Impact of Tax Policies on the Commercial Application of Renewable Energy Technology and on U.S. Economic Recovery

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Before the
Subcommittees on Energy and Environment and Investigations and Oversight,
Committee on Science, Space and Technology
U.S. House of Representatives
April 19, 2012

Executive Summary

Government Subsidies and Tax Incentives for Clean Energy: The wind, solar power, biofuel and ethanol industries do not meet the standard criteria used to justify taxpayer-funded subsidies for their deployment across the U.S. economy. They are not "infant industries," are not essential for U.S. economic and job growth and they are unlikely to provide benefits commensurate with their costs. All taxpayer funded programs have opportunity costs since their existence means less money is available for other programs or for the taxpayers themselves to spend. Addressing the huge U.S. federal budget deficit requires cutbacks in programs whose costs exceed their benefits.

Renewable Energy Costs are High: Energy use is a key component in U.S. economic recovery, in recent years each 1% increase in GDP in the U.S. has been accompanied by a 0.2% increase in energy use. Data from DOE's EIA show that new electric generating capacity using wind and solar power tends to be considerably more expensive than conventional, available and secure natural gas and coal resources. Data on the American Recovery and Reinvestment Act of 2009's 1603 grant program shows that the programs' cost electric generation cost per mega watt hour is almost three times more expensive than is solar thermal (the most costly source of electric generations shown in EIA's tabulation).

Green Jobs are Few and Costly: Anecdotal estimates of job creation in renewable energy suggest that the government's projections of expected new jobs may be significantly overstated and that the cost of each green job is high. The cost to taxpayers to create each short term job under the Recovery Act's 1603 program ranges from about $63,000 to over $91,000. The cost of permanent renewable energy jobs (a total of about 5,000 per year for the next 20 or so years) ranges from over $81,000 to over $88,000. In contrast to the cost of creating jobs under the 1603 program, the average U.S. median wage of all occupations was $45,230 in 2011.

Renewable Energy Receives Largest Share of Tax Code Subsidies: In 2010, an estimated 76% of the $19.1 billion in federal tax incentives went to renewables, for energy efficiency, conservation and for alternative technology vehicles while only 13% went to fossil fuels according to the Congressional Research Service (CRS). Some renewable electricity enjoys negative tax rates: solar thermal's effective tax rate is -245 % and wind power's is -164%. Countries like Germany, the UK, Spain, Italy and Australia are cutting subsidies for renewable energy.

Tax Code Should be Neutral: Accelerated depreciation, Section 199, the foreign tax credit deduction and LIFO are examples of tax code provisions that are available to any industry and are not considered "subsidies."

Fossil Fuels Expansion: Several recent economic analyses suggest that increased access to domestic onshore and offshore oil and gas reserves, including shale gas, could strongly boost U.S. economic recovery, manufacturing and job growth as well as increasing energy security.

Conclusions: Continued high levels of federal support for the deployment of clean energy and alternative fuel vehicles in the U.S. is unlikely to have a significant impact on reducing GHG concentrations in the atmosphere since the real growth in emissions is coming from developing countries. Instead, government funded basic R&D for renewables and conservation may be a better use of taxpayer dollars than the current suite of tax incentives and direct spending programs whose renewal by policymakers is highly uncertain, especially given the critical situation of the U.S. federal budget.

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Introduction

Chairman Harris, Chairman Broun, Ranking Members Miller and Tonko, and members of the Subcommittees, my name is Margo Thorning, senior vice president and chief economist, American Council for Capital Formation (ACCF),* Washington, D.C. I am pleased to present this testimony on the impact of incentives for renewable energy on U.S. economic and job growth and on the federal budget.

The American Council for Capital Formation represents a broad cross-section of the American business community, including the manufacturing and financial sectors, Fortune 500 companies and smaller firms, investors, and associations from all sectors of the economy. Our distinguished board of directors includes cabinet members of prior Democratic and Republican administrations, former members of Congress, prominent business leaders, and public finance and environmental policy experts. The ACCF is celebrating over 30 years of leadership in advocating tax, regulatory, energy, environmental, and trade policies to increase U.S. economic growth and environmental quality.

The Subcommittee Chairmen and Committee members are to be commended for their focus on how the tax incentives, grants and subsidies provided to clean, renewable energy technologies have impacted their deployment as well as the U.S. economic and job growth.

Background

The U.S. federal government has provided funding, tax incentives and subsidies for the development and commercialization of renewable energy for many decades. In 2009, as White House Advisor Joseph Aldy noted, the American Recovery and Reinvestment Act's $90 billion

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* *The mission of the American Council for Capital Formation is to promote economic growth through sound tax, regulatory, energy, environmental, and trade policies. For more information about the Council or for copies of this testimony, please contact the ACCF, 1750 K Street, N.W., Suite 400, Washington, D.C. 20006-2302; telephone: 202.293.5811; fax: 202.785.8165; e-mail: info@accf.org; website: www.accf.org*

in support "represented an unprecedented investment in clean energy".[1] Key areas include support for renewable power generation, transportation including high-speed rail and mass transit, advanced vehicles and battery technology, grid modernization, carbon capture and storage and clean energy manufacturing.

