

# POLICY *Brief*

## A How-to Guide: Measuring subsidies to fossil-fuel producers

WHAT IS A  
PRODUCER  
SUBSIDY?

WHAT  
METHODOLOGIES ARE  
AVAILABLE FOR  
ESTIMATING  
PRODUCER  
SUBSIDIES?

WHAT ARE THE  
CHALLENGES FOR  
MEASURING  
SUBSIDIES TO FOSSIL  
FUELS?

NEXT STEPS:  
IMPROVING SUBSIDY  
ESTIMATION

### INTRODUCTION

The production of fossil fuels—oil, coal and gas—is subsidized by countries across the world. But public information about how countries subsidize fossil-fuel producers, and to what extent, is scarce. How can societies decide whether subsidizing the production of fossil fuels is the best use of public funds if they do not know the scale of this support, who gets it and what its impacts are?

The Global Subsidies Initiative (GSI) estimates that subsidies to fossil-fuel producers are likely to be at least \$100 billion U.S. per year; money that could be used for healthcare, pensions or reducing debt. By encouraging excess use of fossil fuels, these subsidies also cause local and global environmental impacts and speed up the depletion of resource bases.

The policy brief *Defining fossil-fuel subsidies for the G-20: Which approach is best?* outlined a 3-stage process for developing fossil-fuel subsidy reform plans (GSI, 2010):



In that policy brief, the GSI focused on addressing the first stage of reform, how to **define** and identify fossil-fuel subsidies, and provided an illustrative list of over 30 types of subsidies for energy. This policy brief takes as its starting point that list of energy subsidies and identifies methodologies for measuring each. It focuses on how to **measure** producer subsidies but for completeness, a brief explanation of calculating consumer subsidies, which is relatively simpler, is provided in Box 1. The third stage, once countries have defined and measured their subsidies, is to **evaluate** whether those subsidies should be reformed.

## Box 1: Calculating consumer subsidies

*Consumer subsidies* typically lower the price of fossil fuels below what they would be in a “free market” (i.e., one where all financial costs were included and where the value of energy commodities is set using a benchmark such as the world market price). Consumer subsidies are predominantly used in developing countries to lower the price of petroleum products for private transport, kerosene and liquefied petroleum gas (bottled gas) used by residential customers, or for fuels used by electricity generators and strategically important domestic industries.

Calculating the “price-gap” between the observed price for an energy commodity against a reference price or “free market” price provides a simple approximation of the scale of consumer subsidies. The method requires relatively little data and is useful for multi-country assessments. However, it does not capture subsidies that do not affect prices but do affect the structure of supply, and it is sensitive to assumptions regarding the reference price (Ellis, 2010).

Using the price-gap approach, the International Energy Agency (IEA) calculates consumer subsidies for oil, natural gas, coal and electricity in 20 non-OECD countries, to have been \$310 billion U.S. in 2007 (IEA, 2008). For 2008, the IEA updated its database to cover 37 countries in which consumer subsidies amounted to \$557 billion U.S. (IEA, OPEC, OECD & World Bank, 2010). The International Monetary Fund (IMF) estimated that global consumer subsidies for petroleum products in 2003 totalled nearly \$60 billion U.S. (Coady et al., 2010). When including sub-optimal taxation levels in the estimates, the IMF predicts that these subsidies will reach \$740 billion U.S. for 2010 (Coady et al., 2010).

For more information about the price-gap method, the approximations its use leads to and its strengths, weaknesses and biases, see Koplow (2009).

## WHAT IS A PRODUCER SUBSIDY?

There are three broad categories of producer subsidies in the form of preferential treatment for:

- (i) Selected companies (e.g., national oil companies);
- (ii) One sector or product when compared with other sectors or products;
- (iii) Sectors or products in one country when compared internationally (e.g., government incentives to attract foreign investment).

The definition developed by members of the World Trade Organization (WTO) under the Agreement on Subsidies and Countervailing Measures provides a good basis to identify subsidies. To supplement the definition for the energy sector, the GSI has developed an illustrative list of 30 producer subsidy types (GSI, 2010).

The GSI is undertaking country case studies on producer subsidies, initially in Indonesia and Canada. Findings indicate that the most common producer subsidies in the fossil-fuel sector are in the form of government revenues foregone, such as reduced VAT for goods and services or accelerated depreciation allowances, and reduced royalty payments.

