MEMORANDUM

July 30, 2004

TO: Jason Grumet and Drew Kodjak, National Commission on Energy Policy

FROM: Doug Koplow, Earth Track, Inc.

SUBJECT: Federal Subsidies to Energy in 2003 - A First Look

Scope of Work

Value is shifted from the federal government to energy producers and consumers in complex and varied ways across scores of federal programs. Identifying and valuing these subsidies normally takes many months of intense work. This is one reason that highly detailed, multi-fuel subsidy assessments are conducted only very infrequently.

Because NCEP was interested in getting a general sense of how big energy subsidies are today, this memo and associated table were produced in roughly 45 hours of effort. While the programs to include, the valuation methods, and sometimes even the estimates themselves have all been informed by my earlier work, it was not possible to provide the level of detail in the analysis and valuations that a full subsidy assessment would provide. Data refinements, such as evaluating the portion of subsidies flowing to particular types of energy, were not possible. Some program areas, such as credit subsidies (discussed below) were too complicated to update in the available time frame. These caveats aside, the attached table evaluates more than 75 federal subsidies to energy, and provides a good overview of how the federal government subsidizes the sector and how much these programs are worth to the private sector.

Findings

Subsidies to energy for the government interventions evaluated were between $37 and $64 billion in 2003. This is higher than past estimates because none of the earlier studies (mine or others) have included both multiple fuels and oil defense costs.

As there are many ways to group programs, readers are encouraged to review the line items on the table to identify the programs of greatest interest to them. Among the largest sources of subsidy: defending oil shipping lanes in the Persian Gulf; improper accounting for inventory holding costs at the Strategic Petroleum Reserve; construction and maintenance of water infrastructure heavily used by coal and oil; federal spending on energy R&D; accelerated depreciation of energy-related capital assets; underaccrual for reclamation/remediation at coal mines and oil and gas wells; the energy share of federal spending on climate change research; the ethanol exemption from the excise fuel tax; and payments to deal with black lung problems in coal miners.

The last portion of the table also highlights two areas where large subsidies can encourage increased demand for energy: subsidies to driving and to construction. Identified subsidies to road infrastructure, usage, and parking were roughly $7 billion in 2003, though actual levels would be much higher if a comprehensive assessment were to be done. These subsidies allow users to pay less to drive. Since roads are mostly financed through excise taxes on gasoline, subsidies allow gasoline prices to be lower than they would otherwise be. On the construction side, a host of tax breaks worth more than $100 billion per year, help individuals and businesses acquire larger spaces than they otherwise could afford. Subsidies to second and third homes also contributes to sprawl, increased driving, and habitat loss. These subsidies do not subsidize energy as directly as those included in the main section of the table, they are big enough to affect energy demand in a material way.

Exclusions

A number of important elements are missing from the table, and would further increase annual subsidies to energy were they to be included.

- **Credit Subsidies.** The federal government subsidizes or guarantees credit for many types of energy-related activities. Agencies involved with these include the Rural Utility Service, the Power Marketing Administrations, the Export-Import Bank, and US contributions to a host of multi-lateral lending agencies often under the auspices of the World Bank. These subsidies are important, as energy portfolios have historically comprised a significant portion of the total credit portfolio. Koplow 1993 estimated credit subsidies at more than $3 billion per year (adjusted to 2003$). Lower interest rates today mean that the gaps between statutory interest rates and the actual costs of funds would be smaller, bring down the credit subsidies. Nonetheless, these programs probably confer well over $1 billion per year in additional subsidies, mostly flowing to conventional forms of energy (oil, coal, large scale hydro).

  Although federal credit reform has made agencies much more accountable for estimating and tracking credit subsidies, piecing together a realistic picture of these programs remains difficult. First, each annual budget tracks the estimated subsidies for a specific *cohort* of loans or guarantees: those to be made during the year being budgeted. Assembling a picture of the total subsidies for the institutions' outstanding loan and credit portfolio remains a time consuming task. Furthermore, reported credit subsidies do not include the costs of administering the loans; nor do they measure the *intermediation* benefit of the lending

activity. The intermediation benefit measures the value of the subsidy to the recipient, and is equal to the difference between the private market interest rate and the rate the borrower is actually being charged in the federal program. Both of these factors result in subsidy levels that are higher than are being reported to OMB.

- **Energy Related Externalities.** Energy systems generate wide ranging environmental and health effects. Proper pricing of these energy services would shift these costs to the fuels via taxes. The absence of these taxes constitutes a subsidy to polluting fuels. However, the attached table focuses on fiscal subsidies. External costs show up only when damages are being addressed through current federal outlays -- as with black lung payments and remediation of DOE uranium enrichment facilities. Were externalities included, subsidies to oil and coal would be much higher. Subsidies to hydro and nuclear would also rise.

- **New Energy Subsidies.** New legislation often contains new energy subsidies, or expansions to existing ones. With comprehensive energy legislation under consideration by Congress, there are tens of billions of new subsidies on the table. Many of these are poorly characterized. Inclusion of the programs was not possible within the available time frame.

Interpreting the Subsidy Table

All values are shown in 2003 dollars. Estimates from earlier years were scaled to 2003 using the GDP implicit price deflator. The most important columns for viewing subsidy magnitudes are those on the right side of the table showing the subsidy per year. Below is a quick description of each column.

