

IA INTERNATIONAL ASSOCIATION FOR ENERGY ECONOMICS

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Newsletter

Editor: AMS Inc. Contributing Editors: Paul McArdle, Tony Scanlan and Marshall Thomas

Spring 1996

President's Message



The first quarter of 1996 has passed and final plans are being made for two of our major conferences this year. The international conference of the IAEE, only one month away, is the first to be held in Eastern Europe. This year's theme, *Global Energy Transitions*, suggests the opportunity for us to explore the consequences of the opening of a new energy frontier. Of note, there will be sessions on financing Eastern European and Caspian Sea energy

projects.

The North American conference will be convened in Boston in late October. It will be a unique interdisciplinary meeting which will be of great value in shaping opinion and preparing for the events which will effect our industry in the future. This will prove to be an important forum for analysts who are interested in the deregulation of the energy business. The conference will address the strength of the deregulation of energy movement and just how far and how fast change in long-standing regulations will occur.

On the organizational front, in the last newsletter I stated my goal to widen the international membership of our organization. At upcoming Council meetings I plan to introduce ideas toward implementing my initiative. I would like to solicit your ideas on how to do this. Feel free to drop me a note with any of your suggestions.

Best wishes. See you in Budapest.

Tony Finizza

Editor's Note

We're pleased to present a number of thought provoking articles in this issue. Michael Parker leads off with a look at the decline of the U.K. coal industry and concludes that it was the result of a Conservative political agenda reinforced by economic fundamentals. The political agenda consisted of (1) the elimination of the ability of the mine workers to hold the country at ransom, and (2) subjecting British Coal to market forces. A plentiful supply of fossil fuels and falling

*****ATTENTION - URGENT - ATTENTION***** 20th IAEE International Meeting

The 1997 International Meeting is early in 1997 - January 22 to 24 to be specific. It is set early in the year to get the best of the New Delhi, India weather. Be sure to note the details on page 10 and act promptly. Believe it or not, this meeting is only 7 months away. Do not delay in making your plans and submitting your paper. Further details will be mailed shortly.

real prices thereof, together with the privatization of the electricity industry which hastened the use of gas-fired combined cycle electricity generation were the reinforcing economic fundamentals. The employment blow was softened by a very generous redundancy program.

Next, Paul Tempest notes that Mideast petroleum producers are slowly but steadily strengthening their competitive position vis-à-vis the rest of the producing world. At the same time, Russia and the rest of the CIS are no longer in competition with the Gulf area. Indeed, Russian penetration to the Gulf has been achieved and now Iran is drawing Russia and the Lower Gulf interests together. Eventually Iran will open and the balance of power in the Arab world will shift toward it. When this happens, the Saudi/U.S. policy of confrontation with Iran will be hard to maintain. The Arabian response will become more sensitive to Iran. Given increasing energy dependence on Russia/Mideast, new technology responses are likely to accelerate.

Mamdouh Salameh continues the focus on the Mideast by looking at various threats to Saudi Arabian stability and, therefore, the current special Saudi/U.S. relationship. He discusses (1) the destabilizing influence strong support for Saudi fundamentalism, particularly by Iran, could have, (2) the effect of the coming change in Saudi leadership as succession occurs in the House of Saud, (3) the Saudi-Yemeni territorial dispute, (4) the age-old Saudi-Iraqi struggle for primacy in the Gulf and finally, (5) the squandering of billions of dollars of oil revenues and the resulting inability of the Saudi ruling family to financially tackle the socioeconomic problems facing the country. *(continued on page 3)*

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Energy Journal Best Paper Awards

Since 1989 the IAEE has given an annual *Energy Journal* "Best Paper" award. The award is given on the basis of recommendations from a specially convened committee, and is normally presented at an appropriate IAEE or affiliate conference.

In the photograph below, Kverndokk of Statistics Norway is being congratulated by former IAEE President, Campbell Watkins as Kverndokk's wife looks on. Watkins presented a plaque and a \$500 check at the dinner of the BIEE conference, *The UK Energy Experience: A Model or a Warning?* held at the University of Warwick in December.



The title of Dr. Kverndokk's paper was, "Global CO₂ Agreements: A Cost Effective Approach." The paper was published in Volume 14, No. 2 of *The Energy Journal*. The members of the award committee were Dr. Mark Bernstein, National Renewable Energy Lab; Professor Paul Stevens, Centre for Petroleum and Mineral Law and Policy, University of Dundee and Professor John Surrey of the Science Policy Research Unit, University of Sussex. The committee was convened by IAEE Vice President for Publications, Peter Pearson and the recommendation endorsed by *The Energy Journal* Editor, Leonard Waverman.

The 1994 award procedures have recently been completed. There is a joint award for this year and it goes to the authors of two papers, Richard Kosobud, Thomas Daly, David South and Kevin Quinn, for their paper entitled, "Tradable Cumulative CO₂ Permits and Global Warming Control;" and to Rolf Golombek and Jan Braken for their paper entitled, "Incomplete International Climate Agreements: Optimal Carbon Taxes, Market Failures and Welfare Effects."

For this award, the recommendation committee's members were Dr. Mark Bernstein, Dr. Michelle Michot Foss, CBA Energy Institute, University of Houston, Professor Tomas Sterner, University of Gothenberg and Professor Paul Stevens. The Newsletter will carry a report of the award ceremony later in the year.

Peter Pearson

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UHCBA Energy Institute Team Wins Grant from Shell for North American Study

A research team led by the CBA Energy Institute at the University of Houston's College of Business Administration has been awarded a major grant from the Shell Oil Company Foundation for an interdisciplinary study of North American natural gas and electricity integration. The thrust of the study is regulatory coordination between the U.S., Canada and Mexico for natural gas and electricity and barriers to seamless crossborder transactions. "Our notion," says Dr. Michelle Michot Foss, director of the CBA Energy Institute and coordinator of the Shell project, "is to start with the idea that sellers of natural gas and/or electricity anywhere on the continent should be able to engage in transactions with buyers anywhere on the continent, and then work backwards to pinpoint current and prospective policy barriers."

Dr. Michot Foss notes that much work has been done to analyze the physical systems for natural gas and electricity supply and delivery in North America as well as supply and demand balances and flows. Policy coordination and risk has not been well researched. "Mexico is implementing a new regime for private investment in natural gas transportation, distribution and storage. We have electricity restructuring in the U.S. and federal budget issues that are likely to impact energy policy management. There will be continued political instability in Mexico, and the narrow vote margin against the Quebec separation referendum leaves some political uncertainty in Canada. Last, and most important, energy is a minor chapter in the North American Free Trade Agreement. We need to think about all of these things in a systematic way in order to understand how this increasingly integrated continental market might evolve and what the future may hold for business strategies," says Dr. Michot Foss.

The research team includes recognized experts at the University of Houston on business and public policy, energy markets and regulation and technology transfer. Dr. Joseph Allen Pratt, Cullen Chair in History and Business and the lead principle investigator, is widely known for his historical research on the U.S. energy industry and key corporations and was featured in the PBS series *The Prize* based on the book by Dr. Daniel Yergin. "To understand the prospects for future change, we must look first at the historical reasons for the creation of the current systems of regulation. Why were these systems originally created? How do their structure and powers reflect the political and cultural realities of the historical era in which they were created? How have they evolved in the last decade? To what extent have they been driven by economics or politics or ideology in the past?" says Dr. Pratt. Dr. Alan Stone, a political scientist and law and economics specialist, is well recognized for his work on regulatory policy in the telecommunications industry and his books on the AT&T divestiture. Professor Gary Conine at the UH Law Center is a leading author on oil and gas law in the U.S. and Mexico and was a team member in the UH Law Center's project to assist with Russian oil and gas law development. Dr. Robert Keller is an authority on technology transfer and related management strategies. The Shell project team will investigate the process of "regulatory technology" development and transfer, a unique contribu-

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Editor's Note (continued from page 1)

Llewellyn King recounts some of the wrong assumptions and resulting fallacious U.S. energy policies that developed following the early 1970s, particularly the policy of national self-sufficiency. He notes that the market and technology provide the best energy policy and cites examples of technologies' impact. He concludes, hopefully, that we have matured enough to let the market call the signals.

Next, Mike Parker reports on a recent BIEE seminar on *How Much Profit Should Monopoly Networks Make?* in which it was suggested that performance targets might be a better form of regulation than the usual cost regulation.

Finally, Hossein Razavi reports on a meeting of energy financiers to discuss the financing of oil, gas and power projects in Latin America. Noting that there is no shortage of funds for investment or debt financing, he confirms that despite this availability, many projects are not implemented. He examines the reasons why.

There are a number of coming meetings announced in this issue. In addition to the 20th International meeting cited above, we urge special attention to:

- The Alaska conference on *Petroleum Fiscal Regimes* in Anchorage in early May. See page 16 for details.
- The Joint International Conference on *Energy, Economy and the Environment* in Osaka, Japan in June. See page 17 for details.
- The Danish Association for Energy Economics' conference on *Transport, Energy and Environment* in Elsinor, Denmark in early October. See page 15 for details.
- The 17th Annual North American Conference on *(De)Regulation of Energy: Intersecting Business, Economics and Policy* in Boston, MA, USA in late October. See pages 3 and 5 for details.

BP Statistical Review on Internet

The *British Petroleum Statistical Review of World Energy* is now on the Internet. It has all the data in spreadsheet form with data back to 1965 in most cases. It is downloadable in Lotus 1-2-3 format, and can be found through the BP Homepage, <http://www.bp.com> and then taking About BP and Publications. It can be accessed directly on <http://165.121.20.76/stattitl.html>

The Review will be updated annually with the 1996 edition due for publication on 18 June.

Peter Davies, British Petroleum

Waverman Honored

Leonard Waverman, Editor of *The Energy Journal* and Director of the Centre for International Studies and Professor at the University of Toronto, has been given the Chevalier dans l'Order des Palmes Academiques by the French government.

The award is in recognition of Waverman's contributions to the French community through his academic excellence and expertise in the fields of economics, energy, telecommunications and the auto industry.

