LIFTING THE RESOURCE CURSE 2

COVERING OIL

A Reporter's Guide to Energy and Development

Revenue Watch
Open Society Institute

Initiative for Policy Dialogue

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The **Open Society Institute**, a private operating and grantmaking foundation, aims to shape public policy to promote democratic governance, human rights, and economic, legal, and social reform. On a local level, OSI implements a range of initiatives to support the rule of law, education, public health, and independent media. At the same time, OSI works to build alliances across borders and continents on issues such as combating corruption and rights abuses.

OSI was created in 1993 by investor and philanthropist George Soros to support his foundations in Central and Eastern Europe and the former Soviet Union. Those foundations were established, starting in 1984, to help countries make the transition from communism. OSI has expanded the activities of the Soros foundations network to other areas of the world where the transition to democracy is of particular concern. The Soros foundations network encompasses more than 60 countries, including the United States.

OSI's **Revenue Watch** sees the transparent use of revenues generated by the sale and transport of natural resources as an issue of great importance for regional development and the promotion of civil society. The program aims to generate and publicize research, information, and advocacy on how revenues are being invested and disbursed and how governments and extraction companies respond to civic demands for accountability. It also seeks to build the capacity of local groups to monitor government management of oil revenues and to ensure that existing and future natural resource revenues are invested and expended for the benefit of the public.

www.revenuewatch.org

Nobel laureate economist Joseph Stiglitz founded the **Initiative for Policy Dialogue** (IPD) in July 2000 to help developing countries explore policy alternatives, and enable wider civic participation in economic policymaking. All economic policies entail trade-offs that benefit some groups more than others. Yet instead of exploring the full range of economic solutions, the international debate has often centered on a narrow range of policy alternatives. IPD represents a positive response to these concerns. IPD analyzes the trade-offs associated with different policies and offers serious economic alternatives, while allowing the choice of policy to be made by the country's political process. IPD is a global network of more than 200 leading economists, political scientists, and practitioners from the North and South with diverse backgrounds and views. The initiative is housed at Columbia University in New York City.

www.gsb.columbia.edu/ipd/

Foreword

Many countries rich in natural resources exploit and squander that wealth to enrich a minority while corruption and mismanagement leave the majority impoverished.

Breaking that pattern is difficult. Because of their resource wealth, such countries do not have to borrow money from multilateral lending agencies that insist on fiscal transparency and good budget practices. The world's leading democracies, dependent on importing oil, gas, or minerals, often have little appetite to use diplomatic pressure to demand better fiscal practices from resource-rich countries. And multinational energy companies, which depend on good relationships with host governments to allow them to continue extracting natural resources, are also unlikely to press for good economic management.

As a result, the citizens of resource-rich countries—the actual owners of their countries' natural wealth—bear a special responsibility to push their governments toward transparency and spending that responds to public needs. And for that citizenry to be informed, it is up to journalists to convey reliable, accurate information about how their government is managing the development of the country's natural resources. In order for this to happen, journalists themselves must be well informed and able to report and write freely.

Over the last two years, the Initiative for Policy Dialogue and Revenue Watch, working with local partners and other sponsors, have organized workshops for jour-

nalists in the oil-exporting countries of Azerbaijan, Kazakhstan, and Nigeria on the subject of "Covering Resource Wealth." This book is a result of those workshops, in which journalists expressed a great need for more information to help them understand the petroleum industry and the impact that petroleum development and export may have on their countries.

Journalists around the world have told us how hard it is to report on government management of oil, gas, and mining revenues. A shortage of information about extractive sector projects, a lack of technical competency, short deadlines, and government repression of the free press in many countries undermine the quality of reporting on these issues. Journalists are usually not trained economists or engineers and do not have the background in economics, engineering, geology, corporate finance, and other subjects helpful to understanding the energy industry and the effects of resource wealth. Lacking this kind of knowledge and access to information, reporters are often unable to cover natural resource stories in a meaningful way. In addition, some often-underpaid journalists succumb to gifts and payments from local companies, compromising their integrity and objectivity as well as their willingness to report honestly and accurately.

The repression and exploitation of the press are obstacles that this handbook cannot overcome, but knowledge is a powerful tool that can help brave, ethical journalists address them.

Covering Oil: A Reporter's Guide to Energy and Development will provide journalists with practical information in easily understood language about the petroleum industry and the impact of petroleum on a producing country. The report contains tip sheets for reporters on stories to pursue and questions to ask. Sample stories are also included. A resource section recommends further reading. A glossary defines key financial, geological, and legal terms that can improve reporters' understanding of the literature on petroleum development. We hope that this book will give journalists the background information they need to write in-depth, analytical, critical, and informative pieces on energy and development—a subject affecting millions of readers around the world.

Chapter 1, "Making Natural Resources a Blessing rather than a Curse," looks at some of the major policy dilemmas facing governments of resource-rich countries that seek to maximize the return they get from their resources: How quickly should the money be spent and on what? How do accounting frameworks need to be revised to handle the funds flowing into the country? What will be the distributive consequences of resource wealth?

Chapter 2, "Understanding the Resource Curse," explains the paradoxical problem of the "resource curse"—the odd fact that many countries with abundant natural resources are often more economically troubled, conflict-ridden, and poorly governed

than countries lacking natural resources. The chapter explains how a combination of oil price volatility, pressure on the manufacturing and agricultural sectors, growing inequality, tax disincentives, and weak institutions combine to produce policy failures and growth collapses.

Chapter 3, "A Primer on Oil," provides background information on petroleum. The chapter addresses some of the key geopolitical questions surrounding petroleum. Are we running out of oil? What are the security implications of a reliance on oil? And what are the environmental consequences of a reliance on oil?

Chapter 4, "Oil Companies and the International Oil Market," offers background on the oil industry. Which are the largest petroleum companies and how did they reach their dominant position? What are the challenges these titans face in the coming decades? And how is petroleum bought and sold on international markets? The chapter also discusses the increasing pressure on companies to adopt corporate social responsibility practices, including greater transparency over their payments to host governments.

Chapter 5, "The ABCs of Petroleum Contracts," covers one of the most important yet least-reported aspects of petroleum development: the contracts that producing countries enter into with petroleum companies. These contracts, which determine how much the government will earn from development of the country's natural resources, may be binding for periods of 20, 30, or more years. How can reporters tell whether their government is getting a fair deal? This chapter explains the different kinds of contracts that producing governments sign, the main components of such contracts, and the risks that governments and the public need to be aware of.

Chapter 6, "Protecting Developing Economies from Price Shocks," addresses one of the great challenges faced by petroleum-exporting countries: how to protect their economies from huge fluctuations in international petroleum prices. Because the price of oil is so volatile, governments highly dependent on petroleum revenues face great instability. Budget planning becomes difficult. Governments often overspend when oil prices are high, then suddenly cut back on spending when oil prices fall. These sudden changes can cause macroeconomic havoc and political unrest. Chapter 6 explores some tools that governments may use to reduce their exposure to price volatility, including stabilization and savings funds and hedging instruments.

Chapter 7 covers "The Environmental, Social, and Human Rights Impacts of Oil Development." Oil is a resource that can provide financial benefits to local communities if managed transparently and equitably, but these potential benefits can and should be viewed in the context of the possible social and environmental consequences for those same communities. Chapter 7 discusses the various risks that attend many oil production projects, including spills, displacement of local communities and human

rights violations, destruction of surrounding ecosystems, and contributions to global warming. The chapter identifies the kinds of questions that reporters should be asking about oil development projects so that their readers can weigh the potential benefits against potential costs.

Covering Oil: A Reporter's Guide to Energy and Development is the second in a series of guides, published by the Revenue Watch project of the Open Society Institute, which target different audiences to help them break out of what has come to be called the "resource curse." *Follow the Money*, a guide for nongovernmental organizations monitoring government revenues from the development of natural resources, is available at www.revenuewatch.org.

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1. Making Natural Resources into a Blessing rather than a Curse

Joseph E. Stiglitz

There is a curious phenomenon that economists refer to as the "resource curse." It appears that, on average, resource-rich countries have performed worse than those with smaller endowments—quite the opposite of what might have been expected. But not all resource-rich countries have fared the same. Some 30 years ago, Indonesia and Nigeria had comparable per capita incomes, and both were heavily dependent on oil revenues. Today, Indonesia's per capita income is four times that of Nigeria's. Nigeria's per capita income has actually fallen, from US$302.75 in 1973 to US$254.26 in 2002.[1] Both Sierra Leone and Botswana are rich in diamonds. Botswana has had an average growth rate of 5.2 percent between 1974 and 2002,[2] but Sierra Leone has plunged into civil strife over control of its diamond riches. The socioeconomic failures in the oil-rich Middle East are legion.

But even when countries as a whole have done fairly well, resource-rich countries are often marked by large inequality: rich countries with poor people. Two-thirds of the

people in OPEC member Venezuela live in poverty as the fruits of the country's oil bounty go to a minority. Since tax proceeds on oil producers could be used to create a more egalitarian society, one should expect less not more inequality in countries like Venezuela, one of Latin America's largest oil exporters.

These puzzles cry out for an explanation, one that will allow countries to do something to undo the resource curse. Over the past decade, research by economists and political scientists has done much to enhance our understanding of the issues. We understand, in particular, that much of the problem is political in nature. This book is predicated on the belief that wider understanding of the underlying forces can help shape the political processes in ways that will make positive outcomes more likely; that such understanding will lend support to institutional reforms more likely to ensure that the resources will be well used for the benefit of all the people of the country; and that in-depth and balanced coverage by journalists will help limit some of the worst abuses.

There need to be both macroeconomic and microeconomic policies put in place to ensure that the country gets the most for its resources; that the resources of the country lead to increased growth; and that the benefits are widely shared.

Macroeconomic Policies

The most difficult questions facing a producing country include: How fast should the resource be extracted and how should the revenue be used? Should the country increase its cash flows by borrowing? And what institutional reforms should be adopted to ensure that the appropriate macroeconomic decisions are put into place?

The rate of extraction

Resources not extracted today are still around tomorrow—they do not disappear. In fact, it may not make sense to extract natural resources as fast as possible. If a country is unable to use the funds well, it may be preferable to leave the resources in the ground, increasing in value as resources become scarcer and prices increase.[3] A military dictatorship might use the country's resource wealth to repress its population and to purchase arms to fund its favorite wars, so its people may actually be worse off than they would be if the country did not have the resources.

Moreover, the extraction of resources lowers the wealth of a country—unless the funds generated are invested in other forms. Extraction in itself makes the country poorer because resources such as oil, gas, or minerals are not renewable. Once they are out of the ground and sold, they cannot be replaced. It is only the subsequent reinvestment into capital (physical or natural) that can offset the loss of this natural wealth and make the country richer.

Since natural resources are an asset, one should view extraction as simply a portfolio reallocation, converting some of the asset base from the natural resource into another form. A country like Bangladesh, with limited reserves of natural gas, might want to exercise caution when selling its gas, given that there is no other effective way of insuring itself against an increase in the price of energy over the long run.

Borrowing: a word of warning

International banks often contribute to the tendency of petroleum-exporting governments to spend beyond their means. When oil prices are high, they are willing to lend them money to increase their rate of expenditure. However, capital markets are fickle, fair weather friends. When oil prices fall or interest rates rise, the lenders are quick to call in the loans. The bankers' general maxim is that they prefer to lend to those who do not need their money. When oil prices fall, the country needs the money, but it is at that point that the lenders want their money back. That is why capital flows, especially short-term capital flows, tend to be pro-cyclical, exacerbating the fluctuations brought about by the fall in the price of the natural resource anyway.

If the money were well spent by governments on high return investments, yielding a return considerably in excess of the interest rate they have to pay, all of this would be fine. But often it is not. The net increase in investment as a result of the borrowing may be small, typically much less than the amount borrowed. And when the borrowed funds are used to finance domestic expenditures, these expenditures can contribute to the overvaluation of the exchange rate, actually hampering domestic exporters and suppliers through the effect known as Dutch Disease.[4]

Accounting frameworks

Part of the reason that governments often manage their revenues so poorly relates to the widely used standard accounting frameworks. Governments naturally want to show that they know how to manage their economies well. If they can increase their growth rates, they think they are better off. But gross domestic product (GDP) does not provide a true measure of economic well-being. As we have noted, if the country extracts more resources, and the funds are not invested well, the country is poorer, not richer.

Alternative frameworks, sometimes referred to as "green GDP," attempt to more accurately measure sustainable well-being.[5] Just as a firm's accounting frameworks take into account depreciation of its assets, a country's accounting framework should take into account depletion of its natural resources and deterioration of its environment. Just as a firm's accounting frameworks consider assets and liabilities, so should a country's, noting whether there are increases in liabilities (debt) as well as assets. A country that sells off its natural resources, privatizes its oil company, and borrows against future rev-

enues, may experience a consumption binge that raises GDP, but the accounting framework should show that the country has actually become poorer.

Institutional reforms—stabilization funds

International commodity prices are subject to enormous volatility, providing the major motivation for the creation of stabilization funds ("rainy day funds") that allow the smoothing out of expenditures. But such stabilization funds can serve other functions. For instance, they can help ensure that the pattern of expenditures does not give rise to large Dutch Disease problems. By setting aside funds in a separate account, stabilization funds can provide a check against a natural proclivity of governments to spend all of the resources at their disposal; and they can help ensure that the funds are spent on investments, so that the depletion of natural resources is offset by an increase in human and physical capital.

Stabilization funds can also be used to reduce rent seeking. By providing an open and transparent process for determining how the funds are used, stabilization funds can help prevent and diminish the often violent conflicts that have so marked resource-rich countries.

Microeconomic Policies

Governments can undertake a variety of policies to increase the likelihood of obtaining more revenues and of making sure revenues are well spent.

Transparency

Perhaps the most important set of policies are those entailing increased transparency: more information about how the government interacts with those involved in the extraction of the natural resources; the contracts that are signed; the amounts the government received; the amount of natural resource produced; and the uses to which the funds are put. Such transparency reduces the scope for corruption. After all, it is often cheaper for companies to bribe the government of a producing country than to pay market prices for the right to develop a petroleum reserve. Transparency limits the opportunities for corruption. At the very least, questions are raised: why did the government not receive full value for the country's resources?

When the petroleum company BP first proposed making public what it pays to the Angolan government, the government objected.[6] But a number of other producing countries, including Nigeria, have started to require all oil companies to "publish what they pay" and government officials to make public where the money goes.[7]

Auction design

The kinds of contracts that a natural resource–producing country enters into with multinational companies to develop its resources can have a great effect on how much revenue the government subsequently receives. The issue of contracting is a complicated one and is developed more fully in chapter 5.

Some ways of engaging foreign firms may result in markedly reduced competition, and this in turn leads to lower revenues for the government. For instance, "fire sales" where governments make large tracts of oil fields available for commercial development in quick succession are likely to result in lower prices.[8] Even large oil companies have a seemingly limited appetite for risk, and are willing to buy more and more options for exploration (before knowing about the return on leases previously obtained) only at reduced prices.

Allowing one firm to come into a country ahead of others may discourage subsequent competition. A firm that is invited to do initial exploration will benefit from asymmetries of information—that firm will know more about the potential not only of the oil or gas tract it has explored but also have information about neighboring tracts.[9] Even if the government then puts up other tracts for competitive auction, the information asymmetry (as well as the original firm's relationships with officials) will result in less competition and lower revenues for the government. Each of the competitors will know that they are at an informational disadvantage: if they win the auction it is because they bid too much—more than the informed competitor who knows the real value of the field. As a result, the new companies will bid less aggressively.

Governments can organize the bidding for leasing oil tracts in different ways. Bonus bidding requires companies to compete based on how large a bonus they will pay the host government at the start of the contract. Bonus bidding forces producers to pay large amounts up front without knowing either the quantity of the natural resource or the costs of extraction. These risks to bonus bidding may discourage companies from competing. Royalty bidding, where competitors bid on the fraction of the revenues they give to the government as royalties, carries less risk and generates more competition than bonus bidding. Bonus bidding is especially of concern in developing countries, where there is more risk of expropriation, or future governments changing the terms of the contract.[10] As a consequence, royalty bidding may generate more revenue for the government than bonus bidding, due to the lack of significant investment required up front and the lessened risk to companies of major loss should a government later default.

In some places (including the United States), there has been concern that lease provisions lead to premature shutdown of wells or, in other cases, to excessively rapid extraction. The payment of any royalty that lowers the net revenue received may influ-

ence an oil company's decision to shut down a well earlier than necessary.[11] Well-designed contracts thus may have a term that allows, as the oil becomes extracted and the costs of extraction increase, the lowering (or even possibly the elimination) of royalties upon the payment of a fixed amount.

While the details are complicated, the basic point is a simple one: the way a country engages producers can make a great deal of difference. Both in the United States and Europe, the design of auctions for the airwaves used by radio, TV, cell phones, and so forth (the so-called spectrum actions) have had a major effect on enhancing government revenues.[12] Countries should assess their auction processes by looking at the fraction of total natural resource revenues they receive, and comparing these to what other countries with comparable extraction costs and risks receive.

Role of Developed Countries

Resource-rich countries have the primary responsibility for ensuring their governments receive the most that they can for their natural resources and use the funds to improve their long-term well-being. But there are actions that the developed countries and the international community can take to enhance the likelihood of success. The following list is meant to be suggestive, rather than complete.

First, developed countries can put pressure on the oil and natural resource companies to be more transparent, to "publish what they pay." A simple requirement could go a long way: only allowing published payments to be tax deductible.

Secondly, countries can enforce stringent anticorruption and antibribery laws.

Thirdly, secret bank accounts encourage bribery by providing a safe haven. The international financial community has made great strides in stopping the use of secret bank accounts by terrorists, but restrictions on secret bank accounts should be extended to make it more difficult for oil revenues to be funneled through the international banking system, instead of going straight into developing country treasuries.

Finally, the International Monetary Fund should encourage developing countries to establish stabilization funds. This will require it to change its accounting frameworks, which treat increased expenditures out of the stabilization funds, say during a recession, just like any other expenditure and subject the funds to harsh criticism for running deficits, vitiating one of its major benefits. Moreover, the IMF should not put undue pressure on countries to privatize their extractive industries. (In many developing countries, privatization is tantamount to selling the natural resources to foreign firms, since there are no domestic firms with the capital and skills necessary to undertake the task of extraction.) Privatization is only one way of engaging foreign firms in

the extraction of natural resources. There may be alternative ways (contractual arrangements) that generate more revenue for the developing countries.[13]

We have noted that one of the reasons for the resource curse is the conflict to which rent seeking often gives rise. Western governments can try to reduce such conflict by encouraging inclusive democratic processes.

Perhaps even more important is action that the developed world can take to circumscribe the "benefits" that arise from conflict by, for example, extending to other areas the campaign against "conflict diamonds." Much of the revenue goes to the purchase of arms, and arguably restrictions on the sale of arms could also make an important contribution.

There is no simple panacea, no single set of prescriptions that ensures growth and development. But if reforms are adopted by the natural resource–rich countries and by the international community, there is the prospect that the resource curse can be lifted and made a thing of the past. Natural resources can and should be a blessing.

2. Understanding the Resource Curse

Terry Lynn Karl

The experience of four decades has shown that exporting oil by itself does not transform poor countries into flourishing economies within a generation. In earlier years, many experts thought the "black gold" of oil would bring riches and economic development. Today their expectations are far more restrained.

Oil-exporting countries are more likely to be described as suffering from "the paradox of plenty," "the King Midas problem," or what Juan Pablo Perez Alfonzo, the founder of the Organization of the Petroleum Exporting Countries (OPEC), once called the effects of "the devil's excrement." Their reality is sobering: countries that depend on oil for their livelihood are among the most economically troubled, the most authoritarian, and the most conflict-ridden in the world.

What the Resource Curse Is . . . and Is Not

The consequences of development based on the export of petroleum have tended to be negative during the past 40 years. Detrimental effects include slower-than-expected economic growth, poor economic diversification, dismal social welfare indicators, high levels of poverty and inequality, devastating environmental impacts at the local level, rampant corruption, exceptionally poor governance, and high incidences of conflict and war.

When compared to countries dependent on the export of agricultural commodities, mineral- and oil-exporting countries suffer from unusually high poverty, poor health care, widespread malnutrition, high rates of child mortality, low life expectancy, and poor educational performance—all of which are surprising findings given the revenue streams of resource-rich countries.

Due to the highly volatile nature of oil markets, oil-exporting nations often fall victim to sudden declines in their per capita income and growth collapses of huge proportions. The statistics are startling: In Saudi Arabia, whose proven crude oil reserves are the greatest in the world, per capita income has plunged from $28,600 in 1981 to $6,800 in 2001.[1] In Nigeria and Venezuela, real per capita income has decreased to the levels of the 1960s, while many other countries—Algeria, Angola, Congo, Ecuador, Gabon, Iran, Iraq, Kuwait, Libya, Qatar, and Trinidad Tobago—are back to the levels of the 1970s and early 1980s.[2]

The surprisingly negative outcomes in oil- and mineral-dependent countries are referred to as the "resource curse." Before discussing what the resource curse is, however, it is helpful to clarify what it is not. The resource curse is not a claim that natural resource abundance is always or inevitably bad for economic growth or development, as some believe. To the contrary, there are powerful historical examples of successful resource-based development, including the United States (which was the world's leading mineral economy when it became the world's leader in manufacturing), Canada, Australia, Chile, and Norway—although there are almost no cases of successful development based on the export of petroleum.

The resource curse does not refer to the mere possession of petroleum or other minerals, but rather to countries that are overwhelmingly dependent on oil revenues. This dependence is generally measured by the extent to which oil exports dominate total exports (usually from 60 to 95 percent of total exports) or by the ratio of oil and gas exports to gross domestic product—a figure that can range from a low of 4.9 percent (in Cameroon, which is running out of oil) to 86 percent (in Equatorial Guinea, one of the newest exporters).

Nor is the resource curse a claim that oil and mineral exporters would be better off with smaller endowments of natural resources—that it would be better to be Haiti,

for example, than to be Venezuela. Oil is simply a black viscous substance that can be beneficial or detrimental: what matters most is not the inherent character of the resource itself but how the wealth generated by petroleum is shared and utilized.

In its narrowest form, the resource curse refers to the inverse relationship between high natural resource dependence and economic growth rates. A number of recent studies have shown that resource-rich developing countries have underperformed when compared with their resource-poor counterparts. But not all resources are created equal. Those countries dependent on exports of "point source" natural resources (meaning those extracted from a narrow geographic or economic base such as oil or minerals) are more strongly associated with slower growth. In fact, oil- and mineral-driven resource-rich countries are among the weakest growth performers, despite the fact that they have high investment and import capacity.

A study of OPEC members from 1965–1998 showed that their per capita gross national product *decreased* by an average of 1.3 percent per year, whereas non-oil developing countries as a whole grew by an average of 2.2 percent over the same period.[3] Studies show that the greater the dependence on oil and mineral resources, the worse the growth performance. Countries dependent on oil export revenue not only have performed worse than their resource-poor counterparts, they have performed far worse than they should have, given their revenue streams.

Explanations for the Resource Curse

Explanations for this poor economic performance vary and are debatable, but a combination of factors makes oil exporters especially prone to policy failures and growth collapse.

- **Oil price volatility:** The global oil market is arguably the world's most volatile, and the sudden price gyrations and subsequent boom and bust economic cycles are difficult for policymakers to manage effectively. Price volatility exerts a strong negative effect on budgetary discipline and the control of public finance as well as on efforts at state planning. It is also negatively associated with effective investment, improved income distribution, and poverty alleviation.
- **The Dutch Disease:** Oil-dependent countries often suffer from the so-called Dutch Disease, a phenomenon in which the oil sector drives up the exchange rate of the local currency, rendering other exports noncompetitive. In effect, oil exports crowd out other promising export sectors, especially agriculture and manufacturing, making economic diversification particularly difficult. In response, policymakers adopt strong protectionist policies in order to sustain increasingly noncompetitive economic activities, placing the funding burden on

the oil sector. As agriculture and manufacturing become dependent on these transfers from oil, dependence on petroleum is reinforced, removing incentives for a more efficient use of capital. Over time, it can result in a permanent loss of competitiveness.

- **Lagging skill accumulation and heightened inequality:** As the world's most capital and technologically intensive industry, the petroleum industry creates few jobs, and the skills required by these jobs generally do not fit the profile of the unemployed in oil-exporting countries. Instead, highly skilled labor is sent abroad to train or foreign workers are brought in to do the work, thus robbing oil exporters of the huge benefits from the "learn by doing" process that is the crux of economic development. Contrast this with resource-deficient countries where demand for education is high, especially from the manufacturing sector. Skill accumulation occurs at a more rapid rate, and wealth inequalities tend to be less common in these countries. The rate of economic growth generally rises through increased productivity and not merely through financial transfers of petrodollars. The net impact is evident: according to the second Arab Human Development Report, released by the United Nations in 2003, high dependence on oil in parts of the Middle East has led to "the over concentration of wealth in a few hands," and "faltering economic growth," and "weakened the demand for knowledge."[4]
- **The enclave and tax problem:** Because oil projects in many countries tend to be large-scale, capital-intensive, and foreign-owned, there are few productive links with the rest of these countries' economies. Generally, revenues derived from the exploitation of oil go directly to the government, either as royalties or rents paid by foreign oil companies, or as taxes and profits earned by state-owned enterprises. This arrangement removes incentives for establishing tax systems separate from petroleum, further exacerbating dependence on oil. The rulers who control the coffers of the state need not tax their own people, thus breaking a critical link between taxation, representation, and state accountability. Dependence on oil acts as a barrier to more productive activities, and removes the accountability necessary to satisfy the demands and the scrutiny of taxpayers.

The Crux of the Problem: Weak Institutions and Rentier States

Proposals for avoiding the resource curse include commodity stabilization funds that can smooth out price volatility; more economic openness and sophisticated foreign exchange policies to mitigate Dutch Disease; more efficient investment in human resources, especially education and skill acquisition; and greater transparency and new tax policies. But utilizing petroleum wealth effectively is not easy. For these policies to be successfully implemented, capable states and relatively high levels of governance are necessary. If sophisticated governments in the more developed world have trouble executing ambitious interventionist policies, how can governments in less developed countries be expected to administer even more ambitious and complicated policies?

Overdependence on oil exports is strongly associated with weak public institutions that generally lack the capacity to handle the challenges of petroleum-led development. This is partly the result of timing: if pre-existing institutions are weak or the state only partially formed, the influx of rents from petroleum tends to produce a rentier state—one that lives from the profits of oil. In rentier states, economic influence and political power are especially concentrated, the lines between public and private are very blurred, and rent seeking as a strategy for wealth creation is rampant. Rulers tend to stay in power by diverting revenues to themselves and their supporters through subsidies, protection, the creation of public employment, and overspending. Oil states have a chronic tendency to become overextended while promoting cultures of rent seeking among their populations.

In resource-poor countries, intense popular pressure on scarce resources is more likely to reduce the tolerance for inefficiency and predation, and the economy cannot support extensive protection and overexpanded bureaucracies over a long period of time. But in oil states, oil wealth weakens agencies of restraint. The net result is a state that looks powerful but is hollow. Democracy may be another casualty of this rentier dynamic: authoritarian rulers use petrodollars to keep themselves in power, prevent the formation of opposition groups, and create vast militaries and repressive apparatuses. Not surprisingly, such regimes tend to last a long time and democratic change is hindered.

Other political problems make oil states unusually susceptible to policy failures. Because the state is a "honey pot," it is prone to capture by powerful interests and to widespread corruption. As a group, oil-exporting countries are significantly more corrupt than the world average (even if Canada and Norway are included). Nigeria, Angola, Azerbaijan, Congo, Cameroon, and Indonesia compete for the position of "most corrupt" in the annual rankings of Transparency International, a nongovernmental organization dedicated to countering corrupt government and international business

practices.[5] High levels of corruption contribute to the resource curse by deforming policy choices; for example, policymakers in oil-exporting countries tend to favor mega-projects in which payoffs can be more easily hidden and the collection of bribes facilitated, while eschewing productive long-term investments that are more transparent. This, in turn, lowers both growth and income levels.

Countries dependent on oil are particularly susceptible to policy failure. Because the institutional setting is generally incapable of dealing with the economic manifestations of the resource curse, it ends up reinforcing them in a vicious development cycle or "staple trap." As regimes distribute and utilize resources to keep themselves in power, this political distribution of rents causes further economic distortions, depresses the efficiency of investment, entrenches opposition to economic reform, and permits distortions to build behind protective barriers. Foreign borrowing may prolong this trap, but in the end a growth collapse is likely. So is violence. Not surprisingly, where the prospects of wealth are so great, petroleum is more associated with civil war and conflict than any other commodity. Countries dependent on oil are more likely than resource-poor countries to have civil wars, these wars are more likely to be secessionist, and they are likely to be of even greater duration and intensity compared to wars where oil is not present. Oil may be the catalyst to start a war; petrodollars and pipelines may serve to finance either side and prolong conflict. And this, of course, is the biggest resource curse of all.

Questions about the Oil Economy

- How has petroleum production affected your country over time? Are oil revenues being used to help alleviate poverty? Have poverty indicators improved? Has access to clean water, good schools, and hospitals improved over time? Are more people completing higher education since petroleum production began? Are there proposals being considered that could be put in place to help combat poverty using oil revenues?

- Have problems of corruption deepened or improved since your country began producing and selling petroleum?

- Have more jobs been created since your country began petroleum production?

- How have non-oil sectors been affected? Have the manufacturing and agricultural sectors grown, remained stagnant, or diminished?

- Has governance improved since petroleum production and export began? Are elections considered free and fair in your country? Is freedom of expression respected? Are opposition parties allowed to organize and compete freely in elections?

- Look at where the money is going: Examine your government's budget to see what oil revenues are being used for. Compare your government's spending to other countries in the region and in other parts of the world.

- Are oil revenues being used to pay for armed conflict? Is there conflict or labor unrest in oil producing regions?

SAMPLE STORY

More Poverty Than Affluence in Venezuela's Oil-Fed Economy

By Robert Collier of the San Francisco Chronicle

CABIMAS, Venezuela, Sept. 27, 2000—Fredy Valero put down his beer and kicked the dirt angrily.

"Do you know how much wealth comes out of this soil?" he asked. "Dig a hole anywhere and out comes oil. I can't even think how much money that is. And how much do I have? Or anyone here?"

His right arm flailed out, pointing over the ragged, working-class neighborhood. "Next to nothing."

