Chapter 4. Energy

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Introduction

Too often government interventions in markets are driven or co-opted by parochial political interests. The results can be damaging on many levels. In addition to their very large fiscal cost, politically driven subsidies can impede the attainment of social or environmental goals, and hinder the ability of new and emerging industries to compete fairly in the marketplace. Using the example of federal subsidies to the United States energy sector (in mid-2006), this paper discusses the scale and origin of the subsidy problem, and presents a number of strategies that can help address structural deficits in the current system of governance.

While subsidies are most commonly thought of cash payments to a particular person or corporation, this definition misses most of the ways that governments transfer value to private entities. A range of policies, including special reductions, commonly required payments (such as tax breaks) or risk internalization (such as through unrealistically low caps on insurance requirements) offer politicians less visible ways to provide benefits to constituent groups. The Annex provides an overview of subsidy types. As noted here, some can act either as a subsidy or as a tax depending on their specific wording or magnitude.

Assembling an integrated picture of the size and distribution of US federal subsidies to energy is a challenging undertaking. Many of the non-cash interventions are difficult to quantify, and requisite data needed to do so is often lacking. Scores of government programs across many different agencies have some involvement with the sector, compounding the measurement difficulty. The government itself currently faces no requirements to compile this information internally, and multi-fuel assessments, even by outside parties, tend to be conducted on a very infrequent basis.

These problems are even more severe at the state level, where governments are also very active in subsidizing energy. A recent review of state interventions in ethanol and biodiesel markets alone found at least one subsidy to these fuels in 38 of 50 states, and roughly 200 in total (Koplow, 2006). Yet moving from statutory language to quantified estimates of support is often impossible. Many states produce tax expenditure budgets only once every few years, or not at all. Line items often lack sufficient detail to attribute them to particular industry sectors. The value of loan guarantees or access to tax-exempt bonding is rarely recognized.

SUBSIDY REFORM AND SUSTAINABLE DEVELOPMENT: POLITICAL ECONOMY ASPECTS – ISBN 978-92-64-01936-2 © OECD 2007

Energy subsidies in the United States

Though impossible to capture every government support to energy, even partial evaluations indicate the large scale of subsidies to this sector. In a paper for the National Commission on Energy Policy, Koplow (2004) estimated federal subsidies at between US$ 40 and US$ 69 billion per year in 2003. Two factors result in this fairly large spread.

First, primary source material does not always agree on input data or quantification methods. This can generate different subsidy values. Second, many subsidies have a higher value to recipients than their direct cost to the government. Tax credits, for example, often generate tax-exempt savings to recipients. Had a similar amount of financial support been given as a grant, the grant would have been taxed as income. Loans provide another example. Borrowers could never get the same interest rates as the US Treasury does were they to go to capital markets themselves. This generates an incremental subsidy (referred to as *intermediation value)* to the recipient firm (Koplow, 1993).

To this base, the Energy Policy Act of 2005 added an additional US$ 85 billion in subsidies over 10 years, according to consumer group Taxpayers for Common Sense (TCS, 2005), and legislative activity to bring still more continues. Earth Track's preliminary subsidy estimates for 2006 peg federal support at between US$ 49 and US$ 100 billion per year (**Table 1**). This is well above the 2003 estimate. Neither the 2003 or the 2006 estimate includes credit subsidies to energy enterprises, which would boost the totals by a few billion dollars more.

New legislation plays a part in the growth of federal subsidies over the past 3-4 years. However, it is not the only factor. Rising investment in the energy sector, and rising output, can both drive up public subsidy costs. Many subsidies are linked to production levels, and as output has surged so have the public expenditures. Similarly, capital subsidies such as accelerated depreciation are largest in the early years of new capital deployments. Rising energy prices, and the resultant investment boom, are thus contributing factors as well. A third factor involves a number of more recent scandals regarding federal resource management, resulting in large windfall gains to producers. Of note in this category are deep water oil and gas leases that were issued in 1998-99 with no royalty provisions, and that have only recently been publicly acknowledged (Andrews, 2006).

As shown in **Table 1**, the distribution of the subsidies across energy sources in 2006 continues to favor conventional energy. More than 50% of the total benefits the oil and gas sectors. Nuclear power is the next largest beneficiary at 12%, benefiting from a range of new subsidies aimed at new plant construction. Subsidisation of ethanol is on par to support of all other renewables combined (at roughly US$ 5.6 billion/year), though this may in part be due to more comprehensive recent assessments of ethanol than other renewables.

