

LOVRAJ Kumar Memorial Lecture

by Mani Shankar Aiyer, M.P.

Mr. Chairman, my decades-old Rehnuma, Shri Abid Hussain, Friends and family of my friend, Shri Lovraj Kumar, Excellencies, Ladies and Gentlemen,

May I begin by paying my personal tribute to my old friend and mentor, Lovraj Kumar, in whose memory we are here gathered? His wife, Dharma, the brilliant economic historian and principal editor of the multi-volume Cambridge Economic History of India, was an old family friend whom I had known since birth. Lovraj, I came to know later when he was at the apogee of his career as India's leading petroleum expert and I a beginner sliding my way up the slithery ladder at the Ministry of External Affairs. Happily for me, I had already acquired such a terrible reputation as an undisciplined loud-mouth that I was exiled from South Block to MEA's fledgling Economic Division in distant Shastri Bhawan, but put on the same floor where Lovraj held his durbar. It was the most egalitarian durbar in government. So, lowly under-secretaries could mingle with the High and the Mighty. Lovraj was a one-man gurukul who had cultivated what our common history teacher at school, R.L.Holdsworth, called the "inquisitive Greek spirit". He was interested in everything, from succulent croissants to Energy Security, and relished both in equal measure, a true Renaissance man who bridged the two cultures, at ease as much with complex questions of science and technology as with the finer points of the good life and mundane matters of files circulating round the dusty corridors of power. I miss him, I miss them both - and I am glad they have left behind a daughter, Radha, apple of her father's eye and a worthy successor to her mother. To be invited to deliver this lecture is honour indeed.

There can be no Energy Security for the *Aad Admi* without first securing Energy Security for the Nation. Therefore, this Lecture falls in two parts: the first, and longer, section deals with Energy Security for the Nation; and the second, briefer because it is more to the point, with Energy Security for the *Aam Admi*, for whom there must be equitable distribution of whatever energy is available, especially in an economy whose accelerating growth is widening income and wealth inequalities as we have not seen since Independence.

Energy Security for the Nation

Fourteen years ago, in 1996, Dr Vijay Kelkar, one of my distinguished predecessors in the long list of luminaries who have delivered this Lecture, said, "What petroleum was to the 20th century, natural gas will be to the 21st."

Instead of making this profound observation the drumbeat of our march to Energy Security, we have so twisted and mangled natural gas policy, both with respect to internal production and distribution, and with respect to imports by pipeline and as Liquefied Natural Gas (LNG) from abroad, that we are today more energy insecure than we were when Dr. Kelkar mounted this podium.

This Lecture is, therefore, a kind of red alert being sounded because the Integrated Energy Policy, first circulated as a draft in 2004, then submitted at leisure to Government two years

later in 2006, and finally endorsed by Government a further two years later, in December 2008, is yet, another two years later, in 2010, gathering dust as a mere academic exercise, with little or no action by any of the numerous Ministries concerned nor any integration in energy policy on the ground. It shows that waking up the Indian establishment to the imperative of Energy Security is, indeed, to borrow the telling phrase of my friend Sunjoy Joshi of the Observer Research Foundation, tantamount to teaching an "Elephant to Dance".

Secondly, it is essential to teach the Elephant the Dance of Oil Diplomacy, for the Integrated Energy Policy displays a woeful sidelining of the external dimension of Energy Security which is the key to opening the door to assured National Energy Security.

In his Foreword to the Integrated Energy Policy, the Deputy Chairman of the Planning Commission, Dr. Montek Singh Ahluwalia, says that an "optimal energy strategy" is about "utilising all available *domestic* energy resources to the optimal output in a competitive framework"

But why only domestic? The fact is that domestic energy sources will have to be heavily complemented by the external sourcing of energy at least until we operationalise the thorium route to Energy Security on a massive commercial scale, which cannot be much before mid-century. But all that the Integrated Energy Policy has to say on the international dimension of Energy Security is:

"India must also seek to expand its access to energy resources beyond its domestic endowment." (para 2.3)

That's it! Extraordinary when one considers that the same Integrated Energy Policy projects in Table I an external requirement of over 90 per cent crude oil; the external sourcing of up to 57 per cent of our natural gas needs; and another similar import requirement of up to 57 per cent coal, amounting, on average, to some 58-67 per cent of our energy requirements in 2031-32 if we are to sustain 9 per cent annual rates of GDP growth.

