

Editor: Marshall Thomas Contributing Editors: Paul McArdle and Tony Scanlan

Spring 1994

## President's Message



**THE FEEDBACK** that we have received so far on IAEE activities in 1994 indicates that the Association is continuing to develop in a resolute manner. Financially speaking, the situation is now perfectly healthy. This is in itself a source of satisfaction and at the same time it will give us more freedom to invest in what is the *raison d'être* of the Association. A considerable number of events - on a national or even local scale - are scheduled for this

year, and some of them are mentioned in this issue of the *Newsletter*. But we must pursue our efforts, and I have good hopes of seeing the foundation, in the course of this year, of three or even four significant new IAEE affiliates.

I hope you will forgive me if I dwell on a subject that I consider essential. The intellectual enrichment of the *Newsletter* - whose fundamental purpose is to serve as a link between members around the globe - is absolutely vital and must be furthered. I am sure a great many of you have something of interest to pass on to fellow members, whether it concerns coming events, or reports on past events, or simply studies or analyses you have found particularly pertinent. Please do not hesitate to send a brief text on any of the above subjects to Dave Williams or Marshall Thomas who, in liaison with myself and other Council members, will ensure that they are published as swiftly as possible.

I should like to take this opportunity of stressing the importance of our 17th International Conference which will take place in Stavanger from 25 to 27 May 1994. Our Norwegian friends who are organizing the conference have met with some practical problems for reasons beyond their control, but I think that everything is now going ahead satisfactorily and that it will be a success, in addition to the social and professional aspect of this annual international meeting. I do hope you will attend, for the added reason that the Norwegian fjords are extremely beautiful, especially at the end of May!

I cannot resist the temptation to end this message by mentioning a current concern that you no doubt share with me.

Crude oil prices have given rise to considerable appre-

hension, and rightly so, for more than six months now. For reasons with which you are quite familiar, it is the field of energy that has been particularly affected.

A version of a well known joke could consist in saying that when oil prices sneeze, the energy sector succumbs to flu. It has taken only a few weeks of extremely cold winter weather in North America, and to a lesser extent in Europe, for prices to rise, exceeding short term projections by about \$1.50/barrel.

The downturn has already begun, and it is likely to continue for some time, but this phenomenon, which could in fact be qualified as classic, illustrates the extent to which the exogenous aspects of what constitutes our daily life, in addition to the psychological aspects, have an impact on our business.

An International Association for Energy Economics, through the possibilities for exchange and contact that it provides, can certainly help us to better understand this type of reaction that is external to our market, and consequently to perform our daily work more efficiently, whatever the branch of energy we are involved in.

Jean Masseron

## The Newsletter Agenda.....

This issue contains a cross section of articles relating to *Consumer Nation Energy Policy Issues*. We are presently planning the summer edition with a focus on *Energy Producers Policy Issues*, and invite reader comments, ideas and written contributions. We are also looking ahead to surveying the opinions of the IAEE membership for the Energy Forecast and Outlook planned for next winter. Please give us your suggestions *now* so we can be sure to address all of the key issues in preparing the survey questionnaire.

## Best Paper Awards Announced

Campbell Watkins, IAEE past president and 1993 Acting Vice President for Publications, has announced the winners of the 1991 and 1992 Best Paper Awards. These awards are presented to the author(s) of the paper, judged to be the best,

(Continued on page 10)

Contents: President's Message; Best Paper Awards p 1 • Dangers of Consumer Energy Complacency p 2 • U.S. Energy Policy Perspective p 3 • Lithuanian Energy Reform p 5 • Finish and Danish Energy Policy; IEA Perspective p 6 • Sixth Mineral & Energy Forum p 8 • News from the Affiliates p 9 • Italian Natural Gas Consumption; Publications p 11 • Calendar p 12.

## The Dangers of Consumer Complacency on Energy Policy Issues

By Cyrus H. Tahmassebi\*

- *The price trend in world oil markets in the last few years has resulted in an atmosphere of complacency in most major consuming countries. The consensus view in these countries has been that there will be plenty of oil at the currently prevailing or even lower real prices for decades to come.*
- *Although this perception may seem plausible given the abundance of global fossil fuel resources and marginal production costs, a steady flow of oil at these assumed prices is by no means assured.*
- *Stagnant or declining oil revenues (in real terms) in the major oil exporting countries will make it difficult for these countries to make the necessary investments to generate adequate production capacity necessary for a stable world oil market.*
- *Our projections of the future supply/demand balance indicate that the uncertainty for all participants in the world oil markets grows very rapidly after the turn of the century. Since oil will continue to be the residual fuel and OPEC will remain as the residual supplier of oil, the brunt of this uncertainty falls on the shoulder of OPEC and oil companies who have to commit capital in E&P activities to generate capacity.*
- *The higher the degree of uncertainty on financial returns to energy-related investments, the greater the risk for supply interruptions, price volatility and dislocations in the world economy.*
- *Any policy initiative by the governments of the producing countries and of the major consuming countries or by both in cooperation with one another aimed at reducing uncertainty and increasing transparency should contribute to a better investment environment and should be helpful in augmenting other attempts to reduce or avoid harmful price volatility in the future.*

### Energy Complacency

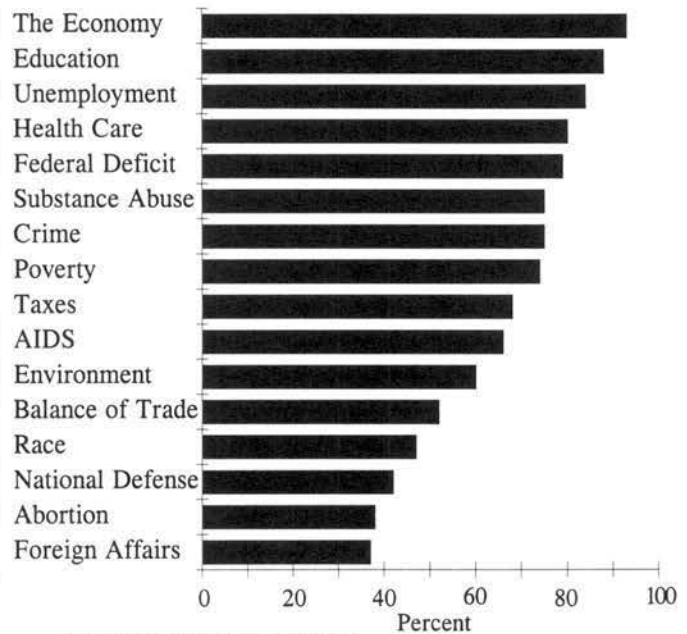
These days there is a sense of complacency in regard to energy issues in almost all major consuming countries. The general perception is that the world is endowed with plenty of energy resources including oil; therefore, its supply is likely to flow with little or not problem for decades to come. On the surface, there is a good justification for this perception. After all, except for a short period in 1990, oil prices have been under downward pressure almost continuously since 1981 - the Iran-Iraq War, the Gulf War and the historic events in the former Soviet Union, notwithstanding. Therefore, most people find it hard to imagine a scenario that could result in supply shortage or rising real oil prices on a sustainable basis.

