ENERGY SECURITY and LEGAL ASPECTS

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Introduction

In this paper we are analyzing the concept of Energy Security in India and alliance with world scenario. So according to our understanding the concept of Energy Security is that the energy security is strongly related to other policy issues which concern the energy system such as affordable energy and climate change and environmental policy, implies that it is important to consider the energy security consequences of different pathways.

In India the concept of energy security can be defined as the availability of commercial energy at competitive prices to support its economic growth and meet the energy needs of its citizens. The widely accepted principles of energy security are assurance of supply, diversity of sources and low price volatility. India faces formidable challenges in meeting its energy needs and providing adequate and varied energy of desired quality to users in a sustainable manner and at reasonable costs. The keys to Energy Security are assurance of supply and diversity of sources.

India seeks to secure her energy security needs, will seek to explore new options. The wars in Iraq and Afghanistan have led to spiraling oil prices which have adversely affected the Indian economy. The major impediments to India's ability to secure her energy are inadequate domestic energy capacity, the conflicting interests with China and India's geographic location. Overland trans-national energy pipelines are one of the options being explored by India to meet her energy security requirements. Overland trans-national energy pipelines by their very nature incorporate multiple nation's source nations, transit nations and destination nations and are affected by regional and geo-strategic interests of the nations involved. Thus, they provide an excellent platform for analysis of India's energy and geo-strategic interests and its security.

In this paper we want to highlight few integrated policy framework for securing Energy Security in India and a comparative case study on India & USA Licensing Policy.

In this paper we will try to enrich the new term coined Energy Interdependence to a wider extent.

Energy Security an overview

"Secure energy is essential to improving standards of living and individual security as well as improving economies around the world."

In India the concept of energy security can be defined as the availability of commercial energy at competitive prices to support its economic growth and meet the energy needs of its citizens. The widely accepted principles of energy security are assurance of supply, diversity of sources and low price volatility. India faces formidable challenges in meeting its energy needs and providing adequate and varied energy of desired quality to users in a sustainable manner and at reasonable costs. The keys to Energy Security are assurance of supply and diversity of sources.

India has to overcome significant challenges, internal as well as external, to achieve energy security. Regulatory uncertainty and opaque natural gas pricing policies have resulted in vast unexplored basins and inadequate upstream activities in the country. In addition, the small pool between oil and gas discoveries and production. Given the scarcity of hydrocarbon reserves across the globe amid the rising demand, India will have to increasingly compete with other nations to secure energy supplies. Fossil-based fuels will definitely remain the dominant source of energy in the near future. Nonetheless, in the long term, India will have to explore alternative energy sources to strengthen its energy security.

The approach of Integrated Energy Policy is summarized below:-

Till market matures in independent regulation across the energy streams is a necessity, Pricing and resource allocation to be determined by market forces under an effective and credible regulatory oversight, transparent and targeted subsidies, improved efficiencies across the energy chain, policies that reflect externalities of energy consumption, incentives / disincentives to regulate market and consumer behavior, management reforms to foster accountability and incentives for efficiency.

Ensuring Energy Security

India's energy security, at its broadest level, is primarily about ensuring the continuous availability of commercial energy at competitive prices to support its economic growth and meet the lifeline energy needs of its households with safe, clean and convenient forms of energy even if that entails directed subsidies. Reducing energy requirements and increasing efficiency are two very important measures to increase energy security. However, it is also necessary to recognize that India's growing dependence on energy imports exposes its energy needs to external price shocks. Hence, domestic energy resources must be expanded. For India it is not a question of choosing among alternate domestic energy resources but exploiting all available domestic energy resources to the maximum as long as they are competitive.

Ensuring energy security requires dealing with various risks. The threat to energy security arises not just from supply risks and the uncertainty of availability of imported energy, but also from possible disruptions or shortfalls in domestic production. Supply risks from domestic sources, such as from a strike in CIL or the Railways, also need to be addressed. Even if there is no disruption of supply, there can be the market risk of a sudden increase in energy price. Even when the country has adequate energy resources, technical failures may disrupt the supply of energy to some people. Generators could fail, transmission lines may trip or oil pipelines may spring a leak. One needs to provide security against such technical risks. Risks can be reduced by lowering the requirement of energy by increasing efficiency in production and use; by substituting imported fuels with domestic fuels; by diversifying fuel choices (gas, ethanol, orimulsion tar sands etc.) and supply sources; and by expanding the domestic energy resource base. Risks can also be dealt with by increasing the ability to withstand supply shocks through creation of strategic reserves, the ability to import energy and face market risk by building hard currency reserves and by providing redundancy to address technical risks.