This level of external dependence is not going to materialise out of thin air. It requires dedicated energy diplomacy, aimed at making National Energy Security at least as important as National Security per se.

There is still time - but barely enough time - to fill this gaping lacuna in our Integrated Energy Policy. If we succeed, generations to come will regard this generation as the saviour of our future. If we do not, those coming generations will never forgive us. All our roseate visions of overtaking China's rate of growth will come to naught; all our ambitions of becoming one of the world's largest economies will vanish on the desert air; all our dreams of making the aam admi energy secure will turn to ashes; and I stress once again that thorium-based energy security will take at least till mid-century to come our way: we cannot navigate our way to the Fifties until we have negotiated the shoals that threaten our frail craft through the Tens, the Twenties, the Thirties and the Forties of the present century.

Are we equal to the task? Or are we going to continue to dither like the "*Jew of Malta*", quoted by T.S. Eliot at the start of "*Gerontion*": "*Thou hast neither youth nor age, But, as it were, an after-dinner sleep, Dreaming on both*" Happily, the international and domestic scenario is so rapidly changing in our favour that if we seize this moment, if we take the tide at the flood as it were, we might still overcome; if we miss the moment, it may not come again.

To assert that domestic and international circumstances are favourable to India as never before would appear to be eccentric in the face of our not having made any major gas discoveries since Reliance found D6 in the Krishna-Godavari basin in 2003, a gas field that is going to start running dry well before the coming decade has run its course. Compound the absence of new discoveries with the exponential explosion in world oil prices from about \$10 a barrel when Dr. Kelkar took the floor here to \$32 when I became Minister for Petroleum and Natural Gas to over \$140 as the decade unfolded to a now further predicted rise to those levels, and what might have initially been laughed off as my trade-mark eccentricity in describing current "domestic and international circumstances" as "favourable to India" turns, it would seem, to lunatic absurdity on my part.

Yet, if we get over the 20th century syndrome of seeing oil as the driver of all hydrocarbon prices and focus instead on the current behaviour of LNG prices, we may discern the beginnings of a break in the nexus between oil prices and gas prices. For, of late, even as crude oil rises, gas prices fall. Thus, while the Western Texas Index for well-head crude oil prices have soared from 7.4 dollars per million British thermal units (mmbtu) in the first quarter of 2009 to nearly double that in 2010, 14.3 dollars already and expected to rise to 14.7 dollars by year-end, US well-head prices for domestic gas have sunk from the peak price of 9.6 dollars two years ago to about 4.5 dollars now. So, while domestic oil prices in the US have doubled, domestic gas prices in the US have been slashed by half!

Similarly, import prices of LNG at the US port of entry, Henry Hub, have been slashed from 11.4 dollars in 2008 to a mere 4.8 dollars in the second quarter of 2010 - indeed, down to just 4.12 dollars yesterday. Astonishingly, the Canadian benchmark price - AECO Canada - is as low as 2.88 US dollars yesterday.

Put another way, the oil:gas price ratio, measured in terms of comparable calorific value, has just about halved over the last 18 months, from about 36 in January 2009 to about 16 in July.

This phenomenon of gas prices shrinking while oil prices soar has never happened before. It augurs the possible emergence of an independent global market for gas, independent of oil. Are we in India equal to taking advantage of this - or is the elephant still learning how to dance?

Equally, we see a dramatically altering market for crude oil. West European and US demand for Asian crude, as a share of their total energy consumption, is falling so steadily that where we used to complain of the Saudis, in particular, and West Asian suppliers, in general, charging an "Asian premium" by squeezing Asian consumers higher than the offer made to US and European buyers, we are now actually seeing an "Asian discount", with

Asian suppliers offering incentives to Asian buyers! I quote from the *Wall Street Journal* of 25 May 2010:

Saudi Arabia, the world's largest oil exporter, sold its Arab Light crude to Asia for \$6.7 **less** per barrel than it charged European buyers .. 'It's a game changer,' said David Ernsberger, Global Director of Oil at Platts. 'The balance of power in pricing is shifting to eastern markets.'

Two years ago, adds the *Wall Street Journal*, Asian consumers paid 8 dollars more per barrel than European consumers, leading to a total 'Asian premium' payment to Asian producers by Asian buyers of 41 billion dollars. Now, again to quote the *Journal*, we are seeing "a reversal of the historical pattern".

