Chapter 9
The Other Side

Most of the arguments to belittle the importance of resource constraints in general, and "peak oil" in particular, have come from the oil companies themselves, some official institutions and economic studies on natural resources. On theoretical grounds, conventional economic theories emphasize two main aspects concerning natural resources: the capacity of the industry to find new reserves and to develop substitutes for costly resources. Both argue against the importance of depletion. While we think both arguments are possible in theory, we believe that their development remains seriously incomplete, especially from an empirical perspective. On the other hand, the empirical studies carried out by many reputable agencies—such as the United States Geological Survey (USGS)—seem to have overlooked important issues about the reliability of the data sources they used. In any case, it is very important to provide the data used to support one's perspective. For example, assessments which are based on access to expensive and presumably reliable private data—such as the ones presented by IHS CERA—cannot be verified, and their forecasts have had a dubious record so far. Of course, "The End of Cheap Oil" relied on private data too, but its claims seem to be more realistic when confronted with actual production and prices.

Campbell, Laherrère, and ASPO have sustained a large debate against all these arguments. Throughout the years, they have refined their claims to take into account other points of view. Yet, they remained skeptical about theories and scenarios that project an ever-growing supply for different reasons. Inside the private oil companies, economic reports are aimed at evaluating the profitability of individual projects or the profits of the company at large rather than assessing energy security. National oil companies usually have to fulfill the production or monetary objectives of their national governments. Their role is not to supply the global market but to guarantee the energy supply in their home countries and maximize the financial benefit from their production.

Private consultancies rely on private data provided by the oil companies worldwide. Compared to public data, their information is more accurate, but the results of their assessments cannot be verified and do not seem to match recent developments.

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Furthermore, they are not exempted from external pressures: the companies, their main clients, may want to portray themselves as members of a healthy and strong industry basically to stimulate their investors, impress potential competitors from other industries, keep good relations with friendly governments, or keep the unfriendly ones away from their realm. Finally since these consultancies are in the business to secure a profit, their products tend to be expensive. A few exceptions, such as BP, make their generalized data publicly available.

In the face of this situation, the governments of the developed world have funded agencies that monitor the oil and energy industries to guarantee energy security. However, their situation has been similar to that of the national oil companies in that they seem to be influenced to some degree by the governments that are funding them. Furthermore, they must rely on the data provided by the oil companies worldwide, who may not have the right incentives to cooperate with them.

Borrowing from original writings of Campbell (2005), we present a brief overlook of the economic tools and the internal dynamics inside the oil companies (Sect. 9.1). Then, drawing from the outstanding dedication and patience of Laherrère (2000), we address the *World Petroleum Assessment* published in 2000 by the USGS and the press releases of the consultancy IHS CERA. Due to lack of space, we cannot cover other issues, such as the position of the US EIA or OPEC. Finally Sects. 9.3 and 9.4 are based on our own research.

9.1 Economic Assessments Inside the Oil Industry

At the heart of conventional economic thinking are the well-known ideas that supply and demand determine the production and distribution of goods and services. If wheat prices rise, farmers plant more in the next sowing, natural gas flows a bit more towards the production of fertilizer, steel goes to the production of agro-machinery, etc. and the whole system readjusts; it is assumed that farmers can control the complex production process completely, simply by their purchases. In essence, economic theory is built around human agency, which indeed reflects many aspects of economic life but overlooks the natural processes that lay outside human will, treating them as "risks" that need to be minimized. For example, the cost of coal is deemed to be nothing more than the cost of the miners and the capital investment weighed by the perceived risks: the resource itself being there for free. If the reserves were infinitely large, perhaps there would be no need to consider them otherwise than as a gift from nature that can be used to produce more and more, but there are some warning signals in this proposition. In this sense, the ideas and tools used in conventional economic assessments are an expression of the old conception, reinforced in the Bible ("dominion over nature," "go forth and multiply") and other religious texts that have been interpreted as depicting humans as the absolute masters of nature.

