

China's Oil and Gas: Crossroads and Strategic Choices

By Xiaojie Xu*

China is not only the fifth largest oil producer but also one of the top twenty major natural gas producers in the world. Oil and gas outputs account for 20 percent and 2 percent, respectively, in the country's primary energy mix. From 1963 through 1989, indigenous production increased steadily, thanks to major discoveries in East China. However, since 1990, China has encountered stagnation in its oil production while imports have steadily increased. Projections indicate that oil production on mainland China will reach 165-170 million tons in 2000 and peak at 200 million tons in 2010. The large gap between demand and supply will be satisfied by imports and increased use of natural gas. However, imports and further development of natural gas are constrained by financial problems, and the current planning system and infrastructure. In addition, environmental concerns have become stronger than ever before. It has been reported that three Chinese cities (Beijing, Xi'an and Shengyang) have been listed in the world's top ten most polluted cities. Several solutions are recommended. However, each requires important strategic choices.

Strategic Concerns

There are five strategic choices that will have to be made to keep the country on the path of sustainable development.

The Growing Economy vs. Large Shortfalls in Oil and Gas

In the last decade, the country had maintained two-digit GDP growth. This dynamic economic growth has propelled a strong demand for oil and gas. The elasticity of oil consumption (ratio between GNP growth and oil consumption) has fluctuated from -0.31 to + 1.59. In 1991-93, the elasticity jumped from 0.85 to 1.06. This soaring demand made China a net oil importer in 1993, earlier expected. The gap between oil supply and demand will rise to 70 million tons by the year 2000.

Since 1978, Chinese residential gas consumption has increased 8.7 times. China's demand for gas will more than double in the next decade. Table 1 gives the EIA's projection of oil and gas consumption over the next two decades.

Table 1
China's Projected Oil and Gas Consumption

	2000	2005	2010	2015
Crude Oil (mt)	220	270	330	420
Natural gas (bcm)	36.8	53.8	70.7	84.9

Source: EIA *International Energy Outlook, 1996*

Clearly, China's future oil and gas development entails not only increasing exploration and production (E&P) and improving energy efficiency but also involvement in the world's energy system.

Unfortunately, there is not an easy way to become

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involved in the world oil and gas system. Several efforts in this direction made in the Middle East have faced resistance. An effective entry strategy needs a systematic analysis of the world oil and gas system. According to the author's study of Asian oil and gas megatrends, balances and geopolitics, China's involvement in the world market is a must. Except for the Mideast and Indonesia, a large portion of natural gas will ultimately be transported from Russian Siberia, the Russian Far East and even from Central Asia by long distance pipelines. Eventually, participation in the world's oil and gas system will be an engine to promote Chinese long-term economic growth, assuming the Chinese government can revise its oil and gas strategy and restructure the petroleum industry.

Regional Imbalance vs. Challenges in Frontier Areas

Regionally speaking, China's potential oil and gas resources and consumption are out of balance. Currently, 80 percent of the proven oil reserves, 86 percent of production and 62 percent of consumption are in East China (see Table 2). Further, in the next decade, East China's oil production will decline to 50 percent. This should be balanced by oil rich areas like West China and the Chinese Offshore.

Table 2
China's Distribution of Oil Reserves, Production and Consumption (percentage)

Area	Proven Reserves	Production	Consumption
East	80	86.5	62.4
West	12.2	8.2	12.9
Central	3.2	1.7	24.73
South	0.1	0.1	n/a
Offshore	4.0	2.7	3.2
Total	100.0	100.0	100.0

Source: *CNPC Statistics 1995*

There are four strategic gas areas. They are: Sichuan (Southwest China), Shenggangning (West China), the Tarim basin (Northwest China) and Yinggehai (Northern South China Sea). Huge reserves and production will come from Central China and West China in the foreseeable future, while a majority of consumption is concentrated on its eastern and southern lands. It is reported that gas demand in coastal areas of China will reach 20 bcm by the end of the century.

