

*International Seminar*

(Jointly organized by the Centre for Security Analysis, Chennai ,  
and the Institute of Southeast Asian Studies, Singapore)

*Emerging Challenges to Energy Security  
in the Asia Pacific*

*16 and 17 March 2009*

*Information Brochure*

**Centre for Security Analysis  
Chennai, India**

*CSA acknowledges the support provided to the seminar by the Hanns Seidel Foundation and its Resident Representative in India, Dr. Volker Bauer*

## **ABOUT CSA**

The **Centre for Security Analysis (CSA)** was set up in 2002 with the initiative of Lt. Gen. V.R. Raghavan (Retd) and Mr. M.K. Narayanan (presently National Security Advisor). The Centre is a non-profit, non-partisan independent think tank. It believes in holistic and multidimensional approach to security, transcending the traditional concept to include various aspects of security such as energy, economy, society, environment, food, health, water and political security. In short, the safety, honour and well-being of the citizen is the ultimate security.

The Centre has developed a special focus on issues related to Sri Lanka, South and Southeast Asia. The issues of conflict resolution and peace building as also gender affirmation have been given due attention. It has undertaken research work on issues of immediate interest to the society and Government. It has built a new focus on civil society and governance and its linkages with security. The centre has also undertaken project studies on important and contemporary issues affecting Peninsular India.

CSA is one of the two organizations from India forming part of the Regional Network of Strategic Studies Centers set up by the Near East South Asia Center for Strategic Studies, National Defence University, Washington D.C

## **ABOUT ISEAS**

The **Institute of Southeast Asian Studies** is a regional research centre dedicated to the study of socio-political, security and economic trends and developments in Southeast Asia and its wider geostrategic and economic environment. The aim of the Institute is to nurture a community of scholars interested in the region and to engage in research on the multi-faceted dimensions and issues of stability and security, economic development, and political, social and cultural change.

The intention is not only to stimulate research and debate within scholarly circles, but also to enhance public awareness of the region and facilitate the search for viable solutions to the varied problems confronting the region. The Institute is strategically placed to assist international, regional and local scholars and other researchers in this networking process by serving as a centre that provides a congenial and stimulating intellectual environment, encouraging the fullest interaction and exchange of ideas in an unfettered ambience. ISEAS is dedicated to long-term reflective analysis and investigations in the best traditions of scholarship. The Institute also seeks to stimulate thinking on and exploring solutions to some of the major salient issues in the region.

## CONCEPT NOTE

Energy security is vital for both developing as well as developed countries that seek to maintain their high living standards because energy is a key input for economic growth. This is especially so for countries in Asia which are dependent on imported energy in the form of fossil fuels. Asia's mushrooming demand for oil, natural gas, and electricity along with its limited energy resource base and slow energy industry reform have impeded the region's ability to mobilize the supplies needed to meet the booming demand. As a result, dependence on energy imports has risen rapidly, particularly for oil, as governments try to prevent energy from becoming a critical bottleneck undermining economic growth and social stability.

In the case of oil, most of Asia's imports inevitably come from politically turbulent and unstable regions such as the Persian Gulf, and are transported along potentially vulnerable sea-lanes and complex pipeline routes crossing several national borders. While in India, imported oil constitutes about a quarter the total energy supply, some countries within ASEAN such as Singapore, Thailand and the Philippines are fully dependent on imports. China and Japan are also significant oil importers. In the case of natural gas, although Asia has traditionally been largely self-sufficient, much of its future supply is also likely to come from the Persian Gulf, Russia, and Central Asia. The need to satisfy relentlessly rising electricity demand—in the face of oil and natural gas supply constraints—is forcing heavy reliance on coal and nuclear power, aggravating future environmental and nuclear proliferation risks.

There are many challenges that could potentially threaten the energy security of countries in the region over the next decade. These include rising oil prices, the approaching peak in fossil fuel production, geopolitical instability in energy producing countries, competition over limited energy resources including disputed offshore reserves in the region, as well as threats to the energy supply infrastructure comprising land pipelines as well as sea lanes of communication.