Presentation was made at a dinner ceremony in Toronto sponsored by the French Consulate.

UNITED STATES ASSOCIATION FOR ENERGY ECONOMICS
INTERNATIONAL ASSOCIATION FOR ENERGY ECONOMICS
Announces

The 17th Annual North American Conference

**"(De)Regulation of Energy:
Intersecting Business, Economics and
Policy"**

To Be Held At The

**Boston Park Plaza Hotel
Boston, Massachusetts, USA**

October 27-30, 1996

Concurrent Panels

Restructuring of the Utility Industry
New Methods of Environmental
Regulation
Energy Reform Overseas:
Experience & Potential
Energy and Security: Is the Battle Won?
Advances in Finance (Theory and Practice)

Plenary Sessions

The New Politics of Energy Policy
Determinants of Fuel Choice
The State of the Environment
Reform of National Oil Companies
Orphans or Accessories: Stranded
Assets, DSM, & Renewables

**CALL FOR PAPERS
and
POSTER SESSION**

Deadline for Submission of Abstracts: June 21, 1996

Anyone interested in organizing a session should propose topics, motivations, and possible speakers to Mike Lynch - 617-253-5806

Abstracts should be between 200-1500 words giving an overview of the topic to be covered at the conference. At least one author from an accepted paper must pay the registration fees and attend the conference to present the paper. Please indicate if you are NOT willing to participate in the Poster Session. All Abstracts/Proposed Sessions and Inquiries should be submitted to:

David Williams, Executive Director
USAEE/IAEE

28790 Chagrin Blvd., Suite 210, Cleveland, OH 44122
USA

Phone: 216-464-2785; Fax: 216-464-2768

General Conference Chairman: Kathleen B. Cooper
Program Chair: Michael C. Lynch
Arrangements Chair: David L. Williams

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The Decline of U.K. Coal: Economics or Politics?

By Michael J. Parker*

The decline of the U.K. coal industry under Conservative Governments since 1979 has often been characterized either as a political conspiracy against the National Union of Mineworkers (NUM), or as the inevitable outcome of "market forces." In fact, the process has been the result of the complex interaction of political and economic factors.

The Political Agenda on Coal

The evidence for a *political agenda* on coal is clear. The Government's attitude can be illustrated from the memoirs of some of the key players. Following the Government's temporary climb down on colliery closures in February 1981, Nigel Lawson wrote: "Our original aim was to build a successful, profitable coal industry independent of government subsidies, to de-monopolize it and ultimately open it to private enterprise... Then the events of February 1981 showed beyond any reasonable doubt we will make no progress towards our aim until we deal with the problem of monopoly union power."¹ And on the 1984/85 NUM strike, he wrote, "Just as the victory in the Falklands war exorcised the humiliation of Suez, so the eventual defeat of the NUM etched in the public mind the end of militant trade unionism which had wrecked the economy and twice played a major part in driving elected governments from office."²

On his pledge in 1988 to achieve the "ultimate privatization" of coal, Cecil Parkinson wrote: "What was ultimate about the proposed privatization of coal was that it would mark the end of the political power of the National Union of Mineworkers."³ He added: "I have never understood the argument that Britain somehow owes a great debt to the mining industry. The industry was given privileged position and it abused the privilege."⁴

The views in Margaret Thatcher's memoirs were, if anything, even more robust. She wrote: "By the 1970s the coal mining industry had come to symbolize everything that was wrong with Britain."⁵ "It was crucial for the future of the industry and the country itself that the NUM's claim that uneconomic pits should never be closed should be defeated...and the use of strikes for political purposes discredited once and for all,"⁶ and "What the strike's defeat established was that Britain could not be made ungovernable by the Fascist Left."⁷ Privatization of British Coal was seen as vital, as privatization in general "was one of the central means of reversing the corrosive and corrupting effects of socialism."⁸ Thus, the *political agenda*, established early in the Thatcher years, consisted of two main elements. First, to eliminate the ability of the NUM "to hold the country to ransom," thereby providing the keystone of a policy to reduce what was seen as the unacceptable power of the trades unions. Second, to subject British Coal (BC) to market forces, in order to change it from the archetypal nationalized industry dependent on state funds into a profitable business which could (ultimately) be denationalized, thus discrediting socialist nationalization. Both these elements of the *political agenda* reinforced each other.

*Michael J. Parker is a Consultant in the United Kingdom.

¹ See footnotes at end of text.

The Economic Fundamentals

In the period between the defeat of the NUM strike in 1985, and the major "downsizing" of the coal industry that occurred after the resolution of the "coal crisis" of October 1992, British coal remained over 80 percent dependent on sales to power stations (and provided over 60 percent of the total fuel used for power generation). In itself, this was not unusual for a steam coal industry (the U.K. industry produced little coking coal). The problem was that the costs of deep mines (which in 1985/86 made up 85 percent of British Coal output) were generally uneconomic against the price of internationally-traded steam coal. Over the period 1986/87 to 1991/92, average U.K. colliery operating costs were higher than the delivered price of imported coal by about £12/tonne at inland power stations and about £22/tonne at coastal stations.⁹ For the overall average cost to be competitive would have required cost reductions of about a quarter over and above the significant cost savings actually achieved in this period, but given the distribution of costs and delivered prices around the average, this would still have left about half of deep-mined output uneconomic. Moreover, imported coal usually had lower sulfur and chlorine contents than U.K. coal. Although there were clear limits to the amount of coal that could be imported, particularly in large vessels, the post-strike position was not sustainable in the long run, except in the absence of an improbable large increase in the delivered price of imported coal. Yet any attempt to implement a policy of "convergence" between U.K. deep-mined costs and imported prices would necessarily involve substantial reductions in manpower, either through the closure of irredeemably uneconomic collieries, or through the necessary increases in productivity at continuing collieries, or both. Thus, a policy to reduce the industry to its "economic size" (that is, consisting only of collieries and opencast sites capable of operating profitably without either subsidy or cross-subsidy) was entirely consistent with the *political agenda* of reducing the power of the NUM by reducing the number of mineworkers.

Further, such a policy was likely to prove to be irreversible because of the rapid erosion of the coal reserves base available to the U.K. industry. Effectively, a deep mine, once closed, was unlikely to be re-opened, and its reserves lost except in some cases adjacent to continuing mines ("Mothballing" capacity was prohibitively expensive except as a temporary and limited expedient). Moreover, the drive to reduce costs has meant ever more selective working of accessible reserves to exclude seams/districts not capable of yielding high productivity. This tendency has been reinforced by the capital intensity of the most modern coalface equipment, which requires high utilization. In addition, it became clear that, with the end of the era of high fossil fuel prices following the collapse of oil prices in 1986, and the continuing expansion of world trade in steam coal at low prices, it was very improbable that major new deep-mines would be sunk in the U.K. (once the "Plan for Coal" program was completed), as capital charges would overwhelm any reduction in operating costs. Thus, in effect, the coal reserve base was limited to seams currently accessible without major expenditure at those existing deep mines which were able to

(continued on page 6)

!!! MARK YOUR CALENDARS -- PLAN TO ATTEND !!!

(De)Regulation of Energy: Intersecting Business, Economics and Policy

17th USAEE/IAEE Annual North American Conference - October 27-30, 1996
Boston, Massachusetts, USA - Boston Park Plaza Hotel

Sponsored by:
USAEE/IAEE

If you're concerned about the future of the energy industry and profession, then this is one meeting you surely don't want to miss. The 17th USAEE/IAEE Annual North American Conference will detail the current developments within the energy field so that you come away with a better sense of energy supply, demand and price. Seven plenary sessions will address the following issues:

Energy Reform Overseas: Experience & Potential
Continental Energy Integration
Utility Restructuring

World Oil Markets in a World of Deregulation
Finance, Theory and Practice
Energy and Security

Energy Debate

In addition, 28 concurrent sessions are planned to address timely topics that affect all of us specializing in the field of energy economics. Further, a poster session is being added to promote energy research and add depth to the conference.

The coming years will see an upheaval in U.S. energy industries unlike any which has occurred since the oil price shocks of the 1970s. A combination of political change and new thinking about regulation among governments, academics, business and environmentalists suggests that many long-standing regulations will be changed, if not abolished.

Many economic and environmental issues remain unclear for all energy industries including: the degree of competition allowed, whether regional electricity pools or bilateral deals make more sense, the disposal of stranded assets, the optimal approach to automobile emission reduction and the role of alternative-fuel vehicles, the accounting for social costs and externalities in fuel choice.

These questions are unique for their cross-cutting relevance to business strategy, economic theory, and government policy-making. As such, the 17th Annual North American Conference of the USAEE/IAEE is a unique forum to address these, bringing together leading policymakers, academicians and energy industry practitioners.

In the past, USAEE/IAEE conferences have attracted outstanding speakers. Below is a listing of some of the influential individuals that have attended and addressed this important conference.

Mike Bowlin, CEO, ARCO
John-Pierce Ferriter, Deputy Exec. Dir., IEA
Peter Gaffney, Sr. Partner, Gaffney, Cline & Assoc.
Hazel O'Leary, Secretary of Energy, U.S. DOE
Dr. Subroto, Former Secretary General of OPEC

Nordine Ait-Laoussine, President, NALCOSA
Herman Franssen, Ministry of Petro. & Min., Oman
Riwani Lukman, Secretary General, OPEC
Alirio Parra, Sr. Advisor, Ctr. for Global Energy Studies
Robert Wilhelm, Sr. Vice President, Exxon Corp.

You can be sure that prominent speakers who are on the cutting-edge of energy economic issues will once again address this annual meeting.

Boston, Massachusetts is a wonderful place to meet and at affordable prices. Single nights at the Boston Park Plaza Hotel are \$122.00 (contact the Boston Park Plaza Hotel at 617-426-2000, ext. 2500, to make your reservations). Conference registration fees are \$425.00 for USAEE/IAEE members and \$525.00 for non-members. Special airfares have been arranged through Traveline (for absolutely the lowest zone fares, call Traveline at - 216-646-8525). These prices make it affordable for you to attend this conference that will keep you abreast of the issues that are now being addressed on the energy frontier.