Table 3
Distribution of China's Gas Reserves in 1994 (percentage)

Region	Reserves	Output
Offshore	11.6	1.9
Onshore	88.4	98.1
East China	20.1	46.1
West China	5.6	6.4
Central China	52.5	45.0
South China	0.2	0.7

The immediate way to increase gas output is to enhance extraction in the Sichuan field, especially the East Sichuan area. However, to sustain its high GDP growth in the next fifteen years, priorities will also be given to acceleration of E&P activities in West China (Shanggangning basin and the Tarim basin) and offshore (the South China Sea along with the

East China Sea). As hoped by Chinese petroleum leaders, one or two "Golden Babies" in West China are badly needed. However, there is considerable uncertainty as to whether this hope can come true. One thing that is certain is that current limited foreign participation and financial arrangements in the Tarim basin are less than effective. This situation can be attributed to prevailing rigid policy and slow responsiveness to worldwide competition. Further implementation of this may bring a loss of foreign capital inflow.

Also, large potential gas reserves are expected in the East China Sea and the South China Sea (including Spratly Island). The challenge here is the fact that there are large historic territorial disputes and potential military conflicts in this area between China and its neighbors, including Japan, Vietnam, Philippines and Indonesia. It is essential for all parties to extract the oil and gas based on practical cooperation in these disputed areas even though it is impossible to make a final settlement of sovereignty in the short-term.

Infrastructure and Financing

Balancing the oil and gas markets in China depends largely on infrastructure and investment. Currently, there are 17,000 km of pipeline with 130 million tons of maximum transportation capacity over mainland China. These pipelines are divided among the Northeast, North, Lower Yangzi and Sichuan areas. A national trunk pipeline is severely needed to balance oil and gas resources in the West and demand in the East and South markets. Without long distance transportation, some Tarim gas has to be burned after extraction.

A T-form pipeline grid has been recommended. Basically, the T-form pipeline is to serve two functions. Initially, it should connect local pipelines; thereafter it should connect with the future national trunkline. A proposed south-eastward pipeline has been approved and designed to transport gas from the Russian Krasnoyarsk, Irkutsk and Yakutsk to the China Yellow Sea. This is estimated to cost more than \$4 billion. Also, future Sakhalin gas will be available to the Northeast Asian markets.

In addition, preliminary discussions regarding a pipeline running from Turkmenistan to East China, South Korea and Japan (6300 km) with an estimated investment \$10 billion have occurred. The Shangjing gas pipeline (from Shangxi to Beijing, 846 km) is the first stage of this plan.

Generally, a huge investment is required for this infrastructure construction. Traditional direct investment by the government seems no longer sufficient to meet the capital requirements. Thus strategic alliances as used elsewhere seem to be needed. It is essential for China to develop such strategic alliances with western oil majors.

Project finance is another option for some major profitable projects. The obstacle encountered in China is the traditional mentality and their preference to own, manage and operate on their own. Some BOT projects are hard to accept in China given the conventional mindset. Further "marketization" is required.¹

¹ This concept was developed by Dr. Michot Foss. It is the process of developing rules and institutional norms for a properly functioning energy market place.

Marketization vs. Regulatory System

China has been transitioning to *The Socialist Market Economy* since the early 1980s. However, its petroleum industry is still in the beginnings of its marketization program. The Ministry of Finance has sharply decreased its direct investment on natural resource exploration and development (from 100 percent to 2-3 percent in 1995). But the State Planning Commission (SPC) continues to maintain planning and pricing on oil and gas. In May 1994, the central government increased oil prices to relieve producers' cash flow problems. Oil pricing in China is still under political control.

Facing the new environment, it's imperative that market oriented oil planning and pricing systems be established. The new system should encourage producers to:

- undertake their E&P activities in light of long-term developments, and
- allow prices to move to and fluctuate with world markets.

Meanwhile, reduction of the current tax burden is also required. This reduction includes: (1) decreasing the value-added tax rate and extending depreciation deductions for oil's fixed assets; (2) upgrading current oil field maintenance allowances; (3) setting up depletion allowances applicable to marginal fields in line with international practice. In order to promote marketization of oil and gas sectors, revision of market-based oil taxation is under consideration.