## WHAT METHODOLOGIES ARE AVAILABLE FOR ESTIMATING PRODUCER SUBSIDIES?

In the agriculture sector, over 20 years of work by the Organisation for Economic Co-operation and Development (OECD) has established a time series of Producer Support Estimate (PSE) and Consumer Support Estimate (CSE) data in OECD countries and emerging economies. The PSE and CSE approach attempts to capture both net budgetary and net market transfers and is used extensively to measure support for agricultural commodities. This approach requires the collection of large amounts of data on specific programs, as well as on production levels and prices. The OECD has published its established methods for calculating agriculture subsidies in *The PSE Manual* (the most recent version being OECD, 2010b). It remains a useful set of methodologies and organizing framework that can be applied to fossil fuels (Ellis, 2010). The OECD is now developing guidance on how the methodologies within the PSE might be applied to the energy sector (OECD, 2010a).

Methodologies for estimating subsidy values have also been developed in other sectors. The Food and Agriculture Organization (FAO) has developed guidance for estimating subsidies in the fisheries sector; the GSI has published a methodology for quantifying irrigation subsidies, and a methodology used in its series of country case studies on biofuel subsidies. More generally, the WTO provides guidance that applies across sectors for investigating countervailing duties under the Agreement on Subsidies and Countervailing Measures, as do many national countervailing authorities.

Although subsidy-reformers may have to draw from multiple sources and make adjustments as necessary, this body of work provides a good basis for calculating subsidies in the energy sector.

The GSI has compiled a manual, *Subsidy Estimation: A survey of current practice*, of the many different methodologies used by organizations to calculate subsidy values (Jones & Steenblik, 2010). It draws on methodologies used and publicly reported by intergovernmental organizations (FAO, IEA, OECD, World Bank and WTO); countervailing authorities (Canada, the European Commission, India, Korea and the United States); other government agencies (Australia, Canada, the European Commission and the United States); and non-government organizations (Earth Track and the Environmental Working Group). The manual provides a good reference for identifying which methodologies exist for calculating most types of subsidy.

Drawing on the GSI's illustrative list of fossil-fuel subsidy types, Table 1 outlines some common data sources and the methodologies available for each type. Box 2 runs through an example of how Table 1 and the GSI manual can be used as complementary tools for tackling subsidy estimation exercises.