Intervention. "Intervention" is a generic term for any government activity affecting the rights/responsibility of producers or consumers. Interventions can act as a tax or as a subsidy, depending on their specifics. The interventions are grouped by their stage in a generic fuel cycle. Interventions that act as taxes (excise fees, for example) tend to be included within the activity they are funding. For example, the assessment of shortfalls in the Black Lung Trust Fund will net out any collections of excise taxes on current coal mining activity.

Anticipated Major Beneficiary Energy Type(s). First approximation of which groups will benefit most from the particular subsidy line item. To generate estimates allocating subsidies back from electricity to source fuels, for example, more analysis and data collection would be needed.

Pro-rate factor. Many interventions are not targeted directly at energy even though the energy sector is a major beneficiary. To ensure only a portion of the total subsidy is allocated to energy, an appropriate pro-rate factor is chosen. While the factors vary by subsidy type, they are generally metrics of the energy sector's intensity of usage of the subsidized program. For example, subsidies to water transit have been allocated using the oil and coal shares of total tonnage using those systems. Pro-rate factors involve judgments and approximations, but provide much greater accuracy in estimates than would be possible by simply ignoring any federal program not targeting only energy.

Policy type. There are a variety of ways to subsidize activities in the economy, such as grants, tax breaks, credit subsidies, and indemnification. Time constraints precluded completing this column for all subsidies.

Status. The table should include only interventions active or believed to be active. In one or two cases, programs were in the process of being discontinued, but still had market impacts in 2003.

Trends/Issues. Catch-all column for descriptions of the intervention and for mentioning issues affecting the subsidy value or beneficiaries.

Low/High Subsidy Values. To more effectively bound the uncertainty in the valuation of energy subsidies, a range rather than a point estimate has been used. Low and high values differ for a variety of reasons. Different sources may have come up views on subsidy magnitude. There may be more than one reasonable pro-rate factor, or a range for that input. For tax subsidies, the high estimate often includes the incremental subsidy associated with the fact that the tax break itself is tax-exempt. This "outlay equivalent" measure is used by the US Treasury in their annual tax expenditure budget, but not by the Joint Committee on Taxation. For credit subsidies (had they been included), the low estimate normally measures the direct cost to the Treasury, while the high estimate includes the intermediation benefit to assess the value of the credit subsidy (and associated market distortion) to the recipient.

Subsidy Per Year. Estimates for multi-year periods help to generate a more level picture of the subsidy. Where a multi-year range was used, the subsidy per year column converts these to an average annual value. Where subsidies are in the form of underaccruals for future or present liabilities (e.g., abandoned coal mine lands), the annualized value represents how much more would need to be collected each year (growing at a 2% real interest rate) to achieve solvency over a specified number of years.

Source(s): Abbreviated sources. Full listings can be found at the back of the table.

Federal Subsidies to Energy, 2003 -- A First Look

This document represents a rough estimate of federal programs supporting energy. It has been prepared for NCEP to provide a general view of the current subsidies picture. Much additional work is needed to update and refine subsidy allocation factors and supporting data.

	Intervention	Anticipated Major Benefiary Energy Type(s)	Pro-rate Factor	Policy Type	Status	Trend/Issues	LOW - Current Value ($mils) Low	Period	# Yrs in period	HIGH - Current Value ($mils) High	Period	# Yrs in period	Per Year ($mils) Low	High	Source(s)
1. Preproduction															
1.1 Research and Development															
>	Expensing of long-term R&D costs		Energy share of private R&D	Tax			420	2004-08	5	469	2005-09	5	84	94	JCS-8-03, 20; PNL (see detailed calcs); Treasury (high est).
>	R&D tax credit		Energy share of private R&D	Tax			98	2005-09	5	127	2004-08	5	20	25	JCS-8-03, 20; PNL (see detailed calcs); Treasury (low est).
	Expensing of contributions to industry research consortia	Natural gas, electric power, alternative-fuel vehicles.				Some energy research is financed by multi-firm consortia (e.g., the Electric Power Research Institute). Evaluating the amounts, and whether the pooled contributions are missing from other R&D numbers would require additional research.							-		
>	Government energy R&D support through DOE, other agencies	Nuclear fission (17.7%); Nuclear fusion (16.2%); fossil (32.6%); all renewables plus conservation (30.2%); power systems (3.4%)	None.	Grant	Active		11,840	1998-2003	6	11,840	1998-2003	6	1,973	1,973	Derived from DOE, BA hist by approp 1978-2004 wksheet
>	Energy new technology credi		None.	Tax	Active		1,850	2005-09	5	2,470	2005-09	5	370	494	Treasury, 287 and 296
>	USDA research into bioenergy	Biomass	Assume 50% of USDA spending linked to energy, 50% to food.		Active	Pro-rate factor of 50% energy is a guess.	143	2003	1	143	2003	1	143	143	Budget data from Duncan, p. 198. Pro rate factor is a guess.
	Allowance of foreign research expenditures to offset domestic income												-		
1.2 Resource Location/Characterizatior													-		
>	US Geological Survey minerals assessment work	Oil, gas, coal		Agency	Believed to be active.	Represents USGS spending on oil only; inclusion of othe fuels would result in a higher number.	23	1995	1	49	1995	1	23	49	Koplow/Martin 1998, 3-2.
	USGS evaluation of earthquake, other risks for power plant siting						NQ			NQ			-		
>	Resource, market characterization, Energy Information Administration	Multi-fuels	None.	Gov't owned/provided services	Active		80	2003	1	80	2003	1	80	80	BA hist by approp 1978-2004 wksheet
													-		
2. Production													-		
2.1 Extraction of Energy Resources													-		
2.1.1 Accessing Publicly Owned Energy Resources													-		
	Competitiveness of bidding					Major US auctions appeared to be competitive (Koplow/Martin, 1998). Many smaller sales are not competed, as are some lease extensions, expansions. Proposed energy legislation contains language that could greatly worsen the problem of non-competitive awards.	NQ			NQ			-		
	Bonding requirements					Plugging and abandonement coverage is inadequate. This is addressed in section 4.1. Historical problems with allowing continued access to federal leases to firms with bond defaults in the past; current status would need to be researched. Also, concerns over coal mine bonding also need verification.	NQ			NQ			-		
	Royalty undercollections or reductions												-		
>	Oil recoveries: improper reporting of oil royalties due	Oil		Access	Litigation may be complete.	Hard to gauge withouth detailed research whether settlements still continuing; full range of period of damage; or amount awards have been reduced on appeal.	445	1990-02	13	445	1990-02	13	34	34	POGO, oil, 2002.
>	Natural gas recoveries: improper reporting of oil royalties due	Gas		Access	Litigation may be complete.	Hard to gauge withouth detailed research whether settlements still continuing; full range of period of damage; or amount awards have been reduced on appeal.	11,489	1990-02	13	11,489	1990-02	13	884	884	POGO, gas, 2002.
>	Lapses in BLM royalty auditing	Oil and gas	None.	Access	Unknown whether past weaknesses corrected.		59	1994	1	88	1994	1	59	88	House Committee on Nat. Resources, 1994.

