

THE GLOBAL SUBSIDIES INITIATIVE

UNTOLD BILLIONS:

FOSSIL-FUEL SUBSIDIES, THEIR IMPACTS
AND THE PATH TO REFORM

5

Mapping the Characteristics of Producer Subsidies: A review of pilot country studies

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Mapping the Characteristics of Producer Subsidies: A review of pilot country studies

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FOREWORD

Shifting development onto a sustainable pathway will require investment on a large scale—in new infrastructure, in cleaner technology, in more efficient production. This is a challenging transformation, one that will be far more difficult if governments continue to subsidize high-carbon energy resources while simultaneously urging us to make the transition away from them.

The IISD's Global Subsidies Initiative (GSI) was created to generate greater understanding of what subsidies are used, who is receiving them and in what amounts, and what impact subsidies have on sustainable development. Transparency in subsidy policy is at the heart of this process. Information on subsidy programs, including the amounts, intended targets and resultant patterns, is a prerequisite for assessing both the impacts and alternatives to the status quo. Toward this end, the GSI is pleased to present "Mapping the Characteristics of Producer Subsidies: A review of pilot country studies," an examination of fossil-fuel data availability in four representative countries: China, Germany, Indonesia and the United States.

This report forms part of a three-year study on various aspects of subsidies to fossil fuels. Throughout the process, we have recognized two challenging aspects of the work: first, that providing a template for understanding and discussing fossil-fuel subsidies requires the use of country-specific case studies, and second, that when presenting detailed information on single countries we risk giving the impression that the chosen countries are particularly heavy subsidizers of fossil fuels, singled out for particular criticism. The fact that many countries are particularly sensitive to energy issues owing to concerns over regional development and energy security aggravates this challenge. In addition, the mechanism of subsidization used most often in developing countries (offering fuels or electricity at reduced prices to consumers) is easier to measure than the approaches used in developed countries (subsidies to producers), creating a potentially misleading picture that subsidies in the developed world are not significant.

These complexities are an inescapable part of the fossil-fuel subsidy landscape. We have done our best to present an objective and systematic review of data sources in all four countries, with the hope and expectation that our approach will be applied to other countries in the future. Because we recognized early on that the GSI did not yet have the capacity to assess fossil-fuel subsidies worldwide, a key driver in the countries chosen was to present a mix of energy market sizes, governance systems and data transparency scenarios on which others could model further work. This bears restating: inclusion as a case study in this paper is no indication in itself that these countries stand out compared with others in respect of their fossil-fuel subsidies. Rather, their market and data characteristics, in combination with accessible information and skilled research partners, made them useful examples on which analysis of many other varied countries can be based.

For this exercise, the GSI did not attempt to determine which subsidies should be reformed or eliminated and when. Those decisions can be complicated and will be taken up by national governments, perhaps working through intergovernmental organizations. Our goal was simpler: to provide a framework by means of which countries can systematically and consistently assess their subsidies to fossil fuels, and to boost the visibility of the policies now in place. This transparency ensures that the public policy purpose for which subsidies were given in the first place is being respected, that the funds are achieving that purpose honestly and efficiently, and that the trade-offs among various policy options can be clearly identified.

We believe that this paper constitutes a solid step toward a sensible and objective debate on fossil-fuel subsidies, an increasingly important topic as most countries in the world grapple with twin challenges of growing budget deficits and concerns over climate change. We invite our readers to contribute to this process by conveying data sources we may have missed, letting us know of any areas of disagreement and, ideally, by testing out this approach on other countries so that our baseline data on global subsidies to fossil fuels can continue to expand.

Mark Halle

Executive Director, IISD-Europe

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LIST OF ACRONYMS

ADB	Asian Development Bank
AGEB	Arbeitsgemeinschaft Energiebilanzen e.V.
AMDAL	Analisa Mengenai Dampak Lingkungan (Analysis of Environmental Impact)
APEC	Asia-Pacific Economic Cooperation
BBergG	Bundesberggesetz (Federal Mining Act)
BBG	Bahan Bakar Gas (see CNG)
BioSOLAR	Automotive Diesel Oil (SOLAR) with biofuel blending brand, produced by Pertamina
BLT	Bantuan Langsung Tunai (direct cash aid program)
BP Migas	Badan Pelaksana Hulu Minyak dan Gas Bumi (implementing body of upstream oil and gas activity)
BPH Migas	Badan Pengatur Hilir Minyak dan Gas Bumi (downstream level oil and gas activity)
CCS	carbon capture and storage
CDB	China Development Bank
CHP	combined heat and power generation
CO ₂	carbon dioxide
CO ₂ e	Equivalent carbon dioxide
CNG	compressed natural gas
CNPC	China Natural Petroleum Company
CRCC	China Railway Construction Corporation
CREC	China Railway Engineering Corporation
CSCEC	China State Construction Engineering Corporation
DEN	Dewan Energi Nasional (National Energy Council)
DMO	domestic market obligation
DOE	Department of Energy (United States)
DOEMR	Department of Energy and Mineral Resources (Indonesia)
DOFIN	Department of Finance (Indonesia)
DOI	Department of the Interior (United States)
EEZ	exclusive economic zone
EIA	Environmental Impact Analysis (see AMDAL)
EIA	Energy Information Administration, part of DOE (United States)
EMR	Energy and Mineral Resources
ETS	Emissions Trading System
EU	European Union
EWG	Environmental Working Group
FiFo Köln	Finanzwissenschaftliches Forschungsinstitut an der Universität zu Köln (FiFo Institute for Public Economics)
FÖS	Forum Ökologisch-Soziale Marktwirtschaft e.V.
FTP	First Tranche Petroleum
G-20	Group of Twenty countries
GBG	Green Budget Germany
GDP	Gross Domestic Product
GHG	greenhouse gas
GOI	Government of Indonesia
GSI	Global Subsidies Initiative
ICI	Indonesia Coal Index

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ICLEI	Local Governments for Sustainability (formerly the International Council for Local Environmental Initiatives)
IEA	International Energy Agency
IISD	International Institute for Sustainable Development
IOGCC	Interstate Oil and Gas Compact Commission
IRS	Internal Revenue Service
JCT	Joint Committee on Taxation (United States)
KfW	Kreditanstalt für Wiederaufbau
LBL	Lawrence Berkeley National Laboratory
LDC	least-developed country
LNG	liquefied natural gas
LPG	liquefied petroleum gas
MMS	Minerals Management Service, part of the U.S. Department of the Interior
MFCOM	Ministry of Commerce
Migas/migas	Minyak dan Gas Bumi (natural oil and gas)
MMBTU	million British thermal units
MOEMR	Minister of Energy and Mineral Resources (Indonesia)
MOF	Ministry of Finance
MOFin	Minister of Finance (Indonesia)
MOPS	Mean of Platt's Singapore/Mid Platt's Singapore
MSCF	thousand standard cubic feet
MSHA	Mine Safety and Health Administration, part of the U.S. Department of Labor
NDRC	National Development and Reform Commission (China)
NEA	National Energy Administration (China)
NGO	non-governmental organization
NPR	National Petroleum Reserve (Germany)
NRW	North Rhine-Westphalia (Germany)
OMB	Office of Management and Budget (United States)
OSHA	Occupational Safety and Health Administration, part of the U.S. Department of Labor
OSMRE	Office of Surface Mining Reclamation and Enforcement, part of the U.S. Department of the Interior
Pertamina	Perusahaan Tambang Minyak Nasional (state-owned oil and gas enterprise)
PPH	Pajak Penghasilan (Income Tax, Indonesia)
PSC	Production sharing contract
PTBA	PT Bukit Asam / PT Tambang Batubara Bukit Asam (state-owned coal company)
PT PGN / PGN	PT Perusahaan Gas Negara (state-owned gas company)
PT PLN / PLN	PT Perusahaan Listrik Negara (state-owned electricity enterprise)
R&D	research and development
Rp	Rupiah (Indonesian Currency Unit)
SASAC	State-owned Assets Supervision and Administration Commission (China)
SOE	state-owned enterprise
SOLAR	Automotive Diesel Oil, produced by Pertamina
UKL	Upaya Pengelolaan Lingkungan (Environmental Management Activity, Indonesia)
UPL	Upaya Pemantauan Lingkungan (Environmental Monitoring Activity, Indonesia)
VAT	value added tax
WP&B	work plan and budget
WTO	World Trade Organization

GLOSSARY OF TERMS

Cap-and-trade system – Market-based system to constrain emissions of greenhouse gases by capping aggregate emissions per year and allowing emitters to trade emissions rights among themselves so that the lowest cost reductions can be secured first.

Carbon capture and storage – Approaches to capture embedded carbon within fossil fuels and sequester them to prevent release into the atmosphere. Effect is to lower the GHG emissions per unit of energy.

Coal-to-liquids – Industrial technologies to convert solid coal fuels into liquid hydrocarbons that can be used in the transportation sector.

Emissions credit allocations – Granting—normally free of charge—rights to emit specified amounts of greenhouse gases to specific, politically selected, constituent groups.

Legacy costs – Costs associated with past fossil-fuel production or consumption, often in the form of environmental damages. Normally applies to situations where responsible parties or their successors are no longer in operation to fund reclamation.

Model runs – Refers to scenarios evaluated on econometric models, such as the OECD's general equilibrium model, to evaluate the economic and environmental effects of changes in energy prices, taxes or subsidies.

Price-gap approach – Technique for estimating fossil-fuel subsidies by comparing domestic prices with world reference prices as adjusted for transport, distribution and any differences in fuel quality.

Site remediation – Process of cleaning up environmental contamination to reduce health and environmental risks. Though resultant site is cleaner, rarely is it returned to pre-industrial contamination levels.

Subsidy-intensity metrics – Approaches to convert gross estimates of fossil-fuel subsidies to activity-linked measures such as subsidy per gallon of gasoline, or per metric ton of CO₂e emitted.

Superfund program – Legislative program within the United States focusing on the most severely contaminated industrial sites.

Tax-exempt bonds – Normally issued by governments for specific public benefit, and on which interest paid to investors is not subject to conventional income tax rules.

Time series – Data that provide measurements for the same specific parameter over time.

1. EXECUTIVE SUMMARY

Fossil-fuel markets have been receiving government support since nearly their inception—yet the full extent of this support is not truly known. This report, published as part of the Global Subsidies Initiative (GSI) series, *Untold Billions: Fossil-fuel subsidies, their impacts and the path to reform*, analyzes the availability of fossil-fuel subsidies data in a selection of pilot countries.

Fossil-fuel subsidies have attracted particularly high levels of assistance in consuming as well as producing countries, given they are a central driver for many economies. Fossil fuels are the main source of energy for a majority of countries with related supporting infrastructure built up over decades of investment and government support. However, a combination of commitments to reduce carbon emissions and increased pressure to cut government spending for use elsewhere in the economy, has led many countries to look at reducing fossil-fuel subsidies with increased momentum.

The ability to undertake any meaningful subsidy reforms, either nationally or multilaterally, is hampered by a basic lack of knowledge about the extent of support to the sector and where information on this support might be held. This multi-country research effort identifying and classifying different sources of data on fossil-fuel subsidies has begun to characterize the extent and nature of subsidy programs, identifying the analytical challenges that need to be overcome in order to de-subsidize. China, Germany, Indonesia, Nigeria and the United States, were selected as pilot studies, given their position in global and regional fossil-fuel markets, their mix of governance structures and differing degrees of transparency. Data and research challenges unfortunately resulted in the Nigerian case study being dropped from this publication. For the remaining four case study countries the project team focused not only on identifying data coverage within these countries, but on looking for patterns across them as well.

This research project found that the fossil-fuel sector is supported by a multitude of policies, ranging from direct payments to preferential access to government-owned lands. While direct payments were relatively easy to identify in government budget reporting, data were not always provided at a sufficient level of disaggregation to allow proper attribution to beneficiaries. In addition, a range of other subsidy mechanisms were far more difficult to gauge. Mechanisms such as preferential access rights to energy deposits, or caps on liabilities related to fossil-fuel enterprises, for example, were not clearly identified in standard government budget documents in any of the four countries examined. Adopting a checklist approach for the policy review was important in ensuring that key potential areas of fossil-fuel subsidy were systematically reviewed by the project team.

An initial tool—developed for the project team to organize and classify sources of data and subsidy programs—identified 12 broad policy areas. The classification tool allowed researchers to organize and present subsidy information in a coherent and presentable form. The approach also quickly demonstrated that providing significant amounts of support to the fossil-fuel sector, but not reporting this support in budgets, was the norm across case-study countries. The value of these programs can only be estimated more precisely once the required investigative methods have been developed.

The mixture of supports to fossil fuels identified in the data review was broad. These ranged from complex tax breaks to supporting indirect complements, such as the inland transport infrastructure used to move large quantities of fossil fuels like coal. In some cases, subsidies to unrelated business sectors were traded for access to fossil-fuel deposits abroad. In addition to a wide mixture of policy types, the pilot studies also found that information on these support measures was held by a variety of government ministries and non-governmental organizations. Within the government, energy ministries were the principal source of energy-related data, followed by transport, health and tax ministries.

Two elements of the subsidy problem help define the appropriate research structure for moving forward. First, because the in-country data on subsidies are fragmented across ministries, and often in forms not widely

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disseminated, the research team will require country experts. These individuals will require an excellent understanding of local governmental structures, as well as local language skills and cross-sectoral expertise. Second, the subsidy mechanisms themselves are often quite complicated, requiring context to interpret and assess against appropriate counter-factual policy structures. Thus, team members with expertise in specific policy types—be it credit supports, insurance or tax systems—are needed to help assess mechanisms in use by various countries and to support the country experts. Having these two overlapping sets of experts working together will ensure that detailed subsidy reviews can generate comprehensive, accurate and comparable data on fossil-fuel subsidies.

The data review also suggests that support for producers is likely to be grossly underestimated by current studies—often focusing only on disparities between domestic energy prices and world reference prices. There are two main sources of this underestimation. First, many subsidies to producers do not affect market-clearing prices in the short term—especially in global commodities such as oil. These subsidies will affect the structure of energy supply within a country, but are generally missed entirely.

Second, even when producer subsidies are captured to some degree, they tend to focus on established programs where financial flows are visible. In contrast, researchers found many emerging subsidy programs that at present are not properly evaluated because they are not yet widely used and thus are not drawing funding from the treasury. Despite a lack of large financial flows at present, subsidies to new facilities or energy infrastructure can greatly influence today's investment decisions and need to be properly assessed. Investments in fossil-fuel infrastructure could potentially lock economies into reliance on fossil-based energy for many additional decades. Similarly, programs supporting carbon capture and storage (CCS) and emission allocations to existing industries may amount to tens or hundreds of billions of dollars per year, also preventing the negative climate impacts of high-carbon fuels from showing up in market prices. Changes to these emerging policies need to be followed, as they will affect financial flows within a country and competitiveness between fossil fuels and emerging competitors.

It was also found that the importance of sub-national policies in supporting the fossil-fuel sector varied across countries. Countries with strong provincial administrations have had relatively large provincial subsidy programs. Some provinces in China, for example, have their own development goals. The extent of government involvement in the energy sector has been another major factor affecting subsidy policy. All countries evaluated had significant levels of government involvement in the energy sector, often including federal, provincial and local institutions. State-owned enterprises (SOEs) appear to be a source of significant recurring subsidies to the fossil-fuel-related industry and are extremely complex to evaluate.

The study concludes with several policy recommendations to improve the access, organization and transparency of data. Among its recommendations are:

- Governments should invest more resources in the modernization of publicly accessible government databases or websites that provide information on fossil-fuel subsidies and invest more resources into capturing data relating to the provision of fossil-fuel subsidies and ensuring it is accurate and verifiable.
- Make government models used to estimate taxation rates, credit support, or expenditure relating to the fossil-fuels sector should be publicly available.
- Countries should conduct more case studies examining fossil-fuel subsidization in order to generate country-specific policy recommendations to help overcome existing data gaps.

It is clear that subsidies to fossil fuels are widespread; information on them is held across many repositories, and it is often difficult to find by specially trained researchers. The detailed findings presented here provide a useful roadmap for more detailed subsidy work on these countries, as well as for researchers hoping to track subsidies in other countries.

2. INTRODUCTION

2.1 Background and aims of the project

Both the G-20 and APEC¹ have made commitments to phase out fossil-fuel subsidies in the coming years. However, much uncertainty remains about what this phase-out will look like, and about the supporting information that will be needed to undertake and monitor such a broad restructuring of fossil-fuel subsidy policies. Countries outside of the G-20 continue to look for ways in which to reform their fossil-fuel subsidies, with many developing countries attempting to reconcile subsidy reform among a variety of development goals.

There are a number of methodological and data availability issues preventing researchers and policy-makers from fully understanding the scale of subsidies to fossil fuels. With only sporadic attention being paid to their scale, and many governments poised to devote even more resources to their energy sectors—for example to reduce dependency on imported natural gas and oil, and to limit growth in carbon dioxide (CO₂) emissions—it is important to establish a clear picture of how much and what kind of support is currently being provided to fossil fuels, and indeed to the energy sector more generally.

An important first step is to identify the major types of subsidies provided and to catalogue what is known about each of these policies. Subsidies to the producers of fossil fuels are poorly estimated and understood by researchers and government. Subsidies to consumers are relatively easy to quantify through a price-gap analysis.² Because these sorts of general consumer subsidies exist mainly in developing countries, there is a temptation to categorize harmful fossil-fuel subsidies as principally a developing-country problem. In fact, price-gap data for consumer subsidies drive the results in most of the existing multi-country studies on fossil-fuel subsidies used to estimate global levels of support (Ellis, 2010). Relying on consumer price-gap estimates understates total transfers to the sector, and overstates the role of developing countries in creating the problem. Equally important, reliance only on price-gap studies misses key policy leverage points for reform. This lack of information is a major barrier to the reform of subsidies, both domestically and internationally.

Many countries subsidize their fossil-fuel producers in a variety of ways, yet remain unaware of their scale and impact. *Producer subsidies* can take many forms, including direct grants, preferential tax treatment, below-market charges for access to publicly-owned resources, subsidized or government-guaranteed loans and government assumption of liability for accidents. Quantifying subsidies to fossil-fuel producers is difficult and painstaking, but necessary. The Global Subsidies Initiative (GSI) recognizes that quantified estimates of producer subsidies are an essential building block for reform. Consequently, this project moves beyond consumer subsidies by assessing data sources that hold information on a variety of subsidies not captured as part of the price-gap approach (Koplow, 2009; Global Subsidies Initiative, 2010).

¹ G-20 refers to the Group of Twenty countries. APEC is the Asia-Pacific Economic Cooperation forum.

² The price-gap approach measures the gap between the domestic and international prices of fuels and electricity. For more information on this topic see Koplow, D. (2009). *Measuring Energy Subsidies Using the Price-Gap Approach: What does it leave out?* Winnipeg: International Institute for Sustainable Development.

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3. THE FRAMEWORK OF THE PROJECT

3.1 Developing a classification tool for subsidy information

Clearly, organizing information on subsidies is the first challenge to developing a better understanding of them. As part of this project, a detailed *Subsidy Data Review Table* (below) was developed as an adaptable tool to assist researchers in organizing and classifying information on prevalent fossil-fuel subsidy types. The *Subsidy Data Review Table* sets out the main types of transfer mechanisms supporting fossil-fuel markets, allowing researchers to classify and organize information on subsidies from a variety of sources and for the three main fossil fuels, oil, coal and natural gas. While policies will not be identical across countries, most countries will have some interventions across each policy type. A checklist approach towards identifying programs is important, because less visible transfer mechanisms will often be missing from conventional budget documents entirely. An important element of the table is that it allows researchers to assess the strengths and limitations of the data sources depending on whether the information has been independently audited or verified. Filling in the table allows for trends and patterns in subsidy use to be identified and notable gaps in knowledge or data coverage to be identified, allowing researchers to question when data is not available for a certain producer subsidy, given similar types of support have been identified in other countries. The main subsidy types are listed in the table below, which formed the basis of the more advanced Subsidy Review Tables completed for each of the pilot country studies.

Table 1. Subsidy Data Review Table

	Subsidy Type	Ease of Valuation	Data Sources
1	General resources on energy policy, industry structure, prices	Varies by country. Available data are not always accurate.	National energy ministries or statistics organizations; international agencies; trade press.
2	Government-owned energy minerals Includes: <ul style="list-style-type: none"> • Process for mineral leasing (auctions or grants) • Royalty relief or reductions in other taxes due on extraction • Problems with accurate payment or collection of royalties due 	Royalty relief, if visible, is fairly easy to quantify. Quantifying the value of non-competitive leasing or improper royalty collections is much more difficult.	Countries with poor transparency will have little published information on what they are buying; complicated where government provides in-kind support or services to complex energy-related enterprises.
3	Government ownership of energy-related enterprises Includes: <ul style="list-style-type: none"> • Energy security-related enterprises (stockpiles, defense planning or policing) • Support to bulk fuels transport • Direct ownership of power generation, transmission or distribution assets 	Complex. Government-owned enterprises often include multiple levels of other subsidies, from operating grants to credit and insurance subsidies. Important subsidies, such as the lack of any required return on capital, often do not show up in any reporting. Impacts on pricing may also be driven by organization of the industry—such as monopolization of natural gas in Russia. There is also a class of critical services provided by government entities, such as energy security and defense; construction and maintenance of energy transport hubs; and remediation of energy-related environmental damage.	Countries with good transparency in general have financial reporting that provides insights into these types of entities, especially if they must produce audited financial statements. Evaluating subsidies in opaque countries will be much harder. Proxies such as poor returns on invested capital or under-pricing of output can be indicators of problems, and may not be picked up well in any country. Cross-subsidies between different users of this infrastructure are also quite common and inadequately characterized.

continued...

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	Subsidy Type	Ease of Valuation	Data Sources
4	<p>Market price support and regulation</p> <p>Includes:</p> <ul style="list-style-type: none"> • Consumption mandates or restrictions • Direct price controls • Border protection (often tariffs) or export restrictions • Regulatory loopholes 	<p>With the exception of regulatory loopholes and non-tariff barriers, these other policies are fairly easy to identify. Quantifying their impact tends to be much more difficult, as the direct impact (e.g., how much tariff revenue is collected) is far less important than the policy's impact on prices or which suppliers are competitive.</p> <p>Regulatory loopholes require comparing complex compliance requirements across industries, and are therefore often difficult to spot, or to value even if you find them.</p>	<p>Country-level studies of energy policy by IEA, the World Bank, the EIA and others are a good starting point to identify market price support or regulatory gaps. Trade cases or filings often identify border protection, and most official tariffs are published and readily available online.</p> <p>The impact of consumption mandates or restrictions often comes through econometric modelling by international agencies, academics, or private firms. These assessments are not completed for all sectors or policies for which they would be relevant.</p>
5	<p>Direct spending</p> <p>Includes:</p> <ul style="list-style-type: none"> • Direct appropriations to government ministries • Government contracts to outside parties • Government support for research and development 	<p>Quality, frequency and coverage of data on direct spending varies by country. Gross data often need some adjustments—such as focusing on expenditures rather than authorized amounts; and deducting any offsetting collections. Similarly, direct purchases of goods or services by governments need to be evaluated to separate basic operations from any incremental subsidy to favoured industries based on how the contracts are structured.</p> <p>It may be useful to segment spending by data types (e.g., research and development, earmarks, contracts, direct appropriations) to better fit available data types.</p>	<p>Countries with poor transparency will have little published information on what they are buying; complicated where government provides in-kind support or services to complex energy-related enterprises.</p> <p>Some spending types benefit from focused national or international databases. For example, the U.S. separately (albeit imperfectly) tracks earmarks; the IEA compiles data on energy R&D spending (though largely self-reported by members with little IEA verification).</p>
6	<p>Tax breaks and special taxes</p> <p>Includes:</p> <ul style="list-style-type: none"> • Tax expenditures • Aggregate measures of overall tax burden by industry • Excise taxes or special targeted taxes on energy industry 	<p>Difficult. Many countries have no tax expenditure budgets at all; others have aggregated data that are difficult to allocate back even to the sector level. Tax breaks are also common at the state, provincial, or municipal levels of government—with even less visibility.</p> <p>Information on energy-related fees or taxes tends to be more available than tax breaks, at least on a gross collections basis. Evaluating net impacts (e.g., is fee too high or too low for what it has been set up for?) requires separate analysis.</p>	<p>Start with tax expenditure budgets for countries that prepare these.</p> <p>For others, may be able to back-calculate using levels of investment combined with the rules for claiming a particular exemption.</p> <p>Sub-national policies are difficult to track systematically.</p>
7	<p>Credit support</p> <p>Includes:</p> <ul style="list-style-type: none"> • Government loans and loan guarantees • Subsidized credit to government-owned energy enterprises or infrastructure • Subsidized credit to energy-related exports via export credit agencies or multilateral development banks 	<p>Difficult. Data availability rapidly declines with specificity. For example, there is good information on gross commitments by most developed governments (less so in developing countries). However, information declines sharply as gross commitments move to commitments by sector, by firm, specific loan terms and specific losses.</p> <p>The U.S. provides annual estimates of credit subsidies at the ministry level; few other countries do this.</p> <p>Provision of subsidized credit in less transparent countries is often done without public records. In all countries, provision of cheap financing to government-owned or led projects is often ignored entirely.</p> <p>Development of benchmarks against which to evaluate lending terms can be challenging.</p>	<p>Multilateral lending agency databases; major national export-import banks; NGOs such as the Institute for Policy Studies and Friends of the Earth have done some work in these areas, though not comprehensive.</p> <p>Analysis requires benchmarking to relevant projects in other sectors, and inputting appropriate costs of funds on government projects where it is missing entirely.</p>

continued...

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	Subsidy Type	Ease of Valuation	Data Sources
8	<p>Insurance and indemnification</p> <p>Includes:</p> <ul style="list-style-type: none"> • Government provision of risk management or risk shifting services • Statutory caps on commercial liability 	<p>Direct government-run insurance programs are normally visible in government documents and budgets. Where annual reports or expenditures are filed, the direct cost to government of these programs can be quantified. Additional benchmarks are needed to evaluate risk-adjusted subsidies, however.</p> <p>Statutory caps on commercial liability for particular sectors or activities may not be commonly known; and if known, are generally quite difficult to value.</p>	<p>Government budget documents, or annual reports or audit documents for insurance-related activities.</p> <p>Information on statutory caps often comes from NGOs; from media reports if an accident makes the cap more visible; or from debate that occurred at the time the cap was initially passed.</p> <p>Less transparent countries will often have implicit guarantees or gaps with little visibility or data.</p>
9	<p>Health and safety oversight</p> <p>Includes:</p> <ul style="list-style-type: none"> • Government oversight of existing extraction, transport, and beneficiation operations • Legacy health costs 	<p>For ongoing operations, the ability to quantify costs varies by general transparency of the country. The U.S., for example, provided detailed budgetary data for each safety oversight agency. In China, even aggregate statistics on coal miner injuries and deaths were not readily available.</p> <p>Health impacts for fossil-fuel-related sectors—especially coal—are much higher than for other industries; but may be blended in with insurance pools for a wide range of industries. Separating out these impacts may not be easy.</p> <p>Legacy health costs are not that well characterized in most countries, though may become visible if a targeted government program to support injured workers is set up (as was done for black lung victims in the U.S.).</p>	<p>Data on ongoing operations can be gleaned from budget documents or annual reports from oversight agencies, where such documents exist.</p> <p>Data on legacy health costs normally rely on infrequent government studies, or work done by outside parties focused on obtaining resources for the injured workers.</p>
10	<p>Environmental issues, site closure, and post-closure care</p> <p>Includes:</p> <ul style="list-style-type: none"> • Legal structure governing financial and operational responsibility for closure and post-closure activities • Legal structure governing ability of injured parties to sue for compensation • Stringency and neutrality of environmental controls (as enforced, not as written) 	<p>All of these areas are difficult to quantify, though offer the potential for very large subsidies to favoured sectors. Where policies can't be quantified, it is still important to qualitatively identify gaps in environmental controls and site management.</p>	<p>Although statutory details on environmental laws are often readily available, enforcement of these laws often diverged sharply across countries, regions, and industries. Some conclusions may be deduced by the absence of material (for example, no evidence of ongoing litigation). Direct questions to government, industry and NGOs may be necessary to identify the basic structure of the rules as enforced.</p>
11	<p>Emerging issues</p> <p>“Watch” list of emerging issues of potential benefit to fossil-fuel industries, even if not yet well captured by commonly monitored policies. Examples include:</p> <ul style="list-style-type: none"> • Windfalls associated with carbon credit allocations or offset programs • Environmental damages from ground fracturing for natural gas extraction • Environmental damages associated with synthetic fuels production • Programs to underwrite the cost or risk of carbon capture and storage 		

Source: Earth Track, Inc. and the Global Subsidies Initiative

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3.2 A series of country case studies

Using the *Subsidy Data Review Table*, Earth Track, Inc., the GSI and research partners have conducted detailed reviews of fossil-fuel subsidy data sources in a series of countries: China, Germany, Indonesia and the United States. A further study in Nigeria was attempted but not completed due to challenges with data availability and accessing in-country researchers with the needed mix of skills. These countries were selected to provide a cross-section of different governance systems, energy markets and stages of economic growth. While it was impossible for the GSI to review fossil-fuel subsidies across the world, adopting a mixture of examples helps illustrate a diversity of practice and visibility, greatly extending the range of countries to which our findings can serve as a starting point for independent assessments.

Some supporting data demonstrating the diversity of the countries included can be found in Annex 1. This includes some basic statistics on energy production and consumption; their position on Transparency International's *Corruption Perception Index* (CPI) and *Bribe Payers Index* (BPI) (a proxy for government transparency and disclosure); and their position on press freedom compiled by *Reporters Without Borders* (a proxy for freedom of information).

3.3 Research methods

The project team evaluated referenced data sources, including budget documents, national accounts statistics, databases collected by international bodies, reports by non-governmental organizations, press reports and public accounts. Any known concerns about data quality or reliability were noted. The reviews assessed the following characteristics of the data: frequency; form (e.g., sortable spreadsheets); coverage (comparable data and data deficits); and disaggregation. Gaps in available data (where the information should have been available but was not) were also identified in order to flag areas where subsidies were underreported and not adequately quantified—drawing attention to areas requiring greater transparency. The distinction between data coverage and data quality is an important one. And to the extent that published data relies on self-reported information, it may not have been validated by third parties. To the extent the researchers were able to gather information on data quality, it has been reflected in the data table. The project did not seek to develop detailed descriptions of subsidy programs or estimates of their fiscal cost.

3.4 Outline of the paper

The remainder of the paper is divided into three main sections. Chapter 4 provides a synthesis of the main findings from the pilot country reviews, including common themes that were visible in multiple countries. The chapter summarizes barriers the team experienced in obtaining information, identifies notable gaps in coverage, and forecasts some of the emerging issues that are likely to become more prominent over time.

Chapters 5 to 8 present the detailed pilot country reviews for China, Germany, Indonesia and the United States, respectively. Each of the country reviews contains both a narrative summary of key findings and a much more detailed *Subsidy Review Table* (including Web links) systematically reviewing data sources for each of the subsidy areas. Some table elements may be blank, indicative of information types the research team was unable to locate. Although ideally all sections would be complete, one of the benefits of the tabular approach is to make these gaps visible, highlighting the need for future action.

Chapter 9 moves from the data review into a series of policy recommendations by the project team that would help improve the availability of subsidy data and information going forward. These recommendations represent a full range of potential options, recognizing that some are more easily achieved than others. By initiating a conversation on the scope of needed changes, however, we anticipate that some progress—even for the more complex changes—can be achieved.

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3.5 Further research

Using the *Subsidy Data Review Table* and the completed pilot studies as a baseline, the GSI hopes that other researchers will expand the range of countries covered in order to map out fossil fuel subsidy data sources and gaps. In addition, additional work within the pilot countries can help identify whether less visible information sources can fill some of the data deficiencies identified in this phase of work; and can move from data availability to detailed evaluation and quantification of fossil-fuel subsidies.

4. MAIN FINDINGS FROM THE PILOT STUDIES

4.1 Introduction

This section synthesizes the main findings from the country studies undertaken as part of the project. It discusses some of the trends that are visible in terms of data availability for fossil-fuel subsidies and forecasts some of the emerging issues that are likely to become more prominent over time. We have attempted to evaluate complex economic and political systems within a short time frame and limited budget. It is likely that some programs or implicit subsidies have been missed by GSI, Earth Track and our research partners. We hope that readers will help identify any gaps, and that this iterative process will support rapid improvement in coverage and estimation over time.

4.2 Key findings derived from the research process

The case studies generated a number of important findings related to the research process. For example, although international organizations provided summary materials on fossil-fuel subsidies in most of the countries studied, it was evident that reviewing primary materials in the local language is critical in identifying and assessing the detail and scale of specific subsidy programs. Similarly, finding these materials can be challenging, especially in countries with limited general transparency. Knowledge of the local governmental structure is very helpful in identifying subsidy data sources, as are personal relationships with individuals within key government ministries who can provide information and advice. Local knowledge needs to be supplemented from outside, however. We found that local researchers sometimes had a difficult time integrating the less direct methods of subsidies. For this issue, external guidance, and possibly specialized research, was helpful.

Countries that do poorly in terms of levels of government transparency or corruption (see Annex 1) tended to have lower-quality data on subsidies as well. The research team found that less subsidy information was publicly available in these countries. Where potential or actual data sources were identified, the researchers had a difficult time accessing the materials. The data contained in those materials were deemed to be less reliable, perhaps in part due to the absence of external quality checks by media or auditors. Finally, fragmentation of information across government ministries holding subsidy information also seemed to be higher. These challenges affected the project team's research in two main ways: first, there was less information with which to characterize the subsidy and work out how to generate better information on it; and second, individuals within the relevant institutions responsible for an area of relevant activity were less willing to share what information might have existed. These challenges rippled through to finding peer reviewers as well. For countries that view disclosure of information as against the national interest, the opt-out rate for potential reviewers was significantly higher. It is expected these problems will remain an issue when conducting more detailed studies in the future to quantify subsidies.

Despite differences among the pilot countries in data availability and quality, the quality of coverage for similar subsidy types was relatively consistent among case study countries. For example, tax and credit subsidies existed in all of the countries assessed, yet were generally less well characterized than direct government expenditures. This was found across all of the countries evaluated. While there were more data on the cost of tax breaks available in the U.S. and Germany than in China, information on a disaggregated, industry-specific basis was generally missing across all the countries examined. Similarly, subsidies resulting from the omission of correct capital or liability pricing mechanisms (e.g., financial returns for taxpayers on publicly-owned infrastructure, requirements for private operators be fully responsible for liabilities throughout the fossil-fuel

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supply chain) were generally missing across all countries. These types of subsidies are more prevalent in publicly-owned infrastructure and firms than in private firms, since private firms have requirements from owners to earn appropriate financial returns, and from governments to implement a moderate level of transparency and liability coverage. Pressures for financial returns and oversight both diminish with many forms of public ownership. Thus, the greater the degree of public ownership and control of energy assets, the more relevant gaps in capital pricing and liability protections are to overall subsidy levels.

The challenges faced by the project team in trying to characterize some of the more complicated subsidy mechanisms suggest that governments or researchers planning to undertake full country studies to accurately characterize and estimate fossil-fuel subsidies would benefit from having a mix of expertise. Engaging a team on the first set of subsidy estimates that includes country specialists with knowledge of government structures as well as individuals well versed in subsidy definitions and methodologies will most likely result in a strong analysis. The country specialists should be more familiar with the institutional and data-reporting framework within the specific country. The subsidy specialists should assist the country specialists in identifying data sources that were less visible, and in describing and valuing specific subsidy programs using expertise gained from assessing a variety of national systems.

The GSI project team did not have the resources to systematically evaluate sub-national data sources for this paper. However, our review did indicate that sub-national policies could be quite important. In addition to direct subsidies, there was evidence that sub-national governments may also generate important *de facto* subsidies to specific sectors based on the stringency with which they enforced federal regulations (such as health and safety standards), or by varying the royalties they charged on the extraction of fossil fuels within their jurisdiction. Sub-national governments were also direct owners or capital providers for energy-related infrastructure in a number of the countries evaluated. Municipal funding and ownership of utilities, for example, is common in both the U.S. and Germany. In China, many coal mines were owned by localities. This involvement in the energy market could likely result in an array of subsidies linked to below-commercial rates for capital lending, for example. In the U.S., funding proper closure of coal mines and abandoned oil or gas wells often involves quite a bit of state money in addition to whatever federal resources are made available. Data on post-operational expenditures was largely missing for both China and Indonesia.

Finally, it is clear that every country reviewed provides subsidies to their fossil-fuel sectors from well beyond energy-focused government ministries. Data sources for subsidies were found to include government ministries dealing with issues such as transportation, taxation and revenue collection, and land-management activities. In the U.S. and China, there are important linkages with foreign affairs as well. Regional development objectives were a significant driver of fossil-fuel subsidies in all of the countries evaluated. Assembling the majority of relevant data will require a review of a wide mix of programs provided by different sections of government, though the composition of this mix will vary by country.

4.3 Key findings from the data availability review

Because the countries reviewed cover a mix of governance systems, our findings illustrate some interesting differences in data availability. Equally, despite differing levels of transparency, country sizes (both Gross Domestic Product (GDP) and population) and development pressures, there are striking similarities in the information provided by governments. Key findings are described below.

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4.3.1 Trends in the disclosure of information to the public

China, Germany, and the U.S. appear to be gradually moving towards more systematic tracking of subsidies directly, or at least of government activities that make tracking subsidies easier to do. Often, this tracking is done on a recurring basis, allowing some visibility into subsidies over time. The process is slow, and the development pathway is not the same in all three countries. Within Indonesia, there has been a gradual shift to more market-based energy policies, and statutory changes have supported much greater transparency. However, implementation of improved transparency has not yet caught up to the statutory requirements.

Germany prepares annual reports to the EU on support to industry, and an internal subsidy report as well. Budgetary documents in Germany and the United States do a good job of disclosing direct spending, which is important for tracking subsidies. Additional improvements to allow topical sorting across ministries would further improve the situation. The U.S. has prepared tax expenditure reports for 40 years, and credit subsidy estimates for about 20—though both could benefit from further expansion and improvement. In contrast, even budget expenditure data in China tend to be fairly opaque—released in five-year plans, but not allocable to specific programs or activities. Disclosure in Indonesia varies widely by type of subsidy. The government has quite detailed information on consumer subsidies associated with petrol and other fuels. However, in other areas little information exists, and much of the details on extraction deals are buried in proprietary production sharing contracts that are not accessible to the public.

Private sector reporting helps in some of these situations. More companies (including some that continue to have some government ownership) operating in the developing world, particularly in China, seek liquidity through stock market listings in the U.S. or Europe. A requirement for these listings is much improved financial disclosure on operations. These filings can provide important insights into national policies subsidizing operations.

In addition to the scope of subsidy coverage, the *form* of data is also quite important. The U.S., through its Energy Information Administration, has increasingly made data sets available in workbook or spreadsheet formats on its Web site. The use of electronic workbooks allows independent researchers to run their own scenarios and calculations, and to estimate subsidies that the government may not have calculated directly. Adopting similar approaches for price-gap calculations by the International Energy Agency and the International Monetary Fund, for example, would allow more visibility of the underlying assumptions each group makes on prices, and transport, and distribution adjustments and would enable more effective pooling of resources so price-gap values could be calculated more frequently.

Statutory requirements on disclosure have driven much of the subsidy disclosure in both the U.S. and Germany. Laws requiring similar reporting in the other case-study countries seem unlikely, though World Trade Organization members are required—at least in theory—to disclose many subsidies. The tools developed to properly track and disclose fossil-fuel-related support are often directly applicable to many other areas of government activity as well, and better control over public expenditure would have substantial benefits for all of the case-study countries. Laws in Indonesia require higher levels of disclosure than is currently being practiced.

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4.3.2 The quality of information available

The project team aimed to identify available information on programs associated with fossil-fuel subsidies and, where possible, identify any mechanisms by which data were verified or externally accessed. It was, however, not possible to vet each data source for accuracy, though any known problems were identified, and any verification mechanism noted. Some general trends are shown below:

- **Corruption affects available data and their quality.** As a general rule, case-study countries with poor transparency and higher corruption indices were found to have less available information (see Annex 1). The subsidy information that was available appears to be more fragmented (spread among a variety of ministries or repositories) and less reliable, though a deeper assessment is required to fully confirm this. Higher-level engagement with the government may uncover a variety of informational resources that we have not, as of yet, been able to access.
- **Even basic budget information varied in accessibility and quality.** Data on budgetary support (government spending that is recorded in government budgets and is generally visible) are normally the easiest information on subsidies to obtain. Specific line-item detail (amounts linked to specific activities or programs as opposed to consolidated figures with fewer details) was generally available in government budgetary reports in Germany and the U.S. Budget information for both Indonesia and China is published, but generally in a more aggregated way. Consequently, identifying spending for specific activities is difficult or impossible to carry out. None of the countries reviewed provided the capacity to undertake topic-based queries of their budget documents in order to carry out a government-wide review of spending and other support measures for specific energy areas. With increased automation and integration of budget data flows, there is no technical reason why the capacity to undertake such queries should not be provided by all governments. This should apply not only to direct budgetary transfers, but to support to specific industries provided through other mechanisms such as tax breaks or credit support. Further, there was no indication that any country had developed a capacity to efficiently query sub-national spending patterns either.

4.3.3 The involvement of state-owned energy enterprises (SOEs) in the energy market

All countries evaluated were found to have significant levels of government involvement in the energy sector, often including federal, provincial and local institutions. State-owned enterprises (SOEs) appear to be the source of significant recurring subsidies to fossil-fuel-related industries. They can also be complex to evaluate. SOEs often benefit from a wide variety of policy interventions, including financial grants, favourable credit rates (below-market interest rates), government provision of rights-of-way (such as corridors on which to construct transmission lines or pipelines) and tax exemptions. These benefits often generate artificially low costs of operations.

In addition, some of the national SOEs are viewed as instruments of the state. As such, they may be subject to assorted market constraints or granted preferential treatment on what products they can buy and sell, to whom and at what prices. These regulations sometimes create disparities between domestic and border prices for fossil-fuel-related products, triggering a range of associated subsidies and mandates to use certain fuels in order to maintain the viability of the SOE. Subsidized domestic product prices often result in reductions in production levels and domestic scarcity. Related problems include the development of a black market (outside the formal distribution channels within the country, or in surrounding countries) to which the subsidized product is diverted to be sold at higher prices. Important findings on SOEs from the case studies included:

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- **Varied government involvement in the energy market by country.** The degree of state involvement and regulation of the energy market varies across the case-study countries. At one end of the spectrum, the U.S. regulates many extraction activities. For example, state or federal governments manage mineral sales for leases on public land; build, own and maintain transport infrastructure; and sometimes own and operate fossil-fuel power stations and infrastructure. Overall, however, government involvement in the U.S. energy industry is low compared with China—where nearly every key participant in the fossil-fuel cycle remains substantially government-owned. Indonesia relies primarily on private entities extracting fossil fuels subject to tight government rules on access and use of local content for both labour and capital. Germany has substantial municipal ownership of smaller utilities, though the largest market players tend to be private.
- **Subsidies to bulk fuel transport are important, but data are limited.** Government-provided transport infrastructure, such as roads and specific rail links, appears to be an important source of subsidy to fossil fuels in most of the countries evaluated. Oil and coal products constitute more than half of the tonnage transported across the U.S. inland-waterway system, and the government's Army Corps of Engineers oversees much of this network's maintenance and development. Coal shipments by state-owned rail companies in China are also significant. These networks are often built and maintained by governments. Though shippers may pay fees for use of the infrastructure, these fees rarely cover the full costs associated with the network's running and administration. Transport subsidies benefit other sectors as well, so careful accounting for subsidies across sectors is necessary to ensure that benefits to bulk fossil-fuel shipments are not overstated.
- **Support to energy security is improperly accounted for in all countries.** Government investments in energy security appear to be large in nearly all of the countries studied. While not normally considered a state-owned enterprise, energy security is quite often heavily provided for by the state. Proper accounting for these expenditures was generally missing, even in the U.S. (which does not adequately account for working capital provided to its Strategic Petroleum Reserve or reflect costs to defend oil infrastructure such as pipelines and international shipping routes). Countries sometimes use a mix of government-owned stockpiles and storage mandates for private firms to provide supply buffers in the event of shortages, but the associated costs are not calculated. In China, energy security is a key element of much of its foreign policy. Development finance and projects in resource-rich countries may be traded for fossil-fuel extraction rights provided to Chinese state-owned energy companies. Any subsidies associated with these non-fuel development projects would properly be counted as a subsidy to fossil fuels, as this a primary (though perhaps not officially acknowledged) reason it has been offered. Indonesia has provided generous support to boost domestic reliance on coal-fired power plants, largely on energy security and diversification grounds. Additional issues relating to defending oil shipping lanes (e.g., by the U.S. military) or key energy terminal points are also relevant across the case-study countries since oil shipments from the Persian Gulf region supply both European and Asian oil markets.

4.3.4 Sub-national subsidies are important, though data are inconsistent

The importance of sub-national policies appears to vary across countries. Nations with relatively strong provincial powers often have relatively large provincial subsidies. Fiscal constraints on sub-national governments appear to affect how large subsidies can grow—less autonomy for sub-national governments restricts the capacity to provide subsidies. For example, sub-national subsidies seem to be less important in the U.S. than in China or Germany.

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While U.S. states do offer some subsidies, they have limited budgets to do so, have lower tax rates by which to offer tax breaks and are not allowed to run budget deficits. While national rules also govern policy in Germany, much electrical capacity is municipally owned, allowing a variety of sub-national support measures to be introduced. The Lander also have wide latitude in setting royalty rates on fuel-mineral extraction within their borders. In China, strong provinces may have separate development objectives from the national government, and often use subsidies to meet those objectives. Chinese provinces exert substantial control in the coal sector, and have been delegated responsibility to enforce federal regulations on health, safety and the environment which they enforce with varying levels of stringency. Within Indonesia, a complex set of rent sharing rules between the federal, provincial, and local governments can create divergent incentives on development. For example, there is limited transparency on funds flowing to sub-national governmental units, and this has contributed to some problems with corruption and poor accountability.

4.3.5 Tax subsidies observed in all countries with inconsistent data available

None of the case-study countries provide regular information on a disaggregated basis for fossil-fuel-related tax expenditures.

- **Variable coverage across countries: sub-national data are consistently poor.** Tracking of tax expenditures is more comprehensive in Germany and the U.S. than in China or Indonesia. However, even in Germany and the U.S., data on specific tax breaks are usually provided only at a nationally-aggregated level, combining multiple industry sectors. This precludes easy use of the available reports to assess the uptake of general subsidies by the fossil-fuel sector. Independent validation of the published data also tends not to exist, even though tax expenditures are in the hundreds of billions of dollars per year in the U.S. alone. Sub-national governments in Germany and the United States either do not track tax subsidies at all, or do so inconsistently. China does track some tax losses, but not systematically. Some information on Indonesian tax subsidies related to oil and gas is provided by the Ministry of Finance and the World Bank; however, many tax breaks are not included in these references.
- **Interaction of various tax and fee policies is complicated, requires mix of in-country and general tax expertise.** To fully estimate subsidies at the national level, it may be beneficial to bring in tax experts to support the in-country research team. A variety of overlapping policies encompassing user fees, standard taxes and environmentally-related charges are evident in most countries, and need to be thoughtfully addressed. For example, Germany views reductions in eco-taxes on energy as an offset to fees on the abatement of greenhouse-gas emissions (GHG). However, some activities escape both systems; and some taxes are associated with fossil-fuel-related spending rather than with a sector-neutral way to fund state activities. The calculation of tax expenditure values carried out as part of country-level studies would be assisted if ancillary data on industrial investments and energy flows can be captured and made available.³ The estimation approach would likely be similar across countries and energy markets, underscoring the benefit of policy-type experts on the future research teams to boost comparability across countries.

4.3.6 Credit support endemic, though often ignored

All countries with large government involvement in the energy sector provide credit support to energy-related entities including utilities, mines, and bulk transit infrastructure. Support may be provided directly, such as through formal revolving loan programs in the United States; or implicitly, such as the *de facto* guarantees for funding shortfalls associated with municipal coal-fired utilities in Germany. In China, credit support to

³ Volumetric information on energy use or production may help calculate tax losses, for example.

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unrelated sectors (e.g., development projects in Sudan) in order to access foreign fossil-fuel reserves further complicates the identification of data sources and would affect subsequent subsidy estimates. Little information on credit support could be located for Indonesia, despite substantial government ownership of energy-related assets. The country is also a large recipient of energy-related lending from the World Bank and other development banks—often at favourable interest rates.

The U.S. provides a useful model for analyzing credit support transparency, with loan supports published for lending programs overseen by each government department (e.g., Department of Energy, Department of Agriculture) on an annual basis. However, even in the U.S., significant data gaps remain. Credit support is benchmarked against the cost of borrowing by the U.S. Treasury (the so-called “risk-free” rate), rather than the more applicable market rate for particular types of borrowers. This approach more understates credit support provided to the risky technologies or firms. Credit support estimates also ignore program administrative costs, such as the cost of government staff to monitor and service the loan. In addition, the published credit support data are aggregated at too high a level to see patterns in loan conditions (for example, that borrowers were given long payback times or clustered in a particular technology or geographic region). This aggregate also precludes visibility of loan repayment performance by borrower, or even by industry sector. Countries such as China, with continued direct government ownership of much of the energy infrastructure, simply extend sovereign credit or guarantees with little discernable data on the subsidy cost of such programs. The project team believes that data on credit supports do exist within most governments; however, accessing that data has proven to be quite difficult.

The broad credit support to government investments in fossil-fuel infrastructure and firms is also reflected in a lack of any required rate of return on public investments—even high-risk ones. While the subsidy value of a lack of expected return on investment can be calculated by subsidy researchers, the issue is normally ignored entirely in the financial reports of these enterprises in all of the case-study countries.

4.3.7 Legacy costs and operational liability coverage

As with credit support, legacy costs⁴ from past extraction activities and injured workers are often poorly characterized in available data sets. In some cases, these costs are sunk and unrecoverable. In others, responsible parties or their successors may still be in business; or the practices that led to these legacy costs may still be in effect. Similarly, proper ongoing insurance coverage for operational liabilities in fossil-fuel-related industries is also difficult to gauge in the data reviewed. In general, this issue was simply not mentioned at all in the information resources accessed by the research team.

If the experience of the U.S. is a guide, liability coverage tends to receive less attention and internalization until outside factors force a change. The current spill at BP’s Deepwater Horizon offshore rig is a salient example, highlighting the gaps and limitations in the U.S. oil spill liability system—a set of laws that last went through major revisions after the Exxon Valdez spill in Alaska. Public outrage and litigation have in the past led to regulatory and statutory changes. In countries without these types of feedbacks, we expect that accidents and other liability risks are not currently being adequately covered by insurance policies. For example, we were not successful even in finding data sources for aggregate statistics on coal-mining injuries and deaths in China; or any information on legacy costs at mine and well sites in Indonesia.

Where there are incidents, this coverage gap results in uncompensated harm to workers or the surrounding community. Even during years when there are no incidents, however, the lack of proper liability coverage results in operating subsidies to the fossil-fuel-related entities (as other industries are required to pay for similar liability coverage).

⁴ Legacy costs are those costs incurred by an organization (whether corporation or government) in prior years under different leadership or when the entity’s priorities and resources were different. Legacy costs are most often seen in health problems experienced by current or retired employees and or environmental damage incurred by the company at earlier point in time.

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The health problems suffered by past workers, particularly in the coal sector, have been shifted into the health portions of federal budgets in both the U.S. and Germany (there may be state-level supports as well). These health costs are not entirely financed by fees on coal use. China appears to have standard compensation schemes for workers killed or injured, though, as noted above, the initial data review located neither systematic statistics on these injuries or deaths at the national level, nor whether workers or their survivors can challenge pre-set damage awards. In principle, Germany has unlimited retroactive liability for occupational and environmental damages associated with fossil-fuel extraction. However, it was not possible to tell whether these rules were enforced in practice. Similarly, Indonesian statutes provide fairly strong legal protections for workers; however, researchers were not able to identify data sources tracking occupational illnesses related to mining, payouts, or whether workers could challenge payouts they deemed to low relative to the harm suffered. Worker protection in unregulated coal pits is believed to be mostly non-existent.

In addition to coal mining, oil and gas field operations and liquefied natural gas (LNG) transport are considered high-risk areas where an absence of regulations requiring companies to have proper liability cover can generate particularly large distortions and advantages for the fossil-fuel sectors.