### Energy: A Non-Issue

In order to give you an indication of the degree of this complacency, allow me to give you a couple of examples. In a Gallup/CNN/USA Today poll conducted in the United States, people were asked to identify and rank the "very important" issues facing the nation. Among the sixteen issues listed, the economy, education, unemployment and health care ranked as the top four. The last four issues on the list were trade balance, race, national defense and abortion. Guess where energy ranked? I am sorry to tell you that it was not even on the list. See chart in following column.

## U.S. Public Opinion: Energy: Not on the Agenda

What are the "very important issues?"



Source: Gallup/CNN/USA Today

### Price Volatility

Another example: In a recent gathering at one of Johns Hopkins University's SAIS seminars in Washington, a prominent energy economist predicted continued decline in oil prices and suggested the U.S. government liquidate the Strategic Petroleum Reserve (SPR) or substantially reduce its size. Well, if you are a trader, you certainly would like to see price volatility and, of course, would not mind seeing the SPR vanish. But if you are one with concerns over the long-term implications of price volatility, you can easily see that it is neither in the interest of the consumer nor the producer of oil to promote uncertainly and risk.

### Forecasting Credibility

The prevailing complacency seems to stem from the fact that most forecasters/analysts look at the current situation or the trend of the past few years and try to extrapolate that into the future. Forecasters using this approach naturally come to similar conclusions, because the same historical data are used and the models are often identical. The outcome is a consensus that by virtue of being the consensus receives an almost unchallenged universal acceptance. This is, of course, very unfortunate because, aside from its other adverse effects, it is the main reason for lack of credibility and respect for the forecasting profession.

### Major Alarm Bells

- It is a known fact that improved technology and possibly certain political considerations have resulted in assumed higher oil recovery rates in a number of major producing countries. This in turn has resulted in significant upward revisions in proven oil reserves. But as we all know, when it comes to hydrocarbons,

proven reserves should not be confused with actual productive capacity. This is particularly true about oil due to a long lead time needed to develop the fields. Proven oil reserves now stand at an all-time high, yet the global operating rate of the available production capacity is very close to 100%.

- Since the 1985-86 price collapse, world oil demand has risen by 6.7 mmb/d and almost all of the increment has been met by rising OPEC production. Among the non-OPEC group, U.S. crude oil production has fallen by some 1.8 mmb/d in the past 8 years while demand has risen by 1.4 mmb/d. These trends are likely to continue or at best to stabilize but are not expected to reverse.

Production and consumption in the former Soviet Union have the potential to rise, but the net effect is that its exports are unlikely to reach the 1988 peak before the turn of the century. Even then, it is not certain that Russia - where most of the oil reserves are - will allow unrestricted export of this strategically important commodity.

- Despite recessions or subdued economic growth since 1990, in almost all of the major industrialized countries, global demand for oil has remained strong. In fact, without the sharp declines in the former Soviet Union and Eastern Europe, global demand today would have been about 3.0-3.5 mmb/d higher than the 1990 level.
- Fuel switching and conservation efforts in the past two decades or so have had their major impact on heavy fuel oil or the bottom of the barrel. Now the consumption of these products has declined considerably limiting the opportunity for further conservation or fuel switching.
- In recent years, the rate of decline in both energy/GDP and oil/GDP ratios has slowed down considerably in a number of major consuming countries. Since oil is the residual fuel, a rebound in economic activity could easily result in a rising oil/GDP ratio in most of these countries.
- The surge in nuclear power capacity during the last two decades has stalled. While only a few plants are slated for commissioning in the years ahead, a growing number of existing plants are scheduled for relicensing and may be retired within the next 10-20 years.
- Future oil consumption growth will be in such light products as gasoline, diesel and heating oil. Taxing energy consumption, particularly these products, is not politically popular as was shown in the case of recent attempts in the United States. Moreover, unless the tax is very large it will have little effect on consumption as is indicated by rising demand in Western Europe and Japan despite their relative high gasoline taxes.
- China, with its large population, is poised for continued strong economic growth and will begin importing oil soon and become a major importer by the turn of the century.
- The bulk of the future increase in oil demand will have to be met by production increases in OPEC countries, all of the current

optimism about non-OPEC production potential notwithstanding. However, new capacity generation in OPEC countries is by no means guaranteed. In most of these countries, governments are facing huge budget and trade deficits of unprecedented magnitudes. In addition, the populace, which only a few years ago was affluent and had high hopes and aspirations for the future, is suddenly facing all kinds of financial hardships. The governments find themselves with very few alternatives but to keep the public satisfied with continued borrowings and subsidies.

Under these circumstances it is hard to see how these countries on their own can procure sufficient capital and make the necessary investments in a timely fashion to generate the needed capacity.

- The capital shortage might be mitigated if foreign oil companies are given enough economic incentives to return to these countries with money and technology. But constraints on such investments are now institutionalized in most of these countries, and in some cases it might take years to change them. Moreover, the ever-rising number of environmental regulations and taxes in the major consuming markets create a very uncertain future for the producing countries and oil companies. This uncertainly not only adds to the upstream investment risks, but also drains the cash flow needed to generate new production capacity. The \$37 billion price tag estimated for the implementation of the United States 1990 Clean Air Act Amendments is a good example of this type of cash drain.
- It seems that there is a false sense of security in the major consuming countries that somehow OPEC or some countries within that organization will *always* strive to maintain a certain amount of spare capacity to cope with production losses that may come about as a result of possible interruptions. A careful study of OPEC's past behavior repudiates this notion. By and large, OPEC has shown no inclination to generate *grassroots* capacity for standby purposes. The huge capacity overhang of the 1980s was never planned. Given their current financial constraints and other priority items, it is difficult to see how they can afford or justify such an investment now or in the foreseeable future.
- Despite past efforts, almost all of the OPEC countries continue to be highly dependent on their oil revenue. However, our calculations show that even in the best world scenario, OPEC's per capita oil revenue is likely to fall short of levels achieved in the early 1980s. With rising population, stagnant or declining oil revenue (in real terms) the financial challenges facing OPEC countries are likely to grow and linger on for many more years. This in turn could result in serious political instability in at least some of these countries with far reaching implications for the world oil markets.

\* Cyrus H. Tahmassebi is Chief Economist & Director of Market Research of Ashland Oil Inc.

## U.S. Energy Policy Perspective

By Ted Eck\*

*The United States remains the world's largest single market for energy. Over 75% of U.S. primary energy comes from oil and gas, with another 20% from coal. Energy policy shifts in the U.S. are often precursors for what happens in other countries. And U.S. policies in other areas - tax policy and foreign policy are good examples - can also impact global petroleum and energy markets.*

## Clinton Policy

We have had a new President and Administration in Washington for about a year now. They came into office promoting a host of new ideas on energy policy. However, more pressing matters have commanded their attention, and some of these issues - such as health care, foreign policy, and the federal budget deficit - are likely to dominate the U.S. political agenda through 1996.