**TABLE 1. METHODOLOGIES AVAILABLE FOR ESTIMATING FOSSIL-FUEL SUBSIDIES**

DIRECT TRANSFERS OR POTENTIAL DIRECT TRANSFERS OF FUNDS		
SUBSIDY TYPE	DATA AVAILABILITY & SOURCES	METHODOLOGIES & SOURCES
Direct payments linked to production volumes; deficiency payments	Government budgets: annual budget statements, main estimates, public announcements and policy documents. Countries with poor transparency will have little published information; complicated where government provides in-kind support or services.	<ul style="list-style-type: none"> <li>GSI manual, chapter 3.1 (Jones &amp; Steenblik, 2010) includes:               <ul style="list-style-type: none"> <li><i>The PSE Manual</i></li> </ul> </li> </ul>
Grants for the acquisition of capital or land: outright and reimbursable grants		<ul style="list-style-type: none"> <li>GSI manual, chapter 3.1.1 (Jones &amp; Steenblik, 2010) includes:               <ul style="list-style-type: none"> <li>International Accounting Standards,</li> <li>Reports by OECD, FAO, WTO</li> <li>Government regulations in Canada, the EU, India, the U.S.</li> </ul> </li> <li>Encyclopedia of the Earth, "Government grants" (Koplow, 2010b)</li> </ul>
Subsidies to intermediate inputs		<ul style="list-style-type: none"> <li>GSI manual, chapter 7 (Jones &amp; Steenblik, 2010) includes:               <ul style="list-style-type: none"> <li><i>The PSE Manual</i></li> <li>U.S. federal regulations</li> </ul> </li> <li>Pembina Institute's study on Canada's subsidies to oil and gas (Taylor, Bramley &amp; Winfield, 2005)</li> </ul>
Equity infusions		<ul style="list-style-type: none"> <li>GSI manual, chapter 5 (Jones &amp; Steenblik, 2010) includes:               <ul style="list-style-type: none"> <li>Reports by the WTO, FAO, OECD</li> <li>Government regulations in Canada, the EU, India, Korea, the U.S.</li> </ul> </li> </ul>
Wage subsidies		<ul style="list-style-type: none"> <li>GSI manual, chapter 3.1.2 (Jones &amp; Steenblik, 2010) includes:               <ul style="list-style-type: none"> <li>Reports by the WTO, FAO, U.N. Statistics Division</li> <li>U.S. federal regulations</li> </ul> </li> </ul>
Government-provided loans, including interest rate subsidies; loan, security or credit guarantees	Multi-lateral lending agency databases; major national export-import banks; NGOs such as the Institute for Policy Studies and Friends of the Earth have some data. Data at an aggregate- or sector-level is often available for developed countries but not for specific firms.	<ul style="list-style-type: none"> <li>GSI manual, chapter 4 (Jones &amp; Steenblik, 2010) includes:               <ul style="list-style-type: none"> <li><i>The PSE Manual</i></li> <li>Reports by the WTO, Earth Track, FAO</li> <li>Government regulations in Canada, the EU, India, Korea, the U.S.</li> </ul> </li> </ul>
Government spending on R&D	Spending via tax code and non-profit research institutions, as well as direct government support. IEA and national databases. Data on energy venture capital also available. R&D expenditures within firms are less available.	<ul style="list-style-type: none"> <li>GSI manual chapter 3.1.2 (Jones &amp; Steenblik, 2010) includes:               <ul style="list-style-type: none"> <li>Report by the FAO</li> </ul> </li> <li>Encyclopedia of the Earth "Government research and development programs" (Koplow, 2010c)</li> <li>Pembina Institute's study on Canada's subsidies to oil and gas (Taylor, Bramley &amp; Winfield, 2005)</li> </ul>

**TABLE 1. METHODOLOGIES AVAILABLE FOR ESTIMATING FOSSIL-FUEL SUBSIDIES (CONTINUED)**

DIRECT TRANSFERS OR POTENTIAL DIRECT TRANSFERS OF FUNDS (CONTINUED)		
SUBSIDY TYPE	DATA AVAILABILITY & SOURCES	METHODOLOGIES & SOURCES
Debt forgiveness		<ul style="list-style-type: none"> <li>GSI manual, Chapter 4.3 (Jones &amp; Steenblik, 2010) includes:                             <ul style="list-style-type: none"> <li>– Reports by the WTO, World Bank</li> <li>– Government regulations in the EU, India, the U.S.</li> </ul> </li> </ul>
Government-provided insurance or indemnification		<ul style="list-style-type: none"> <li>GSI manual, Chapter 4.5 (Jones &amp; Steenblik, 2010) includes:                             <ul style="list-style-type: none"> <li>– Report by the OECD</li> </ul> </li> <li>GSI manual, chapters 4.4 (Jones &amp; Steenblik, 2010) includes:                             <ul style="list-style-type: none"> <li>– U.S. federal regulations (for export insurance)</li> </ul> </li> </ul>
Caps or assumption of commercial liabilities; e.g., occupational health and accident, post-closure risks		<ul style="list-style-type: none"> <li>GSI manual, Chapter 3.1.2 (Jones &amp; Steenblik, 2010) includes:                             <ul style="list-style-type: none"> <li>– Report by the WTO</li> </ul> </li> </ul>
Government expenditure on oil stockpiles		<p><i>The PSE Manual's</i> "Chapter 4: Estimating policy transfers: Price-transfers" may apply. The OECD will be publishing guidance on how to adapt the <i>PSE Manual</i> to the energy sector in the near future.</p>
GOVERNMENT REVENUE FOREGONE		
SUBSIDY TYPE	DATA AVAILABILITY & SOURCES	METHODOLOGIES & SOURCES
Tax expenditure: reduced tax rates, tax credits, exemptions or deferrals; accelerated depreciation allowances	Tax expenditure budgets where available—many countries have no tax expenditure budgets at all; others have aggregated data that is difficult to allocate to the sector level. It may be possible to back-calculate using levels of investment combined with the rules for claiming a particular exemption.	<ul style="list-style-type: none"> <li>GSI manual, Chapter 6 (Jones &amp; Steenblik, 2010) includes:                             <ul style="list-style-type: none"> <li>– <i>The PSE Manual</i></li> <li>– Reports by the WTO, the Australian Productivity Commission, Earth Track, FAO, OECD</li> <li>– Tax expenditure statements in Australia and Canada</li> <li>– Government regulations in Canada, the EU, India, the U.S.</li> </ul> </li> <li>Pembina Institute's study on Canada's subsidies to oil and gas (Taylor, Bramley &amp; Winfield, 2005)</li> </ul>
Reduced royalty payments; reduced resource rents	Government budgets: annual budget statements, main estimates, public announcements, policy documents.	<ul style="list-style-type: none"> <li>Encyclopedia of the Earth, "Natural resource leasing in the United States" (Koplow, 2010d)</li> <li>Pembina Institute's study on Canada's subsidies to oil and gas (Taylor, Bramley &amp; Winfield, 2005)</li> </ul>