Fossil fuels remain a significant component of energy consumption and countries importing them will have to ensure availability of supply through long-term supply agreements and buying assets abroad. A strategic petroleum reserve to insulate against temporary fluctuations in supply is also becoming an important component of an energy security strategy. At the same time, measures to increase energy conservation as well as to tap alternative sources of energy should be explored because of the inherent uncertainty and volatility associated with fossil fuels. The potential of renewable sources of energy such as solar, wind and hydroelectric energy as well as nuclear power has not been fully realized. This acquires further importance in light of the link between fossil fuel

consumption and global warming and the consequent need to maintain a balance between energy security and environmental security.

Since most of these challenges cannot be addressed unilaterally, it becomes imperative for energy consuming countries to develop multilateral initiatives to safeguard their interests and promote regional stability. The Cebu Declaration on East Asian Energy Security in January 2007, signed by ASEAN as well as the six other countries that make up the East Asia Summit, is a step in the right direction.

This Seminar organised in collaboration with the Institute for Southeast Asian Studies (ISEAS), Singapore will explore some of these issues in greater depth.

The broad sub-themes of the seminar include:

- Global Trends of Energy Consumption
- Geopolitics of Energy Security
- Supply Chain Security
- Alternative Sources of Energy

## PROGRAMME

**Monday, 16 March 2009**

9.30 AM – 10.00 AM      **Fellowship and Registration**

10.00 AM – 10:30 AM      **INAUGURAL SESSION**

***Welcome Address***

*Lt Gen (Retd) V R RAGHAVAN*  
President, CSA, India

***Opening Remarks***

*Ambassador K KESAVAPANY*  
Director, ISEAS, Singapore

***Special Remarks***

*Mr. REINHOLD BABEL*  
Hanns Seidel Foundation, Munich

10.30 AM – 11.30 AM      **SESSION I:      GLOBAL TRENDS OF ENERGY CONSUMPTION**

Chairperson:      *Amb. K. Kesavapany*  
Director, ISEAS, Singapore

**Paper 1:      Emerging Global Energy Regime: Dynamics, Trends &Trajectory**

Paper Presenter: Mr. Girijesh Pant,  
Vice Chancellor, Doon University,  
Dehradun

**Paper 2:      Energy Security: The Global Scene**

Paper Presenter: Amb. Joergen Oerstroem Moeller,  
Visiting Senior Research Fellow,  
ISEAS, Singapore

11.30AM – 12.00 AM      Discussion

12.00 AM – 1.00 PM      **SESSION II:      GEOPOLITICS OF ENERGY SECURITY**

Chairperson:      *Mr. P.M. Belliappa, IAS (Retd.)*  
UN expert on Environment

**Paper 3: Seeking Energy Security: Cooperation and Competition between China, Japan and India**

Paper Presenter: Dr. Lim Tai Wei  
Research Fellow, East Asia Institute,  
National University of Singapore

**Paper 4: Global Energy Geopolitics and the Strategy of Chinese Oil Corporates**

Paper Presenter Mr J. Nandakumar,  
Senior Energy Analyst, Global Data,  
Hyderabad

1.00 PM – 1.30 PM Discussion

1.30 pm – 2.30 PM Lunch

2.30 pm – 3.30 pm **SESSION III: SUPPLY CHAIN SECURITY**

Chairperson: *Mr. P. Murari, IAS (Retd.)*  
Advisor to the President FICCI

**Paper 5: Towards Energy Security: Challenges and Opportunities for India**

Paper Presenter: Ms. Rekha Krishnan,  
Visiting Fellow  
Centre for Research on Energy Security  
TERI, New Delhi

**Paper 6: Securing Nuclear Energy Supply Chain: The Maritime Dimension**

Paper Presenter: Dr. Vijay Sakhuja,  
Visiting Senior Research Fellow,  
ISEAS, Singapore