The Recovery Act extended the Production Tax Credit (which has been in existence since 1992) for wind, geothermal and other renewable energy for an additional 3 years and created two new programs to promote renewable power investment: the 1603 grant program and the 1705 loan guarantee program. The 1603 program is a subsidy for investment in new renewable generation capacity, a developer can choose between a PTC, a 30 % investment tax credit (ITC) or a 1603 cash grant equal to 30% of the investment's cost (solar developers can only choose between the ITC and a cash grant).

As noted in Joseph Aldy's 2012 report, the Recovery Act's 1705 loan guarantee program represented a modification of the existing section 1703 energy loan guarantee program created in 2005. "The new program supported conventional renewable power, transmission, and biofuel projects, as well as innovative technologies eligible for loan guarantees under the 1703 program. The Recovery Act appropriated $6 billion to the 1705 program so that the Federal government would pay for the credit subsidy associated with loan guarantees. By providing loan guarantees, this program could make debt capital available and lower the costs of debt for commercial renewable project developers."[2]

The U.S. economic recovery remains weak, unemployment remains stubbornly high, investment remains below the pre-recession level and the federal budget deficit is projected to be 7.2% of GDP in 2012. These economic factors suggest that a careful examination of whether the incentives in the tax code, direct federal expenditures and subsidies (including those added in the Recovery Act) for renewable energy are the best and highest use of U.S. taxpayer's dollars is warranted.

Rationale for Subsidies for Industry

Subsidies are government financial transfers to an industry, through payments to workers or to firms. Probably nobody would deny that the government is subsidizing the industry if it is paying part of the wages of workers in the industry or it is granting firms in the industry funds to make capital purchases. This is the narrowest definition of a subsidy. However there is little difference from the standpoint of the industry between a government transferring funds to it, on one hand, and waiving transfer payments, i.e. taxes, that the firm would normally make to the government. The tax code provisions and direct federal grants made available to clean energy industries meet the conventional definition of subsidies. The key question is: are the benefits of the taxpayer funded incentives worth the cost? Spending money on renewable energy projects creates an opportunity cost by diverting the funds from alternative uses; thus the issue is whether alternative uses of taxpayer dollars would yield a higher return is worth pursuing. Similarly, worth asking is

[1] http://www.rff.org/Publications/Pages/PublicationDetails.aspx?PublicationID=21725
[2] Ibid. p. 13.

whether society would be better off if the public (and private) funds spent on renewable energy were left in taxpayer's pockets.

When economists justify subsidies, they usually do so in one of three ways. First, there is the "infant industry" argument. An industry, for instance, may be dominated by foreign (non-domestic) companies (e.g. textile manufacture by England during the early days of the United States) and for reasons of social policy, the government may want to develop an indigenous industry. Insufficient private capital may be available to permit the private sector, on its own, to accumulate sufficient capital to make the indigenous industry commercially competitive. The government then could subsidize the industry through grants, loans, equity infusions, tariff protection or tax incentives. When the industry has been built up to the point where it is self-sufficient, the subsidies would be removed.

The second argument in favor of subsidization is that a large, critical industry may run into serious temporary difficulties and be in danger of ceasing operations. The government, in such a situation, would have at least three options: it can play no role and let the full market effects be felt; or it can directly subsidize the endangered firms with cash or equity infusions, loans or loan guarantees; or it can let the firms go bankrupt but intervene through the monetary system to prevent the bankruptcy of the firms from affecting other, healthy, part of the economy. A third argument in favor of subsidization is tied to current interests in environmental protection. Subsidies can be used to encourage firms and industries to behave in environmentally friendly ways.[3]

Are Continued Subsidies for Clean Energy Deployment Justified?

- **Infant industries rationale**

Are clean, renewable energies truly "infant industries" and deserving of continued taxpayer support through provisions in the tax code or direct federal expenditures? A look back at history will help put the question in perspective. Regarding solar power, an EIA report notes that solar technology is not new, it dates from the 7th century BC when magnifying glass was used to concentrate the sun's ray to make fire and passive solar to heat rooms was used in Roman bathhouses in the 1st century AD. Almost 3000 years after the use of solar power began; it has many applications but is still not cost-competitive with conventional energy sources in many cases.[4] Similarly, wind power has a long history; the Persians constructed the earliest known windmills in the 6th century AD to grind grain.[5] By 1300 AD windmills were in wide use in Europe for a variety of industrial uses. Though some 1400 years have passed since windmill began to be used for industrial purposes, they are still only an intermittent source of power generation. Finally, batteries have been in use since the early 1800's and the first electric car was invented in Scotland in 1832 by Robert Anderson.[6] Though the plug-in electric vehicle was fairly popular in New York City in the early 1900's, it was quickly supplanted by gasoline

[3] See ACCF testimony at http://accf.org/wp-content/uploads/2011/12/ACCF-Testimony-Final-12-14-11-FINAL.pdf for more details on subsidies for renewable energy.

[4] http://www1.eere.energy.gov/solar/pdfs/solar_timeline.pdf

[5] http://www.utexas.edu/gtc/assets/pdfs/windmills_world.pdf

[6] http://www.npr.org/2011/11/21/142365346/timeline-the-100-year-history-of-the-electric-car

powered vehicles with their greater driving range, quick refueling and lower cost. Thus, looking back at the length of time that renewable energy and alternative fuel vehicles have been in use, it seems questionable that these industries (which receive most federal support) meet the criteria of being "infant industries."