R&D in the energy sector

India's R&D efforts have often been criticized for being sub-optimal and lacking in goal orientation. The situation in energy-related R&D is perhaps even more serious. The challenge of the sector, as brought out in earlier pages, is too large for it to be continued to be treated as a vehicle of social largesse and diffused capacity building. While India may not be able to match the R&D resources of the developed world, it is all the more imperative that its scarce financial resources are targeted strategically to bring about cost reductions, develop/exploit context specific resources, and develop relevant applications and with purpose. Some technologies that could be on the verge of commercial deployment, with just an additional resource injection for design improvements, which the government could place on its priority list, include the

PP Biomass gasification systems several organizations in the country have related biomass gasification systems that require critical innovations relating to gas clean-up systems and engine design. Such systems could also be modified for providing clean cooking energy solutions for school canteens, dhabas, and other establishments, with appropriate safety features built in. PP Bio-fuels a second generation bio-fuels programme needs to be designed and implemented in a mission mode. PP Solar energy R&D on solar PV and thermal technologies, per se, has advanced significantly at the global level. India would do well to focus its R&D efforts on developing context-specific applications and research on grid interface issues.

PP Wind energy Resource mapping exercises have to be refined to be in line with new technology developments globally, with a particular emphasis on offshore wind resources. PP SME sector Designing, developing, and demonstrating energy-efficient technologies to suit specific conditions of SME clusters. PP Smart grids the increasing share of renewable energy in India's energy mix and the greater emphasis on energy efficiency could have serious implications on and be limited by—the nature of electricity grids. India needs to implement pilot projects on the concept of 'smart' grids that would prepare us for such large-scale integration of non-firm and distributed energy sources into our energy systems and their management.

South Asia- India is projected to play a major role in global energy markets over the next several decades, with India alone expected to become the world's third largest importer of petroleum by 2030. Satisfying the region's growing demands will require a heightened degree of energy interdependence among historically antagonistic states. Consequently, like it or not, regional leaders will face a tradeoff between traditional desires for energy self-sufficiency and the ambitious development targets that they have set for themselves. Achieving such growth, therefore, requires that India, and the other countries of South Asia first address the persistent international disputes that hamper cross-border energy trade, establish effective control over presently

ungoverned areas, reorient the missions of military forces to some extent, and develop a better understanding of the effects that energy interdependence will have on broader relations with neighbors.

In the times when the world in on the edge of facing energy crisis given the gulf wars, it becomes even the more important to not only make laws which would preserve energy but also make sure that the application of such laws is done as efficiently possible.

India in 2001, took a step further in preserving the energy laws by implementing a law named “Energy Conversation Act, 2001” where the mere law making was not given the importance but also the effective application was made a point. To understand the true nature of the Act, it becomes pertinent to understand the background and conditions under which the law was passed.

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Historical Background

Energy efficiency is not a new programme in India though its impact has been somewhat limited. A number of industries have been quite successful in implementing energy saving measures but these efforts were restricted to few industrial units, while majority of the industrial units lagged behind.

In the wake of global oil crisis, the Government of India made several efforts to propagate conservation of petroleum products. This led to establishment of Petroleum Conservation Research Association (PCRA) in 1976, which has done commendable work to this end.

The Ministry of Power is charged with energy and energy conservation. Earlier the Department of Power under Ministry of Irrigation and Power had a concern for energy conservation in its generating power stations right from inception. However, realizing the potential of energy efficiency and conservation in end use of energy, a holistic and systematic view was taken and an inter ministerial working group was constituted in 1981 that submitted its report in 1984, which provided the vision for instituting energy efficiency in the country.