**TABLE 1. METHODOLOGIES AVAILABLE FOR ESTIMATING FOSSIL-FUEL SUBSIDIES (CONTINUED)**

GOVERNMENT-PROVIDED OR GOVERNMENT-PURCHASED GOODS OR SERVICES		
SUBSIDY TYPE	DATA AVAILABILITY & SOURCES	METHODOLOGIES & SOURCES
Under-pricing of government-provided goods or services; government-provided infrastructure specific to the sector; government transfer of intellectual property rights	Government budgets: annual budget statements, main estimates, public announcements, policy documents. Some information on expenditures from statistical agencies.	<ul style="list-style-type: none"> <li>• GSI manual, Chapter 7.1 (Jones &amp; Steenblik, 2010) includes:               <ul style="list-style-type: none"> <li>– <i>The PSE Manual</i></li> <li>– Reports by the WTO, Australian Department of Environment, Sport and Territories, Environmental Working Group, FAO, U.N. Statistics Division</li> <li>– Government regulations in Canada, the EU, India, the U.S.</li> <li>– International Accounting Standards</li> </ul> </li> <li>• Pembina Institute's study on Canada's subsidies to oil and gas (Taylor, Bramley &amp; Winfield, 2005)</li> </ul>
Government procurement at above-market rates		<ul style="list-style-type: none"> <li>• GSI manual, Chapter 7.2 (Jones &amp; Steenblik, 2010) includes:               <ul style="list-style-type: none"> <li>– Report by the WTO</li> <li>– Government regulations in Canada, the EU, India, Korea</li> </ul> </li> </ul>
Access to government-owned resources or land	Trade publications; public land management databases; NGOs e.g. Revenue Watch, Publish What You Pay	<ul style="list-style-type: none"> <li>• Encyclopedia of the Earth, "Natural resource leasing in the United States" (Koplow, 2010d)</li> </ul>
INCOME OR PRICE SUPPORT		
SUBSIDY TYPE	DATA AVAILABILITY & SOURCES	METHODOLOGIES & SOURCES
Below-market rate prices for consumers; above-market rate prices for producers Mandated feed-in tariffs; consumption mandates	Some areas already have analysis done by third parties. Others may require commissioning work with academics. Trade cases sometimes help. Often requires economic modeling to assess counter-factual situations and level of resulting market price support.	<ul style="list-style-type: none"> <li>• GSI manual, Chapter 8 (Jones &amp; Steenblik, 2010) includes:               <ul style="list-style-type: none"> <li>– <i>The PSE Manual</i></li> <li>– Reports by the WTO, the Australian Bureau for Agriculture and Resource Economics, the Australian Productivity Commission, FAO</li> </ul> </li> </ul>
Export taxes or restrictions	WTO and other trade data providers; possibly OECD. Some countries (e.g., U.S.) have online tariff schedules. Local partners or firms blocked from markets will be likely source for data on non-tariff barriers. Information on tariffs is fairly good, though groupings may not fit exactly with the problem being analyzed. Information on non-tariff barriers may be harder to obtain.	<ul style="list-style-type: none"> <li>• GSI manual, Chapter 8 (Jones &amp; Steenblik, 2010) includes:               <ul style="list-style-type: none"> <li>– <i>The PSE Manual</i></li> <li>– Report by the FAO</li> </ul> </li> </ul>

## Box 2: How to use the GSI manual - Measuring Accelerated Capital Cost Allowances

The **table** provides a quick reference for finding the relevant subsidy category, tips on data availability and at least one reference for finding available estimation methodologies. In the example, accelerated depreciation allowances fall under the second category, “government revenue foregone,” and identifies Chapter 6 of the GSI manual as the primary source for finding information, highlighting a range of estimation methodologies available.