It appears so far, that any shifts in energy policy from the

*(continue on page 4)*

Clinton administration or from the current American Congress are going to be modest and gradual, not sweeping or radical. And I think that is a favorable report: experience has certainly shown that sudden shifts in U.S. energy policies can be costly and counterproductive.

While I don't see big changes in U.S. energy policies, there are still a lot of incremental policy changes taking place that reflect the interplay of political pressures, shifting market forces and, most importantly, the continuing phase in of laws and regulations enacted in past years.

### **The Challenge of Environmentalism**

Over the nineties, the United States is gradually implementing the provisions of the Clean Air Act Amendments of 1990 - potentially the most extensive set of environmental laws adopted anywhere. The Energy Security Act of 1992 committed the United States to a number of initiatives to substitute alternative fuels for petroleum in motor vehicles with an eye to curbing the growth in oil imports.

And just last fall, the Clinton administration announced that it intends to move the United States towards compliance with the Rio treaty targets on carbon emissions, although its plan emphasizes gradual, voluntary measures rather than rigid controls and limits on energy use. Finally, states and local governments - especially in congested urban areas - are also setting tighter and tighter controls on emissions.

This makes for a very crowded menu of energy and environmental initiatives for the U.S. Some of these goals will be beyond our reach, but the process of sorting this all out is not without risks for energy producers. I can note one very welcome development: I think we are starting to see signs that environmentalism is maturing from an era of challenge and confrontation into one where economic cost and benefit tradeoffs are recognized in the political process and cooperation is the key to progress.

### **The BTU Tax Debate**

One indicator of this shift to a more pragmatic theme in environmental politics was the ill-fated proposal of the Clinton administration to impose a "BTU tax" on all energy used in the United States. Although the tax was hailed by environmental activists, the voting public turned against the levy when it became apparent that it offered only nebulous environmental gains and would have a very detrimental impact on economic growth and jobs, especially in energy-intensive industries. As a compromise, the U.S. adopted a motor fuel tax increase of about one cent a liter.

Now even pro-environmental politicians in the U.S. are acknowledging that carbon taxes or other steep environmental levies can't be sold to the voters. And we are hearing similar stories from other countries. This isn't to say that there will be not further efforts to clean up the environment or that these efforts are undesirable. But voters and taxpayers are seeking solid payoffs for their environmental dollars. Henceforth, environmental technologies are going to have to demonstrate economic viability in addition to technical feasibility.

### **Petroleum/Natural Gas & Fuel Switching**

What does all this mean for the petroleum industry? In the case of the United States - and, I suspect, many other countries as well - the most cost-effective way to cut

emissions of carbon, sulfur, volatile organic and nitrogen oxides is to replace coal and oil in stationary applications with natural gas. In the U.S., relatively little oil is used in stationary heating applications. The remaining market is one where oil offers special advantages (such as flexibility in supply arrangements or lower transportation costs) over competing fuels. Thus, I expect most fuel switching will be from coal to natural gas.

From a practical point of view, there really aren't any fuel substitution options "on the shelf" that can compete with gas for full-scale implementation. Today, a state-of-the-art combined cycle gas turbine electric plant can deliver a kilowatt of power producing about 60% less carbon emissions than a coal-fired steam plant, with comparable reductions in most other pollutants.

Technically, nuclear power could also eliminate a lot of carbon emissions, but nuclear faces even worse political obstacles than fossil fuels. In the United States, prospects are for nuclear electric output to decline as older plants are decommissioned and no new plants are being built.

### **Alternative Fuels**

And in spite of years of intensive research into alternative energy modes, the world's transportation fuel of choice remains petroleum. There are a number of technical alternatives available in the motor fuel market, based either on natural gas (CNG, LPG, and methanol) or biomass (ethanol). I believe some of these fuels will claim a share of the gasoline market, especially where they can improve air quality. Electric autos also get a lot of favorable attention by people who forget that the electricity has to come from somewhere, in most instances from a coal-fired electric plant.

Absent subsidies or special tax treatment, these alternative vehicle fuel systems are more costly than petroleum, and in some instances, bring with them serious new environmental problems. I predict that petroleum will continue to dominate this market for several more decades.

I also believe the automobile is here to stay. Self-anointed pundits blame the auto for many problems, while overlooking the benefits of mobility, convenience and comfort that continue to make the auto one of the most desired consumer goods the world over. Engineering improvements in emissions control technology have been spectacular, and I have been told that new cars in Los Angeles are emitting exhaust with lower levels of volatile hydrocarbon pollutants than the incoming air.

Draconian measures to force everyone into 60 mpg autos aren't politically marketable. In both the United States and other countries, the consumer has consistently opted for comfort and performance over fuel economy. Around the world, per capita vehicle ownership and vehicle miles traveled continue to grow. This is also true in the United States, despite years of dire forecasts that the auto market is saturated.

### **Energy/Economic Outlook**

Oil and gas demand growth in the industrial countries has been soft due to the concurrent economic slowdowns in the United States, Europe and Japan. Although the industrial world has enjoyed lower real oil prices since 1985, the price-induced demand response has been weak. In part this may be due to higher taxes on refined products in consuming coun-

tries claiming part of the price decline. But more importantly, it indicates that the energy conservation moves of the past two decades have eliminated most low-valued, marginal oil uses. The remaining oil demand is relatively price inelastic, as the economics of most substitute fuels aren't competitive at prices below \$25 to \$30 a barrel or more. Overall levels of income and economic activity are far more critical determinants of oil demand than variations in crude and refined product prices.

The U.S. economic recovery is starting to quicken its pace, and I expect to see improvements in other key industrial economies this year. For the longer term, I expect to see world oil demand growing at roughly 2% a year. And this may be a conservative forecast: a lot depends on how rapidly the economies of the developing world expand, and how

dependent they are on petroleum to fuel that expansion. A decade of comparative peace plus healthy growth in trade and income could push vary hard on world oil production capacity by the end of the nineties.

World natural gas demand is a more nebulous concept due to the separation of the markets, but all in all, I expect natural gas will continue to be the fastest growing world energy source over the next decade.

I am also confident that this growth in oil and gas demand does not portend bad news on the environmental front. We have made great strides in curbing pollution over the past two decades while still enjoying the economic benefits we gain from oil and gas use, and I see no reason why this record of progress should not continue.

\* *Ted Eck is Chief Economist, Amoco Corporation*

### Lithuanian Energy on the Way to Reform

Lithuania has undergone a drastic political transformation as a result of its withdrawal from the Soviet Union on 11 March, 1990. Efforts are being made to follow a policy of economic reform and closer relations with the West. However, the general downturn in Europe together with the difficulties experienced in the transition to a market economy have produced a severe downturn in Lithuanian economic activity. The energy sector has been severely impacted.

The energy sector of Lithuania is of primary concern not only because of its importance in the economic development of the country, but also for the large potential for export of processed electricity and refined petroleum products. However, the Lithuanian energy sector is almost totally dependent on imports from the former Soviet Union, mainly Russia.

Following independence, the country moved to establish an institutional and economic structure compatible with political and economic democracy. Along these lines, in March of this year the Committees of Seimas (Parliament) started to debate a draft of the Energy Law. The proposed Energy Law sets forth the following objectives for energy policy and also gives an indication of how these are to be achieved:

- Efficiency: by implementing, wherever possible, comprehensive

competitive measures to reduce production costs, or through regulation as needed; and through the promotion of conservation and similar measures.