Consequently, an energy conservation wing was created in the Department of Power way back in 1985, which formulated various policies, schemes and energy management programmes. Subsequently, the Energy Management Centre (EMC)-a registered society, was set up in 1989 by the erstwhile Ministry of Energy, Department of Power, to promote energy conservation in various sectors of economy. In absence of any legislation on conservation of energy, there were no legal powers available for enforcement of energy efficiency and only promotional activities were being taken up in order to reduce the energy intensity of the Indian economy. Therefore, the Govt. of India felt the need to evolve a regulatory and promotional mechanism to that end.

In 1994, the Ministry of Power constituted a Working Group consisting of representatives from various Ministries for formulation of suitable proposal for a selective legislation on energy conservation. Proposal of energy conservation legislation as formulated was modified in the light of the comments of the State governments and discussions held in the inter-ministerial meeting held in January 1997. The proposal was reviewed again by Ministry of Power in July 1997 and it was decided to propose an enactment for energy conservation, which *inter alia* would provide setting up of a Bureau of Energy Efficiency (BEE) to perform various functions relating to energy conservation. This revised proposal was circulated to all the concerned ministries. The Union Minister of State for Power held a meeting with various industry associations. A Cabinet note was then prepared and the same was approved by the Cabinet on 10th September, 1997. Subsequently, the Ministry constituted a one man Expert Committee to review the various provisions made in the proposed Energy Conservation Bill.

The new act was more or less based on the report submitted by the Expert Committee called "*Integrated Energy Policy: Report by the Expert Committee.*"[1] After approval of the Cabinet and thereafter following the due process the Bill was passed as an Act which came into force on 1st March, 2002. To adhere to the law a Bureau of Energy Efficiency (BEE) was set up for promotion of effective application of the so passed Act.

Some facts:

India's energy intensity per unit of GDP is higher by 3.7 times of Japan, 1.4 times of Asia and 1.5 times of USA, indicating to very high energy wastage. In the globalized economy, countries with high energy intensity may become uncompetitive due to high energy input cost. Therefore, energy cost reduction becomes one of the important benchmarks for economic success. Efficiency in consumption of energy and its conservation could be one of the most important means of energy cost reduction and also for meeting future energy demand.[2]

India has a huge scope for energy saving. Various studies undertaken suggest substantial energy saving potential in industrial, commercial and domestic sectors. Efficient use of energy provides the least cost and environmentally friendly option for capacity creation in the shortest time frame. Energy efficiency also assumes further importance, as *"one unit of energy saved at consumer end, avoids 3 units of fresh capacity addition".*[3]

With the background of high energy saving potential and its benefits, bridging the gap between demand and supply, reducing environmental emissions through energy saving, and to effectively overcome the barrier, in October 2001, the Government of India had enacted the Energy Conservation Act - 2001. The Act provides the much-needed legal framework and institutional arrangement for embarking on an energy efficiency drive.

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[1] Can be accessed at "http://planningcommission.nic.in/reports/genrep/rep_intengy.pdf"

[2] Can be accessed at "http://www.energymanagertraining.com/energy_management/Energy%20Management%20Policy%20-%20Guideline%20-%20New.pdf"

[3] "*National Certification Examination for Energy Managers and Energy Auditiors (Under Energy Conservation Act, 2001)*" by Bureau of Energy Efficiency and National Productivity Council, India. Can also be accessed at "www.**energy**managertraining.com/overview/IIPEC_BEE-**1**.pdf"

SALIENT FEATURES OF THE ACT: AN OVERVIEW

A. Salient features of the Energy Conservation Act 2001[4]

The Act empowers the Central Government and, in some instances, State Governments to:

- specify energy consumption standards for notified equipment and appliances;
- direct mandatory display of label on notified equipment and appliances;
- prohibit manufacture, sale, purchase and import of notified equipment and appliances not conforming to energy consumption standards;
  - notify energy intensive industries, other establishments, and commercial buildings as designated consumers;
  - and prescribe energy consumption norms and standards for designated consumers;
  - prescribe energy conservation building codes for efficient use of energy and its conservation in new commercial buildings having a connected load of 500 kW or a contract demand of 600 KVA and above;
  - direct designated consumers to -
    - designate or appoint certified energy manager in charge of activities for efficient use of energy and its conservation;
    - get an energy audit conducted by an accredited energy auditor in the specified manner and interval of time;
    - furnish information with regard to energy consumed and action taken on the recommendation of the accredited energy auditor to the designed agency;
    - comply with energy consumption norms and standards;
    - prepare and implement schemes for efficient use of energy and its conservation if the prescribed energy consumption norms and standards are not fulfilled;
      - ➢ get energy audit of the building conducted by an accredited energy auditor in this specified manner and intervals of time;