In recent decades, legislation has been enacted at the federal, state and local level to promote the development and deployment of renewable energy, greater fuel economy for transportation vehicles, alternative vehicles and high speed rail.[7] For example, the Energy Policy Act of 1992 initiated the renewable energy production tax credit (PTC), an inflation-adjusted tax credit for electricity produced from qualifying renewable energy sources or technologies. As mentioned above, the Recovery Act extended and amended the PTC and provided additional options including energy investment tax credits and grants. Most states and some localities have also have also enacted renewable portfolio standards or goals and have provided subsidies including grants, rebates and tax credits for the installation of renewable energy. In the mid 1975's, in response to the Arab oil embargo, Congress enacted Corporate Average Fuel Economy Standards to improve the average fuel economy of light cars and trucks. In 2011, new CAFE standards for cars and trucks were set to further improve fuel economy.[8] There has also been substantial government support for alternative fuel vehicles, including hydrogen and electric powered vehicles as well as for biofuel in recent years.[9]

During the recession in the 2008-2009 period, the effort by the federal government to promote the use of renewable energy and alternative vehicles and biofuels accelerated. As provisions of the Recovery Act were being debated, some analysts argued that more grants and loans for renewable energy should be part of the legislation because private sector interest in the sector had declined sharply. For example, Aldy states that during "the financial crisis, the number of tax equity suppliers and the amount of tax equity{for renewable energy}fell by more than half."[10] In fact, it is quite possible that the sudden, dramatic expansion of U.S. natural gas production during that period and the sharp decline in natural gas prices were responsible for a decrease in the private sector's interest in renewable energy investments. As U.S. natural gas production increased, the well-head price dropped from $10.70 tcf in July, 2008 to $3.45tcf in July, 2009. As a result of the decline in natural gas prices, gas became the "fuel of choice" for new electric generation plants.

- **Employment impact of Subsidies for Renewable Energy**

Another key question is whether the phase out of tax incentives for clean energy deployment (including those in the Recovery Act) will have an adverse impact on U.S. economic recovery and job growth. As noted in a 2010 report by Department of Commerce, "Measuring the Green Economy," green products and services comprised only 1 to 2 percent of the total private business economy in 2007. The number of green jobs ranged from 1.8 to as many as 2.4 million when products and services that some might argue were not "green' were included in the total.

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[7] http://www.eia.gov/energyexplained/index.cfm?page=renewable_home#tab3

[8] http://en.wikipedia.org/wiki/Corporate_Average_Fuel_Economy#History

[9] http://www.eia.gov/cneaf/alternate/issues_trends/altfuelmarkets.html

[10] http://www.rff.org/Publications/Pages/PublicationDetails.aspx?PublicationID=21725 , p. 12.

These jobs constituted between 1.5 and 2.0 percent of total employment in 2007.[11] The Commerce Department report concludes that the relatively small size of the green economy suggests that the majority of jobs created during the economic recovery are likely to come from the production of products and services outside the green economy. Thus, phasing out of incentives in the tax code for clean energy is not likely to have a material impact on U.S. economic growth and such savings could help reduce the federal budget deficit, especially if declining government subsidies leads to increased efficiency in the subsidized firms rather than their demise.

An examination of reports on U.S. job growth due to renewable energy outlays in the Recovery Act should be viewed cautiously. For example, Joseph Aldy's recent paper quotes a 2010 estimate by the President's Council of Economic Advisors that the Recovery Act "would support about 720,000 job years through the end of 2012"[12] (a job year is one fulltime job for one year, thus about 180,000 jobs would be created per year according to the CEA estimate). As the CEA noted in its Third Quarterly report on the Recovery Act "Of course, these figures are only estimates. The margin of error for estimates for specific programs from the CEA model is relatively large, and the number of clean energy jobs – either in 2010:Q1 or over the life of the Act – could be somewhat smaller or larger than is indicated here."[13]

The methodology apparently used by the CEA[14] to estimate clean energy job growth appears to be the same as was used by Christine Roemer[15] (former Chairman of the President's Council of Economic Advisors) when she predicted in 2009 that the U.S. unemployment rate would not rise about 8.2% if the Recovery Act were enacted. Unfortunately, the actual U.S. unemployment rate rose to 10% in October of 2009.

Anecdotal estimates of job creation in renewable energy suggest that the government's projections of expected new jobs may be significantly overstated. For example, a recent Wall Street Journal report on the 1603 program concludes "on federal applications, companies said they created more than 100,000 direct jobs at 1603-funded projects. But a Wall Street journal investigation found evidence of far fewer. Some plants laid off workers. Others closed."[16] Another recent report on "green jobs" highlights the opportunity cost of government funding for renewable energy jobs: a Reuters report found that "the green-jobs push has crowded out less fashionable efforts that would have put people back to work quickly. 'From my perspective it makes more sense for us to arm our clients with the basic skills, rather than saying, 'By golly, you will do something in the green economy or you won't work,'' said Janet Blumen, the head of the Foundation for an Independent Tomorrow, a Las Vegas job-training organization that has

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11 http://www.esa.doc.gov/sites/default/files/reports/documents/greeneconomyreport_0.pdf

12 http://www.rff.org/Publications/Pages/PublicationDetails.aspx?PublicationID=21725, p. 10.

