



**BEFORE THE ENERGY SUBCOMMITTEE**

**COMMITTEE ON SPACE, SCIENCE, AND TECHNOLOGY**

**HEARING ON FEDERAL FINANCIAL SUPPORT FOR ENERGY TECHNOLOGIES:  
ASSESSING THE COSTS AND BENEFITS**

**MARCH 13, 2013**

**TESTIMONY OF MARY J. HUTZLER**

**THE INSTITUTE FOR ENERGY RESEARCH**

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The federal government has provided various forms of financial support for the development and production of fuels and energy technologies over the past several decades and that support is growing. The Energy Information Administration (EIA), an independent agency of the U.S. Department of Energy (DOE), evaluated the amount of subsidies that the federal government provides energy producers with its most recent information for fiscal year 2010.<sup>i</sup> Over a 3-year period, from fiscal year 2007 through fiscal year 2010, total federal energy subsidies increased from \$17.9 billion to \$37.2 billion, an increase of 108 percent over the 3-year period. The largest increases in federal energy subsidies were in renewable and end-use subsidies. Over the 3-year period:

- Renewable energy subsidies increased by 186 percent from \$5.1 billion to \$14.7 billion.
- Wind led the various renewables with a more than 10-fold increase in subsidy from \$476 million to \$4,986 million.
- Solar subsidies increased by more than a factor of 6 from \$179 million to \$1134 million.
- Subsidies for biofuels increased by 66 percent, from \$4 billion to \$6.6 billion.

- Conservation and end-use subsidies more than tripled from \$4 billion to \$14.8 billion. Conservation subsidies increased from \$369 million to \$6,597 million, a factor of almost 18. End-use subsidies increased from \$3,618 million to \$8,241 million, more than a doubling.

In contrast,

- Federal subsidies for coal increased 44 percent from \$943 million to \$1,358 million.
- Federal subsidies for oil and natural gas increased 40 percent from \$2,010 million to \$2,820 million.
- Federal subsidies for nuclear energy increased 46 percent from \$1,714 million to \$2,499 million.

New legislation, particularly the American Recovery and Reinvestment Act (ARRA) of 2009, was a major factor in the increase in subsidies over the 3-year period. ARRA, by itself, represented 40 percent of the total subsidy value in FY 2010, and 77 percent of the increase in subsidies from FY 2007. Other legislation impacting the increased subsidy levels were the Energy Improvement and Extension Act, the Food, Conservation, and Energy Act of 2008 that provided new subsidies to biofuel producers, and the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 that extended the sunset dates for several tax expenditure programs and the grant program for qualifying renewables.

The growth in renewable fuel subsidies in FY 2010 is driven mainly by the \$4.2 billion in expenditures for grants under Section 1603 of ARRA, which went mainly to wind facilities, and also in growth in support of biofuels. The 1603 program allowed qualifying renewable projects to receive an up-front grant in lieu of a production tax credit taken over 10 years for wind facilities. Tax expenditures relating to the ethanol tax credit increased over the three-year period due to the growth in ethanol blending under the Renewable Fuel Standard. Because the DOE Loan program was in its early stages in FY 2010, only \$1.6 billion of the subsidies EIA calculated were attributed to it, but EIA acknowledged that expenditures from that program would be much higher in later years.

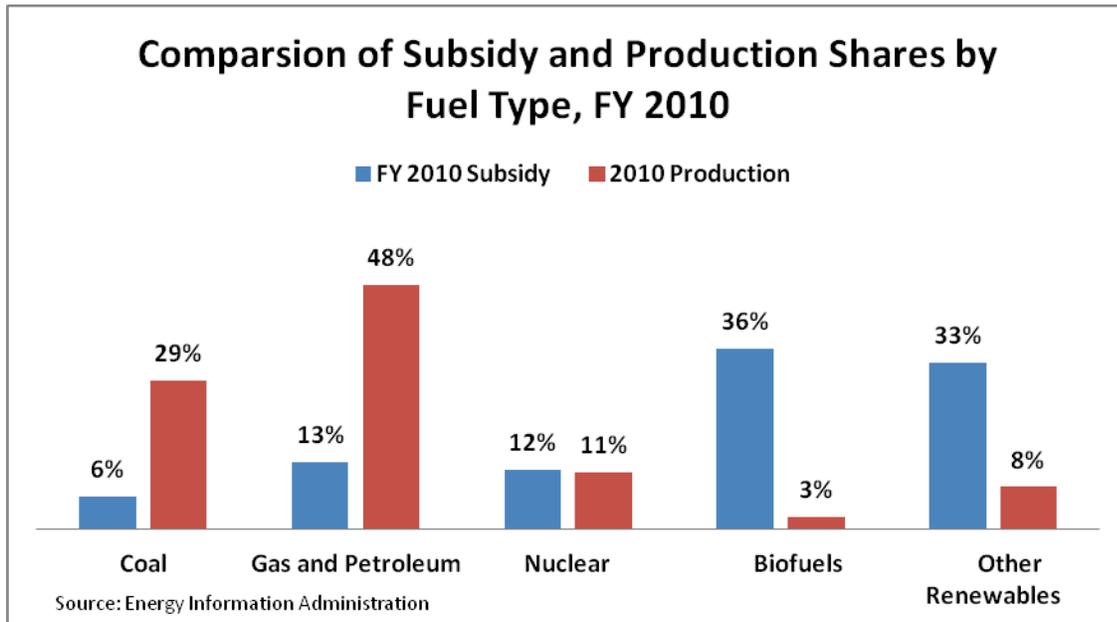
The subsidies covered in EIA's report include:

- Direct Expenditures to Producers and Consumers, which involve direct cash outlays that provide a financial benefit to producers or consumers of energy.
- Tax Expenditures, which are provisions in the tax code that reduce the tax liability of firms or individuals that take specified actions affecting energy production, consumption, or conservation.
- Research and Development expenditures that either increase energy supplies or improve the efficiency of energy technologies in the future.
- Loans and Loan Guarantees that, according to DOE, provide financial support for "innovative clean energy technologies that are typically unable to obtain conventional private financing due to their 'high technology risks.'"

- Electricity programs serving targeted categories of electricity consumers including the federally-owned Tennessee Valley Authority and the Power Marketing Administrations whose electricity is sold preferentially to public bodies and cooperatives.