State Governments may –

- amend the energy conservation building codes prepared by the Central Government to suit regional and local climatic conditions;

[4] An article on "*Salient features on Energy Conservation Act, 2001*"; Can be accessed at "http://www.energymanagertraining.com/announcements/AboutUs_attachment.pdf"

- o direct every owners or occupier of a new commercial building or building complex being a designated consumer to comply with the provisions of energy conservation building codes;
- o direct, if considered necessary for efficient use of energy and its conservation, any designated consumer to get energy audit conducted by an accredited energy auditor in such manner and at such intervals of time as may be specified;

B. Establishment of Bureau of Energy Efficiency

Under the provisions of the Act, Bureau of Energy Efficiency has been established with effect from 1st March, 2002 by merging the erstwhile Energy Management Centre, a society under the Ministry of Power. The Bureau would be responsible for spearheading the improvement of energy efficiency of the economy through various regulatory and promotional instruments.

The mission of the Bureau of Energy Efficiency is to develop policy and strategies with a thrust on self-regulation and market principles, within the overall framework of the Energy Conservation Act, 2001 with the primary objective of reducing energy intensity of the Indian economy. This will be achieved with active participation of all stake holders, resulting in accelerated and sustained adoption of energy efficiency in all sectors of the economy.

The primary objective of BEE is to reduce energy intensity in the Indian economy through adoption of result oriented approach. The broad objectives of the BEE are:

- to assume leadership and provide policy framework and direction to national energy efficiency and conservation efforts and programmes;
- to coordinate policies and programmes on efficient use of energy and its conservation with the involvement of stakeholders;
- to establish systems and procedures to measure, monitor and verify energy efficiency results in individual sectors as well as at national level;
- to leverage multi-lateral, bi-lateral and private sector support in implementation of the Energy Conservation Act and programmes for efficient use of energy and its conservation;
- to demonstrate energy efficiency delivery mechanisms, through private-public partnership,
- to plan, manage and implement energy conservation programmes as envisaged in the Energy Conservation Act.

The Director-General is the chief executive officer of the Bureau of Energy Efficiency. The general superintendence, direction and management of the affairs of BEE is vested in the Governing Council having up to 26 members. The Governing Council is headed by Union Minister of Power and consists of Secretaries of various line Ministries, heads of various technical agencies under the Ministries, members representing industry,

equipment and appliance manufacturers, architects, and consumers, and members from each of the five power regions representing the states of the region. The Director – General of the Bureau is the ex-officio member-secretary of the Governing Council.

BEE has been given a corpus fund of Rs. 50 Crore for setting up of the Central Energy Conservation Fund for meeting the expenses relating to the salaries, allowances and other remuneration of the officers and employees of the Bureau and to meet the expenses of the Bureau in discharge of its functions as well as on objects and for purposes authorized by the Act. It has also been authorised to collect appropriate fees in discharge of functions assigned to it and raise funds from other sources. Bee may become self-sufficient in a period of 5-7 years.

C. Functions of Bureau of Energy Efficiency (BEE)

The functions of BEE can be classified as regulatory functions being recommendatory body to the Central Government in implementing the provisions of the Energy Conservation Act and facilitation, market development and market transformation functions such as:

- arrange and organize training of personnel and specialists in the techniques for efficient use of energy and its conservation;
- develop testing and certification procedures and promote testing facilities;
- strengthen consultancy services;
- create awareness and disseminate information;
- promote research and development;
- formulate and facilitate implementation of pilot projects and demonstration projects;
- promote use of energy efficient processes, equipment, devices and systems;
- take steps to encourage preferential treatment for use of energy efficient equipment or appliances;
- promote innovative financing of energy efficiency projects;
- give financial assistance to institutions for promoting efficient use of energy and its conservation;
- prepare educational curriculum on efficient use of energy and its conservation and
- implement international co-operation programmes relating to efficient use of energy and its conservation.