There are many ways you and your organization can become involved with this valuable conference. You may wish to attend for your own professional benefit, your company may wish to become a sponsor or exhibitor at the meeting whereby it would receive broad recognition or you may wish to submit a paper to be considered as a presenter at the meeting. For further information on these opportunities, please fill out the form below and return to USAEE/IAEE Headquarters.

(De)Regulation of Energy: Intersecting Business, Economics and Policy

17th Annual North American Conference of the USAEE/IAEE

Please send me further information on the subject checked below regarding the October 27-30 USAEE/IAEE Conference.

Submission of Abstracts to Present a Paper(s) Registration Information Sponsorship Information Exhibit Information

NAME: _____
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The Decline of U.K. Coal (continued from page 4)

survive in the short-term, together with opencast coal in such sites as were able to secure planning permission in the face of environmental opposition.

One of the effects of the coal crisis of October 1992 (when British Coal announced the rapid closure of 31 of its 50 deep mines) was that the Government's subsequent Coal Review for the first time brought a realistic assessment of coal reserves into the public domain. By the time BC's mining assets were sold off at the end of 1994, a reasonable assessment of remaining accessible reserves for deep mines was little more than 600 m. tonnes – a reserve/production ratio of about 15:1. Given the unequal distribution of reserves between pits, and the absence of significant replacement capacity, a further fall in deep-mined output can be expected over the next 10/15 years.

Increase in Environmental Concerns

The 1980s saw a steady and significant increase in environmental concerns relating to coal and a change in their character – with increasing emphasis on atmospheric pollution and global warming. The implementation of the EC's Large Combustion Plant Directive from 1988 committed the U.K. to progressive and substantial reductions in SO₂ emissions – down to 40 percent of 1980 levels by 2003 at existing power stations. This was seen as a growing threat to U.K. coal (average 1.6 percent sulfur as against 1 percent or less for imports), particularly as the retro-fitting of Flue Gas Desulphurization (FGD) plant was to be confined to only 6GW of coal-fired plant. From 1988 onwards, coal-fired power stations were often portrayed as the main danger to the planet. As Mrs. Thatcher wrote: "Coal-fired power stations pour out carbon dioxide into the atmosphere and no-one has yet put a credible figure on what it will ultimately cost to deal with the resulting problem of global warming."¹⁰ Indeed the Government lost no opportunity to stress the environmental disadvantages of coal.

The Achievement of the Government's Policy Objectives for Coal

By 1995, the Government's policy objectives for coal (as set out in the political agenda above) had effectively been achieved, summarized as follows:

	1979/80	1995 est.
Deep mine output (m.t.)	109	32
Number of mineworkers (000)	232	8
U.K. coal as % of total power station fuel	76%	30%

Further, with the sale of BC's mining assets, the industry was privatized in December 1994. The NUM's ability to disrupt electricity supplies has been greatly reduced, and its political power effectively ended.

The Government's success in meeting its policy objectives derives from a number of factors:

1. The policy was pursued consistently over a long period. Of course, this depended on holding political office with working majorities. If general elections had had different results, the outcome for the coal industry would have been

very different.

2. The economic fundamentals of the industry, and the generally plentiful supplies of fossil fuels at falling real prices from 1986, reinforced the *political agenda*; and rising environmental concerns, while not decisive in themselves, provided further weight and public justification for the underlying policy. Policy went "with the grain of events."
3. The coal industry had no political constituency of any real influence at national level. Its support was concentrated in Labor-controlled areas, and parliamentary advocacy by NUM-sponsored MP's was counter-productive. (In this respect, there was an enormous difference from Germany, where the Federal structure has enabled the coal industry to retain strong political influence).
4. The Government had the luck of having Arthur Scargill as an opponent in the 1984/85 strike, which led to the creation of the break-away UDM. Without continued working of the UDM pits, it is doubtful if the strike could have been defeated. And if the strike had not been defeated, the Government could not have achieved its objectives.

But in addition to these factors, the attainment of the Government's objectives owes much to the operation of:

- (a) The privatization of the Electricity Supply Industry (ESI).
- (b) Measures to promote coal industry restructuring through subsidy.

We consider these in turn.

Privatization of the ESI

The decision to privatize the ESI before the coal industry had considerable advantages for the Government in relation to coal policy. Firstly, because the ESI privatization process would itself be complex and protracted, this would allow more time for British Coal to close collieries and rundown manpower in a more orderly fashion over a longer period. Secondly, any subsequent restructuring of the coal industry prior to its own privatization could be characterized as the result of commercial decisions by private electricity companies, rather than action by Government. ESI privatization would unleash powerful forces to downsize the coal industry by remote control. Indeed, as Mrs. Thatcher says in her memoirs, "...a privately owned electricity industry would be much more demanding in the commercial terms it expected from the NCB (i.e., British Coal) than would a state owned monopoly."¹¹

Yet, in the initial ESI privatization settlement in 1989/90, the Government was concerned not to prejudice its coal policy. It would appear that the Government acted on three principles.

Firstly, BC needed coal contracts with the major generators sufficiently favorable to BC to avoid the Government having to deal with a "second front" on coal until the ESI had been safely transferred to the private sector. Further, the coal contracts would have to provide for sufficient volumes of coal sales to power stations to avoid large-scale colliery closures which could be attributed directly to ESI privatization; and for coal prices which, although declining in real terms, would be compatible with BC's progress

towards acceptable levels of profitability without explicit subsidy. The *coal subsidy* (the difference between BC prices and hypothetical free market prices based on parity with imports) should continue to be hidden in the coal price.

Secondly, the coal contracts had to be of sufficient duration and firmness to preclude any reopening until after the next General Election (due by 1992), and to allow any subsequent radical "downsizing" of the coal industry to be presented as the result of market forces rather than Government policy. On the other hand, it was already clear that further substantial contraction of the coal industry would be required before BC could be privatized. Thus although the new coal contracts needed to be sufficiently favorable to BC to avoid a contentious quantum of closures in the short term, they could not be of a duration so long as to preclude the downsizing of the coal industry in time to privatize BC within the terms of the following Parliament. Such considerations suggested a contract duration of about three years.

Thirdly, the coal contracts were needed to provide an element of price stability to electricity consumers in the period immediately following ESI privatization. The coal contracts had to be "back-to-backed" into the Regional Electricity Companies' (RECs) franchise markets under a framework of "contracts for differences," and coal prices had to fall in "real" terms in order to increase the profitability of the ESI while maintaining franchise (i.e., domestic) prices broadly constant in "real" terms.

The contracts which emerged were a skillful Government-imposed reconciliation of the policies towards the ESI and the coal industry, with BC sales falling a relatively modest 10m tonnes over three years, and prices by an achievable 5 percent p.a. in "real" terms. However, this was a temporary government "fix" which postponed the difficult decisions till later.

At the time of ESI privatization, it was widely expected that in the future the main challenge to BC would come from increased coal imports by the two main generators: 30 m. tonnes was a widely quoted figure. However, this did not materialize. The main impact on U.K. coal came from a large and rapid program of gas-fired combined cycle plant (CCGTs), known popularly as "the dash for gas." In large measure this arose from the policy of promoting competition in generation by reducing the dominant market share of the duopoly of National Power (NP) and PowerGen (PG) whose plant was mainly coal-fired. Given that, initially, divestment of plant by NP and PG was not contemplated, the only way to reduce their market share was to build new generating plant not owned by NP or PG. In turn, the most cost-effective new stations were CCGTs, which RECs proceeded to build in association with oil companies with surplus gas, with long-term contracts both for supply of gas and the sale of the electricity at high load factors. NP and PG also responded with their own CCGTs in order to protect their market share in the longer term. The net effect of the "dash for gas" was that by the mid-1990s some 30 m. tonnes of BC's sales to the ESI would be lost to gas (even though the avoidable costs of the coal-fired stations, using BC coal, were in many cases less than the total costs of the new CCGTs).

Finally, NP and PG made it clear that, once the initial three-year coal contracts expired in 1993, they would be free

to reduce their stocks of coal, which exceeded their commercial requirements by over 20 m. tonnes.

Thus, during 1992 it became clear that any subsequent coal contracts would involve a drastic reduction in BC's coal sales. Although the means by which these reductions had been secured were not wholly intended, the result was compatible with the Government's policy of downsizing the coal industry to an economic core which would be saleable to trade buyers. Given the risks, there was no way in which buyers would be found unless the major restructuring was done prior to coal privatization. But further firm coal contracts from 1993 were also essential to the sale of BC. Although the "coal crisis" of October 1992 caused some temporary rephrasing of closures, the end result was the same. BC contract sales to NP and PG fell from 65 m. tonnes in 1992/93 to 40 m. tonnes in 1993/94 and 30 m. tonnes for the next four years, at prices initially well above import parity, but falling in "real" terms over the five years. These contracts would not have been secured without the intervention of Government, or the agreement of the Regulator that the higher costs involved could be passed through by the RECs into the franchise market.

Measures to Promote Coal Industry Restructuring Through Subsidy

We have already seen that the price and volume of BC coal sales to generators had been supported by Government-brokered contract arrangements both before and after ESI privatization at levels which would not have obtained in "free market" conditions. Although there was no overt subsidy, and no public expenditure was involved, these contracts were an essential element of government support on a progressively "tapering" basis, as a means of securing a politically acceptable phasing of decline. If BC deep-mined output over the ten years 1985/86 to 1994/95 had been priced on an "import parity" basis, then an overt subsidy of some £11 billion at 1995 money values would have been required to sustain production.

But other measures of restructuring was funded by the taxpayer, rather than the electricity consumer. Government funded a very generous redundancy scheme and the other "social" costs associated with the rundown of manpower. These arrangements were so organized that BC was not inhibited in any way from running down manpower by the cost of doing so, and the redundancy payments were so pitched as to allow a policy of voluntary redundancy to be sustained, thereby making any union opposition to closures ineffective, either at the national or local level. The amounts involved were very large. Government expenditure on redundancy payments and other social costs, over the ten years 1985/86 to 1994/95, amounted to some £10 billion at 1995 money values - approaching £50,000 per job lost. This is a measure of the importance the Government attached to the achievement of its coal policy objectives. There appears to have been no attempt to weigh the costs of restructuring and redundancy against the wider social or unemployment costs. The rapid rundown of coal industry manpower was financed by Government in a way which effectively precluded an overall calculus.