But is India a beneficiary? No - because we are tied into medium- or long-term arrangements and have not been able to take the advantage we could of the rapidly changing petroleum scenario, which is perhaps why so little business or media attention has been given to this historical reversal. What we need is a linkage between India's foreign policy priorities and India's trade in oil and gas, easily the biggest item on our import bill.

How has this divorce between oil and gas prices happened? I would suggest three principal reasons. First, where, during the Greenspan boom, the US LNG entry point of Henry Hub was snapping up every available LNG shipment and driving prices skywards, today LNG ships are roaming the oceans begging for buyers. I quote from the very prescient 'Recent Research' column of the Cambridge Energy Research Association (16 April 2009): "...reduced demand, particularly in Asia; increased unconventional production in North America; and significant global liquefaction capacity additions - all of which have increased the volume of spot LNG looking for a home in the Atlantic."

The collapse in rate of growth of demand for LNG is not a passing market adjustment but a medium- to long-term trend fostered by dramatic increases in domestic shale gas production in the United States. *Cedigaz* May 2010, reports US shale gas production to have trebled from 19 BCM in 2004 to 57 BCM four years later, and steadily rising. The US department of Energy projects the shale gas contribution to the US energy basket by 2035 at 168 billion cubic metres, "more than offsetting" says the Department, "declines in other production". In Canada too, shale gas output has risen precipitously. In consequence, even as the growth in North American energy demand has fallen following the most severe recession since the Great Depression, the world's principal LNG suppliers and the world leaders in piped natural gas - Qatar and the Russian Federation respectively - are now stranded in a buyers' market where just a few years ago they were ruling the roost as the dominant suppliers in a sellers' market.

Second, Europe and China are emerging as major producers of shale gas. Over the next decade, shale gas from Europe's oldest gas play, North-West Europe, running from eastern Denmark through Sweden and thickening to north and east Poland, is likely to emerge as a major shale gas producer. Several other European Union countries are joining the race, with Romania recently coming to the fore. While significant European shale gas supplies may

take the better part of this decade to come on the energy scene, the prospect itself is changing expectations in global energy markets.

Add to this the frenetic prospecting for shale gas that began in China in 2004 simultaneous with what has proved a long-term increase in international crude oil prices. The Institute of Energy Economics Japan has in its latest study estimated China's shale gas resources at 100 TCM, matching that of the United States. Wood Mackenzie, for their part, have estimated that China might secure up to 11 billion cubic feet per day of unconventional gases, principally shale gas, by 2030. All this is already progressively eroding the oligopsony of Russia, Central Asia, Qatar and Iran. This trend will only continue as shale gas becomes the fuel of the 21st century, second only to natural gas.

The Journal of the International Association for Energy Economics for the Third Quarter of 2010 approvingly quotes an independent US expert, Fred Julander as saying: "Shale gas is the most important energy development since the discovery of oil." And the International Energy Association predicts a 71 per cent rise in unconventional gas output globally between now and 2030, leading to an "acute glut" in natural gas availability the world over, thus further pushing down both LNG and piped gas prices. Can there be a more favourable concatenation of circumstances for a major gas importer like India? Yet, tragically, the only major petroleum global importer to have done little about estimating domestic shale reserves or putting in place an exploration policy for shale gas is Hamara Bharat Mahan - although Shri S. Ratnam, former Chairman, Oil India Ltd., Duliajan, had pointed nearly two decades ago to the immense potential of shale gas, particularly in North-East India.

Third, with the United Kingdom leading the European move to shift transport away within the next ten years from fossil fuels to electricity, hybrids and bio-fuels through tough new legislation recommended by their Parliamentary Committee on Climate Change, Asian oil and gas suppliers will have to find replacement markets from among Asian consumers, principally Japan, China and India.

The move in the West away from traditional hydrocarbon sources abroad to new unconventional domestic sources is principally because the New York Metal Exchange has elbowed out OPEC as the principal determinant of international oil prices. Demand and supply for the commodity by actual users of the commodity are being replaced by commodity speculators playing with pieces of paper in forward trading - speculators who have never seen, nor want to see, a barrel of oil in their lives! Marginal adjustments of OPEC production, which could till a few years ago shake and stir the global economy, now have little impact on crude prices; it is *satta* in the *satta* bazaar that drives unprecedented volatility in commodity prices. When such steep and inexplicable inflation in oil prices is combined with the plunge in developed country growth rates, Western technology has started turning inwards in search of domestic energy resources rendered suddenly viable, stable and reliable by the rise in prices of imported alternatives.

