U.S. Department of Energy: Green Energy Efficiency Spruces Budget Practices

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Abstract: *The U.S. Department of Energy (DOE) oversees the United States' energy-related affairs. The department prepares an annual budget by evaluating its fiscal position: the amount of federal funds it received each of the last three to five years, its expenditures' relationship to these appropriations, and the factors causing its financial situation. Then, since the recent sequestration reduced departments' federal appropriations, the DOE must critically prioritize its most effective programs and amend or terminate others. This paper's format follows this budgeting process and analyzes four policies' costs and benefits. The findings suggest the department recommend that Congress retain or reinstate enhanced loan guarantee programs, strengthen and reestablish the advanced energy manufacturing tax credit, maintain and fortify the renewable energy production tax credit, and eliminate the three to eight costliest fossil fuel tax expenditures for companies whose revenues surpass a defined threshold.*

The U.S. Department of Energy (DOE) must deliberate approaches that overcome its financial constraints. The department can improve its fiscal position and accomplish its primary

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objectives—which include benefitting the U.S.'s inhabitants and achieving President Barack Obama's energy production and environmental targets—by strengthening and reinstating the most effective programs while eliminating the weakest. Thus, the author recommends the DOE propose that Congress maintain or reinstate improved loan guarantee programs, amend and reintroduce the manufacturing tax credit (MTC), renew and reinforce the production tax credit (PTC), and discontinue at least the three—if not the eight—largest fossil fuel tax expenditures for corporations whose incomes exceed a specified maximum.

Purpose and Fiscal Place in Government

The DOE seeks "to ensure America's security and prosperity by addressing its energy, environmental and nuclear challenges" with scientific and technological solutions.[96] Its responsibilities range from managing and creating domestic energy and entrepreneurial careers[97] to encompassing an international organization—the Clean Energy Ministerial—dedicated to developing new technologies that limit global greenhouse gas emissions and reverse the effects of global climate change.[98] Obama continually stresses the paramount importance of his energy plan, whose objectives include the U.S. developing renewable energy resources and technologies, fostering high efficiency vehicles, obtaining energy independence,[99] and acquiring clean air.[100] The DOE's responsibilities essentially embody these goals; thus, it crucially abets the president's energy vision.

[96] U.S. Department of Energy [DOE], n.d.-b, Mission section
[97] DOE, n.d.-a, Made in America section
[98] The White House, 2011, p. 16; 2013a, International Leadership section
[99] The White House, 2011, p. 4
[100] The White House, 2011, p. 7

Congress established the DOE's Advanced Research Projects Agency-Energy (ARPA-E)—which employs "scientists, engineers, and entrepreneurs" who conduct creative, "transformational energy research"[101]—within "the America COMPETES Act" of 2007.[102] Obama envisioned the U.S. leading global energy technological innovation since his first term began; thus, "in 2009, the Administration" distributed the ARPA-E's first federal funding[103]—a stimulus-funded $400 million appropriation—that permitted it to devise its initial budget.[104] By March 22, 2013, the organization had assisted with 285 research projects.[105]

The DOE creates jobs by researching and developing new technologies while manufacturing old ones. Environmental Entrepreneurs' (E2) third quarter summary announced that the department created 10,819 total positions (see Table 1).[106] While Congressional inaction and "uncertainty in Washington … contribut[ed] to" the third quarter's declining renewable energy market,[107] during the first and second quarters of 2012, clean energy projects created 46,000[108] and 37,409 jobs,[109] respectively. The DOE not only abets America's energy independence in an environmentally-friendly manner; it also creates jobs and boosts the economy.

Table 1: DOE Jobs Created in Third Quarter 2012

[101] The White House, 2013b, "Staying on"
[102] ARPA-E, n.d.-b, para. 4
[103] The White House, 2013b, "Staying on"
[104] ARPA-E, n.d.-a, para. 1; The White House, 2011, p. 38
[105] DOE, 2013, para. 5
[106] Environmental Entrepreneurs [E2], 2012c, p. 7
[107] E2, 2012c, p. 1
[108] E2, 2012a, p. 1
[109] E2, 2012b, p. 1

Project Type	Positions Created
In Operation*	1,686
In Progress**	4,661
Announced***	4,472

Notes: *These projects either were functional or had only operative manufacturing facilities. **These projects had either begun construction or been initiated. ***These projects were "in earlier [developmental] stages."[110]
Sources: E2, 2012c, p. 7

Fiscal Position: Budget Allocation, Expenditures, & Concerns

Obama plans to continue growing America's clean-energy market while simultaneously allocating to the DOE only 2.2 percent of fiscal year (FY) 2013 and 2.5 percent of FY 2014 through 2017 discretionary spending.[111] Between 2009 and 2011, the department's appropriated budget averaged 2.9 percent of these expenditures.[112] Although this percentage seems negligible, since 2007, the DOE annually has received 90 percent or more of its budget request from the government (see Table 2).[113]