D. Action plan of BEE

During the three year period 4/2004 – 3/2007 BEE shall primarily focus on 9 thrust areas. In addition, it shall also attend to ongoing programmes and such other programmes as are considered essential for promoting the objectives of the Act. In the following sections, the background, legislative mandate, approach, role of BEE for 8 thrust areas

are described. Furthermore three-year target indicators as well as monitoring indicators have been set. Monitoring indicators were used in cases where BEE has little control over compliance or in cases of difficulties to quantify a target.

Problems faced by the American policy on energy conservation

"The energy plans place different levels of importance on energy security, environmental protection, and economic revitalization – the "Three Es." Some of these differences are due simply to politics and others to the timing of the unfolding economic crisis. Plans designed to address economic recovery through green jobs are in ascendancy, while those focusing on energy security are receiving less attention due to the collapse in energy prices and demand. Some plans reflect their visions in detailed blueprints of action, while others offer sparse policy direction. The plans provide hundreds of specific recommendations, some challenging to implement.[5]

Doubling wind power output by 2012 – as recently called for by the Obama administration – would likely require repeating the installation of 8 gigawatts (GW) of new wind capacity for each of the next three years. Recent changes in renewable energy incentives in the American Recovery and Reinvestment Act could promote significant new investments, despite the economic slowdown. Other recommendations, such as building 10 carbon capture and sequestration plants, face greater challenges and unknowns. Evaluating the implementation challenges in most recommendations often depends on policy design details that the plans do not address. One plan, for example, calls for "100% clean electricity within 10 years." Such an achievement would require all coal- and gas-fired power plants to stop generating before their investment costs have been recovered. How generators would be compensated for their stranded costs is not considered in the plan.

Many other recommendations have been proposed including a 25% renewable portfolio standard (RPS) by 2025, rapid deployment of plug-in hybrid electric vehicles (PHEVs), and various cap-and-trade policies. Additional analysis is required in most areas to evaluate implementation challenges under different policy design assumptions. Integrating short-term economic recovery with longer-term priorities such as carbon mitigation is possible, but often not without trade-offs. Some short-term measures may contradict longer-term objectives (highway reconstruction and "sustainability"), while overlapping jurisdiction could lead to unintended consequences from other policy interactions (a national RPS combined with cap-and-trade legislation)

General Findings

- Most energy plans evaluated here call for transformative change in energy policy. They argue that inconsistent national policy has contributed to damaging cyclical changes in energy markets during the past 35 years. Most plans imply that the nation can no longer escape the consequences of petroleum insecurity and climate change. Fundamental changes are needed to improve energy

[5] An article on "*A Comparative Review of a Dozen National Energy Plans: Focus on Renewable and Efficient Energy*"; Can be accessed at "http://www.nrel.gov/docs/fy09osti/45046.pdf"

end-use efficiency, lower emissions, and lessen reliance on oil imports. The recent collapse in oil prices has not helped the environment for political leadership in this regard. However, some argue that the economic crisis opens the door of opportunity to think big in addressing perennial energy – and larger economic – problems.

- Most plans focus on broad recommendations for a new comprehensive energy policy rather than detailed design issues necessary for implementation in any one sector. Because of this, they lack detail on policy design issues that must be known to evaluate strengths and weaknesses of plan recommendations. Evaluating the challenges of a cap-and-trade recommendation, for example, depends on factors such as which sectors are included, how allowances are allocated or auctioned, and what role carbon offsets play.7 Similarly, a national RPS must consider the trade-offs of including carve-outs for specific technologies, designing renewable energy certificate (REC) trading markets, and resolving jurisdictional standing when state and federal requirements conflict (Perera et al. 2007). Additional follow-on analysis can help flesh out the policy design options in many of the plans.

- Recently introduced plans note that economic recovery is the first priority for the new Congress and administration. Whether the recovery law can integrate Keynesian spending with longer-term priorities such as carbon mitigation, oil import reductions, and a greener economy remains to be seen. Some short-term measures may contradict longer-term objectives (highway reconstruction vs. lower oil demand and emissions), while others may create unintended consequences (interaction of a national renewable portfolio standard with cap-and-trade legislation) (Houser et al. 2009).