4.3.8 Extraction-related support

Government policies vary widely in terms of how fossil-fuel resource endowments are owned and managed, resulting in differences in both the form and magnitude of subsidies provided. In Germany, all fossil resources are publicly owned and royalty rates are set at the national level. However, provinces are responsible for enforcing royalty arrangements and have wide latitude—being able to set them as low as they wish. Resource endowments in China and Indonesia are also generally publicly-owned, with widely varied resource-leasing and extraction-fee-setting arrangements. In many countries, the sale of resources and access rights have historically been subject to corruption, in part due to a lack of transparency even on the basic terms and revenue flows associated with oil and gas operations. Within our case study countries, this has been a particular problem in Indonesia (Pallone, 2009; Gillies, 2009). Statutory changes to boost transparency have been passed, but not as of yet widely followed.

The U.S. energy market has a mix of public and private ownership; and most large leases are auctioned. Auctions can help to ensure a fair price is received by the government for the sale of public energy resources; however, not all lease sales in the U.S. are contested. In addition, not all auctions around the world are necessarily fair and free from influence. In contrast, Germany does not auction energy leases, but rather accepts applications from private companies and assigns the lease based on a government review of the application.

Although the U.S. does appear to have competitive leasing sales, the country has been plagued by statutory and administrative problems in setting and enforcing royalty payments. These problems have resulted in large losses to taxpayers, and large subsidies to lease owners. In addition, the United States also provides a variety of targeted subsidies to particular types of oil and gas deposits at both the state and federal levels. Targeted reductions in royalty payments were also present in the three other countries, with variations usually based on type of fuel, the relative difficulty in extracting it, or regional development objectives.

Extraction-related support may be a significant source of subsidies globally and would be a critical component of a country-level study. It is expected that the comparison of transparent resource management systems against opaque ones will provide a number of specific recommendations that can be used both to reduce fossil-fuel extraction subsidies and to improve resource-management options.

4.3.9 The effects of border policies on energy markets

A variety of border policies are in place in the case-study countries. The most challenging of these are not straight tariffs on fuels, but rather incentives for certain types of imports (often capital goods not available in the home country) or tariff exemptions for sought-after energy extraction or related investments. Local rules may require some ownership by domestic firms, or that a set percentage of the good or service be made using local suppliers or labour. These approaches are used in both China and Indonesia, and often act as non-tariff restraints for trade. Germany uses import tariffs on oil to offset cost increases on refiners caused by state mandates for oil stockpiling. Indonesia mandates a portion of production go to the (subsidized) domestic market.

Trade issues related to GHG fees and permits are expected to become increasingly important in the future. Their importance is explained in the section below.

4.4 Issues: Current and emerging

Researchers reviewing existing subsidy data sources generally focus on well-established programs where financial flows already exist. The risk of this approach is that, even in countries with good fiscal controls and transparency, emerging subsidies are not properly evaluated because they are not yet being widely used and drawing funding from the treasury. Subsidies to new facilities or energy infrastructure may actually be a more important influence on the future energy path of a particular country or group of countries than existing policy. The distortions in the choice of new facilities to build result from the combination of both old and new subsidies. The older subsidy programs may be used at a higher rate than in recent years as the surge in new construction drives up utilization of the exemptions. The new programs can tip marginal investment decisions towards particular fuels, locking a country into a pre-set energy and subsidy path, years before construction begins and the financial flows associated from the new spending becomes visible in national fiscal reports. There has been a surge in new energy policies during the past five years, as many countries strive to reduce reliance on imported oil and to mitigate emissions of GHGs. As a result, looking only at existing subsidy uptake is likely to miss a great deal of the impacts from subsidy regimes.

While the following list is not intended to be exhaustive, it does highlight a number of important issues that were identified through the reviews.

- **GHG controls, CCS and emissions-credit allocations.** Attaining lower GHG emissions from the energy sector has been an important policy driver in Germany, the U.S. and China. Existing or proposed schemes to reduce GHG emissions involve a wide array of subsidies to the fossil-fuel industry; examples include public support (or indemnification) for CCS projects and the adoption of regulatory rules that may allocate certain market participants free emissions credits. The scale of this support may run into hundreds of billions of dollars per year, so small shifts in the structure of these policies will affect not only financial flows within a country but also the relative competitiveness between fossil fuels and emerging non-fossil competitors.
- **Subsidies to new energy infrastructure.** Even in countries with good subsidy transparency, the financial cost of programs tends to be limited to current subsidies granted to existing enterprises. Many additional subsidy programs appearing in proposed government legislation, but not yet being used by operating facilities, may get minimal coverage or be ignored entirely. National-level studies should evaluate the uptake of existing programs, as well as the potential impact of existing and new subsidies on the economics of planned investments in the fossil-fuel sector. This can be done by assessing the subsidies to a new facility as a separate calculation—ensuring inter-fuel distortions going forward are properly characterized.

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- **Fuel consumption mandates and vehicle specification.** A variety of purchase mandates affect countries such as Germany and the U.S., sometimes acting as a tax on fossil fuels; and other times as a subsidy to some forms of fossil energy. Where only non-petroleum fuels are mandated, the policies act as a tax on petroleum, which needs to be accounted for when carrying out fossil-fuel subsidy estimations. Often, however, mandates may subsidize specific fossil fuels. In the U.S., for example, mandated vehicle specifications also subsidize the purchase of natural gas-fuelled vehicles. Some electricity purchase mandates treat waste coal as an eligible source. Renewable fuel standards (governing liquid fuels) have included a number of proposals (though none have yet passed) that treated coal-to-liquids as a resource eligible to meet the certification level. Purchase mandates are a complex area, but one with very large financial impacts on the fuels included or excluded by the program rules.
- **Coal-to-liquids, gas-to-liquids, oil shale and tar sands subsidies.** The conflicts between energy security and climate change concerns become clearest in the area of subsidies to oil shale and coal-to-liquids technology. Energy-security proponents support these technologies on the basis that they help boost “friendly” supplies of transport fuels. However, all are more carbon-intensive per unit of delivered motive energy than conventional petroleum fuels, garnering much opposition from those focused on the environmental impacts of fossil energy. Because many of these technologies are evolving, current expenditures are generally small but remain important economic features for fuel choices for new plants.
- **Subsidies to transport infrastructure and energy-intensive basic industries.** Subsidies supporting the transport of basic energy commodities are a logical component in any review of subsidies for a particular fuel chain. More challenging are subsidies to fossil-fuel complements—the road networks on which petrol-fuelled vehicles drive or heavy industries that use prodigious quantities of fossil fuels in the course of production. A systematic review of subsidies to complements would likely be beyond the scope of even detailed country studies. However, country researchers should try and identify programs that provide very large supports to energy-intensive industries in such a way that impedes even economically appropriate transition to more efficient industrial production.

4.5 Summary

The review of data sources on fossil-fuel subsidies in four countries found varying levels of information availability across countries, as well as some consistent gaps in data for all of those assessed. While the exercise did not aim to quantify the magnitudes of subsidies, it did clearly illustrate that subsidies to fossil fuels are widespread, information on them is held across many repositories and they are often difficult to identify even by specially trained or experienced researchers. The detailed findings from each of these studies, presented in the following chapters, provide a useful roadmap for more detailed subsidy work on these countries, and for researchers hoping to track subsidies in related countries as well. The exercise also uncovered a number of important challenges relating to this type of research, and identified suggestions to help future work proceed in an efficient and timely manner. These are contained in the section of this paper called: Policy Guidance: Recommendations for improving subsidy data availability and usability.

5. Summary of Chinese data review of fossil-fuel subsidies

Author: Cynthia Lin

5.1 China as a case-study country

This summary supplements the more detailed information on data sources for each specific subsidy type contained in the accompanying Chinese Subsidy Data Review Table in section 5.4. The Chinese Subsidy Data Review Table provides the information on which this summary was based.

China was chosen as a case-study country for two reasons. First, the country plays a critical role in world markets both as a fossil-fuel user and producer (including through relationships with foreign governments). Second, it has a complex and somewhat opaque policy environment.

The economic and policy structure of China is complex and dynamic. The relationships between the central, provincial and local governments are relatively decentralized. The central government promulgates laws and regulations, and develops targets for different sectors as well as strategies on how to achieve those goals. The provincial and local governments are tasked with enforcement, but often do not adhere to the regulations because of conflicting agendas. The incentive structure of doing business is common and strong through the lower levels of government. Many of the key energy institutions are government-owned, either in whole or in part.

Historically, China did not have a central energy institution. The effective functions of an energy bureau were spread across dozens of ministries. Today, the National Development and Reform Commission (NDRC) and the National Energy Administration (NEA) hold primary responsibilities. The NEA was newly formed in July 2008 to be key energy regulator. However, critics view the restructuring as no different from prior attempts to control the energy sector. This new organization is supposed to approve new energy projects, set domestic wholesale energy prices, and implement central government energy policies.

The oversight has been challenging, particularly with respect to regulation of important energy players. For example, many of the large energy state-owned enterprises (SOEs), such as China National Petroleum Company (CNPC), Sinopec, State Grid Corp, and Shenhua Group are ranked as ministry-level institutions. This is often a higher standing than the government bodies that are supposed to provide oversight. As politically powerful and relatively autonomous units, the energy SOEs have strong influence in shaping Chinese energy policy.

China has been undergoing pricing reforms over the past 35 years, shifting from a centralized to market economy, changes that are also visible to different degrees in the energy markets. Despite market liberalization, core attributes of old China remain in place: substantial government ownership of key assets and continued management of the market to ensure domestic interests succeed over foreign investors. Government ministries and national energy sector firms continue to be heavily involved in making investments and developing strategic plans, including how and where domestic and foreign investments are directed. The government provides subsidies (such as tax breaks, low-interest or interest-free loans) to support industries and firms (SOEs) that it hopes to see succeed as national champions.

Energy market importance

China is a major player in global energy markets, not only through domestic production and consumption, but also through its concerted strategy to use foreign aid and trading functions to establish access to natural resources abroad. China is a critical player in any global climate control scheme, particularly because coal serves as a significant portion of China's primary energy production. Thus, reducing the intensity of greenhouse gases (GHGs) and pollutants is crucial.

There is also less transparency in data reporting and verification, and in rights to litigate for compensation related to negligence or damages, than in many western democracies.

5.2 Main findings of data review

General availability of Chinese data on fossil-fuel subsidies is limited

Data transparency and reliability remains a challenge across most Chinese industrial sectors, including energy. However, our review indicates that fossil-fuel subsidies are an important factor in many market segments. Information in some areas was relatively easy to obtain. This includes information on prices, government revenues and expenditures, and taxes at the central and provincial levels. The monthly Ministry of Finance (MOF) reports break down some of the national fiscal revenue and expenditures by sector or type (e.g., environmental protection, transportation, science and technology). However, detailed information on specific types of subsidies to specific fossil fuels is difficult to find. Although quantified subsidies are not easily found in the public domain, policies indicate favouritism towards “pillar” industries such as coal mining, iron and steel, new energy generation, and transport infrastructure.

Five-Year Plans issued by the NDRC outline strategic plans and goals that the central government aims to achieve in the forthcoming five years. Initially, the Five-Year Plans focused on economic growth through specific industries (heavy industry, transportation, etc.) and improved social services. The more recent plans have shifted to emphasize strategies on addressing environmental and energy concerns. Despite the efforts to balance mitigation of harmful externalities while achieving economic growth, these directional objectives do not necessarily map directly to actual expenditures and policy support. As such, the plans did not provide the detailed information needed to quantify subsidies by fuel.

In addition, the quality of obtainable data is often questionable. Variations exist in the availability and/or quality of data by fuel type, geography, level of government, or ministry. The Ministry of Finance (MOF) has started publishing general budgetary data for the central government as well as provincial governments. The National Bureau of Statistics (NBS) is responsible for collecting statistics related to the economy at national and local levels. Ironically, the energy-relevant portions of NBS statistics can be most easily obtained from Lawrence Berkeley National Laboratory’s China Energy Group, part of the U.S. government.

Government ownership of key portions of the fossil-fuel supply chain remains widespread for all fuels

Ownership of the energy supply chain involves not only the national government, but provincial and local governments as well. This suggests that a wide range of potential subsidies to operations and capital investment exist. However, data by which to quantify this involvement are variable. For larger enterprises, some financial details on activities can be obtained from the SOEs’ Web sites or through filings required by stock exchanges if at least part of the firm has been publicly-floated. In order to strengthen the government’s control of financial derivative transactions, in 2009 the State-owned Assets Supervision and Administration Commission (SASAC) began requiring SOEs to report quarterly on changes in holdings of derivatives, capital usage, settlements, profits and losses, and analysis of hedging results and risk exposure. There are links to provincial SASAC bureaus on the main Web site. Information is accessible, but not necessarily sorted by fossil fuels.

Quality of subsidy tracking varies by type of intervention

In 2008, the MOF started releasing online the annual expenditures by the central and provincial governments for the years 2003 through 2007. Prior years’ budgets are available only through an annual paper publication, *Finance Year Book of China*. Categories and areas of interest contained in the MOF budgets include earmarks, tax breaks and revenue forgone by loss-making enterprises. However, the reported values are aggregated and

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do not contain any line item detail, or any specifics on support to the fossil-fuel sector. Although the government often “balances the books” by providing subsidies to unprofitable SOEs and loss-making enterprises, the support provided to specific SOEs is not readily visible in the budgetary documents. It is possible that somebody inside the Chinese government would be able to access more granular information.

A majority of China’s coal is consumed in the non-electricity industrial sectors, such as iron, steel and cement. Data on subsidies to these sectors have been pieced together by a few academic and industrial research groups. Although China abolished the two-tiered coal pricing system in 2007, allowing both contract and spot coal to be negotiated at market rates, the commodity industries still receive substantial subsidies. Chinese investment costs per kW of power capacity continue to be well below international norms; this is likely due in large part to credit-related subsidies to power plants.

A number of SOEs, including the oil and coal giants, are listed on stock exchanges around the world. Typically, a Chinese company that’s listed has a mixed ownership and corporate governance structure. The shareholders are predominantly the state, followed by legal persons (institutions) and individuals. As more SOEs seek to be listed on international stock exchanges and seek initial public stock offerings (IPOs), fiscal transparency is expected to increase. For example, PetroChina is the listed arm of CNPC. CNPC, the largest of the Chinese National Oil Companies (NOCs), does not fully disclose its financial statement and without PetroChina is far less efficient than international oil companies.

Financial assistance, particularly bank loans provided to large SOEs and NOCs, are often published by news agencies. Despite these recent improvements in transparency, significant challenges still remain in developing frameworks and regulations for SOEs to disclose consistent and reliable information, as well as structures for audits and oversight.

The infrastructure and transport sectors are often subsidized, generating direct and indirect subsidies to particular fossil fuels

Given that China’s land mass encompasses a large footprint, China views transportation of fuels to all regions in its national interest. The majority of China’s coal mines are in the north while the economic and load centres are in the east and south. As a result, transport modes and networks receive large subsidies, and these likely get passed through in the cost of moving goods. The WTO Agreement on Subsidies and Countervailing Duties report of 2006 includes vague data on Chinese subsidies to various infrastructure projects. It is unclear what portions of the activities are fossil-fuel-related, or the magnitude of subsidies that they receive. The Ministry of Transport is a key player in non-rail logistics and regulations, and may be a useful source of data going forward. Urban electrical grids and heavy industry are primarily funded by the state, further suggesting that subsidies to fossil fuels needed in, or moved by, these sectors could be large. Similarly, subsidies associated with rural electrification and resource development in remote regions (e.g., Xinjiang and Inner Mongolia), are likely substantial but difficult to track. The sectors are increasingly open to foreign investment, which may improve subsidy visibility. Power plants more generally receive a similar mix of subsidies, as they are financed by a range of players that include not only private investors, but a variety of state-backed investments as well.

Railways are the primary mode for transporting coal. China has plans to make large investments in rail infrastructure through 2020; the responsibility falls under the Ministry of Railways. Construction of rail networks is primarily funded by the government. The links with the fossil-fuel sector are substantial: there are joint ventures between Chinese shipping and coal SOEs, and indications that shipments to particular routes are directly subsidized by the national government to control blackout risks in remote regions.

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Roads serve as the primary transport mode of refined products. Financing for highway construction are mainly in the form of loans from the China Development Bank, followed by self-finance bonds, private investors and the national government budget. An initial review of refined products shipments indicates that it is likely financed by NOCs, though whether even this area of involvement contains some level of subsidy or cross-subsidy is not clear.

Pipelines are the primary method of transporting crude oil and natural gas. In addition to building and monitoring China's pipeline infrastructure, NOCs also finance shipments of products. Since the NOCs are critical to China's energy security, these firms often have access to capital at preferable terms. Cross-border pipelines with neighbouring countries are planned.

Ports and harbours are important points of access for the import and export of goods, including fossil fuels. These include liquefied natural gas (LNG) imports, crude oil imports and coal exports. In terms of capital financing, similar issues exist as with other transport modes. As mentioned above, there are joint ventures between Chinese shipping and coal SOEs. The entity that oversees ports and harbours maintenance is the China Ports and Harbours Association, under the Ministry of Communications/Ministry of Transport. Individual ports and harbours are usually maintained by the respective port groups or port authorities for that area, and are conglomerates of port-related businesses.

The electrical grids are divided into transmission, distribution and generation components. The Plant-Grid Separation reform of 2000 intended to deregulate the power industry and introduce competition into the system. Rather than having one enterprise (the State Electrical Power Corporation) oversee the integrated power generation to grid sales, separate and defined enterprises are being created in power generation, transmission, distribution, sales and dispatch. A fully integrated national grid currently does not exist, though there are discussions of building one. Capital construction is financed primarily by the central government and provincial power investment entities, but foreign investments and enterprise internal funds also contribute. The Chinese power enterprises recognize the benefit of foreign strategic investment, advanced technologies and management to improve their operations and costs. Based on the experience of other countries, it is likely that the Chinese grid construction and maintenance is subsidized. This would indirectly support all sources of electricity, though coal would be the primary beneficiary.

China also provides substantial support to SOEs involved in infrastructure construction both overseas and within China. Evaluating the degree to which this support benefits the fossil-fuel sector is difficult, though the amount is likely large. The SOEs involved in construction include: China State Construction Engineering Corporation (CSCEC), China Railway Engineering Corporation (CREC) and China Railway Construction Corporation (CRCC).

Stimulus package (2008–2009) has directed new subsidies to fossil fuels

Contributions to the RMB 4 trillion yuan stimulus package come from the central government, local governments, policy loans, local government bonds issued by the central government, corporate bonds, medium-term notes and bank loans. The expenditures will be spread across 10 industries and sectors, with the bulk of the funds being directed towards infrastructure. The NDRC had promised to publish details on the expenditures as they are rolled out. However, the information that has appeared thus far seems to be a generalized question and answer format rather than actual data.

Highlights for stimulus spending related to the fossil-fuel and petrochemical industries include: higher export rebates of some light industrial products, extension of fiscal and credit support to small and medium-sized firms, more favourable tax policies, advantageous and lower interest rates on lending, foreign exchange funds to encourage state-owned oil companies to expand upstream investments abroad, increased downstream refining capacity, augmented crude and oil product stockpiles, and funds to accelerate the building of oil

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product reserves. The Chinese government's long-term priority has been to spur economic growth in any way possible. It's likely that the financing vehicles employed by the stimulus package are similar to the ones used by the Chinese government in normal, business-as-usual operations.

Fossil-fuel supply security is a key element in Chinese foreign policy

In its quest for energy security, China has issued national policies and provided subsidies to encourage resource acquisitions abroad. These involve exploring and developing energy resources in disputed territories, exchanging foreign aid for resource access, creating energy stockpiles, and employing inward and outward foreign direct investments.

The Chinese are trying to acquire access rights for oil and natural gas exploration and development in disputed territories. These disputes are with its neighbours over potential resource-rich waterways, and arise from differing interpretations of the United Nations Oceans and Law of the Sea as well as the limits to China's exclusive economic zone (EEZ). China is moving to expand its control of oil shipping lanes, as exhibited when it dispatched three navy ships to support international fleet fighting Somalian pirates. The major fossil-fuel-related conflict areas are:

- East China Sea/Senkaku islands: Japan (natural gas);
- South China Sea/Spratly islands: Philippines, Malaysia, Taiwan, Vietnam (oil);
- Natuna archipelago in the South China Sea: Indonesia (natural gas); and
- Islands in Amur and Ussuri rivers: Russia (oil).

As part of their efforts to secure energy assets, NOCs are actively pursuing the “going global strategy” laid out by the Chinese government, which encourages enterprises to make investments overseas. Both the Export-Import Bank of China and the China Development Bank provide financing, enabling Chinese NOCs to sign “loan-for-oil” deals with resource-rich nations in countries such as Kazakhstan, Russia, Brazil, Venezuela, Sudan, Nigeria, Ghana and Iran. These countries use the loans to fund oil and gas exploration and development projects, pipeline construction, social and infrastructure development, and open-ended projects (e.g., weapons). In return, China secures guaranteed a long-term oil supply for several decades.

Although the recipients of the loans may not necessarily be in the energy sector, some subsidies are indirectly attributable to fossil fuels, as this is China's impetus for making the deals.

China is developing a Strategic Petroleum Reserve (SPR) to stockpile oil. The effort involves a number of phases, and includes both a government reserve and a “commercial” (i.e., NOCs-owned) reserve. Details on the financial costs of the enterprise and who bears them were not readily available.

Price controls in energy sector remain common

Direct control of energy prices remains a common policy lever in China. The price controls are normally implemented to meet a variety of non-energy policy objectives—including inflation control, mitigation of SOE losses, regional development and employment. Electricity prices often differ across consumers and regions for political reasons as well. Charges and fees related to local policy priorities are tacked onto the “grid selling price.”

Tax expenditures appear to be a significant lever of industrial policy within China

China maintains a multi-layered budgeting system, in which each level of government is responsible for its own budget. The central government provides tax rebates and transfer payments to local governments. The present transfer system consists mainly of the tax rebate programs, some of which comes from fees on refined

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oil products, and earmarked grants. A majority of special transfer payments, or subsidies, were spent on investments in the local governments and in stimulating consumption. In 2009, roughly 40 per cent of local government spending was from central government transfer payments. When local government expenditures exceed revenue, the Ministry of Finance will obtain approval from the State Council to offset the shortfall by issuing local government bonds on behalf of local governments. The revenue growth structure is not balanced and the local governments' debts are increasing. At the Third Session of the Eleventh National People's Congress in 2010, the Ministry of Finance reported on the 2009 and the draft 2010 budget and commented on problems concerning fiscal operations and management. It recognized that the transfer payment system requires further standardization and that the fiscal systems below provincial government levels are weak and requires improvements. The MOF is quoted as willing to "strive to use government funds and fiscal policy to guide non-government investment and consumer spending."

Details on tax expenditure and exemption policies are spotty. However, the information that is available suggests that there are hundreds of special tax exemptions, and that tax policy may be an important source of subsidy for the fossil-fuel industry in China.

Royalty exemptions are common for smaller producers

The Ministry of Commerce (MOFCOM) and Ministry of Finance (MOF) collects mining royalties from resource developers and entities involved in exploiting onshore and offshore petroleum resources (e.g., Sinopec, CNPC, CNOOC). Royalties are calculated based on annual gross production and are payable in kind by installments to the PRC tax authorities. The 1995 amendment of Onshore Royalties Regulations raised the annual production threshold under which enterprises are exempt from royalties from 50 000 to 500 000 or 1 000 000 tonnes, as an added incentive to foreign cooperation in oil exploitation. It is unclear where annual reports, if any, can be obtained.

Corruption remains widespread; can shift fuel chain costs to protect health and environmental quality away from resource owners

Due to the nature of the relationship among the levels of government, corruption is widespread. Collusion between local government officials and owners of enterprises is common. Profit maximization is the ultimate goal and regulations that hurt the revenue stream will likely not be implemented. In the coal sector, collusion often results in an inconsistent adherence to worker safety and environmental regulations. Health insurance and workers compensation are relatively new concepts being explored in China. Currently, families of coal-mine accident victims receive monetary compensation from the government. In the short term, power plants operating pollution controls will take an energy penalty and the operators will not maximize their revenue streams. However, not operating the pollution controls results in harmful consequences on waterways, air quality and human health. These downstream effects are likely to amplify and cost more to fix later.

Some R&D in the fossil-fuel sector is publicly funded, though data sources are fragmented. The MOF reports annually on "state financial expenditure for scientific research," though the data do not break out spending in a manner to segregate spending related to fossil fuels. Public R&D funding that occurs in the fossil-fuel sector comprises a very small portion of any SOE's budget. The NOCs often split research spending with their joint venture partners (typically the Chinese government, universities and foreign oil companies). Although expenditures are not always clearly reported, some patterns can be deduced—such as fossil-fuel R&D expenditures directed towards CO₂ capture and coal-to-liquids technologies. The development of alternative fuels is also a priority.

The Ministry of Science and Technology typically funds university-led research projects. Large SOEs and NOCs have funding arms that contribute money to university research and often also have dedicated R&D enterprises.

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Emerging subsidy policies

Several subsidy policy areas may become increasingly important going forward, though are not necessarily large at present. These include:

- A new and amended Insurance Law, which will likely impact government insurance/indemnification, commercial liability, and occupational safety requirements for firms in the fossil-fuel sector.
- Movements to increase the renewable component of primary energy generation, and extend and expand the electrical grid further into rural areas.
- Carbon controls and CCS, in part through joint R&D efforts with international oil companies, are among the changes anticipated in next Five-Year Plan.
- Accelerated coal plant closures are also expected for older plants. The role of transitional payments in this restructuring is not entirely clear.
- Proposed Energy Law (2007): outlined energy policy goals. Law not yet enacted.

5.3 Sources reviewed

Accessible data sources on the Internet tend to focus on the central and provincial levels, with little publicly accessible reporting at the power plant or locality levels. While this information often provided important insights on policy structure and beneficiaries, quantified information on support to fossil fuel was not generally available. While the more detailed documents were in Mandarin, the major policy trends and descriptions tended to be available in English as well, often translated by third parties such as law firms or bloggers. Noted sources by subsidy type include:

- Credit support: State-owned Assets Supervision and Administration Commission (SASAC), Ministry of Finance (MOF), international agencies and banks, news sources
- SOEs' financial reports: SASAC, annual reports from Web sites, stock exchange
- Tax expenditures: SASAC, MOF
- Government budget data: MOF

Company and ministry Web sites

Government Web sites varied widely in terms of data availability and quality. Some ministry Web sites contained a great deal of information; others were sparse. In general, the Chinese language Web sites have more links to related references. However, even these often lacked specific and detailed information on subsidies to fossil fuels.

- The national Ministry of Finance has also compiled budgetary data at provincial level. This was a useful finding.
- The Ministry of Commerce has information on FDI and on export/import regulations.
- The NDRC has the most recent Five-Year Plan, which outlines policies and earmarks, and also some information on power grid tariffs. There does not appear to be independent audit of most of this information.

Financial filings

Annual reports and financial statements for many of the large SOEs (e.g., China National Offshore Oil Corporation, Shenhua, PetroChina and Sinopec), can be obtained on their home Web sites or from third-party sites that

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compile mandated financial filings. Many of these statements have had external audits, but because of the unique government-enterprise structure that exists in China, the financial reports do not fully reflect the flow of subsidies. The financial reports should be cautiously assessed; SOEs select elements to show in the reports and there are differences in the Chinese accounting standard versus the international accounting standard. Many of the SOEs obtain low-interest or risk-free capital loans from the central government; they are not required to purchase liability insurance (though this may change); and they price their goods and services at levels only sufficient to break even. The government is almost guaranteed to step in if the firms make negative revenue.

International agencies and banks

The banking sector, like many other sectors in China, is under transition from centrally-planned to market-oriented. Under the semi-state-owned nature, the banks range from publicly-owned policy banks (China Exim and CDB) to hybrid ones (Bank of China). Major banks in China still direct capital in directions and with terms dictated by the central government. The fossil-fuel industries have been beneficiaries of this policy.

The majority of the loans used for financing projects come from the China Development Bank (CDB), the World Bank, Asian Development Bank (ADB), and the Export-Import Bank of China (China Exim Bank). On the energy side, the China Development Bank, which is a policy bank under the direction of the State Council, provides loans to both domestic and overseas infrastructure projects. The Asian Development Bank, composed of 67 member countries, provides financial assistance through equity investments, guarantees and loans to enterprises in developing countries to improve quality of life. The China Exim Bank is under the direction of the State Council and lends to domestic and overseas projects.

Trade press and new media

Chinese news sources and press releases, environmental blogs written by foreigners in China, and U.S. congressional reports provide useful background and overviews of issues and regulation summaries. However, many Chinese news sources remain subject to government restrictions and censorship.

Energy partnerships

The China Energy Group of Lawrence Berkeley National Laboratory (LBL) publishes energy-relevant portions of the China Statistical Yearbook, which is issued by China's National Bureau of Statistics, in a CD obtainable from LBL's Web site.

The China Sustainable Energy Program, an affiliate of the U.S.-based Energy Foundation, publishes strategy and status reports that provide great background on China's energy sector. While many of the more recent reports focus on renewable energy, there are policy reports on electric utilities, the power sector, and natural gas cogeneration power. However, this organization does not have data on subsidies to fossil fuels.

5.4 China Subsidy Data Review Table

Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

At the time this study was published the Web links contained in this table were working correctly. Over time, as organizations update their Web sites and reorganize publically available on-line resources, Web links may change and no longer function. Therefore, some of the Web links contained in this table may not function correctly.

The China Subsidy Data Review Table starts on the following page.

Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
1. General resources on energy policy, industry structure, prices				
<p>Energy policy</p> <p>A) Chinese Agencies</p>	<p>Most of relevant government-affiliated Web sites have some information in English; some contain more thorough info than others.</p> <ul style="list-style-type: none"> -National Development and Reform Commission (NDRC) -National Energy Administration (NEA) -Ministry of Finance (MOF) -Ministry of Science and Technology (MOST) -Ministry of Environmental Protection (MEP) -National Bureau of Statistics (NBS) -Ministry of Commerce (MOFCOM) -National People’s Congress <p>More information on agencies can be found in the preceding sections.</p>	<p>China Energy Statistical Yearbook.</p> <ul style="list-style-type: none"> -Data sourced by National Bureau of Statistics but Yearbook costs \$200 to obtain. -Data presentation sometime differs from international system. <p>Division of Energy Statistics within the Dept of Industrial and Transport Statistics of the National Bureau of Statistics. Urban Survey Organization of NBS conducts monthly surveys to capture purchase price and producer price of energy.</p> <p>For some agencies, English and Chinese Web site and publication access are fairly comparable. For others, the English Web sites lack the detail of the Chinese ones.</p>	<p>-Equivalent energy statistics are posted by local government at various levels whose responsibilities and functions are the same as NBS.</p>	
<p><i>Related Web links</i></p> <p>◆ National Development and Reform Commission (NDRC) - Main Website ◆ National Energy Administration (NEA) - outline of responsibilities ◆ Energy Statistics of China (IEA) - overview of agencies’ data collection responsibilities ◆ LBL China Energy Group - China Energy Databook. Much of the statistical information can be obtained (for free) ◆ Ordering Page - China Energy Statistical Yearbook - can be purchased for \$200. [most of the data in this Yearbook are available in LBL’s Databook] ◆ National Bureau of Statistics of China (NBS) - China Statistical Yearbook 2007</p>				
<p>B) Five-Year Plans/Guidelines</p> <p>These documents outline China’s economic and social priorities in five-year increments.</p>	<ol style="list-style-type: none"> 1) Five-Year Plans/Guidelines are set by the Chinese Communist Party. They map out strategies for economic and social development by setting growth targets and outlining reforms. 2) The more recent plans (10th, 11th, 12th) have increasingly focused on energy and the environment. Much of this is on environmental protection (emissions from fossil fuel powered plants) and renewable energy (development). 3) Have to search individually for FYPs; unable to find actual copies of old FYPs on web. Indicated energy sections with Web links. 	<p>The 10th and 11th plans hold the environment and energy as higher priorities than in previous plans.</p>		
<p><i>Related Web links</i></p> <p>◆ Summary 10th Five-Year Plan (English) ◆ NREL China - renewable energy development plan; tax & subsidization policy; changing production VAT to consumption VAT ◆ China Mapping out the 11th Five-Year Guidelines ◆ China’s stimulus package: A six-month report card</p>				
<p>10th Five-Year Plan (2001-2005): adopted on 11 October 2000, retains a primary emphasis on economic development, but also includes significant references to the importance of environmental (more often translated as “ecological”) protection, sometimes acknowledging the need to improve the current situation.</p>	<ol style="list-style-type: none"> 1) Project goals include constructing more than 200 wastewater and sewage treatment facilities and installing desulfurization equipment on 51 coal-fired power plants. The investment required for these and other FYP projects is estimated to be \$85 billion, or roughly 1.3% of China’s gross domestic product over the five-year period. Government began creating a strategic petroleum reserve for its energy sector, although filling the stockpile has been slow because of the high price of crude oil. Subsidy on SPR infrastructure unknown. 2) The plan also sets forth a tax and subsidization policy. This section of the plan states that “tax policy must embody the <p><i>CONTINUED NEXT PAGE</i></p>	<p>A report by the SEPA-affiliated China Research Academy of Environmental Sciences (CRAES) on the proposed 10th Five-Year Plan estimated that the investment requirement to meet the plan’s air quality goals would be \$36 billion, with one-third of that being used to install desulfurization equipment on coal-fired power plants in acid rain control areas. Mr. Xie Zhenhua, director of SEPA, has stated that the overall goal of the 10th Five-Year Plan is to reduce total emissions of major pollutants another 10%, and that the air and water pollution reduction targets might be achieved if environmental protection expenditures over that period equal 1.4% of GDP.</p> <p>See link: 10th FYP - energy section</p>	<p>Local entities are responsible for reporting compliance with regulations instituted by the central government, but they often defy the central government. Study shows only 4 of 113 local governments provided comprehensive details about pollution violations. Of the ones that did report, it was unclear where the reports could be found.</p>	

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
1. General resources on energy policy, industry structure, prices (continued)				
	spirit of national industry policy and promote economic structural adjustment. The tax and subsidization policy should be designed to promote hydropower and new energy industries. For instance, production value-added tax (VAT) will be changed to consumption VAT.”			
<p><i>Related Web links</i></p> <p>◆ Local governments keep Chinese public in the dark about pollution ◆ As China Roars, Pollution Reaches Deadly Extremes ◆ China postpones pollution report ◆ Major SOEs flout pollution laws, summary of National Audit Office’s report on violations of SO₂ and other indicators ◆ [10th FYP - energy section] - Energy Conservation and Resources Comprehensive Utilization - key technology areas for development, clean coal demo projects</p>				
11th Five-Year Plan (2006-2010)	Pursuit of comprehensive energy strategies, including a targeted 20% reduction in energy intensity (consumption per unit of GDP) by 2020. This indicates a shift to emphasizing demand moderation instead of only focusing on expanding the supply of energy. China has also imposed fuel economy standards and a tax on large cars. Several plans listed regarding energy savings. Targeting specific sectors (ex: The Chinese government has launched an energy-conservation drive among 1 000 enterprises, with the focus on tightening control over those consuming 10 000 tons of standard coal or more each year.) It will deepen the reform of energy prices to introduce a pricing mechanism favourable for energy conservation.	See link: [11th FYP - Environmental Protection] for outline of goals in the energy sector.		
<p><i>Related Web links</i></p> <p>◆ [Congressional Research Reports (CRS RL31076), 2008] “Rising Energy Competition and Energy Security in Northeast Asia: Issues for U.S. Policy.” China Selected Environmental Issues and Policies ◆ Policy Innovations: China’s Eco-Entrepreneurs ◆ National Economic and Social Development 10th Five-Year Plan - Special focus on energy development plan [in Chinese] ◆ Outline of 11th FYP ◆ 2007 Energy Conditions and Policies (Information Office of State Council) ◆ Harvard China Project seminar: SO₂ emissions controlled, indicates turning point in how China views the enforcement of environmental policies ◆ 11th FYP on Environmental Protection (English version): environmental protection investment should account for 1.35% of GDP of the same period; includes priority areas for Sci&Tech innovations ◆ NDRC presentation: Introduction to the 11th Five-Year Plan on Energy Development</p>				
12th Five-Year Plan (2011-2015, in planning stages)	High. 11th Five-Year Plan goal: control SO ₂ emissions, which mostly come from coal-fired power plants. Indicates turning point in how China views the enforcement of environmental policies. The 12th Five-Year Plan is currently in planning stages, but it appears the government is making a concerted effort to address environmental problems (ex: controlling NO _x emissions). Currently, very little is mentioned in addressing carbon emissions.			
<p><i>Related Web links</i></p> <p>◆ China’s Environmental Protection 12th Five-Year Plan ◆ Harvard China Project: GHG and pollution control options</p>				

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
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1. General resources on energy policy, industry structure, prices (continued)

<p>Energy Industry Structure</p>	<ol style="list-style-type: none"> 1) The energy sector is identified as a strategic pillar. Energy production and consumption in China are tightly controlled by the government, but involvement varies across sectors. MOF reports on subsidies to loss-making enterprises at central and provincial levels (see section on “Subsidies information - general data” for links.) 2) LBL database: Types of enterprises: state-owned, collective, private. MOF “balances the books” at end of year for unprofitable companies by funding individual losses (see MOF budgets for aggregated amount). Sinopec received subsidies to cover losses in 2008. 3) State-owned energy companies are powerful and relatively autonomous. Sometimes ignores central government guidance. 4) “Under China’s planned economy, Chinese banks have traditionally met government policy goals by financing the operations of SOEs, regardless of their profitability or risk. The U.S.-China Economic and security Review Commission (USCC), a congressional agency established specifically to investigate and report on the national security implications of trade and the economic relationship between the two countries, argues that these credits “amount to a massive government subsidy for Chinese firms” and that China’s \$875 billion U.S. in foreign reserves, accumulated in large part due to Beijing’s long-standing trade surplus with the U.S., can be used to finance acquisitions abroad. Soft credit, driven by lending by China’s state-owned commercial banks (SOCBs) and policy banks, has always been critical to meeting the ongoing cash requirements of SOEs and is a growing factor in financing global acquisitions. 5) Stimulus package to cover power plants’ losses: see section on “Subsidized credit to domestic infrastructure and fossil-fuel power plants” 6) In the fossil-fuel industry, the coal sector has historically been the most privatized. 	<p>-China’s primary energy source is coal (70%) and they have enough supply domestically to be energy independent. China is unable to produce enough oil to meet its demand, and relies on international imports for over half its consumption (45% from the Middle East, 32% from Africa). Strategic regions: Middle East-Africa, Russia-Central Asia, Latin America.</p> <p>-Three state-owned companies (NOCs): CNPC (China National Petroleum Corporation controls oil and gas fields, refineries and petrochemical plants in 12 provinces in the north and west), Sinopec (China Petroleum and Chemical Corporation controls oil production and refining operations in 19 provinces in the east and south), CNOOC (China National Offshore Oil Corporation controls all offshore operations).</p> <p>- The central government provides tax rebates and transfer payments to local governments. Funding for tax rebates comes from tax reforms and fees on refined oil products. A majority of special transfer payments, or subsidies, were spent on investments in the local governments and in stimulating consumption. In 2009, roughly 40% of local government spending was from central government transfer payments. [“Report on the Implementation of the Central and Local Budgets for 2009 and the Draft Central and Local Budgets for 2010.” The Third Session of the Eleventh National People’s Congress. 5 March 2010. Ministry of Finance of the People’s Republic of China.]</p> <p>State Council - China’s Energy Conditions and Policy, 2007 sections of interest:</p> <ol style="list-style-type: none"> 1) Advancing price mechanism reform 2) Developing the coal industry in an orderly way 3) Actively developing electric power 4) Expediting development of oil and gas 5) Spurring innovation in key technologies (IGCC, CFB, ultrasuper critical) 6) Exercising strict environmental management of energy projects 7) Strengthening energy legislation 8) Encouraging foreign investors to invest in and operate energy facilities such as power plants 9) Intensifying mutually beneficial cooperation in energy exploration and utilization 	<p>State Administration of Coal Industry (SACI, 1998) is regulatory body of coal sector. Mines governed by provincial authorities.</p>	
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Related Web links

◆ “China’s New Energy Diplomacy in Africa: Progress and Problems.” Institute of China Studies, University of Malaya, Malaysia. (Working Paper Series) ◆ Wu, Yanrui. “Deregulation and growth in China’s energy sector: a review of recent development.” *Energy Policy*. Volume 31, Issue 13, October 2003, Pages 1417-1425. ◆ OECD-China Country Web page (for stats and policy information) ◆ Development of oil and gas subsectors (in Chinese) ◆ China’s Energy Development Report: Economic Crisis Energy Development Strategy (in Chinese) ◆ Industry Analysis Reports: by sector and by year (in Chinese) ◆ Are Chinese Companies Taking Over the World? ◆ An Examination of China’s Non-Performing Loan Issue ◆ Polluted China doles out \$50b in fuel subsidies ◆ China’s newest documentation challenge: how to defend lossmakers ◆ China Economic Review, “China’s exports, subsidies to state-owned enterprises and the WTO.” Volume 17, Issue 1, 2006, Pages 1-13. In its Protocol of Accession to the WTO China agreed to eliminate subsidies to loss-making SOEs by 2000 ◆ [EIA, China - Refining section] 2008: Sinopec and CNPC/PetroChina reportedly had refining losses ~\$29 billion; government stepped in and provided direct subsidies to partially cover losses ◆ Constraining Energy Consumption of China’s Largest Industrial Enterprises Through the Top-1000 Energy-Consuming Enterprise Program ◆ [APERC] Understanding Energy in China 2008 ◆ State Council - China’s Energy Conditions and Policies, 2007.

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
1. General resources on energy policy, industry structure, prices (continued)				
<p>Energy price data: clean data on wholesale and retail prices, and on taxes, can be used to calculate price-gap subsidy measures.</p>	<p>China's energy market system is still undergoing improvements. The energy pricing mechanism fails to fully reflect the scarcity of resources, its supply and demand and the environmental cost. Order in energy exploration and development must be further standardized, and the energy supervisory system improved. Negotiations over coal prices by China's five top power producers (Huaneng, Datang, Guodian, Huadian and China Power Investment Corporation) have dragged on. Domestic producers want price increases; power companies started to buy more coal from abroad. A domestic price is yet to be fixed. Coal production safety is far from satisfactory, the structure of power grids is not rational, the oil reserves are not sufficient, and an effective emergency pre-warning system is yet to be improved and consolidated to deal with energy supply breakdowns and other major unexpected emergencies.</p>	<p>LBL Ch 6: prices of ex-refinery oil products and grades (gasoline, diesel, jet fuel, kerosene, LPG); price of coal and petroleum products World Bank: gasoline and diesel snapshot prices</p>	<p>LBL Ch 6: wholesale price (government guidance, Sinopec, PetroChina, others) of fuels (different grades of diesel, gasoline, coal, LPG) in major cities; retail prices in selected cities; electricity sale price; transmission and distribution prices; on-grid price; itemized cost breakdown for shipping coal between 2 locations; grid electricity rate schedules for a number of provinces.</p>	<p>-Coal prices have been liberalized and have been market-driven since 1993; a reduction in government subsidies is evident. -Oil prices and imports are state-controlled and highly regulated by the government. Major reform in 1998. Domestic price of crude oil set according to the world price. Central government sets the regional prices of refined oil products according to the prices in the Singaporean oil market. -Natural gas is highly regulated by the government. Subsidies present in past but has recently been removed. Prices lower than international prices (as of 2003).</p>
<p><i>Related Web links</i> ◆ Financial News on China Energy sector: news on coal, oil, gas, renewables (e.g. coal mining M&As), includes consumption, price, FDI, resource development (in Chinese) ◆ Wu, Yanrui. "Deregulation and growth in China's energy sector: a review of recent development" Energy Policy. Volume 31, Issue 13, October 2003, Pages 1417-1425. ◆ China's Energy Development Report: Economic Crisis Energy Development Strategy. Includes tables of domestic and international of oil prices (in Chinese) ◆ Lawrence Berkeley National Labs - China Energy Group ◆ [World Bank] "Changes in End-User Petroleum Product Prices: A Comparison of 48 Countries" petroleum pricing and price reform ◆ Coal mine explosion, compensation to families, coal price negotiations ◆ BP Statistical Review of World Energy. - Production and consumption volumes, prices, trade movements. ◆ International Energy Agency (IEA): statistics and country information ◆ [World Bank] "Government response to oil price volatility"</p>				
<p>General Policy Issues</p>	<p>China continues to face significant levels of corruption in its natural resource industries. Roughly 10% of government spending, contracts, and transactions is used as kickbacks and bribes, or simply stolen. The odds of a corrupt official going to jail are < 3%, making corruption a high-return, low-risk activity. Corruption in China is concentrated in sectors with extensive state involvement, such as infrastructure projects, real estate, government procurement and financial services. The absence of competitive political process and free press make these high-risk sectors susceptible to fraud, theft, kickbacks and bribery. The direct costs of corruption could be as much as \$86 billion each year.</p>	<ul style="list-style-type: none"> - Level of implementation and enforcement of laws and regulations is hard to discern. The decentralization of many governmental functions, and continuing reports of corruption—along with reports of crackdowns on corruption—make compliance very hard to determine. - Government has increased efforts to mitigate environmental deterioration - Laws and regulations are being upgraded - Compliance remains problematic <p>Reinvigorated support for leading state-owned enterprises in sectors it considers important to "economic security" (EIA).</p>	<p>In 2007 China intensified government efforts to improve environmental conditions, tying the evaluation of local officials to environmental targets (CIA World Factbook). LBL Ch 10: GDP data of provinces LBL Ch 4: energy consumption by province/region and energy source (coal, petroleum, electricity, natural gas); per capita consumption; industrial sector end use by subsector (mining, manufacturing, electric power) and energy type; fuel use for power generation by province; provincial supply and consumption of coal gas/LPG/natural gas.</p>	

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
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1. General resources on energy policy, industry structure, prices (continued)

Related Web links

◆ [EIA. General overview of China fossil energy \(coal, oil, natural gas\) and electricity. Includes sector org \(natl companies, pricing reform\), exploration, production, transport networks](#) ◆ [CIA World Factbook. General overview of China's government, economy, transportation networks, resources, etc](#) ◆ [\[Brookings\] China's energy institutions. Restructuring the fragmented energy institutions at the national-level under one umbrella \(National Energy Administration \(NEA\) and the National Energy Commission\).](#) ◆ [NREL - Bilateral Partnerships. NREL-China articles can be found by searching "China"](#) ◆ [LBL China Energy Group - China Energy Databook. Much of the statistical information can be obtained for free](#) ◆ [CHEN Shaofeng. "China's Outward FDI and Energy Security." EAI Working Paper No. 143. Policy structure charts at end \(FDI regime, relationship of policymaking bodies\)](#) ◆ [Carnegie Endowment: "Corruption Threatens China's Future"](#) ◆ [\[NY Times\] "Graft in China Covers Up Toll of Coal Mines"— owner and local government officials nearly succeeded in concealing tragedy; paid off victims' families](#)

<p>Subsidies information - general data</p>	<p>\$50B in fuel subsidies 2008 MOF has some data in their budgetary documents, some directly related to energy but mostly just shows aggregated expenditures, taxes, subsidies, earmarks.</p>	<p>MOF issued an automatic subsidy mechanism for refined oil products, which will be triggered once gasoline cost is over RMB 4 400/ton, and diesel cost over RMB 3 870/ton. Example categories include "Special Revenue on Burning Coal Instead of Oil," "Subsidies to Loss-making Enterprises"</p>	<p>MOF's main Web site has information on subsidies, revenue, budget etc. Searching specific regions turns up some links. For fossil fuels, it's mostly for gasoline. Searching for "gasoline subsidy" turns up news from various provinces.</p>	
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Related Web links

◆ [Refined oil price subsidy mechanism \(in Chinese\)](#) ◆ [Ministry of Finance \(MOF\) main Web site](#) ◆ [MOF - Budgetary Revenue of Central Government by Item 1996-2003: "Special Revenue on Burning Coal Instead of Oil," "Subsidies to Loss-making Enterprises," "Revenue Raised from Funds for Key Construction Projects in Energy Industry and Transportation," "Earmarked Revenue"](#) ◆ [MOF - Budgetary Expenditure of Local Government by Item 1996-2003](#) ◆ [MOF - Final Account of Budgetary Revenue and Expenditure in Xinjiang Uygur Autonomous Region \(2003\) - "subsidies to loss-making enterprises," "earmarked revenue," "capital construction" etc \(not necessarily specific to energy\)*](#) ◆ [GSI Subsidies Box \(very useful if it contained more data\)](#) ◆ [NREL - financial policy overview for China \(subsidies to renewable energy\)](#) ◆ [Harvard China Project: interdisciplinary, peer-reviewed studies on air pollution and greenhouse gases in China, from the root causes in the demand for and supply of energy powering its economy, to the chemistry and transport of pollutants in the atmosphere](#) ◆ [\[Sydney Morning Herald\] \\$50B in fuel subsidies](#) ◆ [Financial background: "Report on the Implementation of the Central and Local Budgets for 2009 and the Draft Central and Local Budgets for 2010." The Third Session of the Eleventh National People's Congress. 5 March 2010. MOF of PRC.](#)

* Data tables originally at this link in October 2009 are no long available at this link or on the Ministry of Finance website.