- Diversity: by striving to expand energy sources to ensure that supply does not rely heavily on a single country, region or contract and to establish a reasonable mix of energy supply among the various types.
- Reliability: by setting strict regulations to ensure supply continuity and quality so as to avoid unreasonable interruptions and quality variations.
- Environmental protection: by establishing strict guidelines for the issuing of permits for and construction of new installations, including the specification of anti-pollution equipment, if necessary, and the establishment of procedures to ensure compliance.
- Outside financing: by establishing clear and consistent "rules of the game" so as to attract local and/or foreign financing and alleviate the need for government funding.

An Energy Agency, a new body of the Ministry of Energy, was established in October 1993 with its primary task being to support the implementation of Lithuanian energy policy.

Lithuania is confident that with the help and cooperation of other European states as well as the Western World, it will be able to achieve its energy objectives.

*Anzelmas Bacauskas*

## Conference Proceedings 16th IAEE International Conference Nusa Dua - Bali, Indonesia, 27-29 July 1993

The Proceedings from the 16th International Conference of the IAEE in Nusa Dua - Bali, Indonesia, are now available for purchase from IAEE Headquarters. Entitled *Energy, Environment and Sustainable Development: Challenges for the 21st Century* (a three volume set), the proceedings are available to members for \$144.95 and to non-members for \$208.95 (includes postage and handling). 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:

Order Department, IAEE Headquarters, 28790 Chagrin Blvd., Suite 210 Cleveland, OH 44122, USA.

Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Mail Code and Country \_\_\_\_\_

Please send me \_\_\_\_\_ copies @ \$144.95 each (member rate) \$208.95 each (nonmember rate).

Total enclose \$ \_\_\_\_\_ Check must be in U.S. dollars and drawn on a U.S. bank.

## Finnish Affiliate Plays Role in Energy Policy

The last twelve months have seen considerable activity in Finnish energy policy. The most significant issues have been a decision by the Finland Parliament to reject construction of a fifth nuclear power unit and to introduce an energy/environmental tax. Extensive work on electricity market reform is also going forward as is development of a programme to support the use of bioenergy.

The Parliament's decision to reject construction of the nuclear power unit came after several years of public debate and despite the Government's early 1993 recommendation that the project be undertaken. Two nuclear power companies had submitted a joint application for construction approval in May 1991. Parliament's vote was 107 against construction; 90 in favor.

In conjunction with the construction rejection, Parliament urged the Government to develop a white paper on Energy Policy that, among other things, would provide recommendations relative to energy conservation, improving energy efficiency and the restriction of CO<sub>2</sub> and other emissions. The Government submitted the white paper in November.

The subject of energy and environmental taxation was studied in the Environmental Economics Committee which had been set up to investigate ways of applying environmentally related economic controls to the energy sector. The Committee proposed a tax which has both an energy component and a CO<sub>2</sub> component. In the case of heavy fuel oil, for example, 75% of the tax would be collected on the basis of CO<sub>2</sub> content, and 25% on the basis of energy content.

A new tax, much along the proposed lines, was introduced on January 1. Electricity is, in general, taxed according to its energy component, though nuclear generated and imported electricity carry additional (politically inspired) taxes. Renewable energy sources such as wood, wind energy and waste used for energy production is not taxed.

Though the new taxes are not expected to appreciably raise total energy costs, the prices of fossil fuels will increase; coal by about 11% and natural gas by about 7%.

The Finnish Association for Energy Economics (FAEE) was actively involved in the country's energy issue discussions. Special meetings were held on the Economics of Energy Taxation, State Aids and Bioenergy and Electricity Market Reform. Those interested in further information may contact the Secretary of the FAEE, Ms. Virve Rouhiainen, fax 358-0-6940896.

*Pekka Tervo*

## Current Issues in Danish Energy Policy

This year's program of the Danish Association of Energy Economics has focused on some of the main issues in energy policy. At all meetings either new research reports or policy documents have been the starting point of the discussions.

In 1993 The Council on Competition published a report on the Danish energy sector, claiming that competitive forces were weak or absent not only because of natural monopolies but also due to non-market

type regulations and a complicated and differentiated energy tax structure.

In the autumn of 1993 the government published a revised version of the Danish energy action plan called "Energy 2000". The primary goal is to reduce CO<sub>2</sub> emissions by 20 percent compared to the 1988 level before the year 2005. The plan was established in 1990, but in 1993 the measures taken so far were seen as insufficient. The potential for further reducing CO<sub>2</sub> emissions are seen to be largest on the supply side, where substitution of natural gas, biomass, etc. for coal and oil may give a significant contribution. The revised plan of Danish energy policy was discussed at two meetings of the Association. At the first meeting the Minister of Energy presented the revised plan and at a subsequent meeting the planning assumptions, i.e., demand and supply forecasts and energy price scenarios, were discussed in relation to the assumptions about the contributions from various parts of the energy sector to the overall CO<sub>2</sub> goal.

The major focus on CO<sub>2</sub> has led to several attempts to estimate the costs of reducing Danish emissions. Thus, comparison of results from different types of models/approaches to assess the cost of emission reductions were on the agenda of a recent meeting. In Denmark as in other countries "bottom up" approaches produce lower average cost estimates of emission reductions than "top down" approaches using economic simulation models while marginal cost estimates are more in line with each other.

One of the issues for discussion is the contribution from the consumption side. Simulation models compared with bottom up analyses usually assume a larger fraction of the reduction to come from demand reductions. Up to now energy taxes have been levied almost exclusively on private households. Since this is less efficient than general taxes on all types of energy consumption the economic effects of introducing energy taxes (and green taxes in general) on the business sector has been put on the political agenda. One of the main concerns is, of course, if it is possible to introduce green taxes on the business sector without hurting international competitiveness of the economy. A report to be released in April this year, which claims that this will in fact be possible under particular conditions, will be the subject of the next meeting of the Association.

*Jørgen Søndergaard*

## The IEA Perspective

The IEA's recently released *World Energy Outlook* (extended to 2010) has received wide distribution and detailed attention in numerous forums. While it reflects many revisions from the *Outlook*, published three years ago, it is based on the assumption that currently enacted energy policies will continue unchanged.

There are four key assumptions which are detailed on the next page since they provide a central framework for the analysis and forecast:

**Economic Growth**

- Projected economic growth (World GNP up over 60%, Asia up over 180%) will lead to significant increases in energy demand.
- Even more important than the income level in the developed economies, however, has been the double-digit growth rates seen in other parts of the world. The non-OECD world is taking over as the major user of energy in the world - non-OECD countries will soon be consuming over 50% of the world's energy.
- If the soaring growth rates in Asia continue, the region's energy needs will double during the 1990's and demand will continue rising thereafter at very significant rates.
- Regarding China and India, with a combined population of almost two billion, there is massive pent-up demand for all goods, but particularly for consumer goods.

