

Background speaking notes

June 2006

To introduce *“Power and Order: the Energy Dimension”* For the Global Policy Council, *“Global Power and International Order in the 21st Century”*

Dr. Robert Skinner

Energy has returned to the policy agendas of all countries and most international organizations. It was on the agenda of the first Economic Summit 30 years ago in Rambouillet, France. Russian President Vladimir Putin has made energy security top on the agenda for the G-8 Summit in St Petersburg this July.

Three years ago today, the World price of oil was \$22.83. Today it is above \$70.

Oil is not alone: the prices of most commodities have increased. While the details differ slightly, the underlying causes are common:

- increased demand, especially in China;
- a decline in spare capacity,
- disruptions or fear of disruptions in supply when spare capacity is slim
- increased entry into commodity markets (‘speculation’) by non-commercial investors.

A root factor behind the tight capacity has been inadequate investment all along the supply chain for most commodities over the past 15 to 20 years.

Thus, the record profits recently reported by the oil industry for 2005, are not a result of what it did last year, but what it didn’t do for the last 15 years—invest; not only in capital stock and capacity, but in skills and people.

In 1996¹, among 16 commodities, China was the top consumer of 6 commodities, and #2 in 4. At the end of 2003², China was #1 consumer of 10 commodities, and #2 of 5 others. Significantly, the commodities of which it moved up to top rank consumer over that period require a lot of energy to produce and to convert to finished product. The consequences are clear. In 2003 China became the second largest consumer of oil after the United States. And it was not due to the increase of private motor vehicles³.

¹ Economist, World in Figures, 1999 Edition

² Economist, World in Figures, 2006 Edition

³ For comparison, China has about 22 million private vehicles; in 2003 15 vehicles per 1000 people. Some 13 to 15 million new vehicles are sold in the United States every year, which had 826 vehicles

The contents of this paper are the author’s sole responsibility. They do not necessarily represent the views of the Oxford Institute for Energy Studies or any of its Members.

Contrary to myth, private cars are not an important element in Chinese oil demand. But they are expected to become more important—provided China manages its economy and its environment.

My remarks will focus on oil and gas. This is not to imply that other fuels are not important—in fact, to the extent oil and gas markets tighten and perceptions of security of their supply change, the prospects for coal and nuclear and new and renewable fuels will improve. We are already witnessing a re-examination of the nuclear option here in Europe after the much-misinterpreted gas price dispute between Gazprom and Ukraine at New Years.

Global Energy projections by the IEA, the US DOE/EIA and OPEC, and those prepared by many private firms, provide a range of possible supply and demand outcomes in the years ahead, depending on a range of assumptions. They are not forecasts. They are projections and are only of value in that they provoke discussions along the lines of, “Well if that, then this, or that.” Our view of the future can change quickly.

Some examples,

- 1) In the late eighties, energy experts universally expected that the new technology that would change the power sector was pressurized fluidized bed combustion of coal. A mere half decade later, combined cycle gas turbines were the technology of choice—few expected to install anything else.
- 2) No energy outlook anticipated the fall of the Soviet Empire and with it the collapse of Russian oil production; while all expected its recovery, few got the timing or rate correct.
- 3) Few energy experts seemed to expect that 1.2 billion Chinese, if told they could become rich, would do so quickly, with the consequences for oil demand.

In five separate outlooks published by the IEA, EIA and OPEC over the last 2 years, the World oil demand projected for 2010 ranges by nearly 6 mb/d (88.7 to 94.6)—nearly equivalent to China’s consumption. Projections of Non-OPEC supply in 2010 range by 5.3 mb/d (51.3 to 56.6) and by 16 mb/d (47.9 to 56.6)—nearly two Russia’s—for 2020. These spreads prompt several remarks:

- OPEC and its leaders call for “stability and predictability”. Uncertainty is a fixture; “Predictability” is an illusion.
- The major divergence of expectations of what industry can achieve in new supply outside OPEC underscores the international discussion regarding access, the changing terms of access and competition for resources; it indirectly points to the tension between the central challenge for the international private industry, namely how they can replace reserves and the resource-owners increased confidence, now that prices are higher, that they can ‘go it alone’ or at least reassert

per 1000 people. See OPEC, Oil Outlook to 2025, on OPEC website, paper for 10th International Energy Forum, Doha, 22-24th April, 2006; also on IEF website.