Table 1. Distribution of US Federal Energy Subsidies, 2006

	$Billions Per Year (Avg. of High/Low Ests)	% Share
Oil and Gas	39	52.4%
Coal	8	10.5%
Fossil, mixed	2	3.3%
Total Fossil	49	66.2%
Nuclear	9	12.4%
Ethanol	6	7.6%
Other Renewables	6	7.5%
Conservation	2	2.1%
Mixed Resources/Other	3	4.2%
Total, all resources	74	100.0%

Source: www.earthtrack.net

The fiscal cost of these subsidies is evident, especially in sectors such as oil and gas where historically high prices alone should provide sufficient incentives for expanded production. However, the subsidies create a range of other risks as well. For example, they can spur subsidy-driven capacity expansions, distorting the mix of supply. Subsidies seem to be an important factor in the rapid expansion of ethanol and biodiesel production facilities in the country, with overbuilding an increasing risk.

Similar dynamics are at play with nuclear power. Federal subsidies to new nuclear power plants are likely between 4 and 8 cents per kWh (levelized), and could well be the determining factor driving the construction of new nuclear power plants (Koplow, 2005a). As a result of low operating costs, nuclear plants are unlikely to close down once they open, despite some of the highest capital costs of all fuel sources. Once operations commence, these capital costs are effectively sunk, and no longer affect shut-down decisions. Thus, the subsidy decisions of today will continue to influence the structure of electricity supply for 40-60 years out.

The environmental costs of energy subsidies also warrant attention. As concern over climate change rises, spending billions to subsidize carbon-intensive energy sources makes little sense. Far more effective would be to structure the marketplace to reward the least-cost carbon reduction strategies. Similarly, existing subsidies mask important variation in supply resources – from carbon intensity to time of delivery, security of supply, and location relevant to congested distribution lines. In all of these areas, improving the quality of the price signal for particular fuels and supply options is important in fostering a more dynamic energy market, and one that properly rewards energy resources that mitigate the issue of concern.

Energy subsidies are a symptom of a larger structural problem

Energy subsidies continue to grow in part due to rapidly rising energy prices and heightened concerns over the security of supply. These factors have encouraged increased legislative initiatives, as government officials try to demonstrate action and attention to

this problem. Often these initiatives focus on deploying federal resources to one fuel or another, rather than on trying to correct baseline market and policy distortions that impede the development and entry of emerging fuels or energy sources in appropriate ways. This choice is not surprising: attacking root causes is both difficult and political risky.

Certainly the current concerns on energy issues are a contributing factor in subsidy escalation. However, it is structural weaknesses in the system of federal checks and balances on Congressional spending that seem to play the dominant role. These factors affect a wide range of economic sectors.

Rent Seeking

At the root of the subsidy problem is an economic force often referred to as "rent seeking". By manipulating the public legislative process, private parties are able to create revenue streams ("rents") for themselves. These returns can spur intensive and wide ranging pressures on the political process.

Although capture of public tax revenues (*e.g.*, through government grants) is an important source of these rents, two others venues are equally important. Policy changes that reduce mandated payments to third parties also provide attractive returns. That third party may be the government (*e.g.*, via tax exemptions), but need not be. Government policy often sets parameters for required payments to private third parties as well, such as by setting caps on required liability coverage below reasonably expected damages from a serious accident.

A third important source of rents is policies that increase the *expected value* of cash flows by reducing the probability and magnitude of downside losses. Though the policies may not boost the profit level of the enterprise should everything go properly, the reduced risk of loss generates tangible savings to the investors by reducing their risk profile in capital markets. Energy industries such as nuclear power or pipeline operations require large scale capital investments that are at great risk of loss should energy prices decline markedly during their construction period. For these types of firms, risk shifting via insurance, loan guarantees, and guaranteed purchase agreements can generate very large subsidies to particular market participants.

Political interests in subsidy generation

For rent seeking to work, a number of other factors must also be present. First, parties seeking the rents must be well organized and focused. They often have concentrated interests that are held quite strongly, enabling them to outmaneuver groups that have less riding on particular decisions financially. Subsidy beneficiaries "reinvest" a portion of their gains into the political process every year, such as through lobbying, to ensure the subsidy programs are continued and possibly expanded. The paybacks can be quite high, with some practitioners estimating 100:1 returns in policy benefits relative to lobbying expenditures (Utt, 2006).