Table 2: DOE Budget Requests, Appropriations, and Percent of Request Received, 2007-2013

Year	Budget Request ($)	Appropriations ($)	Percentage of Request Received (%)
2007	23,556,755	23,754,228	100.84
2008	24,259,251	24,032,338	99.06
2009	25,014,956	33,856,453	135.34
2010	26,393,982	26,425,673	100.12
2011	28,404,359	25,692,833	90.45
2012	29,546,730	26,299,547	89.01
2013	27,155,027	-	-

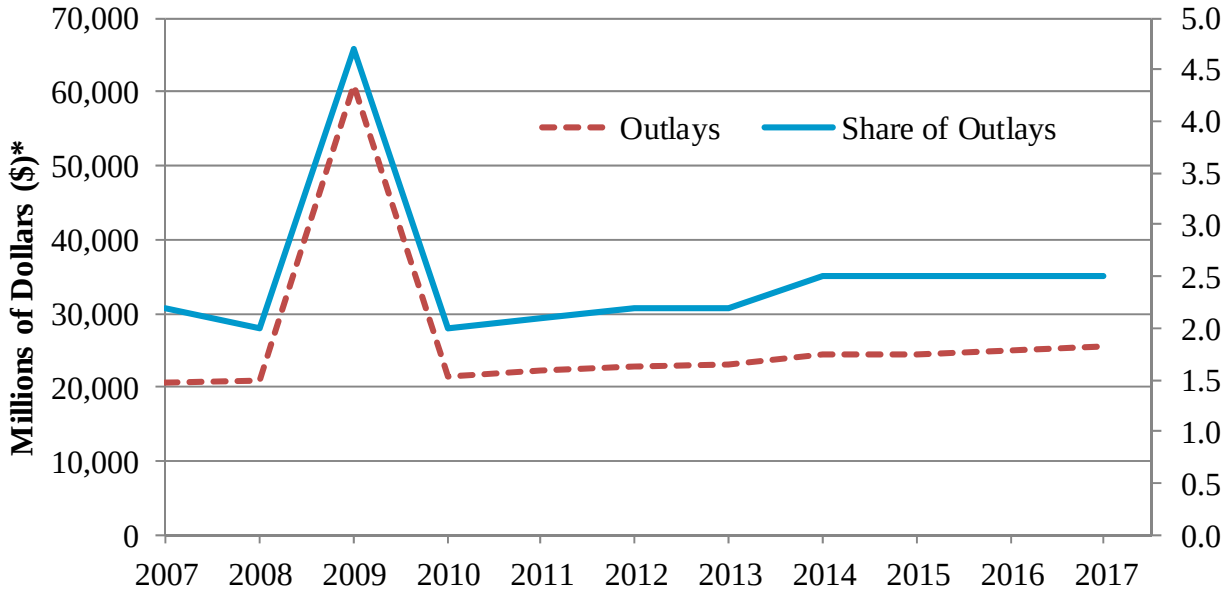
Notes: "In fiscal year 2009, [the] DOE received about $36.7 billion in Recovery Act appropriations, with varying obligation deadlines. During the yearly appropriations process, [the]

[110] E2, 2012c, p. 5
[111] Office of Management and Budget [OMB], 2013b
[112] OMB, 2013b
[113] *Budget and Spending Concerns*, 2012, p. 21

DOE generally receives no-year funding. No-year funding refers to appropriations that do not restrict the time by which funds must be obligated."[114] The appropriations "column does not include Recovery Act appropriations."[115] Budget requests and appropriations are in thousands of dollars.
Source: DOE, as cited in *Budget and Spending Concerns*, 2012, p. 21

Despite the recession, a slowly recovering economy, and the fraction of federal funds distributed to the DOE, the department's outlays proliferated between 2007 and 2012, increasing by approximately 11 percent.[116] Overall, the Office of Management and Budget (OMB) anticipates these expenditures to continue increasing through 2017, albeit at a more gradual rate (see Figure 1).[117]

Figure 1: DOE Discretionary Budget Authority, 2007-2017



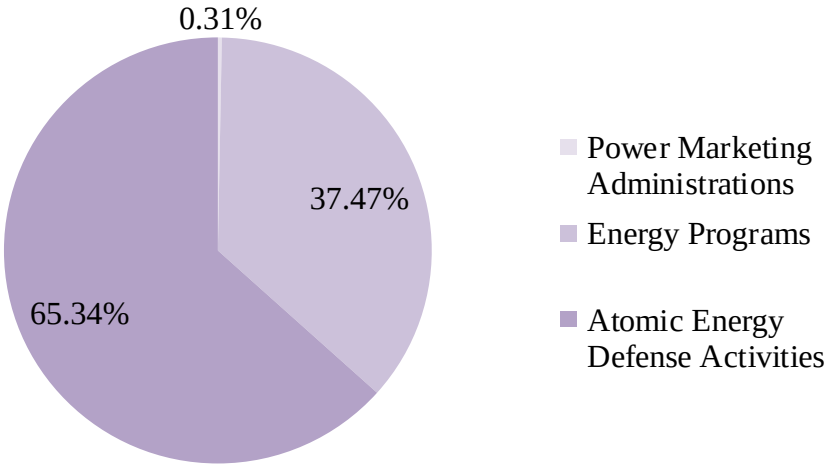
Notes: Years 2013 through 2017 are estimated. The right scale's unit is percent (%). *In constant 2011 dollars
Sources: OMB, 2013a; Deflator: OMB, 2013c; Percent (%): OMB, 2013b