However, marketization can only occur in parallel with legislation and deregulation. Currently, oil, gas and their products are highly regulated by the SPC, industrial ministries and Chinese national oil companies (NOCs). Moreover, some regulatory functions are confused with political and social obligations. On the other hand, due to the absence of a petroleum law and relevant rules compatible with *China's Law of Natural Mineral Resources* and an independent regulatory authority, a number of oil players are trading oil across provincial and national borders. Although their activities were curbed in 1994, the markets remain uncontrolled.

To achieve a healthy market order, the establishment of a Chinese regulatory system is recommended to oversee implementation of the *Resource Law*, industrial policy and market competition. The need here is fourfold:

- A guideline for China's future oil and gas development is required.
- Market access should allow or encourage foreign firms to participate more widely from upstream to downstream.
- Future regulation needs international reconciliation, especially in oil and gas taxation and pipeline access and transportation tariffs.
- Priority of deregulation be given to downstream and as applicable to upstream.

To encourage competition, industrial restructuring is imperative. This differs from privatization in other developing countries (for instance, YPF privatization in Argentina) and those restructurings occurring in developed countries. The focus of the industrial restructuring needs to be both on

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establishing a specific governance structure and on reorganization of the current NOCs.

Security and Strategic Position

Future Asian oil and gas security will be affected by new geopolitical relationships among the United States, Russia and China and other sensitive areas. Current geopolitical studies focus mainly on the United States role in the Middle East, U.S.-Russia and the possible dominance of the Mideast by Russia resulting from a coalition with Iran or Iraq. It is clear that China has a great opportunity to expand its economic and political will in Asia. Its involvement in the Asian oil and gas system will greatly impact the balance of new geopolitics, which include:

1. U.S.-China relations with regard to quests for Middle East oil;
2. Russia-Chinese relations regarding coordination of oil and gas transportation and distribution;
3. China's regional role in Northeast Asia, the South China Sea and Central Asia.

China's future oil and gas market development, its international policies and its involvement in the world energy system will closely link its energy security and geopolitical position. An aggressive geostrategy for oil and gas is required. As a result, oil and gas geopolitical relationships will be revised due to Chinese input, both region-wide and worldwide.

Conclusions

To meet to the challenges discussed above, China must make realistic choices consistent with its future development goals. The central government faces a dilemma. The importance of oil and gas, full employment and high inflation risks are its overriding concerns. Further the Chinese economic system will enter a critical phase around 1997. Multiple crises (including agriculture, population, energy and environment) will loom large by the end of the century. More important, the Chinese political regime will face new challenges resulting from a major turnover of senior personnel along with Hong Kong's return. Its freedom of strategic choice is limited. And these choices and outside responses will be critical to the world energy system and geopolitics.

IA
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East European Workshop

On Monday, 9 December following the 11th BIEE/IAEE/RIIA conference in London, the BIEE gathered representatives from the former CMEA countries to hold a Workshop on energy development based on the theme of *convergence*, that is to say, the increasing compatibility of energy practices in these countries with those of the European Union nations .

Other topics which some of the national affiliates have been working on with the EFCEE (IAEE's European Foundation for Cooperation in Energy Economics) are: Pricing Policies, East-West Energy Trade, Taxation and State Aid, Privatization and Foreign Investment and the Liberalization of Gas and Electricity Markets. Within the general theme of convergence the group could opt to focus on ongoing studies on one or more of these topics, or to describe the structural and institutional changes taking place in their own energy industries.

Participants from the Eastern European countries included Leonid Padalko, Polytechnic University, Minsk, Belarus; Mikhel Veiderma, Academy of Science, Tallinn, Estonia; Tamas Jaszay, Technical University, Budapest, Hungary; Vidmantas Jankauskas, Energy Institute, Kaunas, Lithuania; Nicolae Liciu, Energy Directorate, Bucharest, Romania; Alexander Arbatov, Academy of Sciences, Moscow, Russia; Tatiana Lisochkina, St. Petersburg State Polytechnic University, St. Petersburg, Russia and Natalia Shpak, Diplomatic Academy, Kiev, Ukraine.

