilities cannot meet without purchasing electricity from wind producers in neighboring states.

Facility focus: The Flat Ridge 2 Wind Facility, jointly owned by Sempra U.S. Gas & Power and BP Wind Energy, is the largest wind facility in Kansas, with a nameplate capacity of 407 MW.³⁹ The project generated over 1.9 million MWh of electricity in 2014, more than any other wind facility in the Midwest. The 294-turbine facility is located in Barber, Harper, Kingman and Sumner Counties in the south-central region of the state, and accounts for nearly a fifth of the state's PTC-eligible wind generation.

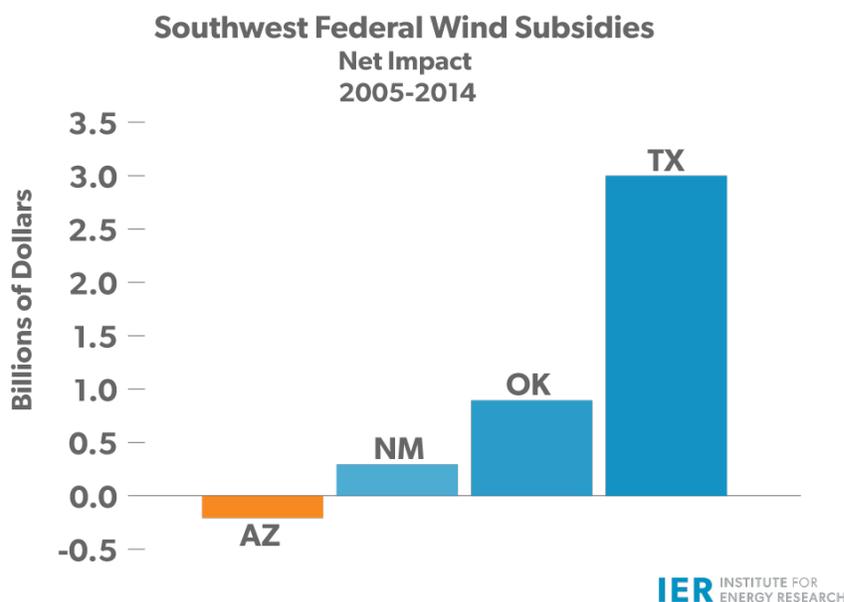
Wind facilities are exempt from property taxes in Kansas, and BP Wind Energy's Director of Wind Development claimed that the company's payments to the counties justifies the project's property tax exemption in his testimony to the state's Joint Committee on Energy and Environmental Policy in 2011.⁴⁰

However, the Kansas Policy Institute found that Flat Ridge 2's exemption lost the state \$35 million in property taxes in 2014—28 times larger than the \$1.25 million annual payments the company pays out in lieu of the tax.⁴¹

The Southwest

The Southwest is the largest net recipient of federal wind subsidies, driven primarily by Texas. As a whole, wind producers in the Southwest received more than \$3.97 billion more in federal wind subsidies than taxpayers in their states paid in taxes from 2005 to 2014 to support federal wind subsidies. For the purposes of this study, states in the Southwest include Arizona, New Mexico, Oklahoma, and Texas.

Figure 4 highlights the net subsidies or net losses of each state in the Southwest.



As figure 4 shows, wind producers in all but one Southwestern state received more federal wind subsidies from 2005 to 2014 than taxpayers in their states contributed to their share of the wind subsidy tax burden. The only state in the Southwest whose taxpayers paid more in taxes than their wind producers took in subsidies was Arizona, with net losses of about \$207 million.

State focus: Texas is the biggest net recipient of federal wind subsidies nationwide, raking in nearly \$3 billion in wind subsidies than its share of the federal wind subsidy-related tax burden.

From 2005 to 2014, Texas produced more than 209.8 million megawatt-hours of federal subsidy-eligible wind generation, more than double the second highest state's eligible wind generation.

Texas has exceeded its RPS due to particularly good wind corridors within the state. States whose geography is not as conducive to wind generation as Texas—such as Ohio—have much more difficulty meeting their state renewable electricity mandates without importing wind energy from other states.