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>	Royalty relief, deep water drilling	Oil and gas		Access	Active	Estimate appears to include only oil; oil and gas value would be higher.	14	ann. avg. from est., 1996-2020	1	14	ann. avg. from est., 1996-2020	1	14	14	Koplow/Martin 1998, 6-14; CBO, 11/2/95.
	Royalty relief: Gulf Coast, Alaska												-		
Losses on public resource sales													-		
	Forest Service losses, timber sales, fuelwood fraction	Biomass			Active		72	2004-08	5	72	2004-08	5	14	14	CBO, budget options, 2003.
2.1.2 Promoting Extraction Activities		Substantial state-level subsidies as well.											-		
>	Capital gains treatment, certain timber income, fuelwood fraction	Biomass	Fuelwood fraction	Tax	Active		110	2005-09	5	146	2005-09	5	22	29	Treasury, 287, 297.
>	Capital gains treatment, coal royalties	Coal		Tax	Active		640	2005-09	5	850	2005-09	5	128	170	Treasury, 287, 296.
>	Expensing exploration and development costs: oil and gas	Oil and gas		Tax	Active		2,000	2004-08	5	2,000	2004-08	5	400	400	JCS-8-03, 20.
>	Expensing exploration and development costs: other fuels	Coal, geothermal, uranium		Tax	Active		200	2004-08	5	460	2005-09	5	40	92	JCS-8-03, 20; Treasury (high est.)
>	Expensing tertiary injectants												-		
>	Tax credit, enhanced oil recovery costs	Oil and gas		Tax	Active		1,500	2004-08	5	3,410	2005-08	5	300	682	JCS-8-03, 21; Treasury, 296 (high est).
>	Expensing multi-period timber growing costs	Biomass		Tax	Active		172	2004-08	5	2,470	2005-09	5	34	494	JCS-8-03, 21; pro-rate from detailed calcs page. Treasury, 297 (high est).
>	Excess of percentage over cost depletion: oil and gas	Oil and gas		Tax	Active		2,400	2004-08	5	3,860	2005-09	5	480	772	JCS-8-03, 20; Treasury, 29, high est.
>	Excess of percentage over cost depletion: other fuels	Coal, geothermal, uranium		Tax	Active		100	2004-08	5	160	2005-09	5	20	32	JCS-8-03, 20.; Treasury, 296 (high est.)
>	Gas/Oil exception to passive loss limitation	Oil and gas		Tax	Active		100	2005-09	5	100	2005-09	5	20	20	Treasury, 287 and 297.
	Alternative minimum tax relief for oil and gas producers												-		
	Special treatment, Alaskan Native Corporation losses												-		
>	Subsidies to agricultural production used for fuels: corn	Ethanol	Share of corn used to make ethanol (9.3%)	Mixed	Active		3,225	1995-02	8	3,225	1995-02	8	403	403	EWG, Corn; prorate from USDA 2004, p. 38.
>	Deferral of income from controlled foreign corporations	Oil	Oil share of foreign pre-tax income x JCT ests. for this tax expenditure for all industries.	Tax	WTO case; being replaced	This tax subsidy has been declared illegal by the World Trade Organization. It is being replaced by new tax breaks for industry in legislation now before Congress. The effect of the replacement on the ultimate size of subsidies to the energy industry remain unclear.	71	1995	1	346	1995	1	71	346	Koplow/Martin, 1998, p. 2-7.
													-		
2.2 Conversion													-		
2.2.1 Capital subsidies													-		
>	Accelerated depreciation for energy infrastructure (buildings, equipment) - energy share	Oil, natural gas, coal-electric, gas-electric. Historically, fission also large beneficiary.		Tax	Active	Note use of single year value for Treasury (high) estimate. Treasury shows large negative numbers in later years for these, indicative of expiring provisions or phase-out of recent increases in highly accelerated schedules. This ma not happen; plus, subsidy value today remains large.	25,977	2004-08	5	10,633	2003	1	5,195	10,633	Low: JCS-8-03, 23; High: Treasury, 297; Pro-rate: Koplow'93 (see detailed calcs).
>	Tax-exempt private activity bonds: energy facilities	Coal, natural gas.		Tax	Active		870	2005-09	5	900	2004-08	5	174	180	JCS-8-03, 21; Treasury, 296 (low est.)
>	Tax-exempt bonds, public power			Tax		IRS release data does not break out utility use-of-proceeds to show energy (including distribution networks) alone. Value here includes water, wastewater as well.	3,511	2004-08	5	5,140	2004-08	5	702	1,028	See munic bond calc page
>	Tax-exempt private activity bonds: solid waste/waste-to-energy facilities						1,294	2004-08	5	1,520	2004-08	5	259	304	See munic bond calc page
	Interest-rate subsidies, public power												-		
	No required rate of return, public power												-		
	Subsidized credit, Rural Utility Service												-		