2. Government-owned energy resources

<p>A) Standard process for resource leasing</p>	<p>1) The coal sector historically had the greatest participation of township, village and private mines. Mines that used to be controlled by central government are now gaining increasingly more provincial and township level ownership. Categories in LBL: centrally administered state owned, locally administered state owned, town and township, others. Grid companies select coal fired power plants through feed-in-tariff bidding process.</p> <p>2) The oil and gas companies are state-owned enterprises. Foreign investments allowed, but usually only through joint ventures with domestic enterprises. "Due to the capital- and skill-intensive nature of oil and gas, non-state investors only play a minor role." Chinese government limits private players to ensure control over projects.</p> <p>3) Government involvement in securing natural resource assets abroad (e.g. "loans for oil" deals): see section on "security related enterprises" for additional information.</p> <p>4) Number of private ownership of mines decreases due to state-led effort to close or merge smaller mines.</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>LBL Ch 3: Total energy industry investment by ownership (state-owned, urban collective, joint venture, shareholding corporations, FDI, HK/Macau/Taiwan invested) and subsector (coal extraction, oil/natural gas extraction, oil refining/coking, coal gas, electricity/steam/hot water, etc). Assets, liabilities, loss making enterprises (in \$).</p> <p>Foreign companies access resources via joint ventures with Chinese companies.</p>	<p>Private oil/gas enterprises focus on upstream exploration market development in the "gray zone" of "low-grade" oil in northern Shaanxi, Jilin, and Xinjiang (e.g. produce from abandoned wells).</p> <p>Oil shale: Fushun (Liaoning Province), Huadian (Jilin Province), Maoming (Guandong Province), etc. Oil shale production important for producing various petroleum products. Operations began in 1920s, amplified in 1950/60s, shut down in 1990s due to cheaper crude oil production at Daqing oil fields. Fushun Bureau of Mines and financing by government allowed for resumption of oil shale production. Production of oil shale works in tandem with coal production.</p> <p>LBL Ch 2: major coal mining enterprises (province, production volume).</p> <p>LBL Ch 2: oil production by region and oilfield.</p>	
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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
2. Government-owned energy resources (continued)				
	5) Conflict of interest: the energy bodies (CNPC, Sinopec, State Grid Corp, Shenhua Group) are ministry ranked. Energy SOEs are politically powerful and relatively autonomous; strong influences in energy policy shaping.			
<p><i>Related Web links</i></p> <p>◆ [China Labour Bulletin] “Bone and Blood: The Price of Coal in China.” CLB Research Report No.6. ◆ Wu, Yanrui. “Deregulation and growth in China’s energy sector: a review of recent development.” Energy Policy. Volume 31, Issue 13, October 2003, Pages 1417-1425. ◆ Effect of global economic crisis on China’s energy macro-control policies, energy industry, and development of energy saving opportunities (in Chinese) ◆ Oil Shale Development in China ◆ LBL China Energy Group - China Energy Databook. Much of the statistical information can be obtained for free ◆ China - Africa oil relationships ◆ “Loans for oil” deals b/w China and Russia ◆ [The Economist] - Shanxi, one of China’s biggest coal-producing regions, a once-booming private mining industry is being taken over by the state. Hundreds of small coalmines are being closed down or merged into larger, government-owned businesses. ◆ [Ren21] Background paper on Chinese Renewables Status, but has section on coal-fired power plants ◆ Summary of budget and spending at central and local levels. Includes direct subsidies ◆ [HKTDCC] Preferential Tax Policies: resource taxes, export rebates, ◆ “China National Petroleum Company (CNPC): A Balancing Act Between Enterprise and Government.” BinBin Jiang. Oct 2009. Working paper ◆ Overview of Chinese Oil Industry. NOCs investments in R&D. ◆ Industry Sector Report: Upstream Oil and Gas in China</p>				
B) Royalty relief or reductions in other taxes due on extraction. Reduced, delayed, or eliminated royalties are common at both federal and state levels. Targeted based on type of energy, type of formation, geography, or location of reserve (e.g., deep water).		VAT/resource tax reform to coal sector and others (not yet determined)	“Royalties” gained by foreign investors for providing special technologies for science research, energy exploitation, transportation development, agriculture/forestry/husbandry production, or major technology development, upon the approval of the State Administration of Taxation, shall be collected at a reduced EIT rate of 10% thereof, whereas those with advanced technologies or favourable conditions are exempted from income tax.	
<p><i>Related Web links</i></p> <p>◆ China’s Energy Development Report: Economic Crisis Energy Development Strategy (in Chinese) ◆ Hunan Government - preferential tax policies and royalties</p>				
C) Process of paying royalties due. Allowable methods to estimate and pay public owners for energy resources extracted from public lands.	Ministry of Commerce (MOFCOM) and Ministry of Finance (MOF) collects royalties. Entities involved in exploiting onshore and offshore petroleum resources (Sinopec, CNPC, CNOOC, etc.) pay mining royalties. Royalties are calculated based on annual gross production and are payable in kind by installments to the PRC tax authorities. The 1995 amendment of Onshore Royalties Regulations raised the minimum amount of annual production under which enterprises are exempt from royalties from 50 000 to 500 000 or 1 000 000 tonnes, as an added incentive to foreign cooperation in oil exploitation. Unsure where to find annual reports, if any.			
<p><i>Related Web links</i></p> <p>◆ MOFCOM - Article 10 - All Chinese enterprises and foreign enterprises taking part in the cooperative exploitation of offshore petroleum resources shall pay taxes according to the law and shall pay mining royalties. ◆ Royalties and Taxes on China’s oil sector</p>				

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
3. Government ownership of energy-related enterprises				
<p>General information on category</p>	<p>High. PetroChina, Sinopec, CNOOC (state-owned enterprises) are a major driving force behind China's drive for energy security. As energy demand increases, government is allowing foreign companies to invest in the Chinese energy sector and has made efforts to shift away from the state-owned model. Although very modest progress has been made in developing competition among the many power generating plants, critics point out that the absence of a true national electric grid leaves some areas with surplus power despite the national shortage of generating capacity. Some enterprises publish financial reports on their company Web sites or in U.S. SEC. Some others can be found on Hoovers, Google Finance etc. State ownership of mining operations and utilities is also high.</p>	<p>Grid: Government keen on expanding China's generation and grid capacity. Expected government investment in China's electric power industry from 2001-2030 = \$2 trillion U.S. (equivalent annual expenditure of \$60 billion U.S./year). Demand for technology will be massive as plants are expanded and retrofitted to meet growing capacity needs. Use of local technologies for plant construction and grid expansion is encouraged, and where foreign technology must be used, full transfer is expected.</p>		
<p><i>Related Web links</i></p> <p>◆ PetroChina - Periodic Reports (some financial information) ◆ Beijing Review, "Electricity System Gets Jolt of Reform": reform to power industry ◆ PetroChina on Google Finance ◆ [Stanford] "Innovation in China's Energy Sector." Grid investments by Chinese government (page 25) ◆ Sinopec Annual Financial Reports (net profits, total assets) on company Web site - audited by KPMG Huazhen ◆ Shenhua Energy - financial reports ◆ Deutsche Bank. Global Equity Research, Industry Focus. "Major Oils 2004. Fossil Addicts: Rest of World Majors." Sept 2004. - includes financials for major NOCs (CNOOC, PetroChina, Sinopec) - not available on-line ◆ Renaissance Capital. Sector Update: Equity Research. Oil & Gas: Russia. "2008 Oil & Gas Yearbook Crosswind." July 2008. - not available on-line</p>				
<p>A) Security-related enterprises: Strategic petroleum reserve (SPR); securing foreign energy shipments or key assets.</p>	<p>High. China has committed itself to securing foreign oil assets and developing strategic petroleum reserves. Data on scope and degree to which loans-for-oil projects are subsidized are limited. Most helpful are news coverage. For example, China Development Bank lends money to NOCs to fund "go global strategy," pushing Chinese firms to acquire assets overseas. CNPC \$30B loan over 5 years at discounted rate [FT]. Unable to identify whether the cost is born by the consumer or government; most likely the government since it controls energy prices. Not sure what the structure is for enterprise SPRs. Was unable to find financial statements on the SPRs.</p> <p>China has invested diplomatic efforts in cultivating relations with oil and gas-exporting countries, and successfully used its political capital to influence those pariah regions to make policy-decisions tilt to China's favour. NOCs are expanding oil investments and cooperation overseas, attempting to hedge against high oil prices and increase energy security. Acquired exploration and production partnerships in: Kazakhstan, Russia, Venezuela, Sudan, West Africa, Iran, Saudi Arabia, Canada and the Middle East. China focuses on securing resource suppliers around the world through partnerships or infrastructure</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>[Web link 2] China's SPR has two parts: government controlled complemented with mandated commercial reserves.</p> <p>Central Government portion has two phases: 101.9 million barrel reserve (completed) + 170 million barrel reserve (planned). The 271.9 million barrel reserve should last 35 days.</p> <p>Enterprise SPR: 209.44 million barrel, 27-day reserve. Involves PetroChina, Sinopec, CNOOC, Sinochem, medium/small Chinese oil companies.</p> <p>NEA's goal is to have a 100-day reserve.</p>	<p>Local governments also planning SPR:</p> <ul style="list-style-type: none"> -Guangdong Province: 6 billion yuan, 20-day reserve -Hainan -Xinjiang -Hebei -Chongqing -Zhanjiang, est capacity 44 million barrels; projected cost \$331.6 million 	

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
3. Government ownership of energy-related enterprises (continued)				
	<p>development projects in which it is paid with access to oil. [Web link 5] Partners often include nations with human rights or government transparency conflicts. Territorial disputes with Asian countries over potential energy resources. Acquiring and investing in oil sands projects in Canada. [Web link 6]</p> <p>Strategic Petroleum Reserves (SPR): China's oil reserve system includes four levels: national strategic oil reserves, local oil reserves, large enterprises' oil reserves for commercial usages and smaller companies' reserves. Central government recognizes the importance of establishing an oil reserve because China will increasingly rely on oil imports to meet its demand. Foreign exchange reserve to stockpile commodities. Explore floating storage. [Web link 1]. Size of subsidies to oil stockpiles not known.</p> <p>Energy Law 2007: state-owned and medium-sized oil companies have to maintain their own oil reserve to provide the nation with fresh oil supplies in emergency situations</p>			
<p><i>Related Web links</i></p> <p>◆ [Web link 1] Reuters, March 2009: Oil reserve full ◆ [Web link 2] China's Energy Development Report: Economic Crisis Energy Development Strategy. Section on Strategic Petroleum Reserve (in Chinese) ◆ ASEAN-China Relations: Past, Present, and Future ◆ EIA – section on Strategic Oil Reserves (oil) and stockpiling: a. Launched in 2001 after announcement in 10th Five-Year Plan (2000-2005) b. Government administered: 3 phases at 4 sites (total reserve capacity ~500 million barrels) c. Commercial crude oil storage: ~300 million barrels (unverified) d. Commercial oil product storage: ~252 million barrels (details under development) ◆ [Web link 5] Institute for the Analysis of Global Security - Fueling the Dragon ◆ [Web link 6] China moves into oil sands ◆ Provincial Strategic Petroleum reserve (SPR) - Guangdong ◆ “China’s Strategic Petroleum Reserves: An Update.” EAI Background Brief No. 371 (2008). Storage for commercial stockpiles built by NOCs ◆ China Exim Bank activities in Africa ◆ China and Africa’s emerging relationship, from oil and aid to soft diplomacy and African investment on the mainland. ◆ “China’s Outward FDI and Energy Security.” Oil and gas sector. \$4B in Sudan, internal competition between Chinese NOCs to secure resources abroad ◆ [Deloitte] Investments abroad by Chinese NOCs and LNG industry ◆ China-Africa Cooperation Forum, Chinese enterprises in Africa: lists some spendings on various infrastructure projects ◆ CNPC wins projects in Sudan: ◆ [Financial Times – registered users] “CNPC boosts war chest with \$30bn loan.” China Development Bank gives 5-year loan at discounted rate to NOCs to fund “go global strategy,” pushing Chinese firms to acquire assets overseas.</p>				
<p>B) Transport of Bulk Fuels</p> <p>Rail (coal) Sea (oil) Pipelines (oil, gas)</p>	<p>High. Ancillary services can provide large additional subsidies to fossil energy. China is a large country; transport of fuel from resource-rich areas to demand-rich areas is crucial. Fuels are transported by pipelines, sea and rail. These include domestically obtained resources as well as foreign imports. Disruptions to transport networks are likely to cause severe supply shocks. Pipelines are built, owned, operated by the NOCs; JV if pipelines cross borders into neighbouring countries. Financing doesn't appear to come from users via fuel taxes. Government subsidizes remote regions to tie country together (e.g. Xinjiang, Inner Mongolia).</p> <p>Transport of coal is great importance since 70% of China's primary energy is coal-based. Rail networks are expanding, but the capacity is unable to satisfy demand for the transport of coal and other commodities.</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>LBL Ch 2: transportation of oil, gas and coal (capacity utilizing railway, pipeline).</p> <p>LBL Ch 5: freight movement in volume-distance by mode: railroad (divided into national, local, JV), highway, waterway (divided into inland, ocean), pipeline, air.</p> <p>LBL Ch 9: freight transport via rail, road, water, air, pipeline in units of billion tonne-km, % shares, tonne-km per capita.</p> <p>Rail: major method of transporting oil from Xinjiang, prior to the operations of the Western China Refined Oil Pipeline.</p> <p>Domestic crude oil pipelines primarily serve industrialized coastal markets; long-distance more recently being built to link producing regions to market. Transnational connections: JV between China's NOCs and others (Russia, Kazakhstan, Myanmar, etc.).</p> <p>Natural gas pipelines: fragmented, undergoing investments.</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>LBL Ch 2: interprovincial transport of coal by rail (capacity by origin and destination); crude oil pipeline.</p>	

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3. Government ownership of energy-related enterprises (continued)				
	<p>China's strained and fragile rail capacity was demonstrated in late 2007, when severe winter weather conditions and blizzards halted trains, disabling coal from reaching power stations, and thereby causing widespread blackouts.</p> <p>Sea transit routes, particularly the South China Sea and the Strait of Malacca, are of strategic importance for transporting oil from the Middle East. Likely to grow in importance as East Asia depends more on the Middle East. Over 50% of China's and 70% of Japan's oil supplies from the Middle East pass by ship through the Strait, vulnerable to organized piracy.</p> <p>See "WTO Subsidies and Countervailing Measures" link for further information.</p>	<p>NOCs operate trunk pipelines. Local distribution companies operate local transmission networks – effectively regional monopolies. Lack of competition in NG distribution. Don't have international NG pipelines yet; in talks with Russia and Central Asia.</p> <p>Ports/harbors/LNG terminals: Several under construction. NOCs formed joint ventures.</p>		
<p><i>Related Web links</i></p> <p>◆ Rising Energy Competition and Energy Security in Northeast Asia: Issues for U.S. Policy ◆ LBL China Energy Group - China Energy Databook. Much of the statistical information can be obtained for free ◆ "National Energy Futures Analysis and Energy Security Perspectives in China." Chinese government to construct 4200 km natural gas pipeline from Xinjiang to Shanghai. Prelim capital investment of \$120B RMB ◆ Ministry of Transport (formerly, Ministry of Communications) main webpage - responsible for road, air and water transportation regulations ◆ Ministry of Railways - responsible for conventional railway transportation ◆ [WTO, 2006] Convention on Subsidies and Countervailing Duties, "New and Full Notification Pursuant to Article XVI:1 of the GATT 1994 and Article 25 of the SCM Agreement." Some information on subsidies to infrastructure and construction; not updated in few years. ◆ "China: Clean Coal Study." Zero Draft – Working Draft in Progress. World Bank - not available on-line</p>				
C) Overseas Exploration and Production (E&P)	See discussion under security-related enterprises (above).			
D) Municipal utilities and public power - primarily state-owned; electricity stations, transmission and distribution systems for both natural gas and electric power.	<p>China's primary energy (approximately 70%) predominately comes from coal-fired power plants. Coal plants require central government's authorization to be legal, but since coal is a commodity, power plants pop up without authorization. Environmental regulations are changing (e.g. SO_x, NO_x scrubbers), so new facilities are held to higher standards than old plants.</p> <p>The generation sector has some market competition; the transmission and distribution sectors are heavily state-controlled.</p> <p>[4] Coal pricing system. Coal prices shifting from 2-tiered structure to free market.</p> <ul style="list-style-type: none"> - sale prices grew slowly from 1953 to 1980 under centralized planning - reform measures started in late 1970s with the opening door policy - five stages of coal prices since then to gradually more market-oriented <p>Historical gap between commercial coal price and power coal price due to inflexible electricity tariffs and priority of electricity generation to industrial sectors. NDRC lifted restriction on power coal pricing in 2006, so price gap should close and allow power prices to float with change in coal prices. Ownership structure suggests the utilities get</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>Electricity generation sector is dominated by five state-owned holding companies, namely China Huaneng Group, China Datang Group, China Huadian, Guodian Power, and China Power Investment. These five holding companies generate about half of China's electricity. Much of the remainder is generated by independent power producers (IPPs), often in partnership with the privately-listed arms of the state-owned companies. Deregulation and other reforms have opened the electricity sector to foreign investment, although this has so far been limited.</p> <p>Transmission and distribution sectors are heavily state-controlled (Southern Power Company and the State Power Grid Company).</p> <p>Government incentives could have a critical role in subsidizing or otherwise creating incentives for the operation of natural gas plants; without them, current patterns of low usage may continue.</p>	<p>LBL Ch 2: installed generation capacity by region; list of large thermal power plants; coverage of rural electric grid (township, village, rural).</p> <p>Major coal-producing provinces: Shanxi.</p> <p>[Power Technology] can find information on some coal-based, LNG, nuclear, hydro power plants built in China by searching "Industry Projects" by "Region: Asia".</p> <p>Unsure how heavily provinces subsidize local coal plants. In addition to loans, there are also soft deals between local government officials and plant owners/operators.</p>	

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
3. Government ownership of energy-related enterprises (continued)				
	<p>subsidized access to capital, don't have to earn a profit or return on capital and therefore could sell power at artificially low rates and still break even. However, price controls restrict them from charging even that level.</p> <p>Project financing differs from project to project. Some rely significant on international financing, some receive loans from domestic banks, some are initiatives at local or central government levels. Officials at lower government levels and power plant operators/owners often receive mutual kickbacks (locality will provide land, operators will provide kickbacks).</p>			

Related Web links

◆ ["1st Large Coal-to-Gas Project Under Construction." Deficiency of NG to Beijing. Build coal-to-gas plant in Inner Mongolia, rich in coal, to deliver NG To Beijing.](#) ◆ [EIA - China, Electricity](#) ◆ [NY Times, "Pinched By Price Controls, Power Plants in China Scale Back": rationing of coal, diesel, etc. causing electricity shortages. Low electricity tariffs for residential users](#) ◆ ["Greener Plants, Grayer Skies?" China coal sector - MIT Industrial Performance Center study \(2008\)](#) ◆ ["Forecasting Long-run Coal Price in China: A Shifting Trend Time Series Approach."](#) ◆ [China State Power Information Network: power tariffs](#) ◆ [China Energy Foundation - Electric Utilities Reports](#) ◆ [State Electricity Regulatory Commission](#) ◆ [\[Stanford\] "Innovation in China's Energy Sector." Working Paper #61 \(2007\). Government incentives to spur more widespread use of natural gas plants \(page 20\)](#) ◆ [\[Power Technology\] Yangcheng Coal-Fired Power Plant, Shanxi Province, China: background, project financing, key specifications](#)

4. Market price support and regulation

A) Consumption mandates (restrictions)	<p>Medium. Consumption mandates and restrictions are more evident at the provincial levels than at the national level. Many of the energy efficiency and clean fuel programs are initiated at the provincial and local levels. Although the central government sets regulations and policies, it relies on local governments to carry out the mandates. If there are economic incentives for the localities to go against the central government's mandates, then the policies don't get implemented.</p>	<p>Chinese government had encouraged the use of shaped coal (briquettes) in domestic furnaces, as opposed to raw coal. To replace household coal use, China is expanding the natural gas network. Other initiatives to improve air quality and efficiency include higher efficiency consumer goods and improved emission controls for factories and power plants.</p>	<p>To reduce domestic coal consumption and improve air quality, Beijing has banned the use of coal by industrial and household consumers within the city.</p> <p>Guangxi, Guangzhou, Hainan, Jiangsu, Anhui, and Jiangxi extend fuel subsidies for LNG to poor residents (2006). [Web link 2]</p> <p>The national government also has targeted air pollution from industrial sources. In 1996, as part of the 9th Five-Year Plan, the State Council mandated that all of the more than 238 000 industrial enterprises in China meet emissions standards for key air and water pollutants by the end of 2000 or face closure. Key air pollutants identified in the Plan were E41 primarily SO₂ and particulates (i.e., soot and industrial dust). Special attention was given to 18 000 large enterprises that accounted for more than two-thirds of all industrial emissions. Also by the end of 2000, 47 key cities were to meet national standards for air and water quality.</p> <p>LBL Ch 4: Biomass energy consumption generally by rural households (percentage and volume consumed provided in tables)</p> <p>[Fuel Processing Technology] Clean energy sources mainly in cities and transfer of coal use to countryside. Bulk coal will be forbidden and briquette and washed coal are encouraged.</p>	
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Related Web links

◆ [Congressional Research Reports \(CRS RL31076: China Selected Environmental Issues and Policies\)](#) ◆ [\[Web link 2\] "Fuel Subsidies Offered amid Natural Gas Price Hikes." Guangdong, Guangxi, Hainan, Jiangsu, Anhui and Jiangxi provinces provided fuel subsidies \(10–20 yuan per month\) to poor residents.](#) ◆ [Comments on the fuel tax program: experts believe 1 yuan/liter of consumption tax rate is too low \(in Chinese\)](#) ◆ ["NDRC to curb new projects that pollute." Paid-in capital will be raised for unwanted investments while support for weak sectors and key industries will be enhanced \(December 2007\)](#) ◆ [LBL China Energy Group - China Energy Databook. Much of the statistical information can be obtained for free](#) ◆ [Fuel Processing Technology. Xin Lu \(lead author\). "Policy study on development and utilization of clean coal technology in China." Volume 89, Issue 4, April 2008, Pages 475-484. Fuel switch to briquettes](#) ◆ [\[NY Times\] NDRC will only approve coal-to-fuel \(synfuel\) projects that produce 3 million metric tons or more a year \(production mandate\)](#) ◆ [Clean Coal Engineering & Research Center of Coal Industry. "Policy Study in the Development of Clean Coal Technology."](#)

Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
4. Market price support and regulation (continued)				
<p>Alternative transportation development, fuel mandates, vehicle tariffs.</p>	<p>High. China’s accession into the World Trade Organization (WTO) was predicted to increase the availability of cars in the Chinese market. Prior to WTO membership, tariffs on cars ranged from 80 to 100%. As a WTO member, tariffs reduced to 25%, greatly reducing the cost of imported vehicles. Tariffs on auto parts drop from 40-50% to 10% by 2006. Moreover, import quotas would be phased out by 2005. Sales tax reduced by 30% on new cars that meet the “Euro-II” emissions standards, which took effect in the European Union in 1996.</p> <p>Other motor vehicle emissions are becoming increasingly serious, and government officials at the national and local levels have begun to address these vehicle emissions through regulations and other policy initiatives (e.g. new car-tax that penalizes large cars).</p>	<p>China is participating in a United Nations Development Programme (UNDP) project to test and demonstrate fuel cell buses.</p> <p>Light rail development started after moratorium was lifted. The China Communications and Transportation Association estimates that more than \$15.7 billion will be invested in rail transit over five years.</p> <p>In 1997, the State Council required all sales of leaded gasoline to cease by 1 July 2000. By the end of 1999, 70% of the vehicle gasoline consumed in China reportedly was lead-free, primarily because of the early controls imposed in urban areas.</p> <p>LBL Ch 5: national stock of vehicles (classified into types), locomotives (classified by engine types), etc.; fuel economy</p>	<p>In addition to emission controls on motor vehicles, major municipalities such as Beijing, Chongqing and Shanghai are implementing requirements for liquefied petroleum gas (LPG) and natural gas vehicles and fueling stations.</p> <p>Beijing has the largest natural gas bus fleet in the world, and several other cities are planning to convert thousands of taxis and buses to natural gas over the next few years.</p> <p>Haikou city in Hainan Province plans to spend \$3.6 million to install natural gas systems in 5,400 buses and cars.</p> <p>Currently, subway systems operate in four cities: Beijing, Tianjin, Shanghai and Guangzhou. Rail transit systems are planned in cities such as Chongqing, Shenzhen and Nanjing.</p> <p>Several major urban areas, including Beijing, required leaded gasoline to be phased out by the end of 1997.</p> <p>LBL Ch 5: Stock of vehicles (provincial)</p>	
<p><i>Related Web links</i></p> <p>◆ Congressional Research Reports (CRS RL31076: China Selected Environmental Issues and Policies) ◆ Vehicle emissions standards for new vehicles and engines (in Chinese) ◆ [Bloomberg, 2010] “China Drivers Shun Hybrids, Electric Cars on Lack of Subsidy” ◆ [NY Times] “China Is Said to Plan Strict Gas Mileage Rules.” New mandates on vehicle gas mileage are more strict; Chinese automakers must improve fuel economy by 18% by 2015; imported vehicles exempt from standard ◆ [EF China] China Automotive Technology & Research Center. “Analysis of Implementation Results of the Standard ‘Limits of Fuel Consumption for Passenger Cars’”</p>				
<p>B) Border protection or restrictions</p>	<p>Overall environmental market in China growing rapidly. Only partially accessible to foreign firms due to low-cost local competition, financing and hard currency constraints, closed bidding practices and other market barriers. Air and water control systems (low-cost flue gas desulfurization systems, air and water monitoring instruments, drinking water purification systems, vehicle emissions control and testing devices, industrial wastewater treatment equipment, and resource recovery technologies) are a rising market.</p> <p>As required of WTO members, China has committed to provide national treatment to foreign investors whereby foreign firms will be afforded the same competitive opportunities, including market access, as are available to domestic firms.</p> <p>See other sections for more information on incentives on foreign investments.</p> <p>Preferential tax policies have encouraged cleaner and more efficient growth in fossil-fuel-related industries (cement, power, etc), not just export-oriented manufacturing.</p>	<p>To encourage foreign investment into border cities and expand the open-up policy and enhance the development of the border areas.</p> <p>The enterprise income tax of the foreign-invested enterprises of a production nature established in 12 border cities, counties or towns may be levied at a reduced rate of 24%.</p> <p>Preferential tax policies for enterprises with foreign investment in the border cities; 2001-2004; MOF, SAT, MOFCOM.</p> <p>LBL Ch 7: gross energy export earnings \$ (coal, coke, oil, oil products).</p>	<p>Preferential tax policies for enterprises with foreign investment established in coastal economic open areas and in special economic zones (excluding Shanghai Pudong area); to absorb foreign investment and expand the open-up policy and enhance development of the areas.</p> <p>(1) The income tax on enterprises with foreign investment established in Shenzhen, Zhuhai, Shantou, Xiamen and Hainan special economic zones and foreign enterprises which have establishments or places in these special economic zones engaged in production or business operations shall be levied at the reduced rate of 15%.</p> <p>(2) The income tax on enterprises with foreign investment of a production nature established in the old urban districts of cities where the above-mentioned zones are located shall be levied at the reduced rate of 24%.</p> <p>(3) The income tax on the production-oriented enterprises with foreign investment established in the old urban districts of cities where the above-mentioned zones are located and which are engaged in the following projects: (a) technology-intensive or knowledge-intensive projects, (b) projects with foreign investments of over \$30 million U.S. and having long periods for return on investment, (c) energy resources,</p> <p><i>CONTINUED NEXT PAGE</i></p>	

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
4. Market price support and regulation (continued)				
			<p>transportation and port construction projects, shall be levied at the reduced rate of 15%.</p> <p>(4) Enterprises with foreign investment established in the Hainan special economic zones and engaged in infrastructure projects such as airports, harbours, docks, highways, railways, power stations, coal mines and water conservation, and enterprises with foreign investment engaged in the development of and operations in agriculture where the period of operations is 15 years or more, shall be exempt from enterprise income tax from the first year to the fifth years starting from the year beginning to make profit and subject to enterprise income tax at a rate reduced by one half for the sixth year through the tenth year.</p> <p>(5) The foreign investors who reinvest the profit made from the enterprises established in Hainan special economic zones into the infrastructure construction projects of, or agricultural development enterprises in, the Hainan special economic zones may be refunded the entire portion of the enterprise income tax that has been paid on the reinvested amount.</p>	
<p><i>Related Web links</i></p> <p>◆ China and WTO - Tariff database ◆ Congressional Research Reports (CRS RL31076: China Selected Environmental Issues and Policies) ◆ LBL China Energy Group - China Energy Databook. Much of the statistical information can be obtained for free ◆ UNCTAD - Foreign Direct Investment Database (general) ◆ MOFCOM oversees imports/exports; determines what products are subject to quotas, import tariffs ◆ Flow of FDI into China, 2004 - not broken out for energy ◆ "China's Outward FDI and Energy Security." EAI Working Paper No. 143. ◆ [UNCTAD Expert Meeting, presentation, 2006] Han Wenke and Liu Qiang. "Inward FDI Utilization and Outward FDI in Energy and Resource Sector in China." ◆ [Asia Times] "China opens up refined oil trade, players cautious." (2005). Loosened restrictions on fuel imports. ◆ Hunan Government - preferential tax policies ◆ [HKTDC] Preferential Tax Policies: resource taxes, export rebates ◆ [UNDP, 2007] "Asian Foreign Direct Investment in Africa: Towards a New Era of Cooperation among Developing Countries."</p>				
Import tariff policy changed to encourage innovation.	Medium. China's government is adjusting its policies on imported technological equipment with hopes of boosting domestic innovation and greater industrial restructuring and upgrading. China actively uses tariffs to protect domestic producers, which violates WTO agreements. Major state-backed key technological equipment includes clean energy power generating systems (likely coal-based) above 1 GW. China's central government in March announced expenditure of 20 billion yuan (2.94 billion U.S. dollars) for this year, from a 908 billion yuan public sector budget, to help enterprises upgrade technology, energy efficiency and innovation.	Not applicable.		
<p><i>Related Web links</i></p> <p>◆ [MOF, 2009] China adjusts import tariffs policy to encourage innovation ◆ [HKTDC] Preferential Tax Policies: resource taxes, export rebates</p>				

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4. Market price support and regulation (continued)				
<p>C) Regulatory loopholes: any legal loopholes, either in the wording of the statute or in its enforcement that transfers significant market advantage and financial return to particular energy market participants.</p>	<p>Low. The key in many Chinese industries is to identify and take advantage of loopholes. The central government has increasingly less control over the state-owned companies and local industries (e.g. coal mining, oil and gas companies). Enforcement of existing regulations and consequences for violating laws are not strong, so identifying loopholes is not necessarily crucial.</p>	<p>Foreign suppliers have been finding loopholes in China's government procurement market. Chinese law allows government purchasing from foreign suppliers only under "exceptional" circumstances, that is, if the goods aren't available domestically at commercially reasonable prices, or will be used outside China. But the WTO noted last year local governments "routinely" buy imported goods, as their compliance is difficult to monitor by Beijing and measuring the domestic content of goods can be open to interpretation.</p>		
<p><i>Related Web links</i></p> <p>◆ [Forbes] "Buy American...And Chinese." Opening up China's government contracts to foreign producers is still a long shot ◆ Cao, Xia. "Regulating mine land reclamation in developing countries: The case of China." Land Use Policy. Volume 24, Issue 2, April 2007, Pages 472-483</p>				
<p>D) Price controls</p>	<p>High. Government is involved in controlling prices at all levels of the economy. It plays with pricing mechanism to help ease inflation, help NOCs recover from losses, and shield consumers from price hikes.</p> <p>By holding retail prices for natural gas artificially low, the government has in effect reduced incentives for increased fuel purchases and infrastructure investment.</p> <p>The "dual-track" pricing system was introduced in the 1980s; a portion of energy products could be sold at higher (unplanned) prices in the free market. In the 1990s, more drastic measures have been implemented towards price liberalisation. Deregulation initiatives have been introduced into all energy sectors, i.e. coal, oil, electricity and natural gas.</p>	<p>1998: NDRC announced national price controls on liquefied petroleum gas (among other things)</p> <p>Government-controlled prices. Residential sector pays more than chemical producers, power generators, fertilizer manufacturers.</p> <p>LBL Ch 6: retail electricity by sector for select cities show that commercial sectors pay more for electricity than residential or industry in some cities; peak and non-peak varies; rural residences pay more than urban</p> <p>LBL Ch 9: close to 50% of end use energy consumption is by industry. Tables show volume and percentage for commercial, residential, transportation sectors.</p> <p>LBL Ch 10: expenditure on commodities and services by urban households</p> <p>Government caps gasoline prices. Oil refineries get indirect or direct subsidies. Affects international demand and prices. Gives rise to black market activities.</p> <p>China is liberalizing prices slowly, but at present, the oil producer prices are not set in accordance with the world market price.</p> <p>Since China deregulated the coal market in 1992, government has set coal prices for power-plants at a much lower level than the prevailing market price in order to sustain low electricity retail prices. Government announced in 2006 that coal price controls will be "removed" and prices allowed to be set by market supply and demand. Government will closely monitor coal price fluctuations and take any necessary measures in accordance with the price law.</p> <p>Government plays with price mechanism to help ease NOCs' losses.</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>Local governments at provincial and county levels to formulate their own interim price control plans, as part of nationwide efforts to curb inflation.</p>	

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4. Market price support and regulation (continued)				
		<p>Electricity tariff policies also seem to heavily influence technology investments in China's power industry. Policy has traditionally focused on ensuring the affordability of electricity to all. In 2004 and 2005, the government raised electricity tariffs three times to more closely reflect market prices while preventing sharp price increases during power shortages. However, in the absence of other incentives, power generation companies have shown a preference for cheaper proven technologies, which has discouraged innovation in the industry.</p>		

Related Web links

◆ [Haley, Usha. "Shedding Light on Energy Subsidies in China: An Analysis of China's Steel Industry from 2000-2007." Alliance for American Manufacturing, 2008. Subsidies to thermal and coking coal for steel production.](#) ◆ [\[International Business Times\] "Why China Gas Subsidies Don't Matter."](#) Chinese subsidies to oil and world oil prices. ◆ [\[Rigzone, 2007\] "Why China Can Withstand \\$90 a Barrel Oil - And Higher"](#) ◆ [\[The Economist\] "Oil spikes hurt China, too"](#) is a commentary on Pacific Economic Review article ◆ [Energy Intelligence: oil and gas related publications.](#) Looks like they may have a good database of information...however, it costs \$ to access ◆ [LBL China Energy Group - China Energy Databook.](#) Much of the statistical information can be obtained for free ◆ [NDRC issued national price controls on LPG, local authorities given permission to formulate interim price controls](#) ◆ [\[Forbes, 2006\] "China to remove price controls on coal in 2006 - report"](#) ◆ [\[Forbes, 2008\] "Price Controls Again In Vogue Among China's Planners."](#) Government instituting price controls on energy prices, food and bank lending to control inflation. ◆ [\[Bloomberg\] "Sinopec Expects Higher Profit on Eased Price Controls."](#) Pricing mechanism allowing NOCs to make profit. ◆ [\[Stanford\] "Innovation in China's Energy Sector." Working Paper #61, 2007](#)

5. Direct Spending, including R&D

<p>General information on category</p>	<p>Medium. The energy sector has been identified as a pillar industry. Government, NOCs, JV, FDI provide investments. Publicized material indicates China's focus is on renewables research.</p> <p>Coal: purchases technologies abroad (super-critical coal-fired power plants, turbine designs, desulfurization equipment, IGCC) in conjunction with foreign-led JV in improving mine safety and mgmt; coal washing techniques (domestic).</p> <p>Natural gas and oil: foreign oil companies signing agreements with Chinese NOCs and universities to do research; Chinese NOCs have corporate research centres and distributed university research centres focused on identifying resources but not developing technologies (ineffective coordination system, so duplication of effort is common); China relies primarily on tech transfer from world leaders.</p> <p>"Domestic R&D capacity as well as adoption of domestically manufactured technologies for natural gas exploration, production, and electricity generation remains low."</p> <p>State Council announced RMB 63 billion worth of funding to support 11 national research programmes in biomedical, energy, IT (amount to energy not specified).</p>	<p>"NDRC has committed \$15 billion in state funds to invest in coal-to-liquids plants over the next five to ten years that could produce up to 16 million tons of oil products." (page 15)</p>		
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Related Web links

◆ [\[Nautilus, 2006\] Ni Weidou, Li Zheng, Xue Yuan. "National Energy Futures Analysis and Energy Security Perspectives in China: Strategic Thinking on the Energy issue in the 10th Five-Year Plan \(FYP\)." Presentation for the Workshop on East Asia Energy Futures](#) ◆ [R&D \(page 9\): super-critical coal-fired power plants, turbine designs, desulfurization equipment, IGCC \(approved for construction in Yantai City\)](#) ◆ ["Total to boost R&D in China."](#) Total signed MOU with Chinese universities and NOCs to do R&D in oil sector.

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
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5. Direct Spending, including R&D (continued)

Related Web links

◆ Collaborative oil and gas R&D with Japan ◆ State-owned Sinopec has subsidiary arms that invests in R&D ◆ Structure of Sinopec's R&D groups ◆ PetroChina financials - shows 0% R&D as percent of revenue ◆ [PetroChina] 2009 Annual Report. R&D expenditures in 2009 = RMB 9 887 and 2008 = RMB 7 760. (page 133) ◆ [Stanford] "Innovation in China's Energy Sector." Working Paper #61 (2007). JV for coal mines (page 14) ◆ Zhijun Jin, Guoping Bai and G. Ali Mansoori. "An introduction to petroleum and natural gas exploration and production research in China." Journal of Petroleum Science and Engineering. Volume 41, Issues 1-3, January 2004, Pages 1-7 ◆ Economist Intelligence Unit. "China's Stimulus Package: A 6-Month Report Card" (2009) ◆ Xin Lu (lead author). "Policy study on development and utilization of clean coal technology in China." Fuel Processing Technology. Volume 89, Issue 4, April 2008, Pages 475-484. Chart on investment and fuel cost in specific clean coal technologies ◆ Financial background: "Report on the Implementation of the Central and Local Budgets for 2009 and the Draft Central and Local Budgets for 2010." The Third Session of the Eleventh National People's Congress. 5 March 2010. Ministry of Finance of the People's Republic of China - money for basic research, major S&T projects ◆ PetroChina R&D Statement ◆ 2008 PetroChina Corporate Social Responsibility Report. CNPC and PetroChina to invest 8 billion RMB in R&D centre in Changping, Beijing (page 16)

<p>A) Earmarks</p>	<p>Earmarks generally built into Five-Year Plans. Energy efficiency and pollution discharge reduction. The pollution control spendings are linked to pollution from energy intensive industries (cement, steel, power production); much of the the pollution controls are directed at coal since it fuels primary electricity generation. MOF budget documents show total earmarks, but not broken down by industry.</p> <p>Anticipated in 12th Five-Year Plan (2011-2015): NO_x controls, black carbon control, carbon tax levels</p> <p>FDI tracked in UNCTAD, but not specific to energy.</p>	<p>Nov 2004: NDRC and the Export-Import Bank of China jointly announced that the bank would earmark a portion of FDI budget for key overseas investment projects including natural resource development at an interest rate discount of at least 2%.</p> <p>Since 1998, Beijing has earmarked nearly \$3.6 billion for implementing 68 air pollution control measures. According to SEPA, these measures resulted in significant improvements in air quality by the end of 1999. Compared with 1998, SO₂ emissions had declined 31%, and NO₂ had declined 7.2%, and total suspended particulates (TSP) had declined 20%. Levels of these pollutants reportedly all declined further during 2000. In addition to aggressive pollution control measures, favourable wind patterns also contributed to reductions in pollution levels. City officials recently announced new measures for the latest stage of this pollution prevention campaign, which include imposing stricter controls on automobile emissions and requiring Capital Iron and Steel, the city's largest polluter, to curtail operations. Beijing is also taking actions to increase the use of cleaner fuels, such as natural gas and low-sulfur coal.</p>		
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Related Web links

◆ [Conference] Institute of China Studies, University of Malaya: "China's Future: Pitfalls, Prospects and the Implications for ASEAN and the World" ◆ China earmarks 10 billion yuan for energy efficiency, discharge reduction ◆ Christina L. Madden. "China's Eco-Entrepreneurs." Policy Innovations, 2007. Increasingly role of non-governmental organizations, earmarks provided to allow small businesses and local governments ability to develop own solution to environmental problems ◆ Harvard China Project: GHG and pollution control options ◆ Silk, Mitchell. "Are Chinese Companies Taking Over the World?" Chicago Journal of International Law, 2006. NDRC and Exim Bank: 1/3 of China's economy is composed of SOEs. Benefits to SOEs: majority shareholder-chief among them being monopoly status, profitable government contracts, information sharing networks, domestic tax breaks, cheap land and preferential access for public listing. Push them to be "national champions" ◆ "Financing Cities: Fiscal Responsibility and Urban Infrastructure in Brazil, China, India, Poland, and South Africa." The World Bank. 2007. Chapter 2: "China: Fiscal Framework and Urban Infrastructure Finance." Su Ming and Zhao Quanhou. Page 74. Chapter 6: "Urban Infrastructure Investment and Financing in Shanghai." Gao Guo Fu. page 220 - General transfer system structure, earmarks, expenditures

<p>B) Agency appropriations and contracts</p>	<p>In China, there are no regular budgetary appropriations to publish energy statistics beyond the few indicators that appear in the China Statistical Yearbook.</p>	<p>Some indications of funding by government and multilateral development banks on coal-to-liquids technologies and production facilities.</p>		
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Related Web links

◆ Sinton,Jonathan. "Accuracy and reliability of China's energy statistics." China Economic Review. Volume 12, Issue 4, 2001, Pages 373-383 ◆ "China: Clean Coal Study." Zero Draft – Working Draft in Progress. World Bank - not available on-line

Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
5. Direct Spending, including R&D (continued)				
C) R&D Support	<p>Foreign investments welcomed for R&D. More foreign investment is being pumped into the coal sector: modernizing existing large-scale mines, developing new ones, and developing new technologies.</p> <p>Ministry of Science and Technology supports a number of R&D projects.</p> <p>Trans-Century Green Project. environment-related projects compiled by China's government and proposed for potential foreign investment (pollution control and treatment infrastructure projects) was unveiled at the 1997 U.S.-China Environment Forum established to facilitate U.S.-China cooperation.</p> <p>[Stanford] Industrial R&D weak, particularly in state-owned sectors as compared to JV, private enterprises and TVEs. Government policies to increase R&D expenditures have met with mixed success due in part to restructuring and IP issues (page 11).</p>	<p>[Web link 5] According to the U.S.-China Business Council, China's State Environmental Protection Agency (SEPA) has reported that by the end of 1997, some 11.3% of these projects had been completed, with total investment at \$1.3 billion, with international investment of \$99.5 million. In addition, one-third of the total, 523 projects, were reportedly underway, with investment in them of \$2.14 billion, of which \$290 million were foreign funding. By the end of 1999, 1 053 projects were completed or initiated, accounting for 72% of all Trans-Century projects and 60.2% of total investment for these projects.</p> <p>"China University of Mining and Technology's gasification research centre provides contracted research services to PetroChina on gasification technologies for use in deep coal seams, while relying on government grants to support a broader research program and gasification test lab." (page 17)</p>		<p>Coal - R&D in other train types.</p> <p>CO₂ - finding ways to make synthetics and polymers from this GHG.</p>
<p><i>Related Web links</i></p> <p>◆ Barry, Keith. "Chinese Coal Rides A Maglev. Why Don't We?" comment posted 2009. Maglev train for coal transport ◆ MoST R&D, National High Technology Research and Development Program (863 Program). Example project: turning CO₂ waste to useful product in Chinese ◆ MoST Web site reports on R&D spending ◆ MoST: "Special funds for research institutes" ◆ OECD China Stats (includes spending for R&D) ◆ [Web link 5] Congressional Research Reports (CRS RL31076: China Selected Environmental Issues and Policies) ◆ Trans-Century Green Project plan ◆ China New Energy - links to R&D in Science and Technology programs ◆ [MOFCOM] "China adjusts import tariffs policy to encourage innovation" ◆ [Stanford] "Innovation in China's Energy Sector." Working Paper #61, 2007. China's trends in energy Innovations/R&D + big picture shifts in Chinese approach to energy development ◆ Xi'an Branch of China Coal Research Institute: coal mine safety and geological exploration ◆ China FDI into other countries' natural resources</p>				
D) Foreign Direct Investments and Equities	<p>[Web link 1] is a study of the World Bank's energy-related project portfolio in China reveals several areas where World Bank assistance has clearly influenced broader trends in energy and environmental protection in China.</p> <p>[Web link 2] presents a survey of recent reforms in this sector; it also analyzes the impact of deregulation on energy policy, ownership, foreign investment and trade, and sheds some lights on the sources of growth in China's energy sector.</p> <p>See "Security-related enterprises" section for further information on Chinese FDI in other countries' natural resources</p> <p>2004-MOFCOM and Ministry of Foreign Affairs issued the Countries and Industries for Overseas Investment Guidance Catalogue, which has a list of preferred industry sectors in sixty-eight countries perceived as prospective areas for Chinese enterprises to invest. Preferred investments benefit from a broad range of incentives offering priority access to financing and foreign exchange, tax concessions and preferential customs treatment. MOFCOM is also establishing an information bank for Chinese enterprises which intend to expand overseas.</p>	<p>[Web link 5] According to the U.S.-China Business Council, China's State Environmental Protection Agency (SEPA) has reported that by the end of 1997, some 11.3% of these projects had been completed, with total investment at \$1.3 billion, with international investment of \$99.5 million. In addition, one-third of the total, 523 projects, were reportedly underway, with investment in them of \$2.14 billion, of which \$290 million were foreign funding.¹²¹ By the end of 1999, 1 053 projects were completed or initiated, accounting for 72% of all Trans-Century projects and 60.2% of total investment for these projects.</p> <p>-Coal: some bilateral loans</p> <p>-Oil: foreign investors involved in oil sector via shareholding; primary interest of foreign oil companies is exploration. Foreign ownership and management of gas stations is in grey area (technically not legal, but exists).</p> <p>-Natural gas: foreign shareholding and construction allowed in LNG, West-East Pipeline, town-gas pipeline</p>		

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

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5. Direct Spending, including R&D (continued)

Related Web links

◆ [Web link 1] Martinot, Eric. "World bank energy projects in China: influences on environmental protection." *Energy Policy*, Volume 29, Issue 8, June 2001, Pages 581-594. ◆ [Web link 2] Wu, Yanrui. "Deregulation and growth in China's energy sector: a review of recent development." *Energy Policy*, Volume 31, Issue 13, October 2003, Pages 1417-1425. ◆ Silk, Mitchell. "Are Chinese Companies Taking Over the World?" *Chicago Journal of International Law*, 2006. NDRC and Exim Bank: Countries and Industries for Overseas Investment Guidance Catalogue for Chinese enterprises to invest overseas. Chinese companies benefit from favourable lending by Chinese banks, direct contribution of capital by the government, and non-financial government incentives. In bidding for Unocal, CNOOC would have received a \$7 billion intercompany loan from its state-owned majority shareholder consisting of a noninterest \$2.5 billion bridge loan to have been refinanced through the sale of shares in two years and a 3.5 percent-interest \$4.5 billion loan with a 30-year term. ◆ CHEN Shaofeng. "China's Outward FDI and Energy Security." *EAI Working Paper No. 143, 2008*. ◆ [Weblink 5] [HKTDC, 2009] "China publishes tax preferential policies to encourage energy saving by enterprises." Resource taxes, export rebates

E) Amount spent on energy conversion technical updating and demo projects		LBL Ch 3: national allocations and loans for energy conversion projects (1981-1995). No data for recent years.		
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Related Web links

[LBL China Energy Group - China Energy Databook](#). Much of the statistical information can be obtained for free

6. Tax breaks and special taxes

General information on category	<p>MOF budgetary documents have some data on tax breaks and revenue forgone (referred to as loss making enterprises) per year, but not specific to energy.</p> <p>15 categories, not comprehensive, of subsidies named (subsidized purchases, tax breaks, free and low-cost loans). Subsidies to thermal coal, coking coal, electricity, natural gas. Look at references under Export section. Subsidies exist in all industries government consider economically or militarily strategic (steel, energy, resource extraction, computing, software, R&D, environmental services and conservation, autos). NDRC sets price guidelines; local regulators influence prices/subsidies/costs.</p> <p>Subsidies to oil giants: Sinopec and PetroChina.</p> <p>There are other direct or indirect subsidies. There are regulated prices. Price controls, tax on refined oil consumption, subsidy to oil companies (page 17/39). Estimates of consumer oil price subsidies (page 21/39).</p>			
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Related Web links

◆ Testimony before Subcommittee on Trade of the House Committee on Ways and Means, 2007. Growing concern by U.S. steel industry about subsidies and state support of industrial capacity in China. ◆ Zhao Zhijiang. "China's gas prices and Sinopec's subsidies." *Commentary on UPI Asia*, 2009. Subsidies to oil giants ◆ "China oil majors alter crude pricing standard to cut tax burden." *NOCs alter crude pricing standard to cut tax burden*. ◆ Shikha Jha, Pilipinas Quising, and Shiela Camingue. "Macroeconomic Uncertainties, Oil Subsidies, and Fiscal Sustainability in Asia." *Asian Development Bank, Working Report No. 150, 2009*. ◆ [Reuters, 2008] "China oil import tax rebate may be quietly dropped." China to remove tax breaks on crude imports ◆ China and Africa's emerging relationship from oil and aid to soft diplomacy and African investment on the mainland ◆ CHEN Shaofeng. "China's Outward FDI and Energy Security." *EAI Working Paper No. 143, 2008*. *NOCs pay taxes...CNPC made RMB379.2B in revenue and paid RMB64.4B in taxes* ◆ [IMF, 2008] "Food and Fuel Prices—Recent Developments, Macroeconomic Impact, and Policy Responses." Fuel and food subsidies

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
6. Tax breaks and special taxes (continued)				
<p>A) Tax expenditures: reduced rates, tax exemptions, special deductions.</p>	<p>[World Bank] “In China (both central and local governments), tax expenditure policy has become popular since 1978, when China launched an economic transformation from a planned to a social market economy. The government has not established a tax benchmark structure, but it recognizes that most tax incentives in its system are tax expenditures. The estimated cost of tax expenditures is not available to the public, even though the central government has made estimates for about 100 tax expenditures. However, according to a reputable tax expert in China, the total number of tax expenditures is probably 1 000, more or less. The size of the tax expenditures could be well over 10% of GDP in 2002.”</p> <p>In 2001, China halved VAT rates on coal refuse and slime, and oil shale. (World Bank).</p>	<p>Granted under the Income Tax Law of the People’s Republic of China for Enterprises with Foreign Investment and Foreign Enterprises (the Tax Law); Encourage foreign investment (others), to encourage foreign investment into infrastructure construction (this one).</p> <p>The income tax of foreign-invested enterprises engaged in energy and transportation infrastructure projects such as harbour and wharf projects may be levied at the reduced rate of 15%.</p> <p>The implementing scope of the policy stipulated in Art.73.1.1.3 of Rules for the Implementation of the Income Tax Law of the People’s Republic of China for Enterprises with Foreign Investment and Foreign Enterprises is enlarged to nationwide.</p> <p>Preferential tax policies for foreign-invested enterprises engaged in energy, transportation infrastructure projects (others listed as well).</p> <p>2001-2004, by Ministry of Finance (MOF), State Administration of Taxation (SAT), Ministry of Commerce (MOFCOM), and Ministry of Science and Technology (MOST) when appropriate.</p>		
<p><i>Related Web links</i></p> <p>◆ Haley, Usha. “Shedding Light on Energy Subsidies in China: An Analysis of China’s Steel Industry from 2000-2007.” Alliance for American Manufacturing, 2008. Subsidies to thermal and coking coal for steel production. ◆ Investing in China (overview of tax policy) ◆ [Xinhua, 2008] “China reduces tax burden on firms.” Cut VAT for all industries, effective 2009: shift from production-based to consumption-based VAT ◆ [HKTDC, 2000] “Changes in China’s Policy on Attracting Foreign Investment after WTO Entry” ◆ [World Bank] Swift, Zhicheng Li. “Managing the Effects of Tax Expenditures on National Budget” World Bank Policy Research Working Paper No. 3927, 2006. page 8 and 16 - partial estimates of data on tax expenditures for China may be available ◆ [HKTDC, 2009] “China publishes tax preferential policies to encourage energy saving by enterprises.” Resource taxes, export rebates ◆ “China: Clean Coal Study.” Zero Draft – Working Draft in Progress. World Bank - not available on-line</p>				
<p>B) Excise taxes/special taxes: excise taxes on fuels; special targeted taxes on energy industry (e.g., based on environmental concerns or “windfall” profits).</p>	<p>Government reduced import fees on oil recently (due to high prices).</p> <p>Oil spill clean-up fund in the works, as of 2009.</p> <p>Coal mine safety fund, 2005: mines to put in 2-15 yuan/ton produced.</p> <p>Sustainable Mining Fund, being established by Shanxi Province.</p> <p>No reference on fund to clean up leaking underground storage tanks.</p>	<p>[WTO] Document indicates a number of subsidies directly targeting energy. Many of these policies and more general regional development policies, are probably used by energy projects -- though it is hard to tell. Subsidies do include preferential tax rates for a variety of enterprises/programs though the details are vague (e.g. harbours; transportation; construction; energy resources; rural energy). China selectively makes certain data available (some programs are directly budgeted) and others not (programs’ cost estimates not provided; losses are not immediately apparent).</p> <p>Consumption tax on imported solvent oil, naphtha, lubricant oil and fuel oil according to the legal tax rate, and exempt the consumption tax on imported naphtha from 1 March 2008 to 31 December 2010.</p> <p>Government believes imposing fees on oil mining sectors while offering subsidies to disadvantaged communities and public services will be good for improving the efficiency of China’s oil mining, breaking up the oil mining monopoly.</p>	<p>Coal Mine Safety Fund: local government stimulate 15 yuan/ton (2005) to cover safety fee</p> <p>Shanxi Province’s Sustainable Mining Fund. 14 yuan/ton (\$1.80 U.S.) for steam coal, 18 yuan/ton (\$2.30 U.S.) for hard coal, and 20 yuan/ton (\$2.60 U.S.) for coke coal. The Local Taxation Bureau of Shanxi predicts annual revenues of up to 15 billion yuan (\$1.9 billion U.S.) from the fund, based on the roughly 600 billion tons of coal produced in the province last year.</p>	

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6. Tax breaks and special taxes (continued)

Related Web links

◆ [“Import & Export Reports \(Official Sources\)”](#) (towards bottom of Web page) ◆ [\[Xinhua, 2009\] “No Timetable for China’s Levy of Fuel Oil Tax, Official Says.”](#) ◆ [\[WTO, 2006\] World Trade Org’s Convention on Subsidies and Countervailing Duties, “New and Full Notification Pursuant to Article XVI:1 of the GATT 1994 and Article 25 of the SCM Agreement”](#). Some information on subsidies to infrastructure and construction; has not been updated in a few years ◆ [\[China Daily, 2009\] “Oil companies cough up for spills.” Oil Spill Clean-up Fund: passed State Council, potentially implement in 2010, possibly charge 0.3 yuan \(4 cents\) for each ton of imported oil, fund to cover victim compensation \(50 million yuan\)](#) ◆ [\[China Daily, 2005\] “Gov’t urges increased mine safety spending.” Coal Mine Safety Fund: range of fee varied. Some local government imposed higher fees than the national government](#) ◆ [David Blumental, Tju Liang Chua and Ashleigh Au. “Industry Sector Report: Upstream Oil and Gas in China.” Royalties and Taxes on China’s oil sector.](#) ◆ [\[Worldwatch Institute, 2007\] “China’s Largest Coal Province Launches Sustainable Mining Fund.” Sustainable Mining Fund, Shanxi Province - 2007, 14 yuan/ton \(\\$1.80 U.S.\) for steam coal, 18 yuan/ton \(\\$2.30 U.S.\) for hard coal, and 20 yuan/ton \(\\$2.60 U.S.\) for coke coal. The Local Taxation Bureau of Shanxi predicts annual revenues of up to 15 billion yuan \(\\$1.9 billion U.S.\) from the fund, based on the roughly 600 billion tons of coal produced in the province last year.](#)