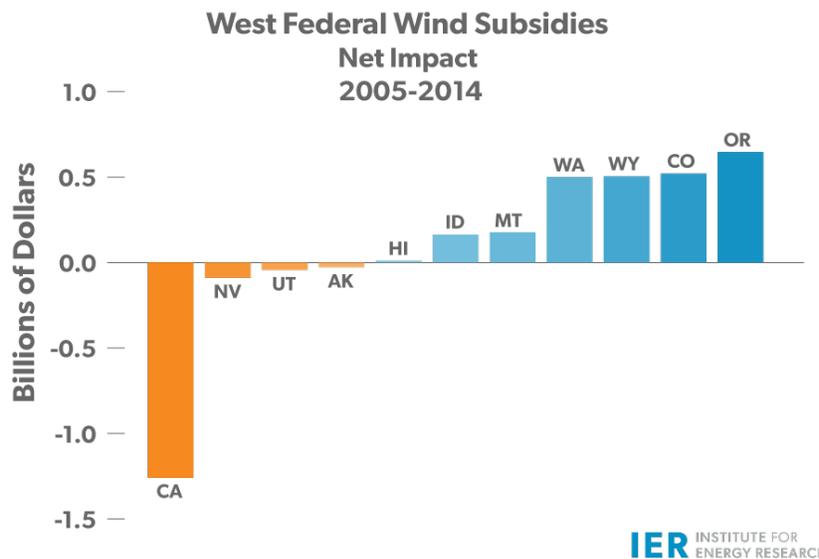
Facility focus: The Roscoe Wind Facility in Texas is the largest facility in the Southwest with a nameplate capacity of 782 MW.⁴² Commercial, residential, and industrial wind facilities are exempt from property taxes in Texas,⁴³ and the facility received \$216 million subsidies from the Section 1603 renewable grant program towards its estimated \$1 billion construction costs.⁴⁴

Roscoe is owned by E.ON Climate Renewables (EC&R), a subsidiary of E.ON, an international power and gas company headquartered in Düsseldorf, Germany with over 125 billion euros in assets.⁴⁵

The West

The West is the third largest net recipient of federal wind subsidies. Wind producers in Western states received, in total, over \$1.09 billion more in wind subsidies than their states' taxpayers paid to support the wind subsidy tax burden from 2005 to 2014. For the purposes of this study, Western states include Alaska, California, Colorado, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

Figure 5 highlights the net subsidies or net losses of each state in the West.



As Figure 5 shows, wind producers in 7 out of 11 Western states received net subsidies. Wind producers in Oregon are the biggest net recipients, at more than \$645.9 million, while taxpayers in California suffer the most net losses, at nearly \$1.3 billion.

State focus: From 2005 to 2014, California had the second highest installed wind capacity in the country⁴⁶ and was the sixth largest taker in terms of gross subsidies, receiving a total of almost \$913.2 million in our ten-year snapshot. However, because California taxpayers contribute the largest share of the federal tax burden—almost 12 percent of the total—California actually shoulders the largest net losses.

Facility focus: The Shepherds Flat Wind Project is the biggest wind facility in Oregon, and its nameplate capacity of 845 MW ranks it among the largest wind facilities in the world. Shepherds Flat is located in Morrow and Gilliam counties in the north central region of the state. GE Energy Financial Services, Google, and Japanese firms Tyr Energy and Sumitomo Corporation invested in the project, partnering with the project manager Caithness Energy to “[expand] their renewable energy portfolios.”⁴⁷ The project, which opened in 2012, was highlighted by White House officials in an internal memo as an illustration of the flaws that plagued the Department of Energy’s loan guarantee program.⁴⁸ The developer of the project, Caithness Energy, received \$1.2 billion in subsidies to fund the \$1.9 billion project, covering nearly 64 percent of its costs, including a partial loan guarantee from the Department of Energy.⁴⁹ In 2013, Caithness Energy appeared to be taking advantage of government subsidies by claiming three separate tax credits totaling \$30 million from the Oregon Department of Energy when the company likely only qualified for one, according to an investigation by *The Oregonian*.⁵⁰