**World Population**

- World population expected to increase by almost 1.5% per year from 1991-2010 or 35% between 1990 and 2010, with ROW accounting for almost all of that increase. That's 1-1/2 new Chinas - almost 2 billion more people in 2010 than 1990. Basically, world incremental population is almost equal to a new China every ten years or so.
- Population in Asia is assumed to grow at 1.6% per annum. This is slower than regions such as the Middle East and Africa and broadly similar to that of Latin America, but considerably faster than that of the OECD.

**Energy Prices**

The new *Outlook* assumes oil and gas prices are considerably lower than in the previous outlook, which was \$35 in '90 dollars by 2000 for oil. IEA has examined a \$20 reference case and has presented the results in the outlook. However, because the demand for oil is, in its view too high at \$20, they believe \$30 in 1993 dollars by 2005 and flat to 2010 is more reasonable.

**The New Independent States**

- Developments in the New Independent States (NIS), particularly in Russia, will be important on the supply and demand side of the energy market.
- Russia was the largest producer of oil in the world, but output has tumbled 30% since the collapse of the previous regime. Where

*(continued on page 9)*

**\*\*\*Call for Papers\*\*\*  
The 16th Annual North American Conference**

***"The World Oil & Gas Industries  
in the 21st Century"***

**Fairmont Hotel, Dallas Texas  
November 6-9, 1994  
Concurrent Sessions Will Include:**

World Industry View      Coal, NG & Electricity Issues  
Exploration/Refining Economics      Nuclear Power Issues  
Interfuel Competition      Energy Conservation Efficiency  
Futures & Risk Management      Energy & Policy Economics  
Environment & Regulation      Renewable Energy Resources

**Deadline for Submission of Abstracts: July 1, 1994  
All Abstracts and Inquiries should be submitted to  
David Williams, Executive Director, IAEE  
28790 Chagrin Blvd., Cleveland, OH 44122 USA  
Phone/Fax: 216-464-5365**

**Advertise in the IAEE Newsletter  
1994 Ad Rates**

1/4 Page	\$250
1/2 Page	\$450
Full Page	\$750
Inside Front/Back Cover	\$900
Outside Back Cover	\$1100

For complete details, please contact:

IAEE Headquarters  
28790 Chagrin Blvd., Ste. 210  
Cleveland, OH 44122 USA  
Phone/FAX: 216-464-5365

**Conference Proceedings  
15th IAEE North American Conference  
Seattle, Washington, 11-13 October 1993**

The Proceedings from the 15th North American Conference of the IAEE held in Seattle, WA, USA are now available from IAEE Headquarters. Entitled *Energy and the Environment*, the proceedings are available to members for \$50.95 and to non-members for \$70.95 (includes 1st class 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:

Order Department, IAEE Headquarters, 28790 Chagrin Blvd., Suite 210 Cleveland, OH 44122, USA

Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Mail Code and Country \_\_\_\_\_

Please send me \_\_\_\_\_ copies @ \$50.95 each (member rate) \$70.95 each (nonmember rate).

Total Enclosed \$ \_\_\_\_\_ Check must be in U.S. dollars and drawn on a U.S. bank

## Sixth Minerals and Energy Forum

From March 16 to 18, around 250 delegates from 25 nations gathered in a sunny, but cool, Beijing for the Sixth Minerals and Energy Forum (MEF). Organized by the Pacific Economic Cooperation Council (PECC), the theme of MEF6 was **Open Regionalism and Sustainable Development: Challenging the New Limits to Growth**.

In the Forum's welcoming address, Rong Yiren, Vice President of the People's Republic of China, emphasized the need to meet the challenges in the mineral and energy sector so as to promote sustained regional economic cooperation within the framework of open regionalism. He noted that with intensified reform and opening up and continued rapid economic growth, China's economic ties and trade with other countries, especially with regional economies, are developing vigorously.

As befitted the Forum's theme, regional environmental issues dominated most sessions, with the opening day line up of Ian Gould, Boum Jong Choe, Guy Caruso, Robert Price, Hidetaka Sacki, and Tom Waring stressing the economic growth and trade opportunities for the region, but flagging the increased level of environmental concern that this would create. The session's attention was drawn to the deep concern within Japan that the rapid expansion of China's coal-fired power station capacity, that is expected to occur in support of rapid economic growth, could create major problems of acid rain for Japan. Later in the conference this topic was touched upon again in the context of technology transfer and would appear to rank high for special consideration at the next MEF meeting.

A formidable array of experts was present to share views on "Developments in Regional Oil Markets." Dennis O'Brien led off with a snapshot of recent economic indicators for China, and growth projections through 1998. With real growth rates in China expected to average around 10% a year, and with similar growth patterns in many other countries in the region, O'Brien emphasized the role of the Asia-Pacific (A/P) region as the driving force for OPEC oil supplies. He also noted that US\$ 50 billion would be required for new refinery capacity in the region, and questioned where the finance was likely to come from.

Subruto extended the analysis to supply side factors, noting that the region was energy deficient, and emphasized the importance of cooperation between OPEC and the A/P region.

Fereidun Fesharaki gave a historical summary of global growth in oil demand, indicating the relatively recent role of the A/P region as the driving force for product demand and refining capacity. He anticipated that the shortage of diesel fuel would become critical over the next decade, and that China's import requirements alone would be so great that they would have a major impact on world prices. While there was an array of expectations regarding China's potential refinery capacity, it was difficult to predict how many would, in fact, be built.

Duncan Clarke followed with an oil supply profile for ASEAN to 2010, and Eugen Khartukov stressed that, with regard to energy issues, the Russian far east should be regarded as part of the A/P region, as it was gravitating towards its neighbors rather than the traditional distant western Russian markets. Local issues with regard to future

oil supplies and requirements were addressed by Chin-Lung Yeh and Hu Nairen.

As would be expected when an energy meeting is hosted by the world's biggest coal producer, the session on A/P coal trade was of great interest. Don Barnett gave his views on the changing pattern of coal trade in the region, and predicted that the traditional pricing structure, whereby the price of steaming coal was set by a relatively fixed formula below the price of coking coal, was about to change around, with steaming coal prices being the determining factor and coking coal receiving a premium on these prices. Wang Naixin gave a detailed review of China's great potential to expand its coal production significantly over the next few years, while Jorge Ochoa and Abraham Romero drew the audiences' attention to the fact that Colombia was intent on using its Pacific ports to ship coal to Asia, thereby introducing additional competition in the Japanese market in particular.

The coal session concluded with two environmentally-based papers. Lowell Miller looked at potential developments and current research emphasis in clean coal technology, while Tony Owen gave an illustration of the economic benefits of using coal gasification technology in China as compared with direct domestic combustion of coal.

Nuclear power was also on the program, which has become something of a rarity at recent energy meetings. Apart from the issue of lack of public acceptability in many countries of the world, the major concern was cost relative to traditional coal fired power stations (particularly for the developing nations of the A/P region). The combination of nuclear, coal, and the environment led to a stimulating session, with very diverse views expressed by participants in the debate.