7. Credit support

<p>General information on category</p>	<p>Low. U.S. Export-Import Bank (Exim Bank) has partnered with the Chinese government on a Clean Energy Initiative to improve efficiency and reduce emissions.</p>			
<p>Government loans and loan guarantees to energy enterprises: market or below market lending to energy-related enterprises, or to energy-intensive enterprises such as primary metals industries.</p>	<p>Chinese banks are state-owned. Lending is typically concentrated in the first part of the year, but government is still pushing banks to lend. They can be ordered by the government to set aside larger reserves and participate in higher lending (Forbes 2). Rates are listed under “Financial Information” section of the banks’ Web sites (e.g. ICBC). General information on who they lend to can be found under “news” sections of the Web sites (e.g. ICBC). Metal (primarily steel and aluminum) industries get subsidies Mineral Resources Law: subsidies to CBM/gas extractions at coal mines, method to improve coal mine safety (2009)</p>	<p>The Industrial & Commerce Bank of China (ICBC): largest bank in China by total assets, total employees and total customers. ICBC differentiates itself from the other state-owned commercial banks by being 2nd in foreign exchange business and 1st in RMB clearing business. It used to be the major supplier of funds to China’s urban areas and manufacturing sector. The Bank of China (BOC): specializes in foreign-exchange transactions and trade finance. In 2002, BOC Hong Kong (Holdings) was successfully listed on the Hong Kong Stock Exchange. The \$2.8 billion U.S. offering was over-subscribed by 7.5 times. The deal was a significant move in the reform of China’s banking industry. The China Construction Bank (CCB): specializes in medium to long-term credit for long-term specialized projects, such as infrastructure projects and urban housing development. The Agriculture Bank of China (ABC): specializes in providing financing to China’s agricultural sector and offers wholesale and retail banking services to farmers, township and village enterprises (TVEs) and other rural institutions.</p>		

Related Web links

◆ [Asian Development Bank - projects that ADB assists](#) ◆ [Haley, Usha. “Shedding Light on Energy Subsidies in China: An Analysis of China’s Steel Industry from 2000-2007.” Alliance for American Manufacturing, 2008. Subsidies to thermal and coking coal for steel production.](#) ◆ [\[Xinhua, 2009\] “Measures to Boost Coal Bed Methane Extraction.” Subsidies to CBM/gas extractions at coal mines, method to improve coal mine safety](#) ◆ [\[China Daily, 2009\] “Cleaner Energy from Coal Mine Methane.” The Coal Mine Methane Development Project \(CMMDP\) at Jincheng in the southern part of Shanxi province was initiated in 2005 as a coal mine methane development and utilization demonstration project. The provincial authority invested about 2.2 billion yuan,](#) ◆ [\[Forbes, 2008\] Chen, Shu-Ching Jean. “Price Controls Again In Vogue Among China’s Planners.” price controls on energy and bank lending to control inflation](#) ◆ [\[Financial Times, 2009. Registered users\] Dyer, Geoff. “China bank lending still on rise.”](#) ◆ [\[Milken Institute, 2008\] Li, Tong. “China’s Nonperforming Loans: A \\$540 Billion Problem Unsolved”](#) ◆ [\[Cri, 2005\] “What’s the structure of China’s banking system?” Banking Structure: 4 major state-owned commercial banks](#) ◆ [\[ICBC, 2009\] “Industrial and Commercial Bank of China Limited Reports profit after tax of RMB 66.7 billion for the first half of 2009.” See “Financial Information” and “ICBC news” for rates and investments](#)

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
7. Credit support (continued)				
A) Subsidized credit to domestic infrastructure and fossil-fuel power plants	<p>Asian Development Bank and Chinese government providing funds for CCS projects.</p> <p>First clean coal plant: GreenGen \$1B. Group of investors: U.S. coal giant Peabody Energy, five of China's largest power companies, two domestic coal companies and government entity State Development and Investment Corp (oversees China's state-owned assets).</p> <p>Stimulus: Refineries received RMB 100 billion for investment to upgrade to cleaner fuels (split b/w RMB 60 billion in 2008 to upgrade gasoline refining, and another RMB 40 billion by 2010 for sulfur emission reduction in diesel production). Power companies and grid operator received RMB 10 billion worth of subsidies to offset losses resulting from the difference between high coal costs in 2008 and price caps on power prices.</p>	<p>Stimulus 2008: new bank lending, much of it directed towards government-guaranteed infrastructure programmes, was RMB 5.17 trillion in the first four months of 2009. Some are "dubious" in their efforts to generate economic benefits; some highways overlap routes and are duplicative construction projects.</p>		
<p><i>Related Web links</i></p> <p>◆ [Business Green, 2009] Chan, Yvonne. "Asian Development Bank backs China's clean coal research." ADB and China government providing funds for CCS projects ◆ [Business Green, 2009] Chan, Yvonne. "China's first clean coal plant underway." GreenGen, Tianjin SynGas \$1B. Group of investors: U.S. coal giant Peabody Energy, five of China's largest power companies, two domestic coal companies and government entity State Development and Investment Corp (oversees China's state-owned assets). ◆ [ADB] Tianjin IGCC (Project Number 42117- 01) ◆ The Economist. Economist Intelligence Unit. "China's Stimulus Package: A 6-Month Report Card" (2009) ◆ MOF - Final Account of Budgetary Revenue and Expenditure in Xinjiang Uygur Autonomous Region (2003) - "subsidies to loss-making enterprises," "earmarked revenue," "capital construction" etc. (not necessarily specific to energy) - search on http://www.mof.gov.cn/</p>				
B) Subsidized credit to fossil-fuel related exports (via Eximbank, multilateral lending institutions, export credit agencies)	<p>Major public financial institutions financing infrastructure and resource extraction projects in developing countries are: Bank of China, China Development Bank, China Export-Import Bank, and Sinosure (source: EDF). Policy banks receive interest subsidies from MOF</p> <p>Multilateral Development Banks lead in financing coal-fired plants:</p> <ul style="list-style-type: none"> -World Bank Group -Asian Development Bank -China Development Bank <p>Export Credit Agencies</p> <ul style="list-style-type: none"> -China Export-Import Bank 			
<p><i>Related Web links</i></p> <p>◆ [EDF, 2009] Rich, Bruce. "Coal, climate and public international finance" - financing subsidies to coal infrastructure ◆ ECA watch: Three-Gorges Dam is the largest ECA-backed project in China ◆ China Exim Bank (main Web site) ◆ [Multinational Monitor, 2007] Bello, Walden. "China eyes Africa; the new imperialism?" Nigerian oil rights exchange for Chinese investment & export credits ◆ [ADB] Shikha Jha, Pilipinas Quising, and Shiela Camingue. "Macroeconomic Uncertainties, Oil Subsidies, and Fiscal Sustainability in Asia." Asian Development Bank, Working Report No. 150, 2009. Oil subsidies in Asia (Price controls, tax on refined oil consumption, subsidy to oil companies); fiscal indicators; estimates of Consumer Oil Price Subsidies ◆ [SSINA, 2008] "China's Specialty Steel Subsidies: Massive, Pervasive, and Illegal." Specialty Steel Industry of North America. Specialty steel used by oil and industry ◆ Ellis, Linden. "China Exim Bank in Africa: Opportunities for Strengthening Environmental Standards for Hydropower in Sudan." Woodrow Wilson International Center for Scholars, 2007. ◆ Silk, Mitchell. "Are Chinese Companies Taking Over the World?" Chicago Journal of International Law, 2006. Policy Banks: China Development Bank, China Exim, Agricultural Development Bank - "where a project is supported by the government, China Exim may receive interest subsidies from its direct parent, the Ministry of Finance, for loans extended below its own" ◆ China Development Bank - projects</p>				

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
7. Credit support (continued)				
C) Funding	<p>Internal (equity and debt financing; most common right now), venture capital (should utilize this more, especially as enterprises are liberalized), Industry Investment Fund (currently in exploratory stages).</p> <p>[NDRC] Government co-investments with foreign companies and domestic SOEs in all sectors (strengthen research, adopt tech transfer, renewables and fossil developments).</p>			
<p><i>Related Web link</i></p> <p>◆ [NDRC, 2007] “China’s National Climate Change Programme” - government policy/guidance/investments in various GHG-reducing activities</p>				
8. Insurance and Indemnification				
A) Government insurance/indemnification: market or below-market risk management/risk shifting services provided by the government.	Government paid compensation to victims or to their families in some cases of accidents. CIRC regulates the insurance industry. Coal mines are supposed to carry injury insurance for employees; not clear on whether this is widely executed. Some NOCs have own insurance arm (e.g. CNOOC).	Accident compensation to families is in part evaluated based on yearly average living expenses of the victims. Severe gas explosion incident at the Chuandong Oil Drilling & Exploration Company (12/23/03): households of 190 victims received compensation for recovery. Total amount of 30 million yuan (\$3.64 million U.S.); each individual’s life was assessed at 100 000 yuan (\$12 121 U.S.). Three Gorges dam construction site, the No. 3 tower belt machine suddenly broke (9/3/00): the three victims’ families received 80 000 to 100 000 yuan (approximately \$ 9 696 U.S. to 12 121) in compensation (no mention of compensation for the injured).		
<p><i>Related Web links</i></p> <p>◆ [Epoch Times] The Cost of a Human Life in China (in Chinese) ◆ China Insurance Regulatory Commission (CIRC): regulates the Chinese insurance products and services market and maintain legal and stable operations of insurance industry ◆ State Administration of Work Safety (SAWS): regulates risks to occupational safety and health in China ◆ OSHA U.S.-China MOU: information exchange on creating OSHA-type entity ◆ China Labor Bulletin: non-governmental organization supporting workers’ rights; research reports and litigation ◆ [Xinhua, 2005] Injury insurance at state-owned mines ◆ [China Labour Bulletin, 2009] “State Council’s revised work-related injury regulations need more bite.” ◆ CNPC - statement on providing insurance for employees ◆ [Mallesons Stephen Jaques Law firm] summary of New Insurance Law 2009 ◆ Mei, Xue. “Do Captive Insurers Have Future in Chinese Market?” APEA 2010 Conference</p>				
B) Statutory caps on commercial liability can confer substantial subsidies if set well below plausible damage scenarios.	<p>Liability insurance currently undergoing development. New, amended “insurance law” took effect in October 2009: expanded business opportunities for insurance companies; more protection for purchasers of insurance; expanded regulatory powers for the China Regulatory Insurance Commission (CIRC); more access for foreign insurers to Chinese markets.</p> <p>MEP and CIRC (2007) issued “Guiding Opinion of the State Environmental Protection Administration on the Environmental Impairment Liability Insurance (the Guiding Opinion)” seek to set standards for environmental cases.</p>	<p>CIRC called for the establishment of a mandatory liability insurance system, under which operators of public facilities are legally required to buy liability insurance, and urged support from fiscal authorities for favourable tax treatment.</p> <p>Commercial General Liability (CGL) policy</p> <p>Environmental Impairment Liability Insurance (EIL insurance) - initial stage; corresponding polices rules and regulations absent.</p> <p>-Maritime Oil Pollution Insurance, regulated by the Maritime Code of the PRC</p> <p>-Chinese Insurance Law</p> <p>-International Convention about the Civil Liability for Oil Pollution Damage 1968</p> <p>-Guiding Opinion of the State Environmental Protection Administration on the Environmental Impairment Liability Insurance (the Guiding Opinion), issued at end of 2007</p>	Majority of areas in cities are not covered by liability insurance. Government ends up paying compensation to victims’ families.	

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
8. Insurance and Indemnification (continued)				
<p><i>Related Web links</i></p> <p>◆ [China Daily, 2004] Liability insurance recognized as important to improving workplace safety ◆ Commentary on the new Environmental Impairment Liability Insurance (EIL Insurance) ◆ [Book, 2006] Prevention and Compensation of Marine Pollution Damage: Recent Developments in Europe, China and the U.S. Editors: Michael G. Faure and James Hu. ◆ [Lehman, Lee and Xu - Law firm] "Director and Officer Liability Insurance in the People's Republic of China." ◆ [China Daily, 2008] Opinion: introduction of an environmental liability insurance / "green insurance" ◆ [Xinhua, 2009] Injured person allowed to make liability insurance claim with insurance company (in Chinese) ◆ [Malleons Stephen Jaques Law firm] summary of New Insurance Law 2009</p>				
9. Health and safety oversight				
<p>Health and safety oversight: includes oversight of mining, oil and gas extraction, fuel transport, nuclear facilities, site clean-ups. If not paid by users, riskier and dirtier forms of energy gain a relative advantage.</p>			<p>Provincial Work Safety Administrations (mentioned in Web link 1)</p> <p>Enforcement of mine safety done at provincial and municipal levels by local bureaus of Coal Mine Safety and Supervision. e.g. Shandong (local) Bureau of Coal Mine Safety and Supervision touted as having low fatalities</p>	
<p><i>Related Web links</i></p> <p>◆ [Web link 1] China's Energy Development Report: Economic Crisis Energy Development Strategy (in Chinese) ◆ State Administration of Work Safety (SAWS): Non-ministerial agency oversees occupational safety and health ◆ National Workplace Emergency Management Center: Performs mine rescues ◆ State Administration of Coal Mine Safety: Department of General Affairs (Department of Technology and Equipment), Department of Safety Supervision and Inspection, and Department of Accident Investigation. ◆ [presentation] Tianyu (Helen) Hei. "Reflections on Coal Mine Safety in China." Discusses structure of coal industry. Shandong (local) Bureau of Coal Mine Safety and Supervision touted as having low fatalities. ◆ [LBL China Energy Group] Coal Mine Death Statistics ◆ [NY Times, 2009] "Graft in China Covers Up Toll of Coal Mines." Owner and local government officials nearly succeeded in concealing tragedy; paid off victims' families</p>				
<p>Compensation to workers with occupational diseases.</p>	<p>Unknown. A formal compensation process across localities and sectors has not been developed. Compensation is variable and often lined with bribes to keep the accidents and incidents from media attention.</p> <p>Ministry of Health conducted a survey to uncover problems in diagnosing occupational diseases and to make appraisal of occupational disease relating to criteria, procedure, administration, personnel and funding.</p> <p>Have not been able to find published data on occupational illness and payments by industry sector.</p>	<p>National survey on diagnosis of occupational disease (e.g. pneumoconiosis, lung disease from dusty environments). Sufferers of occupational diseases are entitled to compensation. Also, workers exposed to the risk of occupational diseases are entitled to subsidies.</p>	<p>Provincial institutions to report to Center for Disease Control and Prevention</p>	
<p><i>Related Web links</i></p> <p>◆ [Xinhua, 2009] "China launches national survey on diagnosis of occupational disease" ◆ [Xinhua, 2009] "Man receives compensation for occupational disease." Migrant worker who contracted pneumoconiosis compensated 615,000 yuan (\$91 000 U.S. dollars) from his former employer, a brick factory in the central Henan Province. ◆ [Labour Action China, 2005] "General Overview on Occupational Disease Conditions in China with Special Reference to Silicosis" ◆ [Environmental Health Perspectives, 2007] "Meeting Report: Threats to Human Health and Environmental Sustainability in the Pacific Basin" ◆ [People's Daily, 2001] "China to Enact Law Preventing Occupational Diseases." New factories and plants in China are to have occupational health facilities as well ◆ [presentation, 2009] Mankui Li. "Workers' Compensation System in Transition China" ◆ [Nanfang Daily, 2007] "Problems of the Work-Related Injury Insurance System of China"</p>				
<p>Coal mine safety, collusion and compensation to deceased miners' families.</p>	<p>State-owned mines with relatively effective safety systems were unable to meet rising coal demand; smaller coal mines are over producing above rated safety production targets to fill the gap; prices on coal dropped; state-owned mines invested less in</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>State Administration of Coal Mine Safety (SACMS) inspects state-owned coal mines and approves safe production capacities (to minimize buildup of explosive gases). Restructuring began in 2006: mines around areas of accidents are "closed" down</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>Coal is lucrative. Small mines (private and TVE-owned), which pay annual taxes to the local governments, bring revenue and economic development to local communities.</p> <p>Some provinces have Coal Mine Safety Supervision Bureaus. Local governments</p> <p><i>CONTINUED NEXT PAGE</i></p>	

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
9. Health and safety oversight (continued)				
	<p>safety infrastructure. TVEs and unregulated smaller mines have problems enforcing safety measures. Larger mines tend to be state-authorized, and thus more regulated and safer (but not necessarily meeting international safety standards). Rising prices and business opportunities brought in many unregulated mines that posed higher risks to workers. Inspections are infrequent, and corruption and bribery often make even the infrequent inspections ineffective in protecting worker health and safety.</p> <p>Corruption is common; bribery is a way of circumventing the country's limited inspection system. Collusion between local government officials (upon whom the central government relies to enforce its policies) and mine owners/operators is well-established and widely acknowledged. It has prevented central government's initiatives from having significant impact. Coal mines classification: large, small, state-run, privately owned.</p> <p>All-China Federation of Trade Unions (ACFTU) established as sole national trade union federation in China; it is illegal to establish competing unions. In 2008, a new labour law in China is forcing most companies - including most foreign owned ones - to create an ACFTU chaptered trade union within them. ACFTU has been criticized as acting in the interest of the government instead of in the interest of its members/workers.</p> <p>Unable to find database of statistics on mine performance in inspections, accident histories, and compensation levels.</p>	<p>(localities ignore directives or will fake the motions). Mines producing <30 kilotonnes/year were to be shut down.</p> <p>Coal resources turned over to private sector and subcontracted out. Legally, licences are required.</p> <p>"The Bone and Blood: the Price of Coal in China" (published by the Hong Kong-based China Labour Bulletin): "Firstly, the system of contracting mines out to private operators on a short-term basis has led to contractors seeking a maximum return on their investment in the shortest possible time; production capacity is exceeded way beyond safe levels, investment in safety equipment is insufficient or non-existent and unskilled and untrained workers are hired as miners. Secondly, mine owners and local officials have created an almost impenetrable network of collusion that prevents central government safety measures from being enforced. Finally, mine workers have no representative body to negotiate with mine owners and management over wages, working conditions and mine safety."</p> <p>LBL Ch 2: coal mine deaths divided by category of mine (centrally administered state owned, locally administered state owned, town and township, other).</p>	<p>are supposed to run safety inspections after central government suspends production to implement safety training/infrastructure. Local governments liberally interprets central government's instructions.</p> <p>5 types of collusion. Local government colludes with mine operators to increase the production rating of a mine (but without implementing safety measures) so that the mine wouldn't be shut down.</p> <p>The local government provides a standard compensation of 10 000-50 000 yuan (1996) to families of coal miners who die on the job in exchange for their silence. Payment includes: funeral subsidy for families of victims, a lump-sum industrial fatality benefit and a bereavement allowance.</p> <p>200 000 yuan (2004) compensation paid by local government. Families pretty much bullied into accepting terms (migrant vs professional miners). Started in Shanxi and became the natl benchmark. Doesn't apply if its an illegal mine. Payment includes: 1. A lump sum compensation payment equivalent to between 48 and 60 months' average salary in the region in which the fatality occurred.</p> <p>2. A lump sum funeral subsidy equivalent to six months' average salary in the region;</p> <p>3. A monthly pension for relatives who have no ability to work or who were dependent on the employee who died. However, the total sum of the pensions shall not exceed the wage of the deceased worker.</p> <p>Additional compensation may be paid to families in exchange for silence or quicker compliance.</p>	
<p><i>Related Web links</i></p> <p>◆ [WSWS, 2009] "Coal mine explosion in China kills 74." Payouts to families of victims. ◆ China Labour Bulletin [Chinese audio files] ◆ Circular on the Immediate Closure and Restructuring of Coal Mines that Fail to Meet Safety Standards and Operate Illegally [directive]; Guanyu jianjue zhengdun guanbi bu jubei anquan shengchan tiaojian he feifa meikuang de jinji tongzhi, issued by the General Office of the State Council, 24 August 2005 - cited by others, but unable to obtain. ◆ Special Regulations by the State Council on the Prevention of Work Safety Accidents in Coal Mines [directive]; Guanyu yufang meikuang shengchan anquan shigu de tebie guiding, issued by the General Office of the State Council, 31 August 2005 - cited by others, but unable to obtain. ◆ Trial Procedures for Industrial Injury Insurance for Enterprise Employees (1996) - cited by others but unable to obtain. ◆ Regulations on enforcing responsibility for mine safety to prevent exceptional loss of life in accidents (Shanxi, 2004) - cited by others, but unable to obtain. ◆ State Council's Work-Related Injury Insurance Regulations (2003); unable to find link to specific document, though one can search for more recent provincial information on www.gov.cn ◆ LBL China Energy Group - China Energy Databook. Much of the statistical information can be obtained for free ◆ [NY Times, 2009] "Graft in China Covers Up Toll of Coal Mines." Owner and local government officials nearly succeeded in concealing tragedy; paid off victims' families ◆ All-China Federation of Trade Unions (ACFTU): main Web site ◆ [China Labour Bulletin] articles on ACFTU by HK-based group advocating for workers' rights ◆ [Asia Times, 2009] "China's mine inspectors bite the dust." Mine work safety inspectors collectively resigned over fears of being penalized for being unable to convince mine operators to shut down unsafe mines; inspectors are facing tougher penalties ◆ [Book, \$25] A Guidebook to Coal Mine Safety Inspection Practices in China (Chinese)</p>				
10. Environmental issues and site closure				
<p>General information on category</p>	<p>Since the 1980s, the government has adopted dozens of pollution control and resource management laws and regulations, although implementation and enforcement have been problematic. The government's pollution control initiatives have targeted water pollution from</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>[Report by MOF to NPC] Expenditures spent on environmental protection. Subsidies for turning farmland to forest (lower participation than anticipated). Key energy saving, recycling, resource conservation projects. Bettering environmental monitoring and enforcement bodies.</p>	<p>Most provinces have local Environmental Protection Bureaus. Links to DaLian and GuangDong EPBs listed.</p> <p>EPBs in provinces with -Large coal mining industry: Shanxi</p> <p><i>CONTINUED NEXT PAGE</i></p>	

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
10. Environmental issues and site closure (continued)				
	<p>industrial and municipal sources and air pollution from various sources including industry, power plants, coal mines, and households. Expenditures on environmental protection have increased significantly since the mid-1990s.</p> <p>The environment (pollution, deforestation) has become a national priority in government policies and has been documented more often in the past several years. Laws have typically been on the books, but enforcement has been problematic. Process to amend, revise and strengthen existing laws (including enforcement) is underway. Main issues impeding effective implementation of laws are: decentralized bureaucratic structure of reporting, lack of resources at all government levels, and relatively weak system of legal recourse.</p>		<p>-LNG terminals: Shandong, Shanghai, DaLian, Jiangsu, Fujian, Tianjin, Zhejiang, Zhuhai</p> <p>-Oil fields: Daqing and Shengli</p> <p>[Vtech thesis] lists 31 regional/provincial EPBs, ranks by potential and realized institutional capacity</p>	
<p><i>Related Web links</i></p> <p>◆ [CRS RL31076, 2001] China: Selected Environmental Issues and Policies ◆ Chinese Academy for Environmental Planning ◆ DaLian Environmental Protection Bureau of China - main Web site ◆ Environmental Protection of Guangdong Province - main Web site ◆ [Vtech thesis, 2005] Wanxin Li. "A Survey of Institutional Capacity of Local EPBs in China." Ranks EPB's potential and realized institutional capacity ◆ List of world's LNG Liquefaction Plants and Regasification Terminals: on-stream, under construction, planned ◆ Financial background: "Report on the Implementation of the Central and Local Budgets for 2009 and the Draft Central and Local Budgets for 2010." The Third Session of the Eleventh National People's Congress. 5 March 2010. MOF of PRC.</p>				
<p>A) Responsibility for closure and post-closure risks: facility decommissioning and clean-up; long-term monitoring; remediation of old contaminated sites; natural resource restoration; litigation capacity to sue past owners for violations; site remediation; management of clean-up, transfer of liability for site clean-up.</p>	<p>Ministry of Environmental Protection (formerly State Environmental Protection Agency). Responsible for formulating national policies and standards for energy, water treatment, air pollution, solid waste management.</p> <p>Ministry of Land and Resources (MLR) is responsible for the regulation, management, preservation and exploitation of natural resources, such as land, mines and oceans.</p> <p>China, which tends to close unprofitable power plants rather than upgrade them, has been decommissioning around 50 GW of older fossil generating capacity since 1999—a process that is due to be completed by 2010.</p> <p>China, on the other hand, still has a lot of coal-fired power plants rated at efficiency levels of between 26 and 30%. To cover the rapidly-growing demand for electricity from industry and households, China is currently building a raft of new power plants, 60% of which are ultramodern facilities.</p>	<p>Coal that is sourced and used locally (especially from smaller mines) is usually unwashed (high sulfur and ash content). Misreporting quality of fuel.</p> <p>NEA closed some coal-fired power plants and plan to do more (July 2009). Not sure what the definition of "closed" is. Intent is to completely shut-down the inefficient plants, but what's on the books is not always what happens in reality.</p> <p>Environmental supervision and enforcement of environmental laws and regulations at the national level happens in reality.</p>	<p>Establish hazardous waste treatment centres at provincial levels.</p>	
<p><i>Related Web links</i></p> <p>◆ "Greener Plants, Grayer Skies?" China coal sector - MIT Industrial Performance Center study (2008) ◆ [GENI, AP, 2009] "Beijing closing coal plants in environmental move" ◆ "Environmental Protection in China, markets, technologies, applications and developments 2006 to 2015 and 2025." Cost money to obtain ◆ Ministry of Environmental Protection - main Web site ◆ [Siemens] Power plant upgrades ◆ Cao, Xia. "Regulating mine land reclamation in developing countries: The case of China." Land Use Policy. Volume 24, Issue 2, April 2007, Pages 472-483. ◆ China Mining Association ◆ Ministry of Land and Resources (MLR): responsible for the regulation, management, preservation and exploitation of natural resources, such as land, mines and oceans ◆ China Coal Qualities by Mine and Evaluation of Application (Chinese): \$120 to buy, collection of data from mines with capacity above 150 kt/a in southern China and those with capacity above 300 kt/a in northern China; maps of coal resources and mine distributions by provinces</p>				

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
10. Environmental issues and site closure (continued)				
<p>B) Enforcement problems</p>	<ul style="list-style-type: none"> -Decentralized bureaucratic structure (enforcement of environmental laws and regulations carried out by provincial and local level environmental protection bureaus (EPBs), which report to provincial or local government authorities)--- development priorities of the local governments supercedes environmental protection laws. -Conflicts of interest arising from funding for the EPBs, which comes from fines collected. EPBs often have commercial subsidiaries that provide technology— sometimes encouraging inappropriate use of them. -Irrational pricing mechanisms that often make paying fines more attractive than investing in pollution control technology. -Unrealistically high legal standards or compliance timeframes. -Lack of environmental experience and traditions among the public and among operators of industrial and other facilities. -Relatively weak system of tapping into public concerns. -Relative lack of legal recourse for public concerns. 	<p>Enforcement problems: safety in mines, oil spills.</p>		
<p><i>Related Web links</i></p> <p>◆ U.S.-China Business Council ◆ Environmental Enforcement and Compliance Indicators for China: difficulty in ensuring data quality, ◆ [World Bank] studies on Supporting Environmental Management in China ◆ [WSI China] “Coal Mining Safety: China’s Achilles’ Heel.” - Coal Mine enforcement problems ◆ Cao, Xia. “Regulating mine land reclamation in developing countries: The case of China.” Land Use Policy. Volume 24, Issue 2, April 2007, Pages 472-483. ◆ [NY Times, 2009] “Graft in China Covers Up Toll of Coal Mines.” Owner and local government officials nearly succeeded in concealing tragedy; paid off victims’ families</p>				
<p>C) Pollution controls: Air Pollution and Acid Precipitation.</p>	<p>There’s a disconnect between the laws on the books and compliance. As China’s rapidly expanding body of environmental legislation grows more sophisticated, the gulf widens between what is mandated by law and how laws are actually implemented. As in many other areas of China’s legal system, environmental laws often reflect a vision far removed from reality. A 1998 SEPA (now MEP) investigation of local compliance levels, for example, revealed that about one-third of the firms inspected were operating in accordance with the law; one third were not using any environmental protection equipment at all; and about one-third operated their environmental technology “inefficiently” (i.e., only during inspections). Greatest obstacle to overcome in improving China’s air quality is the country’s dependence on coal, which is likely to remain China’s primary energy source for the foreseeable future. The government has recognized that its technology for coal</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>Beginning in January 2001, most provinces and key cities reported that 90% or more of the industries in their jurisdictions had met the standards. According to a U.S. Embassy review of government reports, nine areas claimed 99% compliance, while Shanghai, Hainan and Yunnan reported 100% compliance. The Embassy noted that despite the high compliance rates and the closure of thousands of polluting industries, most of the 47 targeted cities still fail to meet applicable standards for air and water quality. Many explanations given...one being that the process of certifying factory emissions “is complex and open to abuse. Embassy noted that, in the past, some bureaucrats have distorted statistics to show that targets were achieved. Hesitant to shut down large SOEs bc they are primarily sources of employment. China’s under-funded environmental enforcement authorities will also need help from society in general in preventing back-sliding in the aftermath of last year’s campaign.</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>–“Clear water, blue skies” project initiated in many regions.</p> <p>–Many government pollution control initiatives have focused on major cities. Coastal cities typically have higher standards than national average.</p> <p>–Beijing Clean Air Campaign. In 1998, municipal officials in Beijing undertook a major environmental pollution prevention campaign with a primary focus on air pollution control and prevention. This campaign reportedly was initiated in response to growing public and official concern regarding the capital city’s poor air quality and also due to interest in hosting the 2008 Olympics.</p> <p>LBL Ch 8: average pH of precipitation in cities</p>	

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10. Environmental issues and site closure (continued)				
	<p>energy production and use has been “comparatively backward” and is looking both domestically and abroad for technical and financial assistance and foreign investment to address this problem. Multilateral institutions and bilateral technical assistance are playing significant roles.</p> <p>Pollution controls (NO_x and SO_x scrubbers) may be installed, but not necessarily running due to avoid ancillary losses in electricity yields, reducing sales. Many new small plants are “unauthorized,” and are often more difficult to force to comply with government regulations on pollution controls. Continuing government regulation of the prices of coal-fired power while input prices for the coal itself were deregulated has further increased the pressure on coal-fired electricity margins and provided a disincentive to use pollution controls due to resultant power sales and revenue losses. More complicated emissions controls (for example, for mercury – China is the world’s largest emitter, and much of its emissions come from coal-fired utilities) are often not even installed.</p> <p>[MIT report] China’s power sector has been expanding at a rate roughly equivalent to three to four new coal-fired, 500 megawatt plants coming on line every week. New market pressures encourage plant managers to buy the cheapest, lowest quality and most-polluting coal available, while at the same time idle expensive-to-operate smokestack scrubbers or other clean-up technologies. The physical infrastructure is advanced, but the emissions performance ends up decidedly retrograde.</p>	<p>-Efforts are underway in government to increase understanding and support for environmental improvement and laws among the public and among industry and economic officials.</p> <p>-Improvements in environmental quality, especially air quality, have been noted as plants have been closed, often in line with environmental mandates, and as the government takes some strong environmental steps.</p>		
<p><i>Related Web links</i></p> <p>◆ U.S.-China Business Council ◆ Environment Protection and Resource Conservation Committee of the National People’s Congress ◆ Congressional Research Reports (CRS RL31076: China Selected Environmental Issues and Policies) ◆ “Greener Plants, Grayer Skies?” China coal sector - MIT Industrial Performance Center study (2008) ◆ [The McIlvaine Company, 2009] “China spending much more on FGD and other air pollution control than the U.S.” FGD scrubbers installed on 67% of coal plants ◆ “China: Clean Coal Study.” Zero Draft – Working Draft in Progress. World Bank - not available on-line</p>				
<p>D) Agencies involved in environmental protection</p>	<p>Governmental Organization for Environmental Protection.</p> <p>-Competing priorities between the national-level ministries responsible for economic development and those with environmental responsibilities. Corruption at all levels of government is China’s biggest environmental problem.</p>	<ol style="list-style-type: none"> 1) Ministry of Environmental Protection (MEP) 2) Environment and Natural Resources Protection Committee (ERPC) of the National People’s Congress (NPC) and the State Council 3) National Development and Reform Commission (NDRC)---five yr plans 4) Ministry of Commerce (MOFCOM) 5) State Administration of Coal Industry 6) Ministry of Water Resources (MWR) 7) Ministry of Land and Resources (MLR) 	<p>Local and provincial government officials and agencies are responsible for implementing regulations promulgated by the central government.</p>	
<p><i>Related Web links</i></p> <p>◆ LBL China Energy Group - China Energy Databook. Much of the statistical information can be obtained for free ◆ Ministry of Environmental Protection (MEP, formerly SEPA)</p>				

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
10. Environmental issues and site closure (continued)				
E) Amount spent on pollution treatment	Documented since 2000, and amount has increased every year thereafter	<p>LBL Ch 3: Investments in Pollution Treatment. industrial pollution encompassed waste water, waste gas, solid waste, noise pollution.</p> <p>LBL Ch 8: various emissions (CO₂, SO₂, particulates). SO₂: mostly industrial contribution, but significant amount from household contribution as well; SO₂ emissions by sector (coal mining, petroleum and natural gas extraction); over 50% of SO₂ emissions come from electric utilities.</p> <p>LBL Ch 9: carbon dioxide emissions from fossil fuel combustion, cement production, gas flaring.</p>	LBL Ch 8: various emissions (CO ₂ , SO ₂ , NO _x , particulates). SO ₂ : mostly industrial contribution, but significant amount from household contribution as well.	
<p><i>Related Web link</i></p> <p>◆ LBL China Energy Group - China Energy Databook. Much of the statistical information can be obtained for free</p>				
11. Emerging issues				
A) Windfalls associated with carbon credit allocations or offset programs	<p>1) Clean Development Mechanism (CDM) - carbon trading system created under the Kyoto Protocol. Developed countries can achieve commitments to CO₂ reduction by buying carbon credits from developing countries via CERs. CDM fossil fuel projects: CMM, gas-steam combined cycle, coal-fired super critical, coking waste, fuel switching, etc. None are CCS (technology is still under development, so it doesn't fit CDM criteria)</p> <p>2) Fossil fuel industry are receiving some of the funding because they are adopting "cleaner" approaches. Through 2007, coal bed methane captured 11% of CDM credits, the second highest category. Fossil fuel switching and landfill methane capture obtained an additional 8 and 3% of the credits, respectively. It's hard to say whether CDM is subsidizing projects that would have already gone forward. Some projects probably did have investors lined up; other projects are serving rural communities thanks to CDM.</p>			
<p><i>Related Web links</i></p> <p>◆ Clean Development Mechanisms (CDM) ◆ [UN Chronicle, 2007] "Moving Forward on Climate Change: Yvo de Boer Visits New York." Quotes from Mr. de Boer on allowing CDM be used on coal-based projects in China as cheaper alternative than cutting emissions in industrialized countries ◆ [World Bank, 2004] "Clean Development Mechanism in China: Taking a Proactive and Sustainable Approach." Findings from CDM case studies ◆ "China: Clean Coal Study." Zero Draft – Working Draft in Progress. World Bank - not available on-line</p>				
B) Rise of NGO's and environmental litigations	<p>Currently, China's laws don't specify a procedure regarding public environment litigations. Environmental NGOs are springing up and initiating environmental litigations. There are many restrictions on NGO activities, but the space for public participation in policy-making has gradually expanded. More channels are now available to NGOs to influence government decision-making.</p> <p><i>CONTINUED NEXT PAGE</i></p>		<p>Chen Faqing vs. the Environmental Protection Bureau of Yuhang District in Hangzhou: 2002, Chen accused the defendant of failing to punish companies that violated environmental protection regulations. The court dismissed the application.</p> <p>Chen Faqing vs. Zhejiang Provincial Government and Zhejiang Planning Bureau: 2003, Chen filed suit on defendants'</p> <p><i>CONTINUED NEXT PAGE</i></p>	

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
11. Emerging issues (continued)				
	Some NGOs register as businesses to circumvent the regulations. See CBL report for some environmental cases (pollution cases related to coal-fired power production).		negligence in pollution control. The court rejected the application on the grounds that the plaintiff did not have a direct interest in the case and had thus failed to establish sufficient standing to sue.	
<p><i>Related Web links</i></p> <p>◆ China Federation of Environmental Protection Organizations accusing Jiangsu Yingang Containers Co., Ltd. for environment pollution (July 2009) ◆ GreenLaw - environmental law and public participation news/blog ◆ [China Policy Institute, University of Nottingham, 2007] Yiyi Lu. “NGOs in China: Development Dynamics and Challenges.” ◆ [Mines and Communities, 2007] “China special: CLB report on public interest legislation.” Lists litigation cases (a few environmental) ◆ [GreenLaw, 2008] “New Report shows Chinese Environmental NGOs and Civil Society Expanding.” ◆ [Xinhua, 2008] “China’s environmental NGOs’ influence increases as total doubles in 3 years.” NGOs are increasingly influential in government’s policy making, supervising the government’s task of environment responsibility and raising public awareness in environment protection</p>				
<p>C) Renewable energy law and energy efficiency goals: Hydro, wind, solar</p>	<p>High. Renewable Energy Law of 2006. Renewable energy sector driven primarily by public sector spending to meet central government’s goal of have 15% renewables (solar, wind, hydro) by 2020. Renewables projects can sell Certified Emissions Reductions (CER) certificates to third parties, in accordance with Kyoto Protocol. Power grid companies must buy all output of local registered renewable energy producers.</p> <p>“Clean coal” is a separate category from renewable energy.</p>	<p>Large hydro directly funded by government. Government subsidies important solar industry: private investments in solar manufacturing, government-financed solar innovation. Wind investments dominated by 5 state-owned power companies and the private players connected with them.</p> <p>[Web link 3] 11th Five-Year Plan: targeted decrease in energy intensity by 20% by 2010 from 2005 level via 9 industries (iron and steel, petroleum and petrochemicals, chemicals, power, non-ferrous metals, coal mining, construction materials, textiles, and paper).</p> <p>LBL Ch 2: renewable energy production by technologies.</p>	<p>Due to transmission problems to rural areas, government encourages private development of small hydro plants in rural areas through tax incentives and relaxed constraints on bank loans. Provincial governments incorporating targets for wind generation capacity in Five-Year Plans. Support for local wind turbine manufacturers.</p> <p>LBL Ch 2: installed wind capacity by province, hydro.</p>	
<p><i>Related Web links</i></p> <p>◆ [Wharton, registered user, 2009] “Renewable Energy in China: A Necessity, Not an Alternative.” Commentary: Chinese government has the funds and willpower to fuel the renewable energy investments necessary to reach its 2020 goal of 15% of energy consumption regardless of whether the private sector participates or not (free registration required)</p> <p>◆ Martinot, Eric. “Renewable Energy Information on Markets, Policy, Investment, and Future Pathways.” 2008. Links to full text of China’s Renewable Energy Law in Chinese and English</p> <p>◆ [Web link 3] China-US Energy Efficiency Alliance ◆ [WorldWatch Institute, 2006] Zijun Li. “China’s Renewable Energy Law Takes Effect; Pricing and Fee-Sharing Rules Issued” ◆ LBL China Energy Group - Energy Efficiency</p>				
<p>D) Cross-border pipeline disputes</p>	<p>Medium. The current struggle between China and Japan over access to Russian oil via a pipeline from Siberia. The bigger issue will be when China becomes even more aggressive in its quest to secure oil resources.</p>	<p>1) Gazprom is reportedly considering a variety of options for exporting gas: Russia Petroleum (a subsidiary of TNK-BP), the China National Petroleum Corp, and Korea Gas Corp signed an agreement for a pipeline to extend from East Siberia to China and South Korea, but Gazprom also is assessing the possibility of developing a giant pipeline system to connect to the Japanese market as well.</p> <p>2) Territorial disputes related to interpretation of UN law of the sea, and the limites to Chinas EEZ. The Chinese are trying to aquire territory for natural gas exploration, access rights.</p> <p>-East China Sea/Senkaku islands: Japan (natural gas).</p> <p>-South China Sea/Spratly islands: Philippines, Malaysia, Taiwan, Vietnam (oil).</p> <p><i>CONTINUED NEXT PAGE</i></p>		

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
11. Emerging issues (continued)				
<p><i>Related Web links</i></p> <p>◆ Congressional Research Reports (CRS RL32466: Rising Energy Competition and Energy Security in Northeast Asia: Issues for U.S. Policy) ◆ [The Jamestown Foundation] John C. K. Daly. "Energy Concerns and China's Unresolved Territorial Disputes." China Brief Volume: 4 Issue: 24. Territorial disputes over natural resources.</p>				
<p>E) Growth areas</p>	<ol style="list-style-type: none"> 1) Policies, regulations, technologies pertaining to more efficient use of transportation fuels, vehicles, and residential energy consumption. 2) Clean coal covered in other parts of this document. 3) Synfuels: coal-to-fuel. 4) Water Treatment Infrastructure (future policies could relate to treating wastewater from coal-fired power plants, mining, petroleum extractions). Chinese and U.S. researchers have identified 3 key causes of water quality degradation in China: rapid and unregulated expansion of industrial activities; growth of urban and suburban areas without adequate investment in water supply infrastructure; and increased use of pesticides and fertilizers combined with a continued reliance on sewage irrigation. Researchers have noted that, for China to meet its wastewater treatment goals, the country will have to overcome several financial and institutional hurdles. A key challenge is that municipal governments have had little or no experience with sewage treatment projects. Moreover, operation and maintenance costs and training typically have not been factored into project costs. China has relied, and continues to rely, heavily on foreign aid to fund wastewater treatment projects. 5) R&D in science and technology. Increase partnerships abroad. 	<p>Priority Programme for China's Agenda 21, First Tranche, prepared by the State Planning Commission and the State Science and Technology Commission. More than 500 proposals for "sustainable development" were suggested by various line ministries of the State Council, local governments, industrial sectors, academic institutions and other organizations. Ministry of Science and Technology oversees China's Agenda 21 program for sustainable development. China has signed more than 20 international treaties on the environment and resources. The domestic legislation is slowly being implemented.</p> <p>Central government adopted several strategies in the 1990s in response to widespread deterioration of water resources. These include increasing the number and capacity of municipal wastewater treatment facilities, more aggressively controlling industrial wastewater pollution (especially among TVIEs), and using sewage irrigation projects. In November 2000, China's State Council issued a circular setting goals for urban water conservation and pollution control. The circular set a goal for cities with populations of 500 000 or more to be treating at least 60% of sewage by 2005, and for all cities to be treating at least 60% of sewage by 2010. The 10th Five-Year Plan increases the number of "key" cities targeted for pollution control from 47 (in the 9th Five-Year Plan) to 100.</p> <p>The objectives of the National Air Pollution Law amendments of 2000 are to improve enforcement, to address critical air quality problems in key urban areas, and to make greater use of market-based methods for cutting emissions. The new provisions increase penalties for violations, broaden the scope of the law, clarify authorities, and call for incentives for clean and renewable energy. The law prohibits pollutant emissions that exceed national standards and imposes compliance deadlines and higher fines for excess emissions; previously, such emissions were legal, provided that</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>Industrial growth among township and village industrial enterprises (TVIEs) "has occurred outside of the central government environmental management systems, and is only regulated to the degree that local bureaus and authorities choose to exercise such authority." TVIEs became subject to state environmental laws in 1996 and 1997, but enforcement was quite lax. Most TVIEs have lacked wastewater treatment facilities and have discharged more wastewater and more highly polluted wastewater than the formerly dominant state-owned enterprises. Recently, industrial wastewater treatment rules have been enforced more aggressively, especially in urban areas. According to SEPA, in 1999, 87.2% of industrial wastewater received some treatment, and 66.7% of wastewater discharged attained standards. In 1996, Chinese officials launched a nationwide campaign to close down inefficient and highly polluting enterprises that were affecting sensitive waterways. According to the World Bank, during 1996 and 1997, the government closed nearly 17 000 small and medium enterprises in Henan Province alone, and most of these were TVI enterprises. These closures correlated closely with a nearly 30% reduction in the total chemical oxygen demand (COD) load from industries. Over 1000 small paper mills along Huai River were shut down; it reduced the amount of wastewater discharged into the river by 15%. The government also issued rules advancing industrial wastewater treatment in specific sectors, and, in the late 1990s, approximately 40 000 industrial wastewater treatment facilities were built.</p>	

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
11. Emerging issues (continued)				
<p>polluters paid fees on them. The law addresses mobile sources for the first time, and emission control systems will be required on new and existing vehicles. As an overarching change, the amendments broaden the focus of the law from controlling the concentration of pollutants emitted from individual sources to include controlling the total volume of pollutants entering an airshed.</p>				
<p><i>Related Web links</i> ◆ [Congressional Research Reports (CRS RL32466), 2008] “Rising Energy Competition and Energy Security in Northeast Asia: Issues for U.S. Policy.” ◆ [Congressional Research Reports (CRS RL31076), 2008] “China: Selected Environmental Issues and Policies” ◆ [Congressional Research Reports (CRS RL33534), 2008] “China’s Economic Conditions” ◆ [U.S. Dept of Commerce - ITA, 2005] “Water Supply and Wastewater Treatment Market in China.” ◆ [NY Times, 2006] “China limits synfuel.” NDRC will only approve coal-to-fuel (synfuel) projects that produce 3 million metric tons or more a year</p>				
<p>F) Subsidies to energy-intensive industries</p>	<p>Unknown. Many Chinese basic industries (e.g., steel, cement, paper, fertilizer) and coal-fired power plants themselves operate at efficiency levels well below international norms (Chinese paper mills use 2.2x as much energy per unit output as international norms). This would not be possible without some form of protection, and that protection likely includes substantial energy subsidies as well.</p>	<p>Some statistics are in the World Bank’s zero draft report on Chinese clean coal.</p>		
<p><i>Related Web link</i> “China: Clean Coal Study.” Zero Draft – Working Draft in Progress. World Bank - not available on-line</p>				
Miscellaneous				
<p>Multilateral development banks (MDBs)</p>	<p>MDBs support and finance projects in developing countries. [ADB] China is second largest borrower and second largest client for private sector financing.</p>	<p>Relevant Programs [from GEF link]:</p> <ol style="list-style-type: none"> 1. “SichuanGas Transmission and Distribution Rehabilitation” (provincial natural gas T&D systems) 2. “Efficient Industrial Boilers” (tech transfer of nine more fuel-efficient, small and medium-sized coal-fired industrial boiler designs) 3. “Beijing Environment II.” (supports Beijing’s municipal government’s efforts to alleviate air and water pollution by converting scattered coal-fired boilers to natural gas, improving the efficiency of coal-fired heating systems) 4. “China Energy Efficiency Financing Project.” (loans via Exim bank and Huaxia Bank) 5. “Thermal Power Efficiency Project.” (close small, inefficient coal-fired power plants) 		
<p><i>Related Web links</i> ◆ [World Bank, Global Environment Facility (GEF) Projects] Provides grants and concessional loans to co-finance projects and programs that protect the environment and promote sustainability ◆ United Nations Development Programme (UNDP), China, Energy and Environment. Supports a variety of projects ◆ Asian Development Bank (ADB), China - Annual report 2008.Support for coal mine methane projects. Tables summarizing lending assistance: loans, credit enhancements, grants ◆ “China: Clean Coal Study.” Zero Draft – Working Draft in Progress. World Bank - not available on-line</p>				

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for China

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
Miscellaneous (continued)				
International Energy Agency (IEA), China	Regularly updated database of energy R&D spending by member countries			
<p><i>Related Web links</i></p> <p>◆ IEA China ◆ IEA has a wealth of publications: a. “China’s Power Sector Reforms” book; b. “Coal Mine Methane” report; c. “Fact Sheets, World Energy Outlooks”; d. “Natural gas market”; e. “Cleaner Coal in China” book. Some relevant topics featured in the Table of Contents of “Cleaner Coal in China”: 1. Coal mine safety; 2. Clean coal technologies and policies</p>				
U.S. Congressional Research Service (CRS)	<p>a. Congress’s public policy research arm aka “think tank”</p> <p>b. Analyses in response to specific Congressional request or initiative</p> <p>c. Reports generally not made public; the public can request individual reports from Senators and Representatives in Congress, purchase them from private vendors, or search various Web archives of previously-released documents</p> <p>d. A few relevant CRS reports on China Energy</p>			
<p><i>Related Web links</i></p> <p>◆ [Congressional Research Reports (CRS RL31076), 2008] “Rising Energy Competition and Energy Security in Northeast Asia: Issues for U.S. Policy.” ◆ [Congressional Research Reports (CRS RL31076), 2008] “China: Selected Environmental Issues and Policies” ◆ [Congressional Research Reports (CRS RL33534), 2008] “China’s Economic Conditions” ◆ Copies of CRS Reports</p>				
Structure of state-owned enterprises (SOEs)	<p>Infrastructure ownership</p> <p>a. Coal: increasingly owned by provinces; illegally-built owned privately and by provinces</p> <p>b. Oil and gas: state</p> <p>c. Refineries: some foreign</p> <p>d. Generation: state</p> <p>e. Transmission</p> <p>f. Distribution</p> <p>g. Grid: Northern China State grids connected with coal-generated power (supply electricity to urban population, industries, rural areas near grid); Mountainous and most rural areas still lack access to coal-based grid (local government constructing small hydro power stations and SHP-based grids)</p>			
<p><i>Related Web links</i></p> <p>◆ [Wall Street Journal, 2004] Matt Pottinger. “Invisible Export – A Hidden Cost of China’s Growth: Mercury Migration, Turning to Coal, Nation Sends Toxic Metal Around Globe; Buildup in the Great Lakes Conveyor Belt of Bad Air.” Wall Street Journal 2004. ◆ “China National Petroleum Company (CNPC): A Balancing Act Between Enterprise and Government.” BinBin Jiang. Oct 2009. Working paper. ◆ Overview of Chinese Oil Industry. NOCs investments in R&D, SOEs</p>				

6. Summary of German data review on fossil-fuel subsidies

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6.1 Germany as a case-study country

This summary supplements the more detailed information on data sources for each specific subsidy type contained in the accompanying German *Subsidy Data Review Table* in section 6.4. The German Subsidy Data Review Table provides the information on which this summary was based, as well as links to organizations mentioned in the discussion.

Market importance

Germany is one of the 10 largest energy consumers in the world. It is a populous country located in the heart of Europe, a member of the G-8 and G-20 and among the largest economies in the world. As a result, its energy policies have a significant impact on the European Union (EU) and beyond.

Germany imports more than 60 per cent of the energy it needs. Nonetheless, the country produces significant (though steadily decreasing) amounts of coal. In 2008, the country produced more than 60 per cent of its total coal and 16 per cent of its natural gas needs domestically. Due to the nature of its reserves, a substantial portion of its domestic coal production was lignite; in 2007 180 Mt of lignite and 24 Mt of hard coal were produced.⁵ While the country also produces some oil domestically, the amounts are small, constituting less than 1 per cent of overall demand.

German policies with respect to energy subsidies have perhaps been most significant in the coal and renewable energy sectors, although they have also supported nuclear power. This case study focuses only on subsidies to fossil fuels. Subsidies to the hard coal industry have occurred for decades, and continue to some degree today.

Transparency of information on fossil-fuel subsidies

The country's subsidy policies, economic significance and commitment to transparency make Germany a useful case-study country. In addition to national policies favouring broad disclosure of direct subsidies to industries, transparency is also enforced by the strict state aid control rules within the European Union.

The German government publishes a formal subsidy review biannually. The most recent, "22nd Subsidy Report: Report of the Government on the development of financial aids of the federal government and tax expenditures for the years 2007–2010" (hereafter referred to as the "Federal Subsidy Report"), was released in January 2010.⁶ It is unclear whether there will be an English summary available later, though some past editions (e.g., the 19th) was summarized in English. The report includes a comprehensive and understandable listing of federal subsidies and tax expenditures for all federal ministries.