Welcome to oil country, Venezuela-style.

Cabimas is at the heart of the Lake Maracaibo region, which pumps about $13 billion worth of crude annually. But its story could be echoed in many places in other OPEC nations, economists say.

Valero is an unemployed oil worker, one of many around the poor, sweltering town. Despite the vast wealth produced in the area, little of it stays or benefits the people. Living costs are sky-high, almost all consumer goods are imported and unemployment is estimated at 25 percent.

Economists say that the Maracaibo region and Venezuela are classic examples of the Dutch Disease, a term derived from the Netherlands' experience in the 1970s after huge North Sea natural gas fields came into production.

Instead of the bonanza the country expected, the resulting flood of cash warped the economy by making citizens rely on government largesse and imports rather than export revenue and domestic products.

"The Dutch Disease is alive and well here, and it's the cause of all our problems," said Pedro Garcia, co-owner of an import company and president of the Maracaibo Chamber of Commerce. "Oil has distorted our economy horribly."

Garcia should know. He is a member of the region's small elite, which has long lived ostentatiously from the nation's oil wealth. In Venezuela, as in other OPEC nations, those who have it, flaunt it.

"Some people think nothing of flying to Miami on Friday to buy shoes for a party here Saturday night," said Norka Marrufo, society columnist for Panorama, Maracaibo's leading daily newspaper.

That's a world apart for Valero. A 25-

year-old worker on the boats that constantly ply the derrick-studded waters of Lake Maracaibo, Valero likes the pay, when he can get it—about $560 per month, plus medical care and other generous benefits given by Petroleos de Venezuela, the state oil monopoly.

By Third World standards, that's not bad. But he has been unemployed for most of the past year and large portions of previous years.

"Unfortunately, vice is all too common because of the boom-and-bust nature of this business," said Pastor Lopez, an oil union official. He noted that gambling on horses and dominoes soaks up a large part of many local residents' income.

Venezuela has another dubious distinction that analysts link to the flow of oil money—it is the world's fifth-highest per capita consumer of Scotch whiskey.

Although they might have more work if OPEC increased production to drive prices down, Valero and his compatriots voice fervent support of President Hugo Chavez's attempts to keep prices relatively high. Chavez was enthusiastically elected because he promised to quell corruption in Venezuela.

Many Venezuelans fondly recall the boom years of the 1970s and early 1980s, when OPEC succeeded in pushing world oil prices more than twice the current price, when inflation is taken into account.

A recent nationwide poll found that 80 percent of the population believes the country is among the richest in the world, although at least two-thirds live in poverty.

It thus follows, in the minds of millions, that the primary task of government is to redistribute existing wealth rather than to create it. Venezuela has developed hardly any high-tech industry and, apart from oil, produces little but consumer goods for domestic consumption.

There is plenty of money sloshing around in the coffers of OPEC nations these days: They are expected to earn more than $200 billion this year, up from $160 billion last year, and oil proceeds account for roughly half of Venezuela's $26.7 billion budget.

When Chavez took the oath of office last year, oil was selling for $13 a barrel and soon tumbled to $8. Among his first acts was to slash public spending. The charismatic former army colonel's government now has $10 billion more in extra oil revenues than last year.

Editor's note: *The story employs an effective technique of using an ordinary citizen to sum up the problems of society. The same technique could be used in most resource-rich countries where the poorer residents do not enjoy the spoils. The reporter backs up statements with statistics from credible sources.*

The story does a nice job of contrasting the lifestyles of the rich and poor in Venezuela, which, like most resource-rich countries, suffers from a poor distribution of wealth. The story could have benefited from a quote from a government official.

3. A Primer on Oil

John Roberts

Oil is a plentiful resource, but it comes with a high price tag. Oil is found in a variety of geological strata but much of the world's richest oil regions are also the most risky, either geologically or politically. While its role in history has changed through the decades, oil is never far from the front pages of the newspapers. Iraq's invasion of Kuwait in 1990 precipitated the Gulf War of 1991, and prompted furious debate about "war for oil." Some would argue that the 2003 war in Iraq, with its continuing U.S. military involvement in that country, was also about oil. The dependence of the United States and other major developed countries on imported oil means that the commodity plays a major role in national security considerations and international relations.

Oil has been used to fuel sacred flames for thousands of years and in medicines for nearly as long. Its primary use today is as a fuel for planes and automobiles. In the industrialized world, no less than 97 percent of transportation runs on oil and there is no readily available and affordable alternative in sight. In addition, oil is vital in some parts of the world for heating, while it is also widely used in the petrochemical industry to make plastics and, in its roughest form, to help pave roads.

Principal concerns in the 21st century include the question of whether oil production is close to reaching its peak. In other words, is oil running out? In the short term, will producer nations be able to meet the routine requirements of consuming nations? Perhaps the most important medium- and long-term issue is oil's contribution to global warming.

This chapter begins by explaining the geology of oil, how oil is measured, and energy consumption patterns worldwide. It then turns to these three crucial questions: First, are we running out of oil? Second, what are the security implications of relying on oil? Finally, what are the environmental consequences of an over-reliance on fossil fuels?

What Is Crude Oil?

Crude oil or petroleum—the terms tend to be used interchangeably—is technically a mixture of pentanes and heavier hydrocarbons, principally recovered from crude oil reservoirs. When pentanes and heavier hydrocarbons are found in natural gas reservoirs, they are known as condensate. In practice, condensate is treated as oil. In addition, oil reservoirs may produce lighter liquid hydrocarbons such as propane and butane, which are classified as natural gas liquids (LNGs).

In many ways, crude, condensate, and LNGs can be considered close members of the same family. But it is worth noting that when organizations talk about oil production or oil reserves, they may—or may not—be including LNGs and/or condensate in their tallies. The Organization of the Petroleum Exporting Countries (OPEC) excludes LNGs and condensate from its members' production quotas, even though these may contribute significantly to some OPEC members' overall hydrocarbons output.

The composition of crude oil varies from field to field. The density of crude oil is usually measured in degrees, according to a scale developed by the American Petroleum Institute (API). The World Energy Conference classifies heavy crude as crude that is below 22° API, medium crude as oil between 22° and 31° API, and light crude as anything above 31° API. Some condensates have a gravity of 60°.

Light, medium, and heavy crudes are considered "conventional crude." Some crude grades can be blended to produce the right overall quality that appeals to refiners while condensate or LNGs are often mixed in with heavier crudes to ensure pipelines do not get clogged up.

The light grades usually sell at a premium to the heavier grades, mainly because of their high yield of valuable refined products like gasoline or jet fuel. North Sea grades like Brent and Ekofisk, Nigerian crude like Bonny Light, and other African crudes are light crudes while most of the Middle East oil is of the heavier variety.

Oil below 10° API is commonly known as bitumen and requires special treatment. Bitumen is mined from sand, sandstone, or other sedimentary rocks, whereas conventional crudes are drilled. One of a number of nonconventional crudes, bitumen is currently produced from the tar sands of Canada and Venezuela.

Bitumen undergoes various washes and treatments to separate the oil content from sand, water, and minerals, and is then diluted with condensate. As a result of undergoing these processes, bitumen has become known as "synthetic crude," sometimes shortened to "syncrude," although in strict linguistic terms it is not synthetic at all.

Measuring Oil

Oil is routinely measured either in barrels or in metric tons. The most common oil production measure is barrels per day (b/d) or metric tons per year (mt/y). Because barrels are a measure of volume and tons are a measure of weight, there is no precise correlation, as different qualities of crude oil will vary in weight. But the rule of thumb is that there are 7.33 barrels to a ton and that 1 b/d corresponds to 49.8 mt/y. Gasoline at the pump is in most cases measured in liters, but in the United States it is measured in gallons (one gallon equals 3.75 litres and 42 gallons equal one barrel) while in some countries it may still be measured in British imperial gallons (one gallon equals 4.5 liters while 35 gallons equal one barrel).

A ton of oil equivalent (toe) is a term used to express the production or use of other forms of primary energy—such as gas, coal, nuclear, or hydro (which each have their own industry's systems of measurement)—so that it can be compared directly with both oil and with each other.

Oil's Place in the Global Energy Mix

By and large, oil is the world's most important commodity. It is the world's most widely used fuel, not least because most of us drive cars or rely on public transport that is powered by oil. But it should also be noted that while oil still accounts for the largest share of world commercial fuel production—3.637 trillion mt in 2003, or 37.3 percent of world production of 9.741 trillion mtoe—some 2 billion people still rely on the most basic fuel of all, wood and combustible waste products, for simple cooking and heating.[1]

In considering oil's place in the global energy mix, one has to look both at the volumes consumed of the major fuel types, and at the varied markets that rely predominantly on specific types of energy. The global energy balance in 2003—in terms of the consumption of fuels that are commercially traded—is summarized in Table 1.

TABLE 1
World Energy Balance in 2003
(In millions of tons of oil equivalent – MTOE)

	MTOE	%
Oil	3,636.6	37.33
Natural Gas	2,331.9	23.94
Coal	2,578.4	26.47
Nuclear Energy	598.8	6.15
Hydro	595.4	6.11
Total	9,741.1	100

Source: BP Statistical Review of World Energy, June 2004
Also available at: www.bp.com/statisticalreview2004

But this balance contains considerable market differences, not least in terms of energy consumption per capita. For example, U.S. energy use per capita is twice as high as that of the European Union, with which it shares a broadly similar standard of living (see Table 2).

In its 2003 assessment of global energy trends, the International Energy Agency (IEA) anticipated that between 2000 and 2030 nonnuclear, nonhydro renewables (in other words, wind power, solar power, and perhaps wave power) would be the fastest growing sector of the global energy market, roughly doubling its share of the market and tripling in terms of absolute output. This growth in renewables, however, represented only a 2 percent increase in market share (from 2 to 4 percent); fossil fuels were also expected to increase their share of the market by 2 percentage points (from 87 to 89 percent). And while oil does lose ground, it is mainly to another fossil fuel, gas.

In comparative terms, the new renewables sector simply compensates for an expected stasis in production of nuclear energy, which is expected to produce about as much energy in 2030 as in 2000, but will lose market share given that the overall energy sector is expected to increase by around 66 percent over this 30-year time frame.

While oil is expected to lose a little of its overall market share, since its 30-year increase is expected to be 60 percent, some areas of the world are expected to see an explosive increase in oil use. For example, oil consumption in China is expected to soar from around 5 mb/d (250 metric tons a year) in 2000 to 12 mb/d (600 mt/y) in 2030. Soaring Chinese demand contributed to the record-high crude oil prices recorded in 2004.

TABLE 2
World Energy Balance by Region and Per Capita (pc) Usage in 2003

(Volume totals in millions of tons of oil equivalent – MTOE; per capita in tons of oil equivalent per person)

	Oil	*Natural Gas*	*Coal*	*Nuclear*	*Hydro*	*Total*	*Pop'n*	*TOE/pc*
North America	1,093.2	686.3	612.7	201.1	133.9	2,727.3		
USA	914.3	566.8	573.9	181.9	60.9	2,297.8	291.0	7.896
Central & South America	216.6	98.6	17.7	4.7	127.8	465.5		
Brazil	84.1	14.3	11.0	3.0	68.9	181.4	176.3	1.029
Europe (including CIS)	942.3	975.7	535.9	285.3	174.3	2,913.4		
EU-15	639.7	363.5	222.7	204.0	68.3	1,498.1	379.0	3.953
France	94.12	39.4	12.4	99.8	14.8	260.6	59.9	4.351
Germany	125.1	77.0	87.1	37.3	5.7	332.3	82.4	4.033
Russia	124.7	365.2	111.3	34.0	35.8	679.8	144.1	4.718
Turkey	31.9	18.9	15.5	-	8.0	74.3	70.3	1.057
UK	76.9	85.7	39.1	20.1	1.3	223.2	59.1	3.777
Middle East	214.9	200.4	8.6	-	3.0	426.8		
Iran	54.0	72.4	0.7	-	2.0	129.1	68.1	1.896
Saudi Arabia	67.0	54.9	-	-	-	121.9	23.5	5.187
Africa			118.6	60.7	90.6	2.9	18.5	291.0
Egypt	25.0	22.1	0.7	-	3.2	52.0	70.51	0.737
South Africa	24.2	-	88.9	3.0	0.8	116.0	44.76	2.592
Asia Pacific		1,048.1	310.9	1,306.2	104.7	137.5	2,908.4	
Bangladesh	4.2	11.0	0.4	-	0.2	15.9	143.8	0.111
Japan	248.7	68.9	112.9	52.2	22.8	504.3	127.5	3.956
China*	275.2	29.5	799.7	9.9	64.0	1,178.3	1,294.9	0.910
India	113.3	27.1	185.3	4.1	15.6	345.3	1,049.6	0.329
Pakistan	17.0	19.0	2.7	0.4	5.6	44.8	149.9	0.299
South Korea	105.7	24.2	51.1	29.3	1.6	212.0	47.4	4.473
World	3,626.6	2,331.9	2,578.4	598.8	595.4	9,741.1	6,400**	1.522

* Excluding Hong Kong
** Author's estimate

Source: BP Statistical Review of World Energy, June 2004
Population figures from IMF, International Financial Statistics, December 2003. EU population from Eurostat.

TABLE 3
World Primary Energy Demand 1971–2030 (in MTOE)

	1971	*2000*	*2010*	*2030*	*Average annual growth 2000–2030 (%)*
Oil	2,450	3,604	4,272	5,769	1.6
Gas	895	2,085	2,794	4,203	2.4
Coal	1,449	2,355	2,702	3,606	1.4
Nuclear	29	674	753	703	0.1
Hydro	104	228	274	366	1.6
Other Renewables	73	233	336	618	3.3
Total	4,999	9,179	11,132	15,267	1.7

Source: World Energy Outlook 2002, International Energy Agency, Paris, October 2002.

Are We Running Out of Oil?

Reserves: how much oil does the world possess?

One of the most contentious subjects in the heated debate on international energy is the extent of the world's oil resources. It is usually said that the world has around 1 trillion barrels of oil; this is a sensible figure for routine day-to-day usage, but it is only the beginning of a complicated story. One well-regarded source for oil reserve numbers is the BP Statistical Review of World Energy, which is updated annually. BP's figure for the volume of "proved reserves" (also known in the industry as "proven reserves") is revised each year and essentially reflects official government claims for an individual country's reserves, taking into account the latest discoveries, improved knowledge of fields already under development, and the amount of oil pumped from known fields.

Normally, little attention is paid to the actual description of what constitutes "proved reserves." BP says simply that these are "generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions." This definition will, of course, change as technology changes.

To Stone Age people, reserves were unknown and irrelevant because production consisted of little more than capturing and using oil that trickled to the surface. Improved technology first enabled humans to dig wells by shovelling and draw up oil

in a bucket; and then to drill for oil some 10 or 20 feet. Currently the prospector can search for oil, even though it may be located in such previously inaccessible places as a couple of thousand meters below a seabed, which itself may lie a couple of thousand meters below the ocean surface. Technology has also improved the types of oil we can extract.

Canada provides a good example of the difficulty of calculating reserves. Canada's National Energy Board (NEB) officially estimates that the Athabasca tar sands contain as much as 174.7 billion barrels in what it terms "established reserves." This is a definition used to cover both proven reserves and half of the country's probable reserves—with "probable reserves" themselves being defined as "reserves contiguous with proven reserves that are interpreted to exist with reasonable certainty." In stating this, Canada was officially proclaiming that it now considers its reserves to be second only to those of Saudi Arabia. Contrast this position with either the 6.9 billion barrels listed in BP's 2003 Statistical Review as the size of Canada's proved reserves of all kinds of oil or the NEB's own figures of 4.3 billion barrels for the country's proven reserves of conventional crude oil.

Essentially, the problem is one of simple definition—and cost. The oil is there, the question, as ever, is how much are we prepared to pay to get it out. With oil at $50/bbl, as it was in 2004, more oil in the ground is going to be economically feasible to extract and produce.

TABLE 4
Increase in Global Oil Demand 2000–2030 (in mb/d)

	Increase in mb/d	*Annual % increase*
OECD N. America	9.5	1.1
China	7	3.0
East Asia	5	2.75
Latin America	4.5	2.4
South Asia	4.5	3.5
Middle East	3.8	2.2
Africa	3.5	3.25
Transition Economies	2.5	1.5
OECD Europe	2.5	1.0
OECD Pacific	2.0	0.8

Source: World Energy Outlook 2002, International Energy Agency, Paris, October 2002

The issue is further complicated where declarations of private companies about the scale of their reserves in corporate filings to banks or regulatory authorities are concerned. These generally require specific programs to be in place for actual development of the resource. So in considering the reserve issue, it is important to note that while geologists and miners may know the oil exists, there are a multitude of reasons why it may still not be formally classified as a proved or proven reserve.

The issue of reserve declarations was front-page news in 2004 after Royal Dutch/Shell, one of the world's largest and oldest oil giants, admitted that it had exaggerated its proven reserves. By the end of May 2004, the company had downgraded the size of its proven oil and gas reserves four times in five months in a scandal that stunned its shareholders and financial markets and forced three top executives to resign. In early 2005, Shell announced a further 10 percent cut in its reserves.

Costs and prices

The question of cost is a recurrent theme. Oil companies operate on tight margins and don't want to spend more than around $10–15 per barrel for the entire cost of exploring for oil, developing the reserve, and transporting it to market. And yet, even if one takes $12/bbl as a reasonable development figure, this is very low compared to other oil prices.

The market price for crude oil, essentially determined by a host of factors from supply and demand to geopolitical tensions to the action of OPEC and of the futures market speculators whose positions can exacerbate any price move, has averaged well over $30/bbl for the past two years, with spikes of well above $50/bbl.

The price of refined products also contains a tax component, making the cost to consumers much higher than for crude oil. Some products, notably aviation fuel, are not taxed, but most motor gasoline is taxed, often very heavily. The price of gasoline at the pump in Western Europe, where it is heavily taxed, can be as much as $180 a barrel. In the UK at the end of March 2004, the price of oil at the petrol pump ranged from 76 to 82 pence a liter, with 82 pence being the equivalent of $4.65 a U.S. gallon or $195 a barrel!

Even if one were to try to calculate an average retail price for all the barrels of oil sold in various forms around the world, the price might reasonably be expected to be more than twice that of the daily price for crude on the open market. And the actual physical cost of producing oil may be as little as 15 percent—and often much less than that—of the average price paid by consumers. That means, in extremis, there is a lot of room for absorbing increased production costs to access ever more complex forms of oil resources.

Such issues help to explain why the U.S. Geological Survey (USGS) postulates that recoverable resources—the amount of oil we might reasonably anticipate extracting from the ground—could effectively double the total of global proved reserves currently listed by BP for the next 30 years.

Reserves and resources

Resources are not quite the same as reserves. They are defined as "reserves plus all the accumulations of a fossil energy source [such as oil, natural gas, or coal] that may eventually become available." To the politician worrying about energy security or to the layman fretting over whether the world will run out of oil, a reasoned resource analysis is probably more relevant than a simple reserve estimate.

At its simplest, the USGS, in a reassessment published in 2000, listed "mean remaining reserves"—essentially the reserves we already know we have—at 859 billion barrels, a level somewhat lower than BP's figure of 1.047 trillion barrels for proved reserves. But to this figure, the USGS added 612 billion barrels of what it termed "mean conventional reserve growth"—essentially an increase from existing fields due to improved oil recovery techniques. It also added some 649 billion barrels in what it termed "mean undiscovered conventional reserves"—oil expected to come from new discoveries.

These three categories of reserves amount to a putative global resource base of 2.12 trillion barrels, but even this total is not final. For one thing, the USGS figures exclude the United States. In 1995, the USGS estimated U.S. "technically recoverable resources" of crude oil to be 165 billion barrels. In addition, the 2000 study puts existing LNG reserves at 68 billion barrels, conventional reserve growth at 42 billion barrels, and undiscovered resources at 207 billion barrels. These four elements add up to a further 482 billion barrels.

If all the USGS forecasts turn out to be accurate, the reserve base available to the world between now and 2030 will not be the current conventional estimate of around 1 trillion barrels, but no less than 2.602 trillion barrels, or 355 billion metric tons.

The consumption issue

How long it might take the world to use up this volume of available oil, or to find a cheaper or more environmentally friendly substitute, depends on how fast we consume it. The BP Statistical Review's global proven reserve figure of 1.048 trillion barrels equates to about 143 billion metric tons of oil. Current usage of oil—taking 2002 usage of 75.7 million barrels a day or 3.52 billion metric tons for the year—yields a standard reserve-to-production (R/P) figure of 40.6 years. Using the mainstream assessments contained in BP's Statistical Review, we have enough oil to last us for 40 years—so long as we confine ourselves to current levels of use.

Global oil consumption, however, is set to grow, with serious projections from the U.S. Energy Department's Energy Information Administration that it could reach as much as 117 million b/d by 2025.

Purely as a hypothetical example, one could say that average consumption between now and 2030, the time frame in the USGS report, might entail an average annual use of around 100 million b/d or 4.65 billion mt/y. If reserves remain

unchanged, the oil would then run out in around 30 years. But if the USGS resource estimates were to be converted into reserves, we would have enough oil to last us for 76 years.

Admittedly, predicting long-term energy trends does not have a very good track record. A 1972 report by the Club of Rome entitled *Limits to Growth* predicted that if oil continued to be consumed at the same rate as in 1972, and there were to be no increase in reserves in the meantime, then the world's oil resources would be depleted by 2003! Even in the report's best-case scenario, with reserves growing five-fold, the Club of Rome expected all the world's oil resources to be consumed by 2022. Fortunately, the forecast was off the mark, though the Club of Rome's arguments may well have helped jumpstart the drive to curb waste—certainly we have become more efficient in our use of energy over the last 30 years. But perhaps its most lasting legacy may yet prove to be a change in the way we think about energy resources in general and oil in particular.

Traditional assumptions of energy production tend to assume there is a finite supply of energy that is measurable. But fitting these calculations into a time frame is extremely complicated because of technological improvements. To use the image conjured up by Peter McCabe of the USGS, we might be better off looking at resources as a pyramid buried underground. How much of the pyramid is above ground and measurable varies over time. As we improve our technology, more of the pyramid is revealed. This does not necessarily mean that resources are infinite, merely that there are limits to our abilities to measure those resources.

The bottom line is that the world possesses much more oil than we generally think it does. But how much of this oil will be produced will very much depend both on consumption patterns and on how much the world is willing to pay to extract oil that exists but cannot yet be classified as proven reserves.

How oil is used

Oil's future role depends on how it is used. In this regard, the United States is in a league of its own. In rough terms, the world's 6.4 billion people use, on average, just over one-third of a metric ton of oil each year (around 0.36 mtoe in 2002). Apart from the United States, the world's major industrialized countries use around 10 times this global average. The United States uses more than 20 times the global average. This means that even though the United States is one of the world's largest oil producers, it is also by far the world's largest consumer and the world's leading importer, shipping in more than half of the oil it consumes daily.

America's huge oil consumption and its dependence on imported oil have profound consequences in several directions. It makes the United States responsible for a disproportionate amount of pollution caused by energy in general and oil in particular.

In political terms, it gives rise to U.S. fears of energy insecurity, which has resulted in a strange symbiosis between the United States and Saudi Arabia, the world's largest oil exporter.

The bulk of the world's oil, consumed by the industrialized countries, is broken down into three broad categories: fuel oil for power plants, middle distillates produced during the refining process for transportation, and jet fuel and aviation kerosene for aircraft.

There are three types of major consumers: industrial, residential, and transportation.

In 2000, industry accounted for 1.2 billion metric tons of oil equivalent (btoe) of total energy consumption in the various member countries of the Organization for Economic Cooperation and Development (OECD), essentially the industrialized world. Of this amount, oil accounted for some 38 percent, or around 460 mtoe. During this time, natural gas, particularly in Japan and South Korea, contributed to a steady downwards trend in the use of oil for electricity generation.

Oil also accounted for around 22 percent of residential energy use in 2000. With the actual level of residential oil consumption totalling around 260 mtoe in both 1990 and 2000, there are indications that this market may have peaked.

The biggest use for oil is in transportation. In 2000, the OECD member states burned up 1.22 btoe to keep their cars, trucks, planes, and ships on the go, with oil satisfying some 97 percent of this demand. Gas accounted for just 2 percent and electricity for 1 percent. OECD North America—the United States, Canada, and Mexico—accounted for 56 percent of total OECD transportation demand, followed by OECD Europe (30 percent) and OECD Pacific (13 percent). The United States used disproportionately more oil to fuel disproportionately more transportation than other industrialized countries. One possible pointer to the future, however, was that natural gas penetrated the transport market at 3.3 percent in North America against just 0.2 percent elsewhere. But while electricity accounted for 1.8 percent of the OECD Europe market and for 1.5 percent in OECD Pacific, it supplied just 0.1 percent of the OECD North America market.

The world's reliance on oil for transportation is likely to continue for some years. While hybrid vehicles, that use a combination of oil and electricity, are being developed to improve fuel efficiency, the real challenge is coming up with a replacement for the internal combustion engine. Fuel cell vehicles have already been developed but mass use of fuel cells in cars is probably still at least some 10-15 years away. Moreover, how the fuel cells will themselves be fuelled remains in doubt. Hydrogen may well become the fuel cell standard, but it should be noted that most current production of hydrogen itself requires extensive natural gas consumption. Even were the United States and the rest of the industrialized world to move swiftly—not least for environmental reasons—

into a world of fuel cell transportation, one could be mistaken in thinking that the burgeoning new automotive markets of India or China would follow the same course.

What Are the Security Implications of Reliance on Oil?

The security implications of reliance on oil depend very much on whether one is looking at this issue from the perspective of the producer or the consumer.

Producer state security issues

For many producers, continued global reliance on oil is a good thing because oil is the main moneymaker for the government. This particularly holds true for most of OPEC, notably Saudi Arabia, Libya, Nigeria, and Venezuela. But it also holds true of leading non-OPEC oil producers such as Oman, Brunei, Yemen, Kazakhstan, and Azerbaijan.

Some OPEC states have a lesser reliance on pure crude oil revenues, either because they have successfully diversified into gas (Qatar and Algeria) or because they have set aside considerable past oil profits that now generate funds for possible use in general national development (the United Arab Emirates and Kuwait). Some major producers, such as Iran, already possess quite diversified economies. For them, oil revenues remain a leading source of government finance but oil itself is but one of a number of economic drivers.

It is commonly asserted that the governments of oil-producing states (whether in OPEC or not) have an interest in maximizing their oil revenues. But there is considerable debate as to whether this goal is best achieved by maximizing current income or by developing policies that might maximize incomes over a period of one or two decades, rather than a year or two.

By and large, most producers tend to operate on a relatively short-term horizon. Getting enough oil revenue to meet this year's budget requirements without damaging next year's prospects has always been their most important consideration. The two great oil price shocks of the 1970s, however, may have changed their thinking. The first great oil price shock resulted after Arab oil producers (rather than OPEC as a whole) initiated an embargo on oil sales to the United States and the Netherlands because these countries were perceived to be helping Israel in the 1973 Arab-Israeli war. The second was after the 1979 Iranian revolution.

Since the 1973 Arab oil embargo, the idea that oil producers might use oil as a political weapon has naturally remained a subject of considerable interest. Several recent trends have profoundly altered the situation. First, the producer states themselves (with the exception of Abu Dhabi, which has never exhibited radical tendencies)

have seen once-considerable financial reserves shrink so low that they would only cover routine government expenditures for a few months. Second, their own populations have grown considerably, so that more cash is needed to pay for basic services and extensive government payrolls. Third, oil prices (even though they may seem high in nominal price terms) stand in real terms today at well under their peak levels in the late 1970s and early 1980s because of inflation and currency fluctuations. Fourth, almost all the leading oil consuming countries have built strategic stockpiles to help counter the consequences of any short-term supply disruption.

That does not mean that any oil embargo or other supply disruption would not result in higher prices. But it does mean that the producer states themselves would suffer considerably. Saddam Hussein's unilateral oil export embargo in April 2002 was easily offset by higher supplies from other producers, leaving only Iraq to suffer the consequences. No matter who is in charge, the producer states need their oil revenues to meet the day-to-day costs of government. As a result of their own reliance on oil, these governments must remain on good terms with consumers in order to be assured of continued markets for their oil. Today, OPEC and the IEA, the Paris-based energy watchdog for the big oil consumers in the OECD, have a much better working relationship.

Consumer state security issues

For consumer states, there is a similar economic issue—and also a military consideration. In overall economic terms, oil plays a considerable role in consumer states, but it is not the sole pillar of their economies.

A prolonged supply disruption might cause price spikes, but most industrialized countries have to a degree inoculated themselves against such increases by their own imposition of high energy taxes. With the price of oil paid to producers so much lower than the price paid by consumers, the impact on the consumers would depend on whether the government increases taxes to keep up with the price hikes or decides to forego some of its take.

Where a supply shortage could really hurt is in the military's use of oil. The military, which runs very much on oil, is only at the start of a long process to see whether other fuels, such as compressed natural gas, can be harnessed to keep its tanks and trucks on the road. Though its warships can use nuclear-powered engines, its warplanes require oil-derived fuels. Preventing or combating supply disruptions remains as crucial today as it was during World War II.

Given their common dependence on oil—whether as a key fuel or as a key revenue-earner—the governments of producer and consumer countries conduct a regular and fairly extensive dialogue. Relations between Saudi Arabia and the United States have been strained by the September 11, 2001 terrorist attacks, in which a number of Saudi individuals played key roles, and by conflicting views on the Israeli-Palestinian

conflict. Yet Washington has praised the Saudi authorities for the kingdom's role in expanding oil supplies to counter actual or feared oil supply shortages during such crises as the Iraqi occupation of Kuwait in 1990–91 and the unsettled situation in the lead-up to the Iraq war, when Venezuelan production crashed in late 2002 and early 2003 as a result of a politically inspired oil workers' strike.

In June 2004, Saudi Oil Minister Ali Naimi convinced his fellow OPEC ministers to boost the group's collective production ceiling by as much as 2.5 million b/d to cool off runaway crude prices that threatened to derail global economic expansion.

What Are the Environmental Consequences of Oil Reliance?

Oil affects the environment in two main ways. It contributes to carbon dioxide (CO_2) emissions; the increase in human-generated CO_2 emissions is generally regarded as a principal cause of global warming. Oil also contributes to general pollution, including acid rain, urban smog, marine pollution, reduced biodiversity, and the degeneration of various ecosystems.

