

HOW FUTURE CONSCIOUS ARE THE OIL CZARS?

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This very article deals not only with the aspects in relation to oil preservation, policies taken up by the concerned government but also about how the various models of society dealt in with regards to oil preservation and how this problem now has taken a u-turn and how its gravity is increasing with every single hour and it's a general fact that complete loss of oil column is generally observed where the crest of the trap is bound by a typically large fault with high post rift displacements. The use of mineral oil for the preservation of species of Pseudomonas is described and a linkage has been drawn with the Energies of the G-8. The G-8's major and decisive role would be in locating on a priority basis other renewable energy sources that will reduce the fuel consumed by all sectors worldwide.

The developing countries can play a vital role by reducing their dependence on crude oil. Both the developing and the developed countries should encourage the use of non-conventional sources of energy, in all areas. More research and development is also required to make industry less dependent on petroleum products and to develop organic alternatives. A large part of this article deals with the aspects of "What we can do and how", focusing on the aspects of sustainable development and its use and also emphasis has been given to other aspects as to role of media, views of antagonists and protagonists and the author had tried to include the data also with regards to fall in production and rapid increase in consumption and also some ways are suggested to overcome this effect and various studies are also incorporated as economic worries, particularly about a slowdown in the United States, the world's largest oil consumer, is one reason the cartel may have agreed [can use as a cover excuse for holding] to hold output steady and also the result of US's consumption of oil has also been included. Much of the emphasis has also been laid down on OIL PEAK concept.

A comprehensive overview has been taken and the author had tried to cover all the important aspects felt to be relevant and had pointed out to a situation which will arise when there will still be plenty of oil flowing in 2020; it just won't be anywhere near enough to satisfy world demand, and as such will be too expensive for many of us to continue to use in the same amounts that we do today. The time to start preparing for a low-energy economy is now.

"OPEC, over the last 20 years, has not managed to add any additional capacity. So we're in a world today where we're going to need a vast amount of additional energy and we're utterly dependent on countries that in the past generation have added absolutely no additional capacity."¹

Steven Lee

"... the consequences would be unimaginable. Permanent fuel shortages would tip the world into a generations-long economic depression. Millions would lose their jobs as industry implodes. Farm tractors would be idled for lack of fuel, triggering massive famines. Energy wars would flare. And careless suburbanites would trudge to their nearest big box stores, not to buy Chinese made clothing transported cheaply across the globe, but to scavenge glass and copper wire from abandoned building".²

Paul Salopek

¹ Peak Oil Quotes, Grinning Planet, URL Referred: <http://www.grinningplanet.com/environmental-quotes/peak-oil-quotes.htm> (Retrieved on 6 March, 2008.)

² Pulitzer Prize Winner, "A Tank of Gas, A world of Trouble" Chicago Tribune, July 2006, URL Referred: <http://www.chicagotribune.com/news/specials/chi-oilsafari2-htmlstory.0.3163462.special> (Retrieved on 8 March, 2008).

INTRODUCTION

Sustainable Development of Petroleum Resources: The Rumpus and Resolution

Civilization is coming to an end soon and this is not the wacky proclamation of a doomsday cult, apocalypse bible prophecy sect or conspire theory society but is the scientific conclusion of the best paid, most widely-respected geologists, physicists, bankers, oil experts, investors etc. in the world. These are rational, professional, conservative individuals who are absolutely terrified by a phenomenon known as global "Peak Oil or Hubbert' Peak ³". The challenge before us is,

Are We 'Running Out'?

Yes as oil production follows a bell curve which is increasingly plentiful on the upslope, increasingly scarce and expensive on the down slope. This means that if *2005 was the year of global 'Peak Oil'*, worldwide oil production in the year 2030 will be the same as it was in 1980. However, the world's population in 2030 will be much larger (approximately twice) and much more industrialized (oil-dependent) than it was in 1980 and worldwide demand for oil will outpace worldwide production by a significant margin. As a result, the price will skyrocket, oil dependant economies will crumble, and resource wars will explode.⁴ In the natural resources sector, the establishment of a modern petroleum industry and its subsequent development and expansion is certainly one of the great success stories of our generation and finally culminating into today's global push for sustainable development.⁵ The Oil and Gas industry, world-wide, faces unique contemporary challenges, crises and opportunities⁶ and same problems arise in supply variations which the OPEC is unable to control effectively resulting in price fluctuations, in turn effecting prices at large.⁷ Various factors like war, terrorism, extreme weather and other "*above ground*" geopolitical factors will push the effective

³ "Peak Oil" or "Hubbert's Peak" applied generally for the Shell Geologist *Dr. Marion King Hubbert*. After Peak Oil, by this Theory, the rate of oil production on Earth will enter a terminal decline. URL Referred: http://en.wikipedia.org/wiki/Hubbert_peak_theory (Retrieved on 8 March, 2008)

⁴ Life After Another Oil Crash, URL Referred: <http://www.lifeaftertheoilcrash.net/>, (Retrieved on 7 March, 2008).