This year, due to other commitments there were apologies from the Czech Republic, Latvia and Poland. Notwithstanding their absence, participants were presented with papers on the national energy economies of these nations which had been given at IAEE related meetings in the recent past.

The participating delegates were grouped into two sections:

- Morning - *Eastern Europe* - Estonia, Lithuania, Hungary and Romania.
- Afternoon - *Commonwealth of Independent States* - Russia (Moscow), Belarus, Ukraine, and Russia (St. Petersburg).

Within each half-day session there was a presentation from Western Europe. In the morning, Pieter Vander Meiren presented a paper on Slovenia and in the afternoon Morten Frisch gave a paper on the natural gas outlook in Europe in relation to the Yamal Project.

Participants also benefited from a special presentation from Mikhel Veiderma on the Baltic Gas Ring Conference in Tallinn in November (papers from this Estonian Conference are now being circulated by Veiderma).

Thanks to Shell (UK) a collection of the papers offered/presented is being made available to all participants.

Several points should be made regarding these workshops:

1. The delegates are usually in leading positions in their IAEE affiliate and not the top experts in any one topic,
2. EFCEE support for European cooperation is not solely directed to Eastern Europe (Portugal was invited the last two years) but in effect most of the levelling of the playing field is East-West,
3. The theme of this meeting - *convergence* - was not limited

to the applicant or future applicant nations of the former CMEA or Comecon to join the European Union. These belong to what is sometimes called Central Europe, the distinction being that they were not formerly part of the Soviet Union. The European Union PHARE program covers this region including the Baltic States. Further east the TACIS (Technical Assistance CIS) covers the European states of the former USSR, but excluding Central Asia and the Russian Federation Asiatic regions.

The European Union has a third project *Synergy* which aims at compatibility for states clearly beyond the European continent where nevertheless the aim to improve trade through *convergence* is mutually attractive.

And, of course, the concept is not limited to energy – the Ukraine, for example, could benefit enormously from the opportunity to secure major engineering projects in Europe as it has done in the USSR/CMEA and by which it has paid for its hydrocarbon imports.

So wherever European Union stops, there is always the trading partner next door – thus our theme was *convergence* without a capital “C,” which is an option for those who seek it within the larger perspective.

The great value of these Workshops is not only in understanding the respective national problems, but to see across the day a pattern of change and modernization. This was highlighted by commencing the Workshop with papers/presentations from the west. Four in particular stand out:

1. The Chairman of the EFCEE, Ulf Hansen, who unfortunately had to leave on Sunday, tabled a paper he had given at the first Minsk Congress which described the transition in the former East Germany in respect of energy industries.
2. The Czech contribution on their amazingly rapid strides to European standards harmonization is a reminder that the Czech Republic has become a full member of the OECD in the last 12 months.
3. Tamas Jaszay’s presentation on Hungary was a watershed. Not only had he presided last May over the first ever IAEE annual conference to be held in a former CMEA region, but since then Hungary, too, had become a full member of the OECD, and a full member of the IEA as well.
4. Nicolai Liciu of Romania gave us a graphic account of the situation one week after the election of President Konstantinescu and before the new government structure was announced.

Estonia and Lithuania, with their currencies linked to the dollar and the German mark, as pegs on which to withstand inflation and root out energy inefficiency (inter alia) added to the general feeling that movement towards modernization is apparent right across the PHARE area.

Although Poland was not represented, participants were given the paper Jerzy Michna and Antoni Goszcz presented at the IAEE conference in Budapest last May (and which was reprinted in the Fall, 1996 issue of the *Newsletter*) which sets out the transition problems of the nation with the longest experience, antedating even East Germany.