- The plans illustrate the complexity of trying to prioritize national energy goals that focus on long-term needs while providing enough flexibility to deal with short-term requirements. Political leadership, as noted in some of the plans, could help catalyze a national discussion resulting in a more strategic, consistent federal role. Almost universally, plans call for an expansion of clean energy R&D, EERE technology deployment, and climate change preparedness. But sharp contradictions also exist regarding domestic drilling, nuclear subsidies, climate mitigation targets, and the fundamental role of government. Unpredictable political dynamics within Congress, and between Congress and the administration, will influence the evolution of support for elements of the plans."

Energy Interdependence and National Security

Finally, addressing South Asia's energy needs, particularly if the solution is along the lines currently envisioned by the development community, will require a reorientation in the way South Asian defense and foreign affairs strategists have historically thought about their respective countries' national security Willingly accepting dependence on foreign suppliers for such a vital resource as energy is something that goes against the instincts of virtually every national security strategist. The link between energy security and national security has become so strong that even countries rejecting the idea of war over other issues seem prepared to contemplate the use of military force to ensure energy supplies in extremis.

Energy interdependence intertwines national economies in two major ways. First, most economies, including some of the biggest, depend on cross-border flows of energy resources for important parts of their total energy requirements. Second, this global energy system is supported by and critically dependent on global flows of information, knowledge, and investment capital. Much of the resource base, as well as many of the other resources such as information and capital, is controlled by (often huge) transnational corporations with global reach, both private and public (such as national oil companies). Flows of capital and technology are often also managed by transnational energy corporations. Overall, energy related activities make up an important part of the world economy, and international energy trade represents a similarly important segment of world trade.

India is the sixth largest consumer of energy and the third largest consumer of oil and gas in Asia only after Japan and China. India's main domestic energy resources are coal (68.3%), hydro (11.9%), gas (11.5%), oil (4.6%) and nuclear power (2.8%). The rest are renewable resources like solar energy and biomass. All forecasts predict that India's hunger for energy will increase as result of a growing population and rapid industrialization. In 2010 India will be the fourth largest consumer of energy after the United States, China, and Japan. The interesting aspect is that India's dependency will increase in nearly all important fossil fuels except hydro. India is already importing 70 percent of her oil supplies and this share is going to increase to 90 percent by 2030. The situation is only slightly better in the gas sector.

India recently made some large discoveries of gas but all estimates show that India's import dependency will be around 40 percent in 2030. Although India's coal reserves are among the biggest in the world, the gap between supply and demand will also make it necessary to import more coal in the years to come. India's import dependence is most obvious in the nuclear field. The sanctions by the West following India's nuclear tests in 1974 and 1998 have restricted the share of nuclear power to a meager 2.8 percent of total energy production. The figures in energy consumption and the long term scenario indicate that India will become more dependent on energy

imports in the future. One of the consequences of this scenario is that India's dependence from the international energy market will increase, making the country more vulnerable against external shocks. Another aspect is that the main oil reserves are concentrated in the Middle East, so that India is, like many other countries, becoming more dependent on oil imports from this crisis ridden region. Part of the government's strategy is to diversify energy imports and to acquire equity oil by India's state-owned oil companies that is Oil and Natural Gas Company (ONGC) and its export arm the ONGC Videsh Limited (OVL). At present OVL is active in 14 countries and has 23 projects.

Interdependence, Energy, and Security

Economic interdependence reflects the average normal ground where states, state-owned firms or multinational energy companies try to secure their share in a competitive market. Depending on economic strength and negotiating skills companies may win or lose in that competition. Apart from this, it is argued here, India is faced with another dilemma of interdependence which results from the close linkage between energy needs and security concerns. This becomes evident when the main energy sources, i.e. coal, oil, gas, hydro and nuclear, are regarded in the context of India's security and foreign policy issues. Besides this, the search for energy brings new indirect security and foreign policy issues.