3.30 pm –4.00pm Discussion

4.00 pm Tea/ Coffee

**Tuesday, 17 March 2009**

10.00 am-11.00 am	<b>SESSION IV: ALTERNATIVE SOURCES OF ENERGY</b>
	Chairperson: <i>Lt. Gen. (Retd) V.R. Raghavan</i>
	<b>Paper 7: The Advantages of and Potential for Renewable Electricity Capacity in Asia</b>
	Paper Presenter: Dr. Benjamin Sovacool, Research Fellow, Energy Governance Programme, Lee Kuan Yew School of Public Policy, Singapore
	<b>Paper 8: The Emerging Domestic and International Photovoltaic Markets and its Contribution to Energy Security</b>
	Paper Presenter: Mr. Terence J. Hart, CEO, Technical Director and Co-founder of ITPI, Director, IT Power UK.
11.00 am – 11.15 am	Tea/ Coffee
11.15 am – 11.45 am	<b>Paper 9: India's Nuclear Power Programme: Challenges and Opportunities</b>
	Paper Presenter: Dr. S. Rajagopal, Former Dean, NIAS, Bangalore
11.45 pm – 12.15 pm	Discussion
12.15 pm – 12.30 pm	<b>Closing Remarks</b>
	<i>Ambassador K KESAVAPANY</i> Director, ISEAS
	<i>Lt Gen (Retd) V R RAGHAVAN</i> President, CSA
12.30 pm	Lunch

# *Profiles of Speakers*

**Lt. Gen. (Retd.) V. R. Raghavan**

President

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**Lt. Gen. (Retd) V. R. Raghavan** is President, Centre for Security Analysis and Advisor, Delhi Policy Group, New Delhi. He graduated from the Royal Military College of Science and Army Staff College, U.K. in 1968. After a distinguished career in the Indian Army, where he was decorated on three occasions, he retired as Director General of Military Operations. His combat experience included operations in wars with Pakistan and China and in counter-insurgency campaigns.

The General is Council Member, International Institute of Strategic Studies (IISS), London and an elected member of the Council of United Services Institution of India. He was a Commissioner of the Weapons of Mass Destruction Commission chaired by Dr. Hans Blix; Visiting Fellow at CISAC, Stanford University and the Henry L. Stimson Centre and member of the Committee to review the Armed Forces Special Powers Act. He is currently advisor and research consultant to the International Commission on Nuclear Non-Proliferation and Disarmament convened by the Governments of Australia and Japan.

He has authored books amongst which, the monograph, *India's Need for Strategic Balance*; essay on *Limited War and Nuclear Escalation in South Asia*, the books *Infantry in India*, and *Siachen-Conflict without End* are widely known. He has edited more than dozen books. His articles have been carried in leading newspapers, journals, magazines in India and internationally. He is a Guest Lecturer at Indian War colleges and the National Defence College.

**Ambassador K. Kesavapany**

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**Ambassador K Kesavapany** is Director, Chief Administrative and Academic officer of ISEAS, Singapore. Prior to his appointment to the Directorship of ISEAS, he was Singapore's High Commissioner to Malaysia since March 1997. In his 30-year career in the Foreign Service, he served as Permanent Representative to the United Nations in Geneva (December 1991 - March 1997) and held key staff appointments in Ministry of Foreign Affairs, Singapore including Director of ASEAN, Director of Directorate II (North America and Europe) and Director of Directorate IV (International Organizations and Third World).

Ambassador Kesavapany was an active participant in the final phase of the Uruguay Round negotiations. He was unanimously chosen as the first Chairman of the WTO's General Council in 1995. Subsequently, he played a key role in securing Singapore as the venue for the first WTO Ministerial Meeting in 1996.

**Mr. Reinhold Babel**

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**Mr. Reinhold Babel** is Deputy Director, Institute for International Contact and Cooperation, Hanns Seidel Stiftung (HSS), Munich. Earlier, he was Project Manager, HSS Manila, Philippines in Cooperation with the Center for Research and Communication (CRC), Manila (1985-88) and Director for Asia and South Pacific, HSS, Munich (1978-85).

Mr. Babel was also Associate Director (Finance and Administration), New Delhi, India and Kabul, Afghanistan with the German Development Service (DED), Bonn (1970-78) and Development Officer in Afghanistan, DED and Economic Advisory Group, Frankfurt (1966-69)

**Prof. Girijesh Pant**

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**Prof. Girijesh Pant** is presently Vice Chancellor, Doon University Dehradun. He is also Professor at the School of International Studies, Jawaharlal Nehru University, New Delhi. He is an economist by training and specializes in development economics, west Asian economies and international energy affairs. He has published nine books and more than fifty research papers. His latest book is 'India: The Emerging Energy Player' (2008).