Second, because politicians are required to pass legislation into law, they must share an interest with subsidy recipients in granting a particular subsidy. Where officials face re-election, this common interest does exist. Politicians benefit by capturing as much federal value transfer for their individual districts as possible. This spending garners the support of some of the concentrated economic interest groups, who then help finance re-

election campaigns for incumbent legislators. To the extent that federal programs create local jobs or prop up local industries, politicians may garner incremental public support as well. Because all elected officials face this same pressure, they cooperate in a general way to share spending across Congressional districts. In contrast, short of federal bankruptcy, there is no current common interest across the US Congress to control spending in the aggregate and to ensure the spending that does occur is properly targeted and efficiently deployed.

Data limitations constrain subsidy challenge

While taxpayers do have a strong interest in curbing excessive spending, their power has historically been quite limited. Each individual taxpayer has neither the time nor the money to organize effectively to oppose the concentrated interests benefiting from the subsidies. Taxpayer groups are somewhat more effective. However, they too remain at an informational disadvantage to rent seeking groups in finding and challenging subsidies. This informational challenge is compounded by the complexity of the subsidies themselves. Data are widely fragmented and many of the value transfer methods are difficult to quantify. Although the US federal government has implemented a number of checks to non-cash value transfers over the years, their associated disclosure requirements remain incomplete.

In the tax subsidy area, estimates of the magnitude of the subsidies (commonly referred to as "tax expenditures") are prepared by the Joint Committee on Taxation or by the Office of Tax Analysis at the US Treasury. Methods and scope vary, but neither provides any detail on their assumptions, model validation, or model sensitivity in any public forum. This secrecy makes critiques of estimates and methods by outside experts virtually impossible (Burton, 2000). The limited public oversight exists despite the fact that the economic impact of tax breaks is well over US$ 800 billion per year.

There have been great strides over the past 15 years in disclosure of credit subsidies through federal direct loans and loan guarantees. These gains are largely the result of the Federal Credit Reform Act of 1990. As a result of the Act, the losses on credit programs are more clearly estimated and reported, and loan subsidy rates are estimated at the programmatic level. Nonetheless, gaps remain. There is no ability to sort individual loans (and losses) by category of recipient (rather than just governmental unit) to see the impact of these programs on various market segments. This would help tremendously in tracking disbursement bias in the energy sector. If there are confidentiality issues regarding release of recipient names, one should at least be able to get totals by subcategories that are more refined than what is currently available.

A second major improvement would be to more accurately track lending subsidies. Administrative costs are generally excluded from the calculation of loan subsidy values. In addition, credit subsidy calculations make no attempt to assess the value of the loan to the recipient by comparing their private cost of capital to what they are actually being charged. This would require assigning borrowers credit ratings, but would provide a much clearer picture of the actual subsidies flowing to high risk endeavors such as oil drilling in unstable regions of the world, or high risk infrastructure projects such as new nuclear power plants or a natural gas pipeline from Alaska.

Factors contributing to a worsening of subsidies in recent years

Rent seeking behavior in terms of energy subsidies is not new. However, there are a number of signals that the problem is worsening. This is evident in rising incidence and magnitude of earmarked spending in many legislative bills; via a declining use of Presidential vetoes; and through the expiration of spending constraints such as *Pay-as-You-Go legislation* that required budget reductions to offset spending increases from new initiatives.

Rising use of earmarks

The number of Congressional earmarks grew tenfold between 1990 and 2005 (Fund, 2006). Growth in particular budget areas have been even higher. A survey of Highway Reauthorization bills, for example, showed an increase from 10 earmarks in 1982 to nearly 6 400 in 2005 (Utt, 2006). Earmarks as a share of total appropriations have also been rising (**Table 2**).

Table 2. Growth in Federal Earmarks, Selected Appropriation Areas

Legislation*	Number of Earmarks		Earmarks as % of Total Appropriation	
	1994	2006	1994	2006
Commerce, Justice, State, the Judiciary, and Related Agencies	253	1,722	11.5%	21.8%
Defense	587	2,506	1.8%	2.3%
District of Columbia	0	95	0%	17.3%
Energy and Water	1,574	2,313	24.8%	17.3%
Foreign Operations, Export Financing, and Related Programs**	38	427	54.5%	73.2%
Department of the Interior and Related Agencies	314	568	3.6%	3.9%
Military Construction	895	504	37.4%	66.1%
Transportation and Related Agencies	140	2,094	2.4%	5.5%

*Includes only appropriations bills where earmarks exceed 1 percent of authorized spending.

**Includes hard and soft earmarks. Soft earmarks "urge" or "recommend" particular spending, rather than "directs" or "allocates".

Source: Congressional Research Service (2006).