The development of petroleum resources also affects the landscape, agricultural patterns, and tourism. In sum, petroleum development and use affects a broad range of human health and activity. Energy use in general and petroleum use in particular contribute significantly to broad-based economic development with positive consequences for human health and happiness; but energy and oil also contribute to forms of pollution that lead to ill health, local environmental degradation, and, through global warming, potentially severe consequences for development in much or most of the world.

The CO_2 issue can be seen in two parts. The first is the global warming issue; the second is the highly uneven distribution of fuel-induced CO_2 emissions around the world. As of early 2004, there are few scientific organizations around the world that continue to doubt the conclusions of the United Nations' Intergovernmental Panel on Climate Change (which itself embraces the ideas of some 2,500 scientists) that a link exists between CO_2 increases in the atmosphere and changing weather conditions.

Even a large number of companies, including such giants as BP and Shell, argue that either global warming should be accepted as a reality or, on the precautionary principle, action should be taken to reduce CO_2 emissions.

The conclusion that mankind was contributing to global warming by means of CO_2 emissions fuelling a greenhouse effect was the driving force behind the Kyoto Protocol of 1997. This pact is intended, by 2010, to provide the world with a workable program for fulfilling the goal set by the United Nations Framework Convention on

TABLE 5
Tax Component of Unleaded Gasoline, FOURTH QUARTER 2001
(as a percentage of final price to consumers)

Mexico	13
USA	26.5
Switzerland	64.9
Hungary	65.4
Turkey	68.9
Netherlands	72.6
Norway	75
France	75.3
Germany	76.2
UK	78.9

Source: Energy Policies 2002, IEA Paris 2002

Climate Change, namely, cutting global CO2 emissions by 7 percent from their 1990 levels.

Implementation of the Kyoto Protocol remains the focus of the world's efforts to combat global warming. However, these efforts remain severely hampered by the refusal of the United States to ratify the protocol. In 2001, the Bush administration withdrew the United States from participation in the Kyoto Protocol, arguing that it would cause serious harm to the U.S. economy while exempting such major population centers as India and China.

The U.S. responsibility for such a large proportion of global CO2 output remains a source of considerable controversy, not least because the Bush administration's focus on exemptions secured by China and India glossed over the relative contributions of these two countries. Between them, India and China reduced their output of CO2 by 10 percent between 1995 and 1999, while the United States increased its consumption by more than 6 percent.

There are ways in which the United States could take action. One would be to increase taxes on gasoline. That would help reduce U.S. automobile use and start to redress the imbalance whereby the United States, with just 4 percent of the world's population, is responsible for more than 20 percent of global emissions.

On the issue of gasoline taxes, the United States lags significantly behind its colleagues in the industrialized world (Table 5). Even Turkey, with a per capita GDP of just $2,605 or less than one-thirteenth of the U.S. per capita GDP of $35,895 (using 2002 comparisons), considers its consumers able to pay gasoline taxes two-and-a-half times

higher than gas taxes in United States. And Turkey's rural population is scarcely less reliant on the automobile to cover vast distances than its U.S. counterpart.

While one can argue that increasing taxes would necessarily entail political consequences, the question remains whether it is necessary to impose increased taxes on fuel use to stave off even more severe environmental consequences or whether the United States might seek to improve its dire record in regard to carbon emissions by resorting to some alternative approach, such as tougher regulation of fuel emissions.

Conclusion: The Price of Oil

Oil remains important for development in general and vital for transportation. In time, this should change, but that day is probably still decades away. There is enough oil to meet current requirements, but at a cost. That cost is generally reckoned in cash. While there is a common perception that the U.S. consumer cannot bear much increase in oil costs, the rest of the industrialized world, which consumes far more oil than the United States but with greater fuel efficiency, has found its consumers can bear much higher costs for this vital product. Moreover, current costs remain highly relative. Even with the oil price hitting record levels of $50/bbl—in terms of nominal U.S. dollars—in October 2004, the true price (adjusted for inflation) was just 60 percent of the oil price peaks of 1980–81. Moreover, with U.S. incomes also rising substantially in the last quarter century, the amount a household has had to spend on gasoline has shrunk massively.

Whether the United States, or consumers anywhere else, will be able to rely on relatively cheap oil for the next few years, or decades, will depend on all sorts of factors, including the state of the world's economy and its vulnerability to acts of political or economic terrorism. But there is no need to fear a shortage of oil. There may, however, be a need to fear the environmental consequences of using too much oil between now and the arrival of a post-oil era.

4. Oil Companies and the International Oil Market

Katherine Stephan

Twenty-first century oil companies are quite different from John D. Rockefeller's Standard Oil Company, which dominated the industry in the 19th century. Today, state oil companies such as Saudi Arabia's Aramco and China's Petrochina are in the top ranks of the world's biggest oil companies. The major U.S. and European private oil companies, while declining in number, have kept competitive through a series of high-stakes mergers that began in the late 1990s.

This chapter will describe these state and private oil companies and the structure of the international oil market, and it will explain how oil is bought and sold in the international market. It will also discuss the growing trend among oil and gas companies to invest in establishing their reputations for corporate responsibility.

Changes in the International Oil Industry

Through much of the last century, the petroleum industry was dominated by the Seven Sisters, a group of three international oil companies—Exxon, BP, and Royal Dutch/Shell—and four American companies that had acquired substantial oil reserves in the Middle East—Chevron, Texaco, Gulf, and Mobil. Most were created from the U.S. Supreme Court–ordered dissolution of Standard Oil in 1911.

These companies were called "majors" because each was large enough to influence international oil supplies and prices, operated in more than one country, and were active in virtually every stage of the oil production process—from crude oil exploration to refining and distribution.

Today, the structure of the petroleum industry has changed, due in large part to wild swings in world oil prices and increased competition from smaller independents and giant national oil companies (NOCs). Another major reason for the restructuring was the poor stock market performance of the industry and the need to grow. Organic growth by discovering new oil fields became more difficult and risky so acquisitions became the way forward. Natural resources were increasingly controlled by the NOCs, a new emerging force. The sector saw several mergers in the late 1990s though 2002 that broke apart the Seven Sisters and reduced them to five integrated "supermajors," known today as the Big Five.

The size of these companies can be measured in two fundamental ways. The first is by looking at market capitalization, or market value. This tells us what investors believe a company is worth and therefore the economic clout the company wields. Market capitalization is calculated by multiplying the number of outstanding shares of a company by the current market price of one share.

The second way is to look at reserves. Oil companies that are publicly traded in the United States must file a report each year with the U.S. Securities Exchange Commission, the regulatory body for the securities industry. This report outlines to shareholders how much oil and natural gas the companies are confident they can develop and produce.

Reserve classifications made front-page news in 2004 when Royal Dutch/Shell admitted it had overestimated its proved reserves. The admission called into question the reserve reporting practices of the industry although no other big companies followed Shell in re-stating their own reserves.

There are two main reserve classifications: proved and probable. Proved reserves are volumes of oil that can be recovered with "reasonable certainty" from known reservoirs under current economic conditions, operating methods, and government

regulations, according to the Society of Petroleum Engineers (SPE). The SPE has specified a 90 percent confidence level for proved reserves. Proved reserves can be described as developed or undeveloped. All companies trading on the New York Stock Exchange are required to report proved oil and gas reserves in their SEC filings.

Probable reserves are those unproved reserves that are more likely than not to be recoverable. The SPE notes there should be at least a 50 percent probability that the quantities recovered will equal or exceed the sum of estimated proved plus probable reserves.

A third category of possible reserves are those unproved reserves that analysis suggests are less likely to be recoverable than probable reserves.

Investors look at reserves estimates to gauge an oil company's future value. How a company accounts for these reserves must be in line with SEC guidelines. Below is a glimpse of the five biggest public companies based on factors such as market capitalization, net income for 2003, and 2003 production. (Note: Barrels of oil equivalent per day or boe/d is a term used to standardize natural gas production with oil production, so companies can refer to one figure rather than two.)

Major Oil Companies

ExxonMobil: ExxonMobil is the world's largest publicly listed oil company, the result of an $80 billion merger between Exxon and Mobil of the United States in 1999. The company has the largest energy resource base of any non-NOC. Its massive scope of operations—from oil exploration and production to refining and marketing to petrochemical manufacturing— allows it unique access to investment opportunities all over the world. Its downstream (retail and refining) business requires much more oil than the company itself is capable of producing. This fact makes it, and the other supermajors, net buyers of crude oil in the market.

Market capitalization, November 2004: $316.5 billion

Net income for 2003: $21.5 billion, up 87.7% year on year

2003 production: an estimated 4.2 million boe/d in 2003, down 1% year-on-year.[I] Like with some other oil companies, production growth has fallen short of market expectations.

BP: BP started merger activity by picking up U.S.-based Amoco in 1998 and Arco in 1999. In 2003, BP took a plunge into the Russian market, agreeing to pay $6.8 billion for a 50 percent stake in TNK-BP, a newly created major that combined the Russian assets of TNK, Sidanco, and BP.

Market capitalization, November 2004: $215.3 billion
Net income for 2003: $10.3 billion, up 50% year-on-year
2003 production: 3.6 million boe/d, up 3% year-on-year. Output is expected to grow another 22% in 2004, with TNK-BP contributing an additional 500,000 boe/d.[2]

Royal Dutch/Shell: Royal Dutch/Shell is an amalgamation of two companies: Royal Dutch Petroleum of the Netherlands and Shell Transport and Trading of the UK. Although it operates like one company, its stock ownership structure is not the same as that of, for example, ExxonMobil. This Anglo-Dutch giant is the world's third largest publicly traded oil company by market value. It shocked investors in 2004 when it announced it had overstated its proved petroleum reserves and would cut 3.9 billion boe from its base. The company also admitted it had been inflating its reserve base since 1996, news that forced Chairman Sir Philip Watts to resign. The major has been less successful at replacing its reserves and has the lowest reserve life of the Big Five.

Market capitalization, November 2004: combined $108.5 billion
Net income for 2003: $12.5 billion, up 32.7% year-on-year
2003 production: 3.9 million boe/d, down 2% year-on-year [3]

Total: Known today as Total, the company was created through two mergers: the first between France's Total and Belgium's Petrofina, which created Totalfina; the second in March 2000 between Totalfina and France's Elf Aquitaine. Growth has been a key feature of the company's strategy. Unlike many of its peers, it met its 2003 stated volume expectations and predicts production growth through 2005.

Market capitalization, November 2004: $127.5 billion
Net income for 2003: $8.8 billion, up 41% year-on-year
2003 production: 2.53 million boe/d, up 4% year-on-year [4]

ChevronTexaco: Chevron merged with Texaco to create the second largest U.S. major based on market capitalization and proved reserves of 12 billion boe. It is the world's fourth-largest major based on oil reserves and production of 2.5 million boe/d. The company has not given any firm production growth estimates but sees flat production through 2005. (In May 2005, the company shortened its name to Chevron.)

Market capitalization, November 2004: $112.1 billion
Net income for 2003: $7.2 billion, up 539% year-on-year
2003 production: 2.5 million boe/d in 2003, down 3% year-on-year[5]

Aside from the Big Five, ***ConocoPhillips*** ranks sixth. The 2002 merger of Conoco and Phillips Petroleum created the third largest U.S. major and world's sixth largest company in terms of reserves.

Market capitalization, November 2004: $57.7 billion
Net income for 2003: $7.8 billion, up 83.7% year-on-year[6]
2003 production: 1.6 million boe/d, up 49% year-on-year[7]
Oil and gas production has been declining. Production in 2004 is expected to be flat.

Additionally, new Russian companies such as Lukoil, Yukos, and Sibneft have emerged as a significant counterweight to the Big Five. Though these companies are comparatively undervalued, they have large reserves and sizable production levels. They are privately owned or partly privatized. Russia exported 49.19 million metric tons (4 million b/d) of crude to the West in the first quarter of 2004, up 18.1 percent year-on-year.

But the Kremlin began in late 2003 to put pressure on Yukos and to a lesser extent Sibneft, two companies that sprouted out of the Russian privatization process of the 1990s. The Kremlin's actions threaten the growth of these companies. An attempt to temper bankruptcy pressures and cover back taxes resulted in the December sale of Yuganskneftgaz, the unit that produced 60 percent of Yukos's output. Nevetheless, the assault on Yukos has been widely blamed for Russia's recent economic slowdown.

Building Reserves

The key challenge for these titans in the coming decade will be replacing their reserves in order to maintain output levels and meet world demand for oil, estimated by the International Energy Agency to grow nearly 2 million b/d in 2004, the highest year-on-year rise since 1988. Companies can either find and develop reserves independently, or acquire those already discovered by others through mergers and acquisitions.

Securing reserves is a tricky task in countries that guard their resources closely and are reluctant to cede control. However, the number of countries that have opened their doors to foreign exploration grew considerably in the 1990s, and most countries are now open to some degree. But access to the oil and gas wealth of the Middle East Gulf, which has most of the world's oil reserves, is limited.

Saudi Arabia, the world's largest oil producer, allows outside development of gas reserves, but only Saudi Aramco, the state oil company, has access to the kingdom's 261 billion barrels of proven reserves, the world's largest. Though foreign investors are obviously attracted to the kingdom's vast reserves, Saudi Arabia had problems finalizing contracts for its gas initiative two years ago. The June 2003 collapse of the $25 billion ExxonMobil-led consortia to develop two of the core ventures in the gas initiative led to a watered-down version.[8] ExxonMobil and all other U.S. companies are absent from the deals because the companies and the government could not reach agreement over rates of return and access to gas reserves.

In non-OPEC Mexico, a strong resource nationalism prohibits direct ownership of upstream assets, much to the chagrin of President Vicente Fox, a free market supporter who has been frustrated in his attempts to allow foreign investment in the country's oil and gas assets to expand production capacity. Five multiple service contracts (MSCs) awarded in late 2003 effectively opened Mexico's gas sector, while preserving the legalities of state control. The MSCs were supposed to raise production and attract $8 billion in investment from firms signing production contracts with Mexico's state oil company Pemex. But two of the largest oil blocks went unclaimed in the first round of negotiations because of concerns about the restrictive contracts and narrow margins.

Nevertheless, Pemex will enjoy an increase in production, albeit smaller than originally envisioned. Carlos Morales, head of Pemex's exploration and production business, while admitting that the MSCs need refining, feels that 2005 will be the year of construction and 2006 the year of production.

National Oil Companies

As Saudi and Mexican examples show, despite all the efforts oil majors make to gain and maintain clout, it is often the government, through the NOC, which has ultimate control of a country's natural resource base. The exploration, refining, and sale of oil in many countries remain firmly in state hands.

Often the NOC is regarded as a symbol of national sovereignty and is the single most important contributor to a government's budget. Government officials often try to maximize the revenue from the NOC to offset political pressures. As a result, the

NOC is unable to retain enough of its earnings to finance needed investments, despite the fact that it controls the reserve base. In Nigeria, for example, more than 80 percent of government revenue is derived from the sale of crude oil.

The strategies of the NOCs vary depending on the role they play within a country and the relationship they have with the government. A growing number of them are now focused on achieving commercial performance, but have struggled to stay at the forefront of technological change. In recent years, NOCs increasingly have courted independent companies, as well as their investment capital and technology, in order to upgrade and increase access to export markets.

Some of their efforts have paid off. In its ranking of the world's 50 largest listed energy companies by market capitalization, Washington, D.C.–based consultant PFC Energy found that Asian NOCs lead the pack in 2003 returns. Topping the list were PTT of Thailand, PetroChina, Sinopec of China, and ONGC of India. These companies benefited from high oil prices and regional economic recovery. Brazil's Petrobras also came in among the highest.

Production-sharing Agreements

Often national oil companies have exclusive rights to make concessions in the form of legally binding contracts with foreign oil companies to explore for and develop portions of the country's reserves. These contracts fall under many descriptions, including production-sharing agreements (PSAs) and production-sharing contracts (PSCs). Governments usually award oil blocks to independent companies through a competitive bidding process, though often they are negotiated on a one-to-one basis.

Under a PSA, a foreign company, or a consortium of companies, typically finances the costs of exploration and risks losing its investment if no oil is found. Companies are rewarded for taking this risk by receiving a share of any oil that is discovered and produced.

A government can take its reward in several forms. The most common method is by taking a signature bonus, a payment made up-front by an exploration company when it agrees to develop an area for oil. Companies pay a signature bonus regardless of whether they actually find oil. These payments are proportional to the expected value of the project. They are a common means of providing the government with an immediate benefit while demonstrating a firm commitment by the company.

If oil is found, a government can take its reward by retaining a portion of the oil production, receiving taxes on production or profits, or obtaining royalties.

Advantages to working with NOCs

Partnering with an NOC is essential for foreign companies wanting access to reserves.

A modern NOC can do more than copy the profit structure of a major international oil company. It can have strategic goals that include commercial and noncommercial operations. It can also have a clear understanding of how to make trade-offs between these goals. Statoil, which is partially owned by the government of Norway, has used its hybrid status not only to access reserves in other countries but also to build relationships between those countries and other foreign firms.

Challenges to working with NOCs

A lack of transparency may be the biggest challenge to working with NOCs, because the state companies are often reluctant to provide important financial and operational information, making it difficult for foreign firms to assess and evaluate their financial health.

Problems arise when there is a lack of transparency surrounding a foreign firm's payment of legitimate fees and royalties, allowing NOC and government officials the opportunity to divert funds. Payment disclosure is routine in developed countries. The very fact that payments are kept confidential in many developing countries raises concerns about the potential for revenue misappropriation. In Angola, for example, more than $4 billion of state oil revenue was lost between 1997 and 2002, according to a report by Human Rights Watch.[9]

Funding can also be an issue. Some NOCs are responsible for funding their share of the costs, despite the fact that they may not receive government funds to do so, thus slowing up projects. In other instances, government funds fail to improve performance. The Nigerian government's $400 million investment in its Kaduna and Port Harcourt refineries over the last six years has not significantly improved refining performance, weakening government attempts to privatize the refineries as investors are put off by the decrepit state of the plants.

Environmental, social, and human rights violations also present daunting challenges to investors. (For more on these issues, see chapter 7.) NOCs and international oil companies alike are often seen as not doing enough to provide for impoverished local communities affected by their operations. Communities frustrated by the lack of benefits, and sometimes environmental damage, have turned to violence against the companies and government. Strong criticism and even action have come from stakeholders such as managers, employees, suppliers, and local communities. In Nigeria, ChevronTexaco admits that it has reduced production by about 140,000 b/d because of local protests and sabotage.[10]

Production is often hampered by crumbling infrastructure, political winds, and smuggling. Because many NOCs do not have the money to maintain and upgrade equipment regularly, oil production is sometimes sporadic. A country's political climate

can also affect production flows. In Algeria, for example, legislation that would boost national oil output was recently sidelined after labor unions protested. The law would have taken away state-run Sonatrach's regulatory role and forced it to compete with foreign firms in bidding for exploration projects.[11] In Venezuela, an oil workers' strike in early 2003, aimed at overthrowing President Hugo Chavez's government, resulted in the loss of about 10 percent of the country's production capacity.[12]

Smuggling generally increases when oil prices are high. Governments often patrol international waters looking for vessels suspected of carrying contraband. In Nigeria, the theft of crude oil from vandalized pipelines is common.[13]

A sound national fuel price policy normally requires the elimination of fuel subsidies, but such a move can, and has, set off domestic revolts. Subsidy schemes and lack of fuel-price harmonization with other countries can lead to corruption, smuggling, and shortages. Fuel smuggling has increased in recent years from Angola into neighboring African countries, where fuel prices on average are much higher than in Angola, according to German Technical Cooperation, which surveyed fuel prices in 165 countries using a standardized methodology. The report also showed much of Iran's below-cost diesel has been smuggled into Afghanistan, with contraband fuel profits going to local warlords.[14]

Bureaucracy presents another hurdle. NOC activities are often controlled by several state agencies, making it difficult for them to push through decisions. Many agencies must have prior approval from the energy ministry or even the country's ruler before negotiating or signing contracts.

Reputation and Corporate Responsibility: Public-Private Partnerships

Human rights organizations have long criticized the oil industry for signing agreements with governments that thwart human rights protections. Additional concern over the negative environmental and social impacts of oil operations has exposed the vulnerability of companies to being held accountable for their conduct, regardless of geographic lines. How they handle crises can increase or decrease damage caused to the company's reputation, a valuable "soft" asset.

To stem criticism and protect profits, companies are investing in what have been traditionally considered noncore business areas. "Sustainable development" and "corporate responsibility" are popular buzzwords companies use to describe these types of activities.

For example, Royal Dutch/Shell plans to invest in two sustainable development projects in Nigeria. The company will donate $15 million to fund agriculture and malaria projects and another $3.4 million to fight malaria and infant mortality. Both projects

will enlist the help of the U.S. Agency for International Development. The Shell Petroleum Development Company Joint Venture (SPDC JV) has also contributed $54.5 million to President Olusegun Obasanjo's Niger Delta Development Commission, created in 2000 to promote sustainable development in the region.[15]

BP took the unprecedented step of creating a human rights assessment for its proposed $2 billion Tangguh liquified natural gas project in Indonesia. Based on the Voluntary Principles on Security and Human Rights framework, the report outlines concrete steps that BP can take to address local community issues related to fundamental land rights, natural resources, cultural rights, and religious rights.[16]

BP also took a lead in addressing human rights concerns in the $3.6 billion Baku-Tbilisi-Ceyhan oil pipeline project, which is to deliver crude oil from the Caspian Sea to the Mediterranean via Georgia. The line, which authorities in early 2005 reported was 93 percent completed, would allow BP and its consortium members, to ship crude from the Caspian to Western markets, avoiding shipping bottlenecks at the Bosporus Straits.

Some countries have policies that ensure involvement of local companies in oil projects. In Nigeria, the government made it mandatory for foreign oil companies participating in tenders to include evidence of plans for enhancing local competence and training local residents to work in the industry. Brazil, Angola, Russia, and Iran also have made local business development and employment a priority in their dealings with foreign oil companies. Companies often provide scholarships to educate locals at Western universities specializing in petroleum engineering and geology. ChevronTexaco recently sent a team of Iraqi oil engineers to the United States to learn the latest technological advances.

International agreements and evolving legislation on corruption have also changed the ways companies do business, although they have a less direct impact on corporate behavior than national laws and regulations. The United Nations Global Compact is a voluntary program that brings companies together with governments, labor, and environmental organizations to encourage good corporate citizenship. The initiative is based on nine principles in the areas of human rights, labor, and the environment. The group agreed in January 2004 to add a tenth principle based on transparency and anticorruption. While Amnesty International, Human Rights Watch, and other NGOs initially welcomed the global compact, they now question its effectiveness because the pact is voluntary, its standards are unclear, and no monitoring or enforcement process exists.[17]

An early proponent of greater transparency, economic growth, and social equity while also protecting the environment was former Norwegian Prime Minister Gro Harlem Brundtland, who in 1983 chaired the UN's World Commission on Environment and Development. Also known as the Brundtland Commission, the commission released

the 1987 Brundtland Report, *Our Common Future*.[18] The report defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

In the area of human rights, most oil majors today subscribe to the Voluntary Principles on Security and Human Rights to guide their projects. Signed in 2000 by the United States and British governments, it is a nonbinding agreement that outlines ways for companies to respect the human rights of local communities and also meet security threats to their operations.

In the area of revenue transparency, the Publish What You Pay campaign (see appendix) has gained the most traction among companies and governments alike. Launched in 2002 by a coalition of NGOs and backed by international financier and philanthropist George Soros, it is a movement among over 200 international NGOs that seeks to make public how much energy companies pay to host governments in order to hold the governments accountable for their use of the funds. The campaign urges companies to publish all payments as a condition to being listed on international stock exchanges. The Global Reporting Initiative is an international standard-setting organization that has developed guidelines for companies to voluntarily report the economic, environmental, and social impacts of their operations. The number of oil companies that call themselves "GRI reporters" has doubled to 20 in the last year.

The Extractive Industries Transparency Initiative (EITI), launched by British Prime Minister Tony Blair at the 2002 World Summit on Sustainable Development, encourages companies, governments, and NGOs to work together voluntarily to promote revenue transparency (see appendix on EITI). In May 2003, a group of institutional investors representing about $3 trillion issued a statement in support of this initiative. Nigeria, labeled by Transparency International as one of the world's most corrupt countries, jumped on the bandwagon early to launch its own transparency program. Angola, which initially resisted signing the EITI, in mid-May disclosed the $300 million it received from ChevronTexaco to extend an oil production concession and pledged to sign the EITI "shortly."[19]

Markets

British North Sea Brent crude and the U.S. Gulf crude West Texas Intermediate (WTI) have for years served as the benchmark grades for the sale of the bulk of the world's oil. Ironically, though production of both grades has been falling, most of the world's largest producers prefer pricing their oil through a differential to these benchmarks rather than setting their own prices.

Companies can purchase oil in several ways: under long-term contracts with producing countries, on the spot or cash market, or by taking physical delivery of contracts bought on the main futures market, the New York Mercantile Exchange.

By far the most active market in global oil is Nymex and its smaller London-based cousin, the International Petroleum Exchange (IPE).

A futures contract allows parties to buy or sell oil at a specified price for delivery in the future. WTI is among the crudes traded as light, sweet crude futures on Nymex, which also hosts futures contracts for gasoline, heating oil, and natural gas futures. Together, these commodities are called the petroleum complex. Brent crude oil, gasoil (a middle distillate used in home heating), and natural gas futures are traded on the IPE. As open markets where large numbers of potential buyers and sellers compete for the best prices, these exchanges effectively discover and establish competitive prices.

Oil-producing countries

Much of the oil traded on the global market is produced by the Organization of the Petroleum Exporting Countries (OPEC), although the group's share of world output is declining, mainly because of self-imposed production quotas. OPEC is comprised of 11 oil-producing nations that try to use their collective production weight to influence world oil prices. Current members are: Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.

Russia, Canada, Mexico, and Norway are the largest non-OPEC oil exporters, while the United States is the third largest producer, after Saudi Arabia and Russia.

OPEC pricing policy

Since March 2000, OPEC has adjusted its production levels to keep prices within its target range of $22–$28 per barrel for the so-called OPEC basket, the average of seven different crude grades. But changing circumstances including the weakness of the dollar—the common currency of oil trade—and rising domestic demands for higher revenues has led OPEC to allow even higher prices. The OPEC basket averaged well above $30/bbl in 2004, much to the chagrin of consuming nations. Some of OPEC's price hawks are advocating an increase in the $22–$28/bbl target price.

Even though crude prices consistently set record highs in 2004, some OPEC oil ministers are concerned that sending too much crude on the market now will come back to haunt them. Saudi Arabia boosted its own production some 600,000 b/d to 9.1 million b/d in June 2004 but other OPEC members, mainly due to their own capacity constraints, did not follow suit.

Information Sources on Oil Companies

Private Oil Companies

When covering company decisions and strategies, it is helpful to start with the annual report, which is often available on the company's website. Alternatively, the company's investor/external relations department can mail a copy.

- In the annual report, you will find a summary of the company's various businesses and factors that impact performance. In this summary, companies are required to talk about any trends that will influence returns to the shareholder. The most important financial details of the annual report are found in the income statement, the balance sheet, and the statement of cash flow.

- Outside of the annual report, you can analyze a company's 10K Form, a more detailed version of an annual report that a company files with the SEC at the end of its fiscal year. You can find 10K's by using the Edgar section of the SEC's website (www.sec.gov). 10Q forms are quarterly statements that companies file with the SEC within 45 days of the end of the quarter. Listed companies will also post presentations on their websites outlining investment strategies.

- When determining the performance of an oil company, there are various criteria. For financial comparisons, look at capital expenditure; cash flow; dividends in relation to cash flow; downstream assets; downstream investment; downstream revenues; long-term debt in relation to total debt; market capitalization; net income in relation to revenue; net profit per employee; operating profit; return on assets; return on equity; shareholder equity in relation to total assets; shareholders return; share price volatility; total assets; total investment spending; total revenues; upstream assets; upstream investment and upstream revenues.

- For upstream comparisons, examine total production and production by region; reserves; reserves in relation to production; oil output versus total oil and gas output; crude production in relation to refining capacity and upstream operating profit per barrel of output.

- When it comes to downstream comparisons, a number of interesting observations can be made by looking at growth in refined product sales; market share by region; number of refineries; percentage of product sales in main area; percentage of total refining capacity in main area; product sales by region; refining capacity by region; refining market share by region; retail outlets worldwide; total product sales; and refinery capacity utilization rates.

- Most oil majors today also issue corporate responsibility or sustainable development reports that outline the ways they are meeting the environmental and social concerns of their stakeholders.

National Oil Companies

- Although national oil companies are more difficult to access, most have websites with contact information.

- Follow-up phone calls can be made to a company's investor relations department, analysts at brokerage houses who watch the company, and major shareholders. Daily, weekly, and monthly analyst reports are often distributed to journalists via email.

- Request interviews with company executives in charge of downstream or upstream operations, senior financial officials, or marketing and sales executives.

- Monitor daily production levels and calculate revenues by multiplying export volumes with average prices. Though official production levels are often not entirely accurate, or in some cases inaccessible, many energy publications and international news agencies publish monthly estimates of production figures for most of the world's producers. OPEC also provides a monthly report on its own members' daily production, based on secondary sources or journalists.

- You can also find analysis at research institutions and consultancies specializing in energy, including the Oxford Energy Institute, Royal Institute of International Affairs and Energy Intelligence, and PFC Energy. Though many charge for their research, a limited amount of information is available free of charge on their websites.

5. The ABCs of Petroleum Contracts: License-Concession Agreements, Joint Ventures, and Production-sharing Agreements

Jenik Radon

It is in the interest of natural resource–rich countries to use their resources to obtain funds for social and economic development. To do so, many governments enter into contracts with foreign companies to develop and sell their oil or gas. Negotiating the right contract is vital to a government's efforts to reap the benefits of its natural resources.

This chapter will focus on the different types of contracts that are standard in the industry while also addressing the important public interest concerns that are too often neglected in contract negotiations. By reporting on these issues, the media can help inform public debate about what kind of contracts are best for their country.

Governments have three options to develop their natural resources: They can create state companies for exploration, development, and production, as in Saudi Arabia, Mexico,

Venezuela, Iran, and Oman. They can invite private investors to develop the natural resources, as in the United States, United Kingdom, Russia, and Canada. Or they can use a combination of these two systems, as in Indonesia, Nigeria, Azerbaijan, and Kazakhstan.