One common theme in all these presentations was the energy import character of the nations. In the TACIS area sessions in the afternoon, the Moscow contribution of Alexander Arbatov, dealing with gas supplies, was a clear

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21ST ANNUAL INTERNATIONAL CONFERENCE OF THE IAEE

Chateau Frontenac, Quebec (Canada), 12-17 May 1998

Theme:

Experimenting with Freer Markets: Lessons from the Last 20 Years and Prospects for the Future

The last 20 years have witnessed a relaxation of the institutional constraints that had previously framed the development of energy industries in many areas of the world, especially North America and Europe. This headlong move into freer markets has transformed many of these industries, which are now considered as models for similar initiatives in other sectors and other areas of the world. This conference aims to provide an opportunity to step back from the developments of the last twenty years and assess the consequences of this increased reliance on market forces: What have been important areas of success? Where have the achievements fallen short of expectations? What would we do differently now? The experience acquired during the last few decades can also shed some light on future directions for change: What remains to be done? What role should we aspire regulation to play in the context of freer markets? How do environmental and sustainable development considerations factor into this trend? How relevant is this experience for other energy industries and for other countries and regions of the world? The conference will provide a unique forum where these and related issues will be debated by experts from around the world.

CALL FOR PAPERS

Deadline for Submission of Abstracts: 1 December 1997

Abstracts may be submitted for plenary as well as concurrent sessions. Anyone interested in organizing a session should propose topics, objectives, and possible speakers to the Program Chairman well in advance of the deadline for submission of abstracts. Abstracts should be between 300 and 500 words, giving an overview of the topic to be covered. Full details, including the full title of the paper, names of the author(s), affiliation(s), address(es), telephone, fax, and e-mail numbers, should also be sent. At least one author from an accepted paper must pay the registration fee and attend the conference to present the paper. All abstracts, session proposals, and related inquiries should be directed to:

Andre Plourde

Program Chairman

21st Annual International Conference of the IAEE
Department of Economics, University of Ottawa
P.O. Box 450, Station A, Ottawa ON K1N 6N5
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telephone: 613-562-5908

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e-mail: apourde@praxis.cc.uottawa.ca

DEADLINES:

Abstract Submission Deadline: 1 December 1997

Notification of Abstract Acceptance: 15 December 1997

Manuscript Submission Deadline: 2 February

The Second Belarusian Energetic and Ecological Congress

This congress was held on October 9-10, 1996 in Minsk, the Republic of Belarus (RB). The meeting took place within the framework of the *Second International Specialized Exhibition, Belarus Energy, Ecology and Controls* which was organized jointly by the Belarusian affiliate of IAEE, the Technical and Commercial Centre (T&C) and the Ministry for Fuel and Energetics of RB. T&C is an exhibition company handling specialized international exhibitions, workshops, conferences and congresses in RB. Within the framework of the congress and plenary meetings, three specialized workshops were held: *The Ways of Modernization and Development of Energetics, Energy Saving and Nontraditional Energetics, and Geoinformation Systems and Technologies*.

The first workshop was dedicated to the problems of technical improvement and development of Belarusian energetics. The present problems are vital for all Eastern European countries. For example, the average age of electricity generating equipment in Belarus is 24 years, but part of the equipment has been in operation for 30, 40 and 50 years. Because of the fact that the equipment is generally worn out, large expenses are incurred for repairs and maintenance. Besides, this equipment, such as steam and gas energetic units, has a higher average fuel consumption than modern equipment. During the conference and at the energetic exhibition which was held at the same time, equipment of companies from Germany (Siemens, AEG) France (Gec Alstom), Russia (Power Engineering Corporation) and others was presented. At the conference the possibilities and sources of investments for the development of energetics were discussed. In this respect the report on the pricing of energy, delivered by the Deputy Minister of Fuel and Energetics was of considerable interest. The former USSR has an obsolete pricing system for energy which needs to be considerably improved. It was noted that the prices of energy should reflect real costs of production and transmission in order to attract foreign investment. The conference touched on the matter of restructuring Belarusian electric energetics by the creation of producing, transmitting and distributing energetic companies. This restructuring is an unalterable condition to receive financial support from The World Bank.