In the US system, separate legislative bills are passed in the Senate and in the House of Representatives. The bills often differ, and a Conference Committee is set up to standardize the language across the two parties, so a common bill can be signed into law. With increasing frequency, these committees are inserting entirely new language into

bills rather than simply reconciling differences in the House and Senate versions. An estimated 95% of recent earmarks were slipped into conference reports, rather than having been included in the original House or Senate bill (Fund, 2006). The Conference Committees have also tried to exclude minority party members from debates entirely, a practice that according to legislative historians, did not occur previously (Babington, 2003).

Expiration of budget enforcement provisions

A number of other factors that in the past have helped to constrain spending have also weakened of late and are likely contributors to the current spending challenges. For example, Presidential vetoes have historically played a role in curbing Congressional power. The current administration has used its veto only once less than any other President in the past 150 years. The Bush administration has vetoed no appropriation bills, in comparison to 6 for Ronald Reagan, 8 for George H.W. Bush, and 14 for Bill Clinton (Kosar, 2006). Without actual vetos, there is also little threat of a veto to legislators. Both help to constrain spending.

Facing rising budget deficits in the 1980s, Congress implemented a number of constraints on itself to control the growth of aggregate spending. Fixed deficit reduction targets were established in the Balanced Budget and Emergency Deficit Control Act of 1985, more commonly referred to a "Gramm-Rudman" after two of the Senators that sponsored it. Aimed at reducing the deficit over a pre-set number of years, the law set up automatic sequestration procedures that cut federal spending by an equal percent across the board. The mandated cuts were often bypassed by Congress, but did provide general spending constraints and forced Congressional compromises to control spending (Rauch, 2005).Ultimately, low economic growth rendered the targets unattainable (CBO, 2003).

Gramm-Rudman was replaced in the Budget Enforcement Act of 1990 by caps on discretionary spending and pay-as-you-go (PAYGO) requirements on new mandatory spending and revenues. PAYGO required increased deficits to be offset by spending cuts or increased revenues in other areas of federal activity. Although the provisions were extended twice, they were ultimately eliminated in 2002. Some elements of PAYGO remain through 2008 in Senate procedures, though there is no comparable provision in the House (CBO, 2003; Keith, 2005). As with earlier attempts at control, the Congressional Budget Office noted that in practice "nearly all mandatory spending was exempt from a PAYGO sequestration" (CBO, 2003). Despite this, CBO does conclude that the laws were effective in curbing deficits through the mid-1990s, but became less effective as economic growth boosted tax revenues, and with them, the pressure to boost federal spending (CBO, 2003). The CBO viewed the threat of sequestration as a useful inducement for forcing compromise.

Reform Options

Subsidy reform in the energy sector will most effectively come from broader reforms that address the structural weaknesses in the existing legislative system in the United States. Three lines of attack seem promising: 1) subsidy contestability, forcing multiple recipients to compete for access to subsidy programs; 2) increased transparency on subsidy amounts and beneficiaries from within the government; and 3) increased transparency from outside of the government. Given the increasing importance of state

policies, it is important that strategies be deployed at the state as well as at the federal level. Each approach is discussed in turn below.

Subsidy contestability

When subsidy funding can be more easily contested, and options for achieving a particular policy outcome competed against each other, subsidy programs can be made more efficient. The approaches described below are not entirely new ideas, but rather new applications of approaches used elsewhere in government.

Subsidy impact assessments

Recognizing that government regulation can generate large costs and competitive impacts on affected industries, a fairly complicated set of procedural guidelines have been developed to ensure the regulatory process if open and fair (Koplow and Dernbach, 2001). These include a variety of steps to publicly justify the action to be taken.

Publication of a proposal in the *Federal Register*, for example, includes the basis and purpose of the proposal; its estimated costs and effects; and a consideration of regulatory alternatives to achieve similar social goals at a lower cost. Preparing this package takes substantial effort, and supporting materials usually provide much detail on the assumptions being made. The proposal is subject to public comment, and those comments must be responded to in writing. Final rules are also published in the *Federal Register*, and subject to court challenge. No such requirements apply to fiscal policies, which include most forms of subsidy. In fact, the requirements to publish in the *Federal Register* expressly exempt agency decisions "to adopt binding and future rules involving loans, grants, benefits, or contracts, the primary routes of subsidization" (Koplow and Dernbach, 2001).

Environmental impacts are another area of disparity. Administrative regulations with a potential effect on the natural environment are required to prepare an environmental impact statement and to evaluate less damaging alternatives (Koplow and Dernbach, 2001). Acts of Congress (including tax expenditures) are normally exempt from such review, though Congressional actions can certainly trigger quite wide environmental impacts.