(continued on page 8)

The Decline of U.K. Coal (continued from page 7)

Conclusion

There is no doubt that there has been a *political agenda* for coal, the objectives of which have effectively been achieved, as a result of a variety of factors, including the fact that policy went "with the grain" of market forces.

Given the objective of a competitive industry, substantial reductions in deep-mined output and, even more so, in collier manpower, were inevitable. But the reduction might not have been so rapid if the "dash for gas" and the generators' stock lift has been moderated. On the other hand, unmitigated free market forces would have led to precipitate and chaotic collapse.

The whole process was less one of free markets than of Government management to secure politically acceptable phasing. Whether the scale of the transitional cost to the electricity consumer and the taxpayer were justified will need to be the subject of a further study!

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¹ N. Lawson: *The View from Number 11* (London: Bantam press 1992) p. 142.

² Ibid. p. 161.

³ C. Parkinson: *Right at the Centre* (London: Weidenfeld and Nicolson 1992) p. 280.

⁴ Ibid. p. 281.

⁵ M. Thatcher: *The Downing Street Years* (London: Harper Collins 1993) p. 340.

⁶ Ibid. p. 364.

⁷ Ibid. p. 378.

⁸ Ibid. p. 676.

⁹ For calculations see: M.J. Parker: *The UK Coal Crisis: Origins and Resolution*, (Chatham House 1993).

¹⁰ Op.cit. p. 684.

¹¹ Op.cit. pp. 685.

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1997 Nominations

The Nominating Committee solicits suggestions from the membership at large for candidates for the following positions on the IAEE Council for the terms beginning January 1, 1997:

President-elect
Treasurer
Vice President for Finance
Vice President for International Affairs

Suggestions, with a brief statement of support, should be sent to Jean H. Masseron, Chairman of the Nominating Committee, at:

Dr. Jean H. Masseron
Executive Director
Institut Francais du Petrole
232 avenue Napoleon Bonaparte
92506 Rueil-Malmaison
France
Fax: 33-1-47-52-70-36

Directories: IAEE and Affiliate

By this time, most members should have received the 1996 Membership Directory. Affiliates are reminded that if they would like, Headquarters can provide Directories specially designed for them. Affiliate leaders should contact Headquarters directly for further information. There is no charge for this service.

Members are reminded to keep Headquarters up-to-date with changes in addresses, titles, affiliations and so on. *Directory Information Forms* to assist in this are mailed with each dues notice. In the case of Affiliates, these forms are mailed to the Affiliate President or Secretary in November of each year for distribution to Affiliate members. March 31 is the cutoff date for preparing the May Directory. Changes received after that date will not appear in the current-year Directory. Information changes may be sent to Headquarters at any time.

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Defining and Overcoming Risk - Some Global and Middle East Factors

By Paul Tempest*

Risk, like beauty, essentially lies in the eye of the beholder. What appears to be dire peril to Shell or Exxon may look to an independent entrepreneur like a golden opportunity. People see the same part of the world or set of circumstances from different angles, so that not only is there a wide variety of risk, but also a wide variety in the perception of risk.

Nonetheless, defining and overcoming risk is something we all have to face in the global oil and gas industries - from the short- and long-term viability and profitability of some of the largest multinational corporations and institutions ever known to the personal risks and opportunities of our own individual survival and advancement.

Covering corporate risk is like a mini-skirt. The wearer wants it long enough to cover essentials, yet short enough to evoke interest. In all such matters, there is a balance of interest to be struck. So it is with risk whether concerning corporate investment, sovereign credibility or regional security.

Some Global Factors

Let me begin with a fundamental macro-economic paradox. Out of total worldwide oil and gas upstream investment, we are spending about three-quarters in high-cost OECD regions. The remaining quarter has to be shared between the entire developing world and the states of the Former Soviet Union. Yet the OECD areas have only 6 percent of proven reserves of oil and 9 percent of gas and there is very little hope that these small shares can be increased from new exploration. What is more, OECD is producing at a much higher rate than would be indicated from the reserve position - 25 percent of world oil production and 43 percent of world gas production. So OECD oil and gas reserves are being depleted much faster than elsewhere. Another way of putting it, is that while oil and gas remain essential to the global economy (certainly over the next 2-3 decades), the main producers (Middle East) are slowly but steadily strengthening their competitive position vis-à-vis the rest. This phenomenon is, however, not fully appreciated by the oil market, which continues to be dazzled by buoyant production growth among non-OPEC producers.

A Russia/Gulf Alignment

What is new in the geopolitics of energy is that we can no longer assume that Russia, the rest of the CIS and the Gulf area are in some form of competition with each other, as throughout the Cold War. In many ways, the past year has seen the realization of Czarist and Stalinist dreams - Russian penetration south to the petroleum riches of the Gulf and a warm-water port, just outside the Straits of Hormuz, with the ultimate intention of splitting Western Europe from the resources of India, China and

South-East Asia. The north-south railway which the Czar proposed in 1901 and whose route was thoroughly surveyed in 1901-3 by the most distinguished Russian engineers and railway builders of their day is now almost complete, offering a brand-new container route through Russia and Iran to the Indian Ocean. Another grand design, the linking of the southern silk route by rail from China to Europe, is also virtually completed offering in combination with the new north-south link, equally valuable rail container routes to the Gulf from both East and West.

The Key Role of Iran

Further evidence of Russian and CIS penetration of the Gulf is immediately apparent in the substantial increasing flow of Russian and other CIS nationals into the Lower Gulf with the airports of Sharjah, Dubai and Abu-Dhabi often offering frequent passenger flights per day to these destinations and with a new role for the Lower Gulf as principal entrepot for consumer goods of Asian, European and U.S. origin destined for the CIS. Predictably, aid in both directions, joint projects in the petroleum and non-petroleum sectors and substantial flows of private capital are creating new opportunities for the CIS to expand their embassies, consulates and commercial representation in the Gulf.

The key to the drawing together of Russian and Lower Gulf interests lies in Iran. Although always wary throughout recent recorded history of the intentions and aspirations of the Bear to the North, Iran's attitude is changing. New common ground between Russia and Iran has recently been found in handling the Kurds in Northern Iran (and deflecting the aspirations of those in Northern Iraq), in facing the problems of a turbulent Afghanistan with its attendant refugee problems and belligerence towards neighbors and above all, in formulating common objectives to stabilize dissidence close to and within their respective borders (e.g., the Chechen uprising, Azerbaijan/Armenia/Georgia and other boundary and ethnic minority disputes.) I have mentioned the rapid progress in coordinating and linking the Russian and Iranian rail networks. Caspian marine links, new air-links and strengthened access by road have all been under recent discussion. Most significant of all is the agreement by Russia and Iran to invoke old Russian-Iranian treaties dating back to 1921 in handling the issues of Caspian oil development and the rights of other riparian states.

While the United States continues to force the pace of the economic and commercial isolation of Iran by the imposition of a trade embargo, Iran turns increasingly to Russia and also to Germany, China and Japan for overt and covert support, much of its trade passing through Dubai and other Emirate ports. Gradually, despite U.S. sanctions, Iran is opening up. I see this as an inexorable if perhaps lengthy process. One day perhaps this year, next year or within the next ten, the government in Iran will begin to embrace more liberal and open policies. Once this great country really begins to move, as undoubtedly it will, and as this natural regional leader begins to recognize its own strength, the whole balance of

* Paul Tempest is Director General, World Petroleum Permanent Council.

(continued on page 10)

Defining and Overcoming Risk (continued from page 9)

power in Arabia will tilt sharply toward Iran. Under such circumstances it is very difficult to view the Saudi and U.S. policy stance as a continuing exercise in confrontation and containment and much more plausible to expect Arabian responses to be more sensitive to Iranian interests.

A New Technology

How will such developments enhance or endanger energy supply security for the rest of the world? Do we have to assume increasing dependence, as at present, on oil and natural gas when the supply is almost bound to be increasingly dominated by Russia and the Middle East?

In this matter, my own view is far from pessimistic. Russian/Gulf hegemony depends on political stabilization and economic growth in Russia and the CIS, which may take some considerable time. The clearer the issue of increasing energy dependence on Russian/Middle East sources becomes, the more likely we are to accelerate global responses in new technology. Already, we can see quite clearly the emergence of new vehicles with very low petroleum consumption, new economies in the use of oil and natural gas for electricity generation and space-heating, the development of new environmentally-friendly energy substitutes. Perhaps the greatest brake and risk in this process will be the reluctance of the major automobile manufacturers and fuel suppliers as well as the slowness of leading consumer and producer governments, all highly dependent on revenue from oil and gas, to modify their stance and to divert investment into stimulating new technology. Indeed it may be that, in the 21st century, the seed-beds of a completely new energy electronics technology will be pioneered by Japan and the Asian tigers, taken up massively by China and developed thereafter in India, Brazil, Indonesia or Nigeria.

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The Price of Oil and the Future of the Saudi Monarchy

By Mamdouh G. Salameh*

The Kingdom of Saudi Arabia is a country of astonishing contrasts where computer print-outs open with the words, "In the name of God," and where men who grew up in goat-hair tents now control more than a quarter of the world's proven crude oil reserves.¹

If it were not for a freak of geology, few people in the world would concern themselves with the well-being of King Fahd, and the United States would not be so closely monitoring internal developments in Saudi Arabia; nor would the Kingdom figure so prominently in the oil geopolitics of the Arabian Gulf.

Under the sands of Saudi Arabia, first conquered by the house of Saud 200 years ago, lie more than 260 billion barrels (bb) of crude oil. More new reserves of very high-quality light crude have recently been discovered in the Hawtah, Hazmiya and Ghinah fields in Central Arabia.²

It is these vast reserves which have enabled Saudi Arabia to emerge as the world's largest producer and exporter of crude oil and there is no reason to expect a change in that position in the foreseeable future.