The contents of this paper are the author’s sole responsibility. They do not necessarily represent the views of the Oxford Institute for Energy Studies or any of its Members.

their sovereignty over their resources (Venezuela, Bolivia, Yemen et al);

- The 'disagreement' on how much non-OPEC oil will be produced creates uncertainty of how much capital OPEC producers should assign to developing new capacity. The above agencies' estimates 6 Quarters ahead for the change in Non-OPEC supply for 2005 ranged by more than 100% and changed from an increase of as much as 1.3 mb/d to a *decrease* of 0.04 mb/d by the time 2005 concluded. [OPEC's uncertainty is compounded when consuming countries' energy 'watch-dog', the IEA urges OPEC to increase investment while the President of the U.S., the largest consumer, declares determination to reduce reliance on Middle East oil. Gazprom receives similar mixed and bizarre signals from Western European politicians; 'continue selling to Ukraine at below-market prices, invest more in supply capacity, but we want to depend on you less'.]

Meanwhile, all energy projections since the early nineties concur on several stylized propositions. They are,

- Primary energy supply will grow at the rate of 0.5 to 0.6 the rate of GDP growth,
- Emerging economies, especially Asian, will dominate this growth,
- Fossil fuels, will continue to account for 80% of supply, and will account for more than 85% of the growth; thus, not just a fossil fuel future, but an increasingly fossil fuel future,
- Gas will grow the fastest, driven by its preference in the power sector.
- Electricity is the fastest growing form of final energy use, followed by transport,
- Oil in transportation will increase; non-OECD regions will dominate growth and will equal the OECD's use of oil by 2020,
- There is no substitute in sight for oil in transport,
- Increasing shares of energy will be traded internationally.

All of these propositions have strategic implications, but there are two in particular worth examining further; firstly, the expectation that gas will dominate growth in the power sector and secondly, the increasing shares of hydrocarbons that will be traded across borders.

Let's deal with the second prognosis first—increased oil and gas trade.

A major strategic issue is presented by what might be called, the **Market / Resource Mismatch**, an acute asymmetry that will define geopolitics in the twenty-first century.

To put some dimensions to the mismatch, the world consumes a little more than 10 Billion tonnes of oil equivalent a year. Oil and gas (hydrocarbons) account for 6 of these 10. The two largest 'entries' in the globe's energy account are US oil consumption and China's coal consumption; about equal and together just under 2 Billion tonnes of oil equivalent—together they underscore the world's energy security and climate challenges.

Of oil, 66% is consumed by what I call the 'Consumer Five', or the 'C5', that account for 83% of the world's GDP (2003, \$36.3T)

<u>GDP(2003)</u>	<u>Share</u>	<u>of</u>	<u>Oil</u>	<u>Demand</u>
• NAFTA	30%		\$12.4 Trillion	
• European Economic Area (EEA)	18%		\$11.3T	
• China	8.2%		\$1.4T	
• Japan	6.4%		\$4.3T	
• India	3.1%		\$0.6T.	

(I really should only talk of the 'C4' as India is not yet an important oil consumer—slightly more than South Korea, but it *will* become important and certainly sees itself as important, if only reflected in its arms purchases and the new embrace from the United States—and that is the point of this meeting).

However, the C5 have only 8% of the world's oil reserves; The Middle East and North Africa have two thirds of the world's reserves.

Of natural gas, the C5 consume 50% of the world's supply, but have only 9% of its reserves; The Middle East and Russia have 2/3rds.

Noteworthy is the asymmetry of *control* over oil and gas resources and their markets: over 75% of the hydrocarbon resources are under state ownership; their development and export are controlled by government officials or state oil companies subject to direct political oversight and influence. The markets, on the other hand, are in countries where governments have largely liberalized access and entry and have devolved the market functions of supply, distribution and marketing to private agents, subject of course to regulations protecting health and safety and promoting competition.