The organization of MEF6 was first rate, thanks to the sterling efforts of Chris Findlay and Peter Crowley; and the quality of the sessions was reflected by the attendance record, which was excellent given that one of Beijing's major stores was located opposite the conference hotel. But I cannot close without paying tribute to our host nation. The immense level of enthusiasm and support given to this Forum by the Chinese was very evident, both in the sessions themselves and at the social events. One can only hope that the rapid "opening-up" of this nation permits it to take a far more formative role in energy and related policy matters at future meetings of international energy groups.

Tony Owen

### Call for Awards Nominations

The IAEE Awards Committee, chaired by Immediate Past President, Fereidun Fesharaki, seeks nominations for the IAEE Award for *Outstanding Contributions to the Profession of Energy Economics and to its Literature* and for the *Journalism Award*. Each nomination should be supported by suitable background information.

Please send your nominations by July 1, 1994 to:

Dr. Fereidun Fesharaki  
c/o Program on Resources  
East-West Center  
1777 East-West Road  
Honolulu, Hawaii 96848 USA



## NEWS FROM THE AFFILIATES

(Affiliates and Chapters are Urged to Keep the Editor Informed of Their Activities)

### Italian Affiliate Begins Active Year

The Italian Association (AIEE) organized two seminars in the first months of 1994. The first one on the *Quality and Environmental Impact of Motor Fuels* discussed the problems of several mogases (leaded and unleaded) and of noxious exhausted emissions from car engines. A representative of the Istituto Motori of Naples University presented an interesting report. This was followed by comments and discussions by several other experts.

A second meeting reviewed a recent book on the *Italian Refining Industry* by professors Amman and Ninni of IEFE (Istituto di Economia delle Fonti di Energia). The review was followed by considerable debate.

In the first months of the year the AIEE awarded its 1993 prizes to the best graduation theses concerning energy economic issues. Winners of the contest were two magna cum laude graduates: Guido Cervigni for an exhaustive work on the *Electrical Sector in United Kingdom and in Italy* and Leonardo Berlen for his work regarding *The Renewable Energies in Sahel*. Other theses submitted deserve special mention.

Seminar and meeting topics scheduled for coming months include:

- *The Rationalization of the Goods Transport Sector in Italy: Energy and Environmental Aspects*. This technical seminar was scheduled for mid April.
- *Rational Use of Energy in Eastern European Countries and the Former USSR*. This is a joint meeting with the EU and ISIS scheduled for mid May at the Technological Village

of Paliano (Frosinone).

- *Italy's Energy Policy: Notes and Suggestions for the Next Parliament*. This meeting/debate, planned with IEFE for around the end June, will review the crucial problems in the Italian energy field and submit recommendations to the new executive and legislature.
- *The Future Minimum and Maximum Price of Oil*. This stimulating seminar, planned with the IEFE, will be based on an Agip report.
- *Energy Saving Actions by Italian Industry: Evaluations and Analysis From the Pragma Research Panel Covering 1988-93*. This seminar will discuss improvements in energy efficiency, energy substitutions and other steps taken by Italian industry over the last five years.
- *New Electricity Tariffs: Analysis and Comments*. ENEL and other experts will discuss the new electric tariffs in Italy.

Looking farther ahead, AIEE is organizing an IAEE European conference on *Energy Strategy for Europe*. This is planned for April of 1995.

During 1994 the AIEE, in cooperation with other organizations, will be helping to develop a revised national energy accounting system. Still another project in development is an Energy Observatory and, finally, the Association is studying the publication of a quarterly letter entitled *Energia*, as an insertion to an existing Italian weekly magazine. Those interested in learning more about AIEE programs can contact the Association at 39-6-3227367 in Rome or 39-2-76006260 in Milan.

*Edgardo Curcio*

### BIEE - A Brief History

The British Institute of Energy Economics (BIEE) originated as a forum in London, formed in 1978 by a group of experts drawn from various backgrounds and sharing a professional interest in promoting a better understanding of "energy economics". By the time of the 1980 IAEE International Meeting in Washington, DC, a close link with the IAEE had been established that resulted in the BIEE becoming one of the first IAEE affiliates. Also by this time the BIEE had developed a relationship with the Royal Institute of International Affairs in London. The RIIA was ultimately to become BIEE's normal venue for meetings and the BIEE, RIIA and IAEE would subsequently collaborate on the annual Chatham House International Energy Conferences.

In 1984 BIEE was incorporated under the United Kingdom Companies Acts, and in 1985 it was registered as a charity. The declared objects for which the BIEE was established are "to advance education...., discussion and understanding of, and exchange of information upon all economic aspects of energy at both the national and international levels...." To this end the Institute is empowered to:

- initiate, promote, hold and generally arrange meetings, lectures, demonstrations, conferences, congresses and other functions,
- establish relations with persons, associations, corporate

bodies, government and international agencies,

- compile, maintain, provide, distribute, print, publish information, records, analyses and other works upon all questions affecting the objects of the Institute.

Today BIEE membership is over 200. Approximately 100 of these are individual members with the balance being representatives of some 30 corporate members.

The Institute is managed by a Council of up to 20 members. Lord Douglas Croham is currently President and Jane Carter Vice President. The 1993 Chairman was Peter Davies, Chief Economist of British Petroleum Company. The current Chairman is Fred Bonner, formerly Deputy Chairman of the Central Electricity Generating Board and a former Non-Executive Director of Nuclear Electric plc.

*Fred Bonner*

### IEA Perspective (continued from page 7)

will Russia go over the next two decades? If it recovers quickly, it would maintain its status as a major supplier of oil and of natural gas to European and world markets. If, on the other hand, Russia is not able to mobilize the requisite capital to finance the work-over of existing fields and the development of new ones, a continued decline in Russia's energy exports might occur. Either way, the future of Russia will be key to determining the changes we shall see in energy markets over the coming years.

*Guy Caruso, IEA Paris*

## Lithuanian Affiliate News

Founded in 1991, the Lithuanian Association for Energy Economics (LAEE) has been an active participant in energy policy discussions during the country's transition from a centrally planned to a more market oriented economy. As might be imagined, the energy sector's transition from a centrally planned, highly monopolized and heavily subsidized operation to a more commercial, market based system, needed careful planning. Lithuania's draft Energy Law was discussed by the LAEE and other institutions several times before its submission to the Parliament.

The LAEE has been involved in a number of conferences focusing on both Lithuanian and East-European energy subjects. In late 1992 the LAEE, together with the Lithuanian Energy Institute, organized a conference on *Improving Energy Efficiency in Former Centrally Planned Economies*. Among the issues discussed were the importance of market relations for an efficient use of energy resources, economic instruments for improving energy efficiency and higher efficiency in energy generation.

In 1993 the LAEE together with the Ministry of Energy organized an international conference on *The Restructuring of the Lithuanian Energy Sector*. The main goal of the conference was to discuss a strategy for the development and restructuring of the energy sector. Over

200 participated with 14 foreign countries being represented. The conference discussed development options for the electricity industry given the current very low level of demand and excess of generating capacity. It was concluded that no new major facilities are needed until at least the year 2000, however, investment in rehabilitation and technical renovation of existing facilities is clearly needed. Special discussion focused on the Ignalina Nuclear Power Plant. In as much as this is Lithuania's cheapest source of electricity, prevailing opinion was that it should be kept in operation. However, the facility needs major and expensive safety upgrades.