⁵ Deffeyes Kenneth, Peter Huber, "*It's the End of Oil / Oil Is Here to Stay*", Sunday, Oct. 23, 2005, Time Magazine, URL Referred: <http://www.time.com/time/magazine/article/0,9171,1122019,00.html?iid=sphere-inline-bottom> (Retrieved on 7 March, 2008.)

⁶ Wald Matthew L., "*Oil Outlook is more Confused Than Usual*", N.Y. Times, 3 May 1990, p. D1.

⁷ Morgan Nina, "*UK Oil Companies Keep It Clean*", Petroleum Economist, February 1993, p.36

decline rate past 10 % per year, thus cutting the total supply by 50 % in 7 years.⁸ In a petrochemical industry, there is a potential growth of new products and novel industrial uses but realizing such potential requires technological innovation and high attendant R&D costs.⁹ The human world is often described as a *'hydrocarbon society'*¹⁰ and with regard to OPEC, it has been called into question in 1973 Oil Crisis. The next largest group of producers, members of the OECD and the Post-Soviet States produced only 23.8 % and 14.8 %, respectively of the world's total oil production¹¹ resulting in large hue and cry. The petroleum or oil & gas being the world's largest commodity is a vehicle of most civilized societies. Therefore any issue that affects petroleum is international in outlook. In a similar vein, sustainable development is an internationally recognized principle, one which formed the basis of the United Nations Conference on Environment and Development.¹²

Estimates reveals that drop in production has already begun and consequences are almost unimaginable as we are sliding down the slope of global oil production curve, best described as a *"post industrial stone age"*¹³. Sustainable Development has been cynically referred as *'moral convictions serving as a substitute for thought' and 'a good idea which cannot be sensibly put into practice'*¹⁴. The perception is more intense in the light of petroleum resources and adverse view is championed by economists who believe that the non-renewability of petroleum is not a very important issue and the primacy ought to be given to the market forces of demand and supply which they believe should govern the development of petroleum resources¹⁵. International oil

⁸ Five Geopolitical Feedback-Loops in Peak Oil, Rhizome, Monday, April 23, 2007, URL Referred: <http://www.jeffvail.net/2007/04/five-geopolitical-feedback-loops-in.html> (Retrieved on 8 March, 2008).

⁹ Douglas Lawrence and Vidal John, *"Shell Haunted by Close Ties to Military Regime"*, The Guardian 13 November 1995, p.8

¹⁰ D. Yergin, *The Prize: The Epic Quest for Oil, Money and Power* (Simon & Schuster, New York, 1991), p.389

¹¹ OPEC, Wikipedia. URL Referred: <http://en.wikipedia.org/wiki/OPEC> and BP plc. *"British Petroleum table of world oil production"*. Retrieved on 7 March, 2008.

¹² This Conference was held in June 1990 at Rio de Janeiro, Brazil, and often referred to as 'The Earth Summit' is indeed the watershed in the evolution of sustainable development.

¹³ Duncan Richard C, *"The Olduvai Theory: Energy, Population, and Industrial Civilization"*, URL Referred: <http://www.thesocialcontract.com/pdf/sixteen-two/xvi-2-93.pdf> (Retrieved on 8 March, 2008.)

¹⁴ Reid D., *"Sustainable Development: An Introductory Guide"* (Earthscan Publications, London, 1995), pp. xiii-xiv.

¹⁵ Campbell Collin, *"The Financial Consequences of Peak Oil"*, URL Referred: <http://www.lifeaftertheoilcrash.net/Archives2008/FinancialConsequences.html> (Retrieved on 9 March, 2008)

and gas exploration and production companies are also being exposed to a steady proliferation of policies, laws, guidelines and other standards applicable to their activities which are a dire need of today.

Why adherence must be given to Sustainable Development?

Sustainable Development as per the Antagonists is a mere theoretical principle¹⁶ and is outlined in *Agenda 21*¹⁷, the *Brundtland Report of the World Commission on Environment and Development* defined it as, ‘Development that meets the needs of the present without compromising the ability of future generations to meet their own needs’¹⁸. Critics attack this definition as being nebulous, very imprecise in respect of the ideas of ‘needs’¹⁹ and contends that it rests on clear ‘principles’ viz. environment, futurity, equity and participation²⁰ thus making it clear is a concept that exhibits economic, ecological and sociological aspects.²¹

“Sustainable Development does not imply absolute limits to growth but is a new concept of economic growth.....it is a process of change in which economic and fiscal policies all aim to induce development paths that are **economically, socially and ecologically sustainable**”²². Oil accounts for around 40 % of the energy mix because of its uniqueness, sufficiency, accessibility, versatility, ease of transport and, in many areas, low costs have been complemented by a multitude of practical benefits that can be gained from decades of intensive exploitation and use in the industrial, commercial and domestic fields.²³

¹⁶ Hayes A.C. and Haynes C. Liston, 23 (1) “Sustainable Resource Use: The Search for Meaning’, *Energy Policy*” 1-2 (1995).