The state, producer side tends to see the trade in political terms, or at least through a state-to-state lens often with linkages not found in normal commercial arrangements. They are increasingly receiving a receptive audience from Asian consuming countries, the latter through their National Oil Companies (NOCs), anxious to secure positions in oil supply. For example, Angola accepted loans from China while the latter's NOC secured offshore exploration licenses; Nigeria granted exploration licenses to Chinese firms while the latter undertook to build roads and infrastructure. The motivations for this kind of counter-trade are of course complex but the relative political 'ease' with which they are consummated by the host state is partly due to the absence of an imperial relationship with the Asians (or at least one that is lodged in the current collective memory). Euro-American private firms are seriously disadvantaged in this business, both in terms of limits imposed by their corporate governance standards and structure and by the historical colonial record (UK, Europe) and current perception (U.S.) of their home states. These International Oil Companies (IOCs), the 'private agents' of the Euro-American consumer states, face serious challenges in this environment in accessing and replacing oil and gas reserves.

This picture of resources, markets and geopolitics is not the product of an econometric projection for the 21st century—it is the starting point; it is the context for energy supply in the twenty first century. Moreover, the mismatch of ‘*markets here—resources over there*’ will increase.

The mismatch means that more oil and gas will pass through choke points and potential disruption points:

- Hormuz (~15 mb/d)⁴ 3 km in/outbound lanes
- Straits of Malacca (11 mb/d) @ 2.5 km wide.
- Suez Canal (1.3 mb/d)
- Sumed Pipeline Red Sea to Med, @ 2.5 mb/d
- Bab el-Mandab passage (3.3 mb/d)
- The Bosphorous (3 mb/d) < 1 km
- Panama (0.4 mb/d),
- Druzhba pipeline (1.2 mb/d),
- Baltic p.l. system (1 mb/d).
- Major gas pipelines from Russian to Europe

The IEA estimates⁵ that by 2030 two thirds of net inter-regional oil trade and 1/3 of LNG trade will pass through the Straits of Hormuz.

When we examine this mismatch and the future trade of hydrocarbons our attention is drawn to the expected preponderance of natural gas in new electricity supply. This importance is underscored by the following reminders:

- A modern economy depends on a dependable steady supply of electricity⁶;
- In 1971, 10% of final energy in North America was delivered by wire—electricity. This has increased to 20% today. In 1971, India and China had only 3% by wire; today 14 and 9%⁷ respectively. In North America, 53% of final energy is grid-based (electricity and gas); in China and India, 17% and 11%.
- Over half of the growth in global electricity generated is expected to come from power plants burning gas increasingly sourced abroad.

In the wake of Kyoto commitments and assurances from the industry that there was plenty of gas, governments felt confident in relying on low-carbon gas as a bridge to when renewable fuels and energy efficiency would carry the day in reducing greenhouse gas emissions and meeting electricity demand—the fastest growing form of energy in final consumption. When there

⁴ The numbers refer to millions of barrels of crude oil in 2005. The world consumed about 84 mb/d in 2005.

⁵ World Energy Outlook 2004, p. 119, International Energy Agency

⁶ This underscores General (retired) Klaus Naumann’s point regarding the capacity of terrorists to “paralyze” a nation’s capacity to function as a modern state, underpinned by grid-based energy supply systems in turn on which information technology systems depend.

⁷ This difference in ‘electrification’ is one of the most significant distinctions between China as a *current* energy consumer and India as a *potential* energy consumer and the irony of communist China’s providing equality of access to energy, versus democratic India’s failure to do so.

The contents of this paper are the author’s sole responsibility. They do not necessarily represent the views of the Oxford Institute for Energy Studies or any of its Members.

were surpluses of electricity capacity and industry was preoccupied with survival in a world of restructuring, mergers and acquisitions, politicians sailed with the winds of popular, but technically-uninformed, opinion. In some respects one could say that governments abdicated their responsibilities to unelected, unaccountable elites and special interests in non-governmental organizations: this phenomenon is not new; often private, corporate interests capture government policy, but the point here is that we are talking about energy—specifically *electricity*—infrastructure.