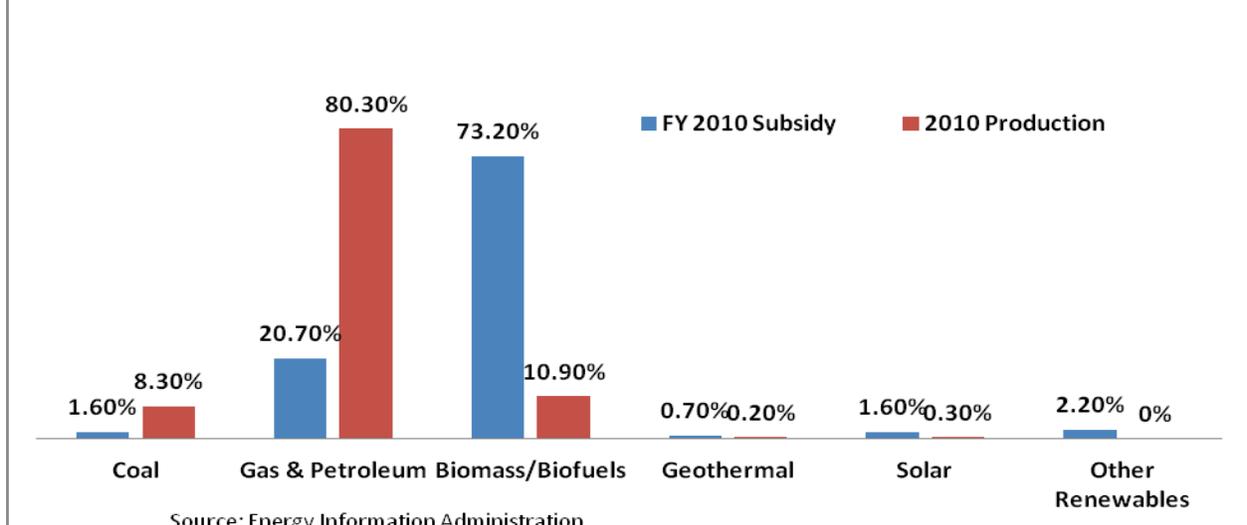
### Subsidy Value by Fuel/Technology

While all subsidy levels increased over the 3-year period, the subsidy levels for the different fuels/technologies were not in concert with their production levels. The following graph compares the share of subsidy received in fiscal year 2010 compared to the share of energy produced by each fuel/technology in 2010. Fossil fuels provided the largest share of production (77 percent), but received only 19 percent of the subsidies, while renewable fuels received 69 percent of the subsidies, but produced only 11 percent of the country’s energy. The remainder of the subsidies was provided to nuclear energy which produced about an equivalent share of energy to its share of subsidies.

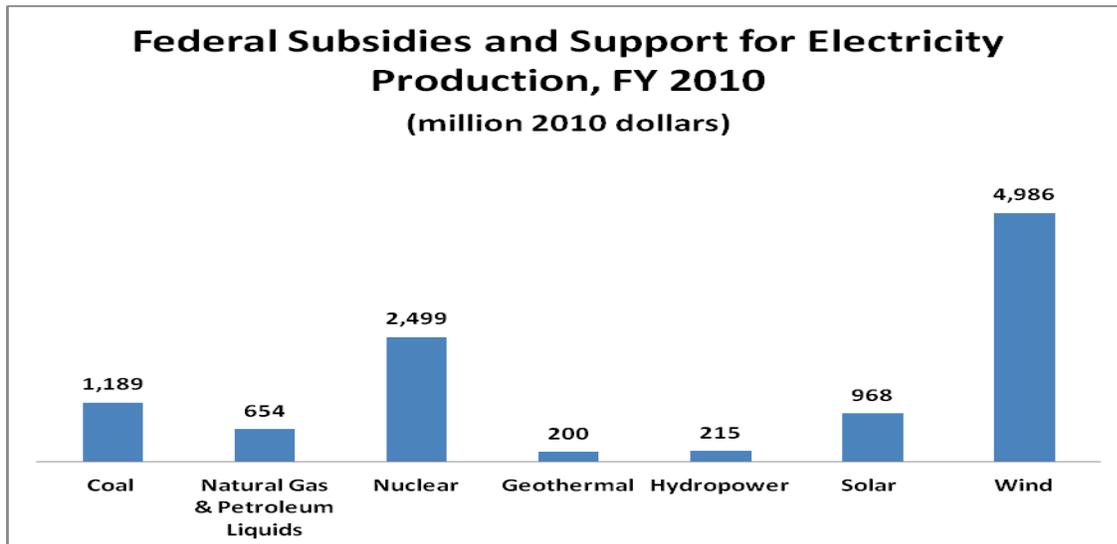


In the non-electric generating sector, biofuels/biomass received the largest share of non-electric subsidies (73 percent) but provided just 11 percent of the non-electric production. Petroleum and natural gas provided the largest share of non-electric production (80 percent), but received only 21 percent of the non-electric subsidies. Clearly, the fuels/technologies receiving the greatest shares of subsidies are not producing the largest amount of production.