Coal

Coal has at least two advantages for India: First, the country has plenty of it, and second, there are hardly any security concern connected with coal. As mentioned before, India is presently number three in the list of coal producing countries worldwide. India has proven reserves in coal for the next 200 years or more 60 to 70 percent of India's power generation comes from coal. The high ash content and the high dependence on coal mean that India has one of the highest levels of carbon intensity in Asia, i.e. carbon emissions per dollar of GDP.

Forecasts predict that India will also face a demand gap in coal, so that it will become necessary to secure more imports and to improve the quality of the domestic coal. Because of this India is already importing coal mainly from Australia, Indonesia, and South Africa. Fortunately India does not have any serious security problems with these three countries so that coal imports should not pose a serious challenge in the future. India has intensified collaboration with these countries not only on the bilateral but also on the multilateral level for instance within the framework of the Indian Ocean Rim Association for Regional Cooperation (IORARC) which was established in 1997. The improvement of India's domestic coal to meet her energy needs and international environmental standards will also intensify cooperation with developed countries. For instance India and the U.S. have already signed agreements for cooperation in the green coal technology and India and Germany have started an energy dialogue.

Oil and gas

The increase of public and private transport following the liberalisation has led to an enormous increase of oil and gas imports in the 1990s. Because of the lack of indigenous resources it is the oil and gas sector where India's dependence will be felt mostly and where the linkage between energy and security issues is most obvious. Within the South Asian framework India's relations with Pakistan and Bangladesh are affected. To overcome the decade old conflicts with Pakistan Indian governments are pursuing a strategy of closer economic cooperation that may help to push contentious issues like Kashmir in the background. Pipeline projects that will link India with Iran and Central Asia have to pass through Pakistan. The Pakistan government seems to be willing to give guarantees for the pipelines. But there is still an inclination in Pakistan to trade off security interest like in Kashmir against an extension of economic relations with India. Moreover Pakistan is faced with attacks on already existing pipelines in Baluchistan which are beyond the scope of India's foreign policy.

The new gas reserve in the Bay of Bengal seemed to start a new area of Indo-Bangladeshi relations. With the help of U.S. companies the gas should be explored and parts of it exported to India. But the ambitions plans of gas exports to India fall prey to the difficult Indo-Bangladeshi relationship. These plans initiated a heated debate in Bangladesh and both main parties the Awami League and the Bangladesh National Party (BNP) were reluctant to find a compromise with India. Afterwards Bangladesh was seen as a transit country for gas from Myanmar to India but these plans again faced various problems

After the plans for gas export with Bangladesh failed India was looking for a trilateral agreement to export gas from Myanmar via Bangladesh to India. But again India and Bangladesh could not reach an understanding. As a consequence India is now promoting a pipeline from Myanmar through the North-East which will circumvent Bangladesh to secure gas supplies from Myanmar directly to India.

Nuclear Energy

At present nuclear energy only has a share of hardly three per cent in India's energy production. This is one consequence of India's refusal to sign the NPT that triggered off a series o f sanctions after the country's nuclear tests in 1974 and 1998. Because of the link between civilian energy issues and strategic question, the nuclear issue has certainly a special status in India's energy diplomacy.

The recent Indo-U.S. deal of March 2006 focuses on the civilian cooperation in the nuclear field in order to cope with India's energy gaps. At the same time the whole debate on the Indo-U.S. nuclear deal is closely connected with India's great power ambitions and her nuclear weapons programme. The possible repercussions of the March 2006 agreement on the Non-Proliferation Treaty (NPT) have triggered a debate whether the Bush-Administration is going to undermine another multilateral regime or whether the agreement may help to strengthen the NPT by bringing India closer to it. The NPT lobby is still critical and demands further commitments from India, whereas the supporters pointed to the positive effects if a country like India can be incorporated in the framework. An interesting aspect in the debate was that even Muhammed Al-Baradei the director of the International Atomic Energy Agency (IAEA) has welcomed the agreement as a "creative break with the past".