The DOE allocates funds while considering the relative importance of three main areas: energy programs, which primarily manage and improve current and future energy resources;

[114] *Budget and Spending Concerns*, 2012, p. 21
[115] *Budget and Spending Concerns*, 2012, p. 21
[116] OMB, 2013a
[117] OMB, 2013a, 2013b, 2013c

power marketing administrations, which promote hydropower from government dams and projects;[118] and atomic energy defense activities, which contain nuclear, ecological, and other security programs. The DOE's budget prioritizes the last area (see Figure 2).[119]

Figure 2: DOE Budget Request, 2013



Source: Office of Chief Financial Officer, 2012, p. 17

Recently, Congress has reduced many departments' budgets, forcing them to adapt or cease some policies. The DOE's diverse responsibilities affect numerous programs, creating a vulnerability to these financial shortages and subsequent programmatic adjustments.[120] Policies fulfilling stakeholders' ideals and needs may deteriorate or terminate. Although rising gas prices—which increase the importance of Obama's reduced oil subsidies[121]—and mounting demand for renewable resources[122] create opportunities for the DOE to research and develop more efficient and affordable clean-energy technologies, delivering these superior products

[118] Office of Chief Financial Officer, 2012, p. 70
[119] Office of Chief Financial Officer, 2012, p. 17
[120] Leiter & Litke, 2013, "Sequestration Impacts"
[121] Cooper, Weisman, & Parker, 2012, para. 4
[122] Jenkins et al., 2012, p. 4; Trembath & Jenkins, 2012a, "Beyond Boom," para. 3

proves challenging, slow, and sometimes costly. In 2011, Solyndra, a solar panel manufacturer, defaulted on its $535 million loan from the DOE.[123] Many Republicans pounced on the announcement, decrying the DOE's capitalism under the Obama Administration.[124]

In its FY 2013 budget request, the DOE curbed expenses, demonstrating to stakeholders its fiscal responsibility.[125] DOE Secretary Steven Chu conveyed the department's strategic plan: use less funding than in previous years to make a greater impact by eliminating unsuccessful programs and investing in effective ones.[126]

Fiscal Policies

The DOE's proposed and employed energy policies include loan guarantee programs, the MTC, the PTC, and fossil fuel tax expenditures. Although most of these policies have budgetary costs and benefits, only some of them currently exist.

DOE Loan Guarantee Programs

Within "Title XVII of the Energy Policy Act of 2005" (EPACT), Congress created the loan guarantee program in order to fund "innovative technologies" for "projects … [that] 'avoid, reduce or sequester air pollutants or greenhouse gases; employ new or significantly improved technologies and provide a reasonable prospect of repayment.'"[127] This program meaningfully contributes to achieving America's renewable energy goals by catalyzing the domestic trade "of innovative and advanced clean … technologies."[128] The DOE Loan Programs Office (LPO)

[123] Stiles, 2012, para. 2
[124] Stiles, 2012, para. 2
[125] Chu, 2012, p. 4
[126] Chu, 2012, p. 5
[127] Hanna, 2010, p. 1
[128] U.S. Department of Energy Loan Programs Office [LPO], n.d.-c, "The Financing Source," para. 1

allocates both Innovative Technology and Advanced Technology Vehicle Manufacturing (ATVM) loan guarantees.[129] Section 1703 of the LPO's initiating statute established the former, which funds programs developing "innovative clean energy technologies that" contain too many "high technology risks" to "obtain conventional private financing."[130] After candidate companies pay the DOE's subsidy fees, it may finance up to 80 percent of their projects' expenses.[131] Created within "Section 136 of the Energy Independence and Security Act of 2007," ATVM loans finance the development of advanced technology vehicles and accompanying parts that meet high efficiency criteria.[132]

Four years after the initial two LPO programs began, Section 1705 revised the EPACT and permitted the DOE to distribute a third—the Section 1705 clean energy loan guarantee—until September 30, 2011.[133] Incorporated within "the American Recovery and Reinvestment Act of 2009" (ARRA), the amendment permitted the DOE to sanction loans for domestic "projects that commenced construction no later than September 30, 2011 and involve[d] certain renewable energy systems, electric power transmission systems, and leading edge biofuels."[134] Companies borrowing 1705 loans did not pay the department a subsidy fee.[135]

In December 2009, Congress amended an EPACT provision that shielded taxpayers should projects fail, instead repaying "lesser creditors" before or concurrently with the