## Comparison of Non-Electricity Related Subsidy and Production Shares by Fuel Type, FY 2010

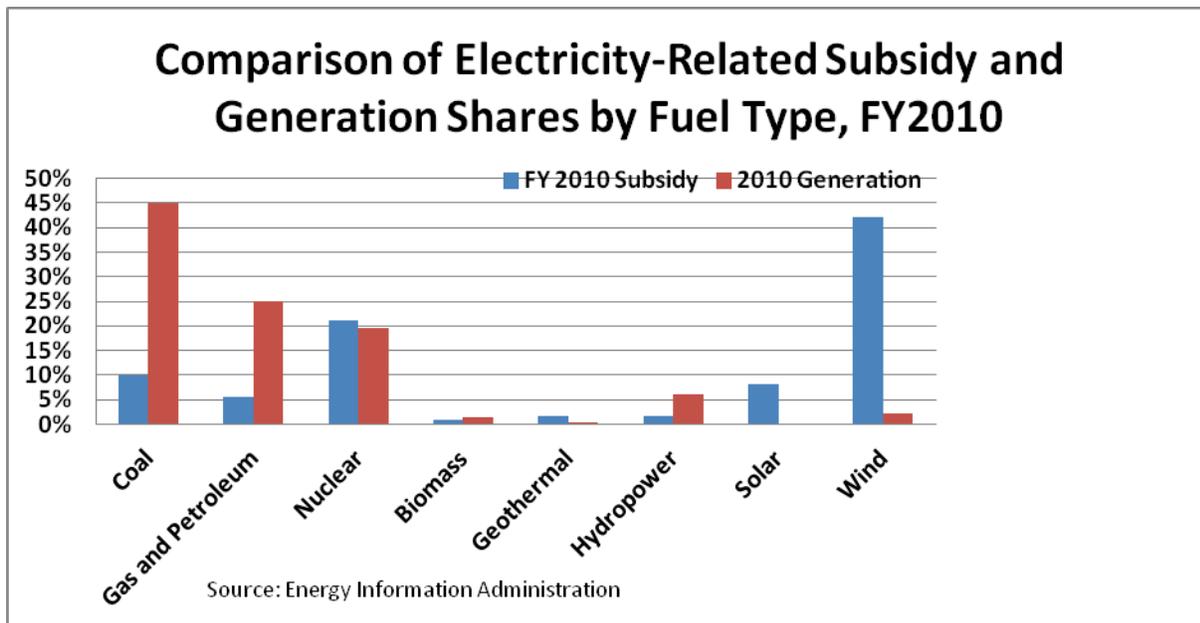


The main focus of the EIA report, however, was on subsidies for electricity generation. Federal subsidies for electricity production increased from \$6,582 million to \$10,902 million, an increase of 66 percent, with the largest dollar amounts received by wind (\$4,986 million) and nuclear (\$2,499 million) technologies. See the chart below.



Source: Energy Information Administration, *Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2010*, July 2011, <http://www.eia.gov/analysis/requests/subsidy/pdf/subsidy.pdf>

In the electric generation sector, renewable energy received 55 percent of the subsidies, but generated about 10 percent of the electricity. Wind was the largest renewable subsidy recipient with 42 percent of the subsidy, but provided only 2.3 percent of the electricity generated. Fossil fuels received 16 percent of the subsidies but generated the largest share of electricity--70 percent. Nuclear energy generated 20 percent of the electricity and received 21 percent of the subsidies—about an equal share of both. (Transmission and distribution received 8 percent of the subsidies but is not displayed on the chart below because those subsidies were not apportioned to fuel/technology.)

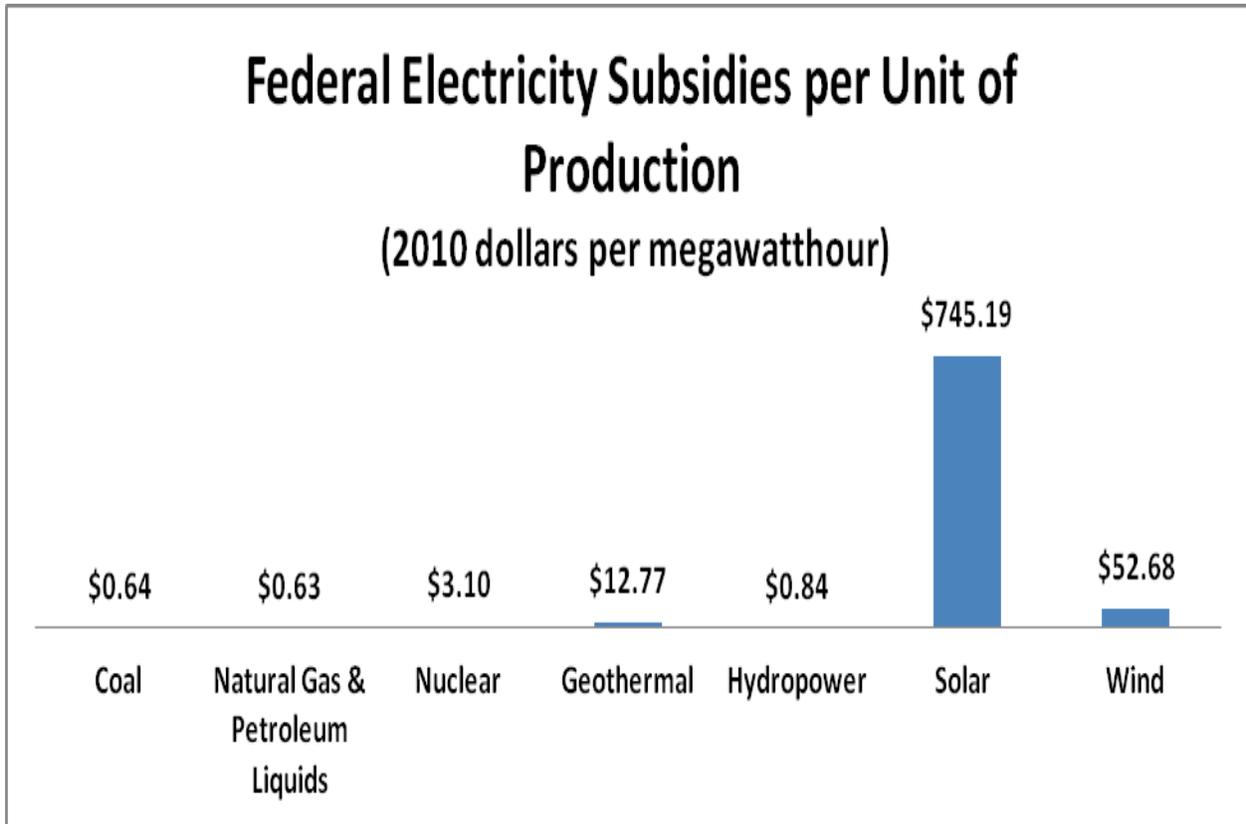


### Federal Subsidies per Unit of Electricity Production

As mentioned above, renewable energy received 55 percent of federal subsidies and support in FY2010, but accounted for only 10 percent of total generation. While this statement is true, the difference is skewed much more than presented by these statistics because hydroelectric power provides the largest share of renewable generation (about 60 percent), but received only 0.6 percent of all subsidies and 1.5 percent of all renewable subsidies. A better measure is the value of the subsidy per unit of electricity production, which is an indicator of how federal dollars are being used and the value the nation is getting from them.