¹⁷ Sustainable Development and Agenda 21, “National Resource and Research Development”, URL referred: <http://www.natural-resources.org/agenda21.htm> (Retrieved on 12 March, 2008.)

¹⁸ World Commission on Environment and Development (WCED), “Our Common Future”, (Oxford University Press, Oxford, 1987), p.43

¹⁹ Ekins P., “Making Development Sustainable”, Sachs W., (ed.), *Global Ecology* (Zed Books, London, 1993), pp. 91-92

²⁰ “Friends of the Earth, *Planning for the Planet: Sustainable Development Policies for Local and Strategic Plans*” (Friends of the Earth, London, 1994), p.10.

²¹ Sergeldin I., “Making Development Sustainable”, 12 *Finance and Development* 6 (1993).

²² Brundtland G.H., “Towards Sustainable Development”(Russell Press, Nottingham, 1987), pp. viii-ix.

²³ Yusgiantoro Dr. Purnomo, Minister of Energy and Mineral Resources, Indonesia, Secretary General, Organization of the Petroleum Exporting Countries (OPEC), http://www.worldenergysource.com/articles/text/yusgiantoro_WE_v7n3.cfm (Retrieved on 10 March, 2008).

Why Implications are needed of Sustainable Development?

The implications of sustainable development on petroleum resources can be determined by looking into the principles which include:

- intergenerational equity;
- sustainable use;
- equitable use; and
- precautionary principle.²⁴

So it means maximizing the benefits of petroleum resources without causing ecological imbalance²⁵ and some requisites need to be followed like to ‘*use petroleum resources to benefit present and future generations*’²⁶, ‘*to consume in an ‘appropriate’, ‘wise’, ‘rational’, and ‘prudent’ manner*’²⁷ as petroleum is susceptible to physical exhaustion because it is a non-renewable natural resource²⁸ and ‘*for the enjoyment of economic benefits by present generations should not be at the expense of future generations*’ meaning thereby that *Dutch Disease* must necessarily be addressed.²⁹ Oil development, mining, logging, road-building and agriculture have opened access to large, underdeveloped areas and have led to severe social costs.³⁰ A need has arisen of a safer and successful social management program requiring a long term commitment to

²⁴ There are a plethora of principles associated with sustainable development. The eight principles selected are not exclusive, but are representative of what sustainability implies for petroleum resources. Handl G., “*Sustainable Development and International Law*” (Graham & Trotman, London, 1995), pp. 173-185.

²⁵ Pearce D., Markandya A. and Barbier E, *Blueprint for a Green Economy* (Earthscan, London, 1989), pp.173-185.

²⁶ Walde T.W., “*Investment Policies in the International Petroleum Industry- Responses to the Current Crisis*”, N. Beredjick and T. Walde (ed.), *Petroleum Investment Policies in Developing Countries* (Graham & Trotman, London, 1988), pp.7-28.

²⁷ Bourrelier P.M., “*Sustainable Development and Public Policies in the Mineral Domain: Some Elements of Reflection*”, Mineral Resources and Sustainable Development Workshop, Elincourt Sainte-Marguerite, France, 5-7 May 1994, pp. 17-18.

²⁸ Subroto H.E., “*Challenges Facing the International Oil and Gas Industry in the 21st Century*”, 20 Energy Policy 913-919 (1992).

²⁹ Auty R. and Warhurst A, ‘*Sustainable Development in Mineral Exporting Economies*’, 3 Resources Policy 14-15 (1993); Dutch Disease is the negative symbiosis between the petroleum and other tradable sectors which mutes both the rate and efficiency of economic growth. Firstly, It weakens the non-petroleum tradable sector so that it cannot propel the economy. Secondly, it retards economic growth so that investment in environmental management is slow and environmental damage becomes worse.

³⁰ While there is little specific documentation of the social impacts of oil operation, there are numerous accounts of challenges and problems experienced by indigenous cultures and local communities threatened by encroaching development. These accounts are directly applicable to oil development, as the issues and circumstances which lead to contact and demographic changes, including the presence of outside workers, new access routes into isolated areas and disruption of local market economies, are similar for any infrastructure project.

on-the-ground assessment and substantial interaction with NGO's, indigenous networks, local stakeholders, the World Bank, financial institutions etc. to address social, political and economic issues to determine and test "best practices" designed to minimize negative social impacts³¹ but National Governments hold the ultimate responsibility for determining culturally appropriate development plans, overseeing operations and protecting the human and legal rights of their citizens.

But, unfortunately the reality is that most federal and provincial agencies do not participate in project implementation for a number of undefined reasons.

What *Antagonists* have to 'Say on Sustainable Development?'