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[129] *Budget and Spending Concerns*, 2012, pp. 5-10; Jenkins et al., 2012, p. 54; *The Obama Administration's*, 2012, p. 31; Office of Chief Financial Officer, 2012, pp. 12-13; LPO, n.d.-b
[130] *The Obama Administration's*, 2012, p. 31
[131] *The Obama Administration's*, 2012, p. 31
[132] *Alternative Fueled Vehicles*, 2011, p. 16; *The Obama Administration's*, 2012, p. 31; LPO, n.d.-a, "Energy Independence"
[133] *The Obama Administration's*, 2012, p. 31
[134] *The Obama Administration's*, 2012, p. 31
[135] *The Obama Administration's*, 2012, p. 31

government, "even when [the] DOE [was] the majority debt holder."[136] Neither Congress nor Obama considered reinitiating the 1705 program,[137] although the LPO continues issuing 1703 and ATVM loans.[138]

Findings & Analysis

Of the policies highlighted, the LPO's clean energy loans contain the most concerns.[139] In September 2009, the LPO issued its first guaranteed loan—Solyndra's $535 million 1705 loan[140] "to build a new factory"[141]—and within a year, it approved 1705 loans for fifteen additional projects totaling $16 billion.[142] "On August 31, 2011," Solyndra closed,[143] leaving 1,100 unemployed and without the statutory severance or "60 days' notice".[144] Five days later, the company filed for bankruptcy.[145] In "a $3.5 million settlement"[146] reached October 22, 2012, the court devised Solyndra's bankruptcy plan,[147] awarding two private companies with tax reductions and millions of dollars in revenue[148] without recompensing the company's primary creditors or the government.[149]

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[136] Hanna, 2010, p. 3
[137] McArdle, 2012, para. 1
[138] LPO, n.d.-b
[139] For more information, see Hanna, 2010 and *The Obama Administration's*, 2012.

[140] Hanna, 2010, p. 1; *The Obama Administration's*, 2012, p. 30
[141] Baker, 2011, para. 2
[142] Hanna, 2010, p. 1
[143] Baker, 2011, para. 11; Kaften, 2012, Case History section, para. 1
[144] Baker, 2011, para. 5
[145] Baker, 2011, para. 1
[146] Kaften, 2012, Case History section, para. 1
[147] Kaften, 2012, para. 1
[148] Kaften, 2012, Lodging an Objection section, para. 1
[149] Kaften, 2012, Winners and Losers section

Within days, "a government source" provided new Treasury and OMB documents cautioning the DOE to consult the Department of Justice before amending Solyndra's loan.[150] After restructuring, it "repa[id] company investors before taxpayers if the company defaulted."[151] DOE spokesman Damien LaVera claimed the department complied but that ultimately, "career lawyers in the loan program" decided the alterations' legality.[152] Now, taxpayers repay the debts of companies with failed projects.[153] Moreover, the DOE improperly assessed all 1705 loan applications.[154]

Additionally, the government approved and appropriated to the DOE "the net present value of the anticipated costs of defaults"[155]—"$2.47 billion in credit subsidy costs."[156] Whereas this fund replaced borrowers' subsidy fees, remunerated "the two current project defaults," and may reimburse the "total defaults of … [the] eight … remaining higher-risk projects and [still] have" residual credit,[157] the LPO's other programs have used applicants' fees to pay for themselves and will continue doing so in order to reimburse future overhead.[158] Since the government guarantees the LPO's 1703, ATVM, and 1705 loans, this fee acts as one of the few factors incentivizing corporations to ensure their projects' successes.[159] Companies receiving 1705 loans paid no DOE subsidy fee and consequently will lose less money from failed projects

[150] Stephens, Leonnig, & Mufson, 2011, para. 4
[151] Stephens et al., 2011, para. 2
[152] Stephens et al., 2011, para. 8
[153] *The Obama Administration's*, 2012, p. 36
[154] *The Obama Administration's*, 2012, p. 37
[155] Hanna, 2010, p. 2
[156] Williams, 2012, "The Program Planned"
[157] Williams, 2012, "The Program Planned"
[158] Williams, 2012, "Ending DOE's"
[159] *The Obama Administration's*, 2012, p. 31

than will those obtaining 1703 or ATVM loans.[160] Thus, the 1705's feeless policy attracted audacious companies.[161]

Nonetheless, corporations with successful projects appreciate the 1705's aid and benefit the DOE's fiscal position by repaying their loans plus interest.[162] On August 5, 2011, the DOE distributed a 1705 loan to one such company—Agua Caliente.[163] Although the project remained incomplete in early September 2012, the factory's operators increased its wattage "to 250 megawatts … [and thus created] the largest operating photovoltaic power plant in the world."[164] The NRG Solar LLC-sponsored Agua Caliente project credits the 1705 program with its success[165] and the 400 jobs it created.[166] However, NRG Solar LLC and other corporations comprise NRG Energy, Inc., "a Fortune 500 … company"[167] which received most 1705 loans, totaling $3.8 billion—23.7 percent—of clean energy loan funds.[168] Furthermore, "nearly 90 percent of the [1705] loans guaranteed by the … government since 2009 … subsidize[d]" large, vastly-resourced corporations' "lower-risk power plants."[169] Finally, as the LPO's programs are not mutually exclusive, "many … companies that … benefitted from … the 1705 … [loans] also received additional grants under the" ARRA.[170]