Contract terms determine how much a producing nation earns from its natural resources, and often, whether a government will have the regulatory authority to enforce environmental, health, and other standards that apply to the contractors.

A government is expected to use its regulatory power to protect the public interest—to ensure, for example, that oil spills don't damage public drinking water. Yet a host government is also expected to create a positive investment climate that promotes economic and job growth while establishing investment laws and penalties for their violation. Host governments need to learn how to balance these competing needs.

Further complicating matters is the fact that as a signatory to any contract, the government acts like a normal business seeking to maximize its revenues. This places the government in the awkward situation of having to regulate itself. Governments of resource-rich developing countries also face the challenge of negotiating with major oil companies, which have the advantage of employing hundreds of well-skilled legal representatives.

Another reason to focus on contracts is the opportunities for corruption that exist in the huge investment costs and vast profits involved in most energy deals. Because normally so little information is made public about negotiations and contract terms, there is potential for abuse on both sides of the table. Companies bidding for potentially lucrative deals have sometimes made illegal payments, often disguised, to government officials or their representatives to curry favor. It is difficult to determine whether a particular company was chosen for its competitive bid or competence, or its close relationship with a government official. If the government official is also the regulator, the opportunity for corruption is even greater. Criminal investigations involving this kind of corruption have been pursued in Angola, Congo-Brazzaville, Kazakhstan, and elsewhere.[1]

Oil Contracts

Though contracts can vary widely in their details, all must establish two key issues: how profits (often called "rents") are divided between the government and participating companies and how costs are to be treated.

What complicates negotiations is the high level of uncertainty caused by incomplete or even faulty information. Typically, neither the oil company nor the host government knows with certainty at the time of signing the contract how much it will cost to explore and develop a field, whether future oil or gas prices will justify that cost, or how much oil or gas there is in a field. Nine out of ten exploration efforts result in a loss.[2]

Companies will seek to protect themselves against possible losses, which drive up investors' internal costs. Contract negotiation requires skillful bargaining to find a reasonable and mutually acceptable balance between the interests of an investor and a government. Often, host governments turn to international financial and legal experts to advise them during these negotiations.

One of the first decisions that governments must make is to select the type of contractual system it will use to establish the terms of the development process: a concession or license agreement, a joint venture (JV), or a production-sharing agreement (PSA).

Each form of contract has its advantages and disadvantages, especially from a commercial point of view. The details of the contract can vary greatly even between similar types of contracts. To add to the confusion, the provisions of license-concession agreements and PSAs have also come to resemble each other. Governments and investors should release the terms of their agreements. If they decline to do so, questions need to be raised about the need for confidentiality since there is no intrinsic reason why such agreements should be kept from the public.

Concession or license agreements

Concession or license agreements have evolved considerably since their introduction in the early 1900s as one-sided contracts when many of the resource-rich nations of today were dependencies, colonies, or protectorates of other states or empires.

The modern form of such agreements often grants an oil company exclusive rights to explore, develop, sell, and export oil or minerals extracted from a specified area for a fixed period of time. Companies compete by offering bids, often coupled with signing bonuses, for the license to such rights. This type of agreement is quite common throughout the world and is used in nations as diverse as Kuwait, Sudan, Angola, and Ecuador.

Advantages: The advantages from a developing country's point of view are substantial. First, licenses or concessions are more straightforward than other types of agreements, especially if a public bidding system is used to set basic terms. The degree of professional support and expertise required is often less complex than that needed to negotiate joint ventures or production-sharing agreements. Yet sound financial advisers are still needed to structure the concession bidding system. An acceptable and reliable legal infrastructure, including a judiciary capable of interpreting complex agreements, is also necessary. With a well-developed legal system, as in most industrialized countries such as the UK, Norway, and Canada, a license or concession agreement can focus on the commercial terms without the burden of devising contractual provisions to fill in gaps in the legal system of the host country.

The financial and other terms of the license are set forth in an agreement draft-

Questions about License or Concession Agreements

If your government has entered into a license or concession agreement, there are a number of questions you can pose to better understand the situation. Some of these same questions are also applicable to JVs and PSAs.

- If the tender terms have not been made public, ask government officials for this information and also ask why the terms were kept secret.

- How long is the concession valid? How many companies bid? What has the successful bidder agreed to pay? Which outside experts advised the government in designing the concession license?

- How long is the work program and how much has the bidder agreed to invest? What environmental standards will be adhered to and what agency will police compliance with these standards? Will any residents be relocated to make way for the natural resource development?

- How will the proceeds be shared between the central government and the local governments?

Questions for Companies

- How much will be paid for the concession and to whom? Will the terms of the concession agreement be made public? Will company officials publicly confirm that they have not paid, in cash or in kind, any government official or his family or friends for the concession? What are the criteria for choosing local subcontractors?

ed by the host government which should then be published and opened to a bidding process by competing companies. The successful bidder pays the bidding price—usually the license fee and/or signing bonus—and these fees are kept by the host government regardless of whether oil is found and commercial production takes place.

If commercial production occurs, the host government also earns royalties based on gross revenue and/or a profit tax based on net income, both of which are based on the quantity of production and the price at which the production is sold. All financial risks of development, including the costs of exploration, are absorbed by the successful bidder. In short, there are few serious financial or other drawbacks for the host government, other than the loss of opportunity or the loss of time if the bidding system does not attract an acceptable, financially strong, and technically competent bidder.

Disadvantages: The main disadvantage from a developing country's point of view, as well as from a bidder's perspective, is commercial. There is normally a lack of adequate knowledge about the potential of a concession area because seismic exploration has not been fully undertaken. The result is that the bidding system is often simply an auction.

Oil companies have no choice but to take calculated risks about what price to bid for a license. A company will be cautious in the amount it is prepared to bid since there is no guarantee the concession will cover the company's costs and return a profit. Where knowledge and facts are inadequate, the host government will not maximize its potential return from an auction system. Since the bidding documents specify a minimum work program—a prescribed period of time within which to make the corresponding investments or run the risk of forfeiting the license—potential bidders will naturally be more judicious and conservative in their offers.

For more information about concessions, refer to Box 1 at the end of this chapter.

Joint ventures

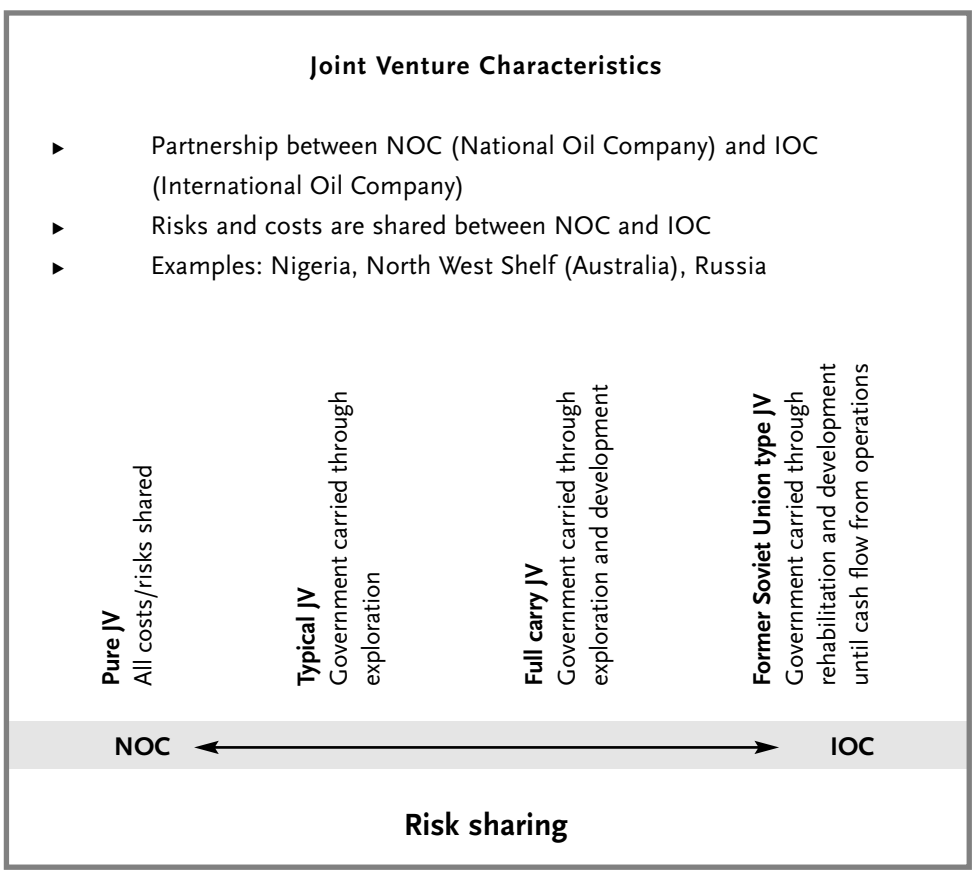
Joint ventures (JVs) defy ready explanation and definition because there is no commonly accepted definition or meaning. A JV simply implies that two or more parties wish to pursue a joint undertaking in some still to be clarified form. A "joint venture can be best understood by comparing it to a modern-day marriage. . . . There is a courtship period. . . . Parties to a joint venture need to know and understand each other's goals, interests and ways of doing business. Without such understanding, it is impossible to draft a workable prenuptial agreement (i.e., the joint venture agreements). . . . The low success rate of modern-day marriage applies equally to corporate joint ventures."[3]

Given the open-ended nature of this type of structure, it is not surprising that JVs are less commonly used as the basic agreement between an oil company and a host government. Nigeria was an exception: The national oil company favored this format

until it could no longer meet its share of the JV's financial commitments. Now, new agreements in Nigeria are mostly PSAs.

It is in the nature of the JV that the list of issues to resolve is long. Because a JV demands that the parties do things jointly, by not resolving material issues prior to entering into a JV, the parties only postpone a potential disagreement or a stalemate, especially if a JV is a 50–50 deal. JVs require painstaking negotiations over an extended period of time to ensure that all matters are thoughtfully addressed and that the parties agree on how to work with each other.

Advantages: The only advantage of a JV for a government is that it is not alone in the decision-making and responsibility for a project. It can count on the expertise of a major oil company. It will also share the profits, on top of any other remuneration like taxes or royalties.



Disadvantages: Sharing has a downside. Risks and costs must also be shared, making the host government a direct and responsible participant in the natural resource extraction. Responsibility also brings with it potential liability, including for environmental damage.

TIP SHEET

Questions about Joint Ventures

The mere introduction of the term "JV" should provoke journalists to question government and oil company officials.

- What is the exact purpose of the JV? Is it for exploration, development, and/or operation?
- What will each party contribute, e.g., cash, know-how, and/or management? What will each party receive? What is the responsibility of each party, e.g., operation, sales, and/or government coordination?
- How long is the JV to remain in existence? What are the agreements that constitute the JV—e.g., establishment agreement, which sets forth the JV governance provisions; operating agreement which sets forth, among other things, how the oil field operations are to be managed?
- How is the JV to be terminated or dissolved? Can one party take over the rights of the other party, and under what circumstances?
- Why was a joint venture format chosen? The decision to use a JV demands an explanation, if not a justification, of why the host government has agreed to assume and accept the sharing of risks, and the consequent financial liabilities. Every term of a JV is freshly drafted and negotiated; full scrutiny is required of almost every single provision.
- What is the government receiving in exchange for taking on these extra risks and liabilities?

The main disadvantage is that the JV format is inherently ambiguous. It can complicate and intensify negotiations. A JV offers no natural advantage over any other form of agreement and will probably require more extended negotiations. In short, a JV will require much more legal advice from experts in petroleum contracts, which will cost the government and companies more. In addition, JVs take a long time to negotiate.

Production-sharing agreements

The production-sharing agreement (PSA) was first used in 1966 in Indonesia. Even though Indonesia had proclaimed its independence in 1945, foreign oil companies' activities were still based on the Indische Mijnwet, the mining law of the Dutch colonial period.[4] As nationalist sentiment grew, this license concession method was discredited as a legacy of imperialistic and colonial periods. The government refused to grant new concessions and introduced the "Indonesian formula," now widely known as the PSA, in which the state would retain ownership of the resources and negotiate a profit-sharing system. At first, foreign companies firmly resisted this change, afraid it would create a precedent that would affect their concessions elsewhere. However, independent companies entered into PSAs and the majors had no choice but to follow.[5] PSAs spread globally and are now a common form of doing business, especially in Central Asia and the Caucasus.[6]

The PSA recognizes that the ownership of the natural resources rests in the state but at the same time permits foreign corporations to manage and operate the development of the oil field.[7]

Under a PSA, an oil company carries most financial risks of exploration and development. The state also faces some risk. Often the national oil company joins the consortium as an interest holder in the PSA, contributing some of its profits as "share capital" to the consortium that is developing the area granted under the PSA. Often the host government has the cost of its initial contribution "carried" by the other companies. This carried cost will be repaid to the companies from the host government's future profits under the PSA.

If the government does not agree to contribute to the share capital, then the oil companies will try to negotiate a greater share. The exact split is a result of hard bargaining since there are no scientific determinants of what an appropriate or reasonable split should be.

The financial terms of the PSAs are similar to those of the license agreement, although the differing structures may lead to different commercial results. The host government often earns a signing bonus, although this is regularly waived or traded for a greater share of future profits. The oil company is first entitled to cost recovery for both current operating expenses, expenses for materials consumed or used in the year in which they were acquired, and capital investment—expenditures for assets such as buildings,

PSA Characteristics

- Started in Indonesia in 1960
- Work commitment
- Bonus payment
- Royalties
- Recovery of production costs (Cost Oil)

Profits – Cost Oil = Profit Oil

- Profit oil split between company and host country
- Overall share of the host country depends on bargaining
- Developing countries now prefer PSAs

equipment, and computers, which have a longer shelf life. Cost recovery for current expenditures is immediate, in the year in which the expenditure is incurred, and cost recovery for capital investment is spread over a number of years. There are gray areas, where accountants can reasonably reach different conclusions as to whether certain items, such as books and tools, should constitute an operating expense or a capital cost.

What remains after companies have used annual earnings to repay themselves for their operating expenses and their capital investment, as depreciated in that year, is then shared according to the agreed percentage division with the host government.[8] The foreign company is required to pay taxes on its share, but these are often waived by the host government and included in the company's portion of the agreed percentage split.

PSAs have developed in such a way that today there are many different versions resembling each other only in the basic concept of sharing. This variation is not surprising as they are a product of intense negotiations and the concerns and interests of each party naturally differ with the circumstances.

The complexity of a PSA depends on the soundness of the legal infrastructure of a state. For example, if a country does not possess basic rules governing petroleum operations, the issues normally covered by such a law will have to be addressed in the PSA. In short, the less reliable and/or predictable a state's legal system the more issues must be covered and specified within a PSA.

Advantages for a host government: All financial and operational risk rests with the international oil companies. The host government does not risk losses other than the

Bonuses

- **Signature bonus**
  Paid upon contract signing
- **Discovery bonus**
  Paid upon first discovery
- **Production bonus**
  Paid when production reaches a specified level
  - Unpopular with oil companies
  - Oil companies prefer higher income taxes

cost of the negotiations (mainly fees paid to advisers). At most, the host government loses an opportunity but suffers no material loss if an exploration or development project fails. Should a project not be pursued in accordance with the terms of an exploration or development program, a government can still, if the PSA is drafted well, cancel or terminate the deal or bring in another oil company. A host government has the added advantage that it shares any potential profits without having to make an investment, unless it agreed to do so.

If the PSA is enacted into law, it provides legal security for international oil companies—a novel approach used by Azerbaijan and other former Soviet republics. But from the point of view of a government, such an approach turns a contract, which is a flexible instrument that can be changed simply by the parties, into an "inflexible" law, which can only be amended with the approval of parliament. In many cases, the PSA is superior to, or trumps, all other present and future laws with respect to the matter addressed in it. The result is that the government effectively surrenders its right to adopt new laws and regulations in the public interest if such laws or regulations should adversely impact any rights of the oil company under the PSA.

Disadvantages for a host government: The theoretical flexibility of the PSA as an all-in-one document is also a disadvantage. It puts a premium on very professional negotiations and the government having access to technical, environmental, financial, commercial, and legal expertise. In structuring the financial provisions, the government must undertake to assess the reserve potential of the oil fields, even though accurate information may not be readily available. In fact, a host government often has considerably less data and technical and commercial knowledge than the oil companies.

Most importantly, if the host government will obtain a significant portion of its share or compensation directly through profits, the PSA puts the government in con-

flict with itself. It has to balance the desire for higher profits with the enforcement of environmental and other regulations. The cost of environmental compliance cuts into profits. Also, the lower the amount of a company's profits, the less taxes it will pay to the government. However, through the terms of the PSA, the host government is at least passively a decision maker in the development of the oil fields.

At the same time, a host government has granted oil companies, through the PSA, a say in the enforcement of environmental and other standards, when these standards have been incorporated as contractual provisions. A contractual provision can be more easily contested, and even violated, than a statute or regulation. The reason is simple. Breaching the provisions of the PSA, even an environmental provision, is only a contractual violation. The violating party will normally be required only to rectify the breach, perhaps even pay damages. Only if a serious or material breach has occurred is termination of the agreement a possibility.

Moreover, a breaching party could argue that its breach came as a direct result of the action or inaction of the other party. A breach of a contractual provision is an extension of the contract negotiation process, a renegotiation, albeit more acrimonious. By contrast, the violation of a legal statute is an offense, subject to legislatively approved sanctions and penalties and even pubic condemnation. A contractual breach is a private affair.

In addition, if a PSA has been enacted into law by a country's parliament, it limits the flexibility of both parties and any changes require parliamentary approval. As the PSA is also a contract, ambiguities will have to be mutually settled by the government and the oil companies. By making the PSA a law, as well as a contract, the government has in part transferred some of its responsibilities to the oil companies and surrendered considerable flexibility.

Furthermore, making contracts into law creates a legal infrastructure of one-off, exceptional situations; the investment climate of a nation suffers accordingly. By adopting PSAs into law, Azerbaijan has little possibility of developing a coherent and comprehensive legal system because the PSAs will remain exceptions to any more general or principled laws. In short, the PSA is a form of positive legal discrimination or favoritism for the oil companies. Other investors, whether in tourism, banking or large-scale agriculture, will invariably lobby the host government and parliament for similar special treatment. The net result is legal confusion and a general disrespect for the law.

The government's take

Many contracts require companies to pay the host government a signing bonus. Subsequent bonuses may be contingent on reaching certain stages of exploration or development.

Local investment provisions in a contract may actually be quite costly for a host country because oil companies will request concessions in the PSA for this form of pri-

Government Take in Onshore and Deep Water Conditions[9]

(expressed in percentages)

Country	*Onshore*	*Deep water*
Portugal	43.2	39.7
State of Louisiana	69.3	47.2
Thailand	67.0	57.5
Nigeria	84.8	64.2
Malaysia	89.4	68.1
Indonesia	89.8	81.1

vate subsidization of local industry. Most of the time, it is simpler and more transparent for a government to use part of its proceeds to train workers or provide commercial credit for local entrepreneurs.

Since the government is typically the owner of the resource, it is legitimately entitled to keep the major share of the rents. This portion that the government keeps, or the "government take," depends on a number of factors, including how risky—financially, commercially, politically, and environmentally—the investment is for the companies; the availability of alternative projects for those companies on a world-wide basis; and the prevailing oil market price at the time of negotiations.

The level of government take can increase with a project's profitability. Thus, where the investment is successful, government revenues can increase without negatively impacting incentives to explore and to produce. In practice however, it appears difficult to design a tax system that adjusts perfectly to the rate of return actually achieved on investment in a project.

The rents from a petroleum deposit cannot be determined in advance so a company will be concerned not only about the overall impact of the tax regime, but also by the way in which the tax burden will be imposed at different points in the field's life (the tax structure).[10]

In order to understand why the level of government take is what it is, the characteristics of each field must be taken into account: Onshore or offshore? Shallow or deepwater? The country's geological history is also important: Large and relatively mature oil sectors as in Norway? Smaller or newer oil fields as in Azerbaijan? The riskier the investment, the greater the share of profit demanded by companies.

Questions about Production-sharing Agreements

In addition to some of the questions asked about license agreements, journalists should ask government officials how the investors were identified and chosen.

- Was there a competitive bid?
- What types of payments will the government receive? Will there be bonuses? When will the bonuses be paid and for what amount?
- What other types of payments will companies make? What are the conditions? Will the companies be paying taxes, and if so at what rate? Will they pay royalties once production begins?
- Are the companies obliged to invest in local communities where they operate, for example, by building schools or hospitals? Will local laborers be engaged? Will they be trained? And if the answer is yes, will the government give tax or other financial concessions for such a commitment? Is this commitment an expense to be deducted from profit or a one-to-one credit against tax obligations?
- How will profits between a host government and the oil companies be shared?
- How will the costs of environmental damage be treated? Are they a deductible expense? Are they deductible under all circumstances, including negligent conduct by the oil companies? Will the oil companies alone be responsible for such costs? (If the government shares the cost of environmental damage, and its portion of the profit is accordingly reduced, lax enforcement of environmental regulation is often the result.)
- Ask the government, as well as oil company representatives, to detail local content contractual requirements. (PSAs often contain provisions requiring a specified share of materials and supplies be procured from domestic suppliers. The selection criteria for domestic suppliers should be transparent to ensure that the system is not vulnerable to bribery or nepotism.)

- How will income and costs be calculated and shared between the companies and the government? (What companies include as expenses can have great consequences on how much the host government earns. In Alaska, legal challenges against the companies' accounting practices brought the state an additional $6 billion in revenue.[11])

- What are the rates of depreciation, and how do these compare to depreciation practices in other countries? How is the price of oil calculated?

If the PSAs in your country are not public documents, ask the government and company representatives why they refuse to share this information with the public. (Some countries, like Azerbaijan, make PSAs publicly available, but only because those PSAs have been enacted into law and therefore must be published.[12] However, most countries keep these contracts confidential.)

- If the PSA has been adopted as a law by parliament, does it take precedence over existing and/or future environmental and safety regulations? What are the consequences if the country later adopts stricter regulations concerning oil and gas operations? Are the added costs of compliance for the companies deductible as expenses or does the government have to compensate the oil companies?

- Does the contract require companies to pay a penalty for damage to the environment? (Some natural gas contracts require companies to pay a price for gas flaring, which contributes to greenhouse gas emissions.)

Certain Contractual Provisions

The concession or license agreement and the PSA have certain provisions in common as they focus on the same subject matter albeit from a different perspective. The following sections examine some of the more common provisions.

Parties. The choice of parties to any agreement should be examined carefully, especially when the parties are from different nations and when one of the parties is a government or a public institution. To the extent that a host government is a direct party to an agreement, it accepts direct responsibility and unlimited liability. But it may limit its liability by engaging one of its own enterprises as a contractual party. There is often confusion between those two related—but separate—legal entities where the state-owned enterprise is perceived as the executive arm of the government.

For example, a host government may agree to provide sufficient electrical power for a project and if it fails to do so, it can be held liable. But if the national electric company, even if wholly owned by the government, agrees to provide the power, then only the electric company will be liable for failure to perfom, and only its assets can be seized to cover compensation costs. In general, it is advisable for the government to never serve as a direct contractual partner in a commercial agreement, although this is not always possible. In oil deals, national oil companies often serve as intermediaries for the government.

For these and other reasons, a government should separate its commercial activities from its governmental or regulatory functions. It should not assume contractual liability for exercising regulatory functions.

The oil company partners in any deal with a host government will usually create a subsidiary to serve as party to the agreement. This type of subsidiary will have limited or no assets of its own, and it will not be able to rely on the financial resources of the parent company to stand behind its commitments, especially in regard to damages resulting from environmental pollution. Host governments should require a guarantee from the ultimate parent company of the subsidiary so that the host government has a reliable contractual counterparty with the resources to cover potential liabilities.

Accounting Methods. In order to determine profits, there must be a decision on accounting methodology. The United States, UK, and France each have their own national accounting standards, and the International Accounting Standards Board is in the process of drawing up international accounting principles. Accounting standards leave room for discretion and interpretation, and can lead to serious disputes.[13]

Moreover, accounting standards do not have provisions prohibiting any particular type of expenses. Consequently how certain expenses are to be treated should be clarified in the contract.

Intercompany pricing—what firms with a common owner or common control charge each other for services and goods—is a particularly difficult issue for which accounting standards provide only guidance and no definitive resolution. Intercompany pricing can inflate costs and decrease government compensation.

Recovery of Costs. Companies' costs are important for host government revenues because the taxes that companies pay and the royalties they share with the government are based on the companies' profits. How companies account for their costs determines what profits they report.

There are two types of costs: current operating costs and capital investment costs. Current costs are expensed in the year in which they are incurred and represent an immediate deduction from gross income and an immediate reduction in profits. Capital investment costs are long term and can be depreciated over a set period of time. From a government's perspective, the longer the rate of depreciation, the higher its share of the profits during the time period. A company, on the other hand, will seek to recover its costs as quickly as possible through a more accelerated depreciation. Thus, the terms that the companies use for depreciating assets can have a significant impact on government revenues.

Whether every expense is valid is a different matter. For example, are bonuses paid to expatriate employees as compensation for working in the host country a valid expense? Is the import of a foreign wine for expatriate employees a necessary expense? Should air travel be limited to economy class? A detailed expense policy is necessary.

Capital investment, whether for drilling rigs and other longer-life or "permanent" investments, is significant. Since they are useable over an extended period of time, they should be depreciated or expensed over time. The oil companies prefer to recover these costs immediately and expense them fully in the year in which they are incurred in order to lower profits for that year and pay less tax and less profit to the host government. If the government allows a rapid depreciation of capital investment, an oil company has less to lose should it decide to discontinue operations. After all, the company will already have recovered the majority of its costs.

Taxation or Compensation. The question of how to tax production is an extremely important issue as income earned from the production and sale of a natural resource often accounts for the biggest portion of the government budget. But if the government taxes too much, it runs the danger of pushing companies out of the country to areas that offer better terms.

There are several different types of taxes the government can apply. The first is a profit tax that can come in the form of a corporate income tax or can be subsumed as part of the amount the government agrees to take from any profits. Tax inspectors col-

lect data on production and sales volume data and the price at which the product is sold, and the inspectors audit company expenses. Oil sold to a company's subsidiary in another country may be priced lower or higher than prevailing market prices. In countries where tax administration is weak, this kind of transfer pricing can create opportunities for tax evasion.

Another tax often imposed on oil companies is a royalty, or excise tax, which is normally a percentage of the value of the production, although it can be a set fee based on volume or quantity. This tax is often imposed on top of other taxes. Governments like these taxes because they are easy to administer, in contrast to the corporate income tax, and their collection does not have to wait until the project becomes profitable. On the other hand, these taxes can be inefficient because they tax production without any regard to profit. When the project is marginal or not competitively profitable, the royalty or excise tax may discourage further investment.

Bonuses are another source of revenue that are easy to administer. A host country can require a one-time payment before the company starts exploration (signature bonus), or continued fixed payments once production reaches certain levels (production bonus). Bonuses are fixed payments and do not take into account the success of the project or its profitability; they are usually tax deductible.

Norway designed a sophisticated system that adapts relatively well to the stage of development of a project, and awards the government a significant share of the oil rents. The tax rules are based on the ordinary corporation tax (28 percent) and the addition of a special petroleum tax (50 percent). Both taxes are based on the companies' net profits, and all expenses relevant for the activities on the Norwegian continental shelf are tax deductible. Investments are favored by a high depreciation rate. In addition, an uplift allowance lets a company deduct 30 percent more than it invests against the special tax. For example, if capital expenditure is $100 million, the company can recover $130 million. Thus, the Norwegian petroleum tax system is favorable for marginally profitable projects because the uplift allowance will shelter profits from the full effect of the special petroleum tax.[14] But it should be noted that Norway has extensive experience in managing a natural resource tax system.

Environment. Each government has an obligation to protect its environment. However, where environmental standards are covered by PSAs and license-concession agreements, environmental rules and regulations can be ambiguous, giving oil companies the right to interpret, negotiate, or even veto, albeit indirectly, environmental standards. For example, the PSA for Azerbaijan's major oil development project allows the contracting companies to discharge air emissions "in accordance with generally accepted international petroleum industry standards and practices." The problem is that there are none!

Moreover, if an environmental standard is simply a contractual provision, then

companies, together with the government, are also interpreters of that provision and effectively can exercise a veto. It is standard for an agreement to provide that parties shall mutually interpret or agree on the meaning of unclear terms, which means the consent of both parties is required.

Developing countries, if they are lax on environmental standards and their enforcement, indirectly subsidize the cost of a commercial commodity by permitting their environment to be despoiled.

Environmental standards are generally higher in Western countries, but there is no rational reason why they should be, especially in the oil and gas industry, where the commodities are in such demand. The problem arises when oil companies, avoiding the stringent environmental standards in one state, take advantage of more lenient legislation in other countries to discharge, for example, their toxic drilling mud.

Oil companies prefer to pay a relatively low penalty for noncompliance with environmental standards rather than invest in costly pollution monitoring and control. Fines should be high enough to act as a deterrent. Companies usually have an obligation to restore the area upon completion of a project. While some countries like Germany strictly enforce this, other nations employ less stringent requirements.

Work Program. A work program detailing a company's exploration or development plan can be murky, often hiding behind technical and financial considerations, including how to drill in deep water or earthquake areas. In that regard, questions concerning how to best protect the natural environment also become an issue, partially because of the cost of installing the necessary protective equipment.

Often an oil company will slow down certain projects it deems too expensive, especially in comparison to other projects that it may be developing in another part of the world. As such, the host government should insist on a work plan that specifies clearly the circumstances under which a project could be delayed or even discontinued and the circumstances under which it may not.

Stabilization. Stabilization provisions protect oil companies from governmental or legislative changes affecting any contract term and grant them compensation from the host government for any added costs due to future legislative changes, unless otherwise agreed.

Originally, stabilization clauses addressed specific political risks that could affect the contract. In developing countries, the greatest worry was that the host government would nationalize the investors' assets or terminate the contract by unilateral decision.

In the 1970s, there were several disputes between foreign investors and Libya following the nationalization of the oil companies' interests and properties in that country. The arbitrating court decided that Libya's unilateral decision to nationalize

the oil companies' interests was a breach of contract that gave rise to liabilities and required remedy.

A stabilization clause is extremely disadvantageous for the government which "agrees" to it because it freezes the legal and regulatory situation of the country for an extended period of time and requires the government to pay compensation if changes affect an investor.