The Institute for Energy Research calculated the federal subsidies and support per unit of electricity production from the information provided in EIA’s report. The ratio of dollars to production is given in the following figure. As can be seen by the figure, solar is being subsidized by over 1100 times more than coal and oil and natural gas electricity production, and wind is being subsidized over 80 times more than

the more conventional fossil fuels on a per unit of production basis. EIA's report shows that on a total dollar basis, wind energy has the highest federal subsidy, but, on a unit of production basis, solar energy is by far the costliest form of electricity production.



Source: Energy Information Administration, *Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2010*, July 2011, <http://www.eia.gov/analysis/requests/subsidy/pdf/subsidy.pdf>

Proponents of subsidies claim that wind and solar are "infant technologies" and need subsidies to be competitive in the market place. But these technologies are not new. Wind was first used to generate electricity over 125 years ago when James Blyth, a Scottish electrical engineer, pioneered the field of electricity generation through wind power --his wind turbine was the world's first-known structure by which electricity was generated from wind power. Although Blyth received recognition for his contributions to science, electricity generation by wind power was considered uneconomical. Similarly, the first photoelectric solar cell was built in the 1880s and the first practical photovoltaic solar cell was built in 1954--almost 60 years ago. Yet, these technologies are still uneconomic without subsidies and/or mandates.

### The CBO Study

The Congressional Budget Office (CBO) evaluated federal subsidies received by the various energy industries for fiscal year 2011, classifying subsidies by two categories: tax preferences, which totaled

\$20.5 billion in fiscal year 2011, and DOE's spending programs, which totaled \$3.5 billion.<sup>ii</sup> (Tax preferences are defined as special tax rates and deductions, tax credits, and grants in lieu of tax credits.)

The agency found that energy-related subsidies totaled \$24 billion in FY 2011, of which \$16 billion (67 percent) were spent on renewable energy and energy efficiency and \$2.5 billion (10 percent) on fossil fuels. In other words, renewable energy technologies and energy efficiency programs received 6.4 times more subsidies than fossil fuels received.

Because the EIA used a broader definition for what constitutes a subsidy, its study showed a higher level of federal subsidies (\$37 billion) in fiscal year 2010 than the CBO found a year later (\$24 billion), even though the American Reinvestment and Recovery Act had been in effect for a year longer in the CBO study. Using the broader definition, the EIA study found that federal energy-related subsidies and financial interventions totaled \$37.2 billion, of which \$21.3 billion was for renewable energy and energy efficiency (57 percent) and \$4.2 billion was for fossil fuels (11 percent). Both studies were in agreement that biofuels and wind were the largest renewable recipients of subsidies. But, EIA also found that the largest recipients of subsidies also produced the smallest amounts of energy for the nation.

### **Tax Preferences**

Energy-related tax preferences were initiated in 1916, but had dwindled to a very small amount by the late 1980s and did not grow substantially again until the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007 were enacted. These acts were followed by the Emergency Economic Stabilization Act of 2008 and the American Recovery and Reinvestment Act of 2009, which expanded and extended the provisions related to energy efficiency and renewable energy.

By fiscal year 2011, energy efficiency and renewable energy accounted for 78 percent of the estimated budgetary cost of federal energy-related tax preferences. According to the CBO, the breakdown of tax preferences for fiscal year 2011 was: renewable energy (68 percent), fossil fuels (15 percent), energy efficiency (10 percent), nuclear energy (4 percent), and other (2 percent).

About half of the total subsidies were from four tax provisions that expired at the end of December 2011. They totaled just over \$12 billion, accounting for about 60 percent of the budgetary impact in 2011 of the energy-related tax preferences. One of the expired provisions was a renewable energy tax credit for the use of alcohol fuels that totaled over \$6 billion. The other 3 provisions were credits for energy-efficiency improvements to existing homes (\$1.5 billion), excise tax credit for biodiesel (\$0.8 billion), and section 1603 grants for renewable energy (\$3.9 billion), some of which have been extended by the American Taxpayer Relief Act of 2012.