Politicians are now beginning to have second thoughts and the consequences will not necessarily be positive. They ask, “*Do we want to rely on foreign gas for both direct use, such as heating and industrial processes, and to generate the lion’s share of our electricity?*” Relying on wind and energy efficiency to meet growth in electricity demand amounts to a triple hope—hope that wind turbines will be approved and installed, hope that the wind will always blow when needed, and hope that consumers will reduce energy consumption. The empirical evidence does not vindicate these hopes. Besides, these are largely irrelevant to addressing the problem at hand—generating baseload power⁸.

But is the ‘fear of foreign gas’ rational? We need to avoid the ‘beggar-thy-neighbour’ strategies and misconceptions that dominated energy policy in the seventies. Gas trade is not like oil trade: the co-dependency is acute; the economics of gas pipelines and infrastructure are so fragile that they actually provide an added security factor for gas supply owing to the contractual obligations needed to under-pin financing. Why would a governing regime that depends on gas exports for its political and economic legitimacy cut off the source of funds for this legitimacy? On the other hand, why would such a state invest in more (very costly) supply capacity and thereby divert funds from social obligations when the customers say they are looking elsewhere?

We are also painfully aware of other features of this geographic asymmetry between hydrocarbon resources and their markets. While there are several exceptions⁹, most oil and gas producers:

- Score very low on Transparency International’s corruption index
- Are the top buyers of conventional arms
- Have non-elected regimes where adherence to democratic principles and the rule of law are weak at best.
- Have high population growth rates, low average ages and high unemployment,
- Depend overwhelmingly on the export of hydrocarbons.

⁸ When nuclear plants are decommissioned they will come off the grid in ‘lumps’ of several hundred megawatts that operate up to 90% of the year. They cannot be replaced by wind power plants of 1 to 2 megawatt capacity that generate at best 35% of the year (the wind mills of Germany generate less than 20% of the time). Advocates of wind correctly point out that if in theory wind turbines could be installed all over Europe and in the most optimal locations, wind could meet a large share of power needs, even some baseload.

⁹ As presented in the excellent overview by Josef Janning at the beginning of the meeting of the Bertelsmann Transformation Index 2006.

One would not have to be too much of a pessimist to view the world as embracing a twin time bomb: political instability in the sources of resources on the one hand and an environmentally unsustainable pace of consumption of those resources on the other.

Meanwhile we have to examine carefully the ‘received view’ that supply from these countries is inherently insecure.

The empirical evidence is mixed. Most supply interruptions originate within consumer countries, mostly due to technical breakdowns, labour disputes or consumer blockades in protest of high prices. It needs to be said that the much-discussed ‘oil weapon’ has been more often used by consumers against producers through the application of economic sanctions. Paradoxically, while the Middle East has the appearance and a history of fragility, and oil supplies in the region have certainly been disrupted frequently and by major amounts, the world has been supplied with oil mostly from elsewhere in the region, principally from Saudi Arabia. But the sanguinity derived from this record is misplaced as it depended on the existence of spare capacity—a spare capacity that was accidental and not the product of prudent planning. Saudi Arabia in particular and other countries are racing to restore some of this spare capacity.

Thus, we need to critically assess any assumption that the future will resemble the past.

The shift in market conditions for hydrocarbons¹⁰ since the beginning of the century has several noteworthy developments that deserve attention and careful analysis.

- 1) The North American natural gas bubble finally disappeared in the late nineties, launching the US back onto the global LNG market; this could have profound effects—on the US economy as gas prices have more than tripled, with a much greater share of power generated by gas, over half of American homes heated by natural gas, compounding inflationary effects of the oil price increase. As the North American continent relies more and more on LNG suppliers, there will be spill-over effects into the European market. The implications are profound: for example, gas to generate steam to produce the Canadian oil sands, and to produce Ammonia to grow American corn for food and fuel ethanol increasingly will come from the Middle East.
- 2) UK North Sea gas and oil have declined rapidly with the result that old ghosts of ‘energy security’ have been let out of the closet. Politicians in other states say this is merely confirmation that free markets don’t look after security of supply and therefore they should not liberalize their markets.