These differences matter, as legislative action and tax policy can, and regularly do, conflict with environmental goals. Policies to reduce greenhouse gas emissions, for example, can be undermined by a single tax bill subsidizing carbon sources. Requiring a level playing field for fiscal policy can help stem this problem. As noted in Koplow and Dernbach (2001), Congress could implement a subsidy justification analysis to mirror what is required for regulatory proposals. A similar impact cut-off of US$ 100 million per year could be used, below which detailed analysis would not be required. Extending environmental impact analysis to fiscal policy would help ensure that fiscal subsidies were not inadvertently working at cross-purposes with environmental goals and laws. These requirements would dramatically change the dynamics and incentives of Congress, altering the types of policies that even get proposed. Not only would subsidy justification and environmental impact analyses require a level of examination subsidy policies rarely get now, but they would be open to challenge (both via peer review and the courts), enforcing greater rigor in the analytic work that is completed.

Competition

As noted above, just at there are multiple options for regulatory action, so too are there many ways to achieve the policy goal associated with government subsidies. Recognizing this fact can make a big difference in what types of programs are implemented and how subsidy funding is targeted. Recipients often favor narrow, tailored language that ensures they get the funding regardless of efficiency or merit. Taxpayer and policy maker interests should be the exact opposite.

By defining the policy *objective* rather than narrowly stipulating the *method* of achieving that objective, far more options are available. Including the demand side as well as alternative supply is critical in achieving these gains. For example, most subsidies to domestic oil and gas are justified on the grounds of energy security. But if the policy objective is defined as "reduce demand for imported oil" rather than "allow percentage depletion on domestic oil production," domestic producers would have to compete for their pork with demand options that may have a lower cost per dollar of imported oil displaced. Calwell and Gordon (2004) for example note that the cost per gallon saved by investing in lower rolling resistance tires is less than the subsidy cost of boosting domestic oil supplies.

A similar situation exists with nuclear power. Tens of billions of dollars have been earmarked for the nuclear sector on the grounds that it is the only large scale, currently available, low carbon power source. Yet defining the objective as "energy services with a small carbon footprint" would likely generate scores of faster, cheaper, and lower risk carbon reduction options that in the aggregate greatly reduce or eliminate the need for nuclear (Lovins, 2005).

Achieving cost savings can be done by grouping spending on the existing subsidies that support a given policy objective and forcing all potential recipients to compete against each other for the funding. The bidders able to achieve a given objective at the lowest per-unit taxpayer cost would be the winner. This approach is routinely used in meeting renewable portfolio standards (RPS). A recent study by van der Linden *et al.* (2005) indicates that when the RPS is structured properly, the competition helps to bring down the incremental cost of supply. For large subsidy programs, such as those associated with spurring construction of new nuclear power plants in the United States, auction approaches have the additional benefit of constraining the scope of action of bureaucrats in how limited funding is distributed, thereby reducing the risks of corruption (Koplow, 2005b).

Reintroduce spending constraints

A third option is to reintroduce some form of spending constraints, similar to those in effect during the 1980s and 1990s. These did work to some degree, though a variety of approaches were also developed to bypass the legislative constraints. (A useful summary of these can be found in Fletcher and Hamilton, 2005). Closing these gaming strategies would be necessary if the constraints were to be binding. Improved budgetary information to integrate the variety of ways governments transfer value (*e.g.*, tax breaks, credit and insurance subsidies, regulatory exemptions, as well as standard cash spending) would provide important supports to making spending constraints work.

An alternative approach would be to improve the linkage between budgetary balance and Congressional pay, along the lines of compensation packages to private sector CEOs. The Pay-for-Performance approach could provide clearer incentives to lawmakers for

fiscal discipline, but would also require supporting information on value transfers and a careful balancing of social welfare against fiscal goals (Koplow, 1996).

Structural reforms from inside government

A variety of changes in the availability and accessibility of information from within the government, and the procedures by which involved parties operate, could all play a positive role in curbing harmful energy subsidies. Internal change would be beneficial not only because this is where the most timely and accurate information resides, but also because the improved data would enable the government to function more effectively over time.

Improving transparency of legislative activities

Practices with regards to legislative earmarks and conference committees have been identified as important factors in the recent uptick in government subsidies. A handful of procedural changes could greatly improve the situation. Requiring that all committee members be allowed to attend committee meetings is a simple step that would codify common practice prior to the current administration, and address concerns noted in Babington (2003).