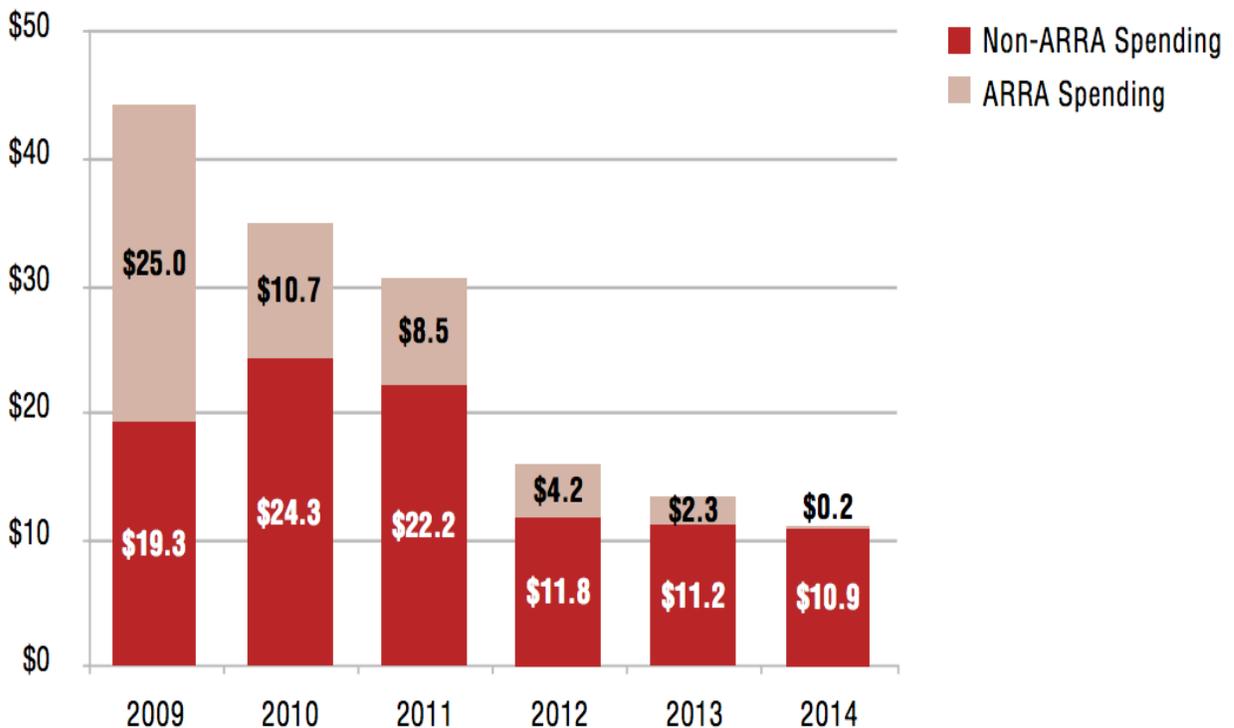
### **DOE Loan and Loan Guarantees**

The stimulus funding in 2009 from the American Recovery and Reinvestment Act (ARRA) totaled \$787 billion<sup>iii</sup>, and most of those funds have been paid out according to the government's website<sup>iv</sup>. Over \$90 billion was earmarked for 'green programs.' However, the total that went to green energy projects is not

clear. Brookings estimated it at \$51 billion, with a total government spending (both stimulus and non-stimulus) on green initiatives at \$150 billion through 2014.<sup>v</sup> About \$100 billion (two-thirds) of that is expected to fund renewable energy, including subsidies for wind, solar and biofuel projects and research and development for new technologies. Conservation is expected to garner another \$15 billion, funding for electric cars and high speed rail about \$10 billion each, and smart grid and nuclear power about \$6 billion each.

**Figure 7**

**Federal ARRA and Non-ARRA Spending on Clean Tech by Year (billions)**



Source: Brookings, *Beyond Boom & Bust*, April 2012, [http://www.brookings.edu/~media/Research/Files/Papers/2012/4/18%20clean%20investments%20muro/0418\\_clean\\_investments\\_final%20paper\\_PDF.PDF](http://www.brookings.edu/~media/Research/Files/Papers/2012/4/18%20clean%20investments%20muro/0418_clean_investments_final%20paper_PDF.PDF)

Unfortunately, about 50 firms receiving government funds are either bankrupt (23) or are having difficulties (27), and many of the latter are in financial trouble.<sup>vi</sup> Over \$15 billion of taxpayer money is either gone or at risk. Further, 29 of the 50 companies had or have political connections, putting the percentage of political cronyism at almost 60 percent.

Let's recap some of the loan commitments and their status. The most famous is Solyndra, a solar manufacturer that received almost all of the \$535 million loan awarded it before filing for bankruptcy in 2011. The cause of Solyndra's demise was its complicated technology that required a custom manufacturing facility and an expensive price tag. Political desires resulted in DOE pushing the loan guarantee out the door quickly despite concerns over the economic and technological viability of the company to the detriment of the American taxpayers.

Abound Solar, another solar manufacturer that received a DOE loan guarantee for \$400 million, filed for bankruptcy in June 2011 after it had laid off 70 percent of its workforce that February.<sup>vii</sup> According to the Daily Caller, Abound Solar sold defective or underperforming products, and company personnel claimed DOE officials knew their panels were faulty before they received taxpayer dollars.<sup>viii</sup> Virtually all of the panels Abound manufactured underperformed, putting out between 80 and 85 percent of the promised wattage and leading to tens of thousands of panels having to be replaced, particularly towards the end of the company's life.

First Solar, one of the biggest recipients from DOE's loan guarantee program, garnered over \$3 billion<sup>ix</sup> before the program expired at the end of September 2011.<sup>x</sup> At the time, DOE was under pressure not to repeat its prior mistakes, but again the agency provided a loan guarantee to a losing company. For example, early in 2012, First Solar laid off half of its employees at its Antelope Valley Solar Ranch One project in the Southern California desert, which was the recipient of a \$646 million loan guarantee that was to create 350 construction and 20 permanent jobs. Further exploiting taxpayers dollars, in 2011, First Solar paid its top eight executives almost \$16 million. Rob Gillette, who was terminated as CEO of First Solar in October 2011, received more than \$32 million since his employment began in October 2009. First Solar sold much of its \$3 billion in federal loan guarantees to third parties before it laid off 30 percent of its workforce. Its stock price plummeted by more than 90 percent from its high in 2011, but not before its head officer received more than \$329 million in stock sales since 2009.

Solar technology firms were not the only companies that received DOE awards, but failed to materialize any benefits. Fisker Automotive, a Finnish electric car maker, originally received \$529 million in DOE loan guarantees, but was cut off at \$193 million because it failed to reach milestones for its luxury vehicle Karma. The company suffered recalls of its extended-range electric sedan that cost over \$100,000, because of technology flaws and failed batteries, which resulted in fires. The federal subsidies attracted some of the rich and famous, as it has been a favorite status purchase for Hollywood movie stars and celebrities, rappers and Hip Hop musicians, and soap opera stars. Consumer Reports gave the Karma a terrible review, calling it the worst luxury sedan on the market.

Fisker's battery supplier, A123 Systems, supplied the defective batteries. A123 Systems declared bankruptcy in October 2012, but not before receiving \$132 million from its \$279 million DOE loan guarantee to refurbish two Michigan plants plus other projects.<sup>xi</sup> Here again the loan guarantee was moved quickly by DOE. Similar to First Solar, A123's officers and directors made more than \$11 million in stock sales before the bankruptcy filing.

It is not just the Fisker electric vehicles that are costly. So is Chevy's Volt that is being purchased by buyers with salaries at the \$170,000 level, according to General Motors.<sup>xii</sup> The DOE and others indicate that battery costs need to come down to \$350 per kilowatt-hour to make electric vehicles competitive in the market place.<sup>xiii</sup> John Gartner, an analyst with Pike Research, estimates battery costs to be around \$900 per kilowatt hour, and expects them to decline by 10 to 15 percent per year, reaching about \$470 per kilowatt hour by 2015. Others are more pessimistic on the cost reductions seeing a battery breakthrough taking at least 10 years.<sup>xiv</sup>

But what is even more striking is the difference in automobile characteristics. A gasoline vehicle has a range of 400 miles, while the range of an electric vehicle is 100-300 miles with recharging taking 4 to 12 hours, depending on the vehicle and the charger. That compares to a 5 minute fill-up for an internal combustion engine at a gasoline station. Plus, storage is more limited in electric vehicles due to the space needed for the battery. Further, while there are numerous stations to get a fill-up, the infrastructure for recharging stations doesn't exist in this country. That means these vehicles will have limited use, restricting their purpose to running errands in the local area or for a round-trip work commute. However, even then, one needs to be cautious regarding traffic patterns for heavy traffic can reduce the vehicle's range.