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	Subsidized credit, Power Marketing Administration												-		
	Subsidized credit, multi-lateral development banks												-		
	Subsidized credit, Export-Import Bank												-		
>	Tax credits for investment in solar, geothermal facilities	Solar, geothermal		Tax	Active		100	2004-08	5	100	2004-08	5	20	20	JCS-8-03, 21.
													-		
													-		
	2.2.2 Tax Credits and Exclusions												-		
>	Alcohol fuel blenders	Ethanol		Tax	Active		25	2004-08	5	150	2005-09	5	5	30	JCS-8-03, 21; Treasury, 296
>	PTC, existing: wind, closed loop biomass, poultry	Primarily wind; other two categories neglible		Tax	Active		1,100	2004-08	5	1,100	2004-08	5	220	220	JCS-8-03, 21.
	PTC, proposed	Biomass, etc.											-		
	Oil and gas enhanced recovery												-		
>	PTC, "non-conventional" fuels	Oil, gas, coal		Tax	Active		2,600	2004-08	5	4,020	2005-09	5	520	804	JCS-8-03, 21; Treasury, 296 (highest).
	Foreign tax credits in excess of standard (non-oil) baseline	Oil		Tax	Active	Historically between $0.5 and $1.0 billion per year. Complicated area; insufficient time to update.	NQ	NQ					-		Koplow/Martin, 1998, p. 2-6; Wahl, 1996.
>	Tax exemption, certain mutual and cooperatives income.	Electricity	Energy share of total cooperatives, estimated in Koplow 1993 at 56%.	Tax	Active		196	2005-09	5	230	2005-09	5	39	46	High: Treasury, 297; Low: Treasury, 288; pro-rate: Koplow 1993, p. B2-35.
>	Tax exemption, public power	Electricity		Tax	Active	Estimated by applying average tax rate of private utilities to net income of publicly-owned utilities. Scaled from Koplow 1993; then reduced by 25% to estimate reductions in corporate tax rates and possible privatizations since that time period.	286	1989	1	286	1989	1	286	286	Koplow 1993, B2-36.
	Tax-exemption, government-owned power and energy lending entities	Electricity				As with municipally-owned energy operations, federally owned entities are also able to deliver energy at a lower price in part because they are exempt from taxation. This includes Power Marketing Administrations, TVA, the Rural Utility Service, and even lending institutions such as the Export-Import Bank.	NQ			NQ			-		
													-		
	2.2.3 Purchase mandates												-		
	Ethanol purchase mandates			Purchase mandate	Believed to be proposal only at fed. level.		NQ			NQ			-		
>	Renewable energy portfolio standards	Depending on state, may include all types of biomass, landfill gas, WTE, even waste coal piles -- as well as wind, solar, closed loop biomass.		Purchase mandate	Active, but only at the state level.	This is currently a state-level subsidy only, though there are attempts at a national standard.	NQ			NQ			NQ	NQ	
													-		
2.3	**Transportation and Distribution**												-		
>	Tax-exempt private activity bonds: docks, wharves, seaports, harbors						113	annual avg., 1996-2000	1	155	annual avg., 1996-2000	1	113	155	Muni Bond calc. page
>	Army Corps operating and capital subsidies, commercial harbors, energy share	Oil, coal	Oil and coal share of total tonnage shipped.	Agency			770	2004-08	5	770	2004-08	5	154	154	CBO 2003; USAC for pro-rate
>	Army Corp unreimbursed costs, infrastructure development, energy share	Oil, coal	Oil and coal share of total tonnage shipped.	Agency			530	2004-08	5	530	2004-08	5	106	106	CBO 2003; USAC for pro-rate