Issues for Further Analysis

This analysis evaluates the impacts of wind subsidies without adjusting the PTC-related tax burden for imports of wind-generated electricity. Likewise, our analysis does not adjust for exports of wind-generated electricity from states such as Iowa, which generates about 20 percent of the electricity it generates from wind due to its large wind resource availability, but also exports a major portion of that electricity. Further analysis could also analyze federal wind subsidies by recipient (on a facility-by-facility basis, using EIA data) and determine what percentage of federal subsidy allocations accrue to foreign-owned facilities. Such information could be useful to policymakers and voters but has not yet been published. Finally, another study could break down the magnitudes and distributional effects of each subsidy type—PTC, ITC, and 1603 grant. For the purposes of this white paper, we calculate wind subsidies based on the “value” of the PTC only.

Conclusion

As this report highlights, federal wind subsidies such as the PTC “benefit” wind producers in a few states, but those subsidies to wind producers come at the expense of taxpayers everywhere. Furthermore, subsidies to wind producers in the relatively few states with excellent wind resources represent losses to the majority of the states within the U.S. Even in states that seem to accrue net “benefits” from federal wind subsidies, these subsidies merely redistribute wealth from taxpayers to wind companies. Federal wind subsidies—beyond being inefficient policies that distort energy markets, threaten grid reliability, and encourage rent-seeking—create an unfair redistribution of wealth across state lines that enriches wind companies in a handful of states at the expense of taxpayers in most other states.

¹ In this study, we use the terms “subsidy” and “allocation” to refer to the granting of tax credits for individual taxpaying entities under the auspices of the wind PTC program. Although in general there is an important distinction between a “tax credit” and a genuine disbursement of other taxpayer dollars to a recipient, in practice this distinction is blurred when it comes to the wind PTC. This is because the actual wind enterprises themselves often do not generate enough tax liability to fully enjoy the available credit, giving an incentive for outside firms (which show a higher net profit on other activities) to absorb the wind enterprise, with its tax credit one of the primary assets of acquisition.

² See Government Accountability Office, *Wind Energy: Additional Actions Could Help Ensure Effective Use of Federal Financial Support*, March 2013, <http://www.gao.gov/products/GAO-13-136>.

³ The 11 states with zero wind production in 2012 are Alabama, Arkansas, Connecticut, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, and Virginia.

⁴ As IER has explained, federal wind subsidies often support foreign industries rather than U.S. industries. See: <http://www.instituteforenergyresearch.org/2012/09/07/obamas-energy-tax-proposals-wind-vs-oil-and-gas/>.

⁵ Averaging EIA's weighted average wholesale price across all regions in 2014 yields \$52.32 per MWh. See: <http://www.eia.gov/electricity/wholesale/>.

⁶ See: Lisa Linowes, *Wind Energy Without the PTC*, Master Resource, May 12, 2012, <http://www.masterresource.org/2012/05/wind-energy-without-ptc/>, and Jonathan A. Lesser, *Wind Intermittency and the Production Tax Credit: A High Cost Subsidy for Low Value Power*, Oct. 2012, http://www.continentalecon.com/publications/cebp/Lesser_PTC_Report_Final_October-2012.pdf.

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¹³ Niki Nixon, *Timeline: The History of Wind Power*. The Guardian, October 17, 2008, <http://www.theguardian.com/environment/2008/oct/17/wind-power-renewable-energy>.

¹⁴ Nixon, *Timeline: The History of Wind Power*.

¹⁵ History Channel, *First Megawatt Wind Turbine Generates Electricity*, This Day in HISTORY, <http://www.historychannel.com.au/classroom/day-in-history/885/first-megawatt-wind-turbine-generateselectricity>.

¹⁶ Travis Fisher, *PURPA: Another Subsidy for Intermittent Energies*, Master Resource, <https://www.masterresource.org/energy-efficiency/purpa-renewable-energy-subsidies/>.

¹⁷ Government Accountability Office, *Wind Energy: Additional Actions Could Help Ensure Effective Use of Federal Financial Support*, March 2013, <http://www.gao.gov/products/GAO-13-136>.

¹⁸ Internal Revenue Service, *1603 Program: Payments for Specified Energy Property in Lieu of Tax Credits*, Mar. 4, 2013, <http://www.treasury.gov/initiatives/recovery/Pages/1603.aspx>.

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