If the agreement is accepted both by the U.S. congress and the Nuclear Suppliers Group (NSG) it will open new avenues for nuclear cooperation not only between India and the U.S. but also for similar agreements with U.K. and France. Even countries like Germany may benefit from such an agreement because more sophisticated technology can be exported to improve India's civilian nuclear programme. Besides the question of energy cooperation the agreement also has a far reaching symbolic dimension. The acceptance of the nuclear powers and the NSG to give India an exceptional position in an enlarged NPT framework would certainly be interpreted that India has achieved a status as a major power in the international system. The global energy system, the base for all social development, represents one of the critical infrastructures of the international system. It is marked by a high degree of interdependence, and global manage ment of this interdependence will pose serious challenges during the next decades. At the same time, the fact that world energy demand presently is, and will continue to be, largely met by fossil fuels links this system closely to the world's ecosphere: the burning of coal, oil, and natural gas is the most important driver of global warming and climate change. Present trends of global emissions of greenhouse gases (GHG) are unsustainable if potentially catastrophic risks related to global warming are to be avoided. Yet national and international policies with regard to GHG and, specifically CO2 emissions, so far clearly have been insufficient to deliver the deep changes needed.

In the light of growing energy demands, fluctuations in oil prices and a concert ed effort by countries to manage their demands for oil acct cording to the changing international scenario, research studies on the constantly evolving global energy regime are significant.

Energy interdependence did nothing more than place consuming countries at the mercy of their suppliers, the strategist's life would be comparatively simple. For example, one might think at first glance that Pakistan would put itself in a strongly advantageous position if a large share of Indian energy supplies flowed across Pakistan's territory. But experience shows that the strategic dynamic created by interdependent energy markets can be complex and hard to predict. Fears that the Soviet Union would use natural gas shipments for political leverage turned out to be exaggerated because the Kremlin's need for cash for the ailing Soviet economy outweighed any possible value the pipeline may have had as a coercive instrument. On the other hand, seen from Kyiv and Minsk 25 years later, Russia's opportunity to manipulate natural gas supplies for political purposes may be a much more serious issue. Moreover, depending on the relative political and military power of the partners in an interdependent energy relationship, supplying countries may find themselves the object of greater solicitude about their foreign policy and domestic politics than they originally bargained for.

Conclusion

Today India is indeed facing a huge problem in the energy sector. What really needs to be addressed now is the energy consumption at the source, so as to preserve and make the energy consumption more efficient. The paper clearly mentions the importance of Energy Security and how, by taking small steps energy can be secured and the consumption can be made sustainable in nature.

The policies and laws governing the consumption pattern in India are still at the developing stage and thereby, not able to meet out the requirements to optimize the usage of energy. The laws address and govern the pattern of usage of energy after it is supplied to its respective place but what the law fails to govern is preserving the energy at source.

With understanding the need of securing energy India's national security can also be preserved. Amidst the Iran's war with America, India has been facing the problem of price hike in the field of oil. This alarms for India to also explore its renewable sources of energy and not just rely on the exhaustible sources, as has also been understood in one of the American reports on the policies governing the energy law.

References

- A Comparative Review of a Dozen National Energy Plans: Focus on Renewable and Efficient Energy- Jeffrey Logan and Ted L. James

- Domestic energy consumption patterns in Uttara Kannada District, Karnataka State, India T.V. Ramachandra*, D.K. Subramanian, N.V. Joshi, S.V. Gunaga, R.B. Harikantra Centre for Ecological Sciences, Indian Institute, Bangalore, 560 012, India

- Book review India, GCC and the Global Energy Regime Exploring Interdependence and Outlook for Collaboration Author: Samir Ranjan Pradhan

- "Understanding the Use and Adoption of Home Energy Meters", Charlotte F. Kelsey & Victor M. González, University of Oxford, Oxford 2006.

- "The importance of energy efficiency in buildings", D.J. Harris, and R. Madomercandy, School of the Built Environment, The Bulletin on Energy Efficiency Vol. 6 Issue 4-6.

- "The Oil "Price Rise" Factor in the Iraq War: A Macroeconomic Assessment", Mamdouh G. Salameh, International Politics, Vol. 2, No. III, Winter & Spring 2009

- "A Comparative Review of a Dozen National Energy Plans: Focus on Renewable and Efficient Energy", Jeffrey Logan and Ted L. James, Technical Report NREL/TP-6A2-45046 March 2009

- "INDIA'S STRATEGY TOWARD ENERGY DEVELOPMENT AND ENERGY SECURITY", R.V. Shahi, Secretary to the Government of India Ministry of Power.