The idea of sustainable development is a nebulous, vague concept and cannot be properly evaluated.³² This uncertainty is camouflaged by the positive impression of '*longevity and durability*' attributed to sustainability in contradistinction to the negative and gloomy expression '*unsustainability*'³³ and now it is of utmost importance to go for the optimal utilization of global petroleum stock for the benefit of both present and future generations. They see this as,

'the assumption dropped is that there exists an exhaustible natural resource... a fixed stock of oil to divide between two (or more) periods. The total mineral in the earth is an irrelevant non-binding constraint. Whatever is left in the ground is unknown, probably unknowable, but surely unimportant'³⁴ and even if the non-renewable nature of petroleum is taken as a significant factor, human ingenuity and technological innovation is the appropriate solution³⁵ and believes that ***'the economic paradigm of petroleum resources will always prevail over the physical paradigm.'***³⁶

The '*physical paradigm of petroleum resources*' postulates that petroleum will be exhausted by continual exploitation but the '*economic paradigm*' of petroleum, physical limitations, incremental costs will necessarily force the price up³⁷(Russian-

³¹ The E&P Forum, "*Oil Industry Operating Guideline for Tropical Rainforests*", pp. 45-56.

³² Ekins P., "*Making Development Sustainable*", W. Sachs (ed.), *Global Ecology* (Zed Books, London, 1993), pp.91-92.

³³ Haynes A.C. and Haynes Liston C, "*Sustainable Resource Use- The Search for Meaning*", 23(1) *Energy Policy* (1995), pp. 1-2

³⁴ Adelman M.A., "*The Economics of Petroleum Supply*", Massachusetts Institute of Technology, Massachusetts, 1993, p.20.

³⁵ Eggert R.G., "*Sustainability and Resources Policy*", 21(1) *Resources Policy* 3-4 (1995).

³⁶ Neff T.L., "*Are Energy Resources Inexhaustible?*", unpublished, Massachusetts (1993), pp. 1-24.

³⁷ Harthorn J.E., "*Oil Trade: Politics and Prospectus*", Cambridge University Press, Cambridge, 1993, pp.241-242.

Ukrainian theory of abyssal, abiotic petroleum origins)³⁸. Sustainable development is unnecessary because it causes undue disruption in the petroleum market. *‘It is a free market which will grant expression to human ingenuity and can sufficiently cope with optimizing the utility of petroleum resources in which government involvement leads to “etatism”’*. So, efforts should be aimed at making the petroleum market truly free and competitive rather than going for nebulous concept.³⁹

What about the Protagonist’s Perception?

Resource constraint is the main thrust of this view. Petroleum is a finite resource and is capable of exhaustion, if not properly developed⁴⁰ and a classic illustration is the experience of Pithole Town.⁴¹ This phenomenon is true of several OPEC countries which had hitherto been oil exporters but currently are oil importers. The World proved reserves of oil currently stands at 1,766.9 thousand million barrels, whilst the daily rate of production is 88.8 million barrels.⁴² Thus continual production at these levels means only 42 years of petroleum availability for mankind.⁴³ The narrow perception of security of supply views is wrong and ought to be jettisoned because it only looks at the *‘question in the immediate term and does not address any long term comprehensive*

³⁸ Kenney J.F., *“Impending Shortages of Petroleum Re-Evaluated”*, Energy World June (1996), pp.16-18. It is argued that the current perception of petroleum originating from biological matters is incorrect, because it has not been subjected to similar scientific scrutiny as their own theory has. Apparently, this theory is quite prominent in the former Soviet Republic, but is yet to be properly examined by Western scientists who currently hold a totally different view. This theory is a body of scientific knowledge dealing with the chemical genesis of hydrocarbon molecules, the physical process which occasions their terrestrial rejects the view that petroleum originates from biological materials, which underlies its finite nature.

³⁹ Gordon R.L., *“Energy Exhaustion, Environmentalism and Etatism”*, 15(1) Energy Journal 1-13 (1994); Singer S.F., *“Sustainable Development v. Global Environment: Resolving the Conflict”*, 27(1) Columbia Journal of World Business, 155-162 (1992).

⁴⁰ Gatehouse Jonathon, *“When the Oil Runs Out: Are we Heading for the End of Civilization -- or Are the Warnings of a coming Apocalypse just another case of Chicken Little?”*, Feb 09, 2006, URL Referred: http://www.macleans.ca/article.jsp?content=20060213_121197_121197 (Retrieved on 10 March, 2008)

⁴¹ Yergin D., *“The Prize: The Epic Quest for Oil, Money and Power”* (Simon & Schuster, New York, 1991), p. 31. The said place is some 15 miles from Titusville, USA. In January 1865, the first successful oil well was drilled, but by January 1866 the populated town became virtually a ghost-town. This was due to the unrestrained and frenzied pace of exploitation which had depleted the petroleum in the region.

⁴² BP Stastical Review of World Energy, 2006.

⁴³ Ibid., The situation is more precarious for OECD and Non-OPEC countries, whose stock can only satisfy their current demand for 15 and 16 years respectively.