Providing a minimum amount of time to review conference reports would reduce the incentives to cram new, unvetted materials into the bill at the last minute. The required review time could be related to the length and complexity of the bill, or to the number of changes made. Advance knowledge that this review period would be required would create pressures to have bills come out in a more orderly fashion.

Procedural changes to improve the transparency of bill modifications would supplement these efforts by making both the sponsors of bill modifications and the modifications themselves, more visible to the public. Text-markup software is a simple addition to the legislative process, already widely used by lawyers in the private sector, and by many states. Requiring simple language explanations of what proposed changes are supposed to accomplish as a hyperlink would add to this visibility and help eliminate earmark programs that are little more than windfall payments to constituents. A final step to mandate that spending earmarks contain the name of the legislator introducing the language, and identify the beneficiary constituent(s) by name, would both help to fill the accountability vacuum that too often exists now.

Some aspects of this transparency have been proposed in the *Federal Funding Accountability and Transparency Act of 2006*, S. 2590, which passed the US Senate in September 2006 (U.S. Congress, 2006). That Act would establish an internet-based searchable database for recipients of federal funding through contracting, loans, grants, and cooperative agreements for the first time in US history. However, the Act has many gaps. For example, reporting applies only once earmarks have been passed, not at the point they are inserted into legislation. In addition, the Act requires much disclosure on the recipient, but little to none on the legislator that inserted the earmark into the bill. Finally, the language is fairly loose with regards to what types of value transfer will be captured. Loans are listed, but tax expenditures, loan guarantees, indemnification, and other non-cash based ways to reward constituencies are not explicitly mentioned.

Improving the transparency of tax expenditures

Subsidies through the tax code are both large and complex. In addition, the current procedures for estimating them are subject to virtually no public oversight making it impossible to gauge the quality and accuracy of the estimates produced by the US Treasury and the Joint Committee on Taxation.

Unlike budgetary expenditures where cash flows are visible and monitored by many government officials, the magnitude of tax losses can accelerate with little or no warning. Small changes in statutory language that create or expand eligibility to a broad array of new recipients can be nearly invisible to taxpayers and lawmakers alike. The Energy Policy Act of 2005, for example, opened eligibility for production tax credits under Section 45 of the tax code to electricity tax credits produced from "municipal solid waste." One might conclude that this expansion benefits a few score plants in the country generating electricity by burning residential waste. However, Act incorporates a specific definition of municipal solid waste that goes far beyond residential trash, though the Act itself, as is commonly done, incorporates this definitional sleight of hand by reference only. A single clause in the Act now defines municipal solid waste as almost any hazardous or non-hazardous waste stream in the country. It includes:

> *"any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under section 1342 of title 33, or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended" (68 Stat. 923) (42 U.S.C. 2011 et seq.)*

All eligible resources for Section 45 credits (and the list is growing rapidly) are captured in a single point estimate prepared by JCT. It is impossible to tell from this estimate whether all sources, including the wide range of industrial waste streams, were estimated in the values or not. Nor can one gauge whether the assumed market growth for each eligible resource fits generally with outside views on market trends.

More accurate prospective evaluation

The Joint Committee on Taxation is responsible for most evaluations of prospective legislation, though the Treasury also produces estimates for existing law. As a result, this section focuses on the JCT. Opening the tax expenditure cost estimation models and their associated assumptions to public review and validation is an important first step in establishing discipline and transparency to the world of tax subsidies. While Congress may have a legitimate need for confidentiality when they are costing out proposed legislative action, the public interest in accurate estimates trumps that interest the moment a hypothetical legislative change is introduced as a bill.

More resolution on the tax loss estimates are also needed, so that the beneficiaries – at least at the industry sector level – can be discerned from the summary tables JCT produces. Note also that evaluations of non-tax elements of prospective legislation is done by the Congressional Budget Office, and that improved resolution to identify key industry beneficiaries, and greater cost attribution to specific parts of legislation, would also be an important reforms for CBO.

A number of other reforms in the tax expenditure process would be helpful. As with the legislative language itself, evaluating tax expenditures can be very difficult. Sponsors may benefit by not giving JCT enough time to properly vet a bill. Implementing mandated scoring, and minimum time windows to do so that increase with the complexity and cost of the bill, are both important changes to reduce potential gaming of the process. A related reform to calculate the present value of proposed subsidies (this is already done with existing law) would address back-loading of subsidies towards the end of 10-year evaluation window used by JCT.