The stabilization clause must be closely analyzed from a time perspective: what does it mean today and what will it mean tomorrow?

Price. How the market price of oil is determined is critical as it directly impacts the compensation of the host government, whether in the form of taxes or profit sharing. The only objective method to calculate the selling price of oil is to start with the price established by the spot market in the particular region. Platts, an oil pricing service owned by McGraw Hill, publishes a comprehensive list of commonly traded crude oils and their daily market prices. Normally, a contract would specify what prices would serve as a benchmark.

What should never be accepted without question as an acceptable contract price is the price paid between related companies because that price is determined internally and will not necessarily reflect market rates.

A related company is not just a company that is partially or wholly owned by the same company. It can also be a company that has contractual or other ties with the selling party, relationships that are not necessarily public or obvious. The danger for governments that tax companies based on what the companies report as the price of oil sold to subsidiaries is that this price may be well below market rates. Even a marginal difference in price per barrel, can make a considerable difference overall.

Termination. A contract needs to address under what circumstances an agreement can be terminated. Agreements can be terminated, for example, for repeated environmental violations. Termination should also result if companies are no longer developing the field. At that point the host government could transfer the contract to another company that is still willing to develop the field.

Outside Experts. In negotiating contracts, developing countries usually must rely on foreign experts, including, ironically, some from the international energy companies. Relying on oil and gas companies for their expertise is inevitable as no number of government officials, even if they had the expertise, can oversee every aspect of natural resource development. Outside experts must be evaluated, selected, then managed and directed. A nation's experts need to be truly independent so they can be true advisers and advocates.

Conclusion

As oil contracts are necessarily complex and can be subject to abuse and corruption, these contracts, as well as any subcontracts and any regulatory terms, should be fully disclosed and made public. Only then can the public effectively judge the efficacy and soundness of these agreements and the decision-making of public servants and government officials.

Questions about Contractual Provisions

- What are the provisions under which investors may end production of a field or refuse to invest more in the development of the field?
- Does the contract contain stabilization clauses that negate new laws and regulations that affect the oil industry?
- What is the price of oil or gas that will be used to determine taxes or other compensation owed by oil or gas companies?
- If there are repeated violations for environmental matters, can or should the contract be terminated? If yes, what does "repeated" mean? If a contract is terminated who should own the facilities?
- If the oil company is no longer developing the field, how is cessation defined? Does it mean no exploitation for a year, or several years? (There is no model answer, except the issue must be resolved. And the rationale for the resolution of that issue should be publicly announced.)
- Who are the outside experts advising the government on contracts? How were they chosen? What is their experience? What are they being paid and who will pay them? (And yes, the unthinkable question, are they being paid too little, because one gets what one pays for!)
- Have the "independent" experts represented or worked for oil companies in the past? What fees have they earned from oil companies? Are they willing to agree not to represent oil companies for an extended period after the engagement with the government is ended?

SAMPLE STORY

Lago Agrio: Ecuador's Bitter Aftertaste

By Nicholas Rosen
March 16, 2005

In Ecuador, a stretch of oil-stained Amazonian jungle region surrounding Lago Agrio—"Bitter Lake"—has become the subject of a complex, long-running legal dispute that has become every bit as acrid as its name.

In 2003, a team of U.S. lawyers filed a US$1 billion lawsuit in Ecuador against ChevronTexaco on behalf of thousands of indigenous people and other rural inhabitants of the Lago Agrio region. The suit alleges that TexPet, then a subsidiary of Texaco (which merged with Chevron in 2001), was responsible for dumping tens of millions of gallons of toxic wastewater into the jungle, and must now pay for the costly clean-up. ChevronTexaco contends that its efforts fulfilled TexPet's responsibilities under its agreement with the Ecuadorian government.

Through a joint partership with the state oil company PetroEcuador, TexPet operated the Oriente oil fields surrounding Lago Agrio from 1972 to 1990. Texaco sold its stake to PetroEcuador in 1992, and launched a multi-year, US$40 million clean up program which was approved by the Ecuadorian government. Chevron-Texaco recently undertook its own tests of various drilling sites in the Lago Agrio region, which showed that pollution levels met World Health Organization (WHO) standards. And that is where Texaco's legal responsibility ends, lawyers for the defense claim.

But the plaintiffs, backed by environmental groups like Amazon Watch, claim that Lago Agrio remains a disaster area. Rivers and drinking water are dangerously contaminated, they contend, and responsible for unusually high cancer rates in the region. They call the U.S. oil giant's recent tests in the rainforest "junk science."

Attorneys for Lago Agrio residents initially filed suit in the United States, claiming that key decisions leading to the current pollution problem were made at Texaco's headquarters in White Plains, New York. But in 2002, a judge in New York pronounced that the case had "every-

thing to do with Ecuador and nothing to do with the United States." The judge dismissed the lawsuit in New York, but ordered the company to submit to the jurisdiction of Ecuador's courts.

Now in Ecuador, the case may take years to resolve. Further complicating matters, ChevronTexaco has since filed its own arbitration claim against the Ecuadorian government, demanding that the government pay all the costs resulting from the current trial.

Whatever the outcome of the Lago Agrio case, it will be momentous—a unique decision regarding the legal liability of multinational corporations, and a hot-button issue in local Ecuadorian politics. A ruling against ChevronTexaco could prompt similar lawsuits in Ecuador, the United States, or other parts of the world. It could also adversely affect the perception of foreign oil companies, at a time when Ecuador is energetically pursuing their involvement in the sector. And if ChevronTexaco wins, it could cause a political uproar in Ecuador, where indigenous groups and their supporters believe that a greedy foreign corporation colluded with a callous Ecuadorian government to rape and pillage their rainforest home.

BOX 1

1ST GENERATION CONCESSIONS CHARACTERISTICS	MODERN CONCESSIONS CHARACTERISTICS
Monopoly vs. Competition	
▸ Very large area ▸ Long concession period ▸ Exclusivity in exploitation rights ▸ Complete control over schedule and work program ▸ No requirement to produce	▸ Well-defined area ▸ Limited period of time: - exploration phase (3 to 5 years) - production phase (15 to 20 years) ▸ Relinquishment rules ▸ Required work program ▸ Additional investment requirements ▸ License bidding
Concessionnaire's Profitability vs. State's Revenues	
▸ Royalty (fixed amount per ton or barrel lifted) ▸ Very modest financial compensation	▸ Higher royalty (graduation, i.e., the more oil, the higher the percentage; the less oil, the lower the percentage) ▸ Substantial income tax ▸ Bonuses ▸ Annual rent (based on size of area) ▸ Fairer financial terms
General Facts and Figures	
▸ Oldest of petroleum agreements (1901 D'Arcy concession, Persia) ▸ Resource-rich countries used to hold a weak position because of economic and technical dependency on foreign oil companies ▸ Hostility towards imperialistic foreign investors ▸ Today, developing countries still skeptical of concessions	▸ Gordon Barrows Survey (1995): 62 states out of 116 use the concession agreement* ▸ Countries that use the concession are decreasing in number ▸ Countries which still use this type of agreement: Sharjah (United Arab Emirate), the UK, Norway, Turkey, Somalia, Trinidad, Australia, and New Zealand

** Andrei Konoplyanik, "Concessions: from d'Arcy to Kozak,"* Oil, Gas & Energy Law Intelligence, *Volume I, Issue #1, January 2003.*

BOX 2

Oil Agreements around the World, 2004

LICENSE, CONCESSION ≈ 62 countries	PSA ≈ 52 countries	PSA and LICENSE	JOINT-VENTURE and/or PSA and/or LICENSE	OTHERS
Asia and Australia Joint petroleum development area between East Timor and Australia[15]	**Asia and Australia** China*, India, Indonesia, Malaysia, Myanmar, Vietnam...			
	Central Asia and Caucasus Azerbaijan, Albania, Georgia, Kyrgyzstan...	**Eastern Europe** Russia*	**Central Asia and Caucasus** Kazakhstan (JV, PSA, and service agreements), Turkmenistan (JV and PSA)	
Europe Norway*, United Kingdom*	**Europe** Malta			
Middle East United Arab Emirates*	**Middle East** Qatar, Syria, Yemen	**Middle East** Iraq, Jordan		**Middle East** Kuwait* and Saudi Arabia*[16], Iran* (buybacks)[17], Oman
	Africa Algeria, Angola, Congo, Côte d'Ivoire, Egypt, Equatorial Guinea, Gabon...	**Africa** Sudan	**Africa** Libya (JV and PSA), Nigeria* (JV and PSA)	
North America United States*		**North America** Canada*	**North America** Canada* (JV to explore)	
Central and South America Argentina, Brazil, Ecuador...	**Central and South America** Guatemala...			**Central & South America** Mexico* (MSC[18]), Venezuela* (licenses and risk service contracts)

* Top World Oil Producers, Source: Energy Information Administration 2003.

6. Protecting Developing Economies from Price Shocks

Randall Dodd

The fact that resource wealth can hamper economic development is by now well known. Less well known are the possible policy measures that governments can take to make oil revenues more stable and to promote economic growth and development.

Briefly restated, the resource curse occurs when a country's abundance in natural resources causes a distortion in its economy resulting in its resources being used less efficiently and leading to lower investment and growth prospects (especially in manufacturing and other tradable goods sectors). The economic distortion can surface in the form of corruption, an overvalued exchange rate, excessive foreign borrowing, unsustainably high wages, and profligate spending by governments. These challenges are described more fully in chapter 2.

Solving these economic problems will usually require governments to adopt and maintain good financial management.[1] Other policy solutions might entail the use of special financial institutions and financial instruments. This chapter focuses on these financial institutions and instruments that can be helpful in managing one of the great

challenges facing economic development: how to manage the commodity price volatility in a country that is dependent on revenues from the sale of its natural resources.

The price of oil and gas is highly variable and does not necessarily follow normal business cycles. This variability creates an economic cost that is borne by the government as well as the private sector. It makes planning extremely difficult for governments when their revenues are highly dependent on natural resource revenue.

Oil Revenue Dependence for Some Major Exporters, 2000

Government hydrocarbon revenue as a percent of total revenue

Angola	90%
Equatorial Guinea	88%
Oman	85%
Nigeria	82%
Saudi Arabia	79%

Source: IMF staff estimates and U.S. Energy Information Administration

Variability in commodity prices makes it difficult to maintain budget discipline. When resource prices suddenly rise, governments tend to increase spending, and this can lead to inflation and waste. Even more damaging is when prices suddenly fall. Governments then face the choice of either cutting spending, raising taxes or finding some alternative source of revenue, or borrowing. Each has its own risks. Cutting spending and raising taxes is difficult to do quickly, it creates a contractionary force in the economy, and it usually falls disproportionately on women and the poor. It can also lead to political unrest. Borrowing abroad is neither cheap nor easy because it occurs at a time when the government's revenues from oil or other resource wealth are low and its creditworthiness poor. In short, prudent fiscal budgeting under this kind of volatility is difficult. It requires governments to build their entire budget around an assumption about the price of oil that could prove entirely wrong.

There are numerous financial institutions and instruments that can reduce governments' exposure to the risk stemming from this price volatility. Financial institutions such as stabilization or savings funds can act as a reserve to cushion the budget. Alternatively, hedging instruments such as futures, options, and other derivatives can protect governments by shifting some of the risk to investors willing to bear it. Reducing risk, however, comes at the cost of giving up some revenues when the price of oil or gas is unexpectedly high, and governments are not always politically ready to give up that windfall.

Policy Remedies

In his novel *East of Eden*, the American writer John Steinbeck described the unreliability of natural resource wealth generated by farming. He described how the rain would come in cycles with several wet years followed by several dry years. During the wet years the land was rich and fertile, and the people grew rich and prosperous. During the dry years the land was bare and desolate, and the people became poor and often moved away. He concluded: "And it never failed that during the dry years the people forgot about the rich years, and during the wet years they lost all memory of the dry years. It was always that way."

But it does not have to be that way. Appropriately designed and implemented public policies can stabilize the income from resource wealth so as to avoid these types of problems and promote prosperous—rather than unproductive—behavior.

Managing the Economic Impacts of Price Volatility

Variability in prices for natural resources can come from the opening of new oil fields, a relaxation of OPEC production quotas, or commercialization of new technologies that result in a price drop. Conversely, a restriction of OPEC quotas, political unrest in an oil-exporting country, rising demand for oil, war, terrorism, or nervousness among traders can all contribute to an increase in the price of oil.

One of the direct ways that price volatility can act as a curse to developing countries is through its impact on their government budgets. When the natural resource price rises, government revenues increase accordingly. Greater revenues from rising natural resource prices can be used to lower budget deficits, increase spending, or some of both. When the price falls the opposite happens and larger budget deficits are the most likely outcome. Unless governments find ways to mitigate this volatility, they are vulnerable to the "stop and go" pattern of pro-cyclical spending: governments increase spending when market prices for oil rise and cut spending when oil prices fall.

One immediate result of a sharp drop in resource prices is to reduce the ability of a developing country to make prompt payments on its foreign debts. In the autumn of 1998, after the price of oil fell from $21 to $13 a barrel over the previous nine months (a 38 percent drop), the Russian government declared a moratorium on foreign debt payments, triggering a financial crisis of global proportion.

Significant price changes can cause other important economic problems. Long-term plans can be disrupted; governments, businesses, and individuals can be forced

to curtail spending. This in turn will lead to fluctuations in other spending, investments, and living standards.

The table on page 91 provides examples of 10 countries whose Gross Domestic Product (GDP), export revenue, and government revenues are highly correlated with changes in the price of the country's major export commodity (second column). The data in the table are the correlation coefficients between changes in the international prices for the commodity, and changes in the countries' GDP, export earnings, and government revenue between 1989 and 2002 (export values are converted to U.S. dollars). The data show how closely these countries' key economic indicators are tied to international prices, over which the countries have little control. An additional example is Mexico where oil accounts for 10 percent of its exports but 40 percent of government revenues.

In order to protect themselves from these fluctuations in the price of their natural resources, developing country governments can use derivatives instruments to hedge against adverse price movements. Hedging is a means of sharing the risk of price volatility with investors. If government budgets are not protected from these price fluctuations, then the price changes are likely to be transmitted throughout the economy.

There are numerous ways that governments that rely on natural resource revenues can use hedging techniques to reduce their exposure to changes in the price of these commodities. The three key techniques are 1) stabilization and savings funds, 2) commodity bonds, and 3) hedging through the use of derivatives.

1) Stabilizing the Effects of Resource Wealth

Some of the ways in which natural resource wealth becomes a curse is through its impact on individual and government spending behavior, and its macroeconomic impact on exchange rates and international trade competitiveness. For example, a large inflow of foreign exchange can put upward pressure on the value of a country's currency in foreign exchange markets. This leads to a decline in the price competitiveness of the country's domestically grown and manufactured goods. The corresponding decline in the manufacturing and agricultural sector is known as Dutch Disease.

One way to prevent or substantially diminish the harmful effects of a sudden increase in wealth is by establishing financial institutions that will prudently manage the newfound wealth over time. Examples of such social trust funds are stabilization funds and savings funds.

Stabilization fund

The basic economic lesson for stabilization funds is as old as the Bible. The story of Joseph describes how Joseph advised the leaders of Egypt to conserve output during a

TABLE 1
Correlations with Major Export Commodity Price

Country	*Commodity*	*GDP*	*Exports*	*Revenue*
Burundi	Coffee	-0.55	0.44	1.00
Colombia	Oil	0.05	0.30	0.62
Ethiopia	Coffee	0.44	0.33	0.36
Ghana	Cocoa	0.75	0.22	0.72
Kazakhstan	Oil	0.65	0.90	0.44
Nicaragua	Coffee	0.48	0.40	0.48
Nigeria	Oil	0.30	0.66	0.11
Uganda	Coffee	0.65	0.52	0.64
Uruguay	Beef	0.20	0.00	0.45
Venezuela	Oil	0.01	0.71	0.50

— GDP and Revenue in real 1995 local currency values
— Exports in nominal U.S. dollar values
— International Financial Ststistics, 1989-2002

Correlation coefficients measure the degree to which variables move together. A value of one means that the two variables move perfectly in tandem, negative one means that they move in the exact opposite directions, and zero means that they move independently of one another. A value such as 0.5 means that half the movement of one variable can be explained by or associated with a similar movement in the other variable. Thus if prices rise or fall by 10 percent then budget revenues can be expected to rise or fall by half that rate, or 5 percent.

period of seven bumper harvests—called the "fat" years—and then to dispense the inventory during future "lean" years. This inventory management stabilized Egypt's income over time and contributed to its peace and prosperity.

Stabilization funds are designed to accumulate funds when resource prices exceed a target level and to dispense funds when the price falls below the target level. In doing so, stabilization funds take income away from current spending when high commodity prices generate windfall gains, and they make additional income available when low resource prices would otherwise create budget deficits. Consider the example of a government setting its benchmark price at $30 per barrel of oil. When the price of oil is above $30/barrel, the excess income will be transferred to the stabilization fund. When the price of oil falls below $30/barrel, the difference will be transferred from the stabilization fund back to the budget.

In order to be effective, stabilization funds require two types of budgetary protections. The first is a requirement that surpluses in the stabilization fund not be used as collateral to increase borrowing and thereby offset the stabilization effect by increasing deficit spending. Without this requirement, government spending would not be damp-

ened during a boom period. There is little point in saving money if the government is simultaneously incurring debt as well as potentially paying interest that exceeds the returns it is making on its stabilization fund. The interest cost on the new debt would also put a burden on future income when commodity prices might not be so high.

The second protection, which is important when prices are depressed, is one that guarantees the fiduciary integrity of the fund so that it is not raided for short-term reasons. The stabilization fund is designed to pump designated amounts of money into the government budget when commodity prices fall below their target. But sometimes governments exert great pressure on fund managers for additional resources. In order to protect the fund's savings for future stabilization purposes, it needs to be managed by leadership that is professional, protected from immediate political pressures, and ultimately representative of the people served by the fund. One way of doing this is to have a commission or board appointed by the legislative body to terms of intermediate length that expire at staggered years in the future.

An example of a successful fund is Chile's Copper Fund. Established in 1985, its savings are held in an account at the Central Bank and its management comes from an independent board (which includes members from the state-owned copper corporation CODELCO.) It has been credited with helping the Chilean government avoid fiscal deficits. A poor example is that of the Macroeconomic Stabilization Investment Fund (FIEM) of Venezuela, where the lack of strict budget rules has allowed the government to borrow against accumulated assets in order to increase spending as well as to delay scheduled payments into the fund. The result is that the FIEM has only $700 million in reserves[2] (even though oil prices have been very high), and that its effectiveness has been diminished.

In addition to stabilizing government budgets, a successful stabilization fund can also protect against Dutch Disease by preventing currency appreciation. This is accomplished by investing the fund's savings in foreign currency denominated securities in order to reduce the pressure to increase the value of the country's currency.

An effective stabilization fund can transform a nation's resource wealth into a stabilizing force in the economy. There is, however, a limit to this policy strategy. It is premised on the assumption that the "fat" years will come first. Unless the fund can borrow against future income, then it cannot begin to exercise a stabilizing influence on government budgets until resource prices have first exceeded the target level. Therefore the fund has the additional political burden of having to first act as a drag on the economy before it can act as a stimulus.

Savings fund

A savings fund is different from a stabilization fund in that its primary purpose is to save money for the future. It can either save for a "rainy day" when the government is in dire need of funding, or it can save for future generations. This is especially desir-

able for nonrenewable natural resources that might otherwise be exhausted by current generations. The assets in a savings fund form a trust, and the income on the trust can be paid out over time. One example is the Alaska Permanent Fund, created in 1977. By the end of 2003 it had accumulated over $28 billion in assets. These assets generate income that is paid to all Alaskan citizens.[3]

2) Commodity Bonds

A bond (or note) is a debt security issued by a corporation or government in order to raise money. A conventional bond consists of regular annual or semiannual payments of interest (known as coupon payments) and a final payment of the entire principal upon maturity. For example, a 30-year, $1,000 U.S. Treasury bond with a 5 percent coupon rate will yield semiannual coupon payments of $25 (based upon 5 percent of the bond's principal) and then pay the full $1,000 principal at the end of 30 years. The price of conventional bonds is determined by the present value of all the future coupon and principal payments. Since future payments are worth less then current payments and payments in the far future are worth less than those in the near future, the bond's value is determined by properly discounting the future payments so as to arrive at their present value.

Commodity-indexed bonds

Commodity bonds are different than conventional bonds because they are structured so that either their coupon payments or principal payment are adjusted according to a specific underlying commodity price. For instance, an oil commodity bond might have its principal set to equal 1,000 barrels times the market price of oil at the time of maturity. At $25 a barrel it amounts to a $25,000 bond. If the price of oil were to fall to $20, then the borrower who issued the bond would only have to repay $20,000. Thus the borrower will obligate to repay less money at maturity if prices are low than if prices are high—this shifts oil price risk from developing country borrowers to investors.

In the event the price rises, the same government will have to make higher payments. But presumably the government will be in a better position to make these larger payments because its claim on the income stream from the nation's oil exports also will be larger due to the oil price increases.

This type of commodity-indexed bond can be thought of as a conventional bond with an attached derivative that converts either the coupon or principal payments into payments based on the price of oil. The single principal payment would be the economic equivalent to a forward contract and the series of coupon payments would be the economic equivalent of a swap or a series of forward contracts.[4]

Commodity-linked bonds

Another version of a commodity bond links the coupon or principal payments to the price of the underlying commodity through an attached derivative called an option.[5] An option generates a payment only if the price of the referenced commodity rises above (or alternatively, only if it falls below) a specified target price known as the "strike" or "exercise" price. For example, a call option on 1,000 barrels of oil with a strike price of $50 a barrel will generate a payment equal to one thousand times the extent that the market price exceeds $50.

In this case of commodity-linked bonds, the coupon or principal payments might be structured to fall if the oil price fell below the target or strike price but would not rise if prices exceeded the strike price. In order to shift the downside risk of oil prices to bond holders, the borrower would need to pay a risk or insurance "premium" to bond investors in the form of a high bond yield. Thus the bond's price and coupon yield would reflect the fact that the borrower would be holding an option that allowed it to make lower payments in the event that oil prices fell below the strike price. The bond investors would pay a lower price or receive a higher coupon rate on the bond in exchange for their risk taking.

Commodity-linked bonds are usually of two basic types. Bonds with a "short" put option provision—as described above—give the borrower the right to pay the lower of a specified cash payment or one determined by the commodity price if the price falls below the strike price. This type of commodity-linked bond shifts the downside risk of resource prices to the foreign bond investor. Bonds with a "long" call option provision give the bond investor the right to the higher of a specified cash payment or one determined by the price of the commodity if the price exceeds the strike price. In this instance the bond investor would share in the upside gain from higher resource prices, and the developing country borrower would benefit by borrowing at a lower interest rate.[6]

While all these types of commodity bonds can serve to help developing countries to transfer some of their exposure to commodity price risk, it can be expensive. Commodity bonds, whether an attached forward contract or option contract, are more complex than conventional bonds. In financial markets, complexity is more costly than simplicity. Moreover, in the commodity-linked type of bond with a short option position, the options premiums are an additional expense—borrowers pay this additional expense in the form of higher coupon yields. In all cases, however, the developing country borrowers will pay higher yields on bonds that are more complex. Yields will be higher still on bonds that give the borrower the option to pay lower coupon or principal payments if the commodity price drops and that must be sold to the subset of foreign investors who are also willing to take on a long-term commodity price risk.

3) Hedging Using Derivatives

Stabilization funds and commodity bonds are two risk management strategies. Yet another policy approach, and one which addresses the problem more directly and does so with potentially less expense, is to use derivatives to hedge the commodity price exposure.

There are a variety of derivative instruments available in the market. Some are traded on futures exchanges (mostly futures and options type contracts) and others are traded in the over-the-counter (OTC) market (forwards, options, and swaps).[7]

While the exchange-traded contracts are mostly short-term, they can be effectively rolled over from one month to the next in order to provide an effective hedge over a long period of time.[8] Roll-over involves selling a futures contract that expires in one month and then buying it back before it expires and selling another one that expires in the month after that. For instance, a hedger would start in January by selling a February oil futures, then buy it back before expiration and sell a March futures, then buy it back before expiration and then sell an April futures, and so on. This approach has its skeptics, who worry about the risks associated with the roll-over process. While roll-over risks, such as basis risk and market illiquidity, are real, they have proven over time to be small and manageable in comparison to the risk of not hedging. Moreover, many multinational oil corporations, global agricultural corporations, and other businesses regularly use this technique as an inexpensive and effective hedge against price risk.

An important variation on this approach comes from the Australian Wheat Board.[9] It promises participating farmers a minimum price for their crops, thus essentially giving away put options to participating farmers, and then hedges its exposure to this agricultural program by selling wheat futures on futures exchanges. As recently as the late 1990s, the Australian Wheat Board was the largest participant in the wheat futures market on the Chicago Board of Trade.

Hedging with futures or forwards

Hedging works to reduce risk in the following manner. Consider the simple case of a country in which the production and export of oil amounts to the total national output and export volume. A 20 percent rise or fall in the price will raise or lower its output and exports by 20 percent. A country can hedge against this shock by taking a "short" position in oil. For instance, it can sell oil in the forward market. A short forward position requires that a certain amount of the commodity be sold for a specific price at a specific time in the future. If oil is sold forward on January 1 for delivery on December 31 at $25 a barrel, then a $5 decline in oil prices will generate a $5 profit for every bar-

The Seesaw of Hedging

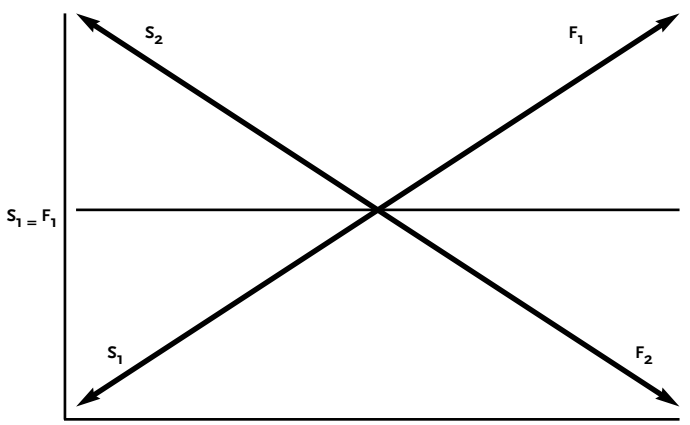
The following are examples of considered existing risks. Farmers face the risk that the price of their crop will fall between the time they have decided to plant and the time they harvest and get the crop to market. Governments of oil-producing nations face the risk that the price of oil will decline over the budget year whereas the governments of oil-importing nations face the risk of oil prices rising.

Hedging is best defined as the reduction of existing risks. In contrast, speculation is best defined as engaging in activity that adds to existing risk.

Existing price risk can be reduced by using derivatives to hedge—a process sometimes called risk management—by entering into a derivative contract that will offset losses on existing risk (and also likely offset gains on existing risks). The value of the derivative used for hedging should change by equal amounts—but in the opposite direction—from that of the existing price risk. For example, a country exporting a billion barrels of oil faces the risk of losing $1 billion for each dollar decline in the price of oil. It can hedge that risk by selling oil futures on the New York Mercantile Exchange whose value will increase by $1 billion for each dollar decline in the price of oil.

The relationship of the existing risk to the value of the hedge can be thought of as financial version of the child's seesaw or teeter-totter. One end rises in direct proportion to the other end falling; if no one moves then both ends are equal along a horizontal plane. The following graphic illustrates this concept by showing how when the value of the spot position, i.e., the crop or oil ready for export (S), rises, then the value of the futures position (F) falls, and vice versa. In both cases, the sum of the two positions remains the same at the fulcrum of the seesaw.

Hedging: Sum of change of existing price risk and hedge is zero, or S = F.



rel of oil covered by the forward contract. However, if the price of oil were to rise by $5 per barrel, then it would generate a $5 loss for every barrel covered by the contract.

Hedging will generate gains when prices fall and losses when prices rise, thereby offsetting the effects of a rise or fall in the revenue from resource sales. This will reduce the variability of budget revenues due to price volatility. This will help prevent pro-cyclical fiscal policy and allow the government to serve a more counter-cyclical role in stabilizing economic performance and promoting sustained growth. Moreover, everyone will know in January that the value of output and exports will be, for example, $250 million by year's end; the government will know that it will have these funds available (no matter what happens to oil prices) to pay its foreign debt or other obligations.

Hedging through derivatives can be conducted with either futures, forward, or swap contracts.[10] Both futures contracts and forward contracts are an obligation to buy or sell a specified quantity of a specified item at a specified price at a specific time in the future. The difference is that futures contracts are standardized, publicly traded, and cleared through a clearing house. A country's oil products may not be the same as the standard ones traded on most major exchanges. If the different grade of oil means a substantial difference in price variability, then the government may enter into a forward contract in the over-the-counter (OTC) market. These are customized contracts traded through derivatives dealers (usually major banks or broker-dealers). OTC transactions provide certain benefits: they allow parties to tailor contracts to their needs, and they do not require initial collateral or margin. OTC transactions also have some drawbacks: they do not occur on official exchanges and so they are less transparent and they are not guaranteed by an exchange clearing house—thus exposing the hedger to credit risk from the derivatives dealer. Also, the OTC market is not well protected against fraud and manipulation while the exchanges are policed by the government and the exchange itself.

The advantages of hedging through derivatives are that it is inexpensive, it is a reversible policy (that is, the government can decide to lift its hedge), and it does not depend on the "fat" years coming first. It allows the government to borrow through conventional debt instruments instead of paying a premium to tap into smaller pools of investors willing to invest in commodity bonds. Unlike stabilization funds, hedging through derivatives contracts neither tempt corrupt officials nor act as a target for those seeking easy funding for new or expanded programs. The disadvantage is that futures contracts give up the gains of price increases. A solution to this problem is to hedge over a limited two- or three-year horizon rather than a longer period or to hedge only 75 percent or 80 percent of the price exposure so that the economy "feels" some of the effects of the price changes.

Options hedging

If the government does not wish to use either futures or forward contracts and thus give up the potential gains from a sudden rise in oil prices, it can use options instead to buy itself "insurance" against a drop in prices.[11] With options, the government pays a premium to the option seller or "writer" that guarantees a minimum price for the oil. For example, a government may determine that it will run into serious financial difficulties if the price of oil were to drop below $25/barrel. The government would hedge against this possibility by buying a "put" option with a strike price at $25/barrel. If the price remains above $25, then the option is not exercised; but if the price falls below $25, then the options writer would pay the difference between $25 and the lower market price of oil. This protects the government on the downside, and the investor would absorb the loss.