Upstream and Downstream Capacity Expansion

The Kingdom is currently engaged in what is quite possibly the most expensive oil expansion program in history. Saudi financial sources estimate that wholly state-owned Saudi Aramco, in a program that began in 1988, will have spent \$17 billion by the end of 1995 to raise production and export capacities to 10 million barrels a day (mbd) and 9.12 mbd, respectively. It is projected that by the year 2010, Saudi Arabia will have a production capacity of 12 mbd and an export capacity of 10.45 mbd (see Table 1).

Table 1
Saudi Arabia
Current & Projected Sustainable Production and Export Capacities, 1994-2010
(mbd)

Year	Production Capacity	Export Capacity
1994	9.50	8.65
1995	10.00	9.12
2000	10.70	9.65
2005	11.40	10.12
2007	11.60	10.21
2010	12.00	10.45

Sources: OPEC Statistical Bulletins, Petroleum Intelligence Weekly, Canadian Energy Research Institute (CERI).

Saudi Arabia's strategy is geared toward ensuring that production of Arab heavy crude is kept down to about 15-20% of overall output, thus enabling higher revenue from the much

* Mamdouh G. Salameh is an international oil economist, a consultant to the World Bank in Washington and a technical expert of the U.N. Industrial Development Organization in Vienna. He is also a member of the International Institute for Strategic Studies in London.

¹ See footnotes at end of text.

demand, more expensive and more environmentally acceptable light oil (see Table 2).³

Table 2
Saudi Aramco's Production & Capacity
By Crude Stream, 1995
(mbd)

Type of Crude	Capacity	Current Production
Arab Heavy	1.30	0.60
Arab Light	5.30	5.12
Arab Medium	2.00	1.10
Arab Extra Light	1.10	1.00
Arab Super Light	0.20	0.19
Total	9.90	8.01

Source: Oil Daily's Energy Compass Estimates

The Kingdom is also investing on a global scale. Its long-term target is to acquire up to 3 mbd in overseas refining capacity and outlets, and also an overseas storage capacity of up to 40 million barrels (mb) of crude near the major consuming markets.

The Threat of Financial Shortfall

Meeting these goals will not be easy. Saudi Arabia drew quite heavily on its monetary reserves to finance its share of the 1991 Gulf War to liberate Kuwait, and for the first time in its history had to seek external borrowing and issue domestic treasury instruments to offset budget deficits. The war cost the Kingdom around \$60 billion according to government sources. Saudi budget deficits, made worse by the Gulf War, were fueled by the Kingdom's arms purchases from the United States, estimated at \$25 to \$30 billion, and a reluctance to trim social programs.

There are now considerable doubts over how the expansion program for both production and refining capacities, estimated at \$30 billion, is to be financed. So far, the Kingdom is reported to have borrowed \$5 billion to finance expansion. Further borrowing is to be expected because of the strain on government finances caused by continuing weak oil prices. Earnings from oil exports in 1994 amounted to \$40 billion and were estimated to have risen to \$44 billion in 1995 (see Table 3).⁴

Table 3
Saudi Arabia
Revenue from Crude Oil & Refined Products Exports
1994-95 Actual, 2000-2010 Projected

Year	Price/Barrel U.S. \$	Production mbd	Exports mbd	Revenue \$ billions
1994	15.33	8.04	7.19	40.23
1995	16.88	8.01	7.12	43.87
2000	21.00	9.00	7.95	60.94
2005	23.50	10.00	8.72	74.80
2010	27.00	11.00	9.45	93.13

Sources: OPEC, IEA's World Energy Outlook 1995, Author's Projections.

The Geopolitics of Oil

The political failure of the United States to address the

(continued on page 12)

Future of the Saudi Monarchy (continued from page 11)

issue of its growing dependence on oil imports from the Gulf has meant that the U.S. had been continuously involved in Gulf politics and its security issues: the key instance is its special relationship with Saudi Arabia.⁵

Today, the U.S. confronts both Iraq and Iran while it is supportive of Saudi Arabia and Kuwait. If, however, Iraq and Iran were both to join hands to counter the U.S. influence in the Gulf, the whole geopolitical situation could change overnight, with very adverse repercussions for both Saudi Arabia and the United States.

These could include a more determined drive to destabilize Saudi Arabia and undermine its royal family through stronger support, particularly by Iran, for the Saudi fundamentalist movement. Iran could also mine or blockade the Straits of Hormuz to stop or hinder Saudi crude oil shipments (as well as United Arab Emirates and Kuwaiti shipments), or join forces with Iraq to mount covert sabotage attacks against Saudi shipping and oil installations in the eastern province.⁶

Another important aspect of the Saudi-U.S. relationship is the succession issue in the House of Saud. The time is coming near when leadership changes could bring to the fore a different set of key princes with difference priorities. If Crown Prince Abdullah becomes the next king, even the new political order in the Gulf could change. The Crown Prince will be less likely to embrace U.S. views on regional politics and may be more willing to mend fences with Iraq, whether or not Saddam Hussein remains in power.

Potential Threats to Saudi Security

The Saudi fundamentalist movement poses the most serious threat to the Saudi ruling family. However, there could also be potential threats to Saudi security from Yemen and possibly Iraq.⁷

Nothing has been more offensive to the sensitivities of the Saudi fundamentalists in recent years than the political fact that Saudi Arabia, the guardian of Islam's holiest places, is itself entirely dependent on a "Christian" nation for its security. Moreover, that "Christian" nation has always been the committed protector of Israel.

But it is the squandering of billions of dollars of oil revenues – and the absence of a system of accountability – that underlies the resurgence of the Saudi fundamentalist movement in recent years and the sharpening of its opposition to the ruling family. Until a few years ago, the Saudi ruling family spent billions of dollars buying off potential enemies; but declining oil prices since 1986 have reduced their export earnings and their ability to fend off enemies and tackle unemployment and other socioeconomic problems facing the country. This situation may not change in the foreseeable future as oil prices are not projected to rise significantly, in real terms, between now and the year 2000.⁸

Then there is the Yemeni threat. In geopolitical terms, Yemen is often referred to as the "soft belly" of Saudi Arabia. If the Saudi-Yemeni territorial dispute is not permanently resolved it will remain a source of conflict between Yemen and Saudi Arabia throughout the 1990s and, in a worst-case scenario, could escalate into a war that could bring Iraq to Yemen's side.⁹

Saudi-Iraqi relations have always been characterized in terms of a struggle for primacy in the Gulf. To Saudi Arabia,

Iraq presents both a potential threat to national security and a rival for supremacy in the Organization of the Petroleum Exporting Countries (OPEC). This uneasy relationship has been complicated by the new political order in the Gulf.¹⁰

Despite these potential threats and financial difficulties, and irrespective of the political orientation of the next Saudi king, the Kingdom will remain the world's oil supplier of last resort and Saudi oil will continue to dominate the global oil markets for at least the rest of this decade.

Footnotes

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⁹ Mamdouh G. Salameh, "Yemen: A New Oil Frontier or a Flashpoint?," *World Oil Market Analysis*, vol. XII, no. 1, Canadian Energy Research Institute, Calgary, June 1994, pp. 9-14.

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News from the Iran Association for Energy Economics, IAEE's Newest Affiliate

IAEE's newest affiliate, the Iran Association for Energy Economics (IRAEE), is off to a fast start. The Affiliate supported *The 1995 International Conference on Oil & Gas Prospects in the Caspian Region* in Teheran, Iran on 10 and 11 December 1995. The conference was organized by the Institute for International Energy Studies (IIES) and the Institute for Political and International Studies.

The conference served as a forum in which the Caspian states and oil and gas organizations explored the grounds for mutual cooperation in the region. More than 400 participants from 40 countries attended.

IRAEE regularly holds educational seminars on energy management. These seminars deal mostly with energy economics in the industries of Iran with the aim of raising energy efficiency and conservation to international levels.

The affiliate is also in the process of implementing an Energy Audit program for the industries of Iran with the aim of determining the optimum energy usage for specific plants.

H. Zaheri
Director of International Studies, IIES

Conceptual Perspectives on Energy Policy

By Llewellyn King*

We live in very ugly times. What I mean by that is that now everything you say or write is recorded for posterity and quoted back to you. This makes life extremely unpleasant.

Happily, the technology wasn't quite as sophisticated in the '70s, and most of the things I said about energy policy in the '70s are hopefully lost because I was one of a very large crew of people, including three Presidents, the first Secretary of Energy and all sorts of people who briefly went under the title of "Energy Czar," which has a sort of circa 1917 ring to it. We all believed frantically, desperately, passionately – and wrongly – that what the country needed was "an energy policy."

In fact, we had an energy policy. It really didn't change very much from the energy crisis of 1973-74 until about 1986-87 and that policy was that we would be self-sufficient in energy. It hung about Richard Nixon's neck (I don't think that that was entirely fair as his neck was already fairly heavily burdened). This idea that we would have an energy policy and that we would be self-sufficient was a national feeling. We, as a nation, previously had never been dependent on a vital import. And it was horribilis to realize that in a way we didn't want dependency. We had joined the world community. So we set about solving this problem.

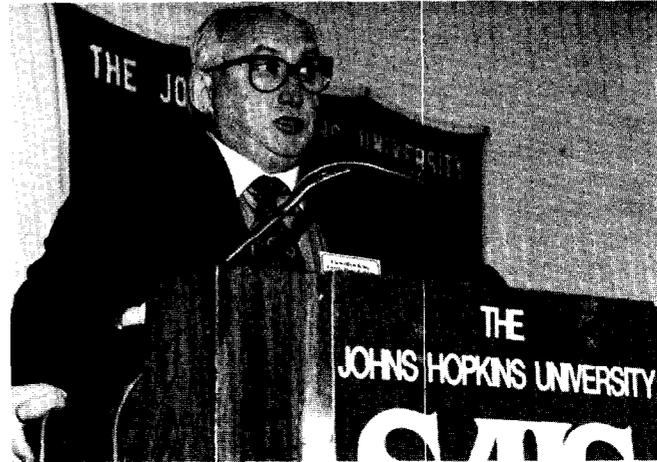
We also had a lot of exquisitely wrong assumptions, including assumptions about growth, demand, in-ground reserves. I vividly recall former Energy Deputy Secretary Jack O'Leary calling a group of reporters to the Old Post Office Building to tell them that they should stop worrying about natural gas. It was a depleted resource and they shouldn't worry about it any more. It wasn't part of the equation. He was very emphatic about this and had a lot of data to back it up. This was the policy.