13 http://www.whitehouse.gov/administration/eop/cea/factsheets-reports/economic-impact-arra-3rd-quarterly-report/supplement_greenjobs

14 "The methodology used to estimate the job impact of the ARRA was described in detail in Romer and Bernstein (Obama Transition Document, January 11, 2009). In this section we briefly summarize the methodology and discuss the results." (p. 2) http://www.whitehouse.gov/sites/default/files/microsites/Estimate-of-Job-Creation.pdf

15 http://www.ampo.org/assets/library/184_obama.pdf

16 http://online.wsj.com/article/SB10001424052970203710704577050412494713178.html

seen positions in trucking and accounting go unfilled because training money had been earmarked for green efforts."[17]

Also, an article on California's green jobs initiative notes that "Job training programs intended for the clean economy have also failed to generate big numbers. The Economic Development Department in California reports that $59 million in state, federal and private money dedicated to green jobs training and apprenticeship has led to only 719 job placements — the equivalent of an $82,000 subsidy for each one."[18]

- **Environmental Impact of U.S. support for Renewable Energy**

Continued high levels of federal support for the deployment of clean energy and alternative fuel vehicles in the U.S. is unlikely to have a significant impact on reducing GHG concentrations in the atmosphere since the real growth in emissions is coming from developing countries (see Figure 1). In addition, renewable energy is not without its own negative environmental and social impacts.

Cost of Job Creation Under the 1603 Program

The cost of job creation in the renewable energy sector through government funded programs such as 1603 is another factor in evaluating the program's effectiveness. For example, a recent report by the National Renewal Energy Laboratory states that between 52,000 and 75,000 temporary jobs were created in 2011 by 1603 grants to solar PV and wind energy projects. Anecdotal estimates of job creation in renewable energy suggest that the government's projections of expected new jobs may be significantly overstated. As shown in Table 1, the cost to taxpayers to create each short term job (expected to last over the 2009-2011 period) ranges from about $63,000 to over $91,000. The cost of permanent renewable energy jobs (a total of about 5,000 per year for the next 20 or so years) ranges from over $81,000 to over $88,000. In contrast to the cost of creating jobs under the 1603 program, the average U.S. median wage of all occupations was $45,230 in 2011.

In addition, renewable energy industries are now globally deployed. As a result, it will be very difficult if not impossible to ensure that the benefits of U.S taxpayer funded subsidies will result in the creation of new investment, jobs, new patents, etc. here in the U.S. On the other hand, it is also true that the U.S. has benefited indirectly from the vast spending on renewables in Europe and lately in China, which have brought down costs for everyone. In this respect it might be argued that the fact that others are subsidizing such technologies is an argument for the U.S. doing less, not more.

[17] http://www.reuters.com/article/2012/04/13/us-usa-campaign-green-idUSBRE83C08D20120413
[18] http://www.nytimes.com/2011/08/19/us/19bcgreen.html?_r=3

Cost of Renewable Energy

Energy use is a key component in U.S. economic recovery, in recent years each 1% increase in GDP in the U.S. has been accompanied by a 0.2% increase in energy use. Higher energy prices tend to slow economic growth and reduce the competitiveness of the U.S. manufacturing sector. As policymakers confront the slow U.S. economic recovery and slow job growth, they need to consider the impact of tax, budget and regulatory decisions that promote the use of renewable energy compared to the expansion of conventional fossil fuels or nuclear power electricity generation and for transportation.

Federal policies such as the Recovery Act's subsidies for renewables and alternative vehicles and biofuels promote the use of more expensive renewable energy to replace cheaper and already environmentally sound and compliant conventional energy sources. These programs have the effect of increasing federal spending, reducing tax receipts and raising the price of energy. According to recent EIA data, new electric generating capacity using wind and solar power tends to be considerably more expensive than conventional natural gas and coal. As shown in Table 2 the total cost of offshore wind, at $244 dollars per mega watt hour (MWH) is almost 300% higher than for advanced combined cycle natural gas–fired plants which cost only $62 per MWH. The cost of solar thermal, at $312 MWH, is over 400% higher than natural gas-fired electricity production. Similarly, advanced nuclear costs an estimated $114 per MWH and advanced coal costs only $110 MWH.[19]

The cost of the electricity generation resources in facilities supported by 1603 grants seems to be much larger than the conventional and renewable new generation cost data provided by EIA (Table 2). As shown in Table 3, the cost of new renewable generation under 1603 is $880.95 MWH, or almost 3 times greater than the most expensive renewable generation (solar thermal) cited in the EIA data.

As shown in the data in Tables 2 and 3, new renewable electricity generation facilities are often substantially more costly (per megawatt hour) that conventional generation from fossil fuel or nuclear plants and can impose higher cost on electricity producers and consumers. Another perspective is provided by examining current data on electricity prices in states with renewable portfolio standards (RPS). States with an RPS mandate tend to experience higher costs for electricity those without an RPS mandate. In 2011, the 29 states with an RPS mandate faced residential electricity prices that were 27% higher than those without a mandate and industrial electricity prices were 23% higher (see Figure 2).