The option serves as an insurance policy against a fall in the price of oil, and so it follows that insurance against a highly volatile price is worth more than insurance against a very stable price. So the option's premium is higher for more volatile commodities like oil than for less volatile items like short-term interest rates. This is akin to higher auto insurance rates for risky drivers. In order to attract investors to accept the risky side of this one-way bet, governments will need to pay a premium that reflects the risks from volatile oil prices. These options premiums can prove very expensive. The advantage, however, is that if the price of oil rises, the government will be able to reap the benefits.

Hedging experience

There is little public information about the extent to which petroleum-exporting countries use hedging instruments to mitigate their risk. While some oil producers, such as Mexico and the state of Texas have used such instruments successfully, market analysts agree that the use of hedging by developing countries is still rather limited.[12] There are a number of reasons why developing countries may refrain from government hedging, despite the financial advantages.

- The primary objection may be a political one. If a finance minister hedged against a low oil price through using futures contracts, and the market price of oil in fact rose, then the country would fail to reap the benefits and few people would commend the minister for his or her prudence. Instead, it would be politically difficult to explain why the government missed out on the higher oil revenues. Conversely, if the finance minister did not hedge, and the price of oil plummeted, the government could shift blame away from itself by blaming international markets. If the finance minister chose to pay a premium for put options to protect against unexpectedly low prices, the minister could be blamed for "wasting" money rather than spending it on more urgent social needs. In

sum, governments may find it difficult to explain hedging policies to their public.

- Hedging can also be expensive. All derivatives transactions incur transactions costs that include commissions, paying the bid-ask spread to dealers, and the capital costs of posting collateral or margin. Also, options premiums can be very expensive and the expense increases with the volatility of the commodity price and the time horizon over which the government wants to hedge.
- Hedging is complex and requires considerable skill and institutional capacity. Commodity risk management tools require a greater level of financial sophistication than that traditionally required by government officials. Expertise is required to understand the risk structure of transactions, to identify risk management strategies, and to enter into and monitor hedging transactions. This expertise is readily available, however, by contracting with commercial risk managers or through the technical expertise provided by institutions such as the World Bank and the United Nations Conference on Trade and Development.

Conclusion

While hedging can provide protection against commodity price volatility, it cannot prevent the problem of corruption, which is so common among petroleum-producing countries. One way to reduce the incidence of both gross fiscal mismanagement and corruption (meaning the outright embezzlement of funds and the misdirection of funds for political purposes) is to require a high degree of transparency in government budgets.

In order to put pressure on governments to make their budgets and budgeting processes more transparent, several hundred nongovernmental organizations have embarked on an advocacy campaign called Publish What You Pay to get corporations to report on their costs for royalties, rights, and all other payments to developing country governments for the extraction of oil and other minerals as well as metals. The campaign is designed to make both corporate reports and developing country budgets more transparent, exposing and diminishing instances of mismanagement and corruption.

While it is perplexing to think that wealth can become a curse, it is even more vexing to see so little done about it. All of the above policy remedies are both feasible and affordable, and none of them would pose a major policy challenge. Each remedy would benefit from further research and investigative reporting in order to discover more of the advantages and flaws as well as what could be learned from earlier experiments. The biggest political challenge is the widespread lack of understanding of the costs of doing nothing, and the lack of knowledge among policymakers about the merits of appropriate policy remedies.

Questions about Revenues

- What share of your government's income comes from the sale of natural resources such as oil, gas, or minerals? Is this in the form of royalties, rents, or profit? Is the amount contracted in fixed amounts of the local or foreign currency, or is the government paid in amounts of the resource produced or exported?

- How much do your government's revenues vary with the prices of your major export commodities?

- What steps is your government taking to reduce the impact of price fluctuations on the government budget? How successful have these steps been?

- What is the government doing to help businesses and individuals protect themselves from the price shocks?

- What additional steps is the government considering to reduce the country's exposure to commodity price risks?

7. The Environmental, Social, and Human Rights Impacts of Oil Development

David Waskow and Carol Welch

The hydrocarbon era undoubtedly has played a positive role in industrial development and the modern way of life, but the price tag for progress is turning out to be higher than expected. The negative impact of oil extraction, transportation, and consumption on the environment, the social and public health of communities, and human rights worldwide is now coming under greater scrutiny.

Massive oil spills, like the 1989 *Exxon Valdez* and 2002 *Prestige* accidents, contaminate shorelines and sensitive marine ecosystems. And climate change is a recognized catastrophe in the making for the environment and public health worldwide, though oil producers dispute oil's role in global warming.

Extracting oil requires reaching deep beneath the surface of the earth, often in remote and environmentally sensitive locations. Oil itself, and the materials that emerge with it from the earth, are made up of extremely toxic chemicals. Processing and moving this liquid over great distances can be technically difficult and environ-

mentally hazardous. Oil leaks occur regularly, damaging plant and animal life, and harmful accidents can happen in all phases of oil development.

Oil extraction may also have profound social impacts. Oil drilling sites are often guarded by large security details. In some cases, oil companies have partnered with military or police forces with terrible human rights records.

Often, those directly affected by oil projects are either not consulted or consulted in a manner that does not allow their full participation in project decision-making. When local citizens have protested against the negative impacts on their communities, the authorities have responded with repressive actions leading to violence and human rights violations.

Drilling sites typically alter the social fabric of a community. Those who gain employment are often resented by the many who have high hopes yet get no jobs. Oil exploration and production is a technically intensive process that generally does not generate many jobs for unskilled workers.

As the oil begins to flow, prices for local goods and services often increase rapidly. The men who get jobs on a drilling site abandon traditional work and traditional ways of life. Indigenous communities are torn apart, permanently changed. The rates of HIV/AIDS increase in work areas as oil workers, far from their families, turn to prostitutes.

These negative results—and a number of others—must be considered and assessed when evaluating oil's impact on development and poverty. Government and company actions in responding to and mitigating these negative impacts should also be critiqued and analyzed.

While oil is a resource that can provide financial benefits to local communities if managed transparently and equitably, those benefits can and should be viewed in the context of oil's potential social and environmental consequences for those same communities.

Environmental Issues in Oil Development

The environmental consequences are substantial throughout the entire process of oil development. Each stage of the process—exploration, onshore and offshore drilling, refining, pipelines and other forms of transportation—poses serious risks to the ecology and public health. Every environmental medium—air, water, and land—is affected. The degree of environmental harm is determined by operator responsibility, government oversight, and conditions in particular ecosystems. Even in heavily regulated environments, some damage occurs.

Exploration, drilling, and extraction

Even before oil and natural gas are brought to the surface, the impacts of development are felt during the exploration process. Oil and natural gas deposits are generally found in sedimentary rock. Various seismic techniques are used during exploration to assess where those deposits are located beneath the surface of the earth.

Increasingly, remote sensing techniques using a mix of high technology from airplanes and satellites are used to find oil reserves. However, these approaches have a limited success rate, and surface-based exploration techniques are still common, often with environmental consequences.

Surface-based techniques permit the detection of fossil fuel deposits by physically creating seismic waves. These surface-based techniques, including vibrating vehicles ("thumper trucks"), explosions in holes drilled beneath the surface, and special "airguns" for marine locations—and the heavy equipment that often accompanies them—are frequently used in remote and environmentally sensitive areas.

In addition, extensive exploratory drilling is particularly common in developing countries where the quantity of oil reserves is less known. Such operations intrude into local environments at the drilling site itself and as a result of the construction of accompanying infrastructure, including road building. Environmental impact assessments often are not conducted for the exploration phase of fossil fuel development.[1]

The exploration process is followed by development of an oil field, involving the drilling of a number of wells, and then the actual extraction process. Frequently, oil deposits include significant quantities of natural gas, which is brought to the surface together with the oil. Natural gas can be produced either from oil wells (associated gas) or separately in wells drilled specifically for the purpose of gas extraction (nonassociated gas).

Crude oil and the byproducts of drilling and extraction all contain significant quantities of toxic substances and other pollutants. Large quantities of rock fragments—called "cuttings"—are brought to the surface during the drilling process, creating substantial volumes of waste material that must be disposed of.

The cuttings are also problematic because they are coated with drilling fluids—called "drilling muds"—that are used to lubricate the drill bit and stabilize pressure in the oil well. Once used in the extraction process, these drilling fluids are contaminated with harmful substances, including heavy metals and other toxic chemicals. The quantity of cuttings and mud produced from a well can range from 60,000 to 300,000 gallons per day.[2]

In addition, during the actual extraction process, large quantities of water combined with suspended and dissolved solids are brought to the surface. Referred to as "produced water," this extracted water generally contains a number of highly toxic substances, including heavy metals (such as lead, zinc, and mercury) and volatile organic compounds (such as benzene and toluene).

Produced water can also have high saline levels; if released onto land, this water can be extremely harmful to plant growth in local ecosystems. Produced water can amount to more than 90 percent of the fluid extracted from a well and represents nearly eight barrels of water for every barrel of oil produced in the United States (the amount of produced water is less for natural gas wells).[3]

Improper handling and release of waste and toxic substances, including cuttings, drilling mud, and produced water, can lead to significant damage to local residents, animals, and vegetation. The use of lined pits is an appropriate, but sometimes underused, disposal technique for disposal of these wastes, particularly mud and cuttings. Pits that are not appropriately lined, or covered with landfill when production ends, can allow seepage of oil and other toxins into soil and groundwater. An alternative to lined pits is the use of tanks in which waste can be collected and exported from sensitive ecosystems.

The discharge of produced water that is highly toxic or highly saline into waterways and the soil can be extremely harmful to ecosystems. Produced water can be treated using a number of mitigation techniques, including filtration and biological processes. In many cases, produced water is re-injected into the well to assist in creating sufficient pressure for extraction; in these cases, the water must be treated adequately before re-injection in order to prevent contamination of the soil and groundwater supplies. At offshore sites, produced water is rarely re-injected, but must instead be brought onshore for treatment.

The extraction of natural gas also poses considerable environmental problems at the extraction site. If natural gas is not separated and processed for use, it is often burned off at the well site, or "flared," thereby releasing harmful pollutants. As the largest source of air emissions from oil and gas extraction, flaring produces carbon monoxide, nitrogen oxides (a key component of smog), and sulfur oxides (the principal cause of acid rain). In Nigeria, the country with the highest levels of flaring, local communities have complained about serious health effects linked to the flaring.

When it is not flared, unprocessed gas is often vented into the atmosphere, releasing large quantities of methane, a potent climate-changing gas. In addition, when natural gas is extracted, it frequently contains significant quantities of hydrogen sulfide, a toxic substance that is potentially fatal and also corrosive to pipes (gas with hydrogen sulfide is often referred to as "sour gas"). This chemical must be removed from the natural gas as soon as possible.

The tremendous impacts of oil extraction on land transcend the facility site. Particularly in remote areas in developing countries, where more and more extraction will take place as new sources for oil are sought, extraction sites usually involve the destruction of large tracts of forests for the facility itself and worker camps. Onshore drilling can also expose animals, including grazing livestock important to human liveli-

hoods, to possible spills. Ingesting oil or oil-contaminated food or water can be fatal to animals, or pose long-term health threats.

One of the most significant environmental impacts of extraction is the construction of access roads. The consequences for sensitive forest areas frequently go substantially beyond the immediate effects of any land clearing. Access roads open up remote regions to loggers and wildlife poachers, who normally would not have access to such areas. Forests then come under threat to further incursion and clearing all along the route of the access roads. Access roads can also fragment and interrupt habitat, effectively reducing the home territories of forest-dwelling animals.

According to some estimates, about 400 to 2,400 hectares (1,000 to 6,000 acres) are deforested and colonized for every one kilometer of new road built through a forested area.[4] In Ecuador, an estimated one million hectares (2.5 million acres) of tropical forest were colonized due to the construction of 500 kilometers of roads for oil production.[5]

Even in the rare instances when oil companies opt not to build roads, thus reducing these negative forest impacts, they must still build landing areas for helicopters and planes, which can also fragment habitat and negatively impact on migration routes.

Globally, most oil drilling sites are on land, but there is also a sizable quantity of offshore drilling sites with the potential for significant impacts on the marine environment. Offshore facilities are particularly common in Africa (almost half of the sites), Europe (more than half of the sites), and Asia Pacific (about two-thirds of the sites).[6] Offshore drilling can pose unique challenges; in particular, harsh weather conditions during the transfer and transport of oil from offshore locations increases the chance for accidents.[7]

Offshore facilities are often difficult for journalists (or regulators) to inspect, increasing the opportunities for operators to shirk regulations. Developing countries with few resources and weak environmental ministries do not have the helicopters needed to bring inspectors to oil platforms. Sometimes companies provide the transport, but they can then determine when inspections occur.

The location of offshore facilities can be important in determining a facility's impact on the marine environment. Rigs stationed in breeding grounds for fish or other ocean animals can disrupt breeding patterns and affect populations. For example, shellfish such as mussels and clams that are covered in oil have difficulty breathing and feeding. Fish eggs that are covered in oil can be destroyed, or they can produce malformed young. A facility's proximity to sheltered marine areas can result in more harmful environmental impacts. The quiet tidal action of estuaries and other sheltered inlets disperse oil slowly, giving it a better chance to seep into the coastlines.

In tropical zones, coastal areas often consist of mangrove ecosystems filled with a plant species whose roots grow out of the water and into the air. An oil spill that cov-

Examples of the Impacts from Toxins and Other Pollutants in the Oil Production Process

Chemical	*Aspect of Oil Production Process*	*Health/Environmental Impacts*
Benzene	Produced water	Carcinogen, reproductive toxicant, developmental toxicant
Toluene	Produced water	Developmental toxicant, suspected blood toxicant, neurotoxicant, liver toxicant, and kidney toxicant
Mercury	Produced water and drilling fluids (mud)	Developmental toxicant, suspected blood toxicant, endocrine toxicant, neurotoxicant, reproductive toxicant, immunotoxicant
Zinc	Produced water and drilling fluids (mud)	Suspected blood toxicant, developmental toxicant, and reproductive toxicant
Lead	Produced water and drilling fluids (mud)	Carcinogen, reproductive toxicant, developmental toxicant
Sodium (salinity)	Produced water	Contaminates soil, making it unfit for vegetation
Hydrogen Sulfide	Natural gas extraction	Suspected blood toxicant, neurotoxicant, and reproductive toxicant
Sulfur dioxide	Natural gas flaring	Major contributor to acid rain

ers these roots systems can wipe out the plants and the other species that depend on them. Mangroves often play a vital role in stabilizing soil and retaining coastlines and in providing important habitat for fish and other marine animals. An oil spill off the coast of Panama leaked 50,000 barrels of oil into a mangrove area and killed vegetation along 20 miles of coastline.[8]

The impact of oil spills on wildlife can be substantial. Fish and shellfish can be harmed or killed. Marine mammals that inhale or ingest oil can suffer vital organ damage, including to the kidney and liver. Lesions and internal bleeding have been found in mammals caught in an oil spill. Immune systems may also be compromised, and

behavior in some cases has been altered. These effects increase the animals' vulnerability to stress and to predators.

Oil can harm birds that nest or migrate along shorelines by oiling birds' feathers, inhibiting their insulation and their ability to fly and swim; moreover, birds that ingest enough oil may die. Spills have killed tens of thousands of birds, their numbers depending on where and when oil spills happen (migration paths and seasons, for example, will affect the tally.)[9] Oil spills can also damage tropical coral reefs, causing them to lose their color and to break apart.

The disposal of oil wastes from offshore drilling operations is another significant environmental concern. An oil platform uses nearly 400,000 gallons of sea water daily as drilling fluids in the extraction process, and, following its use, this oil-tainted water is discharged back into the ocean.[10] One of the apparent impacts of offshore discharges has been mercury pollution; eating contaminated fish is increasingly regarded as a substantial cause of human exposure to mercury. A study found that mercury levels in the mud and sediments beneath oil platforms in the Gulf of Mexico were 12 times higher than acceptable levels under U.S. Environmental Protection Agency standards.[11] The only way to solve the problems caused by offshore discharges is to capture the wastes and dispose of them in a properly lined waste disposal site on land.

Getting the oil to market: pipelines and refining

Pipelines used to transport oil and natural gas can create serious environmental harm. While pipelines are sometimes built below ground, building pipelines above ground is cheaper than burying them, and in many developing countries, above-ground pipelines are nearly universal. These visually obtrusive pipelines often disrupt grazing animals and cause hardships for herders and farmers.

Leaks and ruptures may be caused by faulty joints connecting pipeline components, by faulty valves, and by corrosion; more than half of pipeline spills have been caused by structural problems, most commonly corrosion.[12] Pipeline leaks are one of the most common causes of oil spills; in 1997, for example, pipeline spills were twice as common as spills from tankers.[13]

Leaks from above-ground pipelines can spoil land and surface water, while underground pipeline leaks, which can be extremely difficult to detect, can contaminate groundwater supplies. Leaks and ruptures can result in hazardous fires and explosions. Explosions are a particular hazard in the case of natural gas, which is inherently explosive.

As with extraction operations, pipeline construction frequently disrupts landscapes and environmentally sensitive areas. For example, the wide path that is cut to lay the pipeline—referred to as the "right-of-way"—can pass directly through high-value forests and open these areas to encroachment. The construction process also requires the building of access roads, which facilitate migration and exploitation of nat-

ural resources in the areas surrounding a pipeline. Access roads for pipelines can also lead to fragmentation and reduction of essential wildlife habitat.

In Bolivia, the 630-kilometer Cuiaba gas pipeline built by Enron, Shell, and Transredes in the late 1990s traversed the Chiquitano forest, the world's largest intact dry tropical forest. A number of rare and vulnerable species live in the forest, including approximately 90 species listed in the Convention on International Trade in Endangered Species (CITES). According to residents of local communities, construction of the pipeline facilitated harmful activities along the right-of-way, including hunting, illegal logging, and cattle roaming; it even resulted in an effort by a Canadian mining company to reactivate a dormant gold-mining site in the vulnerable forest, using dangerous cyanide processing methods.[14]

Refining is a stage in the process of oil development that also leads to significant environmental impacts. Using techniques such as boiling, vaporizing, or solvent treatment, refineries separate and convert crude oil so that it can be used as fuel. The end products of oil include gasoline, diesel fuel, jet fuel, kerosene, lubricating oils, and asphalt. The average refinery processes over 3.8 million gallons of oil daily.[15] Even the small fraction of this oil that is released into the environment as waste byproducts—0.3 percent—amounts to over 11,000 gallons of oil released daily at a single site.[16] Water used in the refining process must be treated to address the presence of traces of toxins such as heavy metals and other pollutants.

Refineries also produce significant quantities of air pollutants. In the United States, the refining sector is the third leading source of air emissions of highly toxic Persistent Bioaccumulative Toxins (PBTs), such as mercury, lead, and dioxins, producing more than 184,000 pounds of air emissions of PBTs in 2001.[17] Worldwide, the refining industry produced more than 48 million pounds of toxic air emissions in 2001, including tons of volatile organic compounds, like cancer-causing benzene, and chemicals which, in significant enough quantities, can cause asthma and childhood developmental problems.[18] The refining process can also result in substantial releases of sulfur dioxide, a key contributor to acid rain.

The complex refining facilities are also vulnerable to leaks and accidents. Leaking oil storage tanks and barrels are important contributors to chemical and oil releases at refining facilities, and fires and explosions at refineries can sometimes be a source of large chemical releases into the air.

Oil spills

The extraction and transportation of oil often results in spills. Internationally, between 20 million and 430 million gallons of oil were spilled in reported incidents in each year between 1978 and 1997; the number of incidents during that period ranged from 136 to 382 annually.[19] Spills occur from storage tanks, pipelines, tankers, and barges and

other vessels. With the exception of pipelines, spills most commonly occur during transport, including while loading on tankers, moving from tanker to rail, or from rail car to storage facility.

The vast majority of spills are small compared to tanker disasters, releasing between 10,000 and 1 million gallons, but these "small" spills add up to 15–20 million gallons spilled in most years.[20] If frequent, these spills can be more damaging than tanker disasters by chronically exposing plants and animals to oil pollution.

The most visible and largest oil spills, however, typically occur from a tanker accident, such as the *Prestige* spill that dumped approximately 17 million gallons off the coast of northern Spain in 2002. While large tanker spills are less common, the amount of oil released by spills in any particular year generally depends on the number of extremely large spills releasing more than 10 million gallons.

In the past several decades, supertankers carrying oil have become truly super: from a 150 million gallon capacity in 1960 to over 240 million gallons today. Large and minimally maneuverable, tankers are prone to accidents.[21] In addition, inadequate ship design and construction lead to larger spills when accidents occur. For example, ships with single hulls (or skins) are much more vulnerable in accidents than those with double hulls. The U.S. Oil Pollution Act of 1990 requires that all newly constructed tankers operating in U.S. waters be fitted with double hulls and that all tankers in U.S. waters be double-hulled by 2010. In response to recent spills, particularly the *Prestige* accident, the International Maritime Organization, an intergovernmental body, has now required an accelerated phase-out of large single-hull tankers by 2010. The age of ships is another key factor in spills; explosions and fires are more common with older ships.

Because chronic small spills register low on the radar of many government officials, the media, and the public outside of the affected area, it usually takes large-scale accidents to galvanize officials to take action on oil tanker safety and oil spill response plans. In the United States, for instance, it took the 1989 *Exxon Valdez* disaster in Alaska to push the U.S. government to consolidate legislation pertaining to oil spills. The accident, which resulted in an oil spill of 11 million gallons, revealed problems with coordinated rapid response and clear lines of authority in the emergency. The 1990 Oil Pollution Act established a national response system that mandates the formation of a committee to coordinate the various government agencies and actors, industry, and responsible parties after a spill.[22] The act also made responsible parties liable for cleanup costs, compensation, and potential civil penalties, and it established an oil spill fund for emergency response.[23]

A comprehensive and rigorous oil spill response plan with well-defined accountabilities is crucial for oil-producing countries, yet such plans are lacking in many cases. Azerbaijan, for example, is dramatically increasing its oil production, yet the country

still does not have a national oil spill response plan. This also hampers effective cooperation and coordination with its neighbors on oil spill response in the Caspian Sea.

The cost of oil spill response can vary dramatically, depending on factors such as the location of the spill, impact on sensitive resources such as a vulnerable ecosystem or a tourist area, distance to shoreline, and type of oil spilled. Spills near shorelines are much more expensive to clean up than spills in the ocean. The type of oil spilled also affects cleanup costs. Lighter gravity crude and refined oil tends to evaporate and disperse more quickly, reducing the amount of cleanup effort. Heavy gravity crude oil requires more intense efforts to remove the oil, and heavy crude can be four times as expensive to clean up as light crude.[24] Estimates of cleanup costs for spills range from $1,000 per ton spilled in Africa to more than $24,000 per ton in the United States (when the *Exxon Valdez* spill is excluded from the calculations). In the case of the *Exxon Valdez* spill, Exxon says that it spent $2.1 billion on the cleanup.[25]

When a spill happens, the responders will typically strive to keep the oil away from shorelines. Dispersants, which are chemical agents that break up and spread oil in water, may be used to lessen impacts on the shorelines. Dispersant use has not been free of controversy, however, as the chemicals used can be toxic and they expose fish to chemicals and prolong exposure to the oil. Bioremediation, in which oil-eating bacteria are used, is another method of dispersal. Burning oil is another option, but it is hazardous for the workers and it can be difficult to control. Another response technique is the use of booms to slow the spread of a spill. Booms have a flotation device and a ledge both under- and above-water to contain the oil. The containment helps prevent spills from reaching sensitive areas and helps concentrate the oil for easier cleanup.

Oil spills on land do not spread as fast as on water, and they are easier to contain than spills in water. Nevertheless, spills that pollute soil can make land useless for grazing or agriculture; spills can make groundwater unfit for human consumption, crop cultivation, and livestock.

Consumption of oil and gas

The consumption of oil and natural gas also produces extremely significant impacts on the environment and public health, both locally and globally.

One of the principal products produced from oil is gasoline, a vehicle fuel that creates a number of harmful air pollutants (a significantly smaller amount of oil is also used for production of electricity and home heating). The pollutants from gasoline include volatile organic compounds (such as benzene and toluene), some of which are toxins; nitrogen oxides that result in acid rain and ground-level ozone, the principal component of smog; sulfur dioxide, a critical cause of acid rain; particulate matter that causes respiratory illnesses, including asthma; carbon monoxide; and, in those countries where it is not yet removed from gasoline, lead.

Numerous studies have shown a correlation between these pollutants and mortality.[26] Acid rain—essentially, a phenomenon caused by sulfur and nitrogen emissions that form acidic water droplets in clouds—has harmed forests and lakes, streams, and groundwater supplies. In addition, the combustion of natural gas, which is principally used for electrical power production, creates nitrogen oxides that contribute to acid rain and smog.

Consumption of oil and gasoline also has serious global consequences in the form of climate change (often referred to as global warming). The phenomenon of climate change can be likened to what happens in a greenhouse, with certain gases trapping heat energy from the planet in the earth's atmosphere. The most important of the "greenhouse gases" from oil and natural gas sources is carbon dioxide (CO_2), which is produced both by the use of gasoline and by the combustion of oil and natural gas to create electrical power. Worldwide, about 18 percent of electrical power is produced from natural gas, while 7.5 percent of power is produced from oil. Compared to natural gas, however, oil creates about one and a half times the amount of CO_2 for the same amount of power produced.[27]

There are few scientific organizations around the world that doubt the conclusions of the Intergovernmental Panel on Climate Change—which itself relied on the research of 2,500 scientists—that there is a link between increased concentrations of carbon dioxide and climate change. In a well-publicized 2001 report, a National Academy of Sciences commission determined that "greenhouse gases are accumulating in Earth's atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise."[28]

The consequences of climate change are likely to be substantial and widespread. The melting of glaciers and polar ice caps could cause a rise in sea level. Extreme weather events, such as hurricanes, could increase in frequency and intensity. Increased heat could lead to desertification in some regions and the reduction of forested and agricultural zones in others. Infectious diseases such as malaria could be spread more widely as a rise in global temperature affects the vectors (carriers) for these illnesses. Increases in ocean temperatures are likely to lead to the massive dying off of coral reefs, the most productive ocean ecosystem.

The understanding that humans are the primary cause of climate change was the driving force behind the Kyoto Protocol, an international treaty agreed to in 1997 as a protocol to the United National Framework Convention on Climate Change (itself adopted in 1992). The intent of the Kyoto Protocol is to provide obligations and a framework for achieving the goal of the Framework Convention to reduce global CO_2 emissions by 7 percent below their 1990 level. Its focus is on reductions in carbon emissions in developed countries.

Implementation of the treaty remains an important focus of the world's efforts to

combat global warming. With Russia's ratification of the treaty in 2004, the protocol went into force in February 2005. Efforts to make the Kyoto Protocol effective are severely hampered by the resistance by the Bush administration, which rejected the treaty in 2001. The United States remains the single largest national contributor to climate change, responsible for more than 22 percent of all global carbon emissions.[29]

TIP SHEET

Questions on Environmental Impacts

- Are exploration and drilling activities being conducted in environmentally sensitive areas, such as vulnerable forests, protected wetlands, sensitive marine areas, or other ecologically threatened zones? (Examples of environmentally sensitive areas include IUCN/World Conservation Union protected areas, World Heritage Sites, UN national parks, and Ramsar Convention protected wetlands).

- Is a pipeline right-of-way being cut through environmentally sensitive areas such as those mentioned above? Are roads being constructed in such areas in order to conduct exploration and drilling or construct a pipeline? Are natural habitats for animals, particularly endangered species, being disrupted or destroyed?

- During the exploration process, are remote sensing techniques being used instead of surface-based seismic testing such as explosions and vibrating trucks?

- How are the byproducts of extraction, including produced water, drilling muds, and cuttings, treated and disposed? Are drilling muds being reused? Is produced water being re-injected? Are any disposal pits properly lined? Are tanks to export wastes being used?

- Is associated natural gas being vented or flared into the atmosphere?

- At offshore wells, are wastes transported onshore for treatment and disposal, instead of being released into the marine environment?

- Are pipelines constructed with double-wall piping and automatic cutoff valves to prevent any possibility of leakage or explosion? Are joints appropriately joined and sealed?

- Have adequate environmental impact assessments (EIA) been conducted for the impacts of extraction operations, pipelines, and refineries? Does the EIA address the entire lifespan of an extraction project, beginning with the exploration process?

- Have independent experts conducted the EIAs? Are they publicly available? Can they be reviewed by other experts? Have alternative approaches to the planned project—including no project at all—been fully explored? In the case of pipelines, have alternative routes been fully considered?

- At refineries, what measures are in place to minimize pollutant releases and the potential for accidents?

- Do oil tankers have double hulls and the technology needed to prevent spills? Are other appropriate safety measures in place? Have emergency response plans been established?

Human Rights and Social Issues

Community input and empowerment

Since oil extraction and transportation have such far-reaching impacts, developing oil extraction and transport projects can be extremely contentious. Many civil society groups and communities contend that high-impact projects should only proceed if a community agrees with the project and, in effect, gives the company the "social license to operate" in the form of free and informed consent. In any case, poorly designed processes that fail to capture the range of possible social and environmental risks could result in unforeseen costs for the companies involved and considerable damage to their reputations.

Bad processes also exacerbate tensions with local communities who feel disempowered and suspicious and may be more likely to fight the project.

In the absence of clear domestic laws or enforcement capacity for some laws, many companies see the guidelines of the World Bank as a benchmark to guide their consultation practices and social and environmental policies. The private sector lending arm of the World Bank, the International Finance Corporation (IFC), has a number of environmental and social safeguard policies that companies seeking IFC financial backing must follow. In addition, IFC has certain information disclosure and consultation requirements.

For Category A projects, which are the most environmentally sensitive projects, and which should almost always include oil field development and pipeline construction,[30] IFC requires its private sector clients to commission environmental assessments (EAs) of its projects. These assessments must be publicly disclosed and subject to public consultations. These EAs must be released at least 60 days before the IFC approves the project. Many civil society groups would like to see this consultation period expanded to at least 120 days in order for vulnerable communities to have time to make informed decisions.