Prof. Pant was Senior Fulbright Fellow at University of Illinois, Director Gulf Studies Programme at JNU, and Chairperson of the Center for West Asian African studies. He has also been expert commentator on West Asian Affairs in Indian and International media. Besides these appointments, the Professor is also member, UGC Standing Committee Area Studies; UGC nominee in Managing Committee of Third World Academy, Jamia Milia Islami; Member, Editorial Board, Indian Foreign Affairs Journal. New Delhi; Member, The International Institute of Strategic Studies, London; and President, Indian Academy of Social Sciences, Delhi Chapter.

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**Mr. Joergen Oerstroem Moeller** is Visiting Senior Research Fellow, ISEAS, Singapore, since 2005. He is also Adjunct Professor, Copenhagen Business School & Singapore Management University (SMU), Chairman of the Advisory Board, Asia Research Center, Copenhagen Business School (CBS) and on the Board of Governors ASEF (Asia Europe Foundation) and Advisory Board of Asia Europe Journal, International Advisory Council, Center for Comparative Integration Studies, Aalborg University. Mr. Moeller is also member of Singapore National Council, INSEAD, Forum International Competitiveness, CBS, Council of the World Future Society and ASEM Vision Group working from 1998 to 1999.

Mr. Moeller is a Danish Diplomat. He joined the Danish diplomatic service in 1968 and worked with European integration for 26 years from 1971 to 1997. He was State Secretary from 1989 to 1997. From 1997 to 2005, he was Ambassador to Singapore and Brunei Darussalam and from 2002 also Australia and New Zealand, residing in Singapore.

Mr. Moeller has published several books, articles in Journals and contributed columns to numerous newspapers and websites. His publications include *Political Economy in a Globalized World* (World Scientific, 2009); *European Integration – Sharing of Experiences* (ISEAS, 2008); *A New International System* (ISEAS, 2004) and *The End of Internationalism or World Governance* (Greenwood Publishing House, 2000).

**Dr. Lim Tai Wei**

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**Dr. Lim Tai Wei** is Research Fellow at the East Asian Institute, National University of Singapore (NUS). He has a law degree (LLB Hons) from University of London, First class honours degree in Japanese Studies (with Merit in Political Science) from NUS, MA in Comparative Political Economy in NUS. He obtained his second MA and Ph.D. degree at the Cornell University of New York. Before joining the East Asian Institute in 2008, he served in a Track II Diplomatic think tank Singapore Institute of International Affairs for 7 years, worked as tutor, teaching assistant and Asst Professor in Singapore, New York and New Jersey.

Dr. Tai is the single author of the upcoming *Oil in China: The Quest for Self-Reliance* (New York: Edwin Mellen Press, 2008) with book chapters published by City University of Hong Kong, UCSD/Cornell, ME Sharpe etc. His research papers have appeared in journals such as *Asian Affairs*, *North Korea Review (upcoming)*, *Harvard Asia Pacific Review*, *Stanford Journal of East Asian Affairs* and *Japan Focus*. His research interests include Japanese domestic politics, Chinese oil industry, China-ASEAN relations, Sino-Japanese relations, Chinese history. He also teaches Modern Japan courses at NUS.

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**Mr. J. Nandakumar** is Senior Energy Analyst with 'Global Data, a UK based energy industry research organization. He is currently in charge of research activities relating to conventional as well as non-conventional energy sector and also heads the nuclear energy research division. He has special interest in energy geopolitics and energy security strategies and policies. Mr.Nandakumar has closely worked with security think tanks in India and in Japan. He served for more than four years as Energy researcher in the Energy Cluster of Institute of Defence Studies and Analyses, New Delhi. He was JIIA-Fellow (Japan Institute of International Affairs, under the Ministry of Foreign Affairs, Tokyo) during 2006-2007, where he undertook a research project on Regional Energy Cooperation in Northeast Asia.