*solution.*⁴⁴ Therefore, the stakeholders should include local communities, consumers and consider future generations.⁴⁵

In Indian context, its oil and gas reserves are getting rapidly depleted and at the current level of production they are expected to last between 24 and 35 years only⁴⁶ due to their predominant reliance on it as the way to economic growth and energy consumption.⁴⁷ The increased consumption is a *sine qua non* for economic development so there is a need to ensure the adequate supply of energy to avoid any impediment to the path of economic development by these countries.⁴⁸

The propriety of actualizing it cannot be overemphasized in this era of environmentalism because governments, petroleum industries and consumers of petroleum resources have all lent credence to the value of principle of sustainable development.⁴⁹

How to resolve the Conflict between the two?

It is difficult to accept the view of the antagonists as the '*nebulosity*' is a matter of semantics only and the economic factors are more important than the non-renewable nature of petroleum resources. A proper approach is the fusion of both economic and development concerns and proposition given is weak as it does not deal with the issue of non-renewability of petroleum resources. The protagonists' arguments are credible and necessitate the proper management of petroleum resources both for present and

⁴⁴ Rodenburg E, "Monitoring for Sustainability", *A Sustainable World: Defining and Measuring Sustainable Development* California Institute of Public Affairs, Claremont, 1995, pp. 77-86.

⁴⁵ Ibid.

⁴⁶ OIL-Infraline, "Oil and Gas Exploration and Production in India: A Reference Book", Oil India Limited, URL Referred: <http://eandpbook.infraline.com/> (Retrieved on 11 March, 2008).

⁴⁷ World Bank, "World Prospects for Major Primary Commodities Report no. 814188", vol. III, Energy and Metals and Minerals, Washington, DC (1999), cited in 20 Energy Policy 224-225 (2000). This is reflected in a recent projection which shows that the oil consumption in developing countries will rise from 24 million bbl/day in 2000 to 44 million bbl/day in the year 2006, or at a rate of 4.4%, which is almost double the current increment on average world consumption between the years 1994 and 1995.

⁴⁸ Goldenberg J., "How to stop Global Warming", *Technology Review*, November/December (1990), p. 25 cited in Gao Z., "International Offshore Petroleum Contracts: Towards the Compatibility of Energy Needs and Sustainable Development", Doctoral Dissertation Completed at Dalhousie Law School in July (1993), pp. 595-596.

⁴⁹ The Government supported the principle by their involvement in the UNCED process which culminated in the Earth Summit of 1992. Similarly, the principle of sustainable development has emerged as an accepted business principle. A testament to this is the '*Criteria for Sustainable Development*', a set of initiatives released for the guidance of transnational corporations, such as the oil companies by the United Nations Centre for Transnational Corporations (UNCTC).

future generations. The so called "alternatives" to oil are actually "derivatives" of oil.⁵⁰ Without an affordable supply of energy coupled with healthy and robust capital markets to finance the transition, we have no way of realistically scaling these alternatives to the necessary degree.⁵¹ The widespread acceptance of the principle is a reflection of its usefulness. There is therefore a need to articulate means of actualizing sustainable development of petroleum resources.

Sustainable Development? Is OPEC Aware? What to do?

United Nations Report, 1993 states that at the current rate of world oil production, the world's remaining oil supply would stand at round 75 years⁵² resulting in it a biggest challenge⁵³ and this apprehension is now shaping a reality. Capital must be invested in a sustainable substitute in such a way that it produces an annual sustainable yield equal to the income portion of the receipts from the non-renewable resource⁵⁴ thus making non-renewable resource, 'sustainable'.

An establishment of a '*Resources for the Future Fund*' is to be encouraged as it is one mechanism that can transform non-renewable resources into renewable ones.⁵⁵ OPEC decisions had considerable influence on International Oil prices as in the 1973 Energy Crisis, it refused to ship oil to western countries that had supported Israel in the Yom Kippur War or October War, which they fought against Egypt and Syria. This refusal caused a fourfold increase in the price of oil on October 17, 1973 needless to say a first undertaking towards the oil hike prices. The evidence suggests that OPEC did act

⁵⁰ Environmental Literacy Council, "*Life Cycle Analysis*", URL Referred: <http://www.enviroliteracy.org/article.php/322.html> (Retrieved on 12 March, 2008) It's not just transportation, agriculture, modern medicine, water distribution, national defense but many are entirely powered by oil and petroleum derived chemicals.

⁵¹ Ecotopia, "*Garreau Group*", URL Referred: <http://www.garreau.com/main.cfm?action=chapters&id=44> (Retrieved on 12 March, 2008)

⁵² UN Economic and Social Council, "*Energy and Sustainable Development: Issues Concerning Overall Energy Development*", Emphasis on Developing Countries, UN E/C. 13/1994/2, 15 December 1993, p.18

⁵³ Daly H.E., "*Toward Some Operational Principles of Sustainable Development*", 2 *Ecological Economics* 4 (1990).