The IFC also outlines what these assessments should contain and how they should be designed. They must examine project alternatives, including the "no project situation," and identify ways of improving project selection and design. They should seek first to prevent, and then minimize and compensate for negative environmental impacts. How impacts will be managed should be clearly outlined. In the assessment, environmental issues should be considered broadly by including impacts on air, water, and land, as well as on human health and safety, resettlement, and indigenous peoples. For sensitive projects, IFC also requires the project sponsor to commission an independent party to carry out the EA, and recommends that an advisory panel of independent, recognized experts advise on the project and its environmental impacts.

An effective process also includes public consultation. For sensitive projects, IFC requires two consultations with affected communities and civil society groups during project consideration. The first consultation should occur as early as possible and before the assessment process begins. The second consultation should be held after a draft EA is completed to discuss the report. Materials must be provided during the consultations that are in an understandable language and format for affected people (which includes taking literacy rates into account). The draft EA itself should be available in a public place accessible to project-affected people and local civil society groups, including the World Bank office in the country and national and local government offices.

The EA itself should include an executive summary, description of the project, baseline data on socioeconomic and environmental conditions, the project's likely environmental impacts, analysis of alternatives, and an environmental action plan that responds to the mitigation, monitoring, and capacity building that is needed. Once projects are underway, consultations should be held on a regular basis to address any issues that may arise.

Militarization and human rights abuses

Concerns about the human rights impacts of the oil industry have increasingly centered on the "militarization" of oil development when abusive security forces act to protect industry operations, particularly for multinational oil companies. Militarization in the oil sector has largely been the result of the oil industry's intense global search for

viable petroleum sources, increasingly leading oil companies to establish or expand operations in countries with corrupt or repressive governments. While oil companies have legitimate interests in protecting extractive and pipeline operations, the industry has increasingly collaborated in these countries with security forces that have less than stellar human rights records.

For the most part, the security forces involved have been government sponsored, including national armies and local police and militia (though oil companies have also hired private security firms in some instances). In countries such as Nigeria, Burma, Indonesia, and Peru, the activities of these security forces have resulted in a wide range of human rights abuses, including denial of free speech and justice, torture, slavery and forced labor, rapes, extrajudicial killings, and executions. In a number of cases, the close relationship between companies and governments or security forces, often involving hiring or other contractual arrangements, has resulted in considerable oil company connection to, and even complicity in, the activities of human rights abusers.

The militarization process is often driven by the attempts of oil companies and governments to quell or altogether put an end to local resistance (or what they believe will become local resistance) to the large-scale impacts of extractive operations and pipeline construction.

In some cases, the military intervention has been in response to vigorous community opposition to oil-related social and environmental damage, including oil spills, toxic waste, devastated local ecologies that communities rely on for livelihoods, inadequate or misdirected local development, inadequate compensation for expropriated land or other damage, and poor labor conditions. Objections to these impacts are frequently buttressed by the view of many local communities that the oil resources being exploited should rightfully be theirs to control. Probably the most notable instance of militarization used to suppress opposition to the harmful social and environmental impacts of oil development took place in Nigeria's Niger Delta.

Environmental devastation and human rights abuse

Nigeria is a prime example of the paradox of plenty. According to an IMF working paper, in 1965, when oil revenues per person were about $33, per capita income was $245. Three and a half decades later, when oil revenues were $325 per person, per capita income was the same as in 1965. "In other words, all the oil revenues—$350 billion in total—did not seem to add to the standard of living at all."[31] Between 1970 and 2000, the poverty rate increased from about one-third of the population to almost 70 percent of the population.[32]

For communities in the oil-producing region of the Niger Delta, the effects of oil production have been devastating. Human Rights Watch found that "oil-led development has clearly seriously damaged the environment and the livelihoods of many of those living in the oil producing communities."[33] The Niger Delta is a biologically rich

mangrove area where fishing and agriculture provide the basis for most people's subsistence. Oil spills in the Delta, which are all too frequent, kill fish and crops and pollute water and soil. Canals designed and used by the oil companies to transport the oil have affected natural water flows and water quality, "again killing off crops, destroying fishing grounds, and damaging drinking water supplies."[34] Land has often been expropriated on the oil companies' behalf, without adequate compensation.

Communities for the most part have been unable to seek redress for these wrongs because there is no independent functioning court system. Unsurprisingly, relations between the oil companies and communities are poisonous, and confrontations are common. In response to the ecological destruction caused by oil extraction in the Delta, and to the ruin of fishing and agricultural production that served as the basis for local livelihoods, communities have resisted multinational oil companies' activities. Tactics employed included public rallies, nonviolent occupations of oil installations, and occasional sabotage of pipelines.

Meanwhile, the government has a number of security forces in the region, and oil companies have frequently hired security forces, including local police, to protect oil operations. According to Human Rights Watch, the activities of government security forces protecting those producers have resulted in severe human rights violations, including executions, beatings, and imprisonment without trial. In 1999, when Human Rights Watch reported on the situation in the Niger Delta, the group documented repeated incidents in which people were brutalized for attempting to raise grievances concerning the oil companies and found that Royal Dutch/Shell, the largest producer in the region, was paying for government security forces implicated in human rights abuses. "In virtually every community, there have been occasions in which the regular police, or the army, have beaten, detained, or even killed those involved in protests, peaceful or otherwise, or individuals who have called for compensation for oil damage, whether youths, women, children or traditional leaders."[35]

Most notoriously, in 1995 the government of the then-president, General Sani Abacha, executed writer Ken Saro-Wiwa and eight other activists from the most effective community organization in the Delta, the Movement for the Survival of the Ogoni People (MOSOP), despite no credible evidence that the leaders were guilty of the crimes for which they had been tried.[36]

In other cases, security forces have engaged in offensive efforts to protect oil operations in an unstable security environment that includes opposition to a repressive regime or an active ethnic or separatist movement. Oil development is viewed as the prerogative of a country's ruling elite. While the severity of the actual threat posed by local resistance has varied, there are a number of cases in which security forces have engaged in proactive security measures that reach far beyond, and are far out of pro-

portion to, the security concerns being addressed. Moreover, the repressive measures employed can have the effect of creating a climate of fear and more generally intimidating local communities into compliance with and acceptance of the project.

The most well-known instance of this type of oil sector militarization occurred in Burma in the early 1990s, when Unocal and its consortium partners decided to partner with the Burmese military junta in building the Yadana gas pipeline. Although the appalling human rights record of the regime's brutal military was well known, the company nonetheless contracted with the SLORC, the State Law and Order Restoration Council, now called the State Peace and Development Council (SPDC), to provide security during pipeline construction.[37] Human rights advocates believe that the militarization was aimed at not only ensuring security, but also providing a ready pool of forced labor to help build infrastructure for the pipeline. The militarization along the route resulted in repression that went significantly beyond basic security measures, including forced relocations of entire villages, forced labor for military operations and garrison construction, and rapes and murders of villagers in the area.[38]

Militarization has also occurred in order to suppress efforts by local communities to prevent the introduction of oil development activities in their region. For example, in Latin America, a number of indigenous groups have opposed efforts by oil companies to drill for oil and construct pipelines in indigenous territories. In a well-known case in Colombia, the indigenous U'wa people resisted efforts by Occidental Petroleum to drill for oil on their sacred land in a sensitive rainforest. In order to ensure that Occidental's project could move forward in 2000, the Colombian authorities brought in armed riot police who clashed with U'wa protesters blocking a key road for the oil project. After repeated protests, Occidental in 2002 decided not to pursue its oil concession further.[39]

When human rights abuses occur during militarization, the degree of oil company responsibility for abuses is often disputed. Concrete assistance to security forces is compelling evidence of a company's involvement in militarization, though that assistance has varied widely. In some cases, as in Burma, a national military has been hired by an oil company to provide security; in other cases, the company has paid local security forces, as Shell did in Nigeria.[40] Oil companies have also provided material support to militaries. For example, Shell gave guns to Nigerian security forces, and Chevron called in and provided helicopters and pilots to a police force that then gunned down nonviolent protesters on a Chevron oil drilling platform.[41] Other ways that companies and security forces have cooperated include coordinated security strategies, daily security briefings, and the provision of vehicles, arms, food, and medicine to soldiers and police.

But the level of financial or material assistance provided to security forces only answers part of the question about oil company responsibility. Human rights advocates argue that oil companies that rely on the security services provided by local military or

Examples of Militarization Incidents in Brief

- Nigeria: Shell pays local security forces that commit abuses in Niger Delta; fails to aggressively step in during the trial and execution of local leaders (1990s)
- Nigeria: Chevron recruited and transported Nigerian military and police who shot at and killed peaceful protesters from Chevron helicopters (1998 and 1999)
- Burma: Unocal contracts with Burmese military to provide security for Yadana pipeline; villagers are killed, raped, tortured, and forced to work building infrastructure (1994 – present)
- Colombia: Colombian riot police brought in to remove members of U'wa indigenous people resisting Occidental Petroleum's oil projects (late 1990s)

police forces should be aware of those forces' human rights records. They say companies have a responsibility to be proactive in efforts to prevent and condemn abuses or avoid doing business with those forces altogether.

In the case of Burma, human rights advocates have disputed Unocal's contention that, while it may have been aware of the SLORC's human rights abuses, it did not want or order the SLORC to violate human rights.[42] As human rights advocates have noted, the company knew that human rights abuses were likely to occur and therefore had an obligation to prevent them or to cease doing business with the SLORC.[43]

In Nigeria, Shell's passive stance toward the trial leading to the execution of Ken Saro-Wiwa and his MOSOP colleagues has been questioned. Although Shell called for a fair trial after facing mounting pressure from civil society to do so, Human Rights Watch and other groups have criticized Shell for not making clear its objections to the actual conduct of the trial and the resulting denial of justice.[44]

In 2000, ongoing controversy over human rights abuses by security forces led the U.S. State Department and the UK Foreign and Commonwealth Office to convene oil and mining companies, together with some nongovernmental organizations, to develop a set of *Voluntary Principles on Security and Human Rights*. The principles were intended to provide guidance for establishing human rights safeguards in company security arrangements in the extractive sector (including petroleum and mining). The key components of the principles address engagement with private security, engagement with public security, and risk assessments concerning security environments. Among other provisions, the principles say that companies should clearly communicate their policies to government security forces. The oil companies that signed the principles at the outset included Chevron, Texaco, Conoco, Shell, and BP.

The principles were heralded in some quarters as the first set of guidelines of this type for the extractive sector and as a global benchmark. Some NGOs, however, were cautious. Amnesty International welcomed the principles, but did not endorse them, despite the group's involvement in their development. Other groups, such as EarthRights International, criticized the voluntary nature of the principles as inadequate. The principles have also been criticized for not encouraging companies to release the terms of their security contracts and arrangements with security forces.

Resettlement and forced relocation

Some oil development projects may also require people to be resettled, a socially and economically disruptive experience. Serious concerns have been raised about the failure of oil companies to provide appropriate compensation for land expropriation and other harm experienced by local communities in the process of resettlement. Compensation is a particular concern in the case of pipeline construction, which requires extensive use of land and destruction of natural resources along a pipeline right-of-way.

In many cases, in order to secure agreement on compensation, companies will reach terms with a small subset of a community or its leaders without consulting with the broader community. Compensation amounts are generally kept from public scrutiny, and it can be expected that they will vary widely depending on particular circumstances.

In Peru, an investigation in 2003 by environmental organizations found that the consortium constructing the Camisea pipeline had taken advantage of the inexperience of local communities and failed to use appropriate methods in calculating compensation for lands and natural resources.[45] Similarly, a 2002 investigation found that a consortium comprised of Shell and Enron failed to pay the full costs for taking title to local community lands that were used for the Cuiaba pipeline.[46]

IFC's involuntary resettlement policy is considered one guideline for projects in developing countries. According to the policy, a resettlement plan should accompany any project involving involuntary resettlement, and communities should participate in designing the program. Displaced persons should be compensated for their losses at full replacement cost prior to moving. Compensation includes land, housing, infrastructure, and cash as appropriate to the situation. Displaced people should be assisted in moving and settling into their new location. They should be at least as well-off as before resettlement, and the project sponsor should assist them in improving their income-earning potential. Lacking formal title to land is not considered a reason to be denied compensation. Project sponsors are required to provide a public Resettlement Action Plan, which (like an Environment Assessment) should be available at the World Bank office in the country and at national and local government offices.

The IFC definition of "involuntary" resettlement is controversial, however. Should a community be so negatively impacted by a project that people feel forced to

move—for example, if pollution from a facility causes health impacts—the community's residents would nonetheless be considered to be moving voluntarily according to the IFC policy. As a result, many NGOs feel the definition of involuntary is too narrow.

Beyond cases of voluntary or involuntary resettlement, there are instances in which forced relocations have taken place. In Burma, for example, the SLORC burned entire villages and forced relocations at gunpoint in order to provide security and a right-of-way for Unocal's Yadana pipeline.[47] Because the relocation was accomplished under threat and intimidation, a U.S. appellate court found that the military's actions constituted a violation of customary international law.

Indigenous communities

As oil drilling goes to frontier (unexplored) areas, oil companies frequently come into contact with indigenous communities, many of which have never had contact with the outside world. Too often these communities have little or no say whether oil exploration and drilling goes on in their communities. Such communities are frequently not included in a country's formal legal system.

Indigenous groups are often forcibly contacted and exposed to non-native diseases and other social threats, often devastating their traditional way of life. Industry operations can damage sensitive ecological areas where indigenous communities exist and encroach on lands that are considered sacred.

The introduction of infectious diseases to which indigenous communities have not developed immunities is common. For instance, when oil workers entered the Urarina community's region in the Peruvian Amazon in the 1990s, the Urarina contracted diseases, including pertussis (whooping cough) and strains of malaria, which had never been present in their community.[48]

Legal issues

Human rights violations have led to litigation against oil companies with ties to abusive security forces. Most notably, legal advocates in the United States have brought a series of lawsuits under a U.S. statute, the Alien Tort Claims Act (ATCA), which allows plaintiffs to bring claims for tort damages for violations of international law. The cases brought against oil companies, including Unocal, ChevronTexaco, and ExxonMobil, assert that the companies were complicit in the human rights abuses carried out by security forces that provided security assistance for oil operations. While those defending the companies from the ATCA claims argue that the statute was originally intended for other purposes, the claims thus far have continued to move through U.S. courts and will face critical legal tests in the next several years.

Human rights advocates have also raised concerns about the potential impact of Host Government Agreements (HGAs), special pacts between a government and for-

Impacts on Indigenous Communities: Case of the Camisea Pipeline

The Camisea project, which includes the drilling of gas in the remote Peruvian Amazon and shipment to the coast, is one of the most controversial recent extractive industry projects in the world. The project is located in one of the world's most ecologically prized rainforests. The World Wildlife Fund has designated the area as one of its "Global 200" eco-regions, giving it a top priority for conservation efforts due to its high biodiversity and globally important ecological functions. The export facility is located in an internationally recognized marine reserve.

The project is also violating the rights of the Camisea region's indigenous people, who are living in voluntary isolation within a protected reserve. The reserve was created to guarantee the territory of the Nanti and Nahua isolated peoples and to protect them from outside disturbance. Their rights to remain uncontacted and to determine their own path of development are articulated in the International Labour Organization (ILO) Convention 169 on Indigenous and Tribal Peoples, which has been ratified by the Peruvian government. According to local NGOs, project officials made unannounced visits to these communities.

The presence of project workers and other outsiders in the reserve has introduced diseases to which isolated communities have no immunity. According to the preliminary findings of a health study being conducted by the London School of Tropical Medicine and the Peruvian Ministry of Health, all of the Nanti living in the settlements along the Camisea River are ill with acute respiratory diseases, whereas a typical infection rate for that population would be about 50 percent.

Indigenous groups not living in isolation have been inadequately consulted on project design, environmental management plans, and proposed compensation measures. Environmental organizations found that the consortium behind Camisea took advantage of the inexperience of local communities and did not use appropriate methods to calculate compensation owed for use of lands and natural resources. The communities were also forced to negotiate with up to three different companies offering different deals. This served to weaken and undermine the negotiations process for affected people.

For more information, go to http://www.bicusa.org/bicusa/issues/Camisea_factsheet8-2003.pdf

eign investors, including oil companies, that establishes terms for the companies' investment.[49] HGAs can provide rights and privileges that enable investors to avoid the constraints of public interest policies that would otherwise apply. In the case of the Baku-Tbilisi-Ceyhan (BTC) pipeline, the HGA between Turkey and the BTC consortium (led by BP) allows the pipeline consortium to seek compensation for business-related impacts caused by the application of new health, safety, and environmental laws and regulations.[50] The government is also prohibited from hindering any aspect of the project, including for health, safety, or environmental reasons, unless there is an imminent and material threat present. Further, the Turkish government is itself obligated to expropriate land for the pipeline project and provide police protection.

Impacts on workers and employment

Oil extraction and transportation operations are capital intensive. Employment impacts from such operations are minimal. The greatest employment impact is during the construction of facilities, and this employment lasts a few months at best. For example, BP's oil and gas pipelines in Azerbaijan, Georgia, and Turkey together might employ up to 6,000 people at the peak of construction; however, at least half of the jobs for unskilled workers will likely last no more than "two months."[51] After construction, the two pipelines together are projected to employ 700 people.[52]

Nevertheless, communities often have high (and false) expectations of the employment benefits a project will deliver. When these jobs do not materialize, tensions between the companies and communities escalate. Resentment among those who do not have jobs toward the few that do feeds into further community strife. False expectations are often created by politicians and sometimes company officials seeking to generate support for a project.

Oil operations may also negatively affect the social fabric of communities. Outside workers employed at the sites spend long periods of time away from home. The influx of companies and foreign workers brings with it lots of cash and results in inflation that leaves local community members unable to pay for goods that were previously affordable.

While living in worker camps, the men are often tempted by alcohol, drugs, and prostitution. This further disrupts family life and social structures. While most research regarding the public health consequences of extractive industries, including the spread of HIV/AIDS, prostitution, and drug use, has focused on mining operations, the situation is likely to be similar at oil drilling sites. In the case of South African mining, the prevalence of HIV among miners was almost 20 percent higher than the base population.[53]

Health and safety conditions for workers at oil drilling sites are hazardous. Offshore rigs are exposed to high winds and rough seas. Conditions on oil platforms can be wet and slippery. Shifts are long and physically demanding (workers typically work long shifts for extended periods of time followed by extended time off). The

machines on the rigs are heavy, and their operating speeds can be fast. Excess pressure on drilling heads causes explosions and fires. All these conditions can lead to serious injuries. British oil giant BP was fined for two serious worker-related incidents in its Alaska operations in the United States in 2002: for the death of a worker from a well explosion and for serious injury caused to a worker from a pipe blowout.[54]

In fact, working in the oil industry is one of the most hazardous occupations. In the United States, which has comparatively rigorous occupational safety laws, work-related deaths in the oil and gas extraction sector are higher than deaths from all other U.S. industries combined.[55] In oil-producing developing countries, the labor conditions are probably even worse since work safety laws are usually nonexistent or underdeveloped. Often the laws that exist are not well enforced, with employers frequently escaping punishment by bribing authorities. Weak labor unions offer workers little protection.

On land and at sea, workers at oil extraction sites are potentially exposed to dangerous chemicals, including arsenic and cyanide. High levels of exposure can cause serious injury and illness; long-term, lower-dose exposure can still damage the health of workers. Lost workdays from injury tend to be longer than in other industries.[56]

Conclusion

As the oil industry intensifies its global search for new sources of petroleum, remoter areas are likely to be affected by the oil industry, and those areas where production and development are already taking place could see even more activity. At the same time, the impacts of oil development, including the environmental and social impacts, will also intensify, and the consequences of this hunt for fossil fuels should be carefully scrutinized. The potential financial benefits of intensive oil development can and should be viewed in the context of the serious environmental and social costs that may be borne first by local communities and then by the global community. At the end of the day, oil does not come free.

Questions about Human Rights

- What kinds of consultations have oil companies engaged in with local communities? Have these gone beyond consulting with a limited group of individuals? Have community members been given complete information in local languages?

- What security arrangements have oil companies entered into with security forces, public or private? What is the precise nature of the relationship — i.e., contractual, employer/employee, agency? Has a company disclosed its security arrangements or contracts (whether written or not)? Has a company disclosed any agreements concerning human rights or related issues?

- What is the public human rights record of a country and its security forces where an oil company is investing? What kinds of specific warnings should have put the company on notice about human rights concerns?

- Has the oil company undertaken a security risk assessment prior to investing? What is the nature and content of the risk assessment? Did it address the potential for human rights abuses? Has a company disclosed its security risk assessment?

- What is the company's presence on the ground? Does it have the ability and capacity to monitor, prevent, and address abuses? What is the nature of the relationship between the parent oil company and any subsidiaries operating on the ground?

- Does the oil company allow free, unrestricted, unaccompanied, and unmonitored visits to its operations by journalists, human rights groups, and others?

- Have any local community members been displaced by extraction, pipeline, or other operations? What kind of compensation, if any, has been provided? What is the nature of the displacement and under what circumstances did it occur (e.g., did it take place under threat and intimidation)?

- Does a company have a Host Government Agreement, a legal agreement between a government and oil company that establishes terms for the company's investment, or an equivalent agreement with a country? Has the company made these agreements public? Do the agreements limit the government's ability to protect the public interest? Do these agreements ensure that expropriation and compensation issues will be addressed appropriately?

SAMPLE STORY

Unocal Becomes First US Firm to Stand Trial in US Over Rights Abuses

By Marc Lavine

LOS ANGELES, Dec 10, 2003 (Agence France-Presse) – Oil giant Unocal Tuesday became the first US firm to stand trial in the United States for alleged human rights abuses abroad, in a case centered on the building of a gas pipeline in Myanmar.

Myanmar villagers have sued the California-based oil titan claiming it was complicit in human rights abuses by the Southeast Asian country's brutal military junta, including forced labor, rape and torture.

The trial in Los Angeles follows two lawsuits filed by up to 15 unidentified villagers from the nation formerly known as Burma over the construction of the 62-kilometer (39-mile) Yadana natural gas pipeline.

The villagers claim in their seven-year-old lawsuit that Unocal turned a blind eye as junta troops murdered, raped and enslaved villagers and forced them to work on the 1.2-billion-dollar pipeline in the 1990s.

"Burmese soldiers enforced a system of slave labor and committed horrible acts of violence on Unocal's behalf," said Terry Collingsworth, executive director of the International Labor Rights Fund, which represents some of the villagers.

Unocal, which did not directly operate the field that was owned by the Myanmar government, strongly denies any involvement in abuses.

The case centers on the construction of the much-disputed pipeline, built by Unocal and partners including France's Total, to carry natural gas from Myanmar to neighboring Thailand.

The villagers are suing for unspecified damages alleging that Unocal benefited from use by the Yangon junta of forced labor and its soldiers' use of murder and rape, even if it did not agree with the abuses.

At issue in the first part of the complex trial is whether Unocal can be held liable for the conduct of its subsidiaries which invested in the pipeline.

Daniel Petrocelli, Unocal's lead lawyer, said California's "alter-ego doctrine" bars plaintiffs from trying to tap a parent corporation if a subsidiary has valuable assets of its own.

"The whole case boils down to one point: If the subs (subsidiaries) can pay, the case goes away," he told a crowded courtroom in opening arguments.

But lawyers for the villagers maintain that Unocal is using its subsidiaries as corporate shells to avoid responsibility in the case.

"Unocal's opening statement was a tribute to the ability of corporations to do whatever they want in the name of profit," Dan Stormer, attorney for the villagers, told AFP.

"Nothing about these various entities was independent," he said, adding that Unocal should be held directly responsible for its units' role in the affair as they were sham companies.

But Petrocelli insisted the units—Unocal Myanmar Offshore Co., Unocal International Pipeline Co. and Unocal Global Ventures—had hundreds of millions of dollars in assets and their own corporate structures.

"Every one of these companies has the ability to pay," Petrocelli said.

In July, Judge Victoria Chaney rejected Unocal's arguments that the case should be tried at least in part under the laws of Myanmar or Bermuda, where its subsidies were based, instead of under US law.

If Unocal manages to convince the court in the first phase of the trial, that is expected to last about 20 days, that its subsidiaries, rather than the parent company, should be targeted by any suits, it could move to have the abuse charges thrown out in the second phase of the trial.

In written complaints, the villagers said they were pressed into service to clear a route and build facilities for the pipeline, widely described as the largest foreign-invested project in Myanmar.

The plaintiffs' identities have been concealed for fear of reprisals by Myanmar's junta.

Unocal executives have acknowledged that troops did force villagers to carry ammunition and supplies for the military and to perform other labor in the vicinity of the project, but deny that any of the labor was linked to the pipeline's construction.

Unocal owned the pipeline jointly with Total, formerly TotalFinaElf, and the Thai and Myanmar governments. Total is being sued separately in Europe.

Editor's Note: *As of March 2005, Unocal had agreed to settle out-of-court. The settlement will be aimed at providing funds to improve local living conditions, as well as monetary compensation to the victims.*

Appendix

Extractive Industries Transparency Initiative

EITI, an initiative led by the UK Department for International Development and the World Bank, aims to ensure that the revenues from extractive industries contribute to sustainable development and poverty reduction.

The EITI Principles

1. We share a belief that the prudent use of natural resource wealth should be an important engine for sustainable economic growth that contributes to sustainable development and poverty reduction, but if not managed properly, can create negative economic and social impacts.
2. We affirm that management of natural resource wealth for the benefit of a country's citizens is in the domain of sovereign governments to be exercised in the interests of their national development.
3. We recognise that the benefits of resource extraction occur as revenue streams over many years and can be highly price dependent.
4. We recognise that a public understanding of government revenues and expenditure over time could help public debate and inform choice of appropriate and realistic options for sustainable development.

5. We underline the importance of transparency by governments and companies in the extractive industries and the need to enhance public financial management and accountability.
6. We recognise that achievement of greater transparency must be set in the context of respect for contracts and laws.
7. We recognise the enhanced environment for domestic and foreign direct investment that financial transparency may bring.
8. We believe in the principle and practice of accountability by government to all citizens for the stewardship of revenue streams and public expenditure.
9. We are committed to encouraging high standards of transparency and accountability in public life, government operations and in business.
10. We believe that a broadly consistent and workable approach to the disclosure of payments and revenues is required, which is simple to undertake and to use.
11. We believe that payments' disclosure in a given country should involve all extractive industry companies operating in that country.
12. In seeking solutions, we believe that all stakeholders have important and relevant contributions to make—including governments and their agencies, extractive industry companies, service companies, multilateral organisations, financial organisations, investors, and non-governmental organisations.

The EITI Criteria

1. Regular publication of all material oil, gas and mining payments by companies to governments ("payments") and all material revenues received by governments from oil, gas and mining companies ("revenues") to a wide audience in a publicly accessible, comprehensive and comprehensible manner.
2. Where such audits do not already exist, payments and revenues are the subject of a credible, independent audit, applying international auditing standards.
3. Payments and revenues are reconciled by a credible, independent administrator, applying international auditing standards and with publication of the administrator's opinion regarding that reconciliation including discrepancies, should any be identified.
4. This approach is extended to all companies including state-owned enterprises.

5. Civil society is actively engaged as a participant in the design, monitoring and evaluation of this process and contributes towards public debate.
6. A public, financially sustainable work plan for all the above is developed by the host government, with assistance from the international financial institutions where required, including measurable targets, a timetable for implementation, and an assessment of potential capacity constraints.
   http://www.eitransparency.org/principlesandcriteria.htm

Publish What You Pay

Publish What You Pay campaigns for the mandatory disclosure of taxes, fees, royalties and other payments by oil, mining and gas companies to governments and other public agencies.

The call for companies to *"publish what you pay"* is a necessary first step towards a more accountable system for the management of natural resource revenues paid by extractive industry companies to governments in resource-rich developing countries. There is also a need for governments to *"publish what you earn"*. If companies disclose what they pay in revenues, and governments disclose their receipts of such revenues, then members of civil society will be able to compare the two and thus hold their governments accountable for the management of revenues. This will also help civil society groups to work towards a democratic debate over the use and distribution of resource revenues.

Revenue transparency is a vital first step towards alleviating the crushing poverty of ordinary citizens in many resource-rich but poor developing countries. It is fully consistent with internationally agreed objectives of accountable government, corruption prevention, and democratic debate over resource management, such as the G8 Action Plan on Fighting Corruption and Improving Transparency.

Business will benefit too. Transparency will strengthen companies' social "license to operate", by demonstrating their positive contribution to society, and increase the likelihood that the revenues they pay to governments will be used for sustainable development—which creates a stable business environment—rather than being wasted or diverted by corruption, which exacerbates social divisions and can lead to state failure and conflict.

Transparency would protect companies from allegations of complicity with corrupt governmental practices, as recognised in a recent statement by North American, European and other investors managing nearly US$7 trillion worth of funds. Business would

benefit from a level playing field in which all companies would be required to disclose their payments. This would protect progressive companies from having their contracts terminated by corrupt governments if they disclose information voluntarily, and would prevent them being undercut by less transparent competitors.

Transparency can be achieved through a comprehensive and global approach which involves simple adjustments to existing company law, accounting standards and the lending conditions of financial institutions and banks, so as to require disclosure of revenues by companies and governments. Publish What You Pay believes that disclosure should be on an individual company basis for each country of operation, not aggregated amongst more than one company. The Extractive Industries Transparency Initiative (EITI) has developed one model of a reporting template that could serve as a model for disclosure.

A number of regulatory mechanisms are needed to ensure that multinational and state-owned companies disclose payments made to governments, and that governments disclose revenues received from the extractive sector. In calling for the implementation of these mandatory mechanisms, Publish What You Pay's primary targets are:

- Stock market listing authorities
- The World Bank Group (IBRD, IDA, MIGA and IFC)
- The International Monetary Fund
- Other multilateral and bilateral lending institutions
- Export credit agencies
- Producer country governments
- Developed country governments
- The International Accounting Standards Board
- Private, commercial and retail banks that make resource-backed loans

Transparency is in the best interests of everyone concerned – citizens, companies, donor governments and the wider international community – except a corrupt elite that benefit from the spoils of the systematic misappropriation of state assets.

http://www.publishwhatyoupay.org/english/objectives/index.shtml

Notes

Chapter 1

1. According to the World Bank report, *World Development Indicators 2004*, GDP per capita (at 1995 US$) in 2002 was $254.26 in Nigeria and $1,060.24 in Indonesia.