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	No rate-of-return on Army Corp provision of insfrastructure services					Provision of engineering services by a government entity not subject to taxation or to earning a reasonable return on invested capital contributes to a reduced need for cost recovery from users of the water infrastructure. Competing energy services reliant on transmission, private pipelines, o end use efficiency are disadvantaged.	NQ			NQ			-		
>	Tax deferral on shipping companies that are US flag carriers (via US Maritime Administration)	Primarily oil; some coal.	Energy share of total cargo capacity, US flag carriers	Tax	Active		75	2005-09	5	300	2004-08	5	15	60	JCS-8-03, 24; Koplow '93 (detailed calcs page). Treasury, 297 (low est).
>	US Coast Guard maintenance of shipping lanes	Oil, coal	Oil and coal share of coastal tonnage shipped.	Agency	Active	Current values may differ from these as a result of new Coast Guard activities for homeland security. Values represent oil shipping only; coal would increase energy share of subsidies somewhat.	522	1995	1	522	1995	1	522	522	Koplow/Martin, 1998, p. 3-2.
													-		
													-		
	2.4 Accident Risks/Known worker safety risks												-		
	2.4.1 Nuclear accident liability/plant safety												-		
>	Price Anderson Act - reactor liability	Nuclear fission		Indemnification	Active	Value shown here is for reactors only; excludes federal fue cycle facilities, disposal sites, transporters, contractors.	356	2002	1	356	2002	1	356	356	Heyes, 2002.
>	Price Anderson Act - fuel cycle, contractor, transporter liability	Nuclear fission		Indemnification	Active	Never seen this quantified.	NQ			NQ					
>	Nuclear LLCs and P-A 2nd tier	Nuclear fission		Indemnification	Derivative	Ownership of plants by single asset LLCs increases the likelihood of default on tier 2 coverage (retrospective premiums) under the P-A act. This increases the total subsidy to commercial plants that the Act provides.	NQ	NQ					-		
>	Nuclear Regulatory Commission, net of offsets	Nuclear fission			Active	After 2005, cost recovery from industry slated to drop from 90% to 33%. Based on total outlays in 2003 of $576m, total subsidy would rise to more than $380m/year.	50	2003	1	50	2003	1	50	50	OMB FY05 Budget, Indep. Agencies excel file, line 1058, 1062.
	2.4.2 Oil spills												-		
	Uncovered liability risks shifted to public	Oil		Indemnification	Active	Damage from large oil spills have historically, and are expected to in the future, exceed mandated caps for privat insurance plus maximum payouts from the Oil Spill Liability trust fund. Lower than necessary bonding requirements generate a subsidy to oil shippers.	NQ			NQ			-		Koplow/Martin, 1998, pp. 5-10 - 5-14; Koplow 2004, p. 757.
>	Access to Navy Supervisor of Salvage oil spill equipment at zero reserve price	Oil		Agency	Believed to be active		-	1995	1	21	1995	1	-	21	Koplow/Martin, 1998, p. 3-2.
>	US EPA oil spill response, net of offsetting collections	Oil		Agency	Active	Possibly reimbursed by some other trust fund.	13	2003	1	13	2003	1	13	13	OMB, FY05 Budget, EPA excel table, line 112.
													-		
	2.4.3 Catastrophic dam failure												-		
	2.4.4 Mining												-		
	Subsidence												-		
>	Tax-exemption, payments to disabled coal workers	Coal		Tax	Active		230	2005-09	5	300	2004-08	5	46	60	Low: Treasury, 298; High: JCS-8-03, p. 28.
>	Black Lung Disability Trust fund shortfalls (Employment Standards Admin. of the Dept. of Labor)	Coal			Active	Fund deficit as of 9/03 was $8.2 billion. Excise fees too lo to cover. Increases needed to pay down deficit over 15 years (2% real interest rate) are shown.	623	Annualized payment for 15 year payoff	1	623	Annualized payment for 15 yr payoff	1	623	623	Shortfall from DOL 2003 Annual report: http://www.dol.gov/_sec/media/reports /annual2003/principal_financial_statem ent-10.htm ; Earth Track calculations.
>	Supplemental benefits to disabled coal miners (ESA of the Dept. of Labor)	Coal			Active	Annual appropriations from general fund to support worker harmed in the coal industry. Not supported by coal excise taxes.	421	2003	1	421	2003	1	421	421	OMB, FY05 Budget, DOL Excel table, line 207.
>	Mine Safety and Health Administration (Dept. of Labor)	Mainly coal; some benefits to uranium mines.	72% to energy (Koplow 1993), based on shares of enforcement budget.		Active	Pro-rate factors based on old data; current spending mix may differ.	191	2003	1	191	2003	1	191	191	OMB, FY05 Budget, DOL Excel table, line 263; pro-rate from Koplow 1993, App. B, after B4-118.
>	Occupational Safety and Health Administration (Dept. of Labor)	Coal, oil, gas.	Share of inspections		Active	Unable to quantify at this time.	NQ			NQ			-		
	2.4.4 Worker Health, Nuclear Fuel Cycle												-		