⁵ Available at:

http://www.bgr.bund.de/cIn_145/nn_330984/DE/Themen/Energie/Downloads/Energierohstoffe__2009__Tabellen,templateId=raw,property=publicationFile.pdf/Energierohstoffe_2009_Tabellen.pdf

⁶ The report can be accessed at:

http://www.bundesfinanzministerium.de/nn_54/DE/Wirtschaft__und__Verwaltung/Finanz__und__Wirtschaftspolitik/Finanzpolitik/Subventionspolitik/100113__Subventionsbericht.html?__nnn=true

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This publication is quite valuable in terms of disclosure and transparency. However, there is room for improvement. The subsidy definition employed stems from the late 1960s, and misses a variety of programs now widely recognized as providing subsidies to industry. Specifically, the definition concentrates on direct transfers and tax subsidies that favour specific firms or whole industries. This includes programs such as consumer subsidies for specific goods and services when these have a discernible sectoral impact on demand. However, it excludes horizontal programs like broad consumer subsidies or unspecified research and development (R&D) subsidies. Also, more indirect techniques of subsidization, such as credit guarantees or feed-in laws, are not covered.⁷ Finally, the definition of tax expenditures is not exhaustive. It is based on a rather legalistic perspective of tax exemptions, rather than on an economic perspective of neutral taxation and the policies that violate that neutrality.⁸ In addition, in the definition (Annex 6), the 22nd Federal Subsidy Report explicitly states that it does not include the non-internalization of external costs that stem from private activities in the environmental area. This issue can be important when evaluating trade-offs between different fuel chains. To provide a holistic picture of subsidies to fossil fuels in Germany, we have consulted a variety of other sources as well. These include the federal budget, federal agencies, independent research institutes and non-governmental organizations (NGOs).⁹

Fourteen of the 16 states (“Länder”) produce their own subsidy reports.¹⁰ While this compares favourably with sub-national subsidy tracking in other countries, as there is no legal obligation for publication at the state level, the quality and the frequency of state subsidy reports vary widely. Some cover a broader scope than the federal report, but most state subsidy reports stay within or below the standards of the federal report and are not comparable. Information on subsidies at the state level must often be developed based on a direct review of the state budget documents themselves. Budget information is detailed and can indeed support subsidy identification, though it is a time-consuming exercise. Some efforts have been made by third parties to piece together this information. For example, a comprehensive analysis and comparison of most state subsidies covering the periods 2000–07 was produced by the Kiel Institute for the World Economy.¹¹ Information on future subsidy programs can be found at the Kiel Institute as well.

Obtaining information on the scope or magnitude of fossil-fuel support at the municipal level is more complicated, mainly due to the sheer number of municipalities. Germany’s 12 034 municipalities do not produce reports on the subsidies provided or any summary documents outlining their subsidy policies. ICLEI, an international association of local governments, provides a valuable scientific analysis on local-level subsidies in the transport sector.¹² Municipal subsidies are important with respect to transport and power infrastructure.

⁷ See in detail: Thöne, M. (2005), Subventionen und staatliche Beihilfen in Deutschland, FiFo-Berichte Nr. 4, Köln.

⁸ See Introduction in: Thöne, M., (ed.) (2009): Evaluierung von Steuervergünstigungen, Köln/Mannheim/Copenhagen, <http://www.wiso.uni-koeln.de/finanzfors/Projekte/P174.html>

⁹ See for example: Green Budget Germany (Meyer, Schmidt and Eidems, 2009): Staatliche Förderungen der Atomenergie im Zeitraum 1950–2008, FÖS-Studie im Auftrag von Greenpeace, Berlin, 2.9.2009. An English version of the study on nuclear subsidies is in preparation and will be published in due time on <http://www.foes.de/publikationen/studien/> respectively <http://www.greenpeace.de/themen/aomkraft/publikationen/> Further subsidy studies, though in the transport sector, are on the fiscal treatment of company cars: http://www.greenpeace.de/fileadmin/gpd/user_upload/themen/energie/Greenpeace_Subventionsstudie_final.pdf and <http://files.foes.de/de/downloads/studien/FiwaDiwaRef-Fassung2.0.pdf>

See for more detail in Thöne, M. and S. Dobroschke (2008), WTO Subsidy Notifications – Assessing German subsidies under the GSI notification template proposed for the WTO. Global Subsidies Initiative, Geneva/Winnipeg, http://www.iisd.org/pdf/2008/wto_subsidies_germany.pdf

¹⁰ Examples are: Thuringia: http://www.thueringen.de/imperia/md/content/tfm/berichte/dritter_subventionsbericht.pdf for 2005–07; Hesse: [http://starweb.hessen.de/elbib/hessen/allgemein/subventionsbericht\(12\)19972001.pdf](http://starweb.hessen.de/elbib/hessen/allgemein/subventionsbericht(12)19972001.pdf) for 1997–2001 and Saarland: http://www.saarland.de/dokumente/thema_haushalt_und_finanzen/Subventionsbericht_11.10.07.pdf for 2004–07

¹¹ Available at: <http://www.ifw-members.ifw-kiel.de/publications/publication.2008-01-29.2485036757/kap1394.pdf>

¹² ICLEI (2005) Hidden Subsidies for Urban Car Transportation available under: http://www.increase-public-transport.net/fileadmin/user_upload/Procurement/SIPTRAM/Hidden_subsidies_final.pdf

Guidelines on best practices for subsidies on local level are available at: http://www.iclei.org/documents/Global/Programs/CCP/Sust_Trans_Options.pdf

6.2 Main findings of data review

Although Germany provides an array of resources on subsidy policies, important gaps remain at both the federal and state levels, particularly policies with respect to market structure and royalty and liability regimes that are not clearly presented or quantified. In addition, the combination of reduced energy tax rates with the Emission Trading System (ETS) makes it difficult to assess subsidy magnitude to particular fossil fuels.

Market structure

The energy sector is oligopolistic, with markets dominated by a small number of producers and characterized by insufficient market regulation to address market power of the large providers. Competitive pressures are fairly weak, with a handful of big companies in the oil and gas sector wielding substantial market power. The four big electricity suppliers (RWE, Eon, Vattenfall, EnBW) produce around 85 per cent of all electricity consumed domestically. Despite liberalization, competition is not yet effective in either the electricity or gas markets. Further steps to ensure competition are necessary. A survey report of the monopoly committee (Monopolkommission) concludes that these steps include, among others, a systematic market monitoring on wholesale markets, enforcement of independence between different business segments within a company or a group of companies (unbundling), more liquidity of the gas market through an establishment of a gas exchange and shorter gas supply contracts.¹³ It must be emphasized that the current energy market creates significant advantages for particular energy producers and sellers, and may make market entry for emerging resources more difficult.

State aid: direct subsidies for hard coal

German support for hard coal provides a useful example of the challenges of reform. Although both national and EU rules have pressured the removal of these subsidies, the phase-out has been quite long and some subsidies will continue through 2022. In addition, some of the coal subsidies have led to environmental damages that will continue to require government expenditure well past the official subsidy phase-out date. For example, land subsidence from mining has increased flooding and required continuous pumping of overflow back into the Rhine River.¹⁴ Subsidies remain above 1 billion EUR through 2017. There are also a number of review points during this phase-out, opening the possibility that reforms will be slowed or derailed.

In the European Union, direct subsidies and tax subsidies are regulated by the state aid controls contained within the European Commission (EC) Treaty. Controls on state aid have become more restrictive over the years, reducing the latitude for direct subsidization of the energy sector. Direct subsidies for hard coal are approved as state aid by the European Commission,¹⁵ though have been subject to a long-term phase-out. In 2007, the German government decided to end subsidies for hard coal entirely by 2018. This decision is slated for review by the German Parliament in 2012. Reform has also occurred at the state level, with NRW and Saarland committed to end subsidized promotion of domestic coal sales by 2014.

The law regulating the ending of hard coal subsidies allows for direct subsidies to activities that promote the sale of coal, at the federal level as shown in the table below. Furthermore the subsidies as planned in the budget of North Rhine-Westphalia (NRW) are listed.

¹³ Available at: http://www.monopolkommission.de/aktuell_sg54.html

¹⁴ See <http://www.greenpeace-magazin.de/index.php?id=5455>

¹⁵ See http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_N563_2008

Mapping the Characteristics of Producer Subsidies: A review of pilot country studies

BOX 1

	Financial resources from the federal government	Financial resources from NRW
Year	in billions of Euros	
2009	1.699	0.52
2010	1.550	0.49
2011	1.512	0.47
2012	1.363	0.44
2013	1.371	0.42
2014	1.285	-
2015	1.332	-
2016	1.053	-
2017	1.020	-
2018	0.940	-
2019	0.794	-

The *Anpassungsgeld*, a compensation program for released employees due to mine closings in the sector, is supposed to continue until 2022. Employees who are released before 1 January 2023 and are at least 52 years old (for underground mining) or 57 years old (for open cast mining), receive a special allowance from the federal government to carry them until they enter a pension scheme. This allowance will be provided for a maximum of five years. The *Federal Subsidy Report* provides data concerning the volume of this program for the past and the near future:

BOX 2

Financial resources for the <i>Anpassungsgeld</i>	
Year	in billions of Euros
2007	0.131
2008	0.121
2009	0.130
2010	0.107

With EU restrictions on subsidies to producers growing more stringent, Germany has shifted the form of its energy supports to the consumption side. The focus of these new programs has been on private households and transport (see section Energy tax exemptions as major subsidies).

Mapping the Characteristics of Producer Subsidies: A review of pilot country studies

Energy tax exemptions as major subsidies

As part of the ecological tax reform in 1999 an additional ecotax component relating to energy taxation was introduced. Several tax rate reductions or exemptions were introduced to facilitate the acceptance of the ecotax politically, and to reduce the impact of the new tax on the international competitiveness of German industry. Political rationale aside, the tax reductions nonetheless act as substantial subsidies to specific industries, as noted below:

- Reductions in the electricity and energy tax for industry, agriculture and forestry.
- No energy taxes for certain energy-intensive processes (e.g., chemical production).
- Low tax rate for coal used for heating in industrial processes.
- Private households are fully exempt from the coal tax until the end of 2010.
- Exceptional energy tax reductions (“Spitzenausgleich”). The subsidy is provided to energy intensive companies. If energy-related levies due to electricity taxes and energy taxes on heating material exceed the reduction of contributions to pension funds, compensation will be paid that, in effect, reduces the size of the energy tax. The rationale for this program stems from the introduction of ecotax reform in 1999, at which point Germany decided to rely on revenues from the ecotax to fund a major part of the country’s pension insurance scheme. By reducing direct contributions from worker wages, the country was able to accomplish the dual objectives of making labour cheaper and energy more expensive, while keeping company and consumer burdens for pension funding the same.
- Producers of fuels are exempt from energy taxes for their production processes.
- No energy tax for the non-energetic use of mineral oil such as the production of cosmetics and plastic materials.
- Tax reduction on CHP generation.
- Tax relief for vehicle use such as the commuter’s tax allowance, the exemption of energy taxes on kerosene used for commercial air transport and others as well as mineral oil tax relief for the agricultural sector. This exemption includes all commercial air travel, even within Germany.

Energy tax subsidies must be evaluated in conjunction with the EU ETS

In Germany, as in the other EU countries, there is a strong political commitment to exempt firms participating in the ETS from energy taxes, whether through direct taxation (plus 19 per cent VAT for neutrality), or through the purchase of emissions certificates (also plus 19 per cent VAT for neutrality). This commitment to avoid subjecting energy to both systems implicitly assumes first that environmental externality control is a major justification for the energy taxes; and that detrimental climate effects are the primary externality of concern for fossil fuels.

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There are large areas of economic activity where exemptions under one system are matched by inclusion in the other. However, there are also overlaps (activities captured by both taxes and trading) and loopholes (activities captured by neither; or exempted from taxation, though the ETS addresses only a portion of the environmental concern).¹⁶ Sectors identified in which work remains to close loopholes include:

- thermal waste and exhaust air treatment;
- non-energetic use of energy, e.g., for the production of synthetic material and cosmetics;
- industrial facilities that are exempt from energy tax under § 51 EnergieStG and from ETS due to their small production capacity;
- process-related emissions in facilities that are due to their small production capacity not included in ETS;
- energy use in agriculture and forestry;
- energy for off-site facilities such as heating and cooling of administrative buildings belonging to ETS facilities are not considered in the ETS, but profit from the exemption of the energy tax; and
- commercial air and ship transport.¹⁷

Emission Trading System

For the first two periods of the Emission Trading System (2005–2007 and 2008–2012) the distribution of emission rights was regulated by national governments. For phase 3 (2013–2017), certificates will be distributed centrally by the European Commission. Initially, the emission rights were largely granted for free (through grandfathering). This led to large windfall profits for participating companies. At the start of the third phase in 2013, 20 per cent of all certificates will be auctioned. This share is supposed to increase up to 100 per cent in 2025.

Border protection

Any direct form of border protection is explicitly outlawed within the European Union. Only at the outer borders of the EU there are possibilities for such mechanisms. However, heavily subsidized German hard coal (see below) results in indirect border protection. Without subsidies, German hard coal could not compete with world market levels, and the country would import more energy to serve this demand, save more energy to avoid importing more or choose a strategy combining both.

Municipal energy suppliers

Most municipal energy suppliers are publicly owned. These suppliers can access low-cost, government-guaranteed debt. The fragmentation of municipal data makes this problem challenging to quantify; however, the policies could be important sources of fossil-fuel support.

¹⁶ For details see: http://www.foes.de/pdf/Folie_Ueberschneidungen.pdf

¹⁷ S. Wartmann et al. (2008), Weiterentwicklung des Emissionshandels –national und auf EU-Ebene Ecofys Nürnberg and FiFo Köln für das Umweltbundesamt. UBA Texte 03/08. Available at: <http://www.umweltdaten.de/publikationen/fpdf-l/3444.pdf>., Part II, Kohärenz der deutschen Klimaschutzinstrumente, by S. Heilmann and R. Bertenrath, FiFo Köln. Meyer, Bettina 2008: Thesen und Bausteine zur Weiterentwicklung der Ökologischen Finanzreform. Diskussionspapier für den FÖS. Kiel, 12.5.2008. Available at: <http://www.foes.de/publikationen/foes-diskussionspapiere> (page 62).

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Royalty rates

Royalty rates are normally set to 0 per cent for coal; the states have wide discretion on royalty rates, and may cut royalties to encourage regional projects. For example, Schleswig-Holstein has a royalty rate of 15 per cent for oil and gas production, while Niedersachsen levies 3 per cent for onshore gas, 17 per cent for onshore oil, and nothing for oil production from other fields.

Right of continuance for operations under old mining law

Germany operates under two sets of mining laws, an older and newer set of laws. The terms under the old law (for mining operations that started before 1982) are much more favourable to the industry, with no limits put on the length of mine leases and no requirement for royalty payments to the government.

Inland water transport

Inland water transport moves a significant portion of the country's oil internally. Users, including the fossil-fuels sector, do not pay fees for the transportation system's construction, financing and maintenance, resulting in reduced costs to transport energy commodities, such as coal.

Coal mining legacy costs

Coal mining legacy costs, ranging from the health of workers affected by ailments linked to mining, to land subsidence, are likely large, but not well characterized in the data sources the research team was able to access.

Extraction rights

Extraction rights are allocated by the state governments to applicants. The allocation process does not rely on an auction system.

6.3 Sources reviewed

Data sources

- Data from state and federal governments (the federal subsidy report, mining agencies at the state level, federal agencies (such as the environment), reports on tax policy and research and development policy).
- Non-governmental sources including international NGOs (involved in export credits and oil aid) as well as the AGEBA – Arbeitsgemeinschaft Energiebilanzen e.V. (a national working group on energy balances consisting of representatives of energy industry and research institutes).
- Although the biannual federal subsidy report has some data deficits (as described above), it is still a useful resource as it provides time-consistent information on the subsidy programs it tracks. Overall, transparency is high with respect to federal direct spending, reduced tax rates and specific R&D expenditures. This is also due to the strict state aid control by the European Commission.
- Information on “soft” subsidies such as credit support, insurance and indemnification, and legacy health costs is difficult to generate. These programs are not covered systematically in any data sources located by the research team. A further lack of transparency is seen in the long-term liabilities for mining sites. Our review indicates that the way liabilities are handled differs from state to state, but that overall, there is insufficient information. A study on lignite tried to unveil such difficult-to-detect subsidies and found quite a few.¹⁸ Similarly, Green Budget Germany (GBG) is currently working on a study of public support for coal (both hard coal and lignite) on behalf of Greenpeace Germany. This work analyzes both direct subsidies and more hidden “soft” public support measures, and quantifies them to the extent possible. The planned release date for this study is later in 2010.¹⁹

The most detailed data sources are primarily in German. However, government ministries often provide general information on the industrial structure of the energy sector in English. Research institutes and NGOs also publish material in English. Furthermore, a good overview in English concerning legislation, licensing, and the fiscal regime for oil and gas exploration and production in Germany is provided by the State Office for Mining, Energy and Geology in Lower Saxony, and is available on their Web site.²⁰ However, many of the legal and financial details on these subsidies are available only in German.²¹

State and federal government data sources

The following government data sources provided useful information in our review. Links to specific data sets within the organizations cited can be found in the German Subsidy Data Review Table in section 6.4.

- federal ministries (Environment, Economy and Technology, Education and Research)
- federal agencies (Federal Environment Agency, Federal Network Agency)
- federal and state budgets
- state authorities for mining

¹⁸ Available at <http://www.umweltbundesamt.de/uba-info-presse-e/2004/pe04-095.htm>

¹⁹ See <http://www.foes.de/publikationen/studien> or <http://www.greenpeace.de>

²⁰ Available at http://cdl.niedersachsen.de/blob/images/C39688480_L20.pdf

²¹ As an example, the most recent decrease of the tax on natural gas by Lower Saxony is demonstrated here: <http://www.stk.niedersachsen.de/master.jsp?C=60326335&I=484&L=20> in German only.

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- association for oil stockpiling
- Federal Subsidy Report
- KfW Bankengruppe (Development Loan Corporation)
- municipal utilities (thousands of these within Germany, so there is data variability; the team did find some with published financial reports)
- monopoly committee (Monopolkommission)
- Health Insurance and Pension Scheme for Miners (Knappschaft, Knappschaft-Bahn-See)
- Federal Association of German Inland Waterway Transportation

International agencies

- The International Energy Agency's (IEA) periodic energy policy review, updated every few years, provides a good overview of the subsidy programs within Germany
- European Commission (Approval of State Aid for German Hard Coal)

Non-governmental organizations

- End Oil Aid
- Research Institute RWI Essen (coal subsidies)
- ECA Watch (export credits)
- Öko-Institut Freiburg (ETS)
- GSI (WTO subsidy notification)
- Forum Ökologisch-Soziale Marktwirtschaft (FÖS; i.e., Green Budget Germany, GBG) (subsidies in energy sector)
- Greenpeace (harmful subsidies)
- Schutzgemeinschaft Bergbaubetroffener (SGB) Rheinberg e.V. (a local NGO of potential mining victims)
- ICLEI – Local Governments for Sustainability

Other Data Sources

- Trade Journal “Energy Policy”

Resource management

The *Federal Mining Act* (BBergG) differentiates between resources that are privately owned by land proprietors or are freely mineable. Fossil fuels belong to the latter, thus cannot be privately owned. Mineral leasing is the responsibility of the state; the mining authorities at the state level provide authorization for mining these resources. This means that the state can authorize oil and gas extraction on land that is otherwise owned and occupied by somebody else, a different view of property rights than what prevails in the United States, for example.

There are no auctions of mining rights under German mining law. Firms apply for government approval in order to obtain a permit to extract resources in a specific area. They must meet strict operating conditions and provide guarantees concerning proper site closure and maintenance. If there are multiple applicants, the government chooses the firm anticipated to achieve the greatest financial success. This often means financial strength, such as market capitalization (see, for example, § 14 mining law).

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Although there are royalty guidelines in the federal mining law, determining mining and field royalties (equivalent to “rental” fees in the U.S.), it is under the purview of the states. Allowable rates can vary substantially between 0 and 40 per cent, with some states making use of 0 per cent rates that effectively waive royalties entirely. Rates are published in *specific state regulations* (Verordnungen) *on-field and royalty rates* (see links in section 6.4 German Subsidy Data Review Table).

The payment of royalties has been required only since 1982, the result of mining legislation passed at that time. Mining rights since then are limited to a fixed number of years. The impact of these changes on actual practice has been muted by the continued application of the old mining law (no time restriction or royalty payments) for pre-existing claims and operations. We were not able to identify how many companies still own the old rights; what percentage of the claims they comprise; or how land holders are protected against damages from the mining operations or from royalty-free grants of resources that could make extraction more likely.

State-owned enterprises (SOEs)

Most fossil-fuel infrastructure is owned privately. Exceptions include inland waterways and rail networks, deemed to be a federal responsibility; as well as a large share of the municipal utilities. With government backing, municipal utilities have access to low-cost capital through guarantees by the local government.

The National Petroleum Reserve (NPR) is also a public corporation. User fees (both for the small share of German oil and for imported oil) cover costs for stock and raising of capital. (Researchers need to evaluate NPR in more detail to see if there are hidden subsidies. The payments may treat NPR as a non-profit entity, earning no return on invested capital and paying no taxes.) According to the law, public contributions or state guarantees are not foreseen. However, in an unforeseen situation that triggers an NPR bankruptcy, the government would cover residual liabilities.

Direct financial support

During the last 50 years, hard coal has been heavily supported in numerous ways (direct benefits for plant construction, support for employees, tax exemptions and sales promotion). Subsidies have focused on enabling the German hard coal industry to produce at world market prices, thus establishing indirect border protection for hard coal mines.

The amount of support provided can be found in the federal budget as well as in state budgets. Furthermore the *Federal Subsidy Report* is a useful, though not exhaustive source. The *Law for Terminating Hard Coal Subsidies* gives figures on planned support through until 2019 (see table later in the text).

Research and development support

Currently, R&D support is high for initiatives supporting energy efficiency, industrial plant efficiency and CHP plants and the use of renewable energy. Additional R&D support is provided for underwater exploration and extraction of oil, gas and other resources; and for the adoption of carbon capture and storage (CCS) technologies. Information on R&D can be found in the *government report for research and innovation*, or through the respective budgets of the Federal Ministry of Economics and Technology and the Federal Ministry of Education and Research.

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Tax breaks

Information on many tax expenditures can be found in the biannual *Federal Subsidy Report* published by the government. As not all tax expenditures fall under the subsidy term of the federal government, other sources such as reports from research institutes, federal agencies or NGOs (e.g., GSI [WTO German subsidy notification], Wuppertal Institute, Green Budget Germany [FÖS], Federal Environment Agency, Greenpeace) are needed.

Credit and insurance

No systematic data are available. While we do not expect that the fossil-fuel sector benefits from these programs to a greater degree than other sectors, the lack of data prevents us from addressing this issue systematically. The federally-owned KfW Bankengruppe, for example, provides low-interest loans for investments in communal infrastructure. This includes energy conservation investments, but might include some fossil-fuel-related assets as well. Subsidized credits for fuel-related exports flow through different parts of the government, but are tracked by international NGOs.

Site remediation

Site remediation for gas and oil wells is the responsibility of the operators. Based on communications with the state authority for mining in Lower Saxony, the private owners are liable for damages decades after the cessation of operations and so long as the former companies still exist (either independently or as part of a different entity). While the law may be clear, the handling of these situations in practice differs from state to state. No compiled data on this issue were identified.

In the law for terminating hard coal subsidies and in Bundestag “printed paper” (the official name of their publication) 15/5919 there is information on the responsibility for “eternity costs” of hard coal plants in North Rhine-Westphalia (NRW). Eternity costs refer to mine-related environmental damages that will require perpetual monitoring and remediation, such as water pumping associated with land subsidence. There is also an informative document available from the Federal Environment Agency on lignite.²² While useful, these reports address single issues, underscoring the absence of systematic data collection on the problem.

ETS: grandfathering of certificates

The *Öko-Institut* estimated that costs for granting carbon rights for a selection of German electricity producers reach as high as 35.5 billion EUR for the second period of the EU ETS 2008–2012.

6.4 German Subsidy Data Review Table

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At the time this study was published the Web links contained in this table were working correctly. Over time, as organizations update their Web sites and reorganize publically available on-line resources, Web links may change and no longer function. Therefore, some of the Web links contained in this table may not function correctly.

The German Subsidy Data Review Table starts on the following page.

²² <http://www.umweltbundesamt.de/uba-info-presse-e/2004/pe04-095.htm>.

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
1. General resources on energy policy, industry structure, prices					
A) Energy policy	n/a	-IEA detailed country reviews are a useful resource. They contain information on general policies as well as industry structures for coal, gas, oil and electricity. The most recent review of German policies was completed for CY2007.			<p>International Energy Agency (IEA) - Energy Publications, Germany, EN http://www.iea.org/publications/free_new_Desc.asp?PUBS_ID=1922</p> <p>Ministry of Economics, Energy Information, DE http://www.bmwi.de/BMWi/Navigation/energie.html</p>
B) Energy industry structure	n/a	<p>-Responsible departments for energy and energy subsidies in ministries for economics and environment [Web link 1]. (English pages contain less information than German equivalents).</p> <p>-In general, subsidies can be identified via the federal subsidy report [Web link under 6A] available at the Ministry of Finance and by searching the federal and state budgets.</p> <p>-Electricity market: monopolistic and oligopolistic structures. [Web link 3] Competition increasing since liberalization, but still four big electricity suppliers control a big share of the market.</p> <p>-Gas market: competition still low after liberalization.</p> <p>-Regulatory authority (Bundesnetzagentur) to control electricity and gas market [Web link 2].</p>			<p>Ministry of Econ., Energy, EN http://www.bmwi.de/English/Navigation/energy-policy.html</p> <p>Ministry for Environment, Energy Efficiency, EN http://www.bmu.de/english/energy_efficiency/aktuell/38275.php</p> <p>Federal Network Agency, EN http://www.bundesnetzagentur.de/enid/80bd85dfca346169e4911b737af43e0e,0/areas/electricity/gas_regulation_y6.html</p> <p>Federal Environment Agency, FEA, DE http://www.umweltbundesamt-daten-zur-umwelt.de/umweltdaten/public/theme.do?nodeId=2257</p> <p>Monopolies committee, survey report energy market 2009, DE http://www.monopolkommission.de/aktuell_sg54.html</p> <p>Ministry of Econ., Energy, DE http://www.bmwi.de/Dateien/Energieportal/PDF/energie-in-deutschland,property=pdf,be reich=bmwi,sprache=de,rwb=true.pdf</p>
C) Energy price data	n/a	-Fairly good pricing data from the Federal Agency for Statistics	n/a		<p>Destatis - Data on energy price trends, DE https://www-ec.destatis.de/csp/shop/sfg/bpm.html.cms.cBroker.cls?cmspath=struktur,vollanzeige.csp&ID=1024647</p>

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
2. Government-owned energy minerals					
A) Standard process for mineral leasing: no formal licensing rounds, applications can be sent at any time.	Low. At the moment, no additional large-scale findings of natural gas, oil or hard coal in Germany are to be expected. However the structure of leasing rights and royalties on the deposits that do exist suggest that large subsidies may arise from the extraction that does occur. Additional mining probably mainly in lignite. High public awareness when villages or small towns are destroyed from mining operations. Mining plans do need state approval, and some compensation is paid to landowners. However, sales are mandated and displaced people are not always happy.	-Exploration and production of hydrocarbons are regulated under the Federal Mining Law from 1982. Three different kinds of licences: exploration licence, production licence and mining proprietorship [Web link 1]. -Fossil fuels are freely mineable resources, not owned by private proprietors. For exploration, one needs the authorization of the Länder. Firms send an application, in case of approval they'll get the license. No formal licensing rounds, no auctions. Financial strength and experience with mining are crucial factors in case of competition with others.	-Licensing system is organized on state level. More than 90% of gas and oil production is from Lower Saxony and Schleswig Holstein [Web link 2]. -Hard coal mostly from NRW. -Lignite from NRW and East Germany (Sachsen, Thüringen, Sachsen-Anhalt, Brandenburg). -Additional information on how values are set for land appropriated for mineral extraction are set would be helpful.		Geozentrum Hannover - Licensing for oil and gas EN http://cdl.niedersachsen.de/blob/images/C39688480_L20.pdf State Authority for Mining, Energy and Geology, Niedersachsen, DE http://www.lbeg.niedersachsen.de/live/live.php?_psmand=4
B) Royalty relief or reductions in other taxes due on extraction: reduced or eliminated royalties are common at state levels. Targeted based on type of energy, type of formation, geography, or location of reserve (e.g., deep water).	Moderate. Unit subsidies could be high, as coal and lignite often pay zero royalties, and there is wide variation in royalty rates in oil and gas by state and type of well. Aggregate values may not be that high since Germany is not a major producer. While the federal government sets 10% rates as a guideline, the Länder have wide discretion in actual charges. Rates can't be modified for a specific firm. However, though rates apply to all extraction within the Länder, there can be variation by type of reserve (e.g., onshore versus offshore) which could have the effect of targeting subsidies more precisely towards particular market players.	-The federal mining law gives a guideline for mining and field royalties for the states but at the same time the law enables the states to change these rates in their state for each resource within a specific range (see right). According to the mining law proposal: <i>Mining royalties</i> are 10% of the market value. <i>Field royalties</i> ("Feldesabgabe"): royalty for every squared meter that is used for exploration: 5€/m ² in the first year, additional 5€/m ² for every following year up to a maximum of 25€/m ² .	Oil and gas royalties in 2009: -Federal State Government can set the <i>mining royalty</i> rate from 0% to 40% based on the market value. Examples: NRW: for hard coal: 0% Schleswig-Holstein: for oil and gas production: 15%. Niedersachsen: for onshore gas production: 36% onshore oil production: 17% for oil production from other fields: 0% [Web link 2]. Brandenburg: for oil and gas: 0% Rheinland-Pfalz: for oil and gas: 10% Federal and state governments can set <i>field royalties</i> to a minimum of 0€/m ² and to a max. of 20€/m ² in the first year, max. 60€/m ² from fourth year on. Examples for maximum charges: Niedersachsen and NRW.	Especially hard coal and lignite	Royalty rates in different states, DE Niedersachsen http://www.recht-niedersachsen.de/75100/nfoerdravo.htm Hamburg, Bremen, Schleswig-Holstein NRW http://esb.bezreg-arnsberg.nrw.de/a_1/a_1_021/index.html Brandenburg http://www.bravors.brandenburg.de/sixcms/detail.php?gsid=land_bb_bravors_01.c.44963.de#4 Baden Württemberg http://www.lgrb.uni-freiburg.de/lgrb/download_poi/Merkblatt-Feldesabgabe.pdf Hessen, document not accessible Mecklenburg Vorpommern http://mv.juris.de/mv/FoerdAV_MV_rahmen.htm Rheinland Pfalz http://rlp.juris.de/rlp/gesamt/FldAbgV_RP.htm#FldAbgV_RP_P17 Saarland http://sl.juris.de/cgi-bin/landesrecht.py?d=http://sl.juris.de/sl/gesamt/FldAbgV_SL_L.htm#FldAbgV_SL_P1 Sachsen http://www.revosax.sachsen.de/Details.do?sid=5358212601465&jlink=p15

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
2. Government-owned energy minerals (continued)					
B) (continued)					<p>Sachsen-Anhalt http://st.juris.de/st/FldAbgV_ST_rahmen.htm</p> <p>Thüringen http://www.tlba.de/docs/Feldes-%20Foerderabgabe%202006.pdf</p> <p>Bayern, document not accessible</p> <p>Responsible authority for royalties, DE</p> <p>www.lbeg.niedersachsen.de http://www.lbeg.niedersachsen.de/live/live.php?_psmand=4</p> <p>www.bezreg-arnsberg.nrw.de/bergbau-und-energie http://www.bezreg-arnsberg.nrw.de/dieBezirksregierung/aufbau/abteilungen/abteilung6/index.html</p> <p>www.lbgr.brandenburg.de http://www.lbgr.brandenburg.de/cms/detail.php/lbm1.c.214968.de</p> <p>www.lgrb.uni-freiburg.de/lgrb http://www.lgrb.uni-freiburg.de/lgrb/home/index.html</p> <p>www.rp-darmstadt.hessen.de http://www.rp-darmstadt.hessen.de/</p> <p>www.bergamt-mv.de http://www.bergamt-mv.de/cms2/Bergamt_prod/Bergamt/content/de/Startseite/index.jsp</p> <p>www.lgb-rlp.de http://www.lgb-rlp.de/</p> <p>www.saarland.de/7809.htm http://www.saarland.de/7809.htm</p> <p>www.bergbehoerde.sachsen.de http://www.bergbehoerde.sachsen.de/de/index_bergbehoerde.html</p> <p>www.sachsen-anhalt.de/LPSA/index.php?id=15849 http://www.sachsen-anhalt.de/LPSA/index.php?id=15849</p> <p>www.tlba.de http://www.tlba.de/</p> <p>www.stmwirt.bayern.de http://www.stmwirt.bayern.de/</p> <p>Royalty expenses for oil and gas 2006-2008, DE http://www.erdoel-erdgas.de/article/articleview/56/1/69/</p>

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for Germany

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
2. Government-owned energy minerals (continued)					
C) Process of paying royalties due: allowable methods to estimate and pay public owners for energy minerals extracted from public lands.	Unknown. Operators hand in calculations for royalties due. Some expenses (such as transport) can be deducted from the base on which royalties are calculated. State authorities are entitled to verify and proof the underlying documents and should do this on a regular basis. It is unknown how often audits are done.	n/a	-Extract from regulation on royalties for Niedersachsen, but comparable to other states regulations: Operators have to pay royalties every three months to the state authorities according to estimations. Until 30 September the operator is obliged to execute a declaration about royalties due and in case that the sum exceeds the advanced notification need to clear the debt. State authorities are entitled to verify the calculations by the operator.		Please refer to the Web links in the above row B) Royalty relief or reductions in other taxes due on extraction for information on this area.
3. Government ownership of energy-related enterprise					
A) Security-related enterprises	Believed to be low. Oil stockpile does charge user fees that cover costs for stock and raising of capital. There is an implicit guarantee for the government to step in during the unlikely event of a bankruptcy. In 1998 the stockpile was elevated (from 80 to 90 days), at the same time the duty of stockpiling for individual companies was omitted. The actual inventories are mandated of refiners. The incremental costs of this activity is recovered through elevated fees on consumers rather than charges on the government. Membership fees are also collected for imports of mineral oil products.	-Law for Petroleum Reserve (ErdölBevG). A useful overview about oil stockpiling is published by the EBV, the association for oil stockpiling (a public corporation) [Web link 1]. Yearly the EBV publishes a report on the past financial year [Web link 2]. -Additional work is needed to quantify whether there are hidden operational subsidies to this enterprise; how the public mandate affects private stockpiling decisions; and whether the fees on imports just offset operating costs of the stockpiling or create an additional market protection for domestic refiners.	n/a	Oil.	EBV Petroleum reserves in Germany. DE http://www.ebv.eu/cms/pdf/pflicht2008.pdf EBV Report on the Financial Year 2007/20008, EN http://www.ebv-oil.org/cmse/cms2.asp?sid=139&nid=&cof=57

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for Germany

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
3. Government ownership of energy-related enterprise (continued)					
B) Transport of bulk fuels	<p>-Believed to be low. However, inland waterways are used frequently to transport bulk fuels (27% of total transport in 2008). Oversight of ships and personal is paid by users, but no user fees for waterways.</p> <p>-Rail lines are also utilized, especially for transport of mineral oil (in 2005: out of 111 million consumed tonnes of mineral oil, 15 million tonnes were moved by rail. Liquefied gas is also moved by rail (DB Schenker, Web link 2). But the major part of rail subsidies goes to passenger transport.</p> <p>-Pipelines are private, except for CEPS (NATO pipeline system), transport and storage by government-owned enterprise.</p>		<p>-Inland waterways and rail are federal competencies.</p>	<p>Hard coal, oil, natural gas.</p>	<p>Federal Association of German Inland River and Canal Traffic, DE http://www.binnenschiff.de/</p> <p>DB Schenker BTT, mineral oil transport, DE http://www.btt-gmbh.de/site/bttgmbh/de/waagenladungsverkehr/mineraloel/mineraloel.html</p>
C) Municipal utilities and public power	<p>Low; municipal utilities mostly publicly owned: These utilities often use monopoly rents as a source of subsidization for other fields of municipal activities (e.g., public transport, cultural activities, etc.) The municipal utilities have access to low cost capital through deficiency guarantee by communal authorities (see 7A).</p>		<p>-For an exemplary financial report of a municipal utility, see Web link 1.</p> <p>-A couple of case studies might be useful to evaluate how the government ownership (low cost of capital, tax-exempt status, monopoly position) is affecting the delivered cost of power or the choice of fuel.</p>		<p>Cologne Municipal Utilities, Financial Report 2008, DE http://www.stadtwerkekoeln.de/fileadmin/files/GEW_GB_2008.pdf</p>
4. Market price support and regulation					
A) Consumption mandates (restrictions)	<p>Unknown. See below (4 B). In addition, fossil fuels are indirectly eligible for feed-in tariffs if they are used in combined heat and power applications. A state-level lignite mandate expired in 2003.</p>	<p>-No direct consumption mandates for fossil fuels. But obligatory share of biofuels in total fuel [Web link 2]. Indirect impacts via feed-in tariffs for combined heat and power; though additional work would be needed to puzzle through whether this benefits the fossil fuels or just the efficiency component of the CHP application. Electricity prices are influenced by feed-in tariffs and obligation to take electricity first from renewables [Web link 3] and from CHP plants [Web link 1] on basis of coal, biomass, oil, gas.</p>	<p>-Until 2003 in East German States hedge clause for lignite ("Braunkohleschutzklausel"). 70% of electricity had to be generated with lignite.</p>	<p>Coal, biomass, oil, gas, renewables.</p>	<p>CHP preservation law, DE http://bundesrecht.juris.de/kg_2002/BJNR109200002.html</p> <p>Conditions for biofuels, DE http://www.bio-kraftstoffe.info/kraftstoffe/</p> <p>Renewable energies, DE http://www.erneuerbare-energien.de/inhalt/40508/</p>

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
4. Market price support and regulation (continued)					
B) Border protection or restrictions	Moderate. Indirect border protection for German hard coal: Prices are subsidized so that they can compete with world market levels. Low for other fossil fuels. Any direct form of border protection is explicitly outlawed in the European Union. No trade restrictions for fossil fuels. The research team found no evidence of tariff-related distortions.	-See below (5A), (6B).	n/a	Hard coal.	
C) Regulatory loopholes: any legal loopholes, either in the wording of the statute or in its enforcement, that transfers significant market advantage and financial return to particular energy market participants.	Fossil fuel eligible for feed-in-tariffs when used via CHP. More generally speaking: the lack of regulation particularly in the electricity market leads to insufficient competition in the sector. Regulation of each sector varies; there may be some differential controls on fuels that create distortions, but evaluating these would require careful work on defining an appropriate benchmark of comparison.	-See 4A, Web link 1 (CHP preservation law).	n/a	All.	CHP preservation law, DE http://bundesrecht.juris.de/kg_2002/BJNR109200002.html
Other	Unknown. Lignite mining in East Germany enjoys an exemption from user fees levied on the usage or pumping of groundwater. Most lander levy fees on water withdrawals (including both groundwater and surface water) for energy purposes, although there are often reductions and exemptions associated with particular uses of this water.	-Withdrawal of water is responsibility of the Länder.	-At the moment, 10 of 16 states have fees for the withdrawal of water (Baden-Württemberg, Berlin, Brandenburg, Bremen, Hamburg, Mecklemburg-Vorpommern, Niedersachsen, Sachsen, Sachsen-Anhalt, NRW). NRW wants to abolish the fees slowly until 2018 (see Web link 2). Concerning rates for waterfees in 2005: In some states there are only fees for groundwater, in most of them also for surface water. Fees vary heavily: between 0 002€/m ³ until 0 31€/m ³ , depending on water source (surface/ groundwater), intended use and amount of water. Furthermore there are a whole lot of fee reductions and exemptions (see Web link 1).	Lignite.	FEA, Water withdrawal fees 2005, DE http://www.umweltbundesamt.de/wasser/themen/oekonomie/Tabelle_Wasserentnahmeentgelte_Laender.pdf

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
4. Market price support and regulation (continued)					
D) Price caps (controls): politically-established pricing targets or caps on fossil fuels.	Not applicable. There are no price caps in Germany.				
5. Direct spending, including R&D					
Direct spending, including R&D	In the European Union, direct subsidies and tax subsidies are regulated by the EC Treaty, namely the state aid control enacted by the European Commission. State aid control has become more restrictive over the years, shrinking the opportunity for large and highly visible subsidization of the energy sector.				European Commission, State Aid, EN http://ec.europa.eu/competition/state_aid/legislation/legislation.html
A) Earmarks	n/a				
B) Agency appropriations and contracts	Low. Mining authorities (see Web links under Section 2B) are financed with public funds.				
C) R&D support	Medium. R&D support in the past especially for hard coal. Today R&D support especially for more energy efficiency, among: modern plant technology, CHP plants and for renewables. Furthermore, R&D for underwater exploitation and evacuation of oil, gas and other resources; and for CCS. No evidence found for tax breaks to R&D.	-Energy-related R&D can be found in the government report for research and innovation. Statistics on R&D spending by firms, state governments, and universities as well. Tracking to specific fuels in most cases not possible. -As a new technology CCS is supported especially by the Federal Ministry for Education and Research and also by the Federal Ministry for Economics and Technology (see Web link 2).	-Availability of data in the report for research and innovation. In NRW: R&D support for power plant low in CO ₂ emissions with fossil fuels, nuclear and solar energy.	Supports all fossil fuels, in the past it heavily favoured coal.	Report for research and innovation 2008, DE http://www.bmbf.de/pub/bufi_2008.pdf Gassnova, CCS in Germany, EN http://www.gassnova.no/front-end/files/CONTENT/CCSWorld/Europa/Germany_summary-issue5.pdf

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
5. Direct spending, including R&D (continued)					
D) Sales promotion and support of employees	High. Direct financial support for hard coal for FY2009: 1.6 billion euros on federal level, additional support on state level (in NRW: around 0.5 billion euros).	-Hard coal: sales promotion and for compensation for released employees due to rationalizations and closings in the sector, Web links 1 and 2. -Investment grants for lignite plants, but no systematic data available.	-NRW supports hard coal to a large extent, Web links 1 and 3 -Sachsen and Sachsen-Anhalt support reconstruction in lignite mining and of abandoned industrial sites (see 10A).	Hard coal, lignite.	GSI, WTO German subsidy notification, EN http://www.iisd.org/pdf/2008/wto_subsidies_germany.pdf Federal Budget, Ministry of Econ., DE http://www.bmwi.de/BMWi/Redaktion/PDF/H/haushalt-2009-informationen-zu-foerderbereichen,property=pdf,bereich=bmwi,sprache=de,rwb=true.pdf Budget NRW, DE http://www.landtag.nrw.de/haushalt/cd-fm-0409/hh2009.ges/doku/e08/kap050.pdf RWI 2006, Hard Coal Subsidies, EN http://papers.ssrn.com/sol3/papers.cfm?abstract_id=957572 Energy Policy, 2004, Hard Coal Subsidies http://people.whitman.edu/~storckkh/coal.pdf
E) Other subsidies to consumers of fossil fuels	See 6B.	-For social reasons, private households were given an initial exemption to the newly introduced coal tax. This exemption was slated to expire in 2010.		Coal, gas, oil.	BMU, Environmental tax reform, DE http://www.bmu.de/wirtschaft_und_umwelt/oekologische_steuerreform/doc/37802.php

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for Germany

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
6. Tax breaks and special taxes					
A) Tax expenditures: reduced rates, tax exemptions, special deductions.	Magnitude unknown. There are some subsidies in the transport area, such as favourable tax treatment of company cars. In addition, there is evidence that investments in petrol refining and energy-related pollution-control equipment receive accelerated depreciation benefits. More detailed analysis to compare depreciation life with actual service life would be needed before drawing conclusions, however.	-Tax expenditures usually on federal level, 21st report on subsidies, annex 1 and 2. A useful overview is also given by the Federal Environment Agency, see below 6B. -A comparative study [Web link 2] of depreciation rules and tax rates for energy investments, conducted by Ernst & Young, provides some indication of preferential rates for certain fossil-fuel investments in Germany.	-Direct taxes are “common taxes” of the federal level and the states (sometimes with a local share as well). States have no autonomy in these issues in terms of setting their own tax rates or policies. Instead, they receive a fraction of the tax revenues generated by policies set at the federal level.	Coal, oil (fuels, especially diesel).	22nd subsidy report of the Fed. Gov., DE http://www.bundesfinanzministerium.de/nn_4542/DE/Wirtschaft_und_Verwaltung/Finanz_und_Wirtschaftspolitik/Finanzpolitik/Subventionspolitik/100113_Subventionsbericht__anl.templateId=raw,property=publicationFile.pdf Ernst and Young, International Comparison of Depreciation Rules and Tax Rates for Selected Energy Investments, Prepared for the American Council for Capital Formation, EN http://www.accf.org/media/dynamic/8/media_82.pdf
Overall tax burden by industry.	Unknown. Effective tax rates (ETRs) across many German energy investments are below the country's statutory rate, indicative of potential subsidy. ETRs are lower on petrol refining capital than other sectors; and ETRs within electrical generation are the same for all forms of conventional generation other than nuclear. While lower than statutory rates, German ETRs on energy investments are at the high end of 12 countries reviewed in an Ernst & Young study.	-A comparative study (Web link 2, table 7) of depreciation rules and tax rates for energy investments, conducted by Ernst & Young, provides some indication of preferential rates for certain fossil-fuel investments in Germany.	-Not expected to be relevant since tax policy set at federal level.	Petrol refining appears to have lower rates.	Ernst and Young, International Comparison of Depreciation Rules and Tax Rates for Selected Energy Investments, Prepared for the American Council for Capital Formation, EN http://www.accf.org/media/dynamic/8/media_82.pdf

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
6. Tax breaks and special taxes (continued)					
B) Excise taxes/ special taxes: excise taxes on fuels; special targeted taxes on energy industry (e.g., based on environmental concerns or “windfall” profits).	High: -reduced energy tax rates for energy-intensive processes, for traffic and agriculture. -tax reductions for consumers concerning heating in private households. Heating energy is unsystematically low taxed compared to electricity or fuel in traffic sector. -private households are supported in traffic sector (commuters tax allowance for instance). -until 2018, the energy tax rates for natural gas and for LPG used in transport has a much reduced rate to allow for a fast introduction. As a consequence, the infrastructure of filling stations for these types of fuels has been built up.	-Tax expenditures usually on federal level, 22nd report on subsidies, annex 1 and 2. A useful overview is also given by the Federal Environment Agency [Web link 2].	n/a	Coal, oil (fuels, especially diesel), natural and liquefied gas.	22nd subsidy report of the Fed. Gov., DE http://www.bundesfinanzministerium.de/nr_4542/DE/Wirtschaft_und_Verwaltung/Finanz_und_Wirtschaftspolitik/Finanzpolitik/Subventionspolitik/100113_Subventionsbericht_anl.templateId=raw,property=publicationFile.pdf Harmful subsidies for the environment, FEA, DE http://www.umweltdaten.de/publikationen/fpdf-l/3659.pdf
	General remark: In Germany, like in all EU countries, energy taxes and energy tax expenditures must not be analyzed without deep insight into the Emission Trading System (ETS). Excise taxes and ETS are increasingly intertwined, the existence of subsidization (or negative tax expenditures) in this field can be established only in a simultaneous analysis of both systems. Companies included in ETS are supposed to be exempt from energy tax. But there are some loopholes so that some companies are not touched by either of the two systems.				FOES publication (2008) Ecological tax reform, DE http://files.foes.de/de/downloads/diskussionspapiere/GBG_DisPap2008-05_Thesen_Bausteine_OEFR.pdf

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for Germany

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
7. Credit support					
Government loans and loan guarantees to energy enterprises: market or below-market lending to energy-related enterprises, or to energy-intensive enterprises such as primary metals industries.	Low. Even in the economic crisis, the oligopolistic energy sectors suffer comparatively little. Since subsidized credits almost always come with an associated required obligation, the energy companies do not seek for this kind of finance.	-Projects concerning new efficient power plants are sometimes financed via KfW IpeX Bank to market conditions (for example new hard coal plant Duisburg-Walsum) [Web link 1].			KfW, annual report 2006, DE http://www.kfw.de/DE_Home/Service/Download_Center/Finanzpublikationen/PDF_Dokumente_Berichte_etc./1_Geschaeftsberichte/GB_06_D.pdf
A) Subsidized credit to domestic infrastructure and fossil-fuel power plants	Unknown. The share of fossil fuels in German energy generation is relatively high. The German energy market has an oligopolistic structure: 700 small municipal energy providers (mainly municipally-owned) and four big energy companies (Eon, RWE, EnBW, Vattenfall). These four generate 80% of the overall capacities. The municipal suppliers do receive widespread credit support on their operations, mostly in the form of debt guarantees should they go bankrupt. While these suppliers provide 50% of the clients with energy, the vast majority of the power they sell (85%) comes from the major German suppliers or the EEX (European Energy Exchange AG). Furthermore, we could not find any schematical data of loan guarantees for the municipal providers. There were some incidental examples in the annual reports of municipal suppliers (e.g., Tübingen, Wuppertal). Additional work is needed to characterize potential subsidies in this area.	-From the federally owned KfW Bankengruppe investors can receive low-interest loans for investments in communal infrastructure, for example for energy conservation investments [Web link 3].	-Data and information can be found in the official report/income statements of the individual communal authorities or the accounts of the municipal energy suppliers. For examples see Web links. However, we were unable to identify any systematic collection of data on the municipal programs.	Not specified.	Municipal utility Tübingen, DE http://www.swtue.de/fileadmin/user_upload/PDF_und_Bilder/Unternehmen/Unternehmen_Kennzahlen/geschbericht_2004.pdf Deficiency guarantee sample Tübingen 2009, DE http://www.tuebingen.de/ratsdokumente/2009_33.pdf KfW municipal investments, EN http://www.kfw-foerderbank.de/EN_Home/Infrastruktur/Municipal_Investments.jsp

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
7. Credit support (continued)					
B) Subsidized credit to fossil-fuel-related exports (via Hermes, KfW Bankengruppe)	So far no complete information on net subsidies. End Oil Aid gives an overview of projects related to oil since 1990. Further information in KfW-annual report. German contributions to multilateral development banks, such as the World Bank, would be another source of potential subsidy to fossil fuels. The Bank has tens of billions in current and pending lending to the energy sector, and has historically directed a majority of its energy support towards fossil fuels.	-Among other international institutions Hermes financed the Paiton coal plant complex in Java (1995), and the BTC-pipeline intended to carry oil from the Caspian to the Mediterranean Sea (2002) KfW Ipex also finances energy related projects (in 2006: for example three big power plants in the United Arab Emirates, an energy and water project in Bahrain and several traffic related projects (railway, waterway), see Web link 1. According to EU recommendation investments abroad are screened in terms of environmental aspects and classified. Objective is to avoid financing harmful projects. General info on export credits on agaportal.de.			<p>KfW, annual report 2006, DE http://www.kfw.de/DE/Home/Service/Download_Center/Finanzpublikationen/PDF_Dokumente_Berichte_etc/1_Geschaeftsberichte/GB_06_D.pdf</p> <p>ECA Watch: International NGO Campaign on Export Credit Agencies, EN http://www.eca-watch.org/problems/eu_russ/germany/index.html</p> <p>End Oil Aid, EN http://oilaid.priceofoil.org/userdata_display.php?sortby=&modin=50&custom12=Germany&custom13=&custom2=&custom5=&custom15%5BM%5D=&custom15%5BY%5D=&custom4=&search=Search</p>
8. Insurance and indemnification					
A) Government insurance/ indemnification: market or below-market risk-management/risk-shifting services provided by the government.	See below: 10				
B) Statutory caps on commercial liability: can confer substantial subsidies if set well below plausible damage scenarios.	Although Germany is believed to offer some liability caps on nuclear operations, there are no known caps on activities related to fossil fuels.			Emerging policy for CCS should be monitored for liability caps.	