9.1.1 Risk

Much of the practical work of economists in the upstream sector of the oil industry is concerned with the management of risk. It is thought that there are recognizable economic trends and that certain economic tools can improve the judgment of oil-men in making business decisions. The industry likes to depict itself as having to face exceptionally high risks, for example:

- Natural risk—weather, the 100-year wave, etc. obstruct their activities.
- Environmental risk—they spill some oil and have to clean it up.
- Exploration risk—they may be looking in the wrong place.
- Geological risk—the geological interpretation may be wrong.
- Development risk—the engineers got it wrong.
- Contract risk—the lawyers did a bad job.
- Labor risk—the workers strike.
- Government risk—new governments may not be friendly to the companies.
- Tax risk—the taxes change, even retroactively.
- Political risk—war, sequestration.
- Terrorist risk—somebody blows it up.
- Corporate risk—their stock suffers, or they are subject to a takeover bid.
- Commercial risk—(discounted) prices fall or (discounted) costs rise (see Sect. 9.1.2).

However, most industries and businesses work with even lower profit margins and higher risks: an arbitrary change in government policy-cutting subsidies can bankrupt the farmer after years of work; the arrival of a supermarket puts long established and successful small traders out of business; the lifting of trade barriers may destroy a local enterprise that was effective in providing both goods and employment. According to Campbell, what distinguishes the oil industry is not the risks it faces but the huge sums involved. While the tax rates can be very high, the profits are even larger. The latter amply cushions most of the risk to which they are exposed.

9.1.2 Discounted Cash Flow

The primary economic challenge in exploration is to model actual or anticipated cash flow. Table 9.1 shows a study of a hypothetical development project, undertaken to see if an exploration drilling would be viable if successful. The parameters are quite simple: gross revenue is production (in million barrels) times oil price (in dollars per barrel). Net cash flow is gross revenue less expenditure (capital and operational) and tax (all monetary values in millions of dollars). If it is positive, there is a profit; if negative, a loss.

Table 9.1 Economic evaluation of a hypothetical field using 10% and 15% discount rates

Year	Production (Mb)	Oil price ($/b)	Gross revenue (M$)	Operative expenditure	Operative income	Capital expenditure	Tax	Net cash flow	Net present value (10%)	Net present value (15%)
0	0.00	20.00	0.00	0.00	0.00	95.00	0.00	–95.00	–95.00	–95.00
1	4.60	21.00	96.60	40.00	56.60	0.00	0.00	56.60	51.45	49.22
2	4.20	19.50	81.90	40.00	41.90	0.00	10.40	31.50	26.03	23.82
3	3.90	18.00	70.20	40.00	30.20	0.00	9.40	20.80	15.63	13.68
4	3.50	16.00	56.00	40.00	16.00	5.00	4.00	7.00	4.78	4.00
5	3.10	16.00	49.60	35.00	14.60	0.00	4.50	10.10	6.27	5.02
6	2.60	15.00	39.00	33.00	6.00	0.00	1.90	4.10	2.31	1.77
7	1.90	16.00	30.40	31.00	–0.60	3.00	–0.20	–3.40	–1.74	–1.28
8	0.00	17.00	0.00	0.00	0.00	7.00	–1.60	–5.40	–2.52	–1.77
Total	23.50		423.70	259.00	164.70	110.00	28.40	26.30	7.22	–0.53

At 10% the project is profitable ($7.22 million); at 15% it is not ($–0.53 million)
Actual oil fields have larger life cycles; the regular life for an offshore field is 25 years

Capital expenditure or investment is the cost of the facilities, including the drilling; operating costs are the running costs of labor, insurance, tariffs on pipelines, and contracted services. Finally, tax is the total amount paid to the government, including royalties.

The next step is to calculate what is called discounted cash flow to determine the present value of future earnings. Thus $1,000,000 that you will receive 5 years from now, at a 10% discount rate, is worth today $\$1,000,000/[(1+0.1)^5]=\$620,921.3$.

The sum of each future year's discounted cash flow over the life of the field gives the "present value" (PV). In Table 9.1 we discounted the cash flow at two different rates: 10% and 15%. The higher the discount rate, the less value is assigned to future dollars (i.e., future oil production), or conversely, the more weight is placed in present dollars. Due to the large capital expenditures that have to be done before production begins—that is, in year zero—our hypothetical field is profitable at a 10% discount rate, but not at a rate of 15%. Which discount rate to use is subject to complex and rather arbitrary financial considerations.

9.1.3 Oil Prices and Other Considerations

From this information, companies can also calculate other indicators, such as the "payout," that is, how long to wait until the investment is recouped and the project moves into profit, or the rate of return. Companies normally have what is called a "hurdle rate of return," namely the minimum return that they can accept under their investment policy. These calculations describe the simplest outline of the procedure. There is great scope to make it ever more complex, by addressing multiple scenarios and risking each element using probability theory and so forth. The whole process seems fairly correct at first glance. The geologist provides his or her estimate of reserves; the engineers feed in information about the numbers of wells and producing rates; the construction people estimate how much will cost to build the thing; and a committee of economists is dragged out to pronounce on future oil prices. The calculator whirrs, and out comes the answer: the project flies or it does not.