Although loans extended to startup renewable energy corporations without significant financial backing accomplish their intended purpose, those granted to companies of wealthy

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[160] *The Obama Administration's*, 2012, p. 31
[161] *The Obama Administration's*, 2012, p. 37
[162] *The Obama Administration's*, 2012, p. 36
[163] DOE, 2011, para. 1
[164] Casey, 2012, para. 2
[165] Casey, 2012, para. 1
[166] Casey, 2012, "No More Solyndras," para. 5
[167] NRG Energy, n.d., NRG Companies section
[168] *The Obama Administration's*, 2012, p. 34
[169] *The Obama Administration's*, 2012, pp. 34-35
[170] *The Obama Administration's*, 2012, p. 35

businesses are less efficient. The $16 billion earmarked for the clean energy loan program funded 26 projects and created an estimated 2,378 permanent jobs.[171] With an overall $6,731,034 taxpayer exposure per job, the 1705 program's expenses hampered the effectiveness with which it created positions.[172]

Notwithstanding its faults, the structure of the LPO's current programs protects the DOE and taxpayers against monetary loss.[173] Additionally, the DOE required officials of power generation projects, which received 87 percent of 1705 loan funds, to find consumers for the power produced.[174] These projects' "committed revenue stream … g[ave] lenders confidence that project backers … [could] pay … debt" and thus that they took fewer risks than did "the remaining 13 percent of the portfolio value," for which the department necessitated no such requirement.[175]

The LPO's programs—despite their flaws, their inefficiencies, and their controversies—affect neither the DOE's nor the government's budget.[176] They can only benefit the department's fiscal position. Additionally, 1705 loans allowed companies to undertake domestic-energy-portfolio-diversifying ventures and offered new technology-manufacturing clean-energy corporations opportunities to establish themselves. Furthermore, 1705 loans, especially those lent to small and midsized companies, incentivized American technological innovation without the many risks of completely funding projects.[177] Thus, Congress should modify and reinstate the 1705 while maintaining the 1703 and ATVM programs. The DOE must

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[171] *The Obama Administration's*, 2012, p. 33
[172] *The Obama Administration's*, 2012, p. 33
[173] *The Obama Administration's*, 2012, p. 31; Williams, 2012
[174] Williams, 2012, "Lower-Risk Energy"
[175] Williams, 2012, "Lower-Risk Energy"
[176] Williams, 2012, "Ending DOE's"
[177] *The Obama Administration's*, 2012, p. 37

ensure that the latter two policies do not suffer issues similar to those of the clean energy loan program. If these or other weaknesses occur, Congress should amend the policies.

Section 48C Advanced Energy Manufacturing Tax Credit

The "Internal Revenue Code (IRC)" Section 48C advanced energy manufacturing tax credit (MTC) encouraged manufacturers to develop clean, innovative energy sources.[178] Created within the ARRA,[179] the MTC and the renewable energy production tax credit (PTC) jointly offered "a 30 percent investment credit to manufacturers … invest[ing] in capital equipment [in order] to make components for [domestic] clean energy projects."[180]

The ARRA mandated candidate companies to complete their projects "on or after February 17, 2009", to commission their projects "before February 17, 2013"[181], and to apply for the credit before October 16, 2009.[182] By January 2010,[183] the DOE had accepted 183 projects[184]—which totaled the MTC's $2.3 billion—demonstrating "commercial viability, domestic job creation, technological innovation, speed to project completion, … potential for reducing air pollution and greenhouse gas emissions,"[185] and cost-effectiveness.[186] Congress then allowed the program to expire without financing 235 eligible projects tallying $5.8 billion in

[178] *Impact of Tax Policies*, 2012, p. 6; DOE, 2010, para. 2-3
[179] DOE, 2010, para. 2
[180] DOE, 2012, para. 6
[181] DOE, 2010, Timing of Projects section
[182] DOE, 2010, Applicant Pool section
[183] *Impact of Tax Policies*, 2012, p. 49
[184] DOE, 2010, para. 2
[185] DOE, 2010, para. 4
[186] *Impact of Tax Policies*, 2012, p. 49

48C tax credits.[187] The money demanded outnumbered the funds available by more than three-to-one.[188]

In 2012, Congress denied Obama's request to extend the MTC, but on February 7, 2013, "the Departments of Energy and Treasury announced … that they will [competitively] offer" the 183 projects' residual $150 million in MTCs.[189] This year, the president requested an additional $5 billion in MTCs[190] while continually urging Congress to renew the 48C credit.[191]

Findings & Analysis

The MTC's flaws include relatively specific eligibility standards. Since the 48C is "a non-refundable credit", primarily companies that pay income tax qualify for it.[192] Additionally, projects of startup and other corporations requiring more than 30 percent in 48Cs find this credit inadequate.