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
9. Health and safety oversight					
<p>Health and safety oversight: includes oversight of mining, oil and gas extraction, fuel transport, nuclear facilities, site clean-ups. If not paid by users, riskier and dirtier forms of energy gain a relative advantage.</p>	<p>Low. Miners use a social security system separate from the general system. In the past, this was a source of major subsidies. Today, all social security subsystems receive federal subsidies. The comparison of relative subsidies to both types is difficult. So far, nobody knows whether miners benefit relatively more from the system than other professions.</p> <p>Regulatory agencies for oversight of mining are primarily financed via user fees. (For CCS see 10A).</p>	<p>-The pension scheme for miners is called Knappschaft Bahn See. It is a federal authority and its yearly budget has to be authorized by the Federal Government. For the annual report see Web link 1.</p>		<p>Hard coal.</p>	<p>Knappschaft Bahn See, Annual Report 2008, DE http://www.deutsche- rentenversicherung- knappschaft-bahn-see.de/nn_15142/SharedDocs/de/Inhalt/04_Formulare_Publikationen/03_publicationen/Statistiken/Broschueren/jahresbericht_2008.templateId=raw.property=publicationFile.pdf/jahresbericht_2008</p>
<p>Legacy health costs.</p>	<p>Low. Miners have their own health insurance ("Knappschaft") which is due to declining membership since 2007 as normal health insurance open for others. Furthermore there is the "Berufsgenossenschaft Bergbau" an institution for statutory accident insurance and prevention. There is no specific financial support for silicosis (occupational lung disease). Legal protection and indemnities for miners with black lung are kept on a rather low level. Apparently acceptance and compensation for silicosis by the Berufsgenossenschaft is rather low.</p>	<p>-Web link 1 shows the homepage of the Knappschaft. In general, health effects from coal mining are not singled out from other health issues tracked by the German government.</p> <p>-Declining membership in Knappschaft due to a shrinking mining industry and aging population of former miners has resulted in the plan being opened to other industries.</p>			<p>Health insurance for miners, Knappschaft, DE http://www.knappschaft.de/sid_33E175B458D3A148EA4166203848CE46/DE/0_Home/kv_node.html?__nnn=true</p>

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
10. Environmental issues and site closure					
<p>A) Responsibility for closure and post-closure risks: facility decommissioning and clean-up; long-term monitoring; remediation of old contaminated sites; natural resource restoration; litigation capacity to sue past owners for violations.</p>	<p>Moderate. Hard coal mining and lignite mining produce so called “eternity costs” (i.e., annual costs for the foreseeable future). In principle, these are covered by provisions and, in the case of hard coal in the Ruhr-area, the “RAG-Stiftung” (hard coal foundation) is endowed with considerable assets meant to cover these eternity costs. A KPMG analysis estimated that RAG would pay 40% of total costs, an estimated 13.5 billion euros. The open question is: will that suffice?</p> <p>Source of the foundation’s endowment was a mixture, but mainly private money. However, with the government accepting to taking over a major part of the eternal costs to allow for privatisation of the coal company Ruhrkohle AG, now called Evonik AG. So far these eternity costs are not evaluated regularly.</p> <p>In case of CCS the operator is also responsible for long-term costs and should make a financial provision (leakages, irregularities) to ensure that closure and post-closure obligations can be met. Once responsibility of the site is given back to the governmental authority (years after the closure), the operator has to pay a certain amount to cover future surveillance costs. In case of oil and gas wells operators are responsible for closure and post-closure risks.</p>	<p>-No systematic overview. Government responsible for some of the costs for post-closure and abandoned industrial sites. CCS: Until now the respective EU directive (2009/31/EG) has not been implemented in Germany.</p>	<p>-Hard coal: Contract between RAG (the hard coal company for NRW and Saarland) and federal states NRW and Saarland (“Erblastenvertrag”). RAG foundation (RAG-stiftung.de) is responsible for post-closure costs, but in case of inability to pay federal states and government bear the costs.</p> <p>-Lignite: Federal government and states finance abandoned industrial sites of lignite plants in East Germany.</p>	<p>Hard coal, lignite; emerging issue with CCS.</p>	<p>Ewigkeitskosten: BT-Drucksache 15/5919, DE http://dip21.bundestag.de/dip21/btd/15/059/1505919.pdf</p> <p>Law for terminating hard coal subsidies, DE http://www.rag-stiftung.de/pdf/steinkohlefin g.pdf</p> <p>Ministry for Environment, Clean-up of brownfields from lignite, DE http://www.bmu.de/files/pdfs/allgemein/application/pdf/br aunkohle_lang.pdf</p>

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
10. Environmental issues and site closure (continued)					
B) Resettlement and adjustment of infrastructure	Low. Financial support for resettlement and adjustment of infrastructure due to open-cast mining is low, the operator is responsible for these costs. Although the state historically paid for part of these costs, at present the state or community pays only for costs that are <i>additional</i> to re-establishing the old community in a new location. Also borne by the community are costs that may arise due to double infrastructure during the time of resettlement. Additional work would be needed to assess whether any of these extra costs of transition should be ascribed to the coal-mining activity that triggered the move initially.	-Resettlement regulated on states level.	-Due to lignite mines sometimes complete relocation of villages necessary. In NRW and Brandenburg presently the active mining operator, RWE Power/Vattenfall, pays for all arising relocation expenses (including infrastructure, compensations for houses, etc.) [Web link 1]. Compensations reflect the current market value according to the Federal Mining Act, § 85ff [Web link 3] and will be determined by independent experts (at least in NRW chosen by the owners). (It is likely that this market value is already negatively influenced by the fact that a village is supposed to be relocated.) In case of conflict concerning the offer of the operator, one can address a committee consisting of representatives of the community and the region and of RWE Power. In NRW some years ago costs were shared between mining operator (55%), state NRW (36%) and municipality (9%), one example of resettlement in 2004 [Web link 2].	Lignite.	<p>Information on resettlement in NRW, DE http://www.bezreg-koeln.nrw.de/brk_internet/gr emien/braunkohlenausschus s/umsiedlungen/umsiedlerfib el.pdf</p> <p>Act promoting lignite in Brandenburg, DE http://www.bravors.brandenburg.de/sixcms/detail.php?gsi d=land_bb_bravors_01.c.16 012.de</p> <p>Resettlement "inden" NRW 2004, DE http://www.bezreg-koeln.nrw.de/brk_internet/gr emien/braunkohlenausschus s/braunkohlenplaene/plan_ i nden_2_pier/plan_umsiedlu ng_pier.pdf</p> <p>Federal Mining Act, DE http://www.bundesrecht.juris .de/bundesrecht/bbergg/ges amt.pdf</p>
11. Emerging issues					
A) Windfalls associated with carbon credit allocations or offset programs.	High. Windfalls from ETS (all were given rather than auctioned) are not systematically covered. But they can be judged only in context with the tax-TES-Complex.	Granting for carbon rights is estimated to 35.5 billion EUR for the time period 2008-2012 by the Oeko-Institut [Web link 1].			Oeko-Institut, Windfalls from ETS, EN http://www.oeko.de/oekodoc/ 760/2008-222-en.pdf

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
11. Emerging issues (continued)					
B) Environmental damages from ground fracturing and land subsidence.	High. Subsidence caused by mining, danger of flooding. Environmental damage is huge. At the moment multiple pumping systems manage the problem by pumping water back into the river Rhine as the level of the area outside the riverbed has sunk to a lower level than the river itself. Thus, the area requires eternal pumping, and thus also eternal subsidies. Costs should be borne by the operators— compensation is given by the coal companies—but part of the dike construction, for instance, is paid for by residents to protect their property. It is a big issue, however, often neglected. People even suffer earthquakes from the soil sinking. This is a constantly remaining problem for which no solution is yet found.		Concerning information on land subsidence problems dating 2003 see Web link 1. According to this report by the association to protect mining victims a quick relocation of people in case of flooding is not possible.		Association for mining victims, DE http://www.sgb-rheinberg.de/SGB/rubriken/BWWest/SGB_DSK_Umweltbericht_2003_Kommentare.pdf Greenpeace magazin 5455 http://www.greenpeace-magazin.de/index.php?id=5455
C) Environmental damages associated with synthetic-fuels production.					

7. Summary of Indonesia Data Review on Fossil-fuel Subsidies

Author: Lucky Lontoh

This summary supplements the more detailed information on data sources for each specific subsidy type contained in the Indonesian *Subsidy Data Review Table* in section 7.4. The Indonesian *Subsidy Data Review Table* provides the information on which this summary was based, as well as links to organizations mentioned in the discussion.

7.1 Indonesia as a case-study country

Indonesia provided many useful benefits as a case study. In addition to being a developing country and a significant producer of coal, oil and natural gas, the country has historically subsidized consumer fossil-fuel prices. Indonesia also has had a history of corruption, particularly in the natural resource sector. Together, large subsidies and corruption make transparency an issue of particular importance. The country's experiences in trying to reduce fossil-fuel subsidies and to institute more transparent governance systems provide a useful template for other countries facing similar circumstances.

Market importance

Indonesia is a transitioning energy producer as it tries to manage its own energy resources, as well as its imports. The country was a net oil exporter until 2004. The nation withdrew from the Organization of the Petroleum Exporting Countries (OPEC) in 2008 due to declining domestic oil production combined with rising levels of domestic oil consumption. It had failed to meet OPEC production quotas since early 2002.²³

Nonetheless, Indonesia has the largest proven natural gas reserves in Asia and the eleventh largest in the world (U.S. Energy Information Administration, 2007: 3). It is also a significant player in the coal industry, and an important supplier to Japan. In 2007, for example, Indonesia was the seventh largest coal producer and the second largest coal exporter in the world.

Historically, fossil-fuel exports (primarily crude oil) were the country's largest source of income. But since 2004, Indonesia has become a net oil importer as the national output from existing wells diminished and the opening of new sites stalled. By 2004, Indonesia's Minister of Energy and Natural Resources reported that 90 per cent of existing wells were classified as "old," and experiencing declining output of 15 per cent annually.

Fossil fuels also remain quite important in the country's electricity sector. While many parts of the world shifted away from oil-fired power plants long ago, more than 61 per cent of Indonesia's electricity capacity remained oil-fired in 2007, with an additional 14 per cent supplied by coal and 4.6 per cent by natural gas (IEA, 2008: 172). The Government of Indonesia's (GOI's) Energy Blueprint (2006) lists increasing coal-fired electricity generation from all types of coal as a strategic goal over the next two decades.

Central control of resource development

The GOI controls all energy resources in the country. Development of oil and gas resources relies on operational contracts between private firms (domestic and foreign) and the GOI, formalized in Production Sharing Contracts (PSCs). State agencies represent GOI interests: in the oil and gas sector, the licensing authorities are BP Migas (for upstream level activities, the holder of "Authority to Mine") and BPH Migas (for downstream level activities). Although PSCs are believed to frequently provide direct subsidies, reductions in taxes or other conditions normally placed on producers by the GOI, little of this information is publicly available.

²³ <http://www.energybulletin.net/node/5320>

Corruption has long plagued the country's natural resource sector

Chronic corruption and poor management have prevented the country from capitalizing on the development potential of being the second largest oil producer in the Asia Pacific region (after China). Audits of payments received by governmental units from oil and gas operations often find shortages. Third-party metrics such as Transparency International's Corruption Perceptions Index consistently rank Indonesia in the lower tiers (see Annex 1). Access to information is also a problem: the International Budget Partnership's review of the available fiscal information for the country flagged budget access as a major gap in terms of public information and maintaining accountability. This continues to be a problem, although "the law clearly states that budgetary documents are subject to public scrutiny and budget deliberations in parliament should be open to the public" (Budlender and Satriyo, 2008: 17).

Indonesia has been struggling to improve its performance and reduce corruption. A detailed review of the energy sector by the International Energy Agency in 2007 found that many of the existing requirements and regulations are rarely enforced, and that violations are widely ignored (IEA, 2008). In 2009, an official Note of Understanding was signed between the Coordinating Minister for Economic Affairs, the Finance Minister and the Minister for Energy and Mineral Resources setting out an agreement to work together on the implementation of extractive industries revenue transparency. The commitment is based on international best practices, including the criteria and implementation indicators of the Extractive Industries Transparency Initiative (EITI). The effort is to be led by the Coordinating Minister for Economic Affairs. An overview of the government ministries and statutes that govern Indonesia's fossil-fuel policies can be found in Annex 7A.

Importance of energy pricing and energy-related revenues to the GOI

Revenues from fossil-fuel extraction have historically been a central source of funds for the government. Revenues have declined along with production levels, though the sector remains quite important to the functioning of the state. In 2007, for example, oil and gas still contributed more than 55 per cent of total domestic revenues (Budlender and Satriyo, 2008: 19). This figure appears to exclude energy-related land taxes, so the total share of government revenue could be even higher.

While gross revenues from energy production have been significant, net contributions to state coffers are much lower. Long-standing subsidies to fuel consumption have not been well targeted, in that they have been provided to the entire population rather than just to the segment most in need of assistance. The subsidies have been very expensive for the government to maintain. Substantial revenue transfers to provincial and district levels of government (required under Indonesian law) have further compounded the drain. In some cases, the national government actually lost money on fossil-fuel sales according to calculations by the World Bank (World Bank, 2007). Faced with such large outflows of revenue, the country has successfully implemented some reforms in fossil-fuel pricing.

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7.2 Main findings of data review

The data review identified a number of important attributes about Indonesia's fossil-fuel sector that will help guide future analysis in Indonesia or similar countries. These attributes are described below. A summary of the main government interventions in fossil-fuel markets can be found in Annex 7B.

- **Consumer subsidies are important, but not the only significant part of the problem of fossil-fuel subsidies in Indonesia.** Because fossil-fuel subsidies to consumers have been so large (5–10 per cent of GDP in some years), much of the focus on Indonesian fossil-fuel markets has been on those subsidies. However, the data review indicates subsidy problems in many more areas, such as those to producers. For some types of interventions, such as credit support and some tax breaks, we were unable to identify any comprehensive data. Even for basic government budgets, information was often lacking. A number of issues, including: widespread government ownership of assets; proprietary terms in Production Sharing Contracts; and large-scale investigations into corruption and resource-related payment shortages worth billions of dollars, all indicate that a full subsidy review of Indonesia should address a much wider mix of policies. Such a study would yield a revealing supplement to the historical data on consumer subsidies.
- **Commitment to transparency in governance and fiscal affairs is not matched in practice.** Although Indonesia has expressed support for a number of transparency initiatives related to fossil fuels, and has been liberalizing many aspects of its energy sector, much remains to do. In addition to the gaps noted in the point above, the International Energy Agency (IEA) has indicated systemic under-enforcement of health, safety and environmental regulations as well. Correct procedures are rarely used to close coal mines, particularly small ones. Pollution, spills and accidents are widely reported in the press, but the resolution and financial penalties levied on responsible parties are not. Like the provision of budget information, strong statutory language supporting particular practices and outcomes has not been sufficient to achieve these outcomes on the ground. Enforcement has not kept pace with the development of energy-related governance policies.
- **Decentralization of resource payments to provinces and districts appears to generate both positive and negative results on the country's resource development path, and warrants additional study to assess its impacts.** The GOI uses structured formulas to revert resource rents back to the districts from which the resources have been extracted, with lesser, though still important payments to the provincial government and surrounding regions. The approach has generated disparate incomes across provinces, but does seem to have resulted in more stable extraction activities than what is found some other countries, where attacks on oil operations are common. However, the program is not without challenges. Specifically, fiscal accountability becomes more difficult for the local financial flows. This is a critical problem given that fossil-fuel-related disbursements are the main source of public funding for provincial public services and development projects designed to better people's lives.
- **Subsidies through production sharing contracts may be a primary data gap in Indonesian fossil-fuel markets.** Although there is some information on the structure and operation of standard PSCs (see Annex 7C), the contracts themselves are proprietary and therefore could not be reviewed for this project. A number of sources indicated that (a) firms often get customized terms within PSCs; and (b) these terms are not made public. As a result, it is nearly impossible to gauge the subsidy profile for major oil and gas operations in Indonesia. Improved transparency on this issue by the GOI would be quite helpful. At the very least, confirming that PSC terms and subsidies are carefully monitored and quantified by the GOI in a systematic and centralized manner would be important.

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- **Missing budget data.** While the GOI publishes high-level budget data, division, or program-level information is not routinely made available. Similarly, energy policies are sometimes partially implemented on the basis of “radiograms,” internal memos that are often not widely disseminated. While some of these documents were accessed for this case study, it is difficult to tell whether there are additional memos or other mechanisms by which rules within the oil and gas sector are established or modified.
- **The GOI remains the dominant player in most segments of Indonesia’s fossil-fuel sector.** The GOI’s role spans fuel chain activities from assigning leases and contracts to owning and operating most of the pipelines and electrical infrastructure. Normally, this type of ownership pattern generates a wide variety of quite large subsidies through state-owned enterprises’ (SOEs’) tax exemptions, access to subsidized credit and insurance, and, in some cases, preferential purchase or sale conditions. The research team was unable to find much information on these issues as applied to specific SOEs within Indonesia. However, based on experience in other countries, we expect that these types of subsidies are also present in Indonesia, and that they might be fairly large.
- **The GOI’s involvement in fossil-fuel markets often results in forced sales below market prices to targeted domestic customers.** Mandated sales below market prices often give rise to corruption and the associated diversion of products to unregulated markets offering higher returns. Where the mandated sales do occur, the reduced profitability of the entities may suffer from a reduced ability to maintain, reinvest and further develop infrastructure. To address the lower revenues associated with mandated sales, governments often initiate ancillary subsidy policies (e.g., subsidies to capital investment and the delivery of particular fuels) to soften the blow—though with an equally detrimental effect. While general information on the programs exists, the data needed to quantify benefits or beneficiaries could not be located.
- **Moving towards increased use of coal.** While many countries seek to phase out or clean up the coal sector, the GOI is seeking to boost coal-fired energy production in order to conserve its petroleum reserves and improve its own energy security. A few subsidies linked to this push for new coal capacity were identified, and there are likely others. De facto subsidies to smaller-scale, illegal coal mining via poor oversight of health and safety rules; and an inability to ensure government royalties or taxes are paid, are present in Indonesia. These require additional scrutiny in any country-level review. In other countries, government officials and corrupt practices are sometimes linked to these types of operations. We did not evaluate this specific issue for Indonesia.
- **Royalties and related resource payments continue to lack transparency.** A variety of payments related to oil and gas extraction activities remain problematic in terms of transparency, valuation and accountability. Issues generating inaccurate resource payments include confusion over, and variation in, the allowable deductions for production costs; inaccurate property value appraisals used to set land tax liability; diversions of resources from domestic market obligations (DMOs) for smuggling (DMOs require petroleum to be sold at artificially low domestic prices) which results in lost revenues for the state; and inadequate tracking of resource payments to ensure they end up where they are supposed to. Together, these programs greatly distort the fossil-fuel marketplace in Indonesia.

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7.3 Sources reviewed

The initial stage of this project focused on a review of available data sources by which to track and quantify transfer-based subsidies to fossil fuels. The GSI aims to quantify subsidies as part of a forthcoming country case study examining producer subsidies. The detailed review of data sources is a critical first step in establishing a roadmap for the future work and in identifying important patterns in data gaps that will need to be addressed.

A broad review of potential data sources was undertaken. These included analyzing data from a wide array of provincial and federal government ministries; international agencies such as the World Bank, IEA and the International Monetary Fund (IMF); non-governmental organizations (NGOs) involved with natural resource transparency issues; and trade press and other private sector publications. Sources included resources in both English and Bahasa Indonesia. They incorporated the many plans, laws and regulations issued by government that set energy policy in Indonesia. A review of the data sources is presented below.

A. Policies and Regulations

1. Primary Documents

Blueprint on National Energy Management 2006–2025

Oil and Gas Act No 22/2001

Energy Act No 30/2007 [eng.]

Mineral and Coal Act No 04/2009

Electricity Act No 30/2009

2. Acts

Income Tax Act 1983

Income Tax Act No 17/2000

Occupational Safety Act No 1/1970

Human Resources Act No 13/2003

Employees' Social Security Act No 3/1992

Environmental Management Act No 23/1997

3. Government Regulations

Government Regulation No 11/1979 – Safety in Oil and Gas Purification and Processing

Government Regulation No 20/1990 – Water Pollution Control

Government Regulation No 27/1999 – Environmental Impact Analysis (EIA/AMDAL)

Government Regulation No 144/2000 – Goods and Services Tax Exemption

Government Regulation No 74/2001 – Hazardous and Poisonous Substance Management

Government Regulation No 45/2002 – Implementing Body of Upstream Level Natural Oil and Gas Activity [BP Migas]

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Government Regulation No 67/2002 – Regulatory Body of Fuel Supply and Distribution and Gas Transmission through Pipelines Activity [BPH Migas]

Government Regulation No 35/2004 – Oil and Gas Upstream Activity

Government Regulation No 36/2004 – Oil and Gas Downstream Activity

Government Regulation No 34/2005 – Oil and Gas Upstream Activity 1st Amendment

Government Regulation No 2/2008 – Tariff and Non-Tax State Revenue from Non-Forestry Related Activities in Forest Area (please see the Elucidation appendix)

Government Regulation No 55/2009 – 2nd Amendment of GR 35/2004 on Oil and Gas Upstream Activity

4. Presidential Regulations

Presidential Regulation No 5/2006 – National Energy Policy

Presidential Regulation No 71/2006 – Acceleration on Coal-Fired Power Plant Project

Presidential Regulation No 91/2007 – Government Guarantee for the Development of Coal-Fired Power Plant Program

Presidential Regulation No 45/2009 – Amendment on Presidential Regulation No 71/2005 on Supply and Distribution of Specific Fuel

5. Presidential Decrees

Presidential Decree No 22/1993 – Occupational Disease

Presidential Decree No 41/2004 – Licence and Agreement on Mining Activity in Forest Area (see the Appendix)

6. Ministerial Regulations

Ministerial Regulation [by the Ministry of Energy and Mineral Resources, or EMR] No 37/2006 – Procedure to Submit Import Plan on Goods for Oil and Gas Upstream Activity

Ministerial Regulation [EMR] No 2875K/22/MEM/2006 – Price Standard for Specific Fuel Types, Budget 2006

Ministerial Regulation [EMR] No 1/2008 – Guidelines of Mining Operation on Oil Old Wells

Ministerial Regulation [EMR] No 2/2008 – Implementation of Domestic Market Obligation by Joint Cooperation Contractor

Ministerial Regulation [EMR] No 18/2008 – Reclamation and Mine Site-Closure

Ministerial Regulation [EMR] No 22/2008 – Types of Natural Oil and Gas Upstream Activity Non-Recoverable Costs to the Contractor of PSC [Eng.]

Ministerial Regulation [EMR] No 32/2008 – Utilization and Administration of Biofuel as Alternative Fuel

Ministerial Regulation [EMR] No 6/2010 – Guidelines of Policy on Oil and Gas Production Escalation

Ministerial Regulation [Finance] No 07/PMK.010/2005 – Reduction of Import Duties on Specific Fuel Types

Ministerial Regulation [Finance] No 20/PMK.010/2005 – Exemption of Duties and Tax for Goods Related to Oil and Gas PSCs

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Ministerial Regulation [Finance] No 15/PMK.02/2006 – Procedure in Calculation and Disbursement of Fuel Subsidy in Budget 2006

Ministerial Regulation [Finance] No 242/PMK.011/2008 – Government-Compensated Value Added Tax in Oil and Gas and Geothermal Activity, in Budget 2009

Ministerial Regulation [Forestry] No P.14/Menhut-II/2006 – Guidelines on Forest Leasing (Pinjam Pakai)

Ministerial Regulation [Forestry] No 43/Menhut-II/2008 – Guidelines on Forest Leasing (Pinjam Pakai)

Ministerial Regulation [Human Resources] No PER.05/MEN/1996 – System of Occupational Health and Safety Management

7. Ministerial Decrees

Ministerial Decree [EMR] No 300.K/38/M.PE/1997 – Occupational Safety for Gas Pipeline Operators

Ministerial Decree [EMR] No 8/2005 – Incentives for Marginal Oil Field Development

Ministerial Decree [EMR] No 1397K/20/MEM/2005 – Guidelines and Framework on the Development of Oil and Gas Industry 2005–2020

Ministerial Decree [EMR] No 1680 K/12/MEM/2009 – 2nd Amendment on Standard Price for LPG 3-kg, Budget 2009

Ministerial Decree [Environment] No 30/2001 – Guidelines for Implementing Mandatory Environmental Audits

Ministerial Decree [Environment] No 129/2003 – Emission Standard Quality of from Oil and Gas Business and/or Activity

8. Circulars and Other Regulations

BP Migas Head Decree No Kpts 08/BP00000/2005-S01

BP Migas Head Decree No 0114/BP00000/2007/S0

BPH Migas Head Circular No EDR-0067/8P00000/2008/S0 – Payment to Goods and Services Supplier

Director General on Oil and Gas Circular No 10292/29/DJM/2006 – Supervision of Oil and Gas Upstream Activity

General Director of Tax Circular No SE-03/PJ.51/2004 – Coal Value Added Tax

General Director of Tax Circular No SE - 18/PJ./2008 – Guidelines on Oil and Gas Land Tax (PBB)

9. Notes and State Budget

Fiscal Note and State Budget Plan 2010

10. Procedures

Procedure of Submission and Issuance of Crude Oil, Fuel and Processing Product Storage Licence

Procedure of Submission and Issuance of Crude Oil, Fuel and Processing Product Transportation Licence

Procedure of Submission and Issuance of Natural Gas Processing Licence

Procedure of Submission and Issuance of Natural Gas Transmission through Pipelines Licence

Procedure of Submission and Issuance of BBG (CNG), LPG and LNG Storage Licence

Procedure of Submission and Issuance of BBG (CNG), LPG and LNG Transportation Licence

B. Supporting Sources

1. Lists

Upstream and Downstream Oil Companies, and Pertamina Business Units

Oil Processing Licence Holders (Full and Temporary Licences); Enhanced Oil Processing License Holders (Full and Temporary Licences); Natural Gas Processing Licence Holders (Full and Temporary Licenses), per April 2009

Fuel Storage Licence Holders 2005–2009

Fuel Transportation Licence Holders 2005–2009

Natural Gas Pipelines Transmission Licence Holders per 8 April 2009

LPG Storage Licence Holders per 8 April 2009

CNG Transportation Licence Holders per 8 April 2009

LPG Transportation Licence Holders per 8 April 2009

Designer Engineer of Natural Oil and Gas Measuring Equipment per February 2008

Natural Oil and Gas Measuring Equipment Agencies per February 2008

2. Websites

BP Migas (<http://www.bpmigas.com>)

BPH Migas (<http://www.bphmigas.go.id>)

Department of Energy and Mineral Resources (<http://www.esdm.go.id>)

Information and Legal Directory of Department of Finance of Republic of Indonesia (<http://www.sjdih.depkeu.go.id/Ind/>)

Directorate General of Minerals and Coal (<http://www.djmbp.esdm.go.id>)

Directorate General of Natural Oil and Gas (<http://www.migas.esdm.go.id>)

Pertamina (<http://www.pertamina.com>)

PT Coalindo Energy (<http://www.coalindoenergy.com>)

PT PLN (<http://www.pln.co.id>)

Revenue Watch (<http://www.revenuewatch.org>)

Transparency International (<http://www.ti.or.id>)

3. Documents

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Annex 7A: Main Statutory and Administrative Rules, and Oversight Agencies, Governing Fossil-fuel Development in Indonesia

NATIONAL ENERGY POLICY

Energy Act No 30/2007

Presidential Regulation No 5/2006 on National Energy Policy

OIL AND GAS

Oil and Gas Act No 22/2001

Oil and Gas Upstream Activity, Government Regulation No 35/2004

Oil and Gas Downstream Activity, Government Regulation No 36/2004

COAL

Minerals and Coal Act No 4/2009

ELECTRICITY

Electricity Act No 30/2009

ENVIRONMENT

Environmental Management Act 23/1997

Government Regulation No 23/1999 on Environmental Impact Analysis

HUMAN RESOURCES

Human Resources Act No 13/2003

AUTHORITY STRUCTURE MAPPING REGULATOR

Department of Energy and Mineral Resources

- Directorate General of Oil and Gas
- Directorate General of Electricity
- Directorate General of Minerals, Coal and Geothermal
- Directorate General of Geology

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OIL AND GAS

BP Migas (Badan Pelaksana Minyak dan Gas Bumi) – Upstream Level Implementing Body

BPH Migas (Badan Pengatur Minyak dan Gas Bumi) – Downstream Level Regulatory Body

COAL

Department of Energy and Mineral Resources: Directorate General of Minerals, Coal, and Geothermal
Regional Government (Province and Regency/City Level)

ELECTRICITY

Department of Energy and Mineral Resources: Directorate General of Electricity

TAX

Department of Finance: Directorate General of Tax

ENVIRONMENT

Department of Environment

Monitoring Agency:

- Central Environmental Supervising Officer (Province/Regency/City Level)
- Regional Environmental Supervising Officer (Province/Regency/City Level)

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Annex 7B: Summary of Main Government Interventions in Indonesian Fossil-fuel Markets

KNOWN GOVERNMENT INTERVENTIONS - **STAGE (UPSTREAM (U) - DOWNSTREAM (D)) - LEVEL OF FISCAL (REVENUE/EXPENDITURE) INVOLVEMENT**

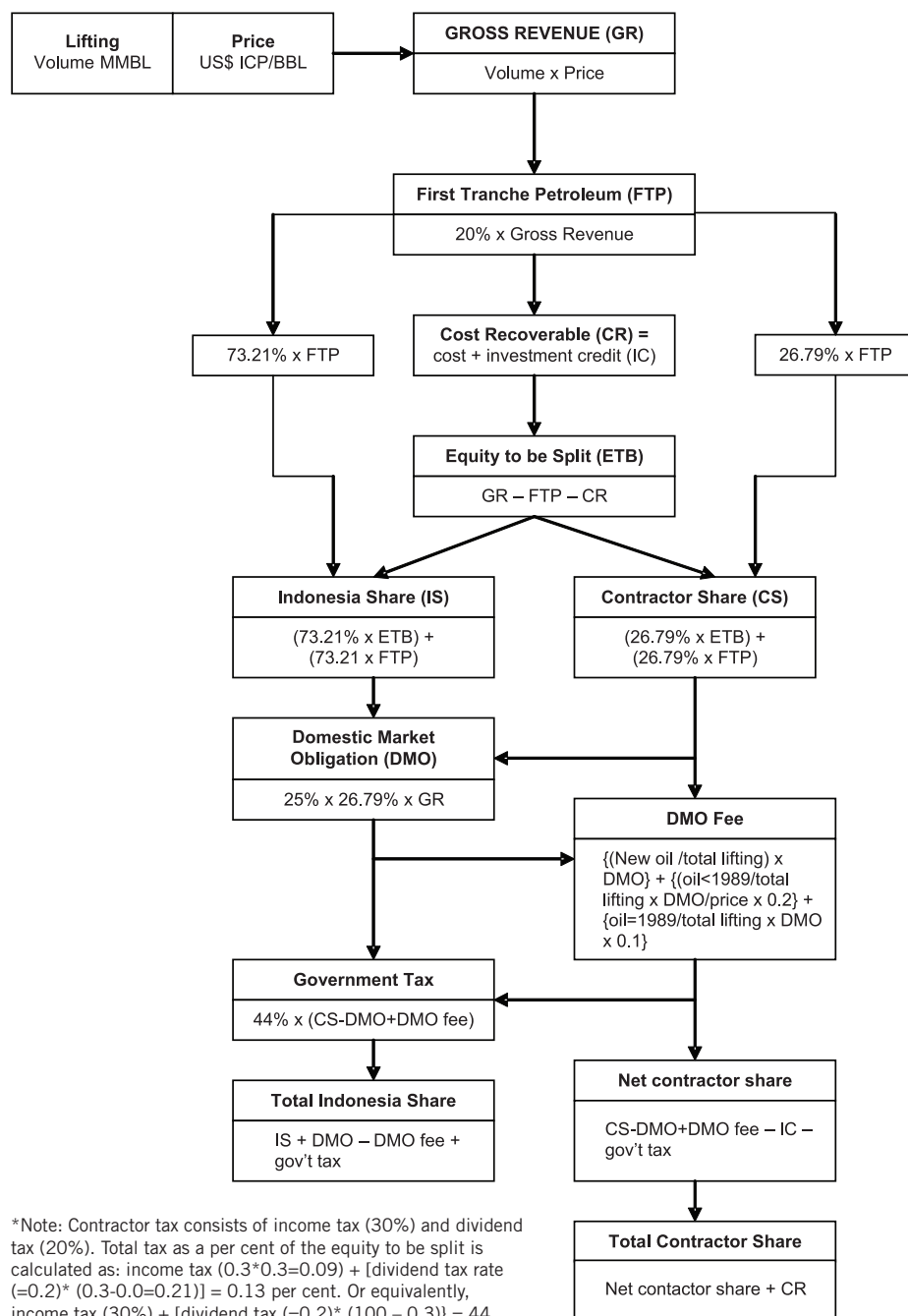
Compulsory local content (Oil, Gas, Coal) - U - NA
Cost recovery deductions from production sharing contracts (oil and gas) - U - HIGH
Distribution zoning for domestic price setting (oil and gas) - D - LOW (<i>Regulating Activity</i>)
Domestic market obligation to feed below-market domestic supply (oil and gas; coal has been discussed) - U - HIGH
Equity split variation on hard-to-reach areas and underdeveloped sites (oil and gas) - U - HIGH
First Tranche Petroleum (oil and gas) - U - HIGH
Investment credit (oil and gas) - U - HIGH
Limited licence in forest area in return for rental payments (oil, gas, coal) - U - HIGH
Government loan guarantees (coal, power) - U - HIGH
Local participation (oil and gas) - U - NA (<i>POTENTIALLY HIGH</i>)
Mandatory consumption (oil, biofuel, gas; coal-fired power plant program) - U - HIGH
Domestic price subsidy (oil, gas, power) - D - HIGH
Regional government and third-party involvement in securing reclamation and site-closure operations (oil, gas, coal) - U - UNKNOWN (<i>Relies on contractor deposits, but residual liabilities not known</i>)
Tax and duties exemption (oil, gas, coal) - U - MEDIUM (<i>lower than price subsidy and safety net programs</i>)
Preferential rates for lowest tier energy consumers/safety net (oil and gas), including public campaign - supporting policy - HIGH
Subsidies related to construction, funding and operations of state-owned energy enterprises (oil, gas, coal) - UD - HIGH
Monitoring on illegal activities and distribution control (oil, gas, coal, electricity) - DU - NA (<i>Amount should be spread into central and regional administration</i>)
Control on gas pipelines (Gas) - DU - NA (<i>potentially HIGH</i>)
Energy data and information collection (oil, gas, coal) - DU - NA

POTENTIAL INTERVENTIONS

- Coal supply for power generation (price detail not available)
- Coal liquefaction technology and industry development will be the target of government incentives, but specific incentives have not been issued yet (source: Presidential Decree No 2/2006)
- Government indemnification (information not available)
- Mining accidents settlement (information not available)
- Energy research (information not available)
- Gas supply for fertilizer industry (research not done)

Annex 7C: Revenue split under sample production sharing contract

FIGURE 1: Tax and non-tax revenue sharing for oil under a typical production sharing contract



Source: Augustina et al. (2008)

7.4 Indonesian Subsidy Data Review Table

Government Interventions in Fossil Energy Markets: Summary of Data Sources for Indonesia

At the time this study was published the Web links contained in this table were working correctly. Over time, as organizations update their Web sites and reorganize publically available on-line resources, Web links may change and no longer function. Therefore, some of the Web links contained in this table may not function correctly.

The Indonesian Subsidy Data Review Table starts on the following page.

Table Notes:

Translation of any legal document in this work is an UNOFFICIAL TRANSLATION of materials from the Government of Indonesia or official agencies.

Type of intervention ratio (high, medium, low) is based on the perceived fiscal involvement. Intervention with lesser fiscal involvement shall be rated lower, intervention with heavier fiscal involvement shall be rated higher.

Type of perceived data quality (high, moderate, unknown) is based on the credibility of source of information, verification by other sources and data consistency. In this report, data and information that come from government regulations, Web sites and publications, and known company Web sites and publications, shall be considered high in quality. Most of the sources are in Bahasa Indonesia.

Government Interventions in Fossil Energy Markets: Summary of Data Sources for Indonesia

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
1. General resources on energy policy, industry structure, prices				
General information on category				
<p><i>Related Web link</i></p> <p>◆ https://www.iea.org/textbase/nppdf/free/2008/Indonesia2008.pdf</p>				
<p>A) Energy policy Indonesian National Energy Policy based on four main drivers: (1) the National Energy Policy (Presidential Regulation No. 5/2006), serves as a regulatory guide but does not have the force of law (The Energy Act 30/2007 codifies key elements of the regulation); (2) the Oil and Gas Act (22/2001); (3) the Energy Act (20/2007); and (4) the Mineral and Coal Act (4/2009). Government Regulation No 35/2004 on Oil and Gas Upstream Business Activity and Government Regulation No 36/2004 on Oil and Gas Downstream Business Activity are also important. The grand strategy of Indonesia's energy policy is explained in the National Energy Blueprint.</p>	<p>High. Fossil fuel industries remain a central element in the country's fiscal health, and fuel subsidies a significant drain on national resources. According to the International Energy Agency (IEA), the GOI has the necessary administrative structures to effectively manage its energy operations, but "co-ordination, decision making and overlapping/unclear division of responsibilities among these institutions remain serious issues" (IEA, 2008: 25). The IEA notes that decentralization of administration to the regions has complicated this problem.</p>	<p>-Energy policy synthesis information can be found in detailed country reviews by the IEA, the World Bank, and by a number of NGOs. More general information on the country has been assembled by the U.S. Energy Information Administration. -Indonesian data resources include energy-related laws and regulations (see text summary for list of the main ones); and the National Energy Blueprint 2006-2025, which contains an overview of the energy policies and strategies planned by the GOI. -The fuel subsidy policies is a national policies. It is issued in the state budget, and formulated by national/central agencies, mainly by coordinated works of Dept. of Finance, Dept. of Energy and Mineral Resources, and Pertamina regional/local governments do mostly supervisory activities during operational process and entitled to receive some retribution such as land royalties.</p>	<p>-Law 22/1999 authorizes local governments to regulate and manage many areas of policy, including formulation of local energy policies and plans (IEA, 2008: 33).</p>	<p>Oil and gas have historically been the most important of the fossil fuels in Indonesia, though the country aims to increase the role of coal going forward.</p>
<p><i>Related Web links</i></p> <p>◆ Energy Act: http://www.esdm.go.id/prokum/uu/2007/uu-30-2007.pdf ◆ Mineral and Coal Mining Act: http://www.sjdih.depkeu.go.id/fulText/2009/4TAHUN2009UU.HTM ◆ Oil and Natural Gas Act: http://www.esdm.go.id/regulasi/uu/doc_download/500-undang-undang-no22-tahun-2001.html ◆ Minerals and Coal Act: http://www.esdm.go.id/prokum/uu/2009/UU%204%202009.pdf ◆ Energy Blue Print: http://www.esdm.go.id/publikasi/lainlain/doc_download/714-blue-print-pengelolaan-energi-nasional-pen.html</p>				
<p>B) Energy industry structure</p>	<p>High. Although the GOI has moved towards increased transparency and market pricing, a detailed IEA review of the country found that regulatory oversight in the coal, electricity, oil and gas markets did not have adequate independence from the government itself. Statutory support for this independence is strong in some sectors (e.g., oil and gas), but not yet implemented. For example, oversight of the electricity sector, as least as of 2007, continued to mix policy and regulation within the same government directorate (IEA, 2008: 27, 39).</p>	<p>-The World Bank also has detailed analysis of Indonesia's fiscal policies. -Specific rules of operation are normally set out in production sharing contracts between GOI and private operators, though these documents are not usually public. -Data on the main players in the Indonesian fossil fuel sector is available from the main oversight agencies: BP Migas, BPH Migas, Directorate General of Oil and Natural Gas, Department of Energy and Natural Resources. CONTINUED NEXT PAGE</p>		

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for Indonesia

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
1. General resources on energy policy, industry structure, prices (continued)				
		-PricewaterhouseCoopers also provides a very detailed and useful summary of the Indonesian oil and gas sector, and its regulatory oversight.		
<p><i>Related Web links</i></p> <p>◆ BP Migas - Executive Agency of Upstream Oil and Gas Activity: http://www.bpmigas.com/English/Default.asp ◆ PwC 2010 Oil and Gas Investment Guide for Indonesia: http://www.pwc.com/en_ID/id/publications/assets/OilAndGas-InvestmentAndTaxationGuide-2010.pdf ◆ Directorate General of Oil and Natural Gas - Dept. of Energy and Mineral Resources: http://www.migas.esdm.go.id/ ◆ Government Reg. No. 42/2002 on Implementing Body of Oil and Gas Upstream Level Activity [BP Migas]: http://www.bpkp.go.id/unit/hukum/pp/2002/042-02.pdf ◆ Government Reg. No. 67/2002 on Regulating Body of Fuel Supply and Distribution and Natural Gas Transmission through Pipelines Activity [BPH Migas]: http://www.bphmigas.go.id/export/sites/default/bphmigaspages/library_regulation/PP_67_2002.pdf ◆ Government Reg. No. 31/2003 on The Status Change of PERTAMINA into Public Company: http://www.anggaran.depkeu.go.id/peraturan/PP%2031%20-%202003.pdf ◆ Government Regulation No 35/2004 on Oil and Gas Upstream Level Activity: http://www.bpkp.go.id/unit/hukum/pp/2004/035-04.pdf ◆ Government Regulation No 36/2004 on Oil and Gas Downstream Level Activity: http://www.anggaran.depkeu.go.id/peraturan/PP%2036%20-%202004.pdf ◆ List of Oil and Gas PSC Contractors (Directorate General Oil and Gas): http://www.migas.esdm.go.id/download.php?fl=gerbang_202.pdf&fd=9 ◆ List of Oil and PSC Contractors (BP Migas): http://www.bpmigas.com/English/kps.asp#a ◆ Requirements and Guidelines on the Implementation of Downstream Oil and Natural Gas Activities: http://www.esdm.go.id/prokum/permen/2005/permen-esdm-07-2005.pdf ◆ MAP - Oil and Gas Depots (Numbers, Location, and Capacity): http://www.bphmigas.go.id/p/bphmigaspages/bbm/fasilitas_depo_dalam_WDN.html ◆ MAP - Indonesian Oil and Gas Refineries and Their Capacities: http://www.bphmigas.go.id/p/bphmigaspages/bbm/fasilitas_dan_kapasitas_kilang.html ◆ MAP - Fuel Distribution Zoning System: http://www.bphmigas.go.id/p/bphmigaspages/bbm/pembagian_wilayah_distribusi_niaga.html ◆ MAP - Distribution Zoning System for Petroleum Fuel (Kerosene, PREMIUM, and SOLAR): http://www.bphmigas.go.id/p/bphmigaspages/bbm/pola_distribusi_premium_minyak_tanah_solar.html ◆ MAP - Kerosene and Imported Fuel Distribution Pattern: http://www.bphmigas.go.id/p/bphmigaspages/bbm/minyak_mentah_dan_bbm_impor.html ◆ MAP - Java Oil Pipelines: http://www.bphmigas.go.id/p/bphmigaspages/bbm/Jaringan_pipa_jawa.html ◆ LPG (Gas) Stock and Distribution: http://www.esdm.go.id/prokum/permen/2009/Permen%20ESDM%2026%202009.pdf ◆ MAP - National Primary Gas Transmission Grid Plan and Distribution Grid: http://www.bphmigas.go.id/p/bphmigaspages/gas/daftar_wilayah_jaringan_distribusi.html ◆ List of 7 Major Gas Pipelines Transmission Grid (click for details, operator, length, zone, and capacity): http://www.bphmigas.go.id/p/bphmigaspages/gas/daftar_ruas_transmisi.html ◆ List of Gas Distribution Zoning System (click for details, operator, length, zone, and capacity): http://www.bphmigas.go.id/p/bphmigaspages/gas/daftar_wilayah_jaringan_distribusi.html ◆ List of Registered Parties in Gas Downstream Activities: http://www.bphmigas.go.id/p/bphmigaspages/gas/daftar_badan_usaha.html ◆ Offering Procedure on Natural Gas Distribution Grid Operation Which is Built by GOI: http://www.esdm.go.id/prokum/permen/2009/Permen%20ESDM%2029%202009.pdf</p>				
C) Energy price data: Clean data on wholesale and retail prices, and on taxes, can be used to calculate price-gap subsidy measures.	High. Historically, domestic price subsidies to key consumer markets has been among the largest sources of fossil-fuel subsidies in Indonesia. The magnitude of the subsidy has risen with world oil prices, since the internal prices would adjust upwards more slowly than price movements in the marketplace.	-Most pricing information relates to Indonesia's domestic fuel price subsidies.		
<p><i>Related Web links</i></p> <p>◆ Domestic Fuel Price (1965-2009): http://www.esdm.go.id/publikasi/harga-energi/cat_view/58-publikasi/249-harga-energi/277-harga-bbm-dalam-negeri.html ◆ Indonesian Crude Oil Price (2005-2010): http://www.esdm.go.id/publikasi/harga-energi/cat_view/58-publikasi/249-harga-energi/250-harga-minyak-mentah-ind.html ◆ Domestic Gas Price List for Household and Small Industry: http://www.bphmigas.go.id/p/bphmigaspages/gas/harga_gas_bumi_untuk_rumah_tangga_dan_pelanggan_kecil.html ◆ Government Regulation No 71/2005 on Supply and Distribution of Specific Fuel. Note: Specific Fuel is Fuel with Subsidy. This regulation includes the method to determine the size of fuel subsidy, using MOPS as price benchmark: http://www.djpp.depkuham.go.id/inc/buka.php?czoyNDoiZD0yMDAwKzUmZj1wczcxLTlwMDUuaHRtijs= ◆ Link to PT Coalindo Energy, the developer of Indonesian Coal Price Index (ICI): http://www.coalindoenergy.com/ ◆ Electricity Tariffs (2010): http://www.plnjava.co.id/pdf/TDL.PDF</p>				
2. Government-owned energy minerals				
A) Standards process for mineral leasing: Auctions are held for many oil and gas sites, though there are concerns over corruption and uncompetitive access for Pertamina, the national oil firm. Some oil and gas leases, and many coal leases, are done by direct offers, where companies	High. The GOI is a monopoly owner of all natural resources in the country. Now uses auctions for oil and gas leases, which international firms sometimes win. However, the EIA notes that in rounds of leases issued in 2005, "the majority of tenders were won by smaller Indonesian firms" (EIA, 2007: 2). Lease tenders have not been viewed as objective, and the IEA's review team recommended "clarifying the tender selection criteria and approval standards, using third-party experts for tender evaluations, and providing feedback to unsuccessful tender applicants" (IEA, 2009: 26).	-Key source of data are the PSCs. However, BP Migas, responsible for regulating the upstream activities, does not consistently disclose new or revised production sharing contracts (IEA, 2008: 60). -Some indications that Pertamina receives preferential treatment in PSCs, with the right to participate in any area of a new PSC without competition at a fixed share of profits (IEA, 2008: 111).	Law No. 25/1999 on the Fiscal Balance between the Central Government and the Regions assigns 15% of net oil revenues and 30% of net gas revenues (profit after cost recovery and payments to private operators under the PSC) to the regions. This is further split: 40% to district of extraction; 40% to all other districts in the province; 20% to provincial government. Coal royalties are split also, though using somewhat different break-outs (IEA, 2008: 34). In large part due to fossil fuel tax and non-tax payments, sub-national governments have almost total fiscal control over 36% of total public expenditure. (Fengler et al., 2007)	Coal-bed methane is regulated like oil and gas, but at present not well utilized in the country.
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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
2. Government-owned energy minerals (continued)				
<p>approach the GOI with offers for a specific area. For direct offer oil and gas leases, other firms will have a chance to outbid the initial offer (IEA, 2008: 114).</p>	<p>Because terms are set through a production sharing contract for resources deemed owned by the GOI, government returns come through production sharing rather than a conventional royalty. Like royalty relief, however, the GOI may provide more favourable policies (such as through a higher share of equity in the production sharing split) for certain types of fields. The equity split has also varied over time. Collections for land utilization (similar to lease rental fees) have been more stable over time, with fixed rates set by regencies (similar to states). First Tranche Petroleum (FTP) and domestic market obligation (DMO) conditions can affect the economics of a field as well, and are included within the PSC but not made public. Finally, there is no special exemptions from these payments for government-owned sites since the GOI does not do extraction at any of its sites.</p>			
<p><i>Related Web links</i></p> <ul style="list-style-type: none"> ◆ Government Regulation No 35/2004 on Oil and Gas Upstream Level Activity: http://www.bpkp.go.id/unit/hukum/pp/2004/035-04.pdf ◆ Government Regulation No 36/2004 on Oil and Gas Downstream Level Activity: http://www.anggaran.depkeu.go.id/peraturan/PP%2036%20-%202004.pdf ◆ PROCEDURE in Determining and Offering OIL AND NATURAL GAS MINING ZONE: http://www.esdm.go.id/regulasi/permen/doc_download/855-peraturan-menteri-esdm-no35-tahun-2008-.html ◆ Oil and Gas Licensing Procedure Collections: <ul style="list-style-type: none"> • GAS PROCESSING: http://www.globalsubsidies.org/files/assets/LICENSING_PROCEDURE_-_GAS_PROCESSING.pdf • GAS STORAGE: http://www.globalsubsidies.org/files/assets/LICENSING_PROCEDURE_-_GAS_STORAGE.pdf • GAS TRANSMISSION PIPELINES: http://www.globalsubsidies.org/files/assets/NSING_PROCEDURE_-_GAS_TRANSMISSION_PIPELINES.pdf • GAS TRANSPORT: http://www.globalsubsidies.org/files/assets/LICENSING_PROCEDURE_-_GAS_TRANSPORT.pdf • OIL FUEL STORAGE: http://www.globalsubsidies.org/files/assets/LICENSING_PROCEDURE_-_OIL_FUEL_STORAGE.pdf • OIL FUEL TRANSPORT: http://www.globalsubsidies.org/files/assets/LICENSING_PROCEDURE_-_OIL_FUEL_TRANSPORT.pdf •• Principal Guidelines on Coal Mining Contract: http://www.esdm.go.id/regulasi/keppres/doc_download/767-keputusan-presiden-ri-no75-tahun-1996-.html 				
<p>Production sharing contracts (PSCs)</p>	<p>High. This is the main mechanism for developing oil and gas resources in Indonesia. The agreement normally contains all of the contract terms and any embedded subsidies including loan guarantees, investment credits, special equity shares, domestic market obligation fees (governing below-market mandated sales) and cost recovery clause. As a result, quantifying the scale of the GOI's involvement is quite difficult.</p> <p>While the research team was able to obtain parts of PSCs, information was difficult to obtain and incomplete. We hypothesize that some part of the GOI has a complete set of PSCs. It would be useful to know whether the terms are summarized anywhere so at least within the government variation can be tracked and evaluated.</p>	<p>Contractor share in current PSCs is 20-35% for oil; 30-40% for gas. Previous levels were 15% for oil and 30% for gas. Contractor take was increased in 2005 due to low exploration interest in the country (IEA, 2008: 117). Costs of exploration and operation are deducted prior to splitting the residuals. Capital assets revert to the GOI at the end of the project.</p> <p>Incentives: Marginal wells (20% increase in reimbursement levels under cost recovery); enhance oil recovery (flexibility to modify terms in an enhanced oil recovery contract)</p> <p>All PSCs include a Domestic Market Obligation, requiring a maximum of 25% of production to be diverted to the (subsidized) local market, though not for the first five years of production. While a fee is paid for this energy, the fee is lower than the market price, so the operator incurs a loss (IEA, 2008: 119).</p>	<p>GOI offers incentives to encourage production from old-wells and remote parts of the country, especially in eastern part of Indonesia. The incentives may come in form of cost recovery (cost-recovery initially was designed to support drilling in old wells) or specific split composition in which the contractor share will be bigger (contract-based, depends on the negotiation).</p>	
<p><i>Related Web links</i></p> <ul style="list-style-type: none"> ◆ Government Regulation No 45/2003 on Tariff of Non-Tax Revenue Which is Applied in DO: Presidential Decree No. 75-1996: http://www.globalsubsidies.org/files/assets/_45-2003_-_Tariff_on_Non-tax_Revenues_in_EMR.pdf ◆ Regulation of the Minister of Finance No.1/2008 - Compensated VAT on oil, gas and geothermal imports: http://www.globalsubsidies.org/files/assets/ulation_of_the_Minister_of_Finance_No_1-2008.pdf ◆ Regulation of the Minister of Finance No.20/2005 - Exemption of Duties and Tax for Goods Related to Oil and Gas: http://www.globalsubsidies.org/files/assets/lation_of_the_Minister_of_Finance_No_20-2005.pdf ◆ Regulation of the Finance Minister No.230/2008 - VAT on imports/taxable goods relative to global slowdown & recovery: http://www.globalsubsidies.org/files/assets/gulation_of_the_Finance_Minister_No_230-2008.pdf ◆ Regulation of the Minister of Finance No.10/2005 - Decrease in Customs Tariff on Certain Fuel Oils: http://www.globalsubsidies.org/files/assets/lation_of_the_Minister_of_Finance_No_10-2005.pdf <ul style="list-style-type: none"> •• Data Quality (Mid Source. Should be directly from government sources): http://www.ortax.org/ortax/?mod=aturan&page=show&id=13559 ◆ DMO Implementation by Cooperation Contract's Contractors: http://www.esdm.go.id/prokum/permen/2008/permen-esdm-02-2008.pdf ◆ PAYMENT PROCEDURE OF DMO FEE AND OVER/UNDER LIFTING IN OIL AND NATURAL GAS SECTOR: http://www.sjdih.depkeu.go.id/fulltext/2006/56~PMK.02~2006Per.htm 				