U.S. automobile manufacturers know that even if they manufactured the electric vehicles, they would be purchased only by a very small niche market.<sup>xv</sup> A recent report by the Center for Automotive Research estimates at best less than a half million electric vehicles would be on the road by 2015 based on deployment rates of hybrid vehicles.<sup>xvi</sup> According to Stanford University's Precourt Energy Efficiency Center, it took hybrids, which do not have the range and infrastructure issues of electric vehicles, over a decade to garner 3 percent of the sales market.<sup>xvii</sup>

Deloitte Consulting interviewed industry experts and 2,000 potential buyers and found that only "young, very high income individuals," making more than \$200,000 a year, would consider purchasing an electric car sometime during the next 10 years. While there are people who may want to own such a car, the cost of around \$40,000, even with the \$7,500 rebate, is still double the cost of some internal combustion engines. For example, a 2011 Chevy Volt sells for \$40,280; a Mercedes-Benz C350 sells for \$39,990.<sup>xviii</sup> Tesla Motors will start its Model S sedan, which has a 160 mile driving range in ideal conditions, at \$57,400.<sup>xix</sup> With larger battery packs, Tesla can expand the driving range. For an extra \$10,000, Tesla will provide an electric vehicle that can go 230 miles on a charge, and for an extra \$20,000, it will provide a vehicle that can go 300 miles.

The Heritage Foundation put together a list of 34 companies that received federal support from taxpayers that have faltered or are now faltering.<sup>xx</sup> These companies have either gone bankrupt, laid off workers, or are heading for bankruptcy. The list below provides the 34 companies along with the amount of money they were offered by the U.S. DOE and other federal government agencies. The amount of money listed does not include other state, local, and federal tax credits and subsidies and it also does not include government mandates, which guarantee a market for the product. The at-risk total

is approximately \$7.5 billion, of which \$1.6 billion is in receivership. And the total will likely get larger as more is known about each company.

1. [Evergreen Solar](#) (\$25 million)\*
2. [SpectraWatt](#) (\$500,000)\*
3. [Solyndra](#) (\$535 million)\*
4. [Beacon Power](#) (\$43 million)\*
5. [Nevada Geothermal](#) (\$98.5 million)
6. [SunPower](#) (\$1.2 billion)
7. [First Solar](#) (\$1.46 billion)
8. [Babcock and Brown](#) (\$178 million)
9. [EnerDel's subsidiary Ener1](#) (\$118.5 million)\*
10. [Amonix](#) (\$5.9 million)
11. [Fisker Automotive](#) (\$529 million)
12. [Abound Solar](#) (\$400 million)\*
13. [A123 Systems](#) (\$279 million)\*
14. [Willard and Kelsey Solar Group](#) (\$700,981)\*
15. [Johnson Controls](#) (\$299 million)
16. [Schneider Electric](#) (\$86 million)
17. [Brightsource](#) (\$1.6 billion)
18. [ECOtality](#) (\$126.2 million)
19. [Raser Technologies](#) (\$33 million)\*
20. [Energy Conversion Devices](#) (\$13.3 million)\*
21. [Mountain Plaza, Inc.](#) (\$2 million)\*
22. [Olsen's Crop Service and Olsen's Mills Acquisition Company](#) (\$10 million)\*
23. [Range Fuels](#) (\$80 million)\*
24. [Thompson River Power](#) (\$6.5 million)\*
25. [Stirling Energy Systems](#) (\$7 million)\*
26. [Azure Dynamics](#) (\$5.4 million)\*
27. [GreenVolts](#) (\$500,000)
28. [Vestas](#) (\$50 million)
29. [LG Chem's subsidiary Compact Power](#) (\$151 million)
30. [Nordic Windpower](#) (\$16 million)\*
31. [Navistar](#) (\$39 million)
32. [Satcon](#) (\$3 million)\*
33. [Konarka Technologies Inc.](#) (\$20 million)\*
34. [Mascoma Corp.](#) (\$100 million)

\*Denotes companies that have filed for bankruptcy.

Loan guarantees continued even though the administration knew of its problems. A memorandum on the green energy loan guarantee program by high ranking officials inside the administration highlighted its numerous flaws.<sup>xxi</sup> According to the memorandum's authors (Larry Summers, Ron Klain, Carol

Browner)<sup>1</sup>, one wind project in particular would receive \$1.2 billion in government subsidies for a \$1.9 billion project, making it about 65 percent subsidized while guaranteeing a 30-percent return on equity to private companies. And, the authors omit that the project would only create 400 construction jobs and 35 permanent jobs. In other words, each one of the 35 permanent jobs would cost the government over \$30 million each.

The memorandum explains that the Office of Management and Budget (OMB) and the Department of Treasury were concerned about three problems with the loan guarantee program: “double dipping” (massive government subsidies from multiple sources), lack of “skin in the game” from private investors and “non-incremental investment,” the funding of projects which would occur even without the loan guarantee.

For example, the Shepherds Flat wind project received over \$1.2 billion in government subsidies, dwarfing the \$100 million investment in the project touted by Google. Shepherds Flat is an 845-megawatt wind farm in Oregon. The \$1.9 billion project would consist of 338 GE wind turbines manufactured in South Carolina and Florida and, upon completion, would represent the largest wind farm in the country. The sponsor’s (Caithness Energy and GE Energy Financial Services) equity is about 11 percent of the project costs, but the project would generate an estimated return on equity of 30 percent.

Subsidy Type	Approximate Amount (millions)
Federal 1603 grant (equal to 30% investment tax credit)	\$500
State tax credits	\$18
Accelerated depreciation on Federal and State taxes	\$200
Value of loan guarantee	\$300
Premium paid for power from state renewable electricity standard	\$200
<b>Total</b>	<b>\$1,218</b>

**Double dipping:** The total government subsidies are about \$1.2 billion from 5 different incentives.

**Skin in the game:** The government would provide a significant subsidy (about 65 percent), while the sponsor would provide little skin in the game (equity about 11%).