The Federal Tax Code and Incentives for Renewable Energy

Renewable energy has received federal support through direct subsidies and tax credits for many years. Another way of measuring the degree of federal subsidies for alternative energy sources to measure the effective tax rate. A negative tax rate indicates that the tax code is subsidizing the investment since the investor is willing to accept a before-tax rate of return that is less than the after- tax rate of return. According to a study by Gilbert Metcalf, the tax code in 2007 created

[19] http://www.eia.gov/forecasts/aeo/electricity_generation.cfm

strong incentives for renewable energy investments.[20] For example, a 30% investment tax credit combined with 5 year accelerated depreciation gave solar thermal investments an effective tax rate of -244.7% (see Table 4).Wind power had a -168.8 % rate. Since the rates Metcalf computed were created before the new renewable energy incentives provided by the Recovery Act, the size of the negative tax rates has doubtless increased. It is worth noting that as of 2007, the overall effective tax rates for renewables and nuclear are substantially lower than the effective rates on gas, integrated oil drilling, refining and coal.

What Lessons Can We Learn From Federal Programs Supporting Renewable Energy?

As the new Aldy paper notes, renewables have received very strong support from government policies and he suggests that "government policies per ton of CO2 abated can inform assessments of the economic efficiency of the sum of renewable policies. The share of a project financed by taxpayers or ratepayers (through higher electricity rates under a state renewable electricity standard) would likely exceed 60 percent for renewable projects receiving tax benefits, grants, loan guarantees, and above-market rates due to state renewable mandates. This raises questions about the efficiency and the bang-for-the-buck of renewable-related promotion policies that further research should explore."[21]

Aldy further notes that the government estimates that the cost per ton of avoided CO2 emissions is about four times the social cost of carbon used by the U.S. government in its Memorandum to the President 2010, Interagency working Group on the Social Cost of Carbon (2010).[22] Finally, he states that the "1705 loan guarantee program has not had a meaningful impact on the U.S. power sector."[23]

In addition, a recent CRS report on the 1603 grant program in the Recovery Act states that the Section 1603 grant program has been popular with the renewable energy sector. Proponents of the program suggest that the added incentive is necessary to continue to promote renewable energy. The Section 1603 grant program, however, results in revenue losses that are greater than the revenue losses associated with the previously available tax incentives. Given the country's large budget deficits, there may be questions of whether further extensions of this program are worth the budgetary cost.[24]

U.S. Trading Partners are Reducing Support for Renewable Energy

Several European countries, including Germany, the UK, Spain and Italy as well as Australia, have recently announced reductions or elimination of subsidies for wind, solar and biomass energy programs.[25] Government budget constraints are driving the decisions in many cases as

[20] See http://www.nationalaglawcenter.org/assets/crs/R41953.pdf

[21] http://www.rff.org/Publications/Pages/PublicationDetails.aspx?PublicationID=21725, p.15.

[22] http://www1.eere.energy.gov/buildings/appliance_standards/commercial/pdfs/sem_finalrule_appendix15a.pdf

[23] http://www.rff.org/Publications/Pages/PublicationDetails.aspx?PublicationID=21725 , p. 15.

[24] CRS "ARRA Section 1603 Grants in Lieu of Tax Credits for Renewable Energy: Overview, Analysis and Policy Options," Phillip Brown and Molly E. Sherlock, November 9, 2011. , R41635.

[25] http://www.euractiv.com/energy/germany-announces-30-cuts-solar-subsidies-news-511104, http://www.guardian.co.uk/environment/2011/oct/20/renewable-energy-subsidies-slashed

well as the growing realization that many programs are imposing higher energy costs on already hard-pressed households and industry.[26]

What Role Can Energy Play in U.S. Economic Recovery and Job Growth?

While the renewable energy industry has a role to play as the U.S. tries to reduce emissions of all types and become less dependent on imported oil, policymakers should evaluate the cost-effectiveness of federal tax and budget outlays subsidizing these industries.

In contrast to the disappointing results from many expensive green energy initiatives funded by the U.S. taxpayer, several recent economic analyses suggest that increased access to domestic onshore and offshore oil and gas reserves (including shale gas) could strongly boost U.S. economic recovery, manufacturing and job growth. Fossil fuels, which provide 78% of U.S. primary energy production, can have a positive impact in restoring strong economic growth. A new Global Insight/CERA analysis, "Restarting the Engine-Securing American Jobs, Investment and Energy Security" finds that allowing exploration and development in the Gulf of Mexico in 2012 could create more 230,000 jobs, a $44 billion increase in GDP and $12 billion in additional tax receipts to federal and state treasuries.[27]

Another new report by Wood Mackenzie, "U.S. Supply Forecast and Potential Jobs and Economic Impacts (2012-2030)" finds that policies that encourage the development of new and existing resources could by 2015 increase production by over 1 million barrels of oil equivalent per day (mboed), create almost 670,000 jobs and provide an additional $10 billion in federal and state tax receipts compared to the base case.[28] By 2030, production would rise by over 10 mboed, employment would be over 1.4 million higher and tax receipts would be $99 billion higher.