If the numbers are unfavorable, well the geologists can estimate some more reserves, the construction people can have second thoughts about the costs, etc. So, if those involved want it to fly, they can usually massage it into shape. They are often under pressure to make it work, whatever their personal judgment, because they may be bidding in a competitive situation where there is much more at stake than the specific project. Failure to participate may create a bad impression with the host government, which would have wider significance. The stock market too encourages companies to explore, naturally being ignorant of the real geological risks. If it is made to fly, the proposal is now blessed with a notional number showing it to be sufficiently profitable, and it passes up the management hierarchy, each level having less and less knowledge of the actual situation.

In reality, all that really sinks in at that stage is what the magic rate-of-return number is and what is left in the budget. The management desires a notional playing field and excludes local tax situations so that they can pretend to fairly compare the rate of return from investing in a refinery extension in Texas versus an exploration well in Norway. They thus fail to notice that 85% of the risk of the well in Norway is borne by the Norwegian taxpayer, who tacitly accepts that the cost of putting the well in the wrong place is deductible from taxable income. Companies with no taxable income in Norway could not take advantage of this tax break and soon withdrew from the game.

The one factor that really affects the economics, however they are conducted, is oil price. On that, the economists have little to contribute, because oil price has been largely politically contrived, although depletion does influence the long-term trend. They are not therefore in a good position to assess its distribution and accordingly cannot take into account the growing control of the resource by a few critical producers, which must surely influence the price more than ordinary economic factors.

Companies tend to have committees to assess future oil prices, mainly comprised of economists. They read the Wall Street Journal and consult Bloomberg, thinking in terms of supply and demand trends. Consequently, they normally come up with one or more bland scenarios, whereby oil price is above or below inflation by so many points. There is talk of the gentle ramp. Their record in forecasting has been abysmal.

But if all this seems rather negative and dismissive of the economist, in fairness we do admit that it is difficult to see how else centrally controlled global companies could run their affairs. Economic analysis does force those involved to think about all the aspects of the project. Moreover, companies clearly have near limitless opportunities to invest money: explore new areas, invest in different assets upstream or downstream, buy reserves or other companies, or invest in non-oil activities. So, they do need some yardstick by which to choose, and perhaps the economic analysis, in a very general way, does provide a comparison among prospects. The bland oil price assumptions are also understandable as it is difficult to plan for a crisis, even if crises are a normal fact of life. The system more or less helps the management avoid serious mistakes, even at the expense of not getting much right either. Above all, it helps managers and companies deal with their multiple responsibilities by allowing them to justify their decisions.

9.2 US Geological Survey

The USGS is a renowned agency dedicated to provide information on ecosystems, environment, natural hazards, natural resources, as well as impacts of climate and land-use change. Its Energy Resources Program has a division specialized in oil and gas resources making periodic assessments of the world's conventional oil and gas endowment since the oil shocks of the 1970s. The last comprehensive assessment was completed in 2000 and came to be known as the "USGS 2000" in the jargon of the oil debate—its official name is *World Petroleum Assessment 2000*. The USGS 2000 has been updated according to the priorities assigned by the USGS. Many agencies and organizations around the world, including oil companies and the IEA, use the data published by the USGS for their own forecasts and planning.

9.2.1 Different Criteria for North America

The USGS 2000 study gives estimates for undiscovered amounts of conventional oil, gas, and natural gas liquids (NGL), using a probabilistic approach. The USA, however, is treated differently from the rest of the world. First, oil and NGL are combined for the USA but distinguished elsewhere. Second, for the rest of the world, P95, P50, P5 (i.e., a low estimate which has a 95% chance of being realized, a "best guess" with a 50% chance, and a 5%, or high estimate), and mean cases are given by region, which are then aggregated using a Monte Carlo simulation—which is indeed the correct way to aggregate reserves. Curiously, for the USA, maxi (P95), mini (P5), and mean cases are quoted for the country as a whole, but the USA is not aggregated to the world total using a Monte Carlo procedure. If the non-US values are added using Monte Carlo, why is it not applied to the world when adding the USA? The failure to use a consistent method means that the assessment of P95 and P5 values for the world as a whole is fallacious.