In North America, this means shale gas, available domestically in such abundance that one estimate by the international Society of Petroleum Engineers puts possible US shale gas reserves at over 107 TCM, Canada's at about 33 TCM and reserves in West Europe at 14

TCM, with East European reserves still being estimated. Inevitably, this means Western buyers are exploring domestic shale gas reserves in North America and the European Union as the preferred incremental alternative to sourcing from Russia and West Asia.

Add China, whose shale gas reserves are nearly equal to the United States at over 100 TCM and you have a global shale gas reserve of an estimated 450 TCM, which would easily take the world as a whole into the 22nd century and perhaps even beyond.

In these changed circumstances, for Asian suppliers of oil and natural gas the Asian Resurgence emerges as the only Ray of Hope. Hence the hitherto unheard-of phenomenon of an "Asian discount". Therefore, I hold that the hour for the Asian Oil and Gas Community has struck. Are we ready to take the lead in oil diplomacy, as we once were? But before we come to that, what of the domestic scenario?

While China has taken full advantage of the dramatically softening market for LNG, we are unable to do so because no one thought out in time the need for LNG terminals to bring in the LNG that is now hunting for buyers. Dabhol, which Government took over from Enron in a flush of high expectation six years ago, languishes, while the two completed LNG terminals we have, and the associated pipelines to take the gas inland, are dedicated to owners Petronet at Dahej and Shell at Hazira, so no other Indian importer, present or potential, has access to these terminals or the pipelines.

Moreover, Petronet, being a partnership of PSUs, is constricted in taking market risks and is, therefore, content to be caught in an unchangeable web of long-term contracts insulated for decades from market upheavals. And Shell, being an international player, is understandably guided by global rather than narrow national considerations. In consequence, we have neither the physical infrastructure nor the widespread entrepreneurship that gives China the edge even as we totter at the sword's edge.

This depressing picture is complicated by the drying up of investor interest in domestic gas exploration. As Minister, I hyped up the hyperbole of the Bay of Bengal being the North Sea of South Asia. The hype had a tinge of credibility because Reliance's then recent find, the largest gas find of the year the world over, had suddenly brought the offshore east coast of India into focus as a region with hydrocarbons potential, especially as the hydrocarbons potential of the eastern littoral of the Bay of Bengal in Myanmar, the Sea of Andaman further south and the northern littoral of the Bay in Bangladesh also found international attention to rival the Reliance boost to India's image. Also, at about the same time, Cairn had made significant oil finds onshore in western Rajasthan. Therefore, the image of India, as a hydro-carbons deficient nation, began to be reassessed.

In consequence, there was an exponential increase in the number of companies, Indian and foreign, awakening to our exploration market - and we responded by exponentially increasing the number and geographic range of NELP blocks on offer. [figures]

What made India an attractive investment destination was that any crude found could be sold within the country at international prices. For natural gas, the prevailing mantra was that there would be "arms' length price discovery through transparent market processes"

(see, I even learnt the jargon!); which means sales could be freely negotiated between suppliers and consumers in an increasingly competitive market; and pipelines would be statutorily obliged to have spare capacity to carry any other suppliers' produce. Moreover, there was to be a National Gas Grid. And a truly independent regulatory authority.

Now, to resolve a quarrel between two brothers, Government have intervened to remind themselves that natural gas constitutes a sovereign national resource; therefore, gas shall not be marketed at a price lower than the minimum fixed by Government (ironically, the current prescribed price is 420...cents per mmbtu!); prices may be determined prospectively or retrospectively; and sectors to which the gas must be sold in the first instance will be determined by Government.

In consequence, the internecine fraternal quarrel is over, but foreign and even domestic private sector interest in exploration has plummeted with the number of Blocks *offered* rising from 20 in NELP V (2005) to 55 in NELP VI (2006) to 57 in NELP VII (200) and soaring to 70 in NELP VIII (2010) but the Blocks awarded sharply declining from 52 in NELP VI to 41 in NELP VII and down to 31 in NELP VIII, with ONGC picking up almost all blocks while private bidders, Indian and foreign, are simply shying away. Alas, NELP has lost its momentum, and the sooner we shift to an Open Acreage Policy, especially for shale gas, the better for our Energy Security.