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>	Energy employees occupational illness compensation fund	Nuclear fission, fusion	Adjusted commercial share of DOE enrichment D&D expenses.		Active	Pro-rate factor needs adjustment. Excludes fusion research (understating energy sector share), but based on enrichment activities only (overstating energy sector share Funding all from Treasury; no excise on commercial contributors.	321	2003	1	321	2003	1	321	321	OMB, FY05 Budget, DOL Excel table, line 198; pro-rate from Koplow 1993, App. B.
													-		
	3. Consumption												-		
	3.1 Poverty alleviation												-		
>	Low income home energy assistance program (LIHEAP) [Admin. for Children and Families in Dept. of Health & Human Services]	Mostly oil, gas, electricity; some DSM.		Grant	Active		2,030	2003	1	2,030	2003	1	2,030	2,030	OMB, FY05 Budget, HHS Excel table, line 414.
	3.2 General subsidies to consumption												-		
	"Postage stamp" pricing of electricity			Cross-subsidy	Active	This pricing approach generates the same average price across fairly wide geographic regions. The result is a cross-subsidy between areas of high density/close proximity to generation to those far away and/or with low populations (often rural). This cross-subsidy destroys important niche markets for renewable and decentralized energy, and end-use efficiency -- markets that would be competitive at today's prices with pricing transparency.	NQ			NQ			-		
>	Power Marketing Administrations: WAPA, SWPA, SEPA, below-market pricing of power	Mostly hydroelectricity		Government-owned enterprise	Active	PMAs often have large historical, financing subsidies as well.	640	2004-08	5	640	2004-08	5	128	128	CBO 2003 budget
>	TVA pricing below what is needed for debt service	Electricity			Active		1,080	2004-08		1,080	2004-08		-		CBO 2003 budget
													-		
	3.3 Targeted exemptions/tax benefits												-		
>	Ethanol partial exemption from motor fuels tax	Ethanol		Tax	Active		4,400	2004-08	5	8,590	2004-08	5	880	1,718	Low estimate: http://www.cbo.gov/bo2003/bo2003_showhit1.cfm?index=REV-25; High estimate: Treasury, 289. For some reason, rev. loss est. higher than outla equiv. on this one.
>	Electric/alternative fueled vehicles	Electricity, LNG, LPG, hydrogen, methanol, ethanol, other alcohols.		Tax	Active		90	2003	1	500	2004-08	5	90	100	JCS-8-03, 24; Treasury, 296 (low est.)
>	Exclusion of utility demand reduction payments from income tax	End-use efficiency		Tax	Active		100	2004-08	5	520	2005-09	5	20	104	JCS-8-03, 21; Treasury, 296 (high est.)
													-		
	4. Post-production activities												-		
	4.1 Long-term Management/Site Decommissioning												-		
	Funding for nuclear decommissioning, decontaminating nuclear fuel cycle sites												-		
>	Reduced tax rate on income earned by qualified nuclear decommissioning trusts	Nuclear fission		Tax	Active		1,800	2004-08		1,800	2004-08		-		JCS-8-03, 21.
	Tax-exempt transfers of decommissioning trust funds	Nuclear fission				A variety of complex rules allow transfer, pre-funding o decommissioning trust funds. They have large potential avoided taxes (billions of dollars), but would require additional analysis to evaluate properly. Key issue is whether utilities retain access/control/influence on funds or not.	NQ			NQ			-		
>	Decontamination and Decommissioning Fund shortfalls	Nuclear fission											-		
>	-Underallocation of current funding to commercial sector	Nuclear fission	DOE funding split is 30% commercial, 70% defense. Seems too low based on other data (Koplow, 1993). Subsidy rate is 47% - 30%, or 17%.	Liability	Active	When I looked at the defense/commercial split in detail in the early 1990s, the commercial share came up much higher than 30%. Shipments of separative work units from 1969-89 were 88% commercial. Prior period probably had more defense. But DOE pegged the commercial share in 1989 at nearly 47% (UEE ann. report, 1989, p. 35). More research would be needed to vet these various figures.	130	2004-05	2	130	2004-05	2	65	65	OMB, FY05 Budget, DOE Excel table, line 164; pro-rate from Koplow 1993, App. B, after B4-74.