⁵⁴ The division of receipts from a non-renewable resource project into capital and income components was originally proposed by Sarafy El., "*The Proper Calculation of Income for Depletable Natural Resources*" Ahmad Y.J. and Lutz E., (eds.), *Environmental Accounting for Sustainable Development* (The World Bank, Washington DC, 1989), pp. 10-18.

⁵⁵ Gao Z., "*International Offshore Petroleum Contracts: Towards the Compatibility of Energy Need and Sustainable Development*", JSD dissertation, Dalhousie University, July 1993, pp. 576-600. '

as a cartel, when it adopted output rationing in order to maintain price.⁵⁶ On question on non-sustainability, Minister was of the view that there is a reserves-to-production ratio of more than 80 years and there is reserve strength to cope with the forecast rises in demand and supply⁵⁷ as Investment comprises of three elements which looks and forecast, *'absolute increase in demand, exhausted reserves to be replaced and oil-producing nations to have sufficient spare capacity'* available to cope with sudden, unexpected shortages in supply.⁵⁸

Petroleum Exporting Countries were founded with two defined goals, *'to re-establish and get a single price structure in world petroleum markets and fairer share of profits'*. In 1960's when OPEC failed in meeting the market prices it lead to future imbalances in the production and today, the Member Countries will have to spend nearly US \$100 billion by 2010 and \$200 billion by 2020 to meet the future demand for oil.

What about the Emergence of International Law?

International law affecting the Oil industry emerged around problems of transboundary pollution and customary international law (*sic utere*) states:

*'No state has the right to use or permit its territory to be used in such a manner as to cause injury on, or to the territory of another or the properties of persons therein'*⁵⁹ and was first applied in the *Trail Smelter Arbitration*⁶⁰, being enshrined in Principle 2, Rio Declaration. There is a shift in the state responsibility from shielding the corporations and the O&G industry to solutions of injuries from violation of obligations under International law⁶¹ thus making it clear that the principle of sustainability⁶² is one of the cardinal principles to shape International law and sticking

⁵⁶ OPEC Price High: A need to look , URL Referred: <http://fmwww.bc.edu/EC-P/WP318.pdf> (Retrieved on 12 March, 2008.)

⁵⁷ Yusgiantoro Dr. Purnomo, Minister of Energy and Mineral Resources, Indonesia President and Secretary General, Organization of the Petroleum Exporting Countries , *"Oil and Gas: The Engine of the World Economy"*, World Energy Magazine, From the pages of: World Energy, v7n4, URL Referred: http://www.total.com/static/en/medias/topic103/Total_2003_fs01_Oil_Gas_engine_world_economy.pdf. (Retrieved on 12 March, 2008.)

⁵⁸ Ibid.

⁵⁹ See *'The Corfu Channel Case, (United Kingdom v. Albania)*, 1949 ICJ Rep. 22.

⁶⁰ *Trail Smelter Arbitration*, 3 UN Rep. Int. Arb. Award 1911,, *United States v. Canada*, [1941] 9 ILR 315.

⁶¹ Birnie Patricia W. and Boyle Alan E., *"International Law and the Environment"*, Oxford (Clarendon Press, 1991), p. 139.

⁶² Report of the World Commission on the Environment, Our Common Future, UN Doc. A/42/427 (1987).

to customary wisdom: *“forewarned is indeed forearmed”*⁶³. The 1992 Treaty of European Union (the Maastricht Treaty⁶⁴) emphasizes the principle of sustainability, and many other treaties also reiterate the same principle as the main goal is to promote a harmonious and balanced development of economic activities resulting in sustainable and non-inflationary growth.

What is to be done? A Pathway to Sustainable Development of Petroleum Resources

It is impossible to attain sustainability because of its non-renewable character and therefore its development cannot be *stricto sensu* be sustained⁶⁵ so emphasis must be laid on the development of petroleum resources in a quasi-sustainable manner⁶⁶ and some precedents can serve as a guidance:

- New Mexico’s Severance Tax Permanent Fund;
- Alaska’s Permanent Fund;
- Alberta Heritage Savings Trust Fund;
- Kuwaiti Reserve Fund for Future Generations.⁶⁷

These funds serve other collateral purposes⁶⁸ and governments with NGO’s should ensure the inclusion of funds for developing renewable resources and steering the ship of petroleum development towards sustainable development.⁶⁹ So a Firm political resolve is needed both on the domestic front and also at the international arena.⁷⁰ Whilst the

⁶³ Fourth ACP-EEC Convention (Lome IV), 29 ILM 783 Art. 39(1), (3), (4) (1990).

⁶⁴ Treaty of European Union, 31 ILM 247 (1992).

⁶⁵ Boxell James, *“Top Oil groups fail to recoup Exploration Costs”*, Published: October 10, 2004, New YorkTimes, URL Referred: http://www.nytimes.com/financialtimes/business/FT20041010_7135_200375.html?_r=2&oref=login&oref=slogin&oref=slogin (Retrieved on 13 March, 2008).