The atrophying of the New Exploration Licensing Policy is essentially because we are perceived, with some justice, as a country where Production Sharing Contracts are ambiguously drafted and terms arbitrarily redefined to the ex-post facto disadvantage of investors who years ago signed the documents in good faith, as a country where producers can neither determine prices nor choose their own customers, and where there is no regulatory authority worth the name. So, we are left with only the tired old war-horses of the public sector (and, of course, Reliance) to find such gas or oil as may lie there, on land or on the ocean floor.

Why, even Cairn, the most successful entrant into Indian hydro-carbons have already packed their bags, handed over their finds to an NRI who has never before been in oil, and are only waiting for Government to raise the boom so that they might quit India forever for greener pastures of ice-bound Greenland. What an indictment!

And, amazingly, while Indian firms rush to the US to invest billions in shale gas exploration, out there where the Red Indians used once to roam, we Brown Indians are told that shale gas exploration in our country cannot even begin until we have first estimated what and where are our reserves of shale, and decide what, if any, our policy for shale gas exploration should be. That will not be till the end of next year at the very earliest. We will thus start getting into shale about a decade after China started. That is how long it takes to teach the Elephant to Dance!

It was my Bangladesh friend, High Commissioner Farooq Sobhan, who once said in retort to *The Economist* of London who had asked about the gas reserves of Bangladesh making that country the Qatar of South Asia, "What can I do if my country wishes to be the Somalia?" It is a riposte with contemporary resonance in our land.

We need an explorer-friendly exploration policy if domestic natural gas output is to surge - and it is only if we having surging domestic supplies that we can throw away the begging bowl and beat down exploitative outside suppliers of natural gas - in piped form or LNG. Instead, alas, we are doing practically everything we can to discourage international and even domestic players from entering our uncertain, deeply ambiguous hydrocarbons sector, thus massively promoting energy insecurity. Not till there is guaranteed stability in our natural and shale gas exploration, exploitation and marketing regime, along with a truly transparent and independent regulatory authority, will domestic natural and shale gas - the fuel of the 21st century - save us from the plunge into the abyss. Indeed, unless we do what the West is so vividly doing, shift from coal and oil to natural and shale gas, there is no way we can meet Jairam Ramesh's offer of a 20 per cent reduction in our carbon footprint by 2020.

Which brings me to the international dimension of our Quest for Energy Security. We seem either to be paralysed in our search for friends and partners or to have abandoned the effort in despair.

The chairman of the Oil Diplomacy Group I had set up, chosen for his unparalleled expertise in the Byzantine ways of West Asian economics and politics, was asked to go home as soon as I was sacked; fortunately, he was then asked to become our Vice-President! Shastri Bhawan's loss is now the Rajya Sabha's gain.

The civil nuclear deal effectively derailed the momentum of the Iran-Pakistan-India gas pipeline. The proposal is still on the table but its snail's pace is in stark contrast to the deliberate speed with which the agreement on the Iran-Pakistan segment of the pipeline has been concluded. The Minister of State for Petroleum and Natural Gas has informed me in response to Unstarred Question no. 2526 on 17 August, a week ago, that "Heads of Agreement and the Operational Agreement that would pave the way for construction of a gas pipeline from Iran to Pakistan have been signed between Iran and Pakistan in March 2010" and that "subsequently, both countries signed the sovereign guarantee agreement in Islamabad in May 2010" but India, is still, so solemnly affirms the Minister, pursuing "various important issues, viz., pricing of gas, delivery point of gas, project structure, payment of transportation tariff and transit fees".

To think that on a matter so vital to India's immediate energy security needs, so vital to bridging the period between now and the possible emergence after half a century of a thorium-powered India, we are still stuck at the starting line five years after the Cabinet authorised negotiations between India and Pakistan and India and Iran. Don't we want the 100 million standard cubic metres of gas *a day* - equal to our most optimistic projections of domestic gas availability - which will come to us by pipeline from Iran via Pakistan? Or is it, quite simply, that we do not want the US to have to convey to us, as the Minister says they have already conveyed to Pakistan, that there are US laws on the subject not to mention UN Security Council resolution 1929 of 9 June 2010? If we are nervous of the US, then why not abandon the hypocrisy of on-going negotiations with Iran? And if we are not apprehensive of the Americans, then why not push the negotiations to conclusion even as the Pakistanis have done?