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	Intervention	Anticipated Major Benefiary Energy Type(s)	Pro-rate Factor	Policy Type	Status	Trend/Issues	LOW - Current Value ($mils) Low	Period	# Yrs in period	HIGH - Current Value ($mils) High	Period	# Yrs in period	Per Year ($mils) Low	High	Source(s)
>	-Long-term uncovered liabilities in the fund, commercial share	Nuclear fission	Commercial subsidy would be 47% of the annualized shortfall.	Liability	Active	GAO projects most likely collection shortfall of $3.5-$5.7 billion by 2044, of which $1.65-$2.68b should fall on the commercial sector. Value shown is annual payment needed to accrue this shortfall over 40 yrs. at a 2% real interest rate.	27	annualized payment for 2005-2044	1	44	annualized payment for 2005-2044	1	27	44	Shortfall from GAO-04-692, 4; annualization based on Earth Track assumptions.
	Post-closure care, landfills												-		
	Reforestation												-		
	Tax credit and rapid amortization, reforestation expenses												-		
													-		
	Oil & gas well plugging and abandonment; pipeline removal												-		
>	Underbonding for current operations, increase in annual premium cost	Oil and gas	Total wells pro-rated by est. likelihood of ending up in public domain.	Liability	Active	Current coverage requirements, bonding availability, and bond prices would affect total estimates.	253	1995	1	961	1995	1	253	961	Koplow/Martin, 1998 & supporting data workbooks.
>	Backlog - improperly closed oil and gas wells	Oil and gas	Total wells pro-rated by est. likelihood of ending up in public domain.	Liability	Active	Values assume relatively small fraction of total portfolio end up requiring public bailout. Actual value probably substantially higher.	1,214	Backlog; assume 10-yr workoff	10	3,060	Backlog; assume 10-yr workoff	10	121	306	Koplow/Martin, 1998 & supporting data workbooks.
	Mine closure												-		
>	Special rules for mine closure and reclamation reserves	Predominantly coal.		Tax	Active		200	2004-08		200	2004-08		-		JCS-8-03, 21.
													-		
	4.2 Waste Management												-		
	Shortfall in collections, federal nuclear waste fund												-		
	Nuclear Waste Technical Review Board	Nuclear fission			Active		3	2003	1	3	2003	1	3	3	OMB FY05 budget, Indep. Agencies Excel table, line 1069.
													-		
	4.3 Reclamation and remediation												-		
	Abandoned coal mine lands	Coal			Active	Excise fees currently fund about $280m/yr in coal site remediation. However, there is a huge and poorly characterized backlog estimated at $30b, with only $1.6b in the trust fund. Coal excise fees are slated to expire in 2015. Even allowing for excise fee renewal, and 25 years to clear the site backlog, collections still lag need by roughly 1 billion per year.	1,174	Annualized payment, 2004-2029	1	1,174	Annualized payment, 2004-2029	1	1,174	1,174	See sources on detailed calcs page.
	Expensing of environmental remediation costs	Not known	Should be pro-rated by energy share of facilities.	Tax	Active		80	2003	1	110	2003	1	80	110	High: Treasury, 297; Low: Treasury, 288.
													-		
	5. Energy externalities												-		
	5.1 Energy security												-		
	5.1.1 Protection of assets and supply links												-		
>	Defending Persian Gulf oil shipments (DOD)					Estimate by Jaffe (p. 5) uses $20b/yr (2004$); falls w/in Koplow/Martin range.	12,047	2003	1	26,733	2003	1	12,047	26,733	Koplow/Martin
	Domestic nuclear power assets												-		
>	Domestic oil production (Dept. Homeland Security)	Oil	None	Grants	Active		38	2004	1	38	2004	1		38	http://pogo.org/p/environment/el040501-oil.html
	Trans Alaskan Pipeline System	Oil				TAPS is clearly and important asset, and the military has conducted drills simulating an attack on the line. However Koplow/Martin were unable to find any information on defense spending related to the line. Spending is likely to have increased since 9/11/01.	NQ			NQ			-		Koplow/Martin, 4-14.
>	Foreign pipelines, production fields (e.g., Columbia)	Oil			Unknown if funding is recurring.	There may be allocations like this for many parts of the world, buried in the defense and homeland security budgets. Assume (arbitrarily) that the funding noted supported three years of effort.	98	2003	3	98	2003	3	33	33	Reeker, 2002;

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	Intervention	Anticipated Major Benefiary Energy Type(s)	Pro-rate Factor	Policy Type	Status	Trend/Issues	LOW - Current Value ($mils) Low	Period	# Yrs in period	HIGH - Current Value ($mils) High	Period	# Yrs in period	Per Year ($mils) Low	High	Source(s)
	Domestic pipeline security, Department of Homeland Security	Oil, natural gas	Energy pipeline share of all activities undertaken by DHS "Transportation Security Enterprise."		Active	No budget detail to assess pipeline share. Assume 10% a a placeholder.	15	2005	1	15	2005	1	15	15	Parfomak, 18.
	Maritime Adminstration (DOT) security program	Likely benefits oil shipments			Active	Funding in 2003 was $97million. Insufficient data tc determine energy sector portion; use 10% as a placeholder.	10	2003	1	10	2003	1	10	10	OMB, 2005 Budget, DOT excel table, line 593.
													-		
	5.1.2 Stockpiling												-		
>	Improper costing/cost recovery for Strategic Petroleum Reserve	Oil		Agency	Active	Costs driven by financing capital and inventory. Declining interest rates have halved this subsidy since the late 1990s Will rise again with rates. High/low spread driven by compounding of past unpaid financing costs.	840	2003	1	3,000	2003	1	840	3,000	Koplow, Oil & Gas, 11/17/03, p. 1
>	Northeast Heating oil reserve	Oil		Agency	Active	Similar issues as with SPR. May displace rather thar expand private storage, mitigating buffering benefits.	20	2003	1	20	2003	1	20	20	Koplow, Oil & Gas, 11/17/03, p. 2
													-		
	5.2 Environmental, health, and safety externalitie												-		
													-		
	Nuclear Proliferation												-		
	International Atomic Energy Agency												-		
													-		
	Oversight and analysis by federal agencies related to energy systems												-		
	US Fish and Wildlife Service												-		
	US National Oceanic and Atmospheric Administration												-		
>	Office of Surface Mining Reclamation and Enforcement (DOI) - Regulation and technology	Coal	None	Agency	Active	OSMRE oversees regulation of new mines, reclamation oi old mines. This program was not historically financed by coal fees, though this may have changed.	104	2003	1	104	2003	1	104	104	OMB, FY05 Budget, DOI Excel table, line 167.
													-		
	Targeted exemptions to environmental laws												-		
	Mining waste												-		
													-		
	Windfall grants of pollution credits												-		
	GHG credits for existing practice, nuclear plants												-		
	US Climate Change Science Program														
>	Funding across 13 federal agencies on climate change-related problems	Coal, oil, biomass, landfill gas	Energy-related share of total human contribution to radiative forcing.	Grants	Active	Not yet pro-rated to energy sector only. Indications of funding cuts in more recent fiscal years.	3,062	2003	1	3,062	2003	1	3,062	3,062	http://www.climatescience.gov/Library/nventory/Inventory_budgetsummary_26Aug02.pdf
													-		
	6. Cross-cutting												-		
	Incremental reduction in state taxes due to federal tax breaks to energy	All energy sources.											-		
													-		
	7. Total Estimated Energy Subsidies/Year												36,967	63,692	
	Fuel Royalty Offsets and Additional Subsidies Affecting Energy Demand														
	8. Subsidies to Activities that Promote Increased Energy Consumptio														
	a. Support for Road Infrastructure and Usage					Public subsidies to road infrastructure reduce the visibl cost of driving to road users. Road use constitutes by far the largest use of oil, and user fees are primarily collected through fuel taxes. Road subsidies allow lower fuel costs than would otherwise be possible.									