⁶⁶ Gao Z., *“International Petroleum Contracts: Current Trends and New Directions”*, Graham & Trotman, London, 1994, p. 234.

⁶⁷ Kryukov V.A., *“The Role of Oil Funds in the Resolution of Regional Economic Problems”*, 12(1) Oil & Gas Law Taxation Review p.3 (1994); the Kuwaiti Reserve Fund for Future Generations, was established in 1976 to serve the Kuwaiti people in the case of eventual depletion of petroleum resources. It consists of 10 percent of the country’s oil income and upon its creation there was a proviso that the fund should not be touched for the next 25 years. Currently the reserve has an estimated sum of US \$ 100 billion. Refer Gribben R., *“Kuwaiti’s Treasure Chest”*, Petroleum Economist September 1990, p.19.

⁶⁸ Supra 55.

⁶⁹ Government pressure is often a product of public opinion, as reflected in the *Brent Spar* incident. In this instance, government exerted pressure on the Royal/Dutch Shell Oil Company, to suspend the adoption of what was perceived to be an environmentally unfriendly means of abandonment.

⁷⁰ World Commission on Environment and Development, *Energy 2000: A Global Strategy for Sustainable Development* (Zed Books Ltd., London, 1987), pp. 55-62.

participation and declaration of the principles of sustainable development⁷¹ expressed in the Earth Summit of 1992 by most governments is commendable, there is a need to show a greater determination to actualize these principles⁷² and emphasis must be given on the maxim *'failing to plan means planning to fail'*⁷³. Sustainability requires the cooperation of the general public with a greater clamor for the involvement of women.⁷⁴ So training should be afforded to managers with proper roles⁷⁵ with a proper energy data⁷⁶ paying a way to National Sustainable Development Strategy⁷⁷ as in developing countries there is a tremendous surge in the growth of energy demand.⁷⁸ The petroleum industry appreciates the fact that as exploration and development of petroleum is taken to the 'last frontiers', the marginal cost of oil will inevitably increase.⁷⁹

Various renewable energy projects are not subjected to scrupulous screening resulting in initiation of technically unsound and immature decisions.⁸⁰ In appropriation of pricing of petroleum resources results in obstacles which can be removed by reducing petroleum subsidy⁸¹ and such information needs to be made more readily accessible to the customers.⁸² The use of gas will almost double in 2000-20 resulting its global share to rise up from 23 % to 28 % but will still be 10 % below the share of oil⁸³ so its ultimately upon the governments, NGO's and other institutions to perform its best at competitive level.

⁷¹ Richardson Lee, Chair, House of Commons, Canada, *"The Oil Sands: Toward Sustainable Development"* Report of the standing committee on Natural Resources, March 2007, URL Referred: <http://cmte.parl.gc.ca/cmte/CommitteePublication.aspx?COM=10803&Lang=1&SourceId=199664> (Retrieved on 14 March, 2008).

⁷² This will require a greater convergence of environmental interests and therefore unanimity amongst governments. Such a development will eliminate blockages to multilateral agreements and thereby strengthens the agreements to be more effective.

⁷³ Htun N, *"The Environmental Challenge and the Impact on the Oil Industry"*, 18(4) Energy Policy 7-9 1990

⁷⁴ Cecelski E.W., *"From Rio to Beijing: Engendering the Energy Debate"*, 23(6) Energy Policy 561-575 (1995).

⁷⁵ Sokon Y., *"Training and Human Resource Development for the Energy Sector"*, Karekezi S. and Mackenzie G.A. (eds.), *"Energy Options for Africa"*, Zed Books, London, 1993, p.45.

⁷⁶ Weeko-Brobby C., *"Innovative Energy Policy Instruments and Institutional Reform-The Case of Ghana"*, Karekezi S. and Mackenzie G.A., (eds.), *"Energy Options for Africa"*, Zed Books, London, 1993, p.25

⁷⁷ Shojai S.(ed.), *"The New Global Oil Market"* Praeger Publishers, Westport, 1995, pp. 159-172.

⁷⁸ Jackson T., *"Renewable Energy- Great Hope or False Promise?"*, 19(4) Energy Policy 110-118 (1991).

⁷⁹ Hilton A.C.E., *"Oil Energy and Capital- A Coming Crunch?"*, 20 Energy Policy 963 (1992).

⁸⁰ Foley G., *"Renewable Energy in Third World Development Assistance: Learning from Experience"*, 20 Energy Policy 355-363. (1992).

⁸¹ Abdalla K.L., *"Energy Policies for Sustainable Development in Developing Countries"*, 22 Energy Policy 31-32 (1994).

⁸² Sioshansi F.P., *"The Myths and Facts of Energy Efficiency: Survey of Implementation Issues"*, 19 Energy Policy 233-235 (1991).

⁸³ Supra 57.

Why isn't media sounding the alarm about this?