The conference also emphasized the critical situation in the heating sector and Lithuania's concern over the security of energy supply. Dependence on Russian delivery of oil and gas is very high. Use of alternative sources cannot be achieved without first building the necessary, and costly, infrastructure, such as storage and pipelines for crude oil and natural gas and oil unloading facilities. It was concluded that the cost of additional supply security could be significantly lowered if the infrastructure was developed for the needs of the Baltic region rather than for Lithuania alone. A recommendation to prepare an energy strategy for the Baltic countries similar to that which has been prepared for the Scandinavian countries emerged.

Vidmantas Jankauskas

## Singapore Affiliate News

In late September 1992, the Institute of Southeast Asian Studies (ISEAS), a non-profit regional research center based in Singapore, solicited from a number of professionals in the petroleum industry their opinions and possible interest in the setting up of a Singapore affiliate of the IAEE. The response was overwhelmingly positive, with frequent expressions that it was time Singapore did establish such a body, given that it is after all the center of the oil business in the Asia-Pacific (Singapore's dominate role in Asia as provider of petroleum refining, blending, and storage services, exporter of refined petroleum products, port of call for bunker and jet fuels, and spot market and price maker for the Asia-Pacific petroleum trade, as well as center for energy information services for the region is well known. Almost all of the world's petroleum companies - majors, independents and national oil companies have offices in Singapore, frequently as HQ's for their Asia-Pacific regional operations. At the heart of Singapore's oil industry, of course, are the refineries, which collectively constitute the world's third largest concentration of refining capacity after Houston and Rotterdam; this combined with one of the world's busiest sea-ports and a very advanced infrastructure have made the country the liveliest petroleum center in the Asia-Pacific.)

The IAEE Singapore Affiliate was registered on 9th September 1993. Membership rapidly rose to over 60 people by the end of the year, and the body's first (inaugural) meeting was held on the 1st of December 1993. The inaugural lecture "Global and Pacific Oil Markets: Key Trends and Implications" was given by Dr. Fereidun Fesharaki, a very appropriate choice given that he was that year's President of IAEE. An introductory speech was given by Mr. Tan Boon Teik who

is President of the IAEE Singapore Affiliate. The meeting was hosted by the Caltex Group, at their new premises in Caltex House at Raffles Place, and a welcome speech was given by Mr. Enrico Sismondo, General Manager of Caltex Operations Limited. The meeting was well attended, by about 40 members, and the lecture was reported in the press.

IAEE Singapore Affiliate is currently planning to have a second lecture by an eminent individual from industry or government.

Tilak Doshi

## Best Paper Awards (continued from page 1)

in the four calendar issues of *The Energy Journal*.

The 1991 Award goes to Cutler Cleveland and Robert Kaufman for their article in the second issue of the year entitled "Forecasting Ultimate Oil Recovery and its Rate of Production: Incorporating Economic Forces into the Models of M. King Hubbert." Both authors are from the Center for Energy and Environmental Studies and Department of Geography, Boston University.

Paul Joskow and Donald Marron were recognized with the 1992 Award for their article on "What Does a Negawatt Really Cost? Evidence from Utility Conservation Programs" in issue four of that year. Joskow and Marron are with the Department of Economics at MIT.

In announcing the awards, Watkins noted that the selection committee which he headed was composed of Paul Bradley, University of British Columbia, Michelle Michot Foss, University of Houston and Peter Odell, Professor Emeritus of Erasmus University.

Both awards will be presented at the 16th Annual North American Conference in Dallas, Texas, November 6-9 of this year.

## THE INTERNATIONAL ASSOCIATION FOR ENERGY ECONOMICS

Announces

The 18th Annual International Conference

### “Into the 21st Century: Harmonizing Energy Policy, Environment and Economic Growth”

To Be Held At The JW Marriott Hotel  
Washington, DC July 5-8, 1995

#### Plenary Sessions:

Robust Policies for the Next Century  
Energy Conservation: How Much  
and At What Cost?  
Energy Economics & Global Climate  
Change Strategies

#### Concurrent Panels:

Concurrent Panels will  
be planned shortly, and  
in the usual IAEE format

\*\*\*CALL FOR PAPERS\*\*\*

*Deadline for Submission of Abstracts: December 1, 1994*

All Abstracts and Inquiries should be submitted to:

David Williams, Executive Director  
28790 Chagrin Blvd., Suite 210, Cleveland, OH 44122 USA  
Phone/FAX: 216-464-5365

Organizing Chair: Dennis J. O'Brien  
Program Chair: Hill Huntington  
Arrangements Chair: Leonard L. Coburn

### Natural Gas: Over a Fourth of Italian Energy Consumption

Despite the economic recession's negative impact on total energy demand, Italy's consumption of natural gas continued to rise in 1993.

Total gas supplied by Snam to the domestic market during 1993 amounted to 49.6 billion cu.m., an increase of over a billion and a half cubic meters (over 3%) from 1992.

This increase in natural gas consumption compares with a 15.1% decrease in solid fuels consumption and a 2% decline in oil consumption in the Italian primary energy market.

The increase is particularly noteworthy given (1) a 37% decline in natural gas demand by the chemical industry, especially in the fertilizer sector, and (2) the milder winter of 1993 as compared with that of 1992.

These negative impacts have been more than counterbalanced by the growing penetration of natural gas both in the residential sector (residential consumption grew by 995 million cu.m. in 1993) and in other parts of the industrial sector.

Natural gas is continuing to increase its market penetration. In 1993 an additional 172 municipalities were connected to the gas network and 87 industrial factories were added.

Natural gas today supplies over a fourth (25.6%) of Italian energy needs and there are strong possibilities for further significant growth. Snam expects that by the end of the 1990s demand for natural gas will rise to 75 billion cu.m./yr.

In 1993 the gas supply of Snam came 35% from domestic

fields (Agip and other producers), 28% from Algerian gas imported by the Trans-Mediterranean gasline (and some LNG), 26% from Russian gas, and 11% from Dutch fields.

Snam, aiming to meet the increased demand for gas in coming years, is doubling the Trans-Med gasline system (already two subsea lines have been laid from Bon-Cape, Tunisia to Mazara del Vallo, Sicily) and is expanding the capacity of the gasline from Czech-Austrian border to the Austrian-Italian border (Trans Austria Gasleitung - T.A.G.), a project that will increase by 5.5 billion cu.m./yr. gas imports from Russia.

Edgardo Curcio

### Affiliate Directories Available

The 1994 IAEE Directory will be in members' hands very shortly.

Individual Affiliate directories are available from Headquarters upon request by the Affiliate President or Secretary. Headquarters will be glad to provide a camera ready copy of an Affiliate directory which the Affiliate can in turn reproduce and distribute to its members. Special formats for an Affiliate directory can be developed should an Affiliate desire this. There is no charge to Affiliates for this service. Contact David Williams at Headquarters.