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>	Tax-exempt bonds: roads and highways	Oil, road users.		Tax	Active		3,299	annual avg., 1996-2000	1	4,830	annual avg., 1996-2000	1	3,299	4,830	Muni Bond calc. page
	Direct federal funds for roads not recovered through taxes on users					Gas taxes at all levels of government cover most, but not all, the costs of highway construction and maintenance. However, once one adjusts to remove baseline commodity sales taxes on gasoline from attribution to roads (to make neutral w/ state taxation of all other products), the deficit rises to tens of billions per year.	NQ			NQ					
	Backlog of road maintenance, deferring true cost of road network					Poor maintenance acts to suppress real cost of road infrastructure and driving.									
	Exemption of roadways from property tax or payments in lieu of taxes	Oil, road users.		Tax	Active	Even federal forests pay states for tying up land in a particular use. Roads generally pay nothing. Lots more on this at www.vtpi.org.									
>	Tax exclusion, employer-paid transportation benefits	Primarily oil (consumption).		Tax	Active	Supports driving, oil consumption; does not directly subsidize oil though. Treasury attributes 18% of total cost to subsidized mass transit, 82% to parking.	19,200	2004-08	5	20,560	2005-09	5	3,840	4,112	JCS-8-03, 24; Treasury, 297 (high est).
	Total direct subsidies to roads and driving												7,139		
b. Support for General Housing/Building Infrastructur															
	Tax breaks for commercial & residential real estate					Subsidies to construction have been shown to contribute to larger square footage per person, driving up energy use. Subsidies to second homes encourage sprawl and habitat destruction as well as higher baseline energy demand.							-		
>	Mortgage interest rate deduction	Pro-rate based on home energy consumption.		Tax	Active		372,200	2004-08	5	393,910	2005-09	5	74,440	78,782	JCS-8-03, pp. 22, 23; Treasury, 297 (high est.)
>	Property tax deduction	Pro-rate based on home energy consumption.		Tax	Active		76,850	2005-09	5	76,850	2004-08	5	15,370	15,370	JCS-8-03, pp. 22, 23; Treasury, 297 (low est.)
>	Capital gains exemptions on sale of principal residence	Pro-rate based on home energy consumption.		Tax	Active		91,400	2004-08	5	149,655	2005-09	5	18,280	29,931	JCS-8-03, pp. 22, 23; Treasury, 297 (high est.)
>	Tax-exempt bonds for construction of rental & owner-occupied housing.	Pro-rate based on home energy consumption.		Tax	Active		7,300	2004-08	5	11,430	2005-09	5	1,460	2,286	JCS-8-03, pp. 22, 23; Treasury, 297 (high est.)
	Tax exemption of public purpose debt, housing			Tax	Active		151	Average, 2004-08	1	222	Average, 2005-09	1	151	222	See Muni Bond calc page
	Total subsidies to construction												109,701	126,591	
9. Subsidies to Energy related pollution															
	Public purpose debt, environmental purposes			Tax	Active	Likely that substantial share of environmental spending linked to energy fuel cycles.	1,963	Avg., 2005-09	1	2,874	Avg., 2005-09	1			See Muni Bond Calcs page.
10. Offsets to Programs Supporting Energy, or to Royalties from Energy													-		
a. Cost to oversee minerals royalties															
	Bureau of Land Management (DOI), management of lands and resources	Oil, gas, coal	Energy share of total land management costs	Agency	Active	Costs not added to total; would reduce gross royalties from resource sales.	837	2003		837	2003				OMB, FY1995 budget, DOI Excel table, line 21.
	Minerals Management Service (DOI), offshore royalty and minerals management.	Oil, gas	All to energy	Agency	Active	Costs not added to total; would reduce gross royalties from resource sales.	1,161	2003		1,161	2003				OMB, FY1995 budget, DOI Excel table, line 116.
b. Energy-related Trust Funds						The many energy-related trust funds are picked up as offsets to other subsidies. There are none that are running above the expected long-term cost of the energy-related liabilities the funds were created to address. Where there are long-term shortfalls, these have been included above.									

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Source Code	Source Detail
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