Indeed, why only IPI, Iran-Pakistan-India; why not IPIC: Iran-Pakistan-India-China? That way we'll also revive the World War II Ledo-Kunming pipeline and the parallel Stillwell Road that won for the Allies their war against Japan and freed China of Japanese colonialism? It will also give such a boost to the economies of North-East India that once the North East Region's growth rate doubles from the present rate to the present all-India average, we will overtake China's GDP growth rate. Enticing prospect, no? But do we have the imagination and the courage to make the leap?

Please also note that if the pipeline is not extended to India, then it cannot be extended across the bosom of Mother India to China and other points east to provide an alternative to LNG supplies through the Straits of Malacca, those narrow treacherous straits that all through history have been the haunt of pirates and usurpers, the memory of which still haunts the energy-thirsty economies of East and South-east Asia. Has anyone measured the transit fees payable to India by China if the pipeline is extended to China? Should that not be factored into the price at which we might buy natural gas from Iran and offer to send it on to China?

And because IPI lies frozen, India is not yet party to even the first axis of the Asian Gas Grid which could assure our energy security not only till we reach the Valhalla of thorium-driven energy security but even thereafter to maintain the diversity of our energy basket.

The bottom line of our Energy Security Policy must be the nation-wide and Government-wide realisation that whether or not we ourselves are hydro-carbons rich, our immediate and proximate neighbourhood is the richest hydrocarbons repository in the world. Not only Saudi Arabia and Qatar, Iraq and Iran to our west but also Bangladesh, Myanmar, Malaysia, Indonesia and Vietnam to our east, and Turkmenistan, Azerbaijan, Kazakhstan and the north Asian reaches of the Russian Federation, stretching from the Urals to the Pacific coast and the island of Sakhalin, are soaked in hydro-carbons. Not only the world's biggest producers but also the world's fastest growing consumers of oil and gas range from Japan and South Korea in the north-east of Asia to China in the east and India in the south. What we need to do is bind these giant Asian suppliers and consumers into a continent-wide Grid of Peace, Friendship and Cooperation. Are we even trying?

Five years ago, understanding the imperative but groping for the answer, **all** ? I stress **every one** ? of the major oil and gas producing and consuming countries of Asia came to New Delhi in January and November of 2005 to launch a forum for the exchange of views and information among themselves. In the meanwhile, the International Energy Forum in Riyadh was inaugurated ? the first forum of producers and consumers designed to work towards a New World Order in Hydrocarbons. Of course, it was no more than a beginning, a tentative reaching out of Asians to each other, but a historic beginning nevertheless. Have we moved forward with all deliberate speed? Does the initiative still enthuse us?

Forget Pakistan, we have not even got our act together with Myanmar or Bangladesh. While Myanmar gas supplies from the offshore Arakan gas fields are piped to distant China because we could not bring ourselves to trust transit through Bangladesh, and Bangladesh now faces a shortage of natural gas because no exploration has been done there in decades,

two MoUs with China, both signed in the same year ? 2006 (with a Minister, me, dropped in between, leaving the Chinese giggling behind their polite masks) - but Sino-Indian hydro-carbons cooperation on the ground is at a standstill.

The Turkmenistan-Afghanistan- Pakistan-India pipeline (TAPI) remains a paper tiger, the last known meeting having taken place in February 2006. When our Foreign Office raised doubts about the adequacy of gas supplies in Turkmenistan?s Daulatabad field (first seized upon by Bechtel?s and then sneered at by Bechtel?s, our Foreign Office faithfully following suit) I asked President Musharraf whether we could not augment supplies by bringing in Uzbekistan (making it UTAPI); then Kazhakstan (KUTAPI); then Astrakhan on the Russian littoral of the Caspian Sea (RUKUTAPI); and then bringing in the Azerbaijan find of Chirag (ARUKUTAPI), President Musharraf smiled and replied, ?That might be feasible; at least the vowels and the consonants fall into place!?

Switch arrangements for our share of Sakhalin crude and gas for LNG from South Korea?s Sumatran suppliers also does not seem to have been pursued. And while India-Australia relations are in the limelight because of Indian students being beaten up Down Under, there is little about India linking up with Australia for LNG. Why?