Mr Nandakumar is a Doctoral Fellow at the University of Delhi, specializing on 'China's Energy Strategy'. He has also undergone Nuclear Knowledge Management training by International Atomic Energy Agency (IAEA) at the International Centre for Theoretical Physics, Trieste, Italy. He has many publications on energy related issues, including research papers in national and international refereed energy journals.

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**Ms. Rekha Krishnan** is Visiting Fellow at the Centre for Research on Energy Security at The Energy and Resources Institute, New Delhi. An economist by qualification, her research experience over the last ten years is on various aspects of energy security including energy policy including energy pricing, energy-poverty linkages and environmental dimensions of energy especially electricity externalities.

Some of her ongoing research projects include **“Towards global energy security: Managing Energy Risks and Vulnerabilities in Hotspots”** where she is the Principal Researcher; **“Building an Energy Secure Future for India through a Multi-Stakeholder Dialogue Process”** where she is the Principal Investigator and **“Sustainable Development Pathways for South Asia – Energy Security in the Region”**-a UNEP funded project, where she leads the analysis pertaining to energy security and sustainability in the region.

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**Dr Vijay Sakhuja**, is Visiting Senior Research Fellow at Institute of Southeast Asian Studies (ISEAS), Singapore. Earlier, he was Senior Fellow at the Observer Research Foundation, New Delhi, Research Fellow at the Institute for Defence Studies and Analyses, New Delhi, and United Service Institution of India, New Delhi. His research areas include Asia and Pacific Security, Maritime and Naval Developments and Marine Risk Analyses.

He retired (prematurely) from Indian Navy in August 2004 and has held several appointments including Commanding Officer. His last appointment was Joint Director at Navy Headquarters. He received his Doctorate from the Jawaharlal Nehru University, New Delhi.. He has authored a book titled 'Confidence Building From the Sea: An Indian Initiative' and is the recipient of Vice Admiral S L Sethi National Maritime Media Award, 2002.

**Dr Benjamin Sovacool**

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**Dr. Benjamin K. Sovacool** is an Assistant Professor at the Lee Kuan Yew School of Public Policy, part of the National University of Singapore. He is also a Research Fellow in the Energy Governance Program at the Centre on Asia and Globalization. He has worked in advisory and research capacities at the U.S. National Science Foundation's Electric Power Networks Efficiency and Security Program, Virginia Tech Consortium on Energy Restructuring, Virginia Center for Coal and Energy Research, New York State Energy Research and Development Authority, Oak Ridge National Laboratory, Semiconductor Materials and Equipment International, and U.S. Department of Energy's Climate Change Technology Program.

Dr. Sovacool is the co-editor with Marilyn A. Brown of *Energy and American Society: Thirteen Myths* (2007) and the author of *The Dirty Energy Dilemma: What's Blocking Clean Power in the United States* (2008). He is also a frequent contributor to such journals as *Electricity Journal*, *Energy & Environment*, and *Energy Policy*.

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**Mr. Terence J. Hart** is CEO and Technical Director, IT Power India Pvt. Ltd. He is a world-renowned expert in renewable energy, resource conservation and rural development with more than 30 years experience in project management. A Mechanical Engineer, he spent his early professional years in the British aerospace industry where he worked on reduction of noise emission from the engines of the famous Concorde.

Mr. Hart is the Country Manager (India and Morocco) for the IFC/GEF USD 30 million Photovoltaic Market Transformation Initiative and Investment Officer for the Solar Development Group in both the countries. He has worked as a consultant for the World Bank, the European Commission, IFC, UNDESA, DFID, USAID, WHO, UNDP, UNSO, UNDTCD, UNEP, UNICEF, FAO, UK-ODA, and GTZ, and PATH. Appropriate technology development for cold chain management and hazardous medical waste disposal has been his focus area more recently. He is a member of TECHNET, the policy/strategy steering committee for the WHO Expanded Programme on Immunization. Mr. Hart has authored over 30 technical papers.

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**Prof. S. Rajagopal** is former Secretary, Atomic Energy Commission and Controller, Bhabha Atomic Research Centre. He headed the technical liaison mission in Paris, France after being a fellowship holder of IAEA at South West Research Institute U.S.A. He was also visiting Professor and former Dean at the National Institute of Advanced Studies. He is presently an affiliate of the Center for Science, Technology and Policy.