9.2.2 Unjustified Discovery Rates

The proposed mean value of undiscovered liquids is 939 billion barrels (Gb) for the world, made up of 649 Gb of oil and 207 Gb of NGL outside the USA and 83 Gb for oil in the USA. It is claimed that the numbers relate to what may be discovered and added to the reserve base between 1996 and 2025, taking into account economic and technological factors. Such a claim of adding more than 50 billion barrels per year (Gb/a) is however very difficult to accept in relation to the past discovery trend, which has fallen from a peak in the 1960s to 10 Gb/a in the 1990s though with a slight recovery of approximately 13 Gb/a for the 2000s (Fig. 6.3). The USGS estimate implies a fourfold increase in discovery rate and reserve addition, for which no evidence is presented. Such an improvement in performance is in fact utterly implausible, given the great technological achievements of the industry over the past 20 years, the worldwide search, and the deliberate effort to find the largest remaining prospects.

9.2.3 Reserve Growth

In the USGS database, oil reserves "grow" due to the addition of previously undiscovered fields as well as the introduction of more efficient technology or the revision of past estimates (see Sect. 5.2.1 and Chap. 6). The USGS 2000 estimated 730 Gb for reserve growth, being made up of 612 Gb oil and 42 Gb NGL outside the USA, and 76 Gb for the USA.

First, in the former Soviet Union (FSU), there were 3,141 fields reported in 1997 but 3,930 fields reported in 2010, so 789 existing fields were missing in the first report. These older fields, if not considered appropriately, are accounted as “reserve growth.” Second, in the USA, oil data has to meet the Securities and Exchange Commission (SEC) rules, while the rest of the world does not have to comply with them. These rules are designed to give certainty to the investor, not to assess the depletion of resources; the reserve estimates reported to SEC (proved reserves only, probable reserves are omitted) are usually lower than the real potential of a field, so the monetary return on investment is somehow guaranteed. Since the initial estimate was very low, after oil is extracted, it usually turns out that the reserves are larger than initially reported. These “extra” reserves give the false impression that actual reserves are growing (Fig. 6.2). The rest of the world reports proved and probable estimates because the industry has a greater need to know what the fields will actually deliver when they plan costly offshore facilities or pipelines to remote areas.

Thus, the huge “field growth” of the USA is clearly a reporting phenomenon, as only one out of every three barrels added over the past 20 years has come from new discoveries. While the cumulative new discoveries reported for 1990–2009 for USL48 were 5.36 Gb, the new discoveries plus discoveries in old fields added up to 18 Gb; meanwhile, the cumulative crude oil production was 37.5 Gb in the same period. Moreover, the USGS analysts extrapolated the model of growth of proved reserves in the old fields of the USA to the probable discoveries of the rest of the world. Even worse, they apply such a flawed method of assessment to present deepwater new fields. Schmoker (2000) uses the Midway-Sunset oil field as the best example of reserve growth. This field was discovered in 1894 and is a heavy oil field (13°API), classified by many as an unconventional field. Midway-Sunset peaked a century later, when production started falling in 1997. It is not the best example to use, as most new fields will not produce for a century before peaking. Jean Laherrère has stated that extrapolating US reserve growth to the rest of the world and also the deepwater fields even within the USA is unscientific.

In spite of these serious problems, due to the renown of the USGS, the World Petroleum Assessment was widely used and misused by other agencies—including the International Energy Agency—and is still cited in the debates concerning peak oil.

9.3 The International Energy Agency

After a period of dismissal, the International Energy Agency has begun to shift its ground to its previous assessment. The agency adopted Campbell and Laherrère’s view in its *1998 World Energy Outlook* (WEO). The message they were sending was very clear:

> This approach […] indicates that a peaking of conventional oil production could occur between the years 2010 and 2020, depending on assumptions for the level of reserves (IEA 1998, p. 44).

However, in the 2002 edition, IEA described a different picture:

> Resources of conventional crude oil and NGLs are adequate to meet the projected increase in demand to 2030, although new discoveries will be needed to renew reserves. […] The approach used to generate these projections is described in Box 3.2 (IEA 2002, pp. 97–98).

When we look at Box 3.2, we read the following:

> The oil supply projections in this Outlook are derived from aggregated projections of regional oil demand, as well as projections of production of conventional oil in non-OPEC countries and nonconventional oil worldwide. OPEC conventional oil production is *assumed to fill the gap* (IEA 2002, p. 95, emphasis added).