Nor have we moved towards the Asian Cocktail in the Indian Ocean. To combat the excessive dependence of Asian consumers on West Asian suppliers which had led to the virtual absence of any competition in the Asian hydro-carbons market, an attempt was made to bring Central Asian oil into the Indian Ocean by extending the Baku-Tblisi-Ceyhan pipeline through Ashkelon and Eilat to the head of the Gulf of Aqaba: that endeavour seems to have withered on the vine for want of follow-up. The same seems to have happened to the reverse pipeline through Egypt to link the Mediterranean with the Red Sea to bring in oil supplies from North and West Africa to compete with West Asian crude in the Indian Ocean area.

In sum, we do not have an Energy Security Policy for our oil-and-gas rich neighbourhood, leave alone the remotest attempt to forge Asian unity through building, if at all possible, an Asian Oil and Gas Community or even an Asian Gas Grid. Or even bilateral or plurilateral deals that are game-changers. How can we have energy security if faltering on the domestic front is compounded by faltering on the pan-Asian front?

Polluting hydrocarbons would not matter if we had ample alternative sources of fuel. Certainly, we are fortunate that our single biggest source of energy is coal. Our present reserves run to a hundred years of assured supply. But if we continue with the current acceleration in growth rates and seek to accelerate it even further, our coal reserves will dip to thirty years reserves within the next two decades and much of it with even higher ash content than we average at present. In any case, until we put in place a far more effective regulatory regime than we have at present, the coal sector is likely to be known more for its coal mafias than for its sterling contribution to energy security.

Other non-conventional and renewable sources have their great attraction, be it solar, wind or tidal energy, but until technical innovation makes them much cheaper and storable and transportable, fossil fuels will continue to dominate the energy scene. The same is true of

such innovative ideas as geo-thermal energy, underground coal gasification, gas hydrates which we have in abundance in the seas surrounding our sub-continent, bio-fuels, hybrid fuels and electrical transport. All have their attractions, none as yet the potential to replace fossil fuels. Realism and commonsense indicate that if we are to survive the next several decades, and grow at the rates predicated on our much-vaunted ambitions, we must needs put energetic energy diplomacy in the arrowhead to ensure our Energy Security as a country and as a people.

And not until we indigenously and by our own efforts resolve complex technological problems relating to all these issues and problems of oil and gas exploration in conditions peculiar to India, such as the Deccan trap onshore and the depth at which we have to drill for off-shore resources compared to most other areas such as the North Sea, can we move beyond tried and tested roads to energy security through domestic resource exploitation and energy imports.

Nothing, absolutely nothing, counts more than the mindset in determining the pace of technological innovation. The Integrated Energy Policy stresses this. And yet, it is the most neglected aspect of our Quest for Energy Security. There was a time long, long ago when the ONGC was a Commission; now the 'C' in ONGC stands for 'Corporation' and, therefore, ONGC is now no different to any money-minting entity, its eyes fixed on bottom lines and market caps, not dull things like technological innovation and knowledge networking, the key of keys to energy security. Such global knowledge networking also calls for integrated energy diplomacy covering the spectrum from global petroleum knowledge networking to networking across all sources of energy, conventional and non-conventional, without being constrained by the silos of individual Ministry mandates.

I suggest, the entire Dehra Dun establishment of ONGC be de-linked from the Corporation and placed under a separate management that could spearhead technological innovation and knowledge networking (named perhaps after Lovraj Kumar who would, I am sure, endorse every word of what I am saying). Linking the Dehra Dun establishment to the Petroleum University and the Indian Institute of Petroleum in the same city, and the new Rajiv Gandhi Petroleum Institute in Sultanpur as well as the renowned Indian School of Mines at Dhanbad, we need to foster petroleum degrees and research in all our IITs or better still establish a series of Indian Petroleum Technology Institutes to rival our IITs.

Moreover, knowledge networking across the globe should be a critical national goal to be pursued with vigour and verve. We need an Energy Revolution as much as we needed the Green Revolution, and like the Green Revolution, technology and more technology, both domestic and imported, would be the spark that lights the Revolution.

True, we now have at last an Integrated Energy Policy ? but are still to get an Integrated Energy Ministry or a National Energy Security Adviser to match the National Security Adviser in the Prime Minister's Office. These are critically important institutional measures to take the road forward to Energy Security for our country.