But the policy really came out right after the oil embargo. It was first put forward in a very modest study done by Dixie Lee Ray for President Nixon. It was done by Gordon Smith (in fact I did the executive summary and I hope it doesn't exist anymore – I hope it's found the famed shredder). This was basically that we would maximize indigenous resources, no matter what the cost. Cost did not come into it. So came talk of uranium, coal for direct combustion, coal for gas, coal for synthetic fuels. Coal would also electrify the transportation system – railroads first, then all sorts of other marvelous electrifications after that – to reduce the dependency on imported oil.

Well, we didn't do it like that. As time went on in the '70s, the plans for self-sufficiency did not get more rational, they got less rational. They reached their ultimate in irrationality with the synthetic fuels project, Jimmy Carter's \$88 billion white elephant, which seemed to most people at the time quite a good idea. Very shortly after that, the market took effect, the world changed, and the whole passion for self-sufficiency was revealed both to be impractical and of less importance than had been thought. We settled into a

* Llewellyn King is publisher of *The Energy Daily* and *White House Weekly*. This is an edited version of his comments before the joint United States Association for Energy Economics and National Capital Area Chapter Annual Washington Energy Policy Seminar, March 11, 1996, Washington, DC.

period of laissez-faire energy policy, which is probably close to the correct one.



Llewellyn King Addressing USAEE/NCAC Energy Policy Seminar

But the result of not actually having an energy policy means that energy policy is what is left over when other policies have taken their toll on the market – environmental policy, defense policy, clean air policy, statecraft, such as the cutting off of Iraqi oil or Iranian oil, etc.

But we do have underlying all of these things the powerful effects of the market. The market does not go where the policy thought it would or should. In fact, it went somewhere quite different. And consistently you see this. The market sends one set of figures and the policy sends another idea. Those countries that have plunged down the energy path with vast coercive policies have ended up as frequently as not with an uneconomic energy basis. It's very difficult to tell the French that their nuclear dependence may be uneconomic (I'm not sure whether it is or not). But the South Africans for their own reasons developed a very expensive synthetic oil, with the Lurgi process, and the Statoil state-owned company. Brazil rues the idea that it would be self-sufficient through ethanol by growing an enormous amount of sugar cane, which could have been better used to produce rum (it would have made the consumers happier and reduced the economic burden to taxpayers).

The market and its friend, technology, changed everything. We talked about technology, but if we were not funding it as part of energy policy at the national laboratories, which of course were funding solar, wind, ocean thermal radials, and various other exotic ideas, we did not see that there were any other technologies. Look at what happened: natural gas changed – after seismic, we found more of it; horizontal drilling meant we extracted more of it. We were dead wrong in the '70s. Now, I was at a meeting recently where they were talking about a 1,000 year supply of natural gas (the same number given to coal in the '70s). We also developed a better machine in which to use it – the aero-derivative turbine and the heavy frame turbine with a lot of technological input from aero-derivative turbines. Technology came and side-swiped the best-laid plans that not insensibly followed the technology and high and dry were all of these exotic technologies that were going to produce the self-

(continued on page 14)

Perspectives on Energy Policy *(continued from page 13)*

sufficiency oil from shale, in situ gasification of coal, magnetohydrodynamics. These wonderful dinosaurs of ideas some of which still tick over in the secret places of the national laboratories where those who believe that one day we will repeat the '70s and they again can be men on horses, cantering.

In fact, it was not just government who got it wrong. Nobody got it more wrong than the oil companies, who rushed out and bought businesses they didn't understand – coal, they paid out enormous sums of money for shale leases, and they tried to get into the nuclear business. Others, believing that the oil business was finite, tried to get into real estate, office machines, and a series of things that they truly didn't understand – without great success.

I think we have reached a sort of maturity toward energy now that we do believe the market will take us where we have to go and that the externalities belong in other policies, such as security in the Middle East, the environment, the safety of supply. These are not energy questions. These, we now clearly see, are matters of national statecraft and I really think, preemptiveness. Because that is where we are. Let the market take care of the supply of the commodity, and many other complex relationships involved belong elsewhere, in other policies.

Shell North American Study *(continued from page 2)*

tion, as well as industry technology development and transfer across borders. Finally, Dr. Michot Foss is well known for her research and commentary on natural gas market developments in Mexico and North America. The CBA Energy Institute, housed in the College of Business Administration, will serve as the team's conduit to outside experts and as the distribution point for study results. The team's work-in-progress will serve as the basis for the CBA Energy Institute's North American Roundtable to be held June 5-7, 1996 in Houston. The Institute plans to engage in similar studies in other key world regions.

The \$100,000 grant is one of two first year awards in the five-year, \$1 million Shell Interdisciplinary Scholars Program at the University of Houston. The purpose of the program is to encourage interdisciplinary research and education at UH. "At Shell, we work in teams. Our concern is that students come out of universities prepared to work that way. Consequently, we need to foster interdisciplinary team-based faculty research, and we need faculty to extend that cooperation to academic courses and student involvement," says Mr. Phil Carroll, President and CEO of Shell Oil Company and member of the University of Houston Board of Regents.

The North American natural gas and electricity study will result in a new, interdisciplinary, team-taught course on North American energy transactions to be offered at the University of Houston in 1997. "Few universities in the world offer studies on international energy transactions and none are known to employ an interdisciplinary approach to the subject," says Professor Conine. The team members will also incorporate results and lessons from the Shell study into current course offerings.

Michelle Foss

How Much Profit Should Monopoly Networks Make?

Notes from the First BIEE Seminar on Competition and Regulation of Energy Utilities

Held on 6 March, this BIEE Seminar was opened by Dr. Tony White, former Head of Corporate Strategy, National Grid Company. The main points of his presentation were:

- The monopoly networks of gas and electricity (and also water) have regulatory regimes which seek to balance the interests of customers and shareholders. But the process of determining the acceptable level of profit is difficult since the evaluation of both the asset base and the appropriate cost of capital is uncertain. Moreover, there are problems in deciding how allowance should be made for future capital investment.
- The present system of cost regulation is RPI-x with periodic review. This has provided strong incentives to reduce controllable costs, but has done nothing to improve service, or provide appropriate signals for investments for the medium- to long-term.
- Even though the electricity and gas grids are often treated as "natural monopolies," they are not without risks, particularly if stranded assets such as under-utilized pipelines or wires or the pattern of gas or electricity supply were to change in the long-term.
- There would be advantages if regulation of the networks moved towards performance related regulation and away from undue emphasis on cost regulation and from the 5-year reviews. Performance against standards should be reflected in profits which would not need to be subject to review unless the rate of return fell outside a range of say, 4-11 percent. Such a system could provide real incentives over a range of policies, e.g., reduction of environmental impact.

In the ensuing discussion, points made included the following:

- It was not clear how performance targets would be set. The process would become politicized and thus subject to unpredictable variation.
- Perhaps the most important performance target related to the ongoing security of the networks and their ability to meet all reasonable demands (although there were differences of opinion as to what "reasonable" meant in this context.) In political terms, the risk aversion to system failure was very high.
- It was possible to introduce competition into the operation of the networks. The only real monopoly was control of the network. Operating services and installations could be sublet, and any "add-on" services developed by the network companies could be regarded as competitive activities.
- It might be possible to create a market in rights to use the capacity of Transco or the National Grid. This could provide signals on the economic value of new investments.
- The benefits intended to flow from privatization of the gas and electricity industries do not really apply to the monopoly infrastructures.
- The present regulatory framework discourages the network companies from promoting demand and load management.

DANISH ASSOCIATION FOR ENERGY ECONOMICS

In cooperation with THE INTERNATIONAL ASSOCIATION FOR ENERGY ECONOMICS

Presents

A Regional European Conference in Celebration of the 10th Anniversary of the Danish Association on:

TRANSPORT, ENERGY AND ENVIRONMENT

The importance of the transport sector in relation to energy demand and long term environmental goals.

To be held at Marienlyst, Elsinore, Denmark,
3-4 October 1996

The conference will focus on economic and broader policy issues as well as technological perspectives. Further, focus will be primarily on medium to long term aspects. The conference is primarily devoted to European issues, but papers addressing global aspects are also welcome. General conference themes:

- Transport sector in relation to energy demand and long term environmental goals
- Recent trends in transport energy demand
- Lifestyle changes and demand for energy and transportation
- Actions and policies to reduce urban air pollution
- Incentives and cost effectiveness of public policies
- Scope for further energy intensity improvements
- The potential for fuel substitution; towards non CO₂ fuels
- Implications for energy industries, the business sector and international trade

The conference is supported by the International Association for Energy Economics (IAEE) and the European Foundation for Cooperation in Energy Economics (EFCEE).

For more details contact:

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- There was room for differences of opinion on whether the cash flow arising from the operation of the monopoly should be "ring-fenced" and dedicated to either reducing charges or providing for investment in the networks; or whether such cash flow should be regarded as the property of shareholders, with the companies having discretion to diversify as they felt fit.