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for Indonesia

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
2. Government-owned energy minerals (continued)				
Coal leases	Current importance unknown, though impacts growing. A huge increase in coal production between 2005 and 2007 has been driven by economic cooperation with Japan, making Indonesia the second largest coal exporter to Japan. A government plan to increase the coal share of domestic electricity generation is also expected to boost demand.	Ministry of Forests of GOI issues land permits, though mining permit issuance and mine oversight is run at the provincial level (IEA, 2008: 155). Two types of licences are used. A Coal Contract of Work lays out all terms, rights, and obligations of a company from exploration through mine closure. These licenses require the majority of the venture to revert to an Indonesian company within 10 years of production. A second form of contract, Mining Authorization, tends to be used by smaller firms. Illegal mining is an increasing problem.		
<p><i>Related Web links</i></p> <p>◆ Presidential Decree No 75/1996 on The Principal on Business Agreement on Coal Mining: http://www.esdm.go.id/prokum/keppres/1996/Keppres%20RI%20No.%2075%20Tahun%201996.pdf</p>				
<p>B) Royalty relief or reductions in other taxes due on extraction: Reduced, delayed or eliminated royalties are common at federal and state levels. Royalties targeted based on type of energy, type of formation, geography or location of reserve (e.g., deep water).</p>	<p>There are many exemptions from standard rates that generate subsidies to fossil-fuel activities in Indonesia. These include wide ranging VAT exemptions, and favourable credit support and production sharing deals for more difficult oil and gas locations. To support the GOI's goal of optimizing oil and natural gas production, materials and machines for oil and gas extraction activities that can not be supplied by national industries are subject to tax relief.</p> <p>-The tax relief rules and eligible items are decided by the Ministry of Finance (MOF). On the other hand, the GOI has also implemented local content rules in mining activities, mandating the use of a certain proportion of local inputs for many activities. Local content rules often drive costs up.</p> <p>-General tax relief (decided by the MOF): Materials and machines for oil and gas extraction activities that cannot be supplied by national industries (the GOI often has local content requirements for the mining sector).</p> <p>-Value added tax (VAT) exemptions: Raw fuel minerals (crude, natural gas, raw coal) at the point of initial extraction (Regulation NO 144/2000); government-compensated VAT for imported goods for upstream oil and exploration activities (MOF Ministerial Decree No 242/PMK/2008). This second provision was estimated to generate tax relief of Rp 2.5 trillion in 2009. This import tax subsidy for oil and gas exploration may contradict Article 31 of the Oil and Gas Act No. 22 (2001) according to one assessment.</p> <p>-Well grants to local governments: Older oil and gas wells (drilled since 1970) are offered to local governments by the GOI. The GOI offers incentives for the old wells and difficult-to-reach locations, especially in eastern Indonesia. The incentives may</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>-Oil and gas payments are in the form of equity sharing rather than traditional royalties. Auctioned leases often also pay a lease bonus.</p> <p>-In the coal sector, royalties go to the central government, and then are split (20% retained by GOI, 16% to provincial government; 32% to district where mine is located; 32% split amongst all other districts in the province) (IEA, 2008: 155). Coal mining in previously restricted forest lands also pay an annual lease rental fee. Information on the coal contracts is held by the Ministry of Energy and Mineral Resources.</p>	<p>1. Government Regulation No 45/2003 Article 4 Land rent for coal in NTT, Maluku, North Maluku and Papua is only 50%.</p>	

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2. Government-owned energy minerals (continued)				
	<p>come in form of cost recovery (cost recovery initially was designed to support the drilling of old wells or specific split composition in which the contractor share will be bigger (contract-based, depending on the negotiation).</p> <p>-More favourable production sharing terms:</p> <p>-Deep sea (>600ft) - credit investment [investment tax credit] of 100% for oil, 55% for gas. Deeper water has even higher credits: 110% for 200-1 500m; 125% > 1 500m (per Incentive Package III, 1992, Oil & Gas).</p> <p>-Reservoir Pre Tertiary Development (Incentive Package III, 1992, Oil & Gas): 110% credits.</p> <p>-Easter Region and Wester Region with Similar Condition (Hard to Reach/Heavy Geographical Barrier, Incentive Package IV, 1993): Oil Split: 65%:35%.</p> <p>-Marginal fields (production <10k bbls/2 years, after Incentive Package II 1989): conventional reserve, known area: split 80%:20%; for new fields, 75%:25% split.</p> <p>-Tertiary recovery: existing fields, EOR: 80%:20%; new field EOR: 75%:25%; rocks: incremental.</p>			
<p><i>Related Web links</i></p> <p>◆ Presidential Decree No 75/1996 on Principal Guidelines in Coal Cooperation Contract: http://www.globalsubsidies.org/files/assets/Presidential_Decree_No_75-1996.pdf</p> <p>◆ Ministerial [Finance] Regulation No 242/PMK.011/2008 on Government Compensate VAT on Imported Goods in Oil and Gas and Geothermal Upstream Activity: http://www.globalsubsidies.org/files/assets/ulation_of_the_Minister_of_Finance_No_1-2008.pdf ◆ MINISTERIAL Regulation [Finance] No 20/PMK.010/2005 – Exemption of Duties and Tax for Goods Related to Oil and Gas PSC: http://www.globalsubsidies.org/files/assets/lation_of_the_Minister_of_Finance_No_20-2005.pdf ◆ Ministerial [Finance] Regulation No 230/PMK.011/2008 on VAT Covered by Government on Imported Goods and/or Delivery of Certain Taxable Goods to Overcome Global Economic Slow Down and Real Sector Recovery in Fiscal Year 2009. (This regulation is followed by MOFIN Regulation No 242/PMK.011/2008): http://www.globalsubsidies.org/files/assets/gulation_of_the_Finance_Minister_No_230-2008.pdf</p> <p>◆ Non-Taxable Government Income Tariff on Energy and Mineral Resources Sector: http://www.esdm.go.id/prokum/pp/2003/pp_45_2003.pdf</p>				
<p>C) Process of paying royalties due: Allowable methods to estimate and pay public owners for energy minerals extracted from public lands</p>	<p>High. Illegal coal mining is believed to be a large problem. Illegal oil and gas extraction, as well as a misrepresentation of production levels is expected to be high as well, given overall corruption in the country. There have also been significant problems relating to cost recovery on oil and gas operations. Ongoing investigations on these items by the Supreme Audit Agency (BPK) suggests losses in excess of \$3.5 billion (Revenue Watch).</p>			
<p><i>Related Web links</i></p> <p>◆ Presidential Decree No 25/2001 on Coordinating Team on Coordinating Team on Illegal Mining, Illegal Use of Fuel, and Attrition on Power Facilities and Electricity Stealing: http://portal.djmbp.esdm.go.id/sjhn/Keppres%2025%20Thn%202001.pdf ◆ Non-Recoverable Contractor's Cost in Upstream Oil and Natural Gas Activities: http://www.esdm.go.id/regulasi/permen/doc_download/837-peraturan-menteri-esdm-no22-tahun-2008-.html ◆ Introduction to on cost recovery concept: http://www.dundee.ac.uk/ceplmp/car/html/CAR10_Article31.PDF ◆ Revenue Watch: Indonesia Transparency Snapshot: http://www.revenuewatch.org/our-work/countries/indonesia-transparency.php</p>				

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
3. Government ownership of energy-related enterprises				
GOI ownership remains central: Total or majority ownership of key players in the natural gas and oil market.	State ownership continues to be a significant factor in the operation of Indonesian fossil-fuel markets, though the Oil and Gas Law 22/2001 has reduced the power of Pertamina somewhat and begun moving the country towards more private involvement in the energy sector. Pertamina historically reported only to the President, with no transparency on operations that allowed it to funnel cash to government officials or allies. The firm used its construction and supply contracts to reward allies of the Suharto regime. Corruption allegations also hit BP Migas in July 2008 over irregularities in production numbers that appeared to short the GOI of \$21 billion in revenues between 2001 and 2008 (Pallone, 2009: 3). Although publicly traded, Perusahaan Gas Negara (PGN) is the largest firm in gas distribution and delivery and remains 55% government-owned. (IEA, 2009: 140). In the power sector, PT Perusahaan Listrik Negara (PLN) (100% state-owned) owned 86% of the country's generation capacity as of 2006 (IEA, 2009: 171).	-Indonesia's Supreme Audit Agency (BPK) has provided important information on missing oil and gas revenues. As of 2009, these totals 107 trillion Rupiah in missing non-tax revenue and income tax revenues unreported by contractors (likely in the hands of local administrators) by BP Migas; 7.8 trillion Rupiah that Pertamina is accused of taking in 2006 and 2007 in inflated fuel subsidies (about \$21billion) (Pallone, 2009: 4).		
A) Security-related enterprises: Unlike other countries with discrete stockpiles, the reserve base in Indonesia is viewed as the fuels in the entire management and production system. There are limited domestic natural gas pipelines to protect, but the country has significant liquefied natural gas facilities.	Relatively low. Under the Oil and Gas Law, GOI must prepare strategic petroleum reserves and guarantee their ability to supply fuel through the country. The stockholding requirement equal to 20 days of domestic demand is put on Pertamina. This was increased to 23 days supply during the price spike of 2008 (IEA, 2008: 136). The research team was unable to identify any source tracking the cost of meeting this security obligation.	Strategic petroleum reserve is regulated by BPH Migas (the distribution regulator), though requires close coordination between BP Migas (the production regulator) and the producers to implement. The Army and Police provide some oversight to domestic distribution activities; however, there is little indication that the country's fossil-fuel operations have never been hit by terror attacks. While there has been some violence associated with coal mining, this has been linked to attempts to close illegal mining sites. Coal management is handled by Directorate General of Minerals, Coal, and Geothermal, under Dept. of EMR. No corporation/state-owned enterprises has regulating power. On some specific occasions, GOI instructs Pertamina, PGN, and PT Tambang Batubara Bukit ASAM, and also PLN (state-owned electricity company) to perform specific tasks, such as distribution of subsidized fuel, power distribution, and biofuel blending.		

Related Web links

◆ BP Migas (Upstream Oil and Gas Activity Implementing Body): <http://www.bpmigas.com/Default.asp> ◆ Indonesia's Gas Reserves, Production, Transmission and Distribution Plan. (BP Migas): <http://www.bpmigas.com/English/act-gas.asp#a> ◆ LNG in Indonesia: <http://www.bpmigas.com/English/act-LNG.asp#a> ◆ BPH Migas - List of Registered Partners (Corporations) in Stockpiling, Transportation, and Marketing: http://www.bphmigas.go.id/p/bphmigaspages/bbm/badan_usaha_yang_sudah_terdaftar.html

Government Interventions in Fossil Energy Markets: Summary of Data Sources for Indonesia

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
3. Government ownership of energy-related enterprises (continued)				
B) Transport of bulk fuels: Natural gas transmission pipeline networks are mostly government-owned. Most coal mines are close to water (tide or river), though rail and truck are also used to move bulk coal.	Likely high, as government ownership remains high in the natural gas sector, and BPH Migas regulates natural gas pipeline tariffs and pricing to residential and small business (IEA, 2008: 146). Key bottlenecks in coal transport routes arise from dry-season loss of barge routes and limited capacity for portions of key rail routes. Water transport requires Indonesian-flagged vessels, often in short supply. Terminal loading and unloading facilities are also unreliable. The lack of secure deliveries for coal makes efforts to boost coal-fired power more uncertain (IEA, 2008: 184).	Pipelines are primarily government owned, with regulated prices as a percentage share of the selling price (Government Regulations 67/2002; 1/2006). Open access lines are main transmission conduits constructed in response to public bids. Downstream dedicated lines and “own interest” lines are built privately (with permits) to service specific firm needs; city gas lines are distribution networks built subject to a national City Gas Plan. Limited natural gas pipeline networks and interconnectability domestically. Undersea lines export to Malaysia and Singapore, and among the world’s leading exporters of Liquefied Natural Gas. (IEA 2007: 9). PGN had 82% share of Indonesia’s natural gas transmission in 2005; Pertamina, a subsidiary of Pertamina, had the remaining 18%. PGN also had more than 87% share of gas retailing, with six private retailers sharing the rest (IEA, 2008: 141). Private share of distribution is expected to rise. Data on pipeline ownership and investment is available from BPH Migas.		
<p><i>Related Web links</i></p> <p>◆ List of Special Seaports/Docks: http://www.bpmigas.com/perkapalan_maritim/index.php ◆ Indonesia’s Gas Reserves, Production, Transmission and Distribution, Plan. (BP Migas): http://www.bpmigas.com/English/act-gas.asp#a ◆ Requirements and Activity License Operating Procedures on Downstream Level Oil and Natural Gas Activities: http://www.esdm.go.id/regulasi/permen/doc_download/537-peraturan-menteri-esdm-no-0007-tahun-2005.html ◆ Regulatory Body on Oil Fuel Supply and Distribution and Natural Gas Transportation Activities by Pipelines: http://www.esdm.go.id/regulasi/pp/doc_download/326-peraturan-pemerintah-no67-tahun-2002-.html ◆ List of Pertamina Special Ports: http://www.pertamina.com/index.php?option=com_content&task=view&id=3897&Itemid=1199 ◆ Natural Gas Activities by Pipelines: http://www.esdm.go.id/regulasi/permen/doc_download/970-peraturan-menteri-esdm-no19-tahun-2009.html</p>				
C) Municipal utilities and public power: Significant public ownership of coal- and natural gas-fired electricity stations; some transmission and distribution systems for both natural gas and electric power.	High. The GOI owns the majority of the country’s power generation and distribution assets. Supply PLN controls approximately 85% of the national power generation capacity; Transmission PLN is a major player in the transmission segment; and Distribution PLN is the sole distribute of electricity to end customers in the country. National plans, implemented by PLN, also drive the fuel choice used by generators.	“Government involvement is quite high in the power sector. Under Regulation No. 71/2006, GOI instructed PLN to speed of 10 000 MW of new coal capacity. Financing was fully guaranteed by the GOI (per Presidential Regulation No. 91/2007). Additional funders included the Export-Import Bank of China and Barclays Bank PLC and China Development Bank. Despite a handful of IPPs, state-owned PLN remains the dominant player in domestic coal markets. Although the price of coal feedstock seemed to be formed in a negotiation process between PLN and the coal producers using Indonesian Coal Index (ICI) and Barlow Jonker price benchmark, PLN has strong bargaining power to push prices lower. To prevent export of too much coal to higher value external markets, a “coal quota” system similar to the domestic market obligation in oil and gas was established in 2008, though not yet ratified. This would require 30% of the total contractor’s share of coal to be diverted to domestic markets, primarily in the power sector. Electricity itself is subsidized. Increasing block rates reduce the unit subsidy for higher volume users.		Indonesia continues to use substantial amounts of oil for electricity generation. Future push towards more coal capacity.

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
3. Government ownership of energy-related enterprises (continued)				
<p><i>Related Web link</i></p> <p>◆ PLN web site: http://www.pln.co.id/pln/</p>				
4. Market price support and regulation				
A) Consumption mandates (restrictions)	<p>Unknown. Foreign investors are required to give priority in hiring Indonesian Labour (IEA, 2008: 57). Local content is also a factor in bids submitted for oil and gas leases (IEA, 2008: 115). National energy goals promote increased use of natural gas and coal, including lower grades such as lignite and liquefied coal. While promotion of coal-to-liquids and low-grade lignite often require subsidies, the research team did not think any factors other than lower prices (for lignite) drove the consumption.</p> <p>Public service obligations exist in both electrification and oil distribution, with state-owned firms slated with the task of supplying high cost regions.</p>	<p>Compulsory Local Content discussed in National Supporting Oil and Gas Industry Meeting in Batam on 2-3 April 2007 (Batam Declaration), in which, the participants agreed to promote the increasing utilization of national financing, technology, human resources, and leadership in oil and gas industry.</p> <p>MOEMR Decree No 1397 K/20/MEM/2005 jo MOEMR Regulation No 6/2010 included a number of aggressive local content targets within the oil and gas sector, including 91% local content of goods and services; and 99% of human resources by 2025.</p>		
<p><i>Related Web links</i></p> <p>◆ BP Migas (Upstream Implementing Body) Annual Report. This reports shows the fluctuation of local content in oil and gas industries: http://www.bpmigas.com/DOKUMEN/LAPORAN-BPMIGAS/2007/BAB1-7.htm ◆ Guidelines on Using Domestic Products in Goods and Services Procurement: http://gaikindo.or.id/download/industry-policies/a-kebijakan-dep-perindustrian/Permenperind_No_49_2009.pdf</p>				
B) Border protection or restrictions	<p>High. Domestic prices for gasoline, kerosene, automotive diesel, natural gas and electricity are subsidized, though targeting is a problem. The top 10% of the wage earners capture 45% of the fuel subsidies (Pallone, 2009: 5); the top 40% capture 70% of the subsidies (IEA, 2008: 24). Domestic market obligations force producers to sell fuel domestically at a loss. However, recipients of this inexpensive fuel, including Pertamina officials, sometimes smuggle the fuel out of Indonesia to sell at full market prices (Pallone, 2009: 6). The GOI has attempted to reduce the subsidies over time, as well as the sectors legally able to purchase the subsidized fuels (as of 2007, only transport, households, smaller fishing boats, and public service facilities); however, subsidized power was also reaching large industrial customers (IEA, 2008: 131, 177).</p>	<p>-Subsidy policy has been expensive in many respects. The cost to GOI in 2005 from revenues lost due to smuggling alone was estimated at at least \$850m. To transition out of the subsidized fuels, GOI has tried to replace lost fuel subsidies with direct cash transfers to poor families (IEA, 2008: 132).</p> <p>-The World Bank estimated oil and gas subsidies for 2008 at \$13.9 billion, with an additional \$6.6 billion going to electricity (Augustin et al., 2008). These absorbed nearly 80% of total oil and gas revenues collected by the GOI.</p> <p>-Export duty of 5% on coal exports supported use of coal in domestic power plants (IEA, 2008: 132). While the GOI lost a legal suit on this duty, they limited the ruling to newer coal contracts (October 2004-January 2006), exempting older ones. As the GOI seeks to ramp up domestic coal-fired power, it is still trying to expand the export credits on coal.</p> <p>-Export credit subsidy was applied from 1978-85 to oil exports; these were modified based on trade agreements signed in 1985 to reflect actual dutiable-input basis only. Subsidized export credits had to be eliminated by 1991.</p> <p>(http://www.idrc.ca/fr/ev-68161-201-1-DO_TOPIC.html). The elimination of export credit subsidy was compensated</p> <p><i>CONTINUED NEXT PAGE</i></p>	<p>There are regional quotas and price setting within Indonesia as well. Distribution (overseen by BPH Migas) is divided into four distribution zones, with allowable price differentials based on varying transport, handling, storage costs. This may promote smuggling where state or regional differences in price encourage it; for example smuggling from NTT to Timor Leste.</p> <p>Additional transfers to provincial and district governments resulted in the GOI actually running a negative balance of more than \$1 billion on revenues from the oil and gas sector in 2007 and 2008 (Augustin, 2008).</p>	

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
4. Market price support and regulation (continued)				
		by the elimination of additional duties by the export destination countries. Import duties have been reduced from previously 5% to 0% since 2005 pursuant to MOFin Regulation No. 07/PMK.010/2005 on Reduction of Duties on Specific Fuel Types.		
<i>Related Web link</i> ◆ MINISTERIAL Regulation [Finance] No 07/PMK.010/2005 – Reduction of Import Duties on Specific Fuel Types: http://www.globalsubsidies.org/files/assets/F_010-2005_-_Reduction_of_Fuel_Import_Duties.pdf ◆ Indonesia: Trade and Foreign Investment Linkages (Article by Mari Pangestu, in IDRC Web site): http://www.idrc.ca/fr/ev-68161-201-1-DO_TOPIC.html				
C) Price controls and subsidy Fuel price in Indonesia is decided by the Ministry of Energy and Mineral Resources (MOEMR). Gas Price is usually negotiated between the buyers and the producers with the acknowledgement of MOEMR. Coal Price is negotiated between the buyers and the producers. Several price standards has been set up as a guideline even for negotiated prices.	High. In general, pricing benchmarks within Indonesia rely on international fuel price benchmarks. The Indonesian crude price (ICP) refers to Mid Oil Platt Singapore (MOPS) and RIM Tokyo. The formula of ICP is 50% Platt's + 50% RIM (since July 2007); gas and coal follow similar international standards. However, the tie-in to international prices is not complete; or as rapid as occurs in a free market. This has resulted in extremely high consumer subsidies in the past.			
<i>Related Web links</i> ◆ http://www.esdm.go.id/regulasi/perpres/doc_download/454-peraturan-presiden-ri-no55-tahun-2005.html ◆ http://www.esdm.go.id/regulasi/perpres/doc_download/448-peraturan-presiden-ri-no9-tahun-2006.html ◆ http://www.esdm.go.id/regulasi/permen/doc_download/885-peraturan-menteri-esdm-no01-tahun-2009-.html ◆ http://www.bphmigas.go.id/export/sites/default/bphmigaspages/library_regulation/Pedoman_3.pdf ◆ [NEWEST] Subsidy Price on PREMIUM and SOLAR: http://www.esdm.go.id/regulasi/permen/doc_download/885-peraturan-menteri-esdm-no01-tahun-2009-.html ◆ Procedure of Supplying, Calculating, and Settlement of 3-kg LPG tank Subsidy: http://www.sjdih.depkeu.go.id/fullText/2007/215-PMK.02-2007Per.HTM ◆ Method to calculate fuel subsidy: http://www.esdm.go.id/regulasi/permen/doc_download/890-peraturan-menteri-keuangan-no-03-pmk022009.html				
D) Free movement of capital and profits	High. Foreign investors were wary of restrictions or appropriation of large capital investments in Indonesia, including in the energy sector. The 2007 Law on Investment attempted to address these concerns by instituting equal treatment for domestic and foreign investors (except for investors from countries obtaining “special rights based on agreement with Indonesia”); freedom to sell or transfer privately-owned assets, ability to transfer or repatriate capital, profits or other financial flows; and assurances that any nationalization of assets will be based on market value or resolved through international arbitration (IEA, 2008: 57).			

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Government Interventions in Fossil Energy Markets: Summary of Data Sources for Indonesia

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
4. Market price support and regulation (continued)				
E) Regulatory loopholes: Any legal loopholes, either in the wording of the statute or in its enforcement, that transfers significant market advantage and financial return to particular energy market participants.		Unknown. Rapid changes in regulations over the past 10 years have caused confusion, and associated missed payments. The use of non-standardized terms in mining contracts has also been a problem, with the same term sometimes having different meanings in different government documents.		
5. Direct spending, including R&D				
A) Safety nets related to energy	High during period of subsidy reform.	During fuel price reform in 2008, the GOI set up cash and food aid for the very poor, as well as microfinance options, to soften the impact. Actual support levels were much higher than what had originally been proposed.		
B) Agency appropriations and contracts	High. Indonesian budget documents continue to suffer from significant problems in transparency and accuracy, despite laws that require budgets to be publicly available. The Supreme Audit Agency (Badan Pengawas Keuangan, or BPK) is responsible for auditing government budgets before they are submitted to the legislature. BPK issued disclaimer status (the worse level of confidence) on the GOI's financial reports between 2004 and 2007—due to a weak accounting system and reporting, irregularities in government accounts, no solid inventory of fixed assets, debts, or receivables (Budlender and Satriyo, 2008: 24).	-Detailed finance bills/act are supposed to be available to the public, though sometimes are not. Pre-budget statements and budget projections have not historically been available. Year-end reports (including performance data) and government audit reports are supposed to be publicly available as well (Budlender and Satriyo, 2008: 29). -Although there are many NGOs active on budget issues in Indonesia, a focus on local issues means only a small portion of them focus on natural resource issues. In addition, “there has been relatively little documentation of what has been done in budget-related work” (Budlender and Satriyo, 2008: 39).	Nearly one-third of the national budget goes to transfers to regional authorities, as most public services are provided at the local level. In addition to federal transfers from the Balance Fund, local governments can also raise revenues from taxes and user charges on local business and activities.	
<i>Related Web links</i>				
◆ Government Explanation on Fuel Subsidy Cut and Other Policies which Follow It (Department of Energy and Mineral Resources). The amount of compensation package for Direct Cash Transfer, Rice for the Poor, and Microfinance Interests Subsidy are published here: http://www.esdm.go.id/siaran-pers/55-siaran-pers/1754-penjelasan-pemerintah-tentang-pengurangan-subsidi-bbm-dan-kebijakan-lain-yang-menyertainya.html ◆ Budget Advocacy In Indonesia, report of the International Budget Partnership: http://www.docstoc.com/docs/8194949/Country-Report-Indonesia/				
C) R&D support	Unknown. Budget for LEMIGAS is not made public.	Research and Development Center for Oil and Gas Technology (LEMIGAS) is the primary R&D Agency under DOEMR. While private consultants and research agencies can also conduct energy-related R&D activity, they have to acquire a licence to be acknowledged as Oil and Gas Supporting Services. LEMIGAS focuses in the following main areas: new reserves, enhanced recovery, improved value added on extracted fuels, conservation, alternative energy, environmental protection, basic materials. R&D spending also received tariff reductions, with the largest reductions (100%) for entities such as foreign firms that could most easily locate R&D elsewhere.	Nearly one-third of the national budget goes to transfers to regional authorities, as most public services are provided at the local level. In addition to federal transfers from the Balance Fund, local governments can also raise revenues from taxes and user charges on local business and activities.	
<i>Related Web link</i>				
◆ Working Group's [National Energy Council] Structure and Procedures: http://www.esdm.go.id/regulasi/permen/doc_download/975-peraturan-menteri-esdm-no20-tahun-2009.html				

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
6. Tax breaks and special taxes				
A) Tax expenditures: Reduced rates, tax exemptions, special deductions.	Incentives for marginal wells; no import taxes on capital goods for oil and natural gas exploration and production. 2007 Investment law provides authority for the GOI to issue wide ranging tax incentives to both domestic and foreign investors, including exemptions or reductions in income, value-added, land, and building taxes or import duties and accelerated depreciation or amortization (IEA, 2008: 57). There are a variety of other tax breaks to fossil-fuel related enterprises.	-Coal has tax-exempt status (though coal producers are unable therefore to reclaim VAT on imported capital goods and services). Coal sector tax terms appear not to be consistent across all operations, including variation in taxes, levies, and fees, as well as in royalty rates. (IEA, 2008: 156). -High-level tallies of specific subsidies were obtained from the World Bank's Jakarta office (not on the Web). These are likely based on the GOI's National Audit Report (the mostly recent applying to the 2008 budget). However, the tallies do not seem to pick up all subsidies to fossil fuels. It is impossible to tell what proportion of total support is being captured.		
<p><i>Related Web links</i></p> <p>◆ Regulation of the Minister of Finance No.1/2008 - Compensated VAT on oil, gas and geothermal imports: http://www.globalsubsidies.org/files/assets/ulation_of_the_Minister_of_Finance_No_1-2008.pdf ◆ Income Tax: http://www.bpkp.go.id/unit/hukum/uu/2000/17-00.pdf ◆ Exempted Goods and Services for Value Added Tax: http://www.bpkp.go.id/unit/hukum/pp/2000/144-00.pdf ◆ Government Supported Value Added Tax on Imported Goods for Upstream Oil and Natural Gas, and Geothermal Mining Activities in FY 2009: http://www.tarif.depkeu.go.id/Data/Regulation/2008PMK242PMK011.pdf ◆ Tax exemption on imported goods in Oil and Natural Gas Production Sharing Contract: http://www.beacukai.go.id/library/data/20.PMK.010.2005.pdf ◆ Procedure on Import Plan and Imported Goods for Upstream Oil and Natural Gas Activities: http://www.esdm.go.id/regulasi/permen/doc_download/526-peraturan-menteri-esdm-no-037-tahun-2006.html ◆ Tariff Exemption on Imported Goods for Upstream Level Oil and Natural Gas Activities: http://www.sjdih.depkeu.go.id/fulltext/2007/177~PMK.011~2007Per.htm</p>				
Investment Credit to Oil and Gas Mining Activities Investment tax credits (ITCs) in Indonesia take the form of incremental take from production sharing contracts (PSCs) rather than reductions in taxes due.	Probably high, though amount is not available. Most available information is focused on the oil and gas sector; however, it is likely that investment credits are also available to the power sector as well.	Although written sources on Investment Credit could not be located, other sources, including the DOEMR, confirmed the existing of a variety of incentive pages that were included in oil and gas PSCs. The basic support is for 17% of capital investment cost, and was introduced in 1988 under Incentive Package I. The incentive is calculated after the First Tranche Petroleum deduction. Even higher deductions were added later: deep sea drilling (100% and 55% added in 1989); tertiary reservoirs (100% added in 1993); and 110% and 125% for deep sea drilling in development areas, 200-1500m and below 1500m respectively (added in 1993). The lack of transparency on these credits has been flagged by the Corruption Commission (Jakarta Post, as cited in Indonesian Embassy to USA's Web site, (http://www.embassyofindonesia.org/news/2009/07/news057.htm). Though only two credit packages are referenced above, the corruption investigation found there were four issued between 1988 and 1993, indicating a wide array of subsidies may still be missing.		
Overall tax burden by industry	While this can be a useful metric to gauge the existence of exemptions that might not otherwise be well characterized, we did not locate data from Indonesia that could serve this purpose. A 2010 PricewaterhouseCoopers (PwC) investment and taxation guide into the Indonesian oil and gas sector does <i>CONTINUED NEXT PAGE</i>	PwC investment and taxation guide for the Indonesia oil and gas sector.		

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
6. Tax breaks and special taxes (continued)				
	include a comparison of the Indonesian terms of extraction versus those in nearby countries. The PwC document also contains a useful overview of the general tax system for oil and gas operations within the country.			
<i>Related Web link</i>				
◆ PwC 2010 Investment and Taxation guide for the Indonesian oil and gas sector: http://www.pwc.com/en_ID/id/publications/assets/OilAndGas-InvestmentAndTaxationGuide-2010.pdf				
B) Excise taxes/special taxes: Excise taxes on fuels; special targeted taxes on energy industry (e.g., based on environmental concerns or “windfall” profits).	No specific information was located.			
7. Credit support				
A) Subsidized credit to domestic infrastructure and fossil-fuel power plants	Likely very high. The combination of a great deal of energy infrastructure owned by the government and poor fiscal transparency suggests that financial costs of public investment are not well captured in public records or energy pricing.	PT PLN, the state-owned power generator, has issued bonds to boost revenues. However, the credit risks of the firm have resulted in limited market interest (IEA, 2008: 177). The GOI has also guaranteed debt needed to reach its objective of 10 000 MW of new coal-fired electricity capacity. The PLN financial record has some information, but we were unable to locate summaries of credit support in standard government publications.		
<i>Related Web links</i>				
◆ Presidential instruction to PLN to hasten the utilization of coal-fired electricity power plant: http://www.presidentri.go.id/DokumenUU.php/239.pdf ◆ Government’s guarantee to the coal supplier for coal-fired electricity power plants: http://www.sjdih.depkeu.go.id/fullText/2008/44~PMK.01~2008Per.HTM				
B) Subsidized credit to fossil-fuel-related enterprises via export credit or multilateral lending institutions	Unknown.	Indonesia has been a frequent recipient of international credit support from foreign export credit assistance banks and multilateral development banks. The face value of these commitments to fossil energy since 1999 totals more than \$4.5 billion according to http://www.endoilaid.org . The subsidy value can’t be calculated with specific data on loan terms.		
8. Insurance and indemnification				
A) Government insurance/indemnification: Market or below-market risk management/risk shifting services provided by the government.	No information on these services, including on liability in the case of fatal accidents. Non-force majeure accidents are the 100% contractors responsibility, the GOI can ask the contractor to invest more funds and effort to cope with the accident.	All mining accidents should be reported to DOEMR; however, data have not been made public to date. Similarly, we could not locate any information on how frequently, or how successfully, the GOI has been able to push responsibility and liability back on to contractors when there have been accidents.		

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
8. Insurance and indemnification (continued)				
<p>B) Statutory caps on commercial liability: Can confer substantial subsidies if set well below plausible damage scenarios.</p>	<p>No information on these services, including on liability in the case of fatal accidents.</p> <p>Non-force majeure accidents are 100% the responsibility of the contractors. The GOI can ask contractors to contribute more funds and effort to deal with accidents.</p>			
9. Health and safety oversight				
<p>Health and safety oversight: Includes oversight of mining, oil and gas extraction, fuel transport and site clean-ups. If not paid by users, riskier and dirtier forms of energy gain a relative advantage.</p> <p>Implementor: mining contractors</p> <p>Supervisors: Department of Human Resources, BP Migas, BPH Migas, local governments</p> <p>JAMSOSTEK = Occupational Insurance / Social Security</p>	<p>Unknown. Despite strong statutory protection of workers, and inclusion of fossil-fuel industries within the country's standard work contract terms, the researcher could not identify actual data on inspection frequency, fines levied, injuries or fatalities in the fossil-fuel sector, or other indicators that would illuminate how well the domestic program was working.</p>	<p>Health and safety clauses are found in every mining and energy contract, requiring contractors to maintain a health and safety standard. The rules are laid out in a number of federal laws and acts: Occupational Safety Act No 1/1970, Human Resource Act No 13/2003, Government Regulation No 11/1979 on Occupational Safety on Oil and Gas Processing, MOEMR Decree 300.K/38/M.PE/1997 on Occupation Safety on Natural Gas Transmission Pipelines, Presidential Decree No 22/1993 on Disease Related to Occupational Relations, and Ministerial [Human Resources] Regulation No PER. 05/MEN/1996 on Occupational Health and Safety Management System.</p> <p>-By statute, health insurance is supposed to be provided by the employer. Each company is furthermore obligated to participate in the Occupational Health and Safety Management System [OHSMS] which is integrated within company's management system.</p> <p>-JAMSOSTEK is the GOI-provided occupational insurance/social security plan; workers can choose that or an employee-provided plan instead.</p> <p>-PT Sucofindo (general mining including coal) and Patra Nirbaya (oil and gas) are firms authorized by Dept. of Human Resources (Sucofindo) and Dept. EMR (Patra Nirbaya) to carry out audit and certification on OHSMS on coal or oil and gas sectors.</p>		
<p><i>Related Web links</i></p> <p>◆ Indonesian National Standards (SNI) [index collection - paid subscription]: http://202.158.23.137/index.php ◆ ILO Working Paper, Occupational Safety and Health in Indonesia, April 2004: http://www.ilo.org/public/english/region/asro/manila/downloads/wp9.pdf</p>				
<p>Legacy health costs</p>	<p>Unknown.</p>	<p>Presidential Decree No 22/1993 on Disease Caused By Occupational Relations lays out the basic rules of occupational illness, and requires coverage by contractors (i.e., firms) for illnesses arising up to three years after the end of employment.</p>		

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel
10. Environmental issues and site closure				
Environmental review	High.	<p>Law No. 4/1982, “Basic Provisions for the Management of Living Environment,” sets up a requirement to conduct an environmental impact analysis and licensing for projects with the potential to have a substantial impact on the natural environment. It also allows entry to inspectors and a process for legal action, compensation, and dispute resolution. However, there is little or no penalty for non-compliance (IEA, 2008: 66). IEA concluded that while the statutes were good, they were implemented poorly and approvals were granted without adequate review. They note that “[e]nforcement of environmental law across Indonesia is generally weak” (IEA, 2008: 67).</p> <p>Under Law No. 41/1999 on forestry, mining operations are banned from a variety of high value forest land, covering some 27% of total Indonesian land area. In 2008, this was changed to allow mining in most of these lands in return for annual rental fees. IEA notes there has been local opposition to the change (IEA, 2008: 156).</p>		
Emissions: Steam power plants and other large industries are regulated by Decree No. 13/1995, “Emission Quality Standards for Fixed Sources.”		<p>While the law requires emissions controls, testing, and reporting of results, IEA noted there “was no consolidated review of impact,” indicating the rules were not being followed (EIA 2008: 72).</p> <p>Under Law No. 4/1982, there is a capability to levy fines. However, the process must use the courts and is difficult to do. The fines are not an adequate check to actions at present (IEA, 2008: 67).</p>		
Responsibility for closure and post-closure risks: Facility decommissioning and clean-up; long-term monitoring; remediation of old contaminated sites; natural resource restoration; litigation capacity to sue past owners for violations.	High. Financial assurance appears spotty, as is actual practice. While reclamation at the largest operations was reasonable, “the environmental performance of medium-scale coal mines was generally poor.” A variety of problems with water pollution, reclamation, and overburdened management were noted in a World Bank report; costs to properly manage the issue were estimated at less than 1% of gross mine revenues. Environmental performance at small, often illegal, mines was systematically poor (IEA, 2008: 74).	<p>Starting in 1995, coal mine operations were required to restore and revegetate land subsequent to the end of mining. A reclamation plan is required prior to the start of mining, and the Reclamation Guarantee Programme levies fines on a company if they do not properly implement their reclamation plan (IEA, 2008: 72).</p> <p>The Mineral and Coal Act No 4/2009 required more formal financial assurance for coal-mine reclamation. Article 100 of the Act requires Mining Permit holders and Special Mining Permit holders to set up reclamation deposit funds and post-mining deposit funds. These funds can be deployed to a third party if the permit holder fails to act.</p> <p>-Pending analysis from the Maastricht European Institute on environmental liability regime in Indonesia.</p>	Since 1999, most environmental monitoring has been done by local authorities rather than by the GOI (IEA, 2008: 73). Enforcement on small and medium coal mines in particular has been poor.	
<p><i>Related Web links</i></p> <p>◆ Reclamation and Mining Site-Closure: http://www.esdm.go.id/regulasi/permen/doc_download/722--peraturan-menteri-esdm-no18-tahun-2008.html ◆ Preventing and Anticipating Environmental Damage and Contamination in General Mining Sector: http://www.esdm.go.id/regulasi/kepmen/doc_download/906-keputusan-mentamben-no-1211k008mpe1995.html ◆ Guidelines on Oil Mining Activities in Old Wells: http://www.esdm.go.id/regulasi/permen/doc_download/423-peraturan-menteri-esdm-no01-tahun-2008.html ◆ Non-Refundable Contractor’s Cost in Upstream Oil and Natural Gas Activities: http://www.esdm.go.id/regulasi/permen/doc_download/837-peraturan-menteri-esdm-no22-tahun-2008-.html ◆ [Pending]: Paralyzed Environmental Law: A Law and Economic Analysis of Environmental Liability and Compensation Mechanisms for Hazardous Activities in Indonesia: http://www.onderzoekinformatie.nl/en/oi/nod/onderzoek/OND1332004/</p>				

continued...

8. Summary of U.S. data review on fossil-fuel subsidies

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8.1 The United States as a case-study country

This summary supplements the more detailed information on data sources for each specific subsidy type contained in the accompanying U.S. Subsidy Data Review Table in section 8.4. The U.S. Subsidy Data Review Table provides the information on which this summary was based, as well as links to organizations mentioned in the discussion.

Market importance

The United States was chosen as a case study principally due to its energy market and issues relating to data transparency. Foremost was the country's central role in all global fossil-fuel markets. The United States is the world's largest oil and natural gas consumer and the second largest consumer of coal. On the production side, the U.S. is number three in the world for oil production and number two for gas and coal production. It is also a major coal exporter.²⁴ The U.S. is also at the forefront of emerging policies in the areas of "clean coal" technologies, carbon capture and storage (CCS) and the use of a variety of unconventional, fossil-derived fuels. All are areas with growing government subsidization and involvement. It is also a leader for offshore oil and gas extraction technologies, and the primary country policing the security of international sea lanes and oil shipments worldwide. The large size of the domestic market for fossil fuels means that where subsidy policies do not cap the level of government financial expenditure, the fiscal cost of the programs will be very high. This will mean that distortions in U.S. fossil-fuel markets may be considerable and can have ripple effects throughout the global economy.

Test case for "beyond price gap"

The United States is also an important test case for the idea that price-gap evaluations alone are not sufficient to capture the many ways that fossil energy is subsidized.²⁵ Recognizing that U.S. energy markets are highly competitive with relatively low fuel taxation, many price-gap studies use U.S. prices as the starting point as the world reference price against which price-gap subsidy metrics are calculated. The result is that price-gap calculations within the U.S. come out as zero subsidies (see Organisation for Economic Co-operation and Development [2001] and Koplow [1998]). Demonstrating the scope and magnitude of fossil-fuel subsidies in-country despite having a zero price-gap subsidy value helps illustrate the potential benefits of a having a broader view when defining subsidies so as to develop more inclusive and robust subsidy estimates.

²⁴ U.S. Energy Information Administration. (2008). *International Energy Annual 2006*. Retrieved 22 September 2009 from <http://www.eia.doe.gov/iea/overview.html>

²⁵ Most multi-country evaluations of energy subsidies calculate the "gap" between domestic energy prices and the cost to replace that supply with imported fuels. This approach is easier than evaluating all government programs, but captures only part of the subsidy. For more on the benefits and limitations of the price-gap approach, see Koplow, D. (2009). *Measuring Energy Subsidies Using the Price-Gap Approach: What does it leave out?* Winnipeg: International Institute for Sustainable Development.

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8.2 Main findings of data review

While a full country case study of the United States would undoubtedly generate additional insights and refinements, the data review did uncover a number of important attributes to help guide future analysis both in the United States and in other countries. These are described below.

Data on many U.S. fossil-fuel subsidies is publicly available

Some data exist on most types of fossil-fuel subsidies within the United States. Although NGOs specializing in U.S. government transparency note many problems with U.S. information, from an international perspective, coverage and visibility of subsidy information is relatively good. Government data on subsidy programs, as well as basic statistics, are normally provided on a recurring basis, with good quality control. Financial reports for many government-owned enterprises are often independently audited by the same accounting firms that audit financial statements for private firms.²⁶ However, the specificity of available data on the fossil-fuel sector varies widely across programs. In nearly all cases, however, some program information is freely available on the Internet, and often in forms (such as Excel versions of the data) that facilitate further or deeper analysis of the programs. While there have been periodic scandals in fossil-fuel-related areas of policy (e.g., royalty collections), there have not been systemic attempts to mask, alter or otherwise degrade available information on fossil-fuel-related spending or activities from inside the government.

Expanding disclosure and transparency over time

The United States is also a useful case study in terms of subsidy transparency. An array of federal laws have made it mandatory for federal agencies to furnish information, forcing general data needed to assess government subsidies into the public domain (though many gaps remain). In some cases, these rules have resulted in more than one official source producing publicly available data, with multiple data sources providing a means of checking accuracy and identifying the causes for estimate variation or error. The push for disclosure in the United States began in the 1960s with tax expenditure reporting, and now includes some aspects of credit subsidies, direct spending (budget outlays, earmarks and contract commitments), and state-owned enterprises (SOEs). In this last area, SOEs are normally run using business-like principles with annual reports and mandated independent auditing of financial results. This is a useful model to assess and from which to benchmark the transparency frameworks seen in other countries.

Transparency in the United States also benefits from robust oversight agencies operating at the federal and state levels; wide latitude of action by non-governmental organizations, trade associations and freedom of the press; and strong civil and criminal liability rules allowing litigation to check practices that may harm human health and the environment from energy-related activities. Of benefit as well is a tolerable environment for whistleblowers both within the industry and government and litigants bringing court actions against private companies. While they may come under some degree of harassment for activities relating to the fossil-fuel sector, there are very few situations where individuals risk physical harm for making this type of information public.

Although the United States is not the only country in the world with this degree of transparency (in fact, others have better disclosure in certain areas and the U.S. has a number of important remaining gaps), its mix of transparency and market importance make it a useful case study for subsidy disclosure.

²⁶ While this approach is not used for all government activities (but should be), the audited statements provide a useful template for what data reporting on government-owned enterprises worldwide should look like. See, for example, the annual report (p. 74) for the Bonneville Power Administration, a large federally-owned power marketing administration in the Pacific Northwest of the United States, retrieved from http://www.bpa.gov/corporate/Finance/A_Report/08/AR2008.pdf

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State and local transparency lags behind that at the federal level

Data on subsidies at the sub-national level are markedly worse for nearly all subsidy types than what exists at the federal level. The problem is particularly bad for non-cash subsidy mechanisms, such as tax breaks, credit and insurance subsidies. As one moves from the federal level to the state level, the scope of information accessible on the Web declines, and the need for local knowledge in order to interpret the applicability of state programs to the fossil-fuel sector also rises. Subsidies provided by local or county governments may be mentioned in press reports or meeting minutes, but are otherwise difficult to identify and estimate. In addition to degrading data flows, there are thousands of municipal government jurisdictions at the state, county and local levels that makes organizing and capturing this information challenging.

Tax-expenditure data at all levels are weaker than data available for other subsidy types

At both the state and federal levels, data on many tax expenditures represent multi-industry aggregates making them complex to analyze. To assess the portion attributed to the fossil-fuel industry, additional data and methods to allocate or pro-rate multi-recipient programs are required. In addition, many states have limited or no tax expenditure reporting. Finally, aside from the limited statistical reviews of federal tax returns that are published by the IRS Statistics of Income Branch, the accuracy or variability of tax expenditure estimates reported by government authorities cannot be gauged. There is virtually no public disclosure of models used to estimate tax revenues, those forgone, the assumptions behind them, or the variance between past estimates and actual claims on tax returns.

Credit subsidies to fossil fuels are not comprehensively captured

A variety of credit subsidies flow to fossil-fuel-related infrastructure, though not necessarily through programs focused specifically on fuels. Often, support comprises a portion of a broader tax-exempt debt program provided at the municipal level. Credit support to fossil-fuel-related exports, which involves an entirely different set of instruments and institutions, is sometimes listed individually but often is not. Rarely is loan performance information made available. As a result, capturing credit subsidies requires more detailed aggregation of data on tax-exempt institutions, tax-exempt bond issuance and lending practices. Because export credit-agencies service multiple countries and sectors, there may be economies-of-scale benefits in tracking some of these data sources across countries, rather than limiting tracking to subsidy analysis within a single country.

Ancillary services can provide large additional subsidies to fossil energy

Areas that may at first seem peripheral to the fossil-fuels sector, such as inland water transport or subsidies to the development and maintenance of ports and harbours, should not be ignored without further analysis. For example, oil and coal comprise more than half of the tonnage shipped through inland waterways in the U.S. Supplemental data on how the infrastructure is used by the fossil-fuels industry may highlight important subsidies to the sector. Other examples where this may apply include spending on greenhouse gas mitigation, roads to access coal fields, carbon capture and storage (CCS) R&D, and subsidies to electrical transmission and distribution infrastructure. Subsidies to complements of fossil fuels, such as general road transport, are more complicated to assess and estimate, though may also warrant discussion given that they provide the single largest market outlet for petroleum fuels.

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Subsidies to energy security are poorly characterized

Very large subsidies to oil security are difficult to piece together from available data sources. Data on federal government activities for oil stockpiling efforts is available but incomplete. Contingency planning and defense expenditures related to energy infrastructure are not readily accessible either. This is another area where assessing activities, costs and benefits from a cross-border approach integrating all of these components might be beneficial.

Data sources often under-report or entirely miss subsidies linked to below-market provision of goods or services

Government administrative data sources do a reasonably good job tracking cash flows and transactions—how many dollars in funding did the Department of Energy receive in 2009, or how many kWh of power did a government utility sell. However, transactional data, such as purchases or sales, focus on “what is” rather than “what should be” in terms of market structure and pricing. Much is often left out, and the complexity of the U.S. system in terms of multiple, sometimes overlapping, areas of activity makes transparency quite difficult to achieve. Examples can include the opportunity cost of capital tied up in government investments in fossil energy, subsidies associated with uncompetitive access to fossil-fuel minerals (e.g., leases on public lands to private companies that are not auctioned), special reductions for fossil fuels in (or elimination of) required payments such as royalties for coal extraction, or the mandated use of specific forms of energy, forcing consumers to purchase certain fuels. The financing costs of oil stored in the U.S. Strategic Petroleum Reserve (SPR) do not show up anywhere in SPR’s reported budget, for example, though they are actually larger than all of the expenses that are visible. For these errors of omission, work carried out by government audit agencies or by NGOs often partially fills the gap. One of the important benefits of the *Subsidy Data Review Table* developed by this project is to establish placeholders, where subsidies are likely to be provided, but are not recorded, so in-country researchers can flag important subsidies that are not being reflected in any national reporting and develop independent subsidy estimates.

Information on the legacy costs from fossil-fuel production exists, though usually in a fragmented form

Current operations, as well as a century or more of historic extraction, have left many environmental problems caused by the fossil-fuel sector. With the exception of certain hazardous waste contamination, the U.S. system normally assigns liability for environmental damage to the current landholder. If an owner is declared bankrupt, site management and clean-up often reverts to the state or federal government. There are efforts to try and involve previous parties in contributions to site clean-up, often ending up in litigation. While liability regimes continue to have gaps, they are generally more stringent for current operations than the legal frameworks that existed in the past. Information on the scope and magnitude of legacy costs is fragmented across many state agencies and only infrequently assembled into a broader picture. These liabilities have effectively understated production costs in the past. To some degree, one could argue these are sunk costs and therefore irrelevant to current inter-fuel economics. However, in many cases, the firms that caused the damages (or their successors) remain in business. In others, the understated cost of environmental liability helps support inadequate financial assurance requirements even for current operations. In this area, states may have better information than the federal government, though compiling that information from disaggregated data sources can be time-consuming.²⁷

²⁷ For further information on bonding levels see <http://cbo.gov/ftpdocs/46xx/doc4688/10-31-SuretyBonds.pdf>

Subsidy estimates are sensitive to assumptions on policy “uptake”

The magnitude of a subsidy is a function not only of the policy rules in place (who can use a subsidy and how much do they get) but also the assumptions made about how quickly others will take advantage of the programs offered by governments (how many firms or individuals meet the requirements to tap into the subsidy and choose to do so). Estimates by national governments, especially if they are prospective, often embed some of these underlying assumptions in their calculations and projections. For example, will default rates on prospective loan guarantees be high or not? If energy prices fall instead of rise, how will residual subsidies change and how will this affect the government budget? What about the prices of carbon emissions—will they increase or decrease and what will that mean? It is important to ensure these assumptions are publicly available for scrutiny. It is important to be able to gauge whether differing subsidy estimates (whether within a country but done by different agencies, or across time periods, or across countries) are the result of real differences in policy rather than driven by changing assumptions on subsidy calculation.

Emerging subsidies benefiting fossil fuels could exceed existing baseline figures

Government budgetary data sources present spending on fossil fuels based on current activity levels. However, a number of large support programs to fossil fuels are in the statutes and available to the sector, but currently they are not yet showing significant uptake. This means that levels of expenditure may increase substantially over time. These expenditures include funding support for new “advanced” coal facilities, research into CCS in general, the production of synthetic fuels and the allocation of emissions rights to incumbent industries under a cap-and-trade system. It is important to examine these programs critically on a prospective basis, as the subsidies often skew marginal investment decisions in significant ways. Those investment decisions are often at the expense of non-carbon-based fuels.

8.3 Sources reviewed

Unlike data areas such as manufacturing activity or levels of unemployment, there is no formal, routine reporting of fossil-fuel subsidies in the United States. Hence a broad review of potential data sources was undertaken. These included data from state and federal government ministries involved not only with energy policy directly, but with tax policy, transport, public lands management and oversight. Non-governmental sources of data included NGOs involved in energy and land-management activities and press sources about trade issues. A review of the main data sources is presented in the sections below.