¹⁰ For a review by the author of some of the differences between the seventies and today regarding the oil market and the potential direction of oil prices, see in **World Energy Developments: Recent trends and their implications for Arab Countries**, in <http://www.oxfordenergy.org/pdfs/SP19.pdf>

The contents of this paper are the author’s sole responsibility. They do not necessarily represent the views of the Oxford Institute for Energy Studies or any of its Members.

- 3) The resurgence in resource nationalism, especially in Latin America, but this phenomenon has many expressions, including accusations of price gouging and recidivist calls for windfall profit taxes and price controls.
- 4) The two big ‘surprises’ over the last 15 years that have affected oil markets the most—the demand surge in China and the supply collapse and recovery of Russia—were essentially unforeseen and miscalculated by experts. They remain sources of significant uncertainty in projecting oil demand and supply, both because their economies and politics are uncertain and the openness and transparency of their statistical services fall well short of the necessary standards to enable proper analysis.
- 5) The increased activity of Asian National Oil Companies in exploration rounds in third party countries, viewed as ‘unfair’ competition by the major private oil companies, will attract increasing political attention, simply because these activities are essentially state-to-state in nature.
- 6) The recurrent theme of ‘peak oil’, reinforced by the failure of gas supply in North America and the UK has gained a foothold in the ‘thinking’ of political leaders. The production of easy, conventional oil will plateau; this plateau can be stretched if markets are allowed to function (prices increase to stimulate efficiency of energy end-use) and the development of new technologies are fostered, including bio-engineering, to improve recovery of oil, efficient use of oil and development of alternatives to oil in certain end-uses.
- 7) ‘Producer – Consumer Dialogue’, mentioned at Rambouillet in 1976, now formalized under the International Energy Forum in Riyadh, confronts a long list¹¹ of problems, irritants and issues¹². OPEC and its leaders repeatedly call for “stability and predictability” and cooperation from consumers and other producers to stabilize the market and to share the burden of spare capacity. Is this merely code for agreement on prices and supply management? Indulging such notions out of diplomatic politeness raises expectations that are simply unrealistic in an open, pluralist market-based system of trade and investment. The asymmetrical representation, engagement and authority with respect to oil trade mentioned above will likely lead to disappointments as to what dialogue can actually achieve. At best ‘dialogue’ should lead to better information and analysis of drivers of demand and supply, to examining the factors that cause uncertainty and dislocations of supply, and therefore to an expanded circle of key consuming countries with Strategic oil stocks whose filling and release should be coordinated in close consultation with key producers. Such initiatives, admittedly expensive and not very politically ‘sexy’, are preferable as they go to the core of security of supply—providing surge capacity to meet upsets in what is at the end of the day, a technical system.

¹¹ See **Energy Security and Producer—Consumer Dialogue: Avoiding a Maginot Mentality**, R. Skinner, <http://www.oxfordenergy.org/presentations/SecurityOfSupply.pdf>

¹² The Communiqué of OPEC in September, 2005 insisted that “*Dialogue must address all the issues of interest to all parties*”.

The increase in commodity prices has ushered in a new era of protectionism, resource nationalism and populism. In some respects this is a backlash against the failure of globalization to better distribute its benefits. There is a fatigue with globalization. It too has been asymmetrical, increasingly failing on the test of reciprocity: we can buy yours, but you can't buy ours (CNOOC, Arcelor steel, Danone, P&O, etc).

Resource producers just a few years ago were competing to invite in industry to invest in development. Today they are revising the terms of access to resources or are sending foreign firms away, emboldened by popular support from a disenfranchised poor majority. In some respects, the support stems from the failure of the earlier model to 'spread the wealth'. Populism in Latin America and the re-nationalization or re-emergence of state ownership is merely a reaction to past regimes failure to address a long-standing, post-European unfinished piece of government, namely to include the indigenous people in the benefits of economic development—and this extends throughout the Americas from Alaska to Argentina.

The growing disparity of incomes and wealth is the greatest asymmetry, and is the single greatest threat to peace and stability, nationally and internationally. It exists in virtually every nation of the world. We ignore it at our peril.

Finally, economic cycles have not been abolished. There is a danger that when the current cycle turns (and it will, triggered by higher interest rates set by the US Federal Reserve), it will be convenient to again place blame on the present high price of oil rather than on the past low price of money.