The **manual** provides background information, methodologies for estimating subsidies, including mathematical equations and examples. In this case, Chapter 6.2 of the manual starts with background information on acceleration depreciation schemes, including a description of the different approaches that can be used to measure them. It then provides mathematical equations developed by the OECD for calculating the value of the subsidy. For instance, the following equation can be used to calculate a straight line depreciation scheme:

$$\left[ \frac{GGBE}{NCG} \right] = \sum_{y=0}^{n-1} EA \times (sr - ar) \left( \frac{1}{1 + rg} \right)^n \times t$$

Or, for a scheme with a declining balance, the following equation can be applied:

$$\left[ \frac{GGBE}{NCG} \right] = EA \times t \times rg \left( \frac{(1 + rg)(sr - ar)}{(sr + rg)(ar + rg)} \right)$$

Where:

*EA* = Expenditure benefiting from accelerated depreciation

*sr* = special rate of depreciation

*ar* = allowed rate of depreciation according to the tax law

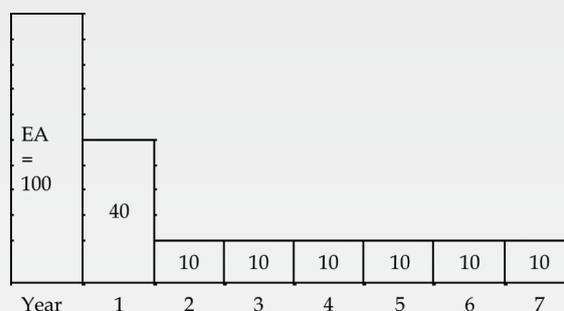
*rg* = Discount rate (to be provided from the OECD’s Main Economic Indicators and/or Analytical Data Base [ADB])

*n* = number of years of regular depreciation

*t* = tax rate (see above for definition)

*y* = years

The manual also includes hypothetical examples of how to apply the equation to different depreciation schemes. For instance, where: investment = 100, discount rate = 8%; tax rate = 2%; and where the depreciation scheme has a declining balance set over 7 years (as opposed to a straight line; e.g., 10 per year for 10 years):



The net cost to government (NCG) would be calculated as:

$$A) \ NCG = 100 \times (40\% - 10\%) \times 20\% - 100 \times 10\% \left( \frac{1}{1.08} \right)^7 \times 20\% - 100 \times 10\% \left( \frac{1}{1.08} \right)^8 \times 20\% - 100 \times 10\% \left( \frac{1}{1.08} \right)^9 \times 20\% = \underline{4.42}$$

## WHAT ARE THE CHALLENGES FOR MEASURING SUBSIDIES TO FOSSIL FUELS?

### Data Quality and Availability

Undertaking detailed subsidy estimations can require significant amounts of specific, and sometimes difficult to source, data. Research by the GSI shows that many governments do not know the full extent of subsidies granted in their country (Laan, 2010). Information is scattered across different ministries and sub-national governments and many forms of support have never been quantified. In developing countries, poor budget transparency and fewer resources for gathering data and estimating subsidies exacerbates the problem. Where data does exist, it is often not publicly available, standardized, validated or accurate (Koplow, 2010a).

In a survey of data sources for producer subsidies, the GSI (Koplow, 2010a) found that the type and quality of information available, varies significantly between countries. For example:

- Germany – although Germany has national policies favouring broad disclosure of direct subsidies to industries—as well as EU rules that govern the transparency of state aid—tax expenditures are reported using an outdated definition that excludes important policies; also, information on the scope and magnitude of subsidies provided by municipalities is inconsistent.
- The United States – has federal laws requiring the reporting of many forms of financial support including tax breaks and credit subsidies, but these are often reported as multi-industry aggregates, making attribution to specific sectors difficult. Information on state or municipal subsidies is markedly worse for nearly all subsidy types.
- China – aggregate data is relatively easy to obtain on government revenues, expenditures and tax rates; however, disaggregated information is lacking. There appear to be hundreds of special tax exemptions that provide an important source of subsidies for the fossil-fuel industry.
- Indonesia – the state-owned oil and gas companies could be benefitting from preferential treatment but their economic activities are governed by confidential production-sharing contracts with the government.