Prof. Rajagopal is a graduate of the College of Engineering, Anna University, Guindy, and holds a post graduate diploma in Systems Management from Jamnalal Bajaj Institute of Management.

*Abstracts*  
*of*  
*Papers*

## **Emerging Global Energy Regime: Dynamics, Trends & Trajectory**

### **Girijesh Pant**

The changing fundamentals of energy are reconfiguring its geopolitics. Energy security today, is of vital interest not only for the western world but for the latecomers from Asia as well, not only for consumers but also producers and above all for the very sustainability of the planet earth. The context has changed phenomenally and so is the discourse. It no more remains the concern of national security but of global security -global common security. This paper intends to address the leading trends of last five years, the changing dynamics and the implications of current economic slowdown on growth and development in terms of emerging global energy regime. The central theme of the paper is that with increasing integration of markets due to globalization processes, the national economies while deriving the advantages of global economic space are becoming vulnerable to global vicissitudes. The hydrocarbon market is clear a illustration of it. The magnitude of rise in oil prices and their fall has more to do with external factors than the supply-demand matrix. It has affected all the stake holders adversely in diverse ways. Their interest can be secured by collective initiatives for global energy regime.

Three sets of factors are impinging upon the makeup of energy security regime. One set includes the economics of hydrocarbon and its strategic premium. The nonrenewable nature of Hydrocarbons, their location and ownership pattern has made it strategic commodity to be transacted by more than economic considerations. The second includes the rising number of players and their mutual relationship. From the days of seven sisters to OPEC, the current configuration of non OPEC players like Russia and new consumers from Asia particularly China has brought the intensity of mutual relationship at the centre of the discourse on energy security. The apprehension of militarisation, the scramble syndrome for energy and denial protests by the local communities often described as oil insurgencies have transformed the political economy of governance of the hydrocarbon sector. The security of energy infrastructures and safe transporting through seas or pipeline is indeed the issue of security but has element of governance as well. The third encompasses the environmental issues arising out of high growth and growing energy consumption by the global middle class, making it imperative to look beyond hydrocarbons. The call for energy independence (read hydrocarbon independence) both for strategic and environmental reasons have brought alternatives in the main stream of debate. According to Global Wind Energy Council, "Global wind energy capacity grew by 28.8% last year, even higher than the average over the past decade, to reach total global installations of more than 120.8 GW at the end of 2008." Formation of GNEP and GBEP underlines the new significance received by non carbons in the emerging global energy mix. But the search for alternatives has lead to yet another crisis, the food crisis. The linkages between biofuels and food crisis have brought new questions in the debate. The ongoing melt down has further complicated the scenario by heightening the sense of uncertainty. No new investment could be conceived unless oil moves up to \$60-70. Volatile market is injurious for all the stakeholders. Shell future scenario suggests that the next five years are critical.

Thus ensuring energy security has become a complex interdependent issue which cannot be addressed by national or market initiatives alone. Moreover it is compelling to revisit the very nature of the interface between development and natural resources. The green economy is the emerging paradigm. The call at Davos was "to use the current economic crisis to launch a global Green New Deal that creates jobs and fights climate change by investing in renewable energy and technological development." Apparently energy is central to the new deal. The deal obviously presupposes that the stakeholders and leadership across the globe look at energy security in a positive sum perspective.

## **Energy Security: The Global Scene**

### **Joergen Oerstroem Moeller**

Will energy security in the region face a demand-supply problem until 2030? If so, what do the figures tell us? There are strong foreign and security plus economic aspects explaining why energy security is crucial. Security wise no nation can live with the feeling that it risks a cut off in its supply. Economically nations need to plan its development, therefore supply of energy plus conditions including price, need for infrastructure etc. are essential elements in such planning. With regard to global supply, there are more than enough energy sources but the problem is that these sources are not available in the form, we require. The world's biggest coal reserves are found in the US, China and India, but these countries want to diversify out of coal for various reasons. Moreover the energy is often available far from where it is used requiring infrastructure, transport and logistics. This imposes not only costs, but also political risks.