It is for several reasons that the role of media is undermined:

- **Lack of Awareness among Journalists**

Investment banker *Adam Cohen* explains:

*"... the financial media is no more interested in the Peak Oil issue. No major financial services company or media outlet would long tolerate any voice loudly proclaiming "Peak Oil! The economy is doomed!" because it would be pretty tough to market other investments or advertising alongside that shrill voice"*⁸⁴.

As most of the major mainstream media outlets are owned by large energy conglomerates or real estate investors⁸⁵ and the financial interests of these companies and individuals would be severely impacted should any significant portion of the public come to understand the magnitude of the crisis at hand.

- **A kind of panic atmosphere created by journalists who are aware.**

Without whitewashing the dire consequences for the average person panic in market forces results in bringing down the house of cards. Market analyst Steven Laguvulin explains:

*"Should the oil markets themselves begin to 'connect these dots', then all our lives are going to be impacted violently and immediately. As soon as it is recognized that for all practical purposes the situation is upon us, then a vicious "resource grab" will be initiated.*⁸⁶

- **Leads to destruction if truth revealed**

An aggressive fuel conservation program would lower the demand for other products and would blunt the demand for new products. This would have devastating effects on the domestic economy and would lead to the rise of extremists political move-

⁸⁴ Investment in Peak: Strategic Considerations, URL Referred: <http://www.peakoil.org/> (Retrieved on 14 March, 2008).

⁸⁵ Failure System, "*Who owns CNN? or MSNBC? ABC?*", Wednesday, Apr. 09, 2003 at 1:43 AM, URL Referred: <http://la.indymedia.org/news/2003/04/47530.php> (Retrieved on 14 March, 2008); Prince Bin Talal Alwaleed, "*Rupert Murdoch and the United Arab Emirates*" Reported by Marie Therese - February 24, 2006, URL Referred: http://www.newshounds.us/2006/02/24/prince_alwaleed_bin_talal_rupert_murdoch_and_the_united_arab_emirates.php (Retrieved on 14 March, 2008).

⁸⁶ "*The Most Important Thing You Don't Know About "Peak Oil"*", Deconsumption, March 16, 2005, URL Referred: http://deconsumption.typepad.com/deconsumption/2005/03/the_most_import.html (Retrieved on 14 March, 2008).

ments not unlike what happened to Germany in the 1920s when its economy collapsed.⁸⁷

So, the policy decisions and role of media is very important as it will lead to the condition that feeds into demand security. Otherwise, wild boom-and-bust cycles will remain a feature of the future energy scene.⁸⁸

Conclusion

There is unlikely *Hubbert Peak* but rather a series of lower peaks spread over 10 or 15 years. The end of the era of cheap oil is at hand. It began in 1999 with the resurgence of oil prices from a very uncharacteristic low, in essence a bottom. We are at the point where demand has caught up with supply and given the huge investment required, it will be 2 - 3 years before slack supply is available again, if ever. We are only a few years away from the time when 50 % of all of the originally recoverable conventional oil in the earth's crust will have been exhausted resulting in decline of supply. So, OPEC being the world dominant supplier and other Oil producing countries have to take this matter into cognizance and must adhered to the gravity of the present matter. There is a great deal we can do to reduce oil consumption, with only neutral or positive impact on the economy. Dependence on oil could easily be cut by a factor of 4 per unit of GDP in less than 20 years, without economic or environmental sacrifice if suggestions are looked into:

- Start to accept with equanimity that higher gasoline and heating oil prices will deplete.
- Stop looking for someone to blame.
- Stop looking for easy outs. As **Peter Senge** has noted "*the easy way out leads back in*".
- Communicate the facts to our fellow citizens and our political leaders.
- Make the economy much more energy efficient.
- Develop alternative (renewable) energy sources.

⁸⁷ Arabe Katrina C., "Automotive Industry: The Big Picture ", Industrial Market Trends, October 8, 2003, URL Referred: http://news.thomasnet.com/IMT/archives/2003/10/automotive_indu.html?archive (Retrieved on 14 March, 2008).

⁸⁸ Shihab-Eldin Dr. Adnan , "OPEC-IEA Co-operation and the International Oil Market Outlook", URL Referred: http://www.worldenergysource.com/articles/text/eldin_WE_v8n4.cfm (Retrieved on 14 March, 2008).

If we start now, in earnest, perhaps enough could be achieved before a healthy millennium to avert a major crisis but there remain many uncertainties that make sound investment planning a hazardous business. Future economic growth rates, energy and environmental policies, technological advances and the path of the oil price all lie at the heart of these uncertainties. Thus, every effort must be made to reduce uncertainties and share the risks involved.

So, in striving towards sustainable development, the initiative of governments is central in leading to its actualization. Our industry can certainly be proud of its past achievements. Yet the challenges we will face in the coming years will be every bit as great as those encountered in the past, due in part to ever-increasing global energy use. They need to show a strong political resolve in this direction and promote programmes that ensure its feasibility otherwise the time is no far where the view of Jeroen Van Der Veer, CEO of Royal Dutch Shell will prove right,

“Oil has probably passed its peak.”

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