### Methodological challenges and presenting information

Many challenges to subsidy estimation remain. Calculating subsidies that arise from tax breaks or reduced royalty rates requires establishing an appropriate benchmark rate against which to calculate the deviation. Tax regimes are complex and unique to each country, so setting the appropriate benchmark will depend on the structural features of the tax regime in question (OECD, 2010a). Similarly for royalty payments, it can be difficult to determine what an appropriate rate should be. Another common difficulty to subsidy estimation is that data is often aggregated, for example, at national rather than sectoral level. If detailed information cannot be obtained, then some assumptions may be required in order to allocate values to the sector in question or to specific policy measures.



## WHAT ARE THE CHALLENGES FOR MEASURING SUBSIDIES TO FOSSIL FUELS?

CONTINUED

However, the objective of subsidy estimation need not be to conclude an exact figure, but to ascertain each subsidy's order of magnitude. This information will enable governments to evaluate which subsidies are economically-distorting, environmentally-harmful or socially-regressive, and identify priorities for reform.

Presenting subsidy values in different ways helps policy-makers to understand the impacts of subsidies. Subsidy values can be organized according to:

1. Fuel types or products – to understand the impacts on market distortions and greenhouse gas emissions.
2. Transfer mechanism (e.g., the grants, tax breaks or income support shown in Table 1) – to understand the main policy and regulatory tools used to confer the benefits, and thereby the government ministries responsible.
3. Economic activity (e.g. exploration, extraction, refining) – to understand how the subsidy affects energy producers and consumers.

## NEXT STEPS: IMPROVING SUBSIDY ESTIMATION

The next steps would be for recognized subsidy estimation experts to develop a set of preferred methodologies for measuring each type of subsidy. Guidance on how to overcome the inherent challenges in subsidy accounting as well as sector-specific issues, starting with energy, is also required. The GSI is undertaking two detailed studies in Indonesia and Canada to estimate producer subsidies to the oil and gas industry. These case studies will provide the basis for developing further best practice and guidance for overcoming challenges involved in applying the available methodologies to the fossil-fuel sector. The OECD is planning to develop guidance for applying its PSE and CSE estimates to the energy sector.

At the international level, work to develop commonly agreed-upon methodologies and best practice for measuring subsidies would facilitate better monitoring and reporting of subsidies, and would assist countries track progress of their efforts to phase-out fossil-fuel subsidies. In the longer-term, an independent subsidy accounting standards board could be established to serve as a central institution for developing common methods for subsidy accounting. Such a body would help bring together subsidy professionals from all types of organizations involved in estimating subsidies—intergovernmental agencies, national countervail authorities, statistics bodies, competition authorities, and interested academics—to develop a body of standards and best practice.

*Coming soon . . .* The GSI's detailed studies of subsidies for oil producers in Indonesia and Canada, which use the three-stage process—define, measure and evaluate—and the GSI manual to provide producer subsidy estimates.



## REFERENCES

Coady, David, Robert Gillingham, Rolando Ossowski, John Piotrowski, Shamsuddin Tareq and Justin Tyson. *Petroleum product subsidies: Costly, inequitable, and rising*. Washington, D.C.: IMF. February 25, 2010.

Ellis, Jennifer. *The effects of fossil-fuel subsidy reform: A review of modelling and empirical studies*. Geneva: IISD, 2010. 15 July 2010. <<http://www.globalsubsidies.org/en/research/economic-social-and-environmental-effects>>.

GSI. *Defining Fossil-Fuel Subsidies for the G-20: Which approach is best?* Geneva, IISD, 2010. Accessed 15 July 2010. <<http://www.globalsubsidies.org/en/research/gsi-policy-brief-defining-fossil-fuel-subsidies-g-20-which-approach-best>>.