The dichotomy between suppliers and buyers also needs added attention. The main suppliers are the Middle East and Russia followed by Africa and Latin America. An important aspect is the emerging role of Africa as a major supplier which makes it imperative to analyze the consequences for the continent. The buyers are mainly in North America, Europe and East Asia along with South Asia emerging as an important buyer. Foreign and security policies of Russia, Ukraine and Western Europe can be brought into play in analyzing the supplier-buyer relationship. In addition, wealth accumulated by oil exporters needs to be included in the geopolitical equation of Sovereign Wealth Funds. Another issue is border dispute which is most likely to be seen in off shore activities. Sprately Islands are a case in point. The issue of supply chain security is another aspect. States are looking into endeavors to build pipelines that do not run through nations regarded as unstable. Even though there have been no terrorist attacks against energy supplies, they must be classified as a potential risk. All these issues have to be viewed in the light of efforts to diversify and reduce consumption. A new geopolitical game under the label of global warming is entering the scenario.

This paper will address the above mentioned issues with the central message that energy security can be expected to grow in importance in the geopolitical scenario. Some of the problems that will be discussed include US resistance to relinquish status/power connected with energy, the competition for energy resources between Japan, China, and India and the unease in Europe regarding LNG supply from Russia and North Africa.

## **Seeking Energy Security: Cooperation and Competition between China, Japan and India**

Lim Tai Wei

This is probably the first time in postwar history that all the three Asian giants of India, China and Japan are major world importers of energy. It was possible in the past to depend on Cold War balancing in energy needs but, with the change of geopolitical circumstances brought about by a rising India and China as well as increasingly autonomous and assertive Japanese energy diplomacy, a new regional energy security dynamics has emerged. Previously, in the realist perspective, energy security balancing and buffering is not new. There is also a tendency for any power to try to reshape any international environment that it regards as threatening its basic interests.

But, with the relative gap in power between the Asian powers and the West closing up and the emergence of Asian powers growing stronger, how would the Asian powers, specially the giants of India, China and Japan, configure themselves in relations to each other in the absence of a unipolar Pax Americana or a bipolar US/Soviet confrontation? India, China and Japan will have to accommodate this through being principally focused on order and based on the belief that states are constantly looking for some measures of regularity in their international activities by creating stable mechanism of habits and practices that ensure survival.

There is great potential and utility in political engagement with the big Asian powers, especially if it could be located within regional institutions and initiatives. A multilateral regional energy institution will enhance the interactions and interdependence of great powers and build up a regional framework of normative behaviour. By integrating the big Asian powers into the family of nations through the construction of multilateral institutions, these powers will have to learn to play by the international rules and to act responsibly.

## **Global Energy Geopolitics and the Strategy of Chinese Oil Corporates**

### **J. Nandakumar**

China is the second largest primary energy consumer in the world, only after the United States. The current consumption accounts for about 1863.4 million tons of oil equivalent which is about 50 percent of the total primary energy consumption in the Asia Pacific region. Oil plays a key role in the primary energy mix of the country which is the second largest consumed primary source in the country. The increasing gap between production and consumption of oil necessitates the country to build strategies that can ensure a continued energy supply from domestic as well as overseas sources. Entering into production sharing contracts and acquiring equity shares in petroleum production assets in overseas region are the key strategies the Chinese oil companies have been following for the past many years in order to ensure overseas supply.

This leads to competition with other petroleum importing countries in overseas energy assets. The two major import dependent countries that have been facing Chinese competition are India and Japan. The paper argues that China is one of the most successful countries in making its physical presence in oil producing regions across the world despite the global scramble for petroleum sources by import dependent countries. It also argues that Chinese companies would continue to be a challenge to its counterparts from other import dependent Asian countries in the global search for petroleum sources.

## **Towards Energy Security: Challenges and Opportunities for India**

**Rekha Krishnan**

The paper will set out the context for examining energy security issues in India in terms of the country's view on what energy security constitutes as well as the current and projected energy mix. This will draw on India's energy securing strategies and the directions that the country appears to be taking. The concerns emanating therefrom will be taken up for detailed analysis to chart possible ways forward.