Despite the MTC's imperfections, it benefited recipient projects and the economy. One approved project, Itron Inc.'s "OpenWay CENTRON smart meter,"[193] spent $5.2 million in 48Cs[194] in order "to install advanced automation equipment … including … [innovative] robotics that work directly on the smart meter assembly line."[195] This equipment "increased the facility's production capacity by 20 percent"[196] and augmented smart meter production sufficiently "to

[187] *Impact of Tax Policies*, 2012, p. 49
[188] DOE, 2010, para. 5
[189] Leiter & Litke, 2013, "$150 Million"
[190] *Impact of Tax Policies*, 2012, p. 51
[191] Office of the Press Secretary, 2013, "Ensuring U.S. Leadership"
[192] Gillon Tax Advisors, n.d., "New Advanced Energy," para. 5
[193] Craft, 2010, "Smart Meters Change," para. 1
[194] Craft, 2010, para. 2
[195] Craft, 2010, "Grant Money Funds," para. 1
[196] Craft, 2010, "Grant Money Funds," para. 1

reduce annual electricity use [*sic*] by approximately 1.7 million megawatt-hours"[197]—"enough electricity to power 52,000 homes for one year."[198]

Economically, this MTC-funded technology created 420 jobs,[199] boosting the company from its position as Oconee County's[200] third to its top employer.[201] "Lowell Rust, Itron's director of product marketing," said that the smart meter almost instantaneously monitors and displays users' energy consumption and cost, allowing people to reduce their energy bills[202] and greenhouse gas emissions. Once Itron firmly establishes this product on the U.S. market, the company plans to produce domestically and export it worldwide,[203] thus generating domestic revenue.

The 48C does not affect the DOE's budget and therefore cannot affect its fiscal position. Economically, the MTC creates jobs, inspires American technological innovation, and may catalyze international exports and trade while increasing the nation's revenue. Environmentally, it reduces dependence on fossil fuels by stimulating a clean energy market. Thus, the findings suggest that Congress reinstate the 48C tax credit.

Section 45 Renewable Energy Production Tax Credit

With "IRC Section 45" production tax credits (PTC),[204] companies producing alternative energy (see Table 3) can claim, for their first ten operational years, "a 2.2-cent per kilowatt-

[197] Craft, 2010, para. 3
[198] Craft, 2010, "Smart Meters Change," para. 7
[199] Craft, 2010, para. 2
[200] Itron maintains its smart meter production facility in Oconee County, South Carolina.
[201] Craft, 2010, para. 1-3
[202] Craft, 2010, "Smart Meters Change," para. 3-5
[203] Craft, 2010, "American Made"
[204] Novogradac & Company LLP, 2010, p. 9

hour" tax benefit.[205] Congress ratified this credit within "the Energy Policy Act of 1992"[206] and modified it most notably within "the American Jobs Creation Act" of 2004 (AJCA), the EPACT, and the ARRA.[207] The PTC incentivizes companies to develop renewable energy resources,[208] "help[s] drive the [wind] industry's growth," and creates and sustains jobs.[209] With the wind PTC, the U.S. created "nearly 20,000 direct" and more than "30,000 manufacturing jobs."[210]

Table 3: Sample Alternative Energies Companies Eligible for PTCs

Type of Resource	Type of Alternative Energy
Renewable*	Landfill Gas, Municipal Solid Waste ^
Perpetual**	Wind, Biomass, Geothermal ^^, and Incremental Hydro, Wave, and Tidal Energy ^^^

Notes: *One must use these resources sustainably—that is, in such a way that they will replenish and remain for future generations. Otherwise, they will diminish and disappear.[211] **One can never deplete these resources.[212] The author classifies them as renewable.
Sources: ^*Impact of Tax Policies*, 2012, p. 46; ^^*Impact of Tax Policies*, 2012, p. 46; Iowa Energy Center, 2013; ^^^UCS, 2013, para. 4

The industry has been growing in magnitude. In 2011, it "remained one of the world's largest and fastest growing wind markets," and it manufactured almost 70 percent of the equipment installed on wind farms.[213] Wind turbines increased energy production by 27 percent from 2011 to 2012.[214] Thus, the PTC abets Obama's goals of expanding the domestic clean energy market and decreasing the country's reliance on nonrenewable energy.[215] Within "the American Taxpayer Relief Act of 2012"[216] passed "January 2, 2013, Congress temporarily