With this assumption, the IEA avoided having to produce a realistic estimate for OPEC production. As years passed, the agency found increasingly difficult to maintain this position. In 2008, the IEA admitted its previous assumptions did not match the reality of the oil fields (Monbiot 2008). A year later, the British press published an article based on the declarations of a senior official of the IEA, who revealed that the agency knew the predictions published in previous years were "nonsense" but fears about "panic in the financial markets," together with the pressure of "the Americans," prevented the IEA to lower the figures even more. A second source said it was a rule in the organization "not to anger the Americans" even though there was not as much oil in the world as the reports said (MacAlister 2009). In 2010, IEA finally admitted, that "conventional crude oil production" for the world had peaked in 2006. In Chap. 3 of the WEO 2010, titled "Oil Market Outlook: A Peak at the Future?," we read the following:

> Almost half of the increase in proven reserves in recent years has come from revisions to estimates of reserves in fields already in production, rather than new discoveries. […] in 2000–2009, discoveries replaced only one out of every two barrels produced –slightly less than in the 1990's (even though the amount of oil found increased marginally)– the reverse of what happened in the 1960's and 1970's, when discoveries far exceeded production (IEA 2010, p. 116).

When interviewed by the Australian media in 2011, Dr. Fatih Birol, chief economist of IEA, said that "global oil demand will increase substantially"; by contrast, on the production side, he said, "we think that the crude oil production has already peaked in 2006 […] the existing fields are declining so sharply that, in order to stay where we are in terms of production levels, in the next 25 years, we have to find and develop four new Saudi Arabias." He added that one of the major conclusions of the WEO 2010 is that "the age of cheap oil is over" (Newby 2011). Compare Birol's comments and the article of Campbell and Laherrère in Scientific American vs the official pronouncements of IEA (including their 2012 pronouncement that the US will become an exporter of oil) and draw your own conclusions.

9.4 IHS Cambridge Energy Research Associates

IHS Cambridge Energy Research Associates (IHS CERA) is a well-known consultancy firm whose business is to deliver "critical knowledge and independent analysis on energy markets, geopolitics, industry trends and strategy" (IHS 2012). IHS and CERA were independent companies until 2004, when the former acquired the latter. Information Handling Services (IHS) was founded by Richard O'Brien in 1959, becoming specialized in databases during the 1980s. The expansion to oil consultancy is related to the acquisition of Petroconsultants S.A. in 1995, whose history goes back to the 1950s. Petroconsultants was an oil information service. Naturally, an oil company has every reason to track the activities of its competitors, which can have much commercial significance. In earlier days in the USA, they used to employ people known as "scouts" who would keep rigs under observation, sometimes with binoculars. They could, for example, count the stands of pipe being removed to figure out how deep the well was. Also they could hang around bars and talk to drillers having a beer. In the early days of the North Sea, oil companies placed observers on trawlers to watch rigs and if possible listen in to radio communications in the best traditions of scouting. It more or less amounted to what would be called industrial espionage today.

In the 1950s an American geologist named Harry Wassall worked for Gulf Oil and was transferred to Cuba, where he married a Cuban lady called Gladys. When Gulf Oil recalled him, he preferred to stay in Cuba and set up a little newsletter to report on oil activities on the island, later expanding it to cover Latin America. He appointed an agent in each country reporting on oil developments, including the location of new wildcats and the results. Much of it was not particularly confidential information.

When Fidel Castro came to power, he could no longer run this business from Cuba and moved to Spain, opening an office in Geneva to expand coverage around the world, naming it Petroconsultants. Over the years he built up a network of contacts, often comprising old oilmen with knowledge and experience of the particular country, who were able to build the database with continuity and trust. The major oil companies informally supported the endeavor as they preferred not to speak directly to each other but did want to know what each other was doing. They wanted good information and so they also gave it. In those days it was not a particularly sensitive matter. Also Petroconsultants was one of the first to apply computers to the database, and for a period, major oil companies found it convenient to subcontract their own databases to be managed in Geneva on a confidential basis. The company aged in parallel with its owner and became a rather charming old-fashioned organization staffed by old oilmen who had built long-term relationships and had the knowledge and background to assemble valid information.

Harry Wassall took an interest in the "peak oil" issue, seeing its wider significance. Petroconsultants read *The Golden Century of Oil*, published by Colin Campbell, which got much wrong due to unreliable public data (Campbell 1991). The firm invited Campbell and Laherrère to make a similar study using its database. The result of the study was eventually suppressed under pressure from an oil company, but Petroconsultants copublished Campbell's *The Coming Oil Crisis* and also encouraged both of them to write the *Scientific American* article.