India's view on energy security is broader than the traditional supply-centric perspective which focuses on the geopolitics of procuring energy. The broader concept entails several aspects including availability and affordability of energy in various forms and across all consumers as well as environmental concerns associated with the energy sector. Critical issues, therefore, include the energy mix of the country (in terms of its extent of diversification as well as its environmental repercussions); inequities in energy access, in addition to dependence on imported energy. India is faced with a sharply rising energy demand trajectory on various counts: large and growing population, economic growth as well as large unmet energy demand. In meeting its rapidly growing energy needs India is challenged not only by supply and price shocks in the global energy market, but also by pressures to reduce its carbon intensity. India's strategies in balancing its development goals as well as energy security and environmental concerns entail some trade-offs, but the complementarities are also significant and need to be tapped, going forward.

## **Securing Nuclear Energy Supply Chain: The Maritime Dimension**

### **Vijay Sakhuja**

The global demand for energy continues to witness an upsurge driven by increasing consumption among the developed and developing countries. While that may be so, there are finite resources of hydrocarbons that can be exploited economically. Consequently, the quest for innovations such as bio fuels and alternative sources in the form of renewable energy continue unabated. Also, there is an urgent need to identify and develop clean energy to overcome the adversarial consequences of climate change that has the potential to impact on humanity with concurrent implications for the global economy.

In that context, nuclear energy is poised to make a comeback and is fast finding an important place in energy security strategies of several countries in South Asia and Southeast Asia. For some, nuclear power has the potential to overcome the problems of deficit electricity, unpredictability of oil and gas prices that impact on national economies, and the environmental degradation arising from greenhouse gases resulting from use of hydrocarbons.

In that conundrum, the security of energy transportation against disruptions is yet another challenge for states. Accidents and non state actors seizing ships carrying oil and gas, with dire consequences of catastrophic and destructive specters have emerged as a subject of intense debate. Given that billions of tones/cubic meters of oil and gas is moved over long distances, the possibility of occurrences of such incidents and accidents in the transportation system is of high probability. Similarly, the fact that nuclear fuel and high-level wastes are transported over thousands of nautical miles over the seas, merits attention.

Several studies have canvassed the vulnerability of energy supply chain with particular reference to hydrocarbons; the complexities relating to maritime transportation of nuclear materials require greater understanding.

## **The Advantages of and Potential for Renewable Electricity Capacity in Asia**

Benjamin Sovacool

This paper evaluates modern power plants according to six criteria: cost, fuel availability, land degradation, water use, climate change, and safety/security. It begins by noting that when these criteria are taken into consideration, renewable energy technologies offer policymakers a superior alternative for minimizing the risk of fuel interruptions and shortages, helping improve the fragile transmission network, and reducing environmental harm. These more environmentally friendly generators cost less to construct, produce power in smaller increments, and need not rely on continuous government subsidies. They generate little to no waste, have less greenhouse gas emissions per unit of electricity produced, and do not substantially contribute to the risk of accidents.

The paper also focuses on renewable resource potential for five regions in Asia: China, India, Japan, Korea, and Southeast Asia

## **India's Nuclear Power Programme: Challenges and Opportunities**

### **S. Rajagopal**

That India is facing acute shortage of electric power is a well known fact. It is also recognized that to enable and sustain the projected growth rates it is absolutely essential to add power from all available sources. In this context, nuclear energy is definitely one of the options for several reasons like adding bulk power in a short period of time, carbon free and above all a good route towards ensuring energy security. The Planning Commission of India and Department of Atomic Energy driven by the above factors have come up with a plan of time bound capacity addition targets which is 63Gwe and 275Gwe by 2030 and 2050 respectively from the present 4.13Gwe.

Addition of capacity refers not only to building more nuclear reactors but also involves many other crucial activities relating to fuel cycle commencing from locating suitable sites, building additional industrial infrastructure, developing competent human resource, strengthening R&D base to absorb new technologies and most importantly finding financial resources. The challenge lies in accomplishing all these in a safe, secure and acceptable cost to consumers of electricity. Every challenge is an opportunity. This paper would make an attempt to discuss some of the important issues specially those relating to capacity addition.

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