In fact, domestic access to shale gas and development of that abundant resource has the ability to reduce operating and feedstock costs for manufacturing and chemicals industries, respectively, in ways that can be transformative for those industries and job growth. In another recent analysis, "The Economic and Employment Contributions of Shale Gas in the United States" the consulting firm Global Insight documents the significant contributions that shale gas is making to the U.S. economy.[29] The report finds that in 2010, the industry supported 600,000 jobs and contributed more than $76 billion to GDP. Capital expenditures were $33 billion in 2010 and will grow to $48 billion in 2015. The current low and stable gas prices will contribute to a 10% reduction in electricity prices in the near term and to a 1.1% increase in the level of GDP by 2013. All sectors of manufacturing benefit, especially those that use natural gas as a feedstock or energy source. In the long run, there will be improvements in the competitiveness of domestic

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[26] http://www.upi.com/Business_News/Energy-Resources/2012/04/02/Italy-to-cut-renewable-energy-subsidies/UPI-52381333362600/;http://www.bloomberg.com/news/2012-01-27/spain-suspends-subsidies-for-new-renewable-energy-plants.html;http://www.theaustralian.com.au/national-affairs/climate/subsidies-under-fire-as-solar-rebate-axed/story-e6frg6xf-1226285622435

[27] http://www.gulfeconomicsurvival.org/phx-content/assets/files/GoM_Restarting_the_Engine.pdf

[28] http://www.api.org/policy/americatowork/upload/API-US_Supply_Economic_Forecast.pdf

[29] http://www.ihs.com/images/Shale-Gas-Economic-Impact-Dec-2011.pdf

manufacturers due to lower natural gas and electricity costs. As a result, industrial production will be 4.7% higher in 2035, the Global Insight report concludes.

How Should the Tax Code Treat Energy and other Investments?

Many public finance experts suggest that the tax code should provide the same provisions for all types of industries and activities so as to avoid advantaging one industry over another. For example, accelerated depreciation, in which the write-off period may be shorter than the actual economic life of an asset, is generally provided to all taxpayers regardless of their industry or type of investment in plant or equipment. Section 199 was established to help support U.S. manufacturing of all types. The foreign tax credit deduction is designed to prevent the double taxation of income earned abroad by U.S. multinationals. Similarly, LIFO is an accounting method in use for more than 70 years to protect companies from inflation or rising prices over the course of their operations. All of the above mentioned tax code provisions are available to any industry and are not considered "subsidies."

As Gary Hufbauer, a member of the ACCF's Center for Policy Research Board of Scholars, noted in a recent article, it is important not to confuse "subsidies" with legitimate tax deductions available to all industries.[30] Dr. Hufbauer states, "The semantically accurate way to describe legislation that would eliminate the manufacturing deduction or curtail the foreign tax credit for oil and gas companies is straightforward: the imposition of tax discrimination, not the removal of federal subsidies. Because most Americans agree that tax discrimination is bad policy - Uncle Sam shouldn't be picking winners and losers through the tax code - accurate language would diminish enthusiasm for these proposals."[31]

By the same token, the current policy of providing subsidies and negative tax rates for renewable energy, energy efficiency and alternative fuel vehicles should be reexamined with an eye toward balancing costs and benefits.

Conclusions

By encouraging the deployment of energy technologies that are more expensive than conventional energy, consumers and industry are forced to spend more on energy and have less for other purchases or for productive investment. As a result, GDP and job growth will be lower than otherwise as resources are diverted from their highest and best use.

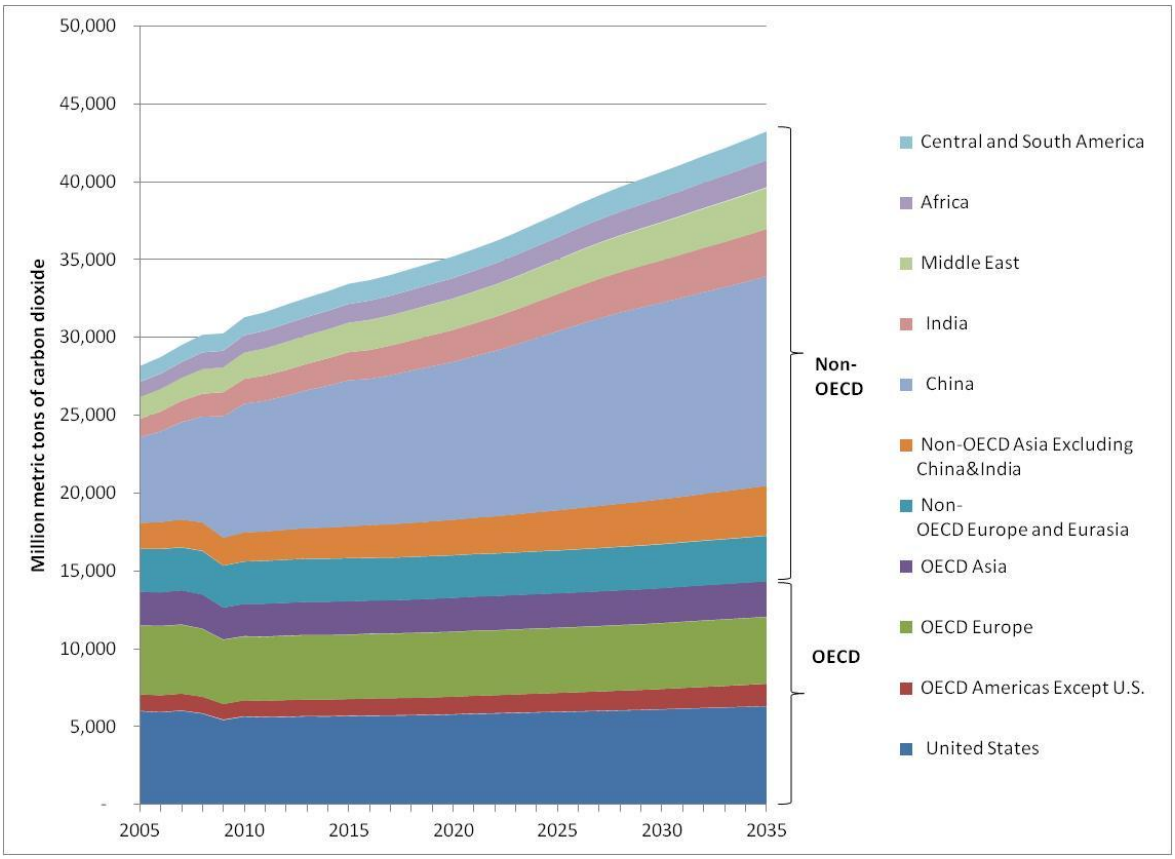
Another issue worth raising is the question of the effectiveness of renewable energy tax incentives and spending programs which are dependent on a financially strapped federal government and are therefore uncertain and possibly non-sustainable. The almost constant uncertainty about whether a tax code provision or direct spending program will still exist by the time the investment is deployed raises the hurdle rate and increases the cost of capital for investment. In the face of the federal government's huge budget deficits and the perceived need to close the budget gap, many potential investors in renewable energy projects may think the