[205] Union of Concerned Scientists [UCS], 2013, para. 2
[206] UCS, 2013, "The PTC," para. 2
[207] Novogradac & Company LLP, 2010, pp. 10-11
[208] UCS, 2013, para. 1
[209] DOE, 2012, para. 6
[210] Office of the Press Secretary, 2012, para. 2
[211] StopWaste, n.d., p. 1
[212] StopWaste, n.d., p. 1
[213] DOE, 2012, para. 1
[214] Office of the Press Secretary, 2012, para. 3
[215] The White House, 2011, p. 4
[216] Independent Sector, 2013, The Issue section

extended the [wind] PTC."[217] PTCs for other eligible technologies will conclude December 31, 2013 unless Congress renews them.[218] Without Section 45 credits, the wind industry will lose much of its recent progress.[219]

Findings & Analysis

Congress balked as the PTC helped to establish a flourishing renewable energy market. Thrice—in 1999, 2001, and 2003—it terminated and, within a 12-month period, extended the wind PTC, creating an uncertain wind industry and undermining this market's long-term stability.[220] Installed wind capacity decreased "between 73 and 93 percent" the year following each expiry[221] while it and cumulative wind power capacity increased with each consecutive-year extension.[222]

Despite impediments and complications, the PTC creates jobs, generates revenue, invigorates renewable energy industries, and diminishes dependence on fossil fuels. Furthermore, the government earmarks PTCs; they cannot affect the DOE's fiscal position. Consequently, the findings suggest Congress continue renewing PTCs for entitled technologies.

Fossil Fuel Tax Expenditures

The DOE's nonrenewable-energy policies include fossil fuel tax expenditures, three of which—the domestic manufacturing deduction, the intangible drilling cost deduction (IDC), and the percentage depletion allowance—heavily influence the DOE's financial position. Congress

[217] UCS, 2013, "Congress Extends PTC," para. 1
[218] *Impact of Tax Policies*, 2012, p. 46
[219] Office of the Press Secretary, 2012, "The President's Plan," para. 5; DOE, 2012, para. 6
[220] U.S. Energy Information Administration, 2012, Figure
[221] UCS, 2013, "The PTC," para. 2
[222] U.S. Energy Information Administration, 2012, Figure

has not fulfilled Obama's desire to eliminate these and other arguably unnecessary[223] nonrenewable-energy policies; however, the Senate came within nine votes of passing to the House a bill limiting fossil fuel tax expenditures.[224]

Initiated within the AJCA, the IRC Section 199 domestic manufacturing deduction intends to expand and retain American manufacturing jobs.[225] With this policy, a company's domestic manufacturing activities determine its tax base and the magnitude of its payroll establishes its tax rate.[226] This tax expenditure reduces labor's effective cost "by allowing a percent [*sic*] deduction of net income"—"beginning at three percent in 2005" and increasing to a "nine percent [maximum] in 2010"—until a company's "payroll limitation."[227] Oil and gas companies have qualified for this program since Congress's 2004 IRC amendment, which limits these corporations' tax rates to six percent.[228]

Created in 1913,[229] IRC Section 57[230] "intangible drilling costs … include" non-drilling expenditures "that have no salvage value, but" that vitally aid drilling exploratory and developing productive wells.[231] Since 1986, companies have deducted 70 percent of their IDCs from taxes over "a 60-month period."[232] Improved technology has achieved this policy's purpose of lowering the costs of oil and gas exploration.[233]

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[223] These tax expenditures' necessity has become a controversial matter.
[224] Center for Effective Government, 2012, para. 8; Hassett & Viard, 2012, "Early Efforts," para. 9
[225] Pirog, 2011, p. 5
[226] Pirog, 2011, p. 5
[227] Pirog, 2011, p. 5
[228] Center for Effective Government, 2012, para. 4; Pirog, 2011, p. 5
[229] Center for Effective Government, 2012, para. 5; Pirog, 2011, p. 3
[230] "26 USC," 2012
[231] Pirog, 2011, p. 3
[232] Pirog, 2011, p. 3
[233] Jenkins et al., 2012, p. 34; Pirog, 2011, p. 3

Introduced in 1926,[234] the IRC Section 613 percentage depletion allowance[235] treats companies' oil and gas deposits as manufacturers' capital equipment; therefore, a certain percentage of each company's gross income—currently 15 percent—evades taxes.[236] A 1975 Congressional amendment halted Section 613s for the largest oil companies and reduced the 27.5 percent deducted for other sizeable ones.[237] This program restricts eligibility to independent, domestic producers' "first one thousand barrels per day per [productive] well … and … 65 percent of … [each company's] net income."[238]

Findings & Analysis

Of the policies analyzed in this paper, only those pertaining to fossil fuels affect the government's fiscal position. The domestic manufacturing deduction, the IDC, and the percentage depletion allowance will likely cost $41,909 billion over ten years (see Table 4).[239] Despite representing only 37.5 percent of the eight pricey tax expenditures, they comprise approximately 96.1 percent of these programs' total cost.[240]

Table 4: FY 2012 Oil/Gas Industry Tax Proposal Revenue Estimates (in millions of dollars)