The second workshop was dedicated to the problems of energy saving and nontraditional energetics. Energy utilization in Eastern European countries exceeds that in Western European countries by a factor of 200 to 300 percent. Energy

saving is an important source of additional energy resources. The cost of saving one unit of energy resource via more efficient production is several times less than the cost of a new unit of energy resource. The potential for energy saving in Belarus, for example, is 30 percent from the general volume of energy consumption which is approximately 8 million tonnes of fuel oil equivalent. Representatives of all branches of economics: industry, the municipal sector, agriculture, construction and others presented reports at the workshop. A series of reports was aimed at the problem of instrument measurement of energy consumption. This problem is especially vital for heat energy, gas and water. Some interesting reports from Germany and France on nontraditional energetics were presented. Siemens has proposed efficient energy generating equipment of small capacity of about one megawatt. These turbines can be installed both at operating boilers and at power plants. It was shown that 1.1 million tonnes of fuel can be saved annually in Belarus by the introduction of steam and gas energy units, and the retirement of old capacities. Economies of 1 million tonnes of fuel can be achieved by increasing the depth of oil processing and reducing fuel for electricity by efficient new generating plant. Considerable economy is provided by the application of efficient heat insulating materials in industrial plants, the municipal sector and other places.

The conference session on Geoinformation Systems and Technologies highlighted questions about applications of modern information technologies in the design and management of energetic equipment, environmental monitoring, and control and management of natural resources.

The present conference showed that the scientific and economic ties between Western and Eastern countries are expanding and deepening. There is a transition from consulting services to realization of concrete projects. In particular, with the assistance of the French company Gec Alstom, the construction of power plants with the capacity of 62 megawatts is provided. The projects in the field of energy saving are beginning to be realized. We hope that the present conference will contribute to the development of energetics in Eastern European countries, and its integration into European energetics.

The next conference will be dedicated to the Problems of Energy Supply for Cities and will be held in Minsk on October 29-30, 1997. Those interested should call 375-017-223-33-86

Leonid P. Padalko
President, Belarusian IAEE Affiliate

Conference Proceedings 19th IAEE International Conference Budapest, Hungary, May 27-30, 1996

The Proceedings from the 19th International Conference of the IAEE held in Budapest, Hungary, are now available from IAEE Headquarters. Entitled *Global Energy Transitions, with Emphasis on the Last Five Years of the Century*, the proceedings are available to members for \$55.95 and to non-members for \$75.95 (includes postage). Payment must be made in U.S. dollars with checks drawn on U.S. banks. To order copies, please complete the form below and mail together with your check to:

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East European Workshop (continued from page 29)

reminder that, alone in the region, Russia is a major exporter of energy. But the Ukraine and Belarus share the Eastern Europe deficit energy position – and this was also the perspective of the St. Petersburg contribution by Tatiana Lisochkina. Russia, in spite of her energy wealth, also needs modernization and efficiency in market consumption.

This is why the distinction of the former EEC, EFTA and CMEA economic blocks is worth maintaining, in spite of the transfer of the former DDR, Czech and Hungarian economies to the OECD and application for EU membership from former CMEA states. Before the Berlin wall came down seven years ago, each trading block (excluding CMEA in Asiatic USSR) had about 300 million people in vastly different systems. This distinction in geographical, political and economic terms is now blurred but the energy rationalization of the greater Europe, the 50 states of the Council for Strategic Cooperation in Europe, still has enormous problems and potential benefits to achieve, and which Workshops bringing these nations together can help to provide the perspective and thereby the motivation and momentum towards this goal.

Tony Scanlan

Publications List

Energy in China: Foreign Investment Opportunities, Trends and Legislation (1995). Price: £350. Contact: FT Energy Publishing, Maple House, 149 Tottenham Court Road, London W1P 9LL, England. Phone: 44-171-896-2241. Fax: 44-171-896-2275.

The New Geopolitics of Energy. Price: £14.95. 216pp. Contact: Royal Institute of International Affairs, Chatham House, 10 St. James's Square, London SW1Y 4LE, United Kingdom. Phone: 44-171-957-5700. Fax: 44-171-957-5710.