Harry Wassall died in November 1995 and Petroconsultants was sold to IHS. The Geneva office has now put on a much more commercial basis, and most of the old staff left, taking with them their years of continuity, friendships, special relationships, and long experience. It accordingly became much more difficult to assemble privileged information, and the task itself became much harder because, with the growth of state companies and many small promotional companies, the major oil companies no longer dominated the business. In many cases it was not possible to do more than secure public information partly from the Internet and try to compile it as best as possible. CERA was an oil consultancy, run by Daniel Yergin, who received the Pulitzer Prize for his excellent book, *The Prize*, which describes the history of the oil industry from a business perspective in great detail (Yergin 2003). Yergin does not himself have oil industry experience, but the company could of course advise on oil developments and secure consultancies without having any particular detailed knowledge of the reserves of specific fields or countries. CERA was in turn acquired by IHS and now does have access to its database, for what it is worth.

However, IHS CERA has always forecasted optimistic scenarios about oil markets, and its executives have consistently argued that oil supply is ultimately driven by factors above the ground and not by any sort of geological constraint. In response to ASPO's critiques, CERA has also argued that a long "undulating plateau" extending over "several decades" is more likely pattern than a peak in oil production (IHS 2009a); this plateau would start, in the third or fourth decade of the century. We would like to point out that neither Hubbert nor Campbell, Laherrère, or ourselves have ever said that geology is the sole driver of oil supply; rather, we believe that there are limits of different kinds to oil supplies, and given the discovery trend of the last decades, together with the decline in producing fields and the state of technology in the oil industry, it is not likely that oil supplies will reach a higher level in the following decades for geological reasons. In addition aboveground conditions, wars, boycotts, political manipulations, and economics can constrain (or possibly enhance) that limitation.

Since CERA is a private consultancy, their predictions are not accountable; when they release a so-called private report, it means that the report can be bought by anyone for US $2,500. The data files used in the report are also "private" rather than being audited or refereed like the data in scientific articles. Nevertheless, ASPO and other observers have kept track of their figures. In 2002, they predicted that North American natural gas production would increase 15% by 2010. In reality the production remained flat until 2008. In 2003, CERA estimated that oil prices would fall to low or mid $20s, while they actually remained above 30 US dollars. In 2004, they said oil prices would be in the range of upper $20s to low $30s thru 2005, but the prices climbed to $65. Then, in 2005, their forecast was a decline towards $40 as 2007–2008 neared, yet again, the price stayed in the mid $50s. In 2007, they predicted prices for the next year as low $60s, but prices reached $90 (Energy Bulletin

2008, see also Brown 2011). In 2008, a group of businessmen and energy experts, including Jean Laherrère, issued a $100,000 wager against the forecast that CERA published in June 2007. The forecast said world oil production capacity would reach 112 million barrels per day (Mb/d) by 2017 (IHS 2008a). That figure would imply roughly 107 Mb/d of actual production, a number that could be easily verified. CERA never answered the wager (Andrews 2008).

Since 2008, as actual oil production has remained flat, IHS CERA has been claiming that demand for oil products has peaked due to high oil prices. In 2008, they stated that gasoline demand had peaked a year before in the USA (IHS 2008b). In 2009, CERA accepted that "peak oil is here," but not because of any underground constraints, but because the oil demand had reached its limit; they said that demand for oil in OECD countries was not likely to return to its 2005 high and that "aboveground drivers" would be crucial to meet growing demand from non-OECD countries (IHS 2009b). Nevertheless, CERA's statements about peak demand conveniently forget the geological causes of the historically highest oil prices that we have been enduring in the last years. These high prices might nurture strong investments in lower-quality resources, such as tar sands and shale oil, whose extraction and environmental costs are larger. However, these costs are not factored into the economic calculations of CERA.

In conclusion, given the critical importance of oil to modern society and the unresolved issues and controversy swirling around "peak oil," it is remarkable that governments do not insist on some kind of solid, technical database. Instead we have a series of very different assessments published by private or public entities that summarize information coming from multiple sources of unknown veracity. Very often the estimates given are a function of the political or economic perspective of the supplier. As scientists used to substantiating values, open analysis, examination of information sources, peer review and, ideally, open discussion of differences, we find the situation amazing.

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