<sup>1</sup> At the time, Summers was the Chairman of the National Economic Council, Klain was Vice President Biden’s Chief of Staff, and Browner was the White House Energy and Climate Change Advisor.

**Non-incremental investment:** This project would likely move without the loan guarantee. The economics are favorable for wind investment given tax credits and state renewable energy standards. GE signaled through Hill staff that it considered going to the private market for financing out of frustration with the review process. The return on equity is high (30 percent) because of tax credits, grants, and selling power at above-market rates, which suggests that the alternative of private financing would not make the project financially non-viable.

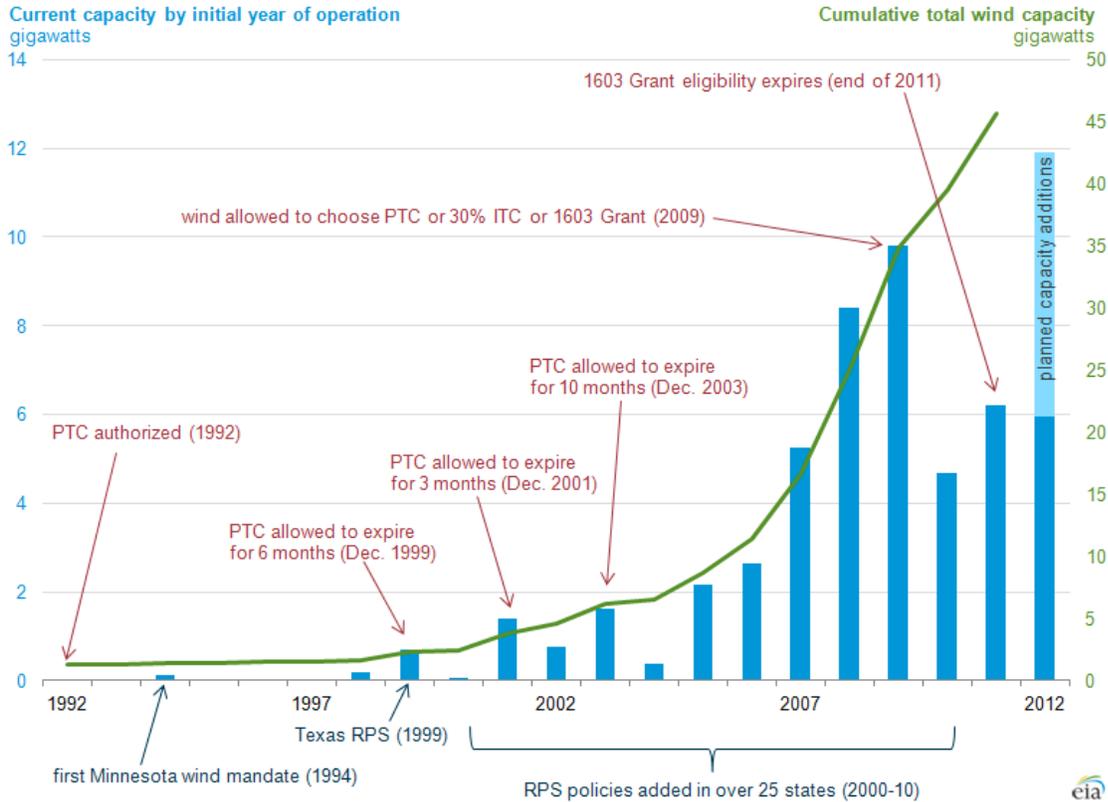
**Carbon reduction benefits:** If this wind power displaced power generated from sources with the average California carbon intensity, it would result in about 18 million fewer tons of carbon dioxide emissions through 2033. Carbon reductions would have to be valued at nearly \$130 per ton carbon dioxide for the climate benefits to equal the subsidies (more than 6 times the primary estimate used by the government in evaluating rules).

In regard to the Shepherds Flat project, taxpayers were expected to fund by far the largest share of the bills and the risk and in return they were getting only miniscule benefits in terms of reduced greenhouse gases. In contrast, the corporations behind the project, who were not taking much of the risk, stood to profit handsomely. Despite understanding that a loan guarantee for the Shepherds Flat project was unnecessary, the administration approved the loan guarantee anyway.

### **The American Taxpayer Relief Act of 2012**

The American Taxpayer Relief Act of 2012 extended a number of energy tax incentives through December 31, 2013, costing the taxpayer over \$18 billion.<sup>xxii</sup> The most publicized and costly is the production tax credit (PTC) for wind garnering a 'one-year' extension that will cost taxpayers over \$12 billion over a ten year period. This tax credit for wind has been in effect off and on for 20 years without accomplishing its job, which is to make this industry competitive on its own.<sup>xxiii</sup> The credit provides 2.2 cents per kilowatt hour for electricity generated for the first 10 years of operation of the wind unit. While the original PTC stipulated that the wind unit must begin operation in the year of the credit, the extension that was passed only indicates that the project must begin construction in the initial year and that the unit has 2 more years to become operational.

Unfortunately for taxpayers, the expense of the PTC was not needed since another policy (the Renewable Portfolio Standard) implemented by over half our states is driving most of the wind capacity additions.<sup>xxiv</sup> As the graph below shows, the PTC was first passed in 1992, but it did little to generate interest in the wind industry in the 1990s. Once Texas introduced its RPS in 1999 under then-Governor George W. Bush, mandating a specific percentage of its electricity be produced by qualified renewable technologies, and most other states followed with their RPS programs between 2004 and 2007, wind construction began to take off.



Further the PTC is designed inappropriately, providing the wrong incentives for wind to truly be competitive in the long run. The PTC, as its name states, awards a subsidy for each kilowatt hour of electricity produced. The problem is that the production of electricity is much more valuable when demand is high during the day, rather than when demand is low during the night and early morning hours. The PTC, however, awards the same subsidy for production anytime. Unfortunately, wind generally blows the strongest when electricity is worth the least. Thus, the PTC not only provides the wrong incentives, but it disrupts the electricity grid. Wind operators are willing to bid negative prices in order to receive the PTC, forcing other technologies that are built to run continuously to stop production or pay penalties.