[234] Pirog, 2011, p. 4
[235] Internal Revenue Service, 2007, p. 11
[236] Center for Effective Government, 2012, para. 6; Pirog, 2011, p. 4
[237] Center for Effective Government, 2012, para. 6; Pirog, 2011, p. 4
[238] Pirog, 2011, p. 5
[239] Center for Effective Government, 2012, para. 3; Pirog, 2011, p. 2
[240] Pirog, 2011, p. 2

Proposed Change	2012	2012-2016	2012-2021
Repeal enhanced oil recovery credit	0	0	0
Repeal credit for oil and gas from marginal wells	0	0	0
Repeal expensing of intangible drilling costs	1,875	8,883	12,447
Repeal deduction for tertiary injectants	6	46	92
Repeal passive loss exception for working interests in oil properties	23	117	203
Repeal percentage depletion for oil and natural gas wells	607	4,977	11,202
Repeal the domestic manufacturing deduction for oil and natural gas companies	902	7,704	18,260
Increase geological and geophysical amortization periods*	59	1,140	1,408
Totals	3,472	22,867	43,612

Notes: "A zero implies no revenue effect under current and forecasted conditions in oil markets."[241] *This suggestion would have "increase[d] [the] geological and geophysical amortization period for independent producers to seven years."[242]
Sources: OMB, 2011, p. 52, as cited in Pirog, 2011, p. 2

The eight programs neither "incentiv[ize] … increased [fossil fuel] production" nor "reduce [consumers'] prices."[243] For wealthy corporations, these policies have become largely ineffective, cost taxpayers significant sums of money, and damage the government's fiscal position. Thus, the author recommends restricting these programs only to companies—which require them in order to offset some costs—below a defined, yearly, net-revenue threshold.

Conclusion

Recently, 1705 loans, MTCs, PTCs, and other policies have sparked innovation and expanded the renewable market, considerably reducing clean energy prices despite fossil fuels' history of primarily powering the U.S. creating an entrenched, cultural tradition that stymies its growth.[244] Nevertheless, since new technologies granting access to previously unattainable

[241] Pirog, 2011, p. 2
[242] OMB, 2011, p. 52
[243] Pirog, 2011, p. 1
[244] Jenkins et al., 2012, pp. 34-35

nonrenewable resources likewise moderated fossil fuel prices, many legislators feel less inclined to advocate for policies reducing renewable energy prices.[245] Absent Congressional action, Jenkins et al. estimated a 50 percent decline and a 75 percent plunge in "federal clean tech[nology] spending. … from 2011 to 2012" and from 2009 to 2014, respectively.[246] Currently, most citizens and companies can afford renewable energy resources only with subsidies or other federal supplemental policies while fossil fuels remain comparatively inexpensive.[247]

In order to reverse this trend, Trembath and Jenkins assert that legislators "should reform clean energy subsidies [and other policies] to reward innovation and … [abet] develop[ing] a robust industry that can thrive without" federal support.[248] These amended programs should "provide sufficient certainty for investment decisions, … set expectations that subsidy levels will decline over time," advance "a diverse energy portfolio," recompense "innovators who deliver better prices or performance," and "maximize the impact of taxpayer resources by limiting transaction costs and ensuring clean tech[nology] can efficiently access affordable private capital."[249]

Additionally, the government should continue funding innovative, cost-reducing, job-creating clean energy research and manufacturing projects until renewable and nonrenewable technologies can compete.[250] The renewable energy market will thrive and clean resources will produce energy independence domestically while "fuel exports to energy-hungry global markets"

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[245] Jenkins et al., 2012, pp. 34-35
[246] Jenkins et al., 2012, p. 14; Trembath & Jenkins, 2012a, para. 6-7
[247] Trembath & Jenkins, 2012b, p. 12
[248] Trembath & Jenkins, 2012a, para. 11
[249] Trembath & Jenkins, 2012a, para. 13
[250] Jenkins et al., 2012, p. 7; Trembath & Jenkins, 2012a, "Beyond Boom," para. 22-23

generate revenue if Congress and "industry leaders … make innovation their guiding principle."[251, 252]

Although some of its policies function more effectively than do others, the DOE and its programs protect the environment, regulate fossil fuels, and produce a thriving, domestic clean-energy market. While the DOE maintains robust past and present fiscal positions, its future financial situation remains uncertain. In order to prevent the renewable energy incentives from expiring and potentially causing the DOE to lose a tremendous investment in—and revenue from—clean technologies, the author recommends that Congress modify and reinstate the 1705 loan, reinvigorate the MTC, extend the PTC, and eliminate unnecessary fossil fuel tax expenditures. Furthermore, Congress should maintain innovative, renewable-energy policies by amending them until renewable and fossil fuel technologies can compete. These acts should ensure the DOE's effective budgeting and secure fiscal position into the future.

[251] Trembath & Jenkins, 2012a, para. 18

[252] For more information, see Jenkins et al., 2012; Trembath & Jenkins, 2012a; and Trembath & Jenkins, 2012b.

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26 USC § 57(a)(2) (2012).

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