State and federal government data sources

Land and resource management

More than one-third of domestically-produced oil and natural gas comes from federally-owned and administered land. Large deposits of coal and oil shale also rest on public land. Substantial additional reserves are on state-owned land as well. Basic assays, or measuring of available resources, are conducted by the U.S. Geological Survey. Data on mineral-lease sales, management and revenues come from both state and federal governments. Federally-managed offshore leasing to private companies is overseen by the Minerals Management Service (MMS), part of the U.S. Department of Interior (DOI). The MMS is also responsible for collecting revenues from mineral leases for both offshore leases and onshore activity on federal and American Indian reserve lands. Onshore leasing decisions and sales are overseen by the Bureau of Land Management (also part of DOI), or in some cases also by the U.S. Forest Service (which is part of the U.S. Department of Agriculture), depending on which agency controls the land associated with the lease.

Each state has a separate mechanism for managing the sale of leases. Revenues from state leases are often collected by the state's general revenue department, just as other taxes and fees are collected. Not surprisingly, states with very large fossil-fuel extraction operations, such as Alaska, also tend to have a more specialized bureaucracy for data collection and reporting.

State and federal agencies do a good job tracking transactions (leases that are awarded to private companies, royalties collected from the extraction of resources). However, they do not generally assess whether the sale of leases was done on a competitive basis or not, or whether royalties or other fees collected were artificially reduced, for example, through transfer prices (where one division of a firm "sells" resources to another at a price that is set internally rather than in the market, facilitating reduced tax or royalty payments). Independent assessment of how these systems are functioning most often comes from government audit agencies or NGOs.

Energy statistics and R&D

The U.S. federal government plays a central role in funding energy research, selected private investments in energy (through grant awards or other funding) and the production of energy statistics. Many of these functions are performed by the U.S. Department of Energy (DOE). Within the DOE, a handful of offices are working on fossil-fuel energy issues. These include the Energy Information Administration (EIA) and the Office of Fossil Energy. The EIA provides overall market reviews for each of the fossil fuels as well as operates in-house economic models on projected supply and demand. In preparing its energy market forecasts, the EIA publishes periodic summaries of existing federal energy policies. These summaries serve as a useful overview of existing

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subsidies as well. The EIA's direct work on energy subsidies is less valuable, though, as it relies on an overly narrow subsidy definition, understating the total support provided and misrepresenting the distribution of subsidies across fuels.²⁸

A number of other DOE offices are associated with research related to electricity and power distribution, both areas with substantial overlap with fossil fuels given the important role of coal and natural gas in the power sector. While U.S. states also have energy offices, few are major funders of research or providers of data. One exception is the California Energy Commission, which also prepares detailed statistical and analytical work on its energy market. Though the work has a California focus, it is often applicable to the entire country.

Data on private-sector R&D spending is tracked in a survey by the National Science Foundation. However, this information is not easily linked to specific forms of energy (such as fossil energy versus renewable). It also includes funding provided to universities, some of which may come from the DOE. Care is needed to avoid any double-counting of subsidy programs or funding.

State-owned enterprises (SOEs)

Most fossil-fuel infrastructure is owned privately. Exceptions (outside of publicly-owned mineral deposits) include publicly-owned power generation, transmission and distribution assets. Some of these are owned federally, through the Power Marketing Administrations. Most, however, are owned by municipalities. Federal data sources identify some federal programs of benefit to public power, such as the issuing of tax-exempt bonds. Summary data on revenue losses can be found in tax-expenditure reports by the Joint Committee on Taxation and the Office of Policy Analysis within the Department of the Treasury. The most detailed information on bond issuances is available from the private sector (such as Thompson Reuters), though at a fairly high cost. More aggregated data on tax-exempt bonds is published periodically by the Internal Revenue Service. Many SOEs must file audited financial reports, however. These are a useful source of data on financing and ancillary subsidies.

Energy security

Activities to secure fossil-fuel supplies are mostly linked to petroleum supply. U.S. expenditures in this area can be assessed by reviewing information on the DOE's Strategic Petroleum Reserve, and through the U.S. Department of Defense. Defense spending abroad involves general patrolling of key oil shipping lanes as well as specific initiatives linked to the defense of critical foreign infrastructure, either of which could become the target of an attack. While these expenditures are among the largest federal supports provided to oil, data availability tends to be poor and there are methodological disagreements on the how to allocate expenditures to various mission or geographic areas. State-level activity linked to key energy assets, such as the Trans-Alaska Pipeline System, is similarly not reported as a distinct project.

General spending

General spending, as well as information on fossil-fuel-related tax expenditures and credit subsidies can be found in the federal budget, published annually by the Office of Management and Budget (OMB), and related databases on federal contracting and earmarks (federal spending with a legislatively-specified recipient).

²⁸ The EIA excludes a wide range of subsidies that provide substantial benefit to energy industries, though may not be solely targeted at the sector. Often their definitional breakpoints on what to include or exclude have been inconsistently applied. Examples include some accelerated depreciation, tax-exempt debt, low-return-on-investment requirements for government-owned energy enterprises, subsidies to transport networks heavily used to move bulk fuels, liability caps, purchase mandates and energy security expenditures. See Koplou, D. (2010). *EIA Energy Subsidy Estimates: A Review of Assumptions and Omissions*, (Cambridge, MA: Earth Track, Inc.).

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However, much of this information remains fairly aggregated, making trend evaluation and topical evaluations of spending difficult to carry out. In addition, different federal sources often are inconsistent, and in some cases (such as tracking earmarks) information is not regularly updated. Budget data exist in every state, though with varying levels of detail. The variation in subsidy estimates, even from different government sources, can be quite high for non-cash transactions such as tax breaks.

Tax expenditures

Federal tax-expenditure estimates are completed for most major new legislative proposals (a process referred to as “scoring”) in order to assess their expected cost to the Treasury. Changes to tax rules are a common feature of most legislative activity. The projections are prepared by the Joint Committee on Taxation (JCT), which is part of Congress. The JCT and the Treasury also prepare tax-expenditure budgets each year based on the existing tax laws and provisions in place. The two resources rely on proprietary models for assessing the impact of tax code changes. The models are not made available to the public. While to some degree they likely benchmark their values against actual tax returns, the results of these comparisons are never made public either. The Treasury also publishes the *Statistics of Income Bulletin*, which provides analytic overviews of various tax-related topics based on actual tax return filings. If the Bulletin articles happen to discuss subsidies that are of interest, they can be a useful supplement to other information sources. State budget departments may or may not prepare similar evaluations for their states.

Credit and insurance

Credit subsidies are summarized in a special “credit supplement” of the annual federal budget prepared by the OMB. This document contains program-level estimates of commitments and estimated subsidy values. Subsidy values are aggregated so may not be easily allocated to specific sectors. In addition, Taxpayers for Common Sense, a U.S. NGO that tracks the accuracy of this federal data, notes that very little information on OMB’s estimation procedures is available, and that, as a result, they have limited confidence in the precision of the data provided in the “credit supplement.”²⁹ On the positive side, U.S. estimates are updated annually based on new information drawn from loan performance data. There is no centralized database on insurance-related subsidies. Some are captured in program reports either issued by the organization itself or the Government Accountability Office, which has a cross-program or agency audit function. Statutory caps for liability, in cases of industrial accidents for example, may be difficult to identify even across federal level programs.

Health and safety

Health and safety issues related to fossil-fuel extraction are broadly dealt with by the Occupational Safety and Health Administration (OSHA). Coal-specific monitoring is carried out by the Mine Safety and Health Administration (MSHA), which is part of the U.S. Department of Labor (DOL). The DOL also oversees payouts to coal-mine workers injured by black lung under the DOL’s Employment Standards Administration.

Site remediation

Data on site remediation are important to track in any review of fossil-fuel subsidies. The transfer of liabilities from the private sector to the taxpayers for site clean-up and reclamation will result in artificially low prices for the fossil fuels extracted as they have not internalized the environmental site clean-up costs. The United States has a large inventory of abandoned coal mine lands requiring site clean-up, as well as existing mines in need of

²⁹ More detail can be found in the U.S. table in the Credit Support section and the Insurance and Indemnification section.

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remediation. The Office of Surface Mining Reclamation and Enforcement (OSMRE), part of the U.S. DOI, oversees mine operational safety and clean-up of abandoned sites. Where contamination of surrounding areas is severe, reclamation at oil and gas sites sometimes falls under the Superfund program, managed by the U.S. Environmental Protection Agency. More often, however, these sites are managed under state programs, which aim to ensure the proper plugging and abandonment (decommissioning) of oil wells. The Interstate Oil and Gas Compact Commission (IOGCC) is a multi-state government association that coordinates oil and gas policy in producing regions and links together the state agencies focused on mineral extraction, bonding and closure activities. The IOGCC collects and publishes data on extraction, oil well management, and oil well plugging and abandonment.

Audit and oversight

At the federal level, analytical work by the Government Accountability Office and the Congressional Research Service can both provide useful current and historical views of fossil-fuel-related spending programs. The Congressional Budget Office analyzes the budgetary cost of new legislative proposals; the Joint Committee on Taxation does the same for impacts on tax revenue from those programs. The Inspector General for the federal agencies (there is one for each agency) involved with fossil energy can be a useful source of supplementary information on specific programs. For all of these sources of data, information is normally provided on an ad hoc basis in response to a specific Congressional request or initiative, or in response to the discovery of a problem. While the sources are extremely helpful in establishing baseline subsidy estimates, because they are done intermittently the sources are insufficient to track subsidy patterns over time.

International agencies

The International Energy Agency (IEA) maintains a regularly updated database containing information on energy R&D spending by its member countries. The information is easy to access and sort. However, the agency normally accepts the data as being accurately reported by member states, and provides no independent checks. The IEA also conducts periodic energy policy reviews of member countries, including the United States. These reviews are updated every few years and provide a good overview of the subsidy terrain within each country.

Multilateral development banks, which are heavily funded by the United States, as well as export credit agencies such as the Export Import Bank of the United States, are also useful sources of data. While most of their work focuses on developing countries, information on their lending and insurance commitments are included on their Web sites and in their annual reports. This information is not disaggregated however, and generally does not contain sufficient detail to allow one to calculate the associated subsidy or loan performance. These credit agencies support the export of fossil-fuel-related goods and services.

Subsidy reporting requirements under the World Trade Organization's (WTO) Agreement on Subsidies and Countervailing Measures should also be a good place to track government support to various industries, including fossil fuels. In reality, however, reporting detail is fairly weak, with most countries reporting only very general information, often with no data on subsidy levels. The U.S. WTO notifications include information on a number of fossil-fuel subsidies, though they only identify the most targeted programs to fuels and only the most visible forms. For example, percentage depletion for oil and gas is listed as a tax break, but royalty relief is not.

Non-governmental organizations

A small number of Washington, D.C.-based non-governmental organizations have been actively tracking government subsidies within the United States. The Project on Government Oversight spent a number of years analyzing the potential underpayment of oil and gas revenues by the sector. They are no longer active in this area. Friends of the Earth has produced periodic publications on fossil-fuel subsidies, as well as analyzed the

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beneficiaries of credit or allowance allocations under carbon cap-and-trade systems. Taxpayers for Common Sense and Good Jobs First both track subsidies to specific industries. The former is focused on the transparency of the federal budget across a variety of issue areas, including energy. The latter focuses on subsidies at all levels to specific production facilities, and subsidies provided in the name of job creation. The Tax Policy Center carries out general modelling relating to U.S. tax policy, and its work sometimes incorporates the energy sector. The Pew Center's Subsidyscope project has compiled data on transport subsidies and is working on a data offering on energy subsidies as well.

Earth Works studies mining policy. Though mostly focused on hardrock minerals, it has an Oil and Gas Accountability Project as well. The Environmental Working Group (EWG) has undertaken some work on water subsidies, but has not specifically assessed fossil-fuel extraction and production. The EWG has also assessed environmental damages associated with oil and gas extraction activities.

A number of NGOs have focused on export credit agencies and their financing of extractive industries. These include Oil Change International (Washington, D.C.), ECA-Watch (multiple cities), and the Bank Information Center (Washington, D.C., and Bangkok, Thailand). While all provide useful background on lending to the energy sector by exporting credit agencies or multilateral development banks, none have developed real-time reporting of subsidy information across the many different credit providers and products that would enable rapid evaluation of support patterns related to specific fuels.

A variety of regional and local NGOs collect more focused data on specific fossil-fuel plants or the environmental damages associated with specific parts of the fossil-fuel sector. Mountain top removal (excavating the top of the mountain, separating out the coal, and dumping the residual material into nearby valleys) by coal mining interests is one such example, with groups such as the Appalachian Center for the Economy & Environment focused on this issue.

The challenge of relying on NGO data for subsidy analysis is that their work is normally focused on a single or a handful of issues, and the issues that they follow often change over time. Despite this limitation, the reports these organizations produce can often shed light on how particular fossil-fuel programs generate subsidies and who benefits most from them. This additional information can be used by researchers to extend subsidy estimates into sequential time periods that were not generated as part of the original NGO work.

Other data sources

Other data sources for information on fossil-fuel subsidies in the United States include press reports and industry-focused documents or publications. Local media are particularly good at identifying and reporting on accidents or environmental damages linked to the fossil-fuel sector, as well as identifying state and local grants or other subsidies going to particular industrial sites. Trade press resources such as the Oil and Gas Journal provide useful data on capital spending and regulatory trends. Information on both of these topics provides useful context when allocating more general subsidies to beneficiaries in the energy sector in an equitable and transparent manner. Although many of these journals are not available online for free, they can often be accessed in libraries.

8.4 U.S. Subsidy Data Review Table

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At the time this study was published the Web links contained in this table were working correctly. Over time, as organizations update their Web sites and reorganize publically available on-line resources, Web links may change and no longer function. Therefore, some of the Web links contained in this table may not function correctly.

The U.S. Subsidy Data Review Table starts on the following page.

Government Interventions in Fossil Energy Markets: Summary of Data Sources for the United States

Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
1. General resources on energy policy, industry structure, prices					
General information on category					Energy Information Administration (EIA) - Official Energy Statistics from the U.S. Government http://www.eia.doe.gov/
A) Energy policy	n/a	-U.S. Energy Information Administration (EIA) Annual Energy Outlook contains a detailed summary of policy assumptions. This is a useful overview of government activities in the fossil-fuel (and other) sector [Web link 1]. -IEA detailed country reviews are also a useful resource. The most recent review of U.S. policies was completed for CY2007 [Web link 2].			EIA – Assumptions to the Annual Energy Outlook 2009 http://www.eia.doe.gov/oiaf/aeo/assumption/ International Energy Agency - Energy Publications http://iea.org/publications/index.asp
B) Energy industry structure	n/a	-Energy Information Administration (EIA) industry surveys; trade magazines. Regulatory impact assessments for any major rules affecting the energy industry can also be helpful if they are relatively recent.	-California Energy Commission produces periodic assessments comparing the future levelized cost of energy from various resources [Web link 1]		Comparative Costs of California Central Station Electricity Generation Technologies http://www.energy.ca.gov/2007publications/CEC-2007-011/CEC-2007-011-SD.PDF
C) Energy price data: clean data on wholesale and retail prices, and on taxes, can be used to calculate price-gap subsidy measures.	n/a	-Fairly good pricing data from the EIA and the International Energy Agency (IEA).			
2. Government-owned energy minerals					
General information on category	High. Government-owned fuel resources account for about 35% of production. Fraction could rise with oil shale production. Sites also potentially important for CO ₂ injection.				
A) Standard process for mineral leasing: auctions for larger sites; sole-source for many smaller sites.	Moderate to High. Basic regulations governing access to resources on public lands are well established. Corruption or looting issues are not significant risks within the United States; however, poorly structured policy and royalty oversight has cost the U.S. Treasury billions of dollars per year.	-Land assays primarily by the U.S. Geological Survey. -The Minerals Management Service [Web link 1] is the primary source of data on leasing statistics. The Bureau of Land Management and the Forest Service also have some involvement for leases they control. -Data on auction competitiveness and overall returns on the leasing activity generally require more detailed analysis/literature review. -Reviews of policy efficacy are often available from the Government Accountability Office (GAO) or the Inspector General's office within the relevant agency.	-State-level royalty relief is common, especially for oil and gas. -Some data are compiled by trade associations such as the Interstate Oil and Gas Compact Commission [Web link 2]. This tends to focus on royalty rates, not on systematic data analysis.	Procedures for shale extraction are much less formal and at higher risk of abuse.	Minerals Management Service - Gulf of Mexico Region http://www.gomr.mms.gov/homepg/lseale/lseale.html Current Taxes and Incentives at the State Level for Oil and Gas Exploration and Production in Louisiana and Surrounding States http://dnr.louisiana.gov/sec/execdiv/techasmt/newsletters/2009/2009-04_topic_1.pdf

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
2. Government-owned energy minerals (continued)					
<p>B) Royalty relief or reductions in other taxes due on extraction: reduced, delayed or eliminated royalties are common at both federal and state levels. Royalties targeted based on type of energy, type of formation, geography or location of reserve (e.g., deep water).</p>	<p>High. In addition to standard royalty relief programs at both the federal and state levels, there have been problems of linkage between relief given and prevailing oil and gas prices, as well as with contract “oversights” that left out royalty provisions entirely.</p>	<p>-No systematic coverage of royalty relief. Shows up piecemeal in reporting by the Congressional Budget Office, the Government Accountability Office and the Congressional Research Service [Web link 1].</p>	<p>Oil and Gas: -Detail on incentives to oil and gas in all states is tabulated every few years by the Interstate Oil and Gas Compact Commission. http://iogcc.publishpath.com/Websites/iogcc/pdfs/2007-Incentives-publication.pdf -Estimates for revenue losses from these provisions, if available, normally require either a state-level tax expenditure report (infrequent) or inquiries to state offices within the Department of Revenue.</p> <p>Coal: -Data sets less established, but some information from the Coal Utilization Research Council (2006): http://www.coal.org/pdf/StateCleanCoalIncentives.pdf</p>	<p>Primarily oil and gas. Most common for offshore or more remote locations.</p>	<p>Overview of the Federal Offshore Royalty Relief Program http://www.eia.doe.gov/pub/oil_gas/natural_gas/feature_articles/2006/ngoffshore/ngoffshore.pdf Royalty Relief for U.S. Deepwater Oil and Gas Leases, 18 October 2008, from: http://openocrs.com/document/RS22567/</p>
<p>C) Process of paying royalties due: allowable methods to estimate and pay public owners for energy minerals extracted from public lands.</p>	<p>High. Ongoing battles regarding the accuracy of both “in-kind” and “in-value” royalty payments for natural gas and oil. Litigation at both the federal level and within some states.</p>	<p>U.S. Government Accountability Office; Department of the Interior (DOI) Office of the Inspector General; NGOs: Project on Government Oversight (Washington, D.C.).</p>	<p>-Project on Government Oversight also covered state cases, but has not updated the materials.</p>	<p>Primarily oil and gas from federal and Native American Indian lands.</p>	<p>Drilling the Taxpayer: Department of Interior’s Royalty-In-Kind Program http://www.pogo.org/pogo-files/reports/natural-resources/drilling-the-taxpayer/nr-rik-20080918.html Oil and Gas Royalties: MMS’s Oversight of Its Royalty-in-Kind Program Can Be Improved through Additional Use of Production Verification Data and Enhanced Reporting of Financial Benefits and Costs http://www.gao.gov/new.items/d08942r.pdf</p>

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
3. Government ownership of energy-related enterprise					
General information on category		-Heavy involvement with transport infrastructure development and maintenance, energy stockpiling. Residual involvement with electricity generation. -Key information comes from audited annual reports these entities are required to produce. However, even these resources often exclude important subsidies associated with the opportunity cost of capital and with the tax-exempt status of these ventures.	-There is widespread municipal ownership of electricity generation at the regional level. Data on subsidies associated with these arrangements are sparse.		
A) Security-related enterprises: strategic petroleum reserve; some Homeland Security Administration; securing foreign energy shipments or key assets.	High. Very large investments, particularly into oil security that are not recovered via user fees.	-In addition to annual reports on the Strategic Petroleum Reserve (SPR) [Web link 1], it has been a frequent topic of Inspector General and GAO analysis, as well as subsidies through capital contributions, failure to charge for working capital, and in-kind payments of oil royalties. -Data on Homeland Security, oil shipping and securing of foreign oil assets, if they exist, are fragmented within Department of Energy (DOE) or Homeland Security budgets.	-Heavy state and local involvement with transport infrastructure development and maintenance.	Primarily related to oil.	DOE – Fossil Energy: The Nation’s Strategic Petroleum Reserve http://fossil.energy.gov/programs/reserves/spr/
B) Transport of bulk fuels: U.S. Army Corps of Engineers; U.S. Coast Guard; U.S. Maritime Administration.	Moderate to high. Fossil fuel subsidies likely well above \$1 billion U.S./year. Could be more important with large influx of transport-related stimulus money. Some port projects may be driven to accommodate deep draft vessels such as tankers.	-Examples within the U.S. include the Army Corps of Engineers (construction and maintenance of water infrastructure); Power Marketing Administrations (electricity generation); Strategic Petroleum Reserve (crude oil depot).	-State and local governments are heavily involved in building and maintaining transport infrastructure used to move bulk oil and coal. Often, spending is entirely linked back to funding mechanisms such as fuel taxes. -State and federal budgets are primary sources for spending information, though municipal bond issuance data can also help.	Oil and coal comprise more than 50 per cent of tonnage moved in intra-coastal and ocean-borne shipping [Web link 1].	U.S. Army Corps of Engineers Navigation Data Center: Waterborne Commerce Statistics Center, New Orleans, LA http://www.iwr.usace.army.mil/ndc/wcsc/wcsc.htm
C) Municipal utilities and public power: significant public ownership of coal- and natural gas-fired electricity stations; some transmission and distribution systems for both natural gas and electric power.	Moderate. Most heavily subsidized federal power administrations have primarily hydro capacity. Subsidies to fossil fuel larger in municipally-owned plants and in Rural Utility Service-supported generation.	-Sector data from EIA and (for a fee) from trade associations (American Public Power Administration and National Rural Electric Cooperative Association). -Data on federal power and Rural Utility Service (RUS)-supported utilities are published periodically by these organizations. Such data often exclude cost-of-capital.	-State data are fragmented, but can estimate subsidies associated with tax exemptions using survey data on type of capacity and revenues collected by the EIA.	Coal and natural gas.	American Public Power Association http://www.appanet.org/aboutappa/index.cfm?itemNumber=9487&navItemNumber=20953 Electric Power Statistics USDA Rural Development’s Electric Programs http://www.appanet.org/aboutpublic/index.cfm?itemNumber=2691 U.S. Energy Information Administration: Electric Power Annual 2008 - State Data Tables http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
4. Market price support and regulation					
A) Consumption mandates (restrictions)	Probably low. Mandates would rise substantially if any legislative proposals included coal with carbon capture and sequestration (CCS) or coal-to-liquids within federal purchase mandates. Impact of historical restrictions (export ban on Alaskan oil, prohibition on use of oil in power sector) believed to be of minimal continuing impact today.	-There are no direct consumption mandates for fossil fuels. Possible related policies include requirements for specific fuel formulations (driven by emissions concerns). Some clean-fuel mandate proposals have included coal-to-liquids as an eligible source, due to domestic content not environmental profile.	-At least one state (PA) includes waste coal in its state electrical portfolio standards that mandate use of preset levels of eligible (but more expensive) fuels in the state's power pool.	If mandates apply, they are most likely to involve oil and coal rather than natural gas.	
B) Border protection or restrictions	Probably low.	-Export bans on Alaskan crude oil have been eliminated. Tariff levels on conventional fossil energy (excluding biofuels) do not seem distortionary.	-Although barriers to interstate trade are illegal, there was evidence of subsidies available only within the state in past assessments of biofuels. It is therefore likely that similar arrangements exist for conventional fossil fuels.		U.S. International Trade Commission: Official Harmonized Tariff Schedule of the United States http://www.usitc.gov/tata/hts/index.htm
C) Regulatory loopholes: any legal loopholes, either in the wording of the statute or in its enforcement, that transfers significant market advantage and financial return to particular energy market participants.	Unknown.	-Very hard to identify. Must generally rely on the general literature to identify and quantify some of these items. Possible areas to explore include transport safety requirements, fugitive emissions regulations (especially for natural gas) and mine-site remediation (discussed below).	-Unknown.		
5. Direct spending, including R&D					
A) Earmarks	High. The U.S. Office of Management and Budget (OMB) tracked more than 11 000 earmarks to all sectors in FY2008, totalling more than \$16 billion U.S. Of this, approximately \$550 million U.S. was related to non-defense energy. However, the tracking is new, and it is generally believed that the OMB database is not capturing quite a bit.	-Office of Management and Budget Earmarks Database. -Taxpayers for Common Sense (TCS), an NGO, also tracks earmarks in appropriation bills. They note that OMB has not tabulated earmarks since FY08, and that its review relied on agency interpretation and reporting, resulting in inconsistent analysis across reporting units. The TCS work is built from Congressional disclosure, supplemented with analysis of the legislation itself to uncover additional earmarks that meet TCS criteria. TCS also captures executive branch earmarks.	-None known.	Unknown.	Taxpayers for Common Sense http://www.taxpayer.net/earmarks.php U.S. Office of Management and Budget, Ear Marks by Agency http://earmarks.omb.gov/2008-appropriations-by-agency/summary.html

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
5. Direct spending, including R&D (continued)					
B) Agency appropriations and contracts	High. Many areas involved with energy. Care is needed to ensure appropriations are picked up only once, that offsetting collections are deducted and that contracts are not treated as <i>de facto</i> subsidies. Special attention to contracts that include price thresholds, are not competitively bid, or structured as cost-plus contracts or include long-term price guarantees is needed.	<ul style="list-style-type: none"> -Office of Management and Budget, annual federal budget and associated documents relating to the President's budget proposals. -Congressional Budget Office (CBO) and the Joint Committee on Taxation (JCT) both prepare cost estimates of policy proposals. CBO focuses on non-tax aspects; JCT focuses on tax aspects. -More automated data through USAspending.gov, a joint project of the Sunlight Foundation and OMB Watch. It integrates data from two government-run systems (including USAspending.org) on federal procurement and assistance. It includes loan programs as well as cash transfers, but not other forms of support such as tax or insurance. -ONVIA.com is a paid subscription that lists all federal contracts; users indicate it is the most accurate source of this type of information. 	-Every state has a published budget document. However, the resolution based on available line items will vary greatly across states.	Supports all fossil fuels, though likely most heavily favours coal.	<p>USAspending.gov http://www.usaspending.gov/</p> <p>U.S. Department of Energy: FY 2010 Statistical Table by Appropriation http://www.cfo.doe.gov/budget/10budget/Content/ApproprStat.pdf</p>
C) R&D support	Moderate. R&D support comes through both general tax credits and direct government spending. In this second area, the share of total support flowing to fossil energy has been declining in recent years—though still worth hundreds of millions of dollars per year. A recent surge in spending related to carbon capture and sequestration is likely to increase the importance of government R&D support in future years.	<ul style="list-style-type: none"> -Energy-related R&D can be found in the DOE budget. Data are also sometimes tabulated by the Congressional Research Service. Data sometimes exclude clean coal or research related to environmental remediation or damages. These line items are represented elsewhere in the budget. -Statistics on R&D spending by firms, state governments and universities are tabulated by the National Science Foundation. The aggregation of these statistics can sometimes make it difficult to attribute to a specific fuel, however. 	-Availability of data expected to vary widely by state.	Within the fossil arena, spending has tended to favour coal (including clean coal) and synthetic fuel conversion.	National Science Foundation: SRS Publications and Data http://www.nsf.gov/statistics/showpub.cfm?TopID=8

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
6. Tax breaks and special taxes					
A) Tax expenditures: reduced rates, tax exemptions, special deductions.	High. Energy is a significant portion of the U.S. economy, and fossil energy the most important component of the energy sector. Through targeted policies as well as significant participation in more general subsidies, tax expenditures are an important source of subsidy to fossil energy at both the federal and state levels.	<p>-Annual summaries are prepared by the Joint Committee on Taxation and the U.S. Treasury. JCT sometimes does energy-specific reports, though these may miss more general tax breaks with significant uptake in the energy sector.</p> <p>-JCT evaluations include “scoring” proposed legislation and projections for existing law. Treasury assesses tax losses based on existing law. Treasury (in its Statistics of Income publication) will also analyze actual tax return data for specific tax expenditure provisions on a periodic basis.</p> <p>-Tax rates by sector, based on EIA surveys, provide an integrated snap-shot of the effect of combined tax breaks over time.</p> <p>-Fairly comprehensive data, though not every tax subsidy is included in the standard reports.</p>	<p>-Much less coverage than at the federal level. Some states prepare tax expenditure budgets, but many do not. Some fairly general information on state-level tax breaks to fossil fuels can be found in the U.S. subsidy reports to the World Trade Organization.</p> <p>-No central location for energy exemptions from state taxes.</p> <p>-Very little data at all on local government tax concessions to industries of any type.</p>	More significant for oil and gas than for coal.	<p>The Joint Committee on Taxation: JCX-25-09R http://www.jct.gov/publications.html?func=startdown&id=3555</p> <p>Internal Revenue Service: Tax Statistics: Produced by the Statistics of Income Division and Other Areas of the Internal Revenue Service http://www.irs.gov/taxstats/index.html</p> <p>Federal Receipts http://www.whitehouse.gov/omb/budget/fy2010/assets/receipts.pdf</p> <p>http://docsonline.wto.org/imrd/gen_searchResult.asp?RN=0&searchtype=browse&q1=+%40meta%5FSymbol+%6%FCSCM%FCN%FC%2A+and+USA&language=1</p>
Overall tax burden by industry.	Benchmark to assess integrated effect of multiple tax subsidies on overall sectoral tax burden. The magnitude will vary by industry sector, but the approach provides a useful check to line-item tracking of specific tax expenditures.	<p>-Data on oil and gas from EIA's Financial Reporting System Survey [Web link 1]; tax rates on electricity can be derived with less resolution from EIA's expense reporting on electric utilities.</p> <p>-Treasury's Corporate Source Book (from the Statistics of Income Division) also has some useful aggregate data by sector (Web link 2 in row above).</p>			<p>Financial and operating information for U.S. major oil and gas companies in 2007 contained within http://www.eia.doe.gov/emeu/perfpro/</p>
B) Excise taxes/special taxes: excise taxes on fuels; special targeted taxes on energy industry (e.g., based on environmental concerns or “windfall” profits).	High. Huge amounts of revenues are collected via severance, excise or other taxes on oil and gas. Usually, these are not net offsets to subsidies. Rather, the collections pay for ancillary services such as roads; compensate taxpayers for resources sold; or substitute for conventional sales taxes. However, there are very little data on adequacy of the fees in covering the energy-related purposes for which they are often collected.	<p>-Fairly good data on excise tax rates, collections, expenditures in budget documents from the Office of Management and Budget, and from Joint Committee on Taxation. “User fees” is a specific section of the Analytic Perspectives portion of the federal budget [Web link 2].</p> <p>-Data on adequacy of collections to cover earmarked uses of excise taxes (often road construction or energy-related environmental clean-up) must be gathered through additional research in the general literature.</p>	<p>-Society of Petroleum Evaluating Engineers tracks fees for oil and gas for all states (see Web links 1).</p> <p>-Data on state-level fuel taxes from International Fuel Tax Association [Web link 1]. Rates change frequently and must be gauged against a baseline to assess if there are subsidies.</p>	Excise taxes most important for oil; some related to coal as well. Oil.	<p>SOI Tax Stats – Corporation Source Book: Agriculture to Construction (sectors 11-23) http://www.irs.ustreas.gov/taxstats/article/0,,id=165716,0.html</p> <p>International Fuel Tax Association http://www.iftach.org/</p>

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
7. Credit support					
Government loans and loan guarantees to energy enterprises: market or below-market lending to energy-related enterprises, or to energy-intensive enterprises such as primary metals industries.	High. Credit subsidies flow to all publicly-owned infrastructure and service providers, and provide an increasingly important source of cheap capital for large-scale generation infrastructure such as coal with CCS.	-Annual budget documents provided by Office of Management and Budget provide overview of loans outstanding, and some data on interest rate subsidies and defaults. [Web link 1]. Searchable database of loan and guarantee commitments on government's USASpending.gov Web site [Web link 2]. -However, accurate and detailed data on interest rate subsidies and defaults require detailed analysis of lending-agency-audited annual reports.	-There are many state-level loan and loan-guarantee programs. They tend to be fragmented and their full cost is often hard to assess.		FY 2010 President's Budget – Supplemental Materials http://www.whitehouse.gov/omb/budget/Supplemental/ Federal Assistance/ Loans Data http://www.usaspending.gov/search?query=loans&Search=Search
A) Subsidized credit to domestic infrastructure and fossil-fuel power plants	High. Increasing risk shifting to government where up to 100% of debt risk is borne by taxpayers.	-Municipal debt used for energy-related infrastructure can be evaluated broadly in period evaluations by the Treasury's Statistics of Income Bulletin; more detailed use of proceeds data is available for purchase from Thompson-Reuters or the Bond Buyer magazine. -Aside from municipally-owned plants, specific federal programs have large energy components. These include the Rural Utility Service (part of USDA) and federal Power Marketing Administrations (which are primarily hydro, but do include some coal-fired generation as well), and stand-alone entities such as the Tennessee Valley Authority. Each of these programs produces their own audited financial statements.	-Bond use of proceeds data sources would be the same for state-level patterns. However, related programs (enterprise zones, industrial development bonds) may also apply to fossil-energy-related uses, though the rules will vary by jurisdiction.	Appears most important for coal.	
B) Subsidized credit to fossil-fuel-related exports (via Eximbank, OPIC, U.S. contributions to multilateral lending institutions such as the World Bank)	Moderate. Supports domestic equipment suppliers.	-Some information on fossil-fuel-related spending is available in annual reports of these institutions. However, translating loan commitments (which are public) into subsidy estimates at the loan-level (which is private) is difficult. -A number of NGOs, such as Export Credit Agency (ECA) Watch [Web link 1] also tabulate data; as has Oil Change International for oil support [Web link 2].	-While some states do promote export industries with subsidies, these are not believed to be significant relative to federal incentives.	Historically has supported primarily oil and gas.	ECA Watch: International NGO Campaign on Export Credit Agencies http://www.eca-watch.org/ End Oil Aid: Oil Aid: tracking subsidies to the international oil industry http://www.endoilaid.org/

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8. Insurance and indemnification					
A) Government insurance/ indemnification: market or below-market risk management/risk shifting services provided by the government.		-Data in the federal budget documents tend to be fairly vague. There is a need to rely on audited annual reports for various programs. Insurance subsidies are likely to be large for government-owned enterprises that are effectively self-insuring for a variety of operating risks.	-Little data appears to exist.		
B) Statutory caps on commercial liability: can confer substantial subsidies if set well below plausible damage scenarios.		-Indemnification through statute, such as the Price-Anderson Act, which shifts the risks of a nuclear accident from industry to Congress and the citizens, can be found and priced only through a broader literature review. -In the fossil-fuel sector, these types of subsidies are common for oil spills, and mine and well reclamation. -Government exposure on some of these programs has been evaluated by the Government Accountability Office.	-Plugging and abandonment regimes for oil and gas wells are within state and local jurisdiction rather than federal.		
9. Health and safety oversight					
Health and safety oversight: includes oversight of mining, oil and gas extraction, fuel transport, nuclear facilities, and site clean-ups. If not paid by users, riskier and dirtier forms of energy gain a relative advantage.		-Programs are usually covered in the Office of Management and Budget's annual budget document. However, adequacy of collections from users is not always self-evident. -Examples include the Nuclear Regulatory Commission and the Federal Energy Regulatory Commission.	-Fairly widespread state and local oversight roles in this. Hard to gauge whether all or any of the cost of this oversight is recovered directly from users.		U.S. Department of Labour: Mine Safety and Health Administration http://www.msha.gov/ U.S. Coast Guard: National Pollution Funds Center http://www.uscg.mil/ccs/npfc/About_NPFC/default.asp
Legacy health costs.	Moderate. Large payments every year to black lung victims from the general taxpayer. Would need additional research to evaluate what portion of these workers should be receiving compensation from firms that remain ongoing concerns.	-Data on annual transfers can be found in conventional budget documents. Evaluating a portion attributable to coal interests that continue to exist would be more difficult.	-Unknown.	Primarily coal.	U.S. Department of Labour: Division of Coal Mine Workers' Compensation http://www.dol.gov/owcp/dcmwc/regs/compliance/bltable.htm U.S. Department of the Interior: Bureau of Land Management – Abandoned Mine Lands http://www.blm.gov/wo/st/en/prog/more/Abandoned_Mine_Lands.html

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Type of Intervention	Importance of Policy Type (H, M, L)	National Level: Overview, data sources	State/Provincial/ Local Level: Overview, data sources	Review of Attributes: Variation in importance by fuel	Web links
10. Environmental issues and site closure					
<p>Responsibility for closure and post-closure risks: facility decommissioning and clean-up; long-term monitoring; remediation of old contaminated sites; natural resource restoration; litigation capacity to sue past owners for violations.</p>	<p>High. Historic evaluations of the scope of abandoned coal lands and the cost to stabilize them have put forth figures in the many tens of billions of dollars. Growing problems with coal ash disposal site stability. Large backlog of improperly closed oil and gas wells.</p>	<p>-No central location for tracking the adequacy of financial assurance for closure and post-closure needs. -While both government and industry annual reports provide some data, mandated disclosures in financial reporting tend to be quite general. They often combine multiple types of risks from many sites into a single value. As a result, these data sources may not be that useful in evaluating net subsidies to the sector.</p>	<p>-Large state role regarding abandoned oil and gas wells, coal mines and hard rock mines. -Some data exist on scale of problems from third parties (Interstate Oil and Gas Compact Commission, Minerals Policy Center). However, tracking of state programs and costs incurred is non-standard and incomplete.</p>		<p>U.S. Department of the Interior: Office of Surface Mining Reclamation and Enforcement http://www.osmre.gov/</p>
11. Emerging issues					
<p>A) Windfalls associated with carbon credit allocations or offset programs.</p>	<p>High. Grants of credits to incumbent industries will be worth hundreds of billions of dollars over a period of decades. The fossil-fuel industry is expected to be the single largest beneficiary of these rules.</p>				
<p>B) Environmental damages from ground fracturing.</p>	<p>Unknown. The property and environmental damages associated with fracturing rocks to extract natural gas is a growing concern. Problem remains now well characterized, with strong industry opposition to claims that the practice is damaging.</p>	<p>-Most information on this is expected to come from the U.S. Environmental Protection Agency (EPA), and possibly through litigation of observed damages.</p>		<p>Natural gas, some oil.</p>	
<p>C) Environmental damages associated with synthetic-fuels production.</p>	<p>Unknown. They are a large consumer of water with substantial GHG emissions.</p>			<p>Oil, coal.</p>	

9. POLICY GUIDANCE: RECOMMENDATIONS FOR IMPROVING SUBSIDY DATA AVAILABILITY AND USABILITY

The GSI has evaluated how different countries track and report on fossil-fuel subsidies. The goal is two-fold: first, to provide a roadmap that future researchers could use to develop detailed, quantified estimates of subsidies to the fossil-fuel sector; and second, to explore patterns in subsidy visibility in countries with different governance systems. The analysis, carried out in a series of countries that have very different profiles, has shown that the type of subsidies supplied varies, as does the way in which subsidy data are tracked and made available to the public. The quality and accessibility of data provided by governments on fossil-fuel subsidies often reflect the importance placed on, and resources invested more generally in making information available to citizens.

A number of important findings were apparent. First, there is large variation in data availability. Not only does the type of subsidy supplied vary significantly across countries, but there is wide variation in the efficacy with which governments track and publicize information on subsidy distribution and magnitude. Second, governments may choose to disclose less information because of political or competitive factors. Third, a number of fairly simple changes in how information is provided could greatly improve decision-making in relation to fossil fuels; and many of these changes would have more generalized fiscal benefits to the governments as well. Improvements in transparency, while helping researchers working in this field, also help governments themselves develop a better understanding of the scale and impact of their support policies, allowing them to make better, more informed decisions when setting policy and allocating resources.

Some policy recommendations generated by this research project are country-specific (due to the nature of the subsidy interventions provided in that country), while others are generally applicable to many or all of the countries examined. A more complete understanding of the different steps governments could undertake to improve what is known about the size of their fossil-fuel subsidies would allow stakeholders to better assess the extent and impacts of fossil-fuel subsidies. This, in turn, should improve public scrutiny, boost pressure to reform the most harmful subsidies and help stem the creation of new or poorly-designed policies.

The recommendations noted below cover a number of areas of transparency where governments may be able to take immediate action to improve access to data. Other recommendations may take much more thought to implement, and external factors such as resources and competing government priorities would need to be taken into account.

9.1 Data availability

- **Legal mandate: Governments should consider enacting legislation making it a legal requirement to publicly provide information on fossil-fuel subsidies.**

This recommendation refers to information already held by governments, but not made available to the public, such as tax models. Enacting legislation directing government ministries to provide subsidy information would install a legal directive that discourages non-compliance due to potential internal sanctions. For example, government agencies could be subject to internal oversight or reviews by independent committees, resulting in sanctions or job loss for senior staff who fail to comply. Enacting laws encouraging the provision of subsidy information could provide a baseline for the minimum level of information that must be provided by government. It might help prevent backsliding, i.e., when governments have reformed subsidies but choose to reinstate them. Governments could conduct an internal review to ensure that subsidy information currently being made available meets existing legal requirements, revealing areas needing improvement to meet existing standards.

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- **Governments should invest more resources in the modernization of publicly accessible government databases or Web sites that provide information on fossil-fuel subsidies.**

The format of the available data on subsidies varies by country and ministry from very user-friendly HTML search pages or data files to PDF overviews (some of which are not searchable) or even lists. Quantitative data need to be made available in a format that allows entire data sets to be downloaded in a usable spreadsheet. While much government subsidy data are stored and presented on spreadsheets such as Microsoft Excel, they may not be accessible to outsiders in that form. In addition, display formats may be difficult to sort by a particular characteristics, may display similar information very differently across programs, or be poorly labelled. These are obstacles for researchers reviewing data and conducting an in-depth analysis of subsidies. The positive effects of data availability can often be diluted by a high level of difficulty in analyzing the data. Data availability should always be combined with usability. Also, depending on the circumstances, identifying end users or companies that receive subsidies up to or over a certain financial threshold might be considered. This would be an enormous step forward in identifying the recipients and non-recipients of government expenditure.

- **Governments should ensure basic contact information for agencies tasked with providing subsidy information is accurate and functioning correctly.**

In many instances, basic contact information, including e-mail addresses of government staff, telephone numbers and URLs, are incorrect or not functioning correctly. This adds another obstacle for stakeholders trying to obtain information on fossil-fuel subsidies.

- **Agency-specific databases should be public.**

Governments should consider making department specific databases publicly available to allow for better external evaluation of government expenditure and policy. Agency-specific databases on fossil-fuel subsidies should also be clearly linked to each other to allow analysts to move between data sources in order to assess all relevant subsidy programs. This would require some standardization of formats and programming, and the development of specialized search or tabulation tools that work across individual agency Web sites.

9.2 Data standardization: Common methods of calculating and analyzing

- **Agree on methods for calculating fossil-fuel subsidies.**

Certain complicated policies, such as credit support, expenditures-related energy security and mandates, need to have a standardized approach across agencies for national and international estimates. Microsoft Excel templates could be developed to assist researchers breaking apart policy interventions into the relevant components so valuations could be taken as a next step. Past efforts to conduct multi-country studies within some international agencies allowed each country to choose the methods “most appropriate” for the circumstances they found in-country. The end results of this flexibility were summaries and values that were calculated in different ways and could not be aggregated, thereby greatly weakening the value of the initiative.

- **Governments should invest more resources into capturing data relating to the provision of fossil-fuel subsidies and ensuring they are accurate and verifiable.**

Improving the disaggregation and uniformity of presentation of data is an important step in increasing its value for research. It allows researchers to analyze the information to examine trends, carry out comparisons against other industries and provide better recommendations to help governments manage their expenditures. Governments should introduce policies setting common standards on data structure across agencies to facilitate topical integration either within government or by outside parties.

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- **Establish a recurring research mandate to track and estimate indirect government programs supporting fossil fuels.**

The influence that indirect support may have on distorting energy markets is believed to be large. More precise calculations require better information and cannot be carried out until the full extent of government expenditure and support measures are at least acknowledged by the governments themselves. For example, subsidies providing security for energy-related facilities and transport are poorly characterized in the United States. There are methodological disagreements on measuring the extent to which military expenditure supports the fossil-fuel sector, but it is likely that, in the United States, energy security and Defense Department expenditure are closely linked. Acknowledging this link will allow for follow-up work to better define indirect support and help generate methods for calculating their financial value. There are a number of subsidy problems that are complex but important to address comprehensively nonetheless. Research into them needs to be better resourced so a consensus on their valuation can be reached. This may require more financial resources invested by governments to assess and monitor these issues.

- **Generate norms for valuing subsidies.**

Developing a range estimate for the values of many subsidies would be more feasible, and more robust, than point estimates. Researchers would be able to more effectively integrate differing data sources or assumptions on value or uptake. This approach would also enable researchers to present different values for the cost to the government versus the value to the recipient, both important approaches depending on the questions one is trying to answer. Particularly large ranges would signal a need for additional analysis in order to better estimate the value.

- **Present subsidies to new facilities as well as current subsidy-cost estimates.**

Many of the subsidy programs available to new facilities have been recently implemented and are not yet costing treasuries significant funds. However, they are affecting marginal investment decisions, and need to be captured in subsidy reviews in addition to existing fund flows.

- **Develop subsidy-intensity metrics.**

A selection of important subsidy-intensity metrics and tools should be developed to assist researchers and policy-makers assessing the impact of the subsidy program on key market or environmental conditions. Examples include subsidy per unit of energy output and subsidy per unit of GHG emissions avoided.

9.3 Data validation and accuracy

- **Make government models used to estimate taxation rates, credit support, or expenditure relating to the fossil-fuels sector publicly available.**

Using the United States as an example, data on many tax expenditures (at both the state and federal level) represent multi-industry aggregates. Many states have limited or no tax expenditure reporting at all. For all levels of government, it is difficult to gauge the accuracy or variability of tax expenditure or credit subsidy estimates as there is virtually no public disclosure of models, the assumptions behind them or the variance between past estimates and actual claims on tax returns or loan loss reserves. Publishing these models publicly would allow academic and economic institutions to examine the underlying assumptions and calculations put forward by governments. It would also allow civil society to draw their own conclusions on the support provided by government to the fossil-fuel sector. Over time, we expect that an open-source approach for many of these applications would develop, and the quality of the estimates would improve.

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- **Improved tracking and monitoring of state-level subsidy programs are needed.**

Many countries have powerful sub-national governments with the capacity and resources to provide subsidies. Unfortunately, our research indicated that the provision of subsidy information at the sub-national level was sometimes not fully reflective of the actual subsidies provided. Sub-national reporting was also generally worse than that at the national level. In order to avoid “subsidy stacking,” where national subsidies to the fossil-fuel sector are added to subsidies provided by regional governments, better monitoring and sharing of information is needed at all levels of government. National governments should take steps to encourage sub-national governments to better track subsidy expenditure. There may be opportunities for cost sharing on some of the tools needed to do so.

9.4 Ongoing research needs and improved international cooperation

- **Conduct more country case studies examining fossil-fuel subsidization in order to generate country-specific policy recommendations to help overcome existing data gaps.**

Local researchers carrying out detailed country case studies will extend the available data on fossil-fuel subsidies. This process will also result in country-specific recommendations to improve data accessibility and provision. As researchers access the national or regional data sources needed to generate their subsidy estimates, it is important to capture their experiences on data access, quality and gaps.

- **Set up a platform or centralized venue to promote researcher collaboration across countries.**

Often a lack of visible data does not mean there is no subsidy—only that nobody has gathered information on it. The checklist matrix approach, listing subsidy types and attributes, helps to address this problem by creating a placeholder for each type of subsidy. Collaboration among researchers across countries will be helpful in flagging emerging subsidy types and issues and in sharing approaches to quantify them.

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Annex 1. Country indexes

Corruption Perception Index (CPI)* (2008) World Rankings	Corruption Perception Index (CPI)* (2009) World Rankings	Bribe Payers Index (BPI)† (2006) World Rankings	Bribe Payers Index (BPI)† (2008) World Rankings	Press Freedom Index‡ (2008) World Rankings	Press Freedom Index‡ (2009) World Rankings
Germany 14th	Germany 14th	Germany 7th	Germany 5th	Germany 20th	Germany 18th
United States 18th	United States 19th	United States 10th	United States 9th	United States 40th	United States 22nd
China 72nd	China 79th	China 29th	China 21st	Indonesia 111th	Indonesia 101st
Nigeria 121st	Indonesia 111th	Indonesia Not assessed	Indonesia Not assessed	Nigeria 131st	Nigeria 135th
Indonesia 126th	Nigeria 130th	Nigeria Not assessed	Nigeria Not assessed	China 167th	China 168th

* Corruption Perception Index (CPI). Source: Transparency International (2008, 2009)

† Bribe Payers Index (BPI). Source: Transparency International (2006, 2008)

‡ Press Freedom Index. Source: Reporters Without Borders (2008, 2009)

About the Corruption Perception Index:

- The Corruption Perception Index (CPI) table shows a country's ranking and score, the number of surveys used to determine the score, and the confidence range of the scoring.
- The rank shows how one country compares to others included in the index. The CPI score indicates the perceived level of public-sector corruption in a country/territory.
- The CPI is based on 13 independent surveys. However, not all surveys include all countries.
- The confidence range indicates the reliability of the CPI scores and tells us that allowing for a margin of error, we can be 90 per cent confident that the true score for this country lies within this range.
- 175 countries were ranked in the Index in 2009.

About the Bribe Payers Index:

The BPI ranks the likelihood of firms from 22 top exporting countries to bribe abroad. These 22 countries account for approximately 75 per cent of total foreign direct investment outflows and export goods worldwide. The Index is based on interviews with almost 3 000 senior business executives working in 26 countries.

The 2008 BPI also includes supplementary information on perceptions of corruption across 19 business sectors.

About the Press Freedom Index:

The Reporters Without Borders index measures the state of press freedom in the world. It reflects the degree of freedom that journalists and news organizations enjoy in each country, and the efforts made by the authorities to respect and ensure respect for this freedom.

A score and a position is assigned to each country in the final ranking. They are complementary indicators that together assess the state of press freedom. A country can change position from year to year even if its score stays the same, and vice-versa.

This ranking reflects the situation during a specific period. It is based solely on events between 1 September 2006 and 1 September 2007. It does not look at human rights violations in general, just press freedom violations.

One hundred and seventy-five countries were ranked in the Index in 2009.

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**About the FiFo Institute. The FiFo Institute for Public Economics, University of Cologne (Finanzwissenschaftliches Forschungsinstitut an der Universität zu Köln) was founded in 1927. It is an independent, non-profit institute pursuing economic research and policy consultancy in fiscal and budget policy, taxation, and fiscal relations.*

THE GLOBAL SUBSIDIES INITIATIVE (GSI) OF THE INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT (IISD)

The International Institute for Sustainable Development (IISD) launched the Global Subsidies Initiative (GSI) in December 2005 to put a spotlight on subsidies—transfers of public money to private interests—and how they undermine efforts to put the world economy on a path toward sustainable development.

Subsidies are powerful instruments. They can play a legitimate role in securing public goods that would otherwise remain beyond reach. But they can also be easily subverted. The interests of lobbyists and the electoral ambitions of officeholders can hijack public policy. Therefore, the GSI starts from the premise that full transparency and public accountability for the stated aims of public expenditure must be the cornerstones of any subsidy program.

But the case for scrutiny goes further. Even when subsidies are legitimate instruments of public policy, their efficacy—their fitness for purpose—must still be demonstrated. All too often, the unintended and unforeseen consequences of poorly designed subsidies overwhelm the benefits claimed for these programs. Meanwhile, the citizens who foot the bills remain in the dark.

When subsidies are the principal cause of the perpetuation of a fundamentally unfair trading system, and lie at the root of serious environmental degradation, the questions have to be asked: Is this how taxpayers want their money spent? And should they, through their taxes, support such counterproductive outcomes?

Eliminating harmful subsidies would free up scarce funds to support more worthy causes. The GSI's challenge to those who advocate creating or maintaining particular subsidies is that they should be able to demonstrate that the subsidies are environmentally, socially and economically sustainable—and that they do not undermine the development chances of some of the poorest producers in the world.

To encourage this, the GSI, in cooperation with a growing international network of research and media partners, seeks to lay bare just what good or harm public subsidies are doing; to encourage public debate and awareness of the options that are available; and to help provide policy-makers with the tools they need to secure sustainable outcomes for our societies and our planet.

www.globalsubsidies.org

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.

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