Maintaining Energy Security in a Global Context. Price: \$9.00. Contact: The Brookings Institution, Dept. 029, Washington, DC 20042-0029. Phone: 202-797-6258. Fax: 202-797-6004. E-mail: bibooks@brook.edu

Who's Who in the CIS Oil & Gas Industry. Price: \$445.00. Contact: Russian Petroleum Investor, 14755 Ventura Blvd., Suite 1-424, Sherman Oaks, CA 91403. Phone: 818-343-8474. Fax: 818-343-8475.

Petroleum Intelligence Weekly. Price: \$1575.00 by mail; \$2950.00 by fax. Contact: PIW Publications, 575 Broadway, 4th Floor, New York, NY 10012. Phone: 212-941-5500. Fax: 212-941-5509.

World Gas Intelligence. Price: \$795.00 by mail; \$1510.00 by fax. Contact: PIW Publications, 575 Broadway, 4th Floor, New York, NY 10012. Phone: 212-941-5500. Fax: 212-941-5509.

International Petroleum Finance. Price: \$645.00 by mail; \$1045.00 by fax. Contact: PIW Publications, 575 Broadway, 4th Floor, New York, NY 10012. Phone: 212-941-5500. Fax: 212-941-5509.

Oil and Gas Quarterly. Price: £800. Contact: Julia Thomas, The Royal Institute of International Affairs, Chatham House, 10 St James's Square, London SW1Y 4LE, United Kingdom. Phone: 44-171-957-5700. Fax: 44-171-321-2045.

Gas and Oil in Northeast Asia: A Briefing for Investors (Spring 1996). Price: £295. Contact: Julia Thomas, The Royal Institute of International Affairs, Chatham House, 10 St James's Square, London SW1Y 4LE, United Kingdom. Phone: 44-171-957-5700. Fax: 44-171-321-2045.

The New Geopolitics of Energy (November 1996). Price: £14.95. Contact: Plymbridge Distributors, Ltd., Estover Road, Plymouth, Devon, PL6 7PZ, United Kingdom. Phone: 44-1752-202-301.

Calendar

10-12 February 1997, Global Energy Forum: Strategies for the 21st Century. Houston, Texas, USA. Contact: Breda Nolan, CERA, 20 University Road, Cambridge, MA 02138. Phone: 617-497-0423. Phone: 617-441-2609.

16-17 February 1997, International Gas Conference. Kish Free Zone Island, Iran. Contact: Dr. Hamid Zaheri, Managing Director, Iranian Association for Energy Economics, No. 125 Zafar Ave., Tehran, Iran. Phone: 98-21-225-7633 or 98-21-225-7649. Fax: 98-21-222-0149.

24-26 February 1997, Developing, Negotiating and Contracting Retail Electricity Prices. Atlanta, Georgia, USA. Contact: IBC USA Conferences, Inc., 225 Turnpike Road, Southborough, MA 01772-1749. Phone: 508-481-6400. Fax: 508-481-7911.

17-18 April 1997, Fourth Annual Utility Strategic Marketing Conference: From Commodity to Service. Orlando, Florida, USA. Contact: June Appel, Resource Management, Inc., 111 Presidential Boulevard, Bala Cynwyd, PA 19004-1008. Phone: 610-667-2160. Fax: 610-667-3047.

21-22 April 1997, Oil & Gas in Latin America: The Challenges Ahead. London, England. Contact: Jenni Wilson, CGES, 17 Knightsbridge, London SW1X 7LY. Phone: 44-171-235-4334. Fax: 44-171-235-4338 or Katie Stainton, Centaur Conferences, 50 Poland St., London W1V 4AX. Phone: 44-171-434-3711. Fax: 44-171-287-8706.

21-23 April 1997, Asian Oil & Minerals. Bali, Indonesia.

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Conference Proceedings 18th IAEE International Conference Washington, DC, July 5-8, 1995

The Proceedings from the 18th International Conference of the IAEE held in Washington, DC, are now available from IAEE Headquarters. Entitled *Into the Twenty-First Century: Harmonizing Energy Policy, Environment, and Sustainable Economic Growth*, the proceedings are available to members for \$55.95 and to non-members for \$75.95 (includes postage). Payment must be made in U.S. dollars with checks drawn on U.S. banks. To order copies, please complete the form below and mail together with your check to:

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