[30] http://www.washingtontimes.com/news/2011/dec/7/debunking-the-big-oil-subsidy-myth/
[31] Ibid

risks are too great. Given this uncertainty, current federal programs to significantly increase the use of renewable energy and promote energy efficiency may simply be ineffective.

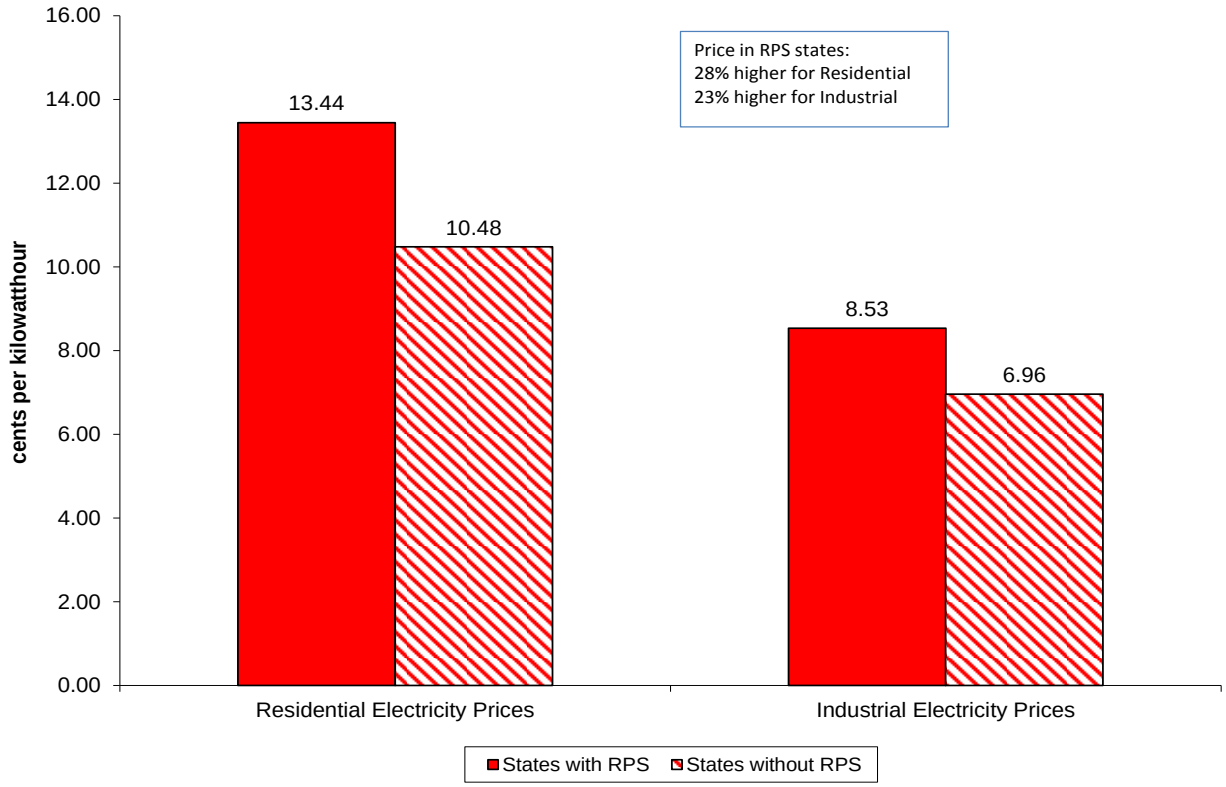
If markets are allowed to select the energy technologies that are deployed rather than government officials using tax incentives, subsidies or a CES mandate, costs to consumers and the federal government's budget will be reduced. Policies that encourage the responsible development and transportation of U.S. oil and gas resources should be accelerated so as to promote a cleaner environment and stronger economic and job growth.