Recent decisions that have eliminated outlay equivalent estimates from tax expenditure reporting should be reversed. The outlay equivalent approach incorporates the fact that many tax expenditures are themselves tax-free. It is a better measure of market distortions caused by tax breaks than the revenue loss measurement of the subsidy's direct cost to the Treasury. Sunset language, phasing out tax breaks automatically after a stipulated period of time, would be helpful. So would assigning each special tax break a unique tax subsidy number that could be easily tracked in tax filings. This approach is already used by the Internal Revenue Service to track tax shelters.

Retrospective evaluation

The degree to which JCT and Treasury actively compare actual usage of tax breaks to what they had predicted in their models is difficult to discern. Staff at JCT has informally told me that they do conduct such assessments to improve their model accuracy. However, as with the prospective estimates, these comparisons are not publicly available. Stipulating the method and frequency that such evaluations are conducted would be helpful in ensuring that ex post evaluations are done with adequate regularity, and in a statistically justifiable manner. Similarly, both groups should be required to issue a formal variance report on their estimates versus actual on an annual basis. This report would be available to the public and document the cause of any prediction errors in excess of $100 million.

Improving transparency in credit and insurance programs

Credit and insurance programs are tracked to some degree by each agency. Special reports also tally projected credit subsidies across agencies. However, the link between aggregate exposure and losses and beneficiaries needs to be greatly improved. Listing the corporate and cooperative recipients of these federal programs is an easy solution. It can be modeled on what has been proposed in S. 2590, though must explicitly include loan guarantees and subsidized insurance programs. New commitments, and the performance of past ones, need to be published in a disaggregated, standardized way.

Current reporting requirements need bolstering to provide a more useful evaluation of the degree of subsidization. For example, administrative costs need to be incorporated into the pricing of the credit or insurance product. So too, financial risk modeling should be used to estimate the intermediation value of the commitments to recipients in order to be able to more accurately gauge the market distortions from government interventions. This is important since federal lending and insurance programs often have a selection bias in what types of activities receive access to the lower cost products.

Finally, a great deal of additional disclosure is needed regarding contingent liabilities, such as caps on nuclear accident or oil spill liability. Mandated disclosure of implicit insurance and liability caps generated by statutory actions should be standard and

centralized. The federal government should be required to estimate the expected value of exceeding these caps on an annual basis. In the energy sector, liability caps generate quite large *de facto* subsidies to particular fuel cycles.

Instituting transparency from outside of government

Past evidence suggests that effective internal reforms are likely to be heavily opposed by Congressional and industry beneficiaries. Thus, consideration of options to institute improved transparency from outside is also necessary. The core objective of external action is to develop enabling tools to see policy interventions more clearly, in near real-time.

Such tools are necessary. They aim to establish much improved baseline analytical capabilities. In many arenas, new capabilities are necessary to move NGOs or citizens from reactive to proactive; and to successfully challenge the concentrated financial interests of subsidy beneficiaries. However, the task is not easy. Successful implementation will require a higher level of coordination across non-governmental actors (and possibly some governments as well) than has currently been the case. Many of the reforms relate to tracking and are procedural in nature, not the normal glamour projects that are often attractive to funders. A dialogue with funders to convey why such tools are important will need to be established.

Longer-term, however, the tools should be self-sustaining. This would avoid a continued need for financial recharges from funders. Perhaps more importantly, however, establishing a viable revenue model will help to focus these tools on what is most useful; and to allow them to grow organically across geographic and topical areas of focus. A phased approach can speed payback and optimize incremental learning. Some of the tools that would be useful in the early phases are below.

Legislative versioning and comparison tools

While tracking changes as they are made is the most desirable, there is no reason this capability can't be added retroactively to released bills. Text comparison applications could be tailored to federal legislation. Not only could this application highlight changed language in different legislative releases, it could compare that language to a library built up over time of legislative proposals introduced in earlier sessions, or proposed by particular interest groups. The application could provide enhanced search and text compare functions, and could autogenerate links to statutes referenced in the bill, or being changed by it. Legislative language could also be linked automatically to a variety of external databases, such as on campaign contributions or emissions.

Because federal legislative proposals contain so much arcane language, definitions, and references, a large number of specialists are often needed to interpret various sections. A single organization is unlikely to have all of these specialists on staff. However, a broader network of organizations will likely have many of them. Developing a function to allow integrated commenting on legislative language would enable the specialized expertise interpreting each section to be quickly captured for the benefit of the whole, into an integrated commentary. Furthermore, it will provide a structured format to solicit and capture iterative interpretations or comments on particular clauses, gradually improving the understanding of what the legislative proposal or statute will engender.