M. J. Parker

Forum of Energy Financiers

A forum of financiers gathered in Dallas, Texas on February 26-27, 1996 to discuss among themselves and with potential investors the prospects for financing oil, gas and power projects in Latin America. The Forum was chaired by Dr. Hossein Razavi, Chief of the Oil and Gas Division at the World Bank and comprised high level executives from:

- Multilateral financiers including World Bank, International Finance Corporation (IFC), Inter-American Development Bank (IDB), Inter-American Investment Corporation (IIC) and the Multilateral Investment Guarantee Agency (MIGA).
- Bilateral financiers including, U.S. Export-Import Bank, Japan Export-Import Bank, U.S. Overseas Private Investment Corporation (OPIC), Canadian International Development Agency (CIDA), Canadian Export Development Corporation (CEDC), U.K. Export Credit Guarantee Department (ECGD), and Italy's Mediocredito Centrale.
- Commercial financiers including Chase Manhattan, GE Capital, Societe General, JP Morgan, and Duetche Morgan Grenfell.
- Rating agencies, Standard and Poors and Moody's.

In addition, many high level executives of energy companies from Latin America, U.S. and Europe participated in the Forum.

The main theme emerging throughout the discussions was that there is no specific shortage of funds for investment and even for debt financing of energy projects in Latin America. Indeed, most financiers expressed interest in expanding the level of their involvement in the region. Also, most financiers stated that they had a much higher lending capacity than currently utilized. They would be interested in financing "sustainable projects" undertaken by "sustainable entities" in "sustainable economies."

Despite availability of sufficient funds, many energy projects do not proceed to the implementation stage due to difficulty in securing finance. The Forum speakers attributed the difficulty to the following factors:

- The lack of clarity and stability in the business environment. It was noted that in many of the countries in the region, the rules of the game are either unclear or keep changing. This is particularly true for the relationship between the public and private sectors, and the role of the government entities as producers, as well as, regulators of the energy sector.
- The problems in the ownership and security structures of the proposed energy projects. While there is a lot of interest in investing in the sector, and thereby, many potential sponsors for energy projects, financiers do not come until they see clear risk mitigation arrangements. Risk mitigation requires mobilizing support from the governments, multilateral and bilateral financiers, as well as, guarantee and insurance arrangements with parties involved in construction and operation of the project. A pre-requisite for satisfactory risk mitigation is a suitable ownership structure, and the ultimate evidence for effective

(continued on page 17)

International Conference on Petroleum Fiscal Regimes

United States Association for Energy Economics/School of Business, University of Alaska Anchorage/Journal of Energy Finance & Development/BP Exploration (Alaska)/USAE (Alaska Chapter)
May 2-3, 1996, Hotel Captain Cook, Anchorage, Alaska

Overview

Experts from the United States, Canada, and Europe will meet to discuss and assess the emerging changes in international petroleum fiscal incentives/disincentives and their implications for global energy competition, investment, and socioeconomic developments in petroleum producing nations.

Program

On Thursday, May 2, 1996, the following papers will be presented: State-of-the-Art of Petroleum Fiscal Systems Design by D. Johnston; The Risk of Fiscal Reform by R Marks; Is Fiscal Efficiency the Panacea for Investors and Governments? by M.Castellani; The Impact of Petroleum Taxation of Russian Oil Production by J. Smith; Caveat Emptor: Purchasing Petroleum Industry Investment with Fiscal Incentives by M. Berman; International Comparative Analysis of Fiscal Systems for Oil by P. Van Meurs; Roulette and Offshore Exploration Development and Production by K. Forbes, J. Diemer, D. Van Wagener, and E. Zampelli; Oil Prices, Taxes, and the Response of States to Reserve Depletion by Charles Logsdon; Alberta's New Generic Oil Sands Royalty Regimes by R. Mason, P. Precht, and B. Remillard; Enabling Better Policy Decisions for Fiscal Change by P. Burden; Inter- jurisdictional Competition, Resource Rents, Tax Exporting, and Oil and Gas Severance Taxes by M. Fagan and K. Forbes; The Comparative Effects of Petroleum Fiscal Systems on Development and Exploration Decisions by A. Kemp and P. Jones.

On Friday, May 3, 1996, the following papers will be presented: Fiscal and Regulatory Regimes in the Former Soviet Union by R. Weiner; Fiscal Regimes and LNG Projects by G. Benson and G. Wetzel; The Impact of Taxation and Foreign Exchange Controls on the Location of Petroleum Investments in the Former Soviet Union by R. Rolfe; Alternative Tax Regimes and the Survival Probability of Oil Firms by J. E. Portillo; Oil Pricing and Traffic Taxation in Austria by A. Jochlinger; The Impact of Petroleum Taxes on Residential Heating Oil Demand in Denmark by J. Bentzen; Fiscal Versus Non-Fiscal Incentives by G. Kellas; Tax System Interactions and Fiscal Incentives, by K. Sunnevag; Fiscal Impact of Marginal Oil Field Development in Alaska by S. Goldsmith; Financial Strategies and Economic Performance of the Major Petroleum Companies, by J. Siu, C.G. Krouse, and F. Weston.

Who Should Attend

- Specialists from Petroleum Companies
- Petroleum Economists in Petroleum Producing States and Nations
- Petroleum Taxation Specialists in State, National, and International Organizations
- Energy Investment Specialists/Financing Institutions
- Oil and Natural Gas Executives
- Academics Specializing in Energy Taxation, Finance, and Investment
- Energy Environmental Analysts

Registration

Registration fees are \$300 (includes registration materials, five meals, and many coffee breaks).

Registration Form

International Conference on Petroleum Fiscal Regimes

May 2-3, 1996 - Hotel Captain Cook, Anchorage, Alaska.

Name: _____
Title: _____
Company: _____
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City/State/Zip: _____
Phone: _____

Please return this form with check payable to "UAA School of Business" to: Dr. Musa Essayyaci, School of Business, University of Alaska Anchorage, 3211 Providence Dr., Anchorage, AK 99508.

Forum of Energy Financiers *(continued from page 15)*

tive risk management is a comprehensive security package.

- Fears about lack of sustainability. It was observed that the only hope for sustainable growth is an increase in domestic savings and development of domestic capital markets. In this regard, Latin America is facing a problem particularly when competing with Asia for capital resources. While national savings in Asia range between 30-40 percent, those of Latin American countries fall between 15-20 percent. With such low savings ratios, Latin American countries are becoming increasingly dependent on foreign flow of funds for their investment. This trend is one of concern for financiers who have previously experienced the debt crisis of the 1980s and the Mexican crisis of 1994.

The Forum of financiers analyzed a number of investment operations in the region to draw upon the lessons learned in each case. It was observed that most of the successful projects involved a "hybrid" of project-based and corporate-based financing. While pure project-based finance, with zero recourse to corporate sponsors, is practiced in the U.S., financing projects in developing countries does require some corporate sponsorship. The corporate sponsorship results in more effective implementation as well as less expensive financing arrangements. It was also noted that in the case of complex energy projects, joint ventures between private and state-owned entities are more likely to take off than projects sponsored by each side.

Hossein Razavi

Notes From the Polish Affiliate

At its February 26th meeting the Polish Affiliate of the IAEE elected Franciszek Krawczynski president. Mr. Krawczynski is Department Director in the Polish Ministry of Planning. Members of the Affiliate agreed to reorient the Association with the aim of taking a more active role in the Polish energy economy and in international activities with the objective of representing opinions of energy consumers in the hopes of influencing energy policy. The Affiliate now has 30 individual and five institutional members.

Zbigniew Mantorski

16th North American Conference Proceedings

The Proceedings of the 16th North American Conference of the IAEE/USAE held at Dallas, Texas, November 1994 and entitled *The World Oil & Gas Industries in the 21st Century* are available from Headquarters at \$55.95 for members and \$75.95 for nonmembers. Send check and order form below to IAEE Headquarters, 28790 Chagrin Blvd, Suite 210, Cleveland OH, USA.

Name _____
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Country _____

Conference Announcement

IEW/JSER'96

Joint IEW/JSER International Conference on Energy, Economy, and Environment

June 25-27, 1996

Osaka University Convention Center, Osaka, Japan

The following topics will be covered:

- National, regional, and global energy projections.
- Energy resources assessment: fossil fuels, renewables, and nuclear resources.
- Analysis of energy-economy interactions.
- Innovative energy technology in supply, end-use, and environmental protection.
- Policy analysis of climate change issues.
- Energy conservation and efficiency policies.

Sponsoring Societies:

International Institute for Applied Systems Analysis (IIASA)
Japan Society of Energy and Resources (JSER)

Collaborating Societies:

Power Engineering Society of Institute of Electrical and
Electronics Engineers (IEEE)
International Association for Energy Economics (IAEE)
Research Institute of Innovative Technology for the Earth
(RITE)

**Registration Fee: ¥30,000 before April 30, 1996
and ¥40,000 thereafter.**

The conference program will include technical and discussion sessions on the above topics. Some sessions for plenary and invited papers are also planned. Industrial visits and social programs will be arranged during and after the conference. The official language throughout the conference will be English.

The conference will be held as a joint meeting of the JSER and the International Energy Workshop (IEW). JSER has organized an annual Energy Systems and Economics conference for more than ten years; the IEW has jointly organized annual meetings since 1981 in the USA and Austria. The joint meeting will include important features of the traditional JSER and IEW meetings. It will include discussions around the results of the IEW Poll on energy projections and also feature sessions on broader energy and environmental topics such as CO₂ control and recycling technologies.

For Further Information Contact:

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E-mail: pak@ise.eng.osaka-u.ac.jp

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Spring 1996 Publications List

Regulating Power: The Economics of Electricity in the Information Age, Carl Pechman (1993). 256 pages. Price: \$90.00. Contact: Kluwer Academic Publishers, Order Dept., Box 358, Accord Station, Hingham, MA 02018-0358.

Service Opportunities for Electric Utilities: Creating Differentiated Products, Shmuel Oren & Stephen Smith (1993). 352 pages. Price: \$85.00. Contact: Kluwer Academic Publishers, Order Dept., Box 358, Accord Station, Hingham, MA 02018-0358.

From Regulation to Competition: New Frontiers in Electricity Markets, Michael Einhorn (1994). 296 pages. Price: \$110.00. Contact: Kluwer Academic Publishers, Order Dept., Box 358, Accord Station, Hingham, MA 02018-0358.