Because wind does not blow all the time, it must have back-up power, typically coal-fired or natural gas-fired power plants that can provide power when demanded. That means that we are essentially paying twice for new generating capacity, i.e. the wind turbines that generate the wind power and the natural gas- or coal-fired power that provides the back-up electricity when the wind isn't blowing. The Electric Reliability Council of Texas, for example, in its planning assumes that only 8.7 percent of its wind capacity can be relied on to supply electric capacity when needed. The distinction is that wind supplies generation, but not dependable generating capacity. This is akin to a government policy that forces Americans to buy an additional car that runs only some of the time with all its expenses, when all the family needs is one car that operates all the time.

Other energy tax incentives extended through December 31, 2013, by the American Taxpayer Relief Act and their cost to the taxpayer through FY 2022 are<sup>xxv</sup>:

- Credit for energy-efficient existing homes (\$2,446 million).
- Credit for alternative fuel vehicle refueling property (\$44 million).
- Credit for 2- or 3-wheeled plug-in electric vehicles (\$7 million).
- Cellulosic biofuel producer credit (\$50 million).
- Incentives for biodiesel and renewable diesel (\$2,181 million).
- Production credit for Indian coal facilities placed in service before 2009 (\$1 million).
- Credit for energy-efficient new homes (\$154 million).
- Credit for energy-efficient appliances (\$650 million).
- Special allowance for cellulosic biofuel plant property (\$2 million through FY 2014).
- Special rule for sales or dispositions to implement FERC or State electric restructuring policy for qualified electric utilities (\$315 million through FY 2017).
- Alternative fuels excise tax credits (\$360 million).

### **Issues with Government Subsidies**

Subsidies have ramifications in the economy. One of which is that the money to provide the subsidies is money that is taken from taxpayers. This means that taxpayers have less money to spend and this destroys jobs elsewhere. Subsidies don't create jobs—they shift jobs from one sector of the economy to another. A study analyzing Spain's experience with renewable energy and job shifting found that for every renewable job, 2.2 jobs were lost elsewhere in the economy.<sup>xxvi</sup> Spain is now experiencing the exodus of its renewable energy industries because its financially strapped government and 20+ percent unemployment means neither the government nor consumers can afford to pay for the more expensive energy renewable sources provide.<sup>xxvii</sup> The electricity system deficit due to the higher cost of electricity in Spain is over 24 billion Euros (over \$30 billion) and that amount is growing.<sup>xxviii</sup> Further, the Spanish government is now being faced with international legal action from its foreign investors in renewable energy projects who allege that the new rules that remove subsidies and levy taxes on all energy forms break their contracts.<sup>xxix</sup> And Spain is not alone, as other countries including Germany, Greece, France and the United Kingdom are dropping or reducing subsidies for "green energy."<sup>xxx</sup>

Subsidies also create industry dependence on the government because they remove the incentive for companies to make their technologies cost-competitive from the onset. Without the subsidy, companies can determine at what price the technology would enter the market place and work towards the economics to achieve it. According to the Energy Information Administration, without subsidies, the cost of new onshore wind generation on a kilowatt-hour basis is estimated to be 32 percent higher than new natural gas combined cycle generation and solar photovoltaic generation is 120 percent more expensive than generation from that same gas-fired technology.<sup>xxxi</sup> And, these costs exclude hidden costs of

these renewable technologies such as the cost of the back-up power required to keep consumers' energy demand met continuously since electricity cannot be stored as fossil fuels can.<sup>xxxii</sup> For decades, representatives and advocates of wind and solar have claimed that their technology was near a competitive tipping point—but just needed a bit more subsidies, set-asides, and government aid to succeed. But even after decades of massive subsidies, wind and solar continue to be more expensive and contribute only a small amount of electricity.

Subsidies also tend to offset financing from the private sector—a sector that has a much better track record for picking winners and losers than does the government. Often, subsidies provide financing to companies that would have undertaken the investment without the subsidy support.

Further, if the project is a winner, subsidies waste taxpayers' money by funding projects that the private sector should fund and would fund if the project were economic, thereby offsetting part of the projects' cost with government funds. And, if the project is a loser, the government is directly wasting taxpayers' money by subsidizing it, such as the case with Solyndra. Because investors have more expertise, knowledge, and “skin in the game” than government bureaucrats in making these decisions, they, rather than the government, should be making them.

For example, the massive amount of subsidies in ARRA failed to anticipate, predict, or even help the most important technological advancements and biggest change in energy production in the last couple decades -- hydraulic fracturing coupled with directional drilling. Hydraulic fracturing is a completely market driven technology that has not been subsidized by the government. The hydraulic fracturing revolution shows why the market is superior to government subsidies in selecting winning technologies. Funded entirely by the private sector, it has dramatically lowered natural gas prices, increased oil production on non-federal lands at the fastest rate since 1859, created jobs, and led to real benefits for Americans, which is not the case for most government subsidies.

Subsidies also promote crony capitalism by encouraging industries that benefit to spend more money lobbying for government handouts from politicians and bureaucrats. If a company's business model requires a guaranteed subsidy from the government, the company will dedicate whatever resources are necessary to ensure that such subsidies continue. For example, industries that benefit from subsidies will spend more money lobbying for continued government handouts.<sup>xxxiii</sup> Clearly, the American Wind Energy Association and the Renewable Fuels Association have continued to lobby for renewable subsidy extensions and mandates when they have already received them for decades without making their technologies cost-competitive.

## **Conclusion**

From the EIA study, we see that those energy fuels/technologies receiving the largest subsidies are producing the least amount of energy for the nation. And those technologies, some of which have been subsidized for decades, are still a long way from being cost-competitive given the lobbying that their industry associations are doing to continue their subsidization.

Clearly, there are issues with subsidies. The shifting of jobs from one economic sector to another because of subsidization can actually result in more job losses than gains as can be seen from Spain's experience. Furthermore, governments historically do not have a good track record for determining winners and losers, which is exemplified through DOE's loan guarantees to companies like Solyndra. Numerous companies went bankrupt despite free or easy money either because their technologies were too complicated, too expensive, or markets were insufficient to support their products.

Wise investments would most likely have been undertaken anyway even without the expenditure of government funds. After all, energy is the largest business in the world and whoever provides an economically-winning source of energy stands to benefit handsomely.

Thank you for the opportunity to supply this testimony for the Committee's use.

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