Energy Security for the Aam Admi

But what of Energy Security for the *Aam Admi*? Fact no.1 is that the most recent National Sample Survey shows that 39.8 per cent of rural and 6 per cent of urban citizens of this great country of ours have no access to electricity at all, that makes 350-400 million Indians plus many hundreds of millions more who are subjected to arbitrary power cuts and frequent load-shedding. Another 400 million at least ? probably nearer 600 million - have some access to energy but will lose it if we let the market alone determine the prices of essential petroleum products. And our current administered price regime disproportionately benefits those remaining 200 million Indians who can and should pay market prices. In short, the *aam admi* is being short-changed, and the *khaas mem sahib* is being privileged. Subsidised LPG for the *mem sahib* is doing far greater harm to our economy than subsidy leakages for kerosene.

The neat economist's answer to Energy Security is market determination of prices - a simple solution that turns simplistic when the Indian 'market' ranges from 400 million who have no access to energy to billionaire households that are also subsidised at Rs. 170 an LPG cylinder by our ever-generous government. So long as there are obscene distortions of income and wealth in our democracy, the stability of that democracy demands differential pricing of essential articles of daily consumption, including essential petroleum products such as kerosene and LPG. That is the ineluctable political economy of our democracy - and economics without politics, which suffuses much of the Integrated Energy Policy, is no answer.

But we do need to move beyond differential pricing of the *ad hoc* kind we now have. The basic argument against subsidies is leakages. All leakages in our subsidy system are systemically the consequence of our relying on the same administrative system that has failed in all departments to deliver development to the people because 85 paise in the rupee goes into administrative costs.

Not until kerosene is taken out of Civil Supplies departments ? which have long proved their corruption and inefficiency - and entrusted instead to elected community-run institutions, such as local women's self-help groups under the overall supervision of village panchayats responsible to the intended beneficiaries in community-wide meetings of the Gram Sabha, as has been experimented so successfully in Chhatisgarh, can we even begin ensuring the availability of a little light to drive away the darkness of the village night for hundreds of millions of our poor villagers and slum dwellers.

LPG should be charged at full rates from all urban consumers not living in slum areas and provided virtually free to tribals and other forest-dwellers, and all those living in remote and difficult locations such as desert and mountain habitations, so that the environment is protected from poverty-driven degradation and these totally energy-deprived fellow-citizens of ours are given a modicum of what we, the urban middle classes, take for granted. Smart cards might help in determining both inclusion and exclusion.

Diesel should be subsidised only for transport trucks and buses ? and paid for from whinging cesses imposed on buyers of diesel cars as part of the initial purchase price at a rate equivalent to the estimated cost of diesel subsidies over the lifetime of the car.

Petrol should be totally de-regulated. When international crude prices rise, equitable burden sharing between upstream companies, central and state governments, and the consumer should provide the guiding principle. We can move to the Integrated Energy Policy principle of market-determined prices for petroleum products as soon as we reach US levels of prosperity or Norwegian levels of equity, whichever is earlier.

I want to conclude on a note of warning which I hope does not sound too alarmist. We have entered the sixth decade of our Industrial Revolution. History teaches us that the giddy success of a few contrasted with the trailing behind of most that any Industrial Revolution augurs shakes the foundations of the political system, democratic or autocratic, which has engendered the Industrial Revolution about six to eight decades into the Industrial Revolution. Therefore, this decade, which is already listing to the rumblings in Dandakaranaya, and the coming decade or two are, without doubt, the most dangerous decades in which the dilemmas of development and democracy will be played out in our country.

Think of the England of Charles Dickens and "Please, Sir, may I have some more?"; the France of Victor Hugo's *Les Miserables* and the barricades of Paris; Karl Marx's "spectre that is haunting Europe" (1848); the Civil War in the United States ("four score and ten years ago" - the Battle of Gettysburg); Hitler coming to power six decades after Bismark united Germany; and the Soviet Union's sclerotic decline six decades into the Soviet Revolution - and you see why I fear that in India too the sixth to eighth decades of the Industrial Revolution might prove to be our most dangerous decades. We are now entering those decades. That is why Energy Security for the *Aam Admi* must be integral to Energy Security for the country. An economic order in which India prospers but Indians do not cannot long endure. Unless we rise to the occasion, our successes in democracy and development may prove ephemeral, our future imperilled.

Thank you.
Jai Hind.
Jai Peepli!

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