2. World Bank, *World Development Indicators 2004*.

3. In particular, it may be desirable for countries with large costs of extraction to postpone extraction. The costs of extraction may fall due to improvements in technology, or the market price of petroleum may rise. Moreover, rents—the difference between the value of the oil and the costs of extraction—will be rising at a rate considerably faster than the rate at which the price of oil increases.

4. So-called because of the adverse effects of the increase in the Netherlands' exchange rate after the discovery of North Sea gas.

5. See Takahiro Akita and Yoichi Nakamura, eds., *Green GDP Estimates in China, Indonesia, and Japan: An Application of the UN Environmental and Economic Accounting System* (United Nations University [UNU/IAS], Tokyo, 2000).

6. Global Witness, *All the Presidents' Men* (March 2002). http://www.globalwitness.org/reports/show.php/en.00002.html

7. "Africa Opens Books on Oil Deals," News24.com, June 27, 2004. http://www.news24.com/News24/Africa/News/0,,2-11-1447_1549016,00.html

8. This was true even in the United States. See J. Leitzinger and J.E. Stiglitz, "Information Externalities in Oil and Gas Leasing," *Contemporary Economic Policy Issues 5* (March 1984): 44-57.

9. The checkerboard pattern (in which the land is divided into a large number of tracts, and every other tract is initially put up for lease) used by Alberta may, by the same token, reduce the scope for information asymmetries, thereby enhancing government revenue. See, J.E. Stiglitz, "The Efficiency of Market Prices in Long Run Allocations in the Oil Industry," in G. Brannon, ed., *Studies in Energy Tax Policy*, (Cambridge: Ballinger Publishing, 1975): 55-99.

10. This is one of the reasons that governments should be wary of providing significant concessions beyond the normal terms. Future governments will be put under pressure to rescind such concessions. The oil companies know this, and, accordingly, the value of these concessions will be reflected in the prices the government receives only to a limited extent.

11. Even with bonus bidding, there is typically a 16 percent royalty.

12. See Paul Milgrom, *Putting Auction Theory to Work* (Cambridge, MA.: Cambridge University Press, 2004).

13. Again, there may be a need to change accounting frameworks. Accounting frameworks currently used by the IMF consolidate borrowing of state enterprises with other government borrowing. Thus, if the government-owned oil company borrows to make investments, the country will avoid being chastised by the IMF only if it runs a corresponding large surplus on its own account. This discourages investment by the state-owned oil company and encourages privatization.

Chapter 2

1. Robert Baer, "The Fall of the House of Saud," *Atlantic Monthly*, May 2003.

2. Terry Lynn Karl, *The Paradox of Plenty: Oil Booms and Petro-States* (Berkeley: University of California Press, 1997).

3. Thorvaldur Gylfason, "Natural Resources, Education, and Economic Development," Institute of Economic Studies (September 2000): 1. http://www.ioes.hi.is/publications/wp/w0010.pdf

4. United Nations Development Programme, *Arab Human Development Report 2003*.

5. Transparency International, *Corruption Perceptions Index 2004*. http://www.transparency.org/pressreleases_archive/2004/2004.10.20.cpi.en.html

Chapter 3

1. Biomass is generally excluded from most mainstream international energy calculations, essentially because at present much of it is not traded commercially. But it remains an important source of global energy. The International Energy Agency in its 2002 *World Energy Outlook* notes that noncommercial biomass accounts for one-quarter of total energy demand in developing countries, with biomass use in the developing world expected to rise from 891 mtoe in 2000 to 1,019 mtoe in 2030.

Chapter 4

1. ExxonMobil, *Annual Report 2003*.

2. BP, *Annual Report 2003*.

3. Royal Dutch/Shell, *Annual Report 2003*.

4. Total, *Annual Report 2003*.

5. ChevronTexaco, *Annual Report 2003*.

6. See information found at: http://finance.yahoo.com/q/ks?s=COP

7. ConocoPhillips, *Annual Report 2003*.

8. "Saudi Arabia: Rise and Fall of Saudi Arabia's Great Gas Initiative," *Middle East Economic Digest,* June 27, 2003.

9. Human Rights Watch, "Some Transparency, No Accountability: The Use of Oil Revenues in Angola and Its Impact on Human Rights," *Human Rights Watch Report*, vol. 16, no.1 (January 2004).

10. ChevronTexaco press release, "Chevron Nigeria Limited Declares Force Majeure" March 20, 2003.

11. *Country Analysis Brief: Algeria* (February 2004). http://www.eia.doe.gov/emeu/cabs/algeria.html

12. See information found at: http://www.eia.doe.gov/cabs/venez.html

13. For more information on the frequency of vandalized pipelines in Nigeria and the theft of crude oil go to: http://www.hrw.org/reports/2002/nigeria3/

14. See information found at: http://www.zietlow.com/docs/Fuel-Prices-2003.pdf

15. See information found at: http://www.shell.com/static/nigeria/downloads/pdfs/annualreport_2003.pdf

16. The following is a link to the BP Location Report on Indonesia: http://www.bp.com/subsection.do?categoryId=2011189&contentId=2016392

17. Articles surrounding the debate on the UN Global Compact's effectiveness can be found through the Global Policy Forum webpage link: http://www.globalpolicy.org/reform/indxbiz.htm

18. Gro Bruntland, ed., *Our Common Future: The World Commission on Environment and Development* (Oxford: Oxford University Press, 1987).

19. Additional information about EITI can be found at: http://www.eitransparency.org/implementation.htm, including Russian-language documents relating to the initiative.

Chapter 5

1. Global Witness, *Time for Transparency: Coming Clean on Oil, Mining, and Gas Revenues (March 2004)*.

2. Daniel Johnston, *International Petroleum Fiscal Systems and Production-Sharing Contracts* (PennWell Books, 1994).

3. Jenik Radon, "Negotiating and Financing Joint Venture Abroad" in N. Lacasse and L. Perret, eds., *Joint Venturing Abroad* (Wilson & Lafleur Itee, Canada, 1989).

4. See Coordinating Committee for Geoscience Programmes in East and Eastern Asia (CCOP) at http://www.ccop.or.th/

5. A typology of oil companies can be found in Ian Gary and Terry Lynn Karl, *Bottom of the Barrel: Africa's Oil Boom and the Poor* (Catholic Relief Services, 2003). The largest oil companies in the world are called "supermajors" and include Royal Dutch/Shell, BP, Total, ExxonMobil, and ChevronTexaco. At another level are the "majors" such as ConocoPhilips, Occidental Petroleum, and Unocal. The "independents" are smaller companies that generally focus on the "upstream" part of the business (Amerada Hess, Marathon, Talisman). Finally, national oil companies (NOCs) are significant in the Middle East and other countries such as Brazil (Petrobras) and Malaysia (Petronas), where they control most production. In African countries, the NOC is not an operator but rather creates partnerships with foreign companies with capital and technical expertise.

6. See generally Kirsten Bindemann, "Production-Sharing Agreements: An Economic Analysis," *World Petroleum Market Report* 25 (Oxford Institute for Energy Studies, October 1999).

7. Indeed, countries like Iran, Saudi Arabia, Mexico, or Venezuela have enacted as a constitutional requirement that ownership of the land and the natural resources be retained by the state.

8. The share of the state in profit production (or profit oil) is determined as a fixed share of production or on a predetermined sliding scale. The latter method allows greater flexibility, especially in case of price changes. The two most common ways of calculating payments using sliding scales are based on either average daily production (such as the Indonesian PSAs) or R-factors (such as the Azeri PSAs). R-factor is the ratio of accumulated income to accumulated expenditure under the project. Based on the R-factor, the share of profit production that the government will keep will vary. See Bindemann, "Production-Sharing Agreements: An Economic Analysis."

9. Chakib Khelil, "Fiscal Systems for Oil: The Government 'Take' and Competition for Exploration Investment," *Public Policy for the Private Sector* 46 (May 1995).

10. See Philip Daniel/World Bank, *Petroleum Revenue Management–An Overview* (World Bank/ESMAP Program).

11. Richard A. Fineberg, "Securing the Take: Petroleum Litigation in Alaska," in Svetlana Tsalik, *Caspian Oil Windfalls: Who Will Benefit?* (Open Society Institute, 2003).

12. PSAs for Azerbaijan's main oil and gas fields can be found at: http://www.caspiandevelopmentandexport.com

13. In an attempt to appreciate and interpret the differences in generally accepted accounting principles across the world, an author accurately states that "accountants exercise considerable judgment on how to give a 'true and fair view' of a company's operations and financial position." The author's view is that the differences in the very conception of accounting are determined by "environmental" factors such as "the legal framework, the nature and role of capital markets, political and economic influences, and the cultural traits that affect business relationships." Wendy D. Rotenberg, "Different Strokes," *CA Magazine* (April 1995), found at: http://www.camagazine.com/multimedia/camagazine/Library/EN/1995/Apr/education.pdf

14. See Rögnvaldur Hannesson, *Petroleum Economics: Issues and Strategies of Oil and Natural Gas Production* (Quorum Books, 1998).

15. Treaty between Australia and the Republic of Indonesia on the Zone of Co-operation in an Area between the Indonesian Province of East Timor and Northern Australia, Timor Sea, December 11, 1989, in force February 9, 1991. See *Australian Treaty Series* 9 (1991).

16. The state-owned companies Kuwait Oil Company in Kuwait and Saudi Aramco in Saudi Arabia are the sole beneficiaries of the oil concessions in their countries. Foreign companies may participate in the refining and marketing activities, through joint-ventures with the state-owned company.

17. The Iranian Constitution prohibits the granting of petroleum rights on a concessionary basis. The 1987 Petroleum Law permits the establishment of contracts, such as buy back contracts, between the state company NIOC and private companies. Buybacks are arrangements in which the contractor funds all investments, receives remuneration from NIOC in the form of an allocated production share, then transfers operation of the field to NIOC after the contract is completed.

18. Under Mexico's Constitution, only the state-owned company, Pemex, may own oil and gas reserves. In order to increase production, Pemex introduced in June 2002 a Multiple Services Contract (MSC) program, allowing foreign companies to acquire a relatively limited participation.

Chapter 6

1. For some guidelines, see the following: IMF Manual on Fiscal Transparency, March 23, 2001, found at: http://www.imf.org/external/np/fad/trans/manual/; Lima Declaration of Guidelines on Auditing Precepts found at: http://www.intosai.org/Level2/2_LIMADe.html; and OECD Best Practices for Budget Transparency, May 5, 2001, found at: http://www.olis.oecd.org/olis/2000doc.nsf/4f7adc214b91a685c12569fa005d0ee7/c1256927006 23b74c1256a4d005c23be/$FILE/JT00107731.PDF

2. Venezuelan Ministry of Finance, April 2004.

3. Alaska Permanent Fund Corporation, financial statements for December 2003.

4. Randall Dodd, "Primer: Derivatives," *Financial Policy Forum,* Washington, D.C., 2002, available at: http://www.financialpolicy.org/dscprimer.htm. See also "Primer: Derivative Instruments," *Financial Policy Forum,* Washington, D.C., 2004, available at: http://www.financialpolicy.org/dscinstruments.htm

5. Ibid.

6. A short position is akin to owing something, while a long position amounts to owning something, thus the former benefits from a price decrease and the latter benefits from a price increase.

7. Randall Dodd, "The Structure of OTC Derivatives Markets," *The Financier,* vol. 9, no. 1-4 (2002) available at: http://www.financialpolicy.org/dscprimer.htm

8. Rolling contracts consists of buying back futures that will soon expire and then selling similar futures for the next contract period.

9. The Australian Wheat Board was privatized in the late 1990s.

10. A swap in this context is the economic equivalent to a series of forward contracts.

11. See Dodd "Primer: Derivatives" and "Primer: Derivatives Instruments" (note 4 above) for discussion and explanation of the various derivatives instruments.

12. James A. Daniel. "Hedging Government Oil Price Risk," *IMF Working Paper* (November 2001).

Chapter 7

1. Paul Epstein and Jesse Selber, eds., *Oil: A Life Cycle Analysis of its Health and Environmental Impact*, (Harvard Medical School–Center for Health and the Global Environment, March 2002): 9.

2. Ibid.

3. U.S. Environmental Protection Agency, *EPA Office of Compliance Sector Notebook Project, Profile of the Oil and Gas Extraction Industry* (October 2000): 38 found at http://www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/oil.html

4. Amy B. Rosenfeld, Debra Gordon, and Marianne Guerin-McManus, "Reinventing the Well: Approaches to Minimizing the Environmental and Social Impact of Oil Development in the Tropics," in Ian A. Bowles and Glenn T. Prickett, eds., *Footprints in the Jungle: Natural Resource Industries, Infrastructure, and Biodiveristy Conservation* (Oxford University Press: 2001): 57.

5. Ibid.

6. Epstein and Selber, 7.

7. Joanna Burger, *Oil Spills* (New Brunswick, NJ: Rutgers University Press, 1997): 29.

8. Ibid, 137.

9. Ibid, 161.

10. Epstein and Selber, 9.

11. Ibid, 12.

12. Ibid.

13. Dagmar Schmidt Etkin, *Historical Overview of Oil Spills from All Sources (1960-1998)*: 7, presented at 1999 International Oil Spill Conference, found at http://www.environmental-research.com/publications/pdf/spill_costs/paper1.pdf

14. Amazon Watch, Bolivia: *Enron/Shell Cuiaba Gas Pipeline*, found at www.amazonwatch.org/amazon/BO/cuiaba

15. Epstein and Selber, 27.

16. Ibid.

17. U.S. Environmental Protection Agency, *2001 Toxics Release Inventory (TRI) Public Data Release Report* (2001).

18. Ibid.

19. Etkin, 2.

20. Ibid, 2.

21. Epstein and Selber, 20.

22. Burger, 97.

23. Ibid, 108.

24. Dagmar Schmidt Etkin, *Estimating Cleanup Costs for Oil Spills*, 1999 International Oil Spill Conference found at: http://www.environmental-research.com/publications/pdf/spill_costs/paper6.pdf

25. Exxon Valdez Oil Spill Trustee Council found at: http://www.evostc.state.ak.us/facts/qanda.html

26. Epstein and Selber, 36.

27. Based on data from the International Energy Agency found at: http://www.iea.org/dbtw-wpd/textbase/stats/electricitydata.asp?country=World&SubmitA=Submit&COUNTRY_LONG_NAME=World

28. National Academy of Sciences, Commission on Geosciences, Environment and Resources, *Climate Change Science: An Analysis of Some Key Questions* (2001).

29. World Resources Institute, Earth Trends found at: http://earthtrends.wri.org/pdf_library/country_profiles/Cli_cou_840.pdf

30. The Extractive Industries Review, an independent review commissioned by the World Bank to evaluate its role in oil and other extractive industries, recommends that all extractive industry projects be classified as World Bank Category A.

31. Xavier Sala-I-Martin and Arvind Subramanian, "Addressing the Natural Resource Curse: An Illustration from Nigeria," *International Monetary Fund Working Paper* 03/139 (July 2003): 4.

32. Martin and Subramanian, "Addressing the Natural Resource Curse: An Illustration from Nigeria."

33. Human Rights Watch, *The Price of Oil* (1999) found at: http://www.hrw.org/reports/1999/nigeria/Nigew991-01.htm

34. Ibid.

35. Ibid.

36. Ibid.

37. Earth Rights International, *Total Denial Continues* (May 2000): 62 found at: http://www.earthrights.org/pubs/TotalDenialContinues.pdf

38. Ibid.

39. "Colombian Indians and Police Clash Over Oil Company Site," *New York Times*, February 14, 2000.

40. Human Rights Watch.

41. Ibid. See also Earth Rights International, *Bowoto v. ChevronTexaco,* found at: http://www.earthrights.org/chevronindex.shtml

42. Earth Rights International, *Doe v. Unocal*, found at: http://www.earthrights.org/unocal/index.shtml.

43. Ibid.

44. Human Rights Watch.

45. Amazon Alliance, et al., Summary of Findings: *June 2003 Investigative Mission to Indigenous Communities Affected by the Camisea Project; Upper and Lower Urubamba River Valley, Peru* found at: http://www.amazonwatch.org/amazon/PE/camisea/reports/020724_camisea.pdf

46. Amazon Watch, *Field Audit of Enron and Shell's Cuiaba and Bolivia-Brazil Pipeline Impacts,* November 14, 2002, found at: http://www.amazonwatch.org/amazon/BO/cuiaba/reports/bolivia_audit_0211.pdf

47. Earth Rights International, *Doe v. Unocal*.

48. Epstein and Selber, 18.

49. Amnesty International, *Human Rights on the Line: The Baku-Tbilisi-Ceyhan Pipeline Project* (May 2003).

50. Ibid.

51. *Regional Review: Economic, Social and Environmental Overview of the Southern Caspian Oil and Gas Projects* (February 2003) found at: http://www.caspiandevelopmentandexport.com

52. Ibid.

53. See information found at: http://www.worldbank.org/ogmc/wbminingaids.htm

54. Sheila McNulty, "Alaska Fines BP over Death of Worker," *Financial Times*, May 27, 2003.

55. Epstein and Selber, 13.

56. Ibid.

Glossary

Acid Rain: Precipitation containing harmful amounts of nitric and sulfuric acids formed primarily by nitrogen oxides and sulfur oxides released into the atmosphere when fossil fuels are burned. (Source: energytrends.pnl.gov/glosa_d.htm)

Assets: An item of economic value that could be converted into cash.

Bitumen: Any of a group of solid and semi-solid hydrocarbons that can be converted into liquid form by heating. Bitumens can be refined to produce such commercial products as gasoline, fuel oil, and asphalt. (Source: Houghton Mifflin: http://www.college.hmco.com/geology/resources/geologylink/glossary/b.html)

Boe/d: Barrels of oil equivalent per day. Term used to standardize natural gas production with oil production.

Bonus: Payment made by a firm to a host government for the right to develop a natural resource such as oil, gas, or a mineral deposit. Bonuses are often paid in stages: at the start of a project and when various stages of development are reached.

Butane: A normally gaseous hydrocarbon which is extracted from natural gas or refinery gas streams. It is used as household fuel, propellant, and refrigerant. (Source: http://www.pplweb.com/glossary.htm)

Capital Expenditure: An expenditure for the acquisition, replacement, modernization, or expansion of facilities or equipment that, under generally accepted accounting principles, is not properly chargeable as an expense of operation and maintenance. (Source: http://www.ohca.state.ct.us/glossary.htm)

Capital Flows: The movement of foreign exchange from one country to another. The types of transactions used to move money internationally include: loans and loan repayments, bond issues and payments, foreign direct investment and capital repatriation, and portfolio investment such as stocks, bonds, and derivatives. (Source: Currency Transaction Tax, Glossary of Financial Terms. http://www.currencytax.org/glossary.php)

Cash Flow: A measure of a company's financial health. Equals cash receipts minus cash payments over a given period of time.

Commodity: This term covers a wide range of items that can be traded, such as gold and other metals, petroleum, and agricultural products.

Concession: Usually used in foreign operations and refers to a large block of acreage granted to the operator by the host government for a certain time and under certain government conditions which allows the operator to conduct exploratory and/or development operations. (Source: http://www.gomr.mms.gov/homepg/lagniapp/glossary.html)

Condensate: A term used to describe light liquid hydrocarbons separated from crude oil after production and sold separately. (Source: ConocoPhillips energy glossary: http://www.conocophillips.com/utilities/glossary/glossary-c.asp)

Consortium: A group of unrelated companies combining their forces to develop an oil or gas field for commercial production, with one company usually serving as the operator.

Crude oil: Liquid petroleum as it comes out of the ground, as distinguished from refined oils manufactured out of it. Also called simply "crude." (Source: http://www.mme.state. va.us/DMR/DOCS/MinRes/OIL/glos.html)

Depreciation: The loss in value of an asset due to its use and/or the passage of time.

Dividends: When companies pay part of their profits to shareholders, those profits are called dividends.

Downstream: The oil industry term used to refer to all petroleum activities from the process of refining crude oil into petroleum products to the distribution, marketing, and shipping of the products.

Dutch Disease: The deindustrialization of a nation's economy that occurs when the discovery of a natural resource raises the value of that nation's currency, making man-

ufactured goods less competitive with other nations, increasing imports, and decreasing exports. The term originated in Holland after the discovery of North Sea gas. (Source: http://www.investorwords.com)

Exchange Rate: The price of one currency expressed in terms of another currency.

Excise Tax: Tax or duty on the manufacture, sale, or consumption of commodities.

Fossil Fuel: A carbon or hydrocarbon fuel formed in the ground from the remains of dead plants and animals. It takes millions of years to form fossil fuels. Oil, natural gas, and coal are fossil fuels. Many scientists worry that the emission of carbon dioxide into the atmosphere when fossil fuels are burned is a major contributor to global warming.

Fuel Cell: A piece of equipment that converts chemical energy into electricity and hot water through an electrochemical process rather than through combusting the fuel source. (Source: http://www.fuelingthefuture.org/contents/glossary.asp)

Fuel Oil: A liquid fuel composed of a mixture of medium-sized or heavy hydrocarbons and produced by refining crude oil. Lighter varieties of fuel oil include diesel fuel, home-heating oil, kerosene, and jet fuel, while heavier fuel oils are used by industries, ships, and electric power plants to generate heat and power. (Source: http://www.uwsp.edu/cnr/wcee/keep/Audit/glossary-f-g.htm)

Gasoline: A refined form of petroleum used for fueling vehicles with internal-combustion engines.

Global Warming: The progressive gradual rise of the earth's surface temperature thought to be caused by the greenhouse effect and responsible for changes in global climate patterns. Many scientists believe that a rise in carbon dioxide levels (caused by automobile, power plant, and other emissions) will lead to further global warming.

Gross Domestic Product (GDP): The total value of all goods and services produced by a country's economy.

Hydrocarbon: An organic compound containing only carbon and hydrogen and often found occurring in petroleum, natural gas, and coal. (Source: http://www.envirotools.org/glossary.shtml)

Internal Combustion Engine: A type of engine that works by burning fuel (petrol) in a cylinder to make power. (Source: http://www.learningonthemove.co.uk/gloss.html)

Joint Venture: An investment undertaken by a consortium of companies, usually with one member acting as operator.

Liability: A financial obligation to pay a debt owed at some future time.

License Agreement: An agreement in which a government gives an oil company the rights to explore for and produce oil and/or gas in a designated area.

Local Content Requirements: Laws specifying the portion of a product or the share of hiring that must come from domestic sources.

Market Capitalization: The stock market value of a company, calculated by multiplying the total number of shares outstanding by the market price of a share. (Source: http://www.slb.com/ir/ar/glossary.html)

Middle Distillate: Hydrocarbons that are in the so-called "middle boiling range" of refinery distillation. Examples are heating oil, diesel fuels, and kerosene. (Source: http://www.thebullandbear.com/resource/RI-archive/gloss-oil.html)

Market Share: A company's sales expressed as a percentage of the sales for the total industry.

Natural Gas Liquids (LNG): Liquids obtained during natural gas production, including ethane, propane, butanes, and condensate (Source: http://www.careersinoilandgas. com/ general/glossary.cfm)

Net Income: Income after taxes, deductions, and allowances have been subtracted from gross income.

Operating Profit: A measure of a company's earning power from ongoing operations, equal to earnings before deduction of interest payments and income taxes. (Source: http://www.investorwords.com/3464/operating_profit.html)

Pentane: Any one of the three metameric hydrocarbons of the methane or paraffin series. They are colorless, volatile liquids, two of which occur in petroleum. So called because of the five carbon atoms in the molecule. *Webster's Revised Unabridged Dictionary,* © 1996

Per Capita Income: Total income divided by total population, which gives you the average income per person.

Petroleum: A generic name for hydrocarbons, including crude oil, natural gas liquids, natural gas and their products. (Source: http://www.conocophillips.com/utilities/glossary/glossary-p.asp)

Pro-cyclical Capital Flows: Lending that increases when times are good (for example, when the international price of natural resources is high) but is recalled when times are bad (such as when the prices of natural resources are low).

Pro-cyclical Fiscal Policy: Government spending that increases when times are good (for example, when the international price of natural resources is high) and contracts when times are bad (such as when the prices of natural resources are low).

Production-sharing Agreements (PSAs): An agreement between an energy exploration company and a host government in which the company bears the costs and risks of exploration and production of a petroleum or mining project in exchange for a share of the production. In some cases, the host government receives a much smaller or no share of production up to the point that the energy company has recovered its investment.

Profit Oil: In production-sharing agreements, profit oil refers to the oil that is subject to profit-sharing between a company or consortium and a host government. Profit oil is what remains after companies have used income from the oil produced to offset their current expenses and depreciated capital expenses for developing that oil.

Propane: A natural hydrocarbon occurring in a gaseous state under normal atmospheric pressure and temperature; however, propane is usually liquefied through pressurization for transportation and storage. Propane is primarily used for rural heating and cooking and as a fuel gas in areas not serviced by natural gas mains and as a petrochemical feed stock. (Source: http://www.turtletrader.com/glossary.html)

Probable Reserves: In respect of quantities of oil and gas, "probable reserves" are those reserves that are not yet "proven" but which, on all the available evidence and taking into account technical and economic factors, have a better than 50 percent chance of being produced. (Source: http://www.emeraldenergy.com/docs/ar_00/glossary.htm)

Proved Reserves: Estimated quantities of hydrocarbons that geological and engineering data demonstrate will be recoverable from known oil and natural gas reservoirs under existing economic and operating conditions. (Source: http://www.conocophillips.com/utilities/glossary/glossary-p.asp)

Rent-seeking: The expenditure of resources in order to bring about a transfer of goods or services to one's self as the result of a "favorable" decision on some public policy. Examples of rent-seeking behavior would include the various ways by which individuals or groups lobby government for taxing, spending, and regulatory policies that confer financial benefits or other special advantages upon them at the expense of others. (Source: Paul M. Jonson, "A Glossary of Political Economy Terms" http://www.auburn.edu/~johnspm/gloss/)

Return on Assets: A measure of a company's profitability, equal to a fiscal year's earnings divided by its total assets, expressed as a percentage. (Source: http://www.investorwords.com/4246/Return_on_Assets.html)

Return on Equity: Earnings divided by stockholder's equity. This indicates how much a company's owners (its stockholders) are making on their investments and is an important measurement of a company's performance. (Source: http://www.meredith.com/archive/investors/financial/glossary.htm)

Royalty: A share of the revenue from the sale of oil, gas, or other natural resources paid to the owner, usually the host government. The amount is usually a percentage of revenues obtained through its use.

Smog: A dense, discolored radiation fog containing large quantities of soot, ash, and gaseous pollutants such as sulfur dioxide and carbon dioxide, responsible for human respiratory ailments. (Source: http://www.nrdc.org/reference/glossary/s.asp)

Stabilization Funds: A fund that can be used to stabilize the government budget against commodity price volatility. When commodity prices are high, excess earnings can be transferred to a stabilization fund. When commodity prices are low, the stabilization fund can transfer assets back to the government budget.

Staple Trap: Increasing dependence on the export of a particular staple.

Tax-deductible: A business expense that can be deducted from taxable income.

Tort: Tort refers to that body of law that will allow an injured person to obtain compensation from the person who caused the injury.

Upstream: The oil industry term used to refer to oil and natural gas exploration and production activities.

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American Petroleum Institute: http://api-ec.api.org/frontpage.cfm

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International Energy Agency: http://www.iea.org/

Kyoto Protocol: http://unfccc.int/resource/convkp.html

Organization of the Petroleum Exporting Countries: http://www.opec.org/

United Nations Framework Convention on Climate Change: http://unfccc.int/essential_background/convention/items/2627.php

United Nations Intergovernmental Panel on Climate Change: http://www.ipcc.ch/

United States Energy Information Administration: http://www.eia.doe.gov/

United States Geological Survey: http://www.usgs.gov/

Chapter 4

Alexander's Gas and Oil Connections: http://www.gasandoil.com/goc/

American Petroleum Institute: http://www.api.org

Energy Intelligence: http://www.energy intel.com

Extractive Industries Transparency Initiative: http://www.eitransparency.org/

Foumylinks: http://www.freespace.virgin.net/alan.foum/

Global Reporting Initiative: http://www.globalreporting.org/

International Association of Oil and Gas Producers: http://www.ogp.org.uk

International Energy Agency: http://www.iea.org

New York Mercantile Exchange: http://www.nymex.com

Oil and Gas International: http://www.oilandgasinternational.com/

Organization of Petroleum Exporting Countries (OPEC): http://www.opec.org

Oxford Institute for Energy Studies: http://www.oxfordenergy.org/index.php

Petroleum Argus: http://www.argusonline.com/

PFC Energy: http://www.pfcenergy.com/

Platts: http://www.platts.com

Publish What You Pay Campaign: http://www.publishwhatyoupay.org

Schlumberger News Digest: http://www.slb.com/ba.cfm?baid=1

Security and Exchange Commission's: EDGAR database: http://www.sec.gov/edgar/searchedgar/webusers.htm

Society of Petroleum Engineers: http://www.spe.org

United Nations Global Compact: http://www.unglobalcompact.org/Portal/Default.asp

U.S. Energy Information Administration: http://www.eia.doe.gov (good for historical information on prices)

Voluntary Principles on Security and Human Rights: http://www.state.gov/g/drl/rls/2931.htm

Yahoo Oil & Gas Operations Industry News: http://biz.yahoo.com/ic/n/oilprd.html

Chapter 5

Azerbaijan Production Sharing Agreements: http://www.caspiandevelopmentandexport.com

Barrows Company: http://www.barrowscompany.com

Centre for Energy, Petroleum, & Mineral Law and Policy at the University of Dundee: http://www.dundee.ac.uk/cepmlp/welcome.htm

Chapter 6

Financial Policy Forum: http://www.financialpolicy.org

UNCTAD–UN Conference on Trade and Development: http://www.unctad.org

Publish What You Pay Campaign: http://www.publishwhatyoupay.org

New York Mercantile Exchange (oil, mineral, and metal futures and options): http://www.nymex.com

New York Board of Trade (futures and options): http://www.nybot.com

World Bank, Treasury Department–Risk Management: http://treasury.worldbank.org/index.html

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Many countries rich in natural resources exploit and squander their wealth to enrich a minority while corruption and mismanagement leave the majority impoverished. A special responsibility falls on civil society in such countries to push their governments toward transparency and spending that responds to public needs.

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The Open Society Institute and its Revenue Watch program published this report in collaboration with the Initiative for Policy Dialogue. It is the second in a series of guides published by Revenue Watch to promote government transparency and accountability. The first, *Follow the Money*, is a guide for nongovernmental organizations on monitoring budgets and oil and gas revenues.

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