Financial modeling and automated data integration tools

In the absence of internal reforms in tax expenditure and credit subsidy reporting, a number of innovations warrant development from the outside. Rule-based allocation of tax expenditures by sector could be developed for a variety of the larger tax expenditures, or with a focus on a particular sector or problem area. Core baseline data on capital investment, research and development expenditures, construction, and a handful of other economic activities, could be generated and maintained by a consortium of non-governmental users. These tools could also help highlight situations where official government estimates seem particularly inaccurate.

Similarly, credit and insurance risk pricing models to adjust the risk-based subsidy based on geography, industry, firm type, or firm size could also be generated by a consortium. Much of this core data already exists in financial firms and universities. Contracts with these data providers, combined with the development of translation routines to apply the data as needed in subsidy evaluation, would likely be a cost-effective way to proceed.

A central element of the *Federal Funding Accountability and Transparency Act* was the establishment of a searchable database of earmarks. A broader effort to make the entire federal budget searchable would be extremely valuable as well. Current searchable versions of the federal budget tend to be at a fairly high level of aggregation. Much more useful would be the ability to search topically at a disaggregated level of all of the federal agency budget submissions. Standardized search routines should be able to quickly generate cross-government spending patterns on particular areas (*e.g.*, ethanol, or coal), incorporating all methods of value transfer rather than just budget allocations. The tools would also allow one to drill down from high level totals to see details on program components.

Bringing in the States

Most states have their statutes on the internet, often in a searchable format. External groups could build integration utilities that search and compile data on these statutes to present a state and federal perspective on subsidies to particular sectors. To the extent that budgetary and other (*e.g.*, tax expenditure) data are available electronically, the federal tools could be gradually extended to the state level.

Conclusions

Energy subsidies remain a large factor in US energy markets, worth an estimated US$ 49 to US$ 100 billion per year from federal policy alone. The support is distributed unevenly across energy resources, with oil, gas, nuclear, and ethanol being large beneficiaries. Subsidy policies often conflict with social or environmental goals from other government agencies.

Rising subsidies to energy and other sectors in recent years reflects a lack of core checks and balances in the legislative and appropriations process. Addressing these structural problems will be vital in achieving spending reforms that help curb distortions in the energy sector. Three promising approaches to subsidy reform include 1) making subsidy recipients compete against one another and against market substitutes; 2) improving information availability and procedural transparency within government; and 3) improving these factors from outside of government should internal reform be blocked.

The objectives of all three approaches are similar. *First*, the approaches aim to provide much greater visibility on who is getting subsidized, which legislators enabled the policy, and how much subsidy particular groups are receiving. In addition to visibility, the methodological approaches to measure subsidies would be scrutinized and improved over time. *Second*, the approaches aim to more efficiently gather specialized knowledge on what particular legislative actions are putting in place, so that the policies can be more effectively challenged. *Finally*, the reforms would bring down the subsidy cost per unit of policy objective achieved, possibly to zero in some areas.

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ANNEX: TYPES OF GOVERNMENT SUBSIDIES

Intervention Type	Description
Access[‡]	Policies governing the terms of access to domestic on-shore and off-shore resources (e.g., leasing).
Cross-Subsidy[‡] *	Policies that reduce costs to particular types of customers or regions by increasing charges on other customers or regions.
Direct Spending*	Direct budgetary outlays for an energy-related purpose.
Government Ownership*	Government ownership of all or a significant part of an energy enterprise or supporting service organization.
Import/Export Restriction[‡]	Restrictions on the free market flow of energy products and services between countries.
Information*	Provision of market-related information that would otherwise have to be purchased by private market participants.
Lending*	Below-market provision of loans or loan guarantees for energy-related activities.
Price Controls[‡]	Direct regulation of wholesale or retail energy prices.
Purchase Requirements[‡]	Required purchase of particular energy commodities, such as domestic coal, regardless of whether other choices are more economically attractive.
Research and Development*	Partial or full government funding for energy-related research and development.
Regulation[‡]	Government regulatory efforts that substantially alter the rights and responsibilities of various parties in energy markets, or exempt certain parties from those changes.
Risk*	Government-provided insurance or indemnification at below-market prices.
Tax*[‡]	Special tax levies or exemptions for energy-related activities.

*Interventions included within the realm of fiscal subsidies.
[‡] Can act either as a subsidy or a tax depending on program specifics and ones position in the marketplace.

Source: Koplow, D. (1998). *Quantifying Impediments to Fossil Fuel Trade: An Overview of Major Producing and Consuming Nations.* Prepared for the OECD Trade Directorate.