IEA. *World Energy Outlook 2008*. Paris: International Energy Agency: Paris, 2008.

IEA, OPEC, OECD and the World Bank. *Analysis of the scope of energy subsidies and suggestions for the G-20 initiative: Joint report*. Prepared for submission to the G-20 Summit Meeting, Toronto (Canada), 26–27 June 2010. Accessed 14 July 2010, <http://www.oecd.org/dataoecd/55/5/45575666.pdf>.

Jones, Darryl and Ronald Steenblik. *Subsidy estimation: A survey of current practice*. Geneva: IISD, 2010. <<http://www.globalsubsidies.org/en/resources/subsidy-estimation-a-survey-current-practice>>.

Koplow, Doug. (2009). *Measuring energy subsidies using the price-gap approach: What does it leave out?* Geneva: IISD, 2009. Accessed 15 July 2010, <[http://www.iisd.org/pdf/2009/bali\\_2\\_copenhagen\\_ff\\_subsidies\\_pricegap.pdf](http://www.iisd.org/pdf/2009/bali_2_copenhagen_ff_subsidies_pricegap.pdf)>.

Koplow, Doug. *Mapping the characteristics of producer subsidies: A review of pilot country studies*. Geneva: IISD, 2010a. Accessed 15 July 2010. <<http://www.globalsubsidies.org/en/research/mapping-characteristics-producer-subsidies-a-review-pilot-country-studies>>.

Koplow, Doug. *Government grants*. The encyclopedia of earth. 2010b. Accessed 14 July 2010. <[http://www.eoearth.org/article/Government\\_grants](http://www.eoearth.org/article/Government_grants)>.

Koplow, Doug. *Government research and development programs*. The encyclopedia of earth. 2010c. Accessed 14 July 2010. <[http://www.eoearth.org/article/Government\\_research\\_and\\_development\\_programs](http://www.eoearth.org/article/Government_research_and_development_programs)>.

## REFERENCES

Koplow, Doug. *Natural resource leasing in the United States*. The encyclopedia of earth. 2010d. Accessed 14 July 2010, <[http://www.eoearth.org/article/Natural\\_resource\\_leasing\\_in\\_the\\_United\\_States](http://www.eoearth.org/article/Natural_resource_leasing_in_the_United_States)>

Laan, Tara. *Gaining traction: The importance of transparency in accelerating the reform of fossil-fuel subsidies*. Geneva: IISD, 2010. Accessed 15 July 2010. <<http://www.globalsubsidies.org/en/research/transparency>>.

OECD. *Measuring Support to Energy, Version 1.0*. Background paper to the joint report by IEA, OPEC, OECD and World Bank on “Analysis of the Scope of Energy Subsidies and Suggestions for the G-20 Initiative.” 2010a. Accessed 14 July 2010. <<http://www.oecd.org/dataoecd/62/63/45339216.pdf>>.

OECD. (2010b). *The PSE Manual*. 2010b. Accessed 12 May 2010 <[http://www.oecd.org/document/43/0,3343,en\\_2649\\_33773\\_41106667\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/43/0,3343,en_2649_33773_41106667_1_1_1_1,00.html)>.

Taylor, Amy, Matthew Bramley, and Mark Winfield. *Government spending on Canada’s oil and gas industry: Undermining Canada’s Kyoto commitment*. Canada: Pembina Institute, 2005

---

## FURTHER DETAILS AND CONTACT INFORMATION

The GSI is an initiative of the International Institute for Sustainable Development (IISD). Established in 1990, the IISD is a Canadian-based not-for-profit organization with a diverse team of more than 150 people located in more than 30 countries. The GSI is headquartered in Geneva, Switzerland and works with partners located around the world. Its principal funders have included the governments of Denmark, the Netherlands, New Zealand, Norway, Sweden and the United Kingdom. The William and Flora Hewlett Foundation have also contributed to funding GSI research and communications activities.

**See the GSI's *Subsidy Primer* for a plain-language guide to subsidies on: [www.globalsubsidies.org](http://www.globalsubsidies.org).**

**For further information contact Kerryn Lang at: [klang@iisd.org](mailto:klang@iisd.org) or [info@globalsubsidies.org](mailto:info@globalsubsidies.org) or +41-22-917-8920.**