Electric Cooperatives: On the Threshold of a New Era (1996). 250 pages. Price: \$79.00. Contact: Denise Benoit, Public Utilities Reports, Inc., 8229 Boone Blvd., Ste. 401, Vienna, VA 22182. Phone: 703-847-7720. Fax: 703-917-6964.

World Oil Companies (1995). Price: \$312.00. Contact: FT Energy Publishing, Maple House, 149 Tottenham Court Road, London W1P 9LL, United Kingdom. Phone: 44-171-896-2698. Fax: 44-171-896-2276.

The Development of European Gas Markets: Environmental, Economic and Political Perspectives, Javier Estrada, Arild Moe and Kare Dahl Martinsen (1995). 352 Pages. Price £50.00. Contact: John Wiley & Sons, Ltd., Baffins Lane, Chichester, West Sussex, PO19 1UD, United Kingdom. Phone: 44-1243-770284. Fax: 44-1243-770225.

The Global Gas Guide. Price: \$995.00. Contact: PIW Publications, 575 Broadway, 4th Floor, New York, NY 10012. Phone: 212-941-5500. Fax: 212-941-5509.

System of Taxation in the Russian Oil and Gas Industry and the Problems of Attracting Foreign Investment. Price: \$375.00. Contact: PIW Publications, 575 Broadway, 4th Floor, New York, NY 10012. Phone: 212-941-5500. Fax: 212-941-5509.

Energy and the New China. Price: \$795.00. Contact: PIW Publications, 575 Broadway, 4th Floor, New York, NY 10012. Phone: 212-941-5500. Fax: 212-941-5509.

Petroleum in Singapore - 1994/95. Price: \$245.00. Contact: PIW Publications, 575 Broadway, 4th Floor, New York, NY 10012. Phone: 212-941-5500. Fax: 212-941-5509.

Natural Gas: Trade and Investment Opportunities in Russia and the CIS (1995). Price: £395. 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 Changing Politics of International Energy Investment (1995). Price: £395. 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.

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.

Calendar

21-22 May 1996, Central & Eastern European Power Industries. Brno, Czech Republic. Contact: Debbie Graham, Customer Services Manager, IIR, Ltd., 6th Floor, 29 Bressenden Place, London SW1E 5DR. Phone: 44-171-915-5055. Fax: 44-171-915-5056.

27-30 May 1996, 19th IAEE International Conference - "Global Energy Transitions: With Emphasis on the Last Five Years of the Century". Budapest, Hungary. Contact: IAEE Headquarters, 28790 Chagrin Blvd., Ste. 210, Cleveland, OH 44122. Phone: 216-464-5365. Fax: 216-464-2737. E-Mail: IAEE@IAEE.org

3-7 June 1996, The 6th International Energy Conference and Exposition - Energex '96. Beijing, China. Contact: Liu Feng, China International Conference Center for Science and Technology, 44 Kexueyuan Nan Road, Shuangyushu, Beijing 100086, China. Phone: 86-1-257-5681. Fax: 86-1-257-5691.

13-14 June 1996, Project Finance for Oil & Gas in Latin America. Houston, Texas, USA. Contact: Institute for International Research, 708 Third Avenue, 4th Floor, New York, NY 10017. Phone: 212-661-8740. Fax: 216-661-6677.

17-18 June 1996, Fundamentals of Cogeneration and On-Site Generation. Detroit, MI. Contact: AEE Energy Seminars, PO Box 1026, Lilburn, GA 30226. Phone: 770-925-9633. Fax: 770-381-9865.

12-14 June 1996, Managing the Powerplant in a Competitive Environment. Richmond, VA. Contact: Managing the Powerplant, 6155 Almaden Expy., #350, San Jose, CA 95120. Phone: 408-997-6474. Fax: 408-997-6487.

23-28 June 1996, Implications of the World Energy Balance: A Strategic Vision for the Future. Houston, TX. Contact: Beth Woodman, Deputy Director for Programs, The Mosher Institute, 2121 W. Holcombe Blvd., Houston, TX 77030-3303. Fax: 713-677-7727.

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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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WEB Marketing has agreed to expand its services and internet development to all IAEE members at phenomenal rates. If you are currently on the "net" or are considering gaining access, we strongly recommend that you contact WEB Marketing to inquire about their services. In particular, for those members who are currently on the web, the following services are now made available exclusively to IAEE members.

1. **FREE listing in the IAEE Directory** with a Hyperlink to your own E-Mail box and/or HomePage for one year. Log onto IAEE's HomePage and take our "Directory" option to enter yourself in the directory. You will be prompted to leave a descriptive listing of your areas of energy expertise. Members may then search the directory and then have direct access to either your E-Mail box or HomePage. This is a must for all IAEE members who wish to "network" over the "net". Please note that this free listing will only last for one year. Subsequent years in the IAEE Directory will cost \$15.00 and will be billed annually.
2. **HomePage, E-Mail Box and 600 words (text only).** WEB Marketing will custom design your own personal HomePage with an URL of "<http://www.IAEE.org/yourname>". Here you will be added as a SubPage under IAEE's own HomePage with your personal E-Mail Box. Those members regularly visiting IAEE's HomePage will have a greater chance to view your own HomePage to see the services and products that you have available. This is a must for energy consultants. Further, your name will be added into IAEE's Directory and no yearly fee will be charged. The costs for this service is: \$60.00 one time set-up charge - \$30.00 monthly charge.
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For those IAEE members who are interested in these services we recommend that you contact WEB Marketing directly at:

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Please identify yourself as an IAEE member in order to receive the above discounted prices. Gain access and a presence on the World Wide Web today!! Contact Web Marketing!!

Calendar (continued from page 18)

23-28 June 1996, 11th World Hydrogen Energy Conference - Hydrogen '96. Stuttgart, Germany. Contact: DECHEMA e.V., Tagungen, Theodor-Heuss-Allee 25, D-60486 Frankfurt am Main, Germany. Fax: 49-69-7564-304.

24-26 June 1996, Understanding Energy Derivatives. Mayfair Inter-Continental, London, U.K. Contact: The Customer Services Manager, The International Faculty of Finance, 2nd Floor, Market Towers, 1 Nine Elms Lane, London, SW8 5NQ, England. Phone: 44-171-344-3833. Fax: 44-171-344-0083.

25-27 June 1996, Joint IEW/JSER International Conference on Energy, Economy, and Environment. Contact: Assoc. Prof. Pyong Sik PAK, Secretary of NOC, Department of Information Systems Engineering, Faculty of Engineering, Osaka University, 2-1 Yamadaoka, Suita, Osaka 565, Japan. Phone: 81-6-879-7831. Fax: 81-6-879-7832.

28 June - 1 July, 1996, The Mechanics & Operations of Oil Trading. Durdent Court, Denham, Bucks, UK. Contact: Petroleum Economist, Baird House, 15/17 St Cross Street, London EC1N 8UN. Phone: 44-171-831-5588. Fax: 44-171-831-5313.

2-5 September 1996, National Energy Conference - CNE'96 "Improving Energy Efficiency in a Transition Economy". Neptun, Romania. Contact: CNE '96 Secretariat, c/o ICEMENERG, 8 Energeticienilor Blvd., 79619 Bucharest 3, Romania. Phone: 401-321-44-65. Fax: 401-321-10-10.

1-4 October 1996, 1996 Gasification Technologies Conference. San Francisco, California. Contact: James M. Childress, Executive Director, Gasification Technologies Council. Phone: 703-276-0110. Fax: 703-276-7662. E-Mail: jmchil@aol.com

28-30 October 1996, 17th Annual North American Conference of the USAEE/IAEE - "(De)Regulation of Energy: Intersecting Business, Economics and Policy". Boston, Massachusetts, USA. Contact: USAEE/IAEE Headquarters, 28790 Chagrin Blvd., Ste. 210, Cleveland, OH 44122. Phone: 216-464-5365.

Fax: 216-464-2737. E-Mail: IAEE@IAEE.org

29 October - 2 November 1996, Energy and Power 1996 - EP China '96. China International Exhibition Centre, Beijing, P.R. China. Contact: Mr. Perry Tang, Adsale Exhibition Services Ltd., 14/F, Devon House, Taikoo Place, 979 King's Road, Quarry Bay, Hong Kong. Phone: 852-25163346. Fax: 852-25165024.

26-30 November 1996, 2nd Conference: Dam Safety Evaluation. Trivandrum, India. Contact: C.V.J. Varma, Member Secretary, Central Board of Irrigation & Power, Malcha Marg, Chanakyapuri, New Delhi-110021, India. Phone: 91-11-3015984/3016567. Fax: 91-11-3016347.

4-6 December 1996, POWER-GEN '96 International. Orlando, Florida, USA. Contact: Laura Ariane, Conference Manager, PennWell, 3050 Post Oak Blvd., Ste. 205, Houston, TX 77056. Phone: 713-963-6236. Fax: 713-963-6284. E-mail: lauraa@pennwell.com

11 December 1996, SNS Energy Day 1996 "Is There a Large-scale Future for Biomass Energy in Industrialized Countries?" Stockholm Sweden. Contact: Susanne Rothschild-Lundin. Phone: 46-8-453-99-77. Fax: 46-8-24-22-44.

22-24 January 1997, 20th IAEE International Conference. New Delhi, India. Contact: IAEE Headquarters, 28790 Chagrin Blvd., Ste. 210, Cleveland, OH 44122. Phone: 216-464-5365. Fax: 216-464-2737. E-Mail: IAEE@IAEE.org

8-10 September 1997, USAEE/IAEE 18th North American Conference. San Francisco, California, USA. Contact: USAEE/IAEE Headquarters, 28790 Chagrin Blvd., Ste. 210, Cleveland, OH 44122. Phone: 216-464-5365. Fax: 216-464-2737. E-Mail: IAEE@IAEE.org

11-15 November 1997, Fifth Chemical Congress of North America. Cancun, Quintana Roo, Mexico. Contact: 5NACC Congress Secretariat, c/o American Chemical Society, Room 420, 1155-16th St., NW, Washington, DC 20036. Phone: 202-872-4396. Fax: 202-872-6128.

IAEE Newsletter

Volume 5, Spring 1996

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