### Publications

*Efficient Electric Motor Systems for Industry*, The United States Department of Energy. (DOE/PO-0008), Office of Energy Demand Policy. Phone: 202-586-4456.

*Electric Utilities: Moving into the 21st Century*, G. Enholm and J. Malko, 335pp., \$50. Public Utilities Reports, Inc., PO Box 17008, Arlington, VA 22216-9848, USA. Phone: 800-368-5001.

*Energy Efficiency in Process Technology*, P. Vilavachi, 1280pp., £210. Commission of the European Communities/Elsevier Applied Science, Chapman & Hall, 2-6 Boundary Row, London, SE1 8HN, United Kingdom. Fax: 44-71-522-9623.

*Minerals, Energy, and Economic Development in China*, James P. Dorian, 304pp, £35. Oxford University Press, Saxon Way West, Corby, Northants NN18 9ES, United Kingdom. Phone: 44-0-536-744964.

*Oil & Gas Journal*, Pennwell Publishing Co., 1421 S. Sheridan Rd., Tulsa, OK 74101 USA. Phone: 800-633-1656.

*The Oil Supply Mountain: Is the Summit in Sight?*, P. Barnes, £60. Oxford Institute for Energy Economics, 57 Woodstock Road, Oxford, OX2 6FA, United Kingdom. Phone: 44-865-311377.

*The Regulation of Public Utilities, 3rd Edition*, C. Phillips, 1050pp., \$65. Public Utilities Reports, Inc., PO Box 17008, Arlington, VA 22216-9848, USA. Phone: 800-368-5001.

*Regulatory Finance: Utilities' Cost of Capital*, R. Morin, 400pp., \$89. Public Utilities Reports, Inc., PO Box 17008, Arlington, VA 22216-9848, USA. Phone: 800-368-5001.

*Report on the Study of the Tax and Rate Treatment of Renewable Energy Projects*, The United States Department of Energy. (ORNL-6772), Office of Policy. Phone: 202-586-5659.

## Calendar

**25-27 May 1994, 17th IAEE International Conference.** Stavanger, Norway. Contact: Odd Anker Hassel. Phone: 47-2-53-10-34, Fax: 47-2534308.

**29 May - 1 June 1994, 14th World Petroleum Congress.** Stavanger, Norway. Contact: Congress Secretary, Mrs. AG Ellingsen, 14th World Petroleum Congress, c/o Statoil, PO Box 300, N-4001, Stavanger, Norway. Phone: 47-4-80-60-81, Fax: 47-4-80-60-20.

**8-9 June 1994, Electric Pricing and Market Policies.** Sheraton Carlton Hotel, Washington, DC. Contact: Executive Enterprises, Inc., 22 West 21st Street, New York, NY 10010 USA. Phone: 800-831-8333, Fax: 212-645-8689.

**8-9 June 1994, The Financing and Economics of Gas and Electricity Projects.** Cafe Royal, London, U.K. Contact: Monique Quant or Nicola Coslett, IBC Financial Focus Ltd., 57/61 Mortimer Street, London, W1N 7TD, England. Phone: 44-71-637-4383, Fax: 44-71-323-4298.

**16-17 June 1994, Restructuring of the Nordic Electricity Industry.** Sherton, Stockholm, Sweden. Contact: Monique Quant or Nicola Coslett, IBC Financial Focus Ltd., 57/61 Mortimer Street, London W1N 7TD, England. Phone: 44-71-637-4383, Fax: 44-71-323-4298.

**15-17 August 1994, Sixth International Conference on Thermal Energy Storage.** Espoo, Finland. Contact: Helsinki University of Technology. Phone: 358-0-451-3193.

**18-19 August 1994, Mineral Economics: Emerging Issues and Methodologies.** Golden, Colorado. Contact:

Conference Office, Mineral Economics, Colorado School of Mines, Golden, CO 80401-1887 USA. Phone: 303-273-3028, Fax: 303-273-3416.

**11-16 September 1994, World Renewable Energy Congress.** Reading, England. Contact: A.A.M. Sayigh, University of Reading, Dept. of Engineering, PO Box 225, Whiteknights, Reading RG6 2AY, England. Fax: 44-734-313-835.

**31 October - 4 November 1994, 27th International Symposium on Automotive Technology and Automation.** Aachen, Germany. Contact: Dr. John Soliman, 42 Lloyd Park Avenue, Croydon, England CR0 5SB. Phone: 44-81-681-3069, Fax: 44-81-686-1490.

**6-9 November 1994, 16th Annual North American IAEE/USAAE Conference.** Dallas, Texas, USA. Contact: David Williams, IAEE/USAAE Headquarters, 28790 Chagrin Blvd., Ste. 210, Cleveland, OH 44122 USA. Phone/Fax: 216-464-5365.

**8-10 May 1995, 1995 International Conference on Energy & Environment.** Shanghai China. Contact: Prof. Zhi-Hang Chen, Conference Chairman SIME, PO Box 482, 516 Jun Gong Rd., Shanghai 200093 P.R. China. Phone: 86-21-5435883, Fax: 86-21-5431258.

**8-13 October 1995, 16th World Energy Council Congress, "Energy for Our Common World: What Will the Future Ask of Us?"** Tokyo, Japan. Contact: Organizing Committee, Shuwa Kamiyacho Bldg., 4-3-13 Toranonmon, Minato-ku, Tokyo 105, Japan. Phone 81-3-3437-4727, Fax: 81-3-3437-4678.

### *IAEE Newsletter*

#### **Volume 3, Spring 1994**

The *IAEE Newsletter* is published quarterly in February, May, August and November, for and on behalf of the IAEE for distribution to its members. Items for publication and editorial inquiries should be addressed to the Editor, Marshall Thomas, at 28790 Chagrin Boulevard, Suite 210, Cleveland, OH 44122 USA. *Telephone and fax* 216-464-5365. Deadline for copy is 20th of the month preceding publication.

**Contributing Editors:** *Paul McArdle* (North America), Economist, US Department of Energy, Office of Policy, Planning and Analysis, PE-50, Washington, DC 20585, USA. *Tel:* 202-586-4445; *Fax* 202-586-4447. *Tony Scanlan* (Eastern Europe), 37 Woodville Gardens, London W5 2LL, UK. *Tel* 44-81 997 3707; *Fax* 44-81 566 7674.

**Advertisements:** The *IAEE Newsletter*, which is received quarterly by over 3000 energy practitioners, accepts advertisements. For information regarding rates, design and deadlines, contact the IAEE Headquarters at the address below.

**Membership and subscriptions matters:** Contact the International Association for Energy Economics, 28790 Chagrin Boulevard, Suite 210, Cleveland, OH 44122, USA. *Telephone and fax* 216-464-5365.

**Copyright:** The *IAEE Newsletter* is not copyrighted and may reproduced in whole or in part with credit given to the International Association for Energy Economics.

#### *IAEE Newsletter*

International Association for Energy Economics  
28790 Chagrin Boulevard, Suite 210  
Cleveland, OH 44122 USA

BULK RATE  
U.S. POSTAGE  
PAID  
Cleveland, OH  
Permit No. 1297