Figure 1. World Carbon Dioxide Emissions by Region



Source: International Energy Outlook 2011, Energy Information Administration, U.S. Department of Energy.

Figure 2. Electricity Prices: States with Renewable Portfolio Standards versus States without RPS



Source: Data for August 2011. Energy Information Administration, Table 5.6.A, http://www.eia.gov/electricity/data.cfm#sales

Table 1. Jobs in Solar PV and Wind Projects Funded by 1603 Grant Program						
1603 Program: Payments for Specified Energy Property in Lieu of Tax Credits	Cost	Jobs Created Low	Jobs Created High	Cost Per Job Low	Cost Per Job High	U.S. Median Wage
Short-Term Jobs in 2011	$4.7 Billion	52,000	75,000	$91,275	$63,284	$45,230
Permenant Jobs Created by 1603 for next 20 years per year	$9 Billion	5,100	5,500	$88,235	$81,818	$45,230
Sources: * 1603 cost numbers are from U.S. Treasury Website, http://www.treasury.gov/initiatives/recovery/Pages/1603.aspx						
List of Awards file.						
* Job numbers are from "Preliminary Analysis of the Jobs and Economic Impacts of Renewable Energy Projects						
Supported by the §1603 Treasury Grant Program" http://www.nrel.gov/docs/fy12osti/52739.pdf						
* U.S. Median Wage, May 2011 National Occupational Employment and Wage Estimates						
http://www.bls.gov/oes/current/oes_nat.htm#00-0000						

Table 2. Estimated Levelized Cost of New Generation Resources, 2016.

Plant Type	Capacity Factor (%)	U.S. Average Levelized Costs (2009 $/megawatthour) for Plants Entering Service in 2016				
		Levelized Capital Cost	Fixed O&M	Variable O&M (including fuel)	Transmission Investment	Total System Levelized Cost
Conventional Coal	85	65.5	3.9	24.5	1.2	95.1
Advanced Coal	85	74.7	7.9	25.9	1.2	109.7
Advanced Coal with CCS	85	92.9	9.2	33.3	1.2	136.5
Natural Gas-fired						
Conventional Combined Cycle	87	17.5	1.9	44.6	1.2	65.1
Advanced Combined Cycle	87	17.9	1.9	41.2	1.2	62.2
Advanced CC with CCS	87	34.7	3.9	48.6	1.2	88.4
Conventional Combustion Turbine	30	45.8	3.7	69.9	3.5	123.0
Advanced Combustion Turbine	30	31.7	5.5	61.3	3.5	102.1
Advanced Nuclear	90	90.2	11.1	11.7	1.0	114.0
Wind	34	83.3	9.5	0.0	3.4	96.1
Wind – Offshore	34	209.7	28.1	0.0	5.9	243.7
Solar PV[1]	25	194.9	12.1	0.0	4.0	211.0
Solar Thermal	18	259.8	46.6	0.0	5.8	312.2
Geothermal	91	77.4	11.9	9.5	1.0	99.8
Biomass	83	55.4	13.7	42.3	1.3	112.6
Hydro	53	78.5	4.0	6.2	1.8	90.5

[1] Costs are expressed in terms of net AC power available to the grid for the installed capacity.

Source: Energy Information Administration, Annual Energy Outlook 2011, April 2011, DOE/EIA-0383(2011)

Table 3. Cost of Electric Generation under 1603 Program (As of March 29, 2012)	
Total 1603 funding (federal)	$11.2 billion
Total private and federal investment in 1603 projects	$37 billion
Total Estimated Electricity Generation from funded projects	42 TWh
Cost per mwh	$880.95
Source: http://www.treasury.gov/initiatives/recovery/Documents/Status%20overview.pdf	

Table 4. Effective Tax Rates for Energy-Related Capital Investments, 2007

	2007 Law	No Tax Credits	Economic Depreciation
Electric Utilities: Generation			
Nuclear	-99.5	32.4	-49.4
Coal (Pulverized Coal)	38.9	38.9	39.3
Coal (IRCC)	-11.6	38.9	-10.3
Gas	34.4	34.4	39.3
Wind	-163.8	12.8	-13.7
Solar Thermal	-244.7	12.8	-26.5
Petroleum			
Oil Drilling, Non-Integrated	-13.5	-13.5	39.3
Oil Drilling, Integrated	15.2	15.2	39.3
Refining[a]	19.1	19.1	39.3
Natural Gas			
Gathering Pipelines	15.4	15.4	39.3
Other Pipelines	27.0	27.0	39.3

Source: See http://www.nationalaglawcenter.org/assets/crs/R41953.pdf. Data from Gilbert E. Metcalf, "Investment in Energy Infrastructure and the Tax Code," in *Tax Policy and the Economy*, ed. Jeffery R. Brown, 24 ed. (The University of Chicago Press, 2010), pp. 1-33.

Notes:

a. The effective tax rate on refining capital reflects the 50% expensing allowance available in